

# **VALENTINE NATIONAL WILDLIFE REFUGE**

**Valentine, Nebraska**

**Annual Narrative Report**

**Calendar Year 2011**

## **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 71,772-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 271 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 sub-headquarters located on Hackberry Lake, 17 miles south of the town of Valentine on US 83 then 13 miles west on State Spur 16B. Valentine National Wildlife Refuge staff also manages the Yellowthroat Wildlife Management Area in Brown County (see J.3) and four easements (see F.13).

[Type text]

INTRODUCTION.....	2
TABLE OF CONTENTS.....	3
A. <u>HIGHLIGHTS</u> .....	5
B. <u>CLIMATIC C. ONDITIONS</u> .....	7
C. <u>LAND ACQUISITION</u> .....	7
1. Fee title.....	7
2. Easements.....	ntr
3. Other.....	ntr
D. <u>PLANNING</u> .....	7
1. Master Plan.....	7
2. Management Plan.....	ntr
3. Public participation.....	ntr
4. Compliance with Environmental and Cultural Resource Mandates.....	7
5. Research and Investigations.....	8
6. Other.....	ntr
E. <u>ADMINISTRATION</u> .....	9
1. Personnel.....	9
2. Youth Programs.....	ntr
3. Other Manpower Programs.....	ntr
4. Volunteer Program.....	ntr
5. Funding.....	10
6. Safety.....	11
7. Technical Assistance.....	11
8. Other.....	11
F. <u>HABIATAT MANAGEMENT</u> .....	14
1. General.....	14
2. Wetlands.....	14
3. Forests.....	ntr
4. Croplands.....	ntr
5. Grasslands.....	16
6. Other Habitats.....	ntr
7. Grazing.....	23
8. Haying.....	26
9. Fire Management.....	27
10. Pest Control.....	30

[Type text]

11. Water Rights.....	44
12. Wilderness and Special Areas.....	44
13. WPA and Other Easement Monitoring.....	45
<b>G. <u>WILDLIFE</u>.....</b>	<b>46</b>
1. Wildlife Diversity.....	46
2. Endangered and/or Threatened Species (including plants).....	47
3. Waterfowl.....	56
4. Marsh and Water Birds.....	59
5. Shorebirds, Gulls, Terns, and Allies.....	60
6. Raptors.....	60
7. Other Migratory Birds.....	60
8. Game Mammals.....	61
9. Marine Mammals.....	ntr
10. Other Resident Wildlife.....	62
11. Fisheries Resources.....	71
12. Wildlife Propagation and Stocking.....	ntr
13. Surplus Animal Disposal.....	ntr
14. Scientific Collections.....	ntr
15. Animal Control.....	ntr
16. Marking and Banding.....	ntr
17. Disease Prevention and Control.....	ntr
<b>H. <u>PUBLIC USE</u>.....</b>	<b>74</b>
1. General.....	74
2. Outdoor Classrooms – Students.....	75
3. Outdoor Classrooms – Teachers.....	ntr
4. Interpretive Foot Trails.....	76
5. Interpretive Auto Tour Routes.....	ntr
6. Interpretive Exhibits/Demonstrations.....	ntr
7. Other Interpretive Programs.....	ntr
8. Hunting.....	76
9. Fishing.....	79
10. Trapping.....	80
11. Wildlife Observation.....	80
12. Other Wildlife Oriented Recreation.....	81
13. Camping.....	ntr
14. Picnicking.....	ntr
15. Off-Road Vehicling.....	ntr
16. Other Non-Wildlife Oriented Recreation.....	ntr
17. Law Enforcement.....	82
18. Cooperation Associations.....	83
19. Concessions.....	ntr

[Type text]

I. <u>EQUIPMENT AND FACILITIES</u> .....	83
1. New Construction.....	83
2. Rehabilitation.....	84
3. Major Maintenance.....	84
4. Equipment Utilization and Replacement.....	85
5. Communication Systems.....	ntr
6. Computer Systems.....	ntr
7. Energy Conservation.....	85
8. Other.....	ntr
J. <u>OTHER ITEMS</u> .....	85
1. Cooperative Programs.....	ntr
2. Other Economic Uses.....	ntr
3. Items of Interest.....	85
4. Credits.....	86
K. <u>FEEDBACK</u> .....	86

[Type text]

## **A. HIGHLIGHTS**

Searches and control of purple loosestrife and invasive phragmites was conducted on and around the refuge using an Early Detection Rapid Response Grant (see section F-10)

Trumpeter swans had a record nesting year (see section G-3)

Major repairs were made to refuge public use roads (see section I-2)

## **B. CLIMATIC CONDITIONS**

No temperature records (high or low) were set in 2011. Temperatures from January to May averaged from 0.3°F to 4.9°F below average. In December, the average high and low temperatures were 6.4°F and 3.8°F above average. Averaged for the year, high and low temperatures in 2011 were pretty close to the 2003-2011 averages. Total precipitation for the year was 5.23” above the average annual precipitation for Hackberry Headquarters (data from 1945-2011, Table B1). Three months (May, Jun, and Oct) had precipitation amounts greater than 1.7” above average for that month, versus one month (Apr) which was 1.4” below average. The remaining 8 months were all within 1” of the average precipitation for the month. Snowfall for the year was above the 2003-2011 average, and there was snow cover on the ground for about 47 days. Most of the snow fell in Jan-Apr, with only 3.5” of snow recorded in Nov-Dec. Temperatures starting the year (Jan-May) were all lower than average, but by the end of the year, the overall average across months was near the 2003-2012 average. Dec was unusually warm, with the high and low temperatures for the month 6.4°F and 3.8°F above average, respectively. Refuge lakes were ice covered until about 19 March, when 5 consecutive days of above freezing temperatures and strong south winds combined to break up remaining ice. Ice up in the fall took place in fits and starts; some ice formed as early as 20 Nov, but then several warm days opened everything up again. In early Dec, lakes began slowly freezing up, and ice covered the lakes by 7 Dec. Lakes remained mostly frozen until the end of Dec, when warm temperatures caused weakened ice conditions, and in Jan 2012 the refuge lakes were open water for a period.

A more detailed description of month by month weather conditions can be found on the biologist’s computer (C:\Documents and Settings\nennemanm\My Documents\mel\Work files\MAR, and C:\Documents and Settings\nennemanm\My Documents\mel\Work files\Weather).

[Type text]

Table B1. Monthly weather data summary from the weather station at Hackberry Headquarters, Valentine NWR, during 2011.

Month	Precip. (inches)	Snow (inches)	Temperature (° F)			Record Temperature (° F)					
			Min	Ave	Max	Ave	Min	Year	Max	Year	
Jan	0.99	9.2	-11	12.3	53	32.1	-38	1894	70	1974	
Feb	0.78	5.7	-14	13.6	69	36.8	-37	1899	76	1982	
Mar	0.95	13.4	2	25.0	69	46.8	-28	1948	87	1946	
Apr	1.28	8.0	22	35.7	76	57.7	-8	1936	97	1992	
May	5.00	0	31	44.9	86	66.6	17	1909	102	1934	
Jun	6.56	0	46	56.0	96	80.2	30	1973 <sup>a</sup>	107	1937	
Jul	2.89	0	60	66.6	100	90.0	38	1971	111	1990	
Aug	2.80	0	55	62.6	97	86.5	34	1935	108	1947 <sup>a</sup>	
Sept	1.49	0	34	48.3	94	77.5	12	1926	103	1952	
Oct	3.56	0	26	41.1	87	67.7	-6	1925	96	1922	
Nov	0.55	2.2	13	28.2	73	54.8	-36	1887	82	2010 <sup>a</sup>	
Dec	0.06	1.3	-1	20.6	60	44.6	-34	1907	76	1936	
Total	26.91	39.8	Average precipitation (1945-2011)								21.68

<sup>a</sup> Indicates the most recent year record was observed.

### **C. LAND ACQUISITION**

#### **1. Fee Title**

Steve Shuck from RO Realty visited the refuge on June 7. We are looking at re-starting the land acquisition process that was put on hold in 2003.

### **D. PLANNING**

#### **1. Master Plan**

In January a meeting was held to report on work accomplished in 2010 and to plan for work in 2011. Employees also reported on personal goals for last year and set goals for this year.

#### **4. Compliance with Environmental and Cultural Resource Mandates**

A request for engineering services and a request for archeological review were sent in for the Visitor Facility Enhancement fishing access project. A request for archeological review was also sent in for the repairs to the Calf Camp/Pelican Lake Trail which we plan on doing force account. Neither project required additional archeological work.

[Type text]

Preconstruction notifications for improvements to boat ramps and addition of docks at Duck, West Long, Hackberry, and Clear Lakes were sent to the Corps of Engineers. We already had the necessary clearance for the work at Pelican Lake. We will be doing the work under a nationwide Permit. We also applied for and received Water Quality Certification with the Nebraska Department of Environmental Quality.

## **5. Research and Investigation**

Following a meeting with Dr. Craig Allen from the Nebraska COOP Unit, the following research proposals were formulated and sent on to him. He has funds through IGERT to support graduate students for 3 years each. The refuge would need to provide support in the fourth year. We would like to get one student starting this year and one in 2012. The research proposals we proposed are; Koi Herpes Virus as a Carp Control Measure, Valentine NWR; Using Prescribed Fire to Control Bullsnares, Valentine NWR; Evaluation of Range Management Techniques for Carbon Sequestration, Fort Niobrara and Valentine NWRs; Woodland Restoration Within The Niobrara River Corridor, Ft. Niobrara NWR; Management Options For Combating Invasive Grasses In The Nebraska Sandhills, Ft. Niobrara and Valentine NWRs; Measuring the effectiveness of management treatments for controlling Kentucky bluegrass, Ft. Niobrara and Valentine NWRs; and Inventory of invertebrate communities in Sandhills grasslands and measure of their resilience to management; Valentine NWR; and Evaluation of techniques to control reed canary grass in areas populated by the federally threatened western prairie fringed orchid, Valentine NWR. None of the proposals were funded.

Special use permits were issued to Dr. Robert Gibson at UNL for grouse research and to Mark Kaemingk at SDSU for fisheries research.

### **b. Ongoing research at Valentine NWR**

Dr. Robert Gibson (professor/researcher from University of Nebraska-Lincoln) visited Valentine NWR in April to collect more data on stress hormone levels in displaying Sharp-tailed Grouse. The summary report that Dr. Gibson sent the refuge appears below.

1. We captured, blood sampled and banded 16 birds (14 males, 2 females) for hormonal analyses. This is to extend the analysis of stress physiology described in detail in last year's report. Our current goal is to examine changes in stress hormones through the season and try to link hormonal profiles to individual variation in lek behavior (see #2 below). The samples are frozen pending additional collections planned for 2012. Marked birds (with band ## and color band combinations) are listed below.
2. Working at a lek on Nelson's ranch just outside the refuge, my graduate student Sarah Cowles collected a detailed seasonal profile of male lek behavior along with data on individual variation in display performance and mating success (not yet completely analyzed). I also collected all day lek activity data using time-lapse video on several days. The most interesting pattern in the data analyzed so far is that males spent a non-trivial proportion of their time at the lek foraging ( $17 \pm 3$  %, during the first 2 hours of daylight),

[Type text]

that males foraged less ( $r = -0.498$ ,  $p = 0.026$ ) and displayed more ( $r = 0.799$ ,  $n = 20$ ,  $p < 0.0001$ ) as female numbers increased, and that there was a period of six consecutive days during the peak of female attendance and mating activity, when display peaked and males foraged very little while on the lek. Additionally, the video data showed that some males were on the lek for up to six hours daily at this time which suggests that they might not be eating enough to maintain energy balance. Consistent with this possibility, males during and trapped at the end this period included several in very poor condition (low mass relative to skeletal size). Collectively, these data pinpoint a context in which some males may experience the negative effects of physiological stress.

3. We counted a number of refuge leks and provided the data to Mel Nenneman for incorporation into the population census dataset.

Banded bird list

LEK (unit id)	DATE	Capt Time	SEX	AGE	BAND	Metal Band #
Pvt-1a5sw	4/10/2011	8:35	M	AD	BIOr/BIM	112
Pvt-1a5sw	4/10/2011	9:29	M	YR	BkY/YM	108
Pvt-1a5sw	4/12/2011	6:36	M	YR	RG/RM	113
Pvt-1a5sw	4/12/2011	8:01	M	AD	WBI/W	115
31C1	4/13/2011	7:02	M	YR	GW/GM	124
Pvt-1a5sw	4/24/2011	6:10	F	AD	M	153
Pvt-1a5sw	4/24/2011	6:10	M	YR	GP/GM	119
Pvt-1a5sw	4/24/2011	7:21	M	AD	YR/YM	114
14A4	28-Apr-11	5:47	M	YR	WW/WM	126
14A4	28-Apr-11	6:26	F	AD		143
14A4	30-Apr-11	5:57	M	YR	RW/RM	125
14A4	30-Apr-11	6:58	M	YR	RY/RM	127
14A4	30-Apr-11	7:13	M	AD	WOWM	123
Pvt-1a5sw	1-May-11	5:50	M	YR	PW/PM	118
Pvt-1a5sw	1-May-11	6:00	M	AD	null/OM	116
Pvt-1a5sw	1-May-11	6:10	M	AD	BIM/BIBI	103

Color bands are listed from top to bottom and left leg/right leg. Bk=black, BI=blue, G=green, M-metal stamped with NGPC address and #, O=orange, P=pink, R= red, W= white, Y= yellow.

This report can be found in C:\Documents and Settings\nennemanm\My documents\mel\work files\Birds\prairie grouse\Gibson data\VNWR 2011 Report.doc.

## **E. ADMINISTRATION**

### **1. Personnel**

Valentine National Wildlife Refuge is part of the Fort Niobrara/Valentine National Wildlife Refuge Complex with three permanent and one permanent part time staff assigned to the station.

[Type text]

A career seasonal maintenance position was transferred from Ft. Niobrara NWR to Valentine NWR to better balance the work load with available staff. Gordon Suhr started in this position at Valentine NWR on March 28.

#### Permanent Staff

Mark Lindvall	Refuge Manager	GS-12
Mel Nenneman	Wildlife Biologist	GS-11
Dave Kime	Maintenance Worker	WG-8
Gordon Suhr	Maintenance Worker	WG-8 career seasonal March 28 – Nov 4

#### Temporary Staff

Matt Coleman	STEP Biological Science Aid GS-0404-2	May 9 -Aug 19
Troy Nelson	STEP Biological Science Aid GS-0404-2	May 9 -Aug 12
Ethan Teters	STEP Bio Tech GS-404-3	May 9 –Aug 19
James Bachelor	STEP Laborer WG -3	May 9 –Aug 12
Shea Magstadt	Biological Technician GS-404-5	Jan 1 - May 20

Shea Magstadt continued his work at the Ft. Niobrara/Valentine NWR complex as a Term GIS technician until 20 May 2011, when he left for another term position in Crosby, ND. Shea was able to complete many GIS and map-related projects for Valentine NWR through the winter, including creating a map to be produced for sale that is expected to be popular with hunters, and perhaps useful for other refuge users, and he was able to bring all of the grazing records from Mark Lindvall's D-base file into RLGIS. This was a big undertaking, and having these records in GIS should help with grazing planning in the future.

Ethan Teter returned for a second summer of work at Valentine NWR. Ethan was eligible as a STEP hire as he will be a senior at CSC in fall 2011. With his summer of experience in 2010 at Valentine NWR, Ethan was very valuable because he was familiar with the surveys that are done, and the methodology used to complete them. He helped conduct most of the biological surveys and monitoring done on Valentine Refuge through the summer, including waterfowl pair and brood counts, blowout penstemon and western prairie fringed orchid surveys, and invasive plant mapping.

Individual development plans were prepared for Lindvall, Kime, and Nenneman.

## **5. Funding**

We received \$2,400 of equipment rental funds to rent a scraper for making repairs to the Calf Camp/Pelican Lake Trail.

A proposal for early detection and response for invasive species was submitted and funded. The proposal was for \$4,150 to survey for and spray invasive phragmites and purple loostrife around Valentine NWR. The Sandhills Weed Management Area will do

[Type text]

the work around the refuge and we plan of looking on refuge. An additional \$6,250 was received due to other projects falling out.

Visitor Facility Enhancement funds in the amount of \$144,030 were received for docks and boat ramps for the refuge fishing lakes. Additional funds left over from other VFE projects were added to bring the total available to \$240,000. Nebraska Game and Parks has agreed to help us with an additional \$100,000 if needed to complete the work.

We received \$38,000 to update the National Wetland Inventory on the refuge. The work was contracted out and we heard nothing about the project other than a crew was out to do a day of ground truthing.

We requested special funds to repair flooded roads on the refuge. We would like to repair and upgrade the School Lake and East End Access Roads. Both are presently closed due to flooding.

We received \$125,000 in Refuge Roads money to repair and upgrade the east part of the Pelican Lake Road. The bulk of the funds were used to purchase base rock and gravel. Some culverts were also purchased.

We received funding (\$750,000) for a new refuge office to be located at Pony Lake. We started looking at locations and designs. The office will be built in 2012.

## **6. Safety**

Regional Heavy Equipment Coordinator Wade Briggs inspected the screens on the loader that we installed so the machine could be used for a tree shears. He used the OSHA guidelines to do the inspection and will sent us confirmation on the inspection. We also prepared a job hazard analysis for use of the loader and shears.

Four items needing correction were found during the Annual Station Self Safety Inspection. They were missing fire missing, improper storage of flammables, and outdated first aid supplies. All were corrected by month's end.

## **7. Technical Assistance**

Refuge Manager Lindvall attended a meeting hosted by the Nature Conservancy in Valentine. The meeting was held to determine what influence the TNC's prescribed fire program had on the acceptance of this practice in the area and how to further information transfer from TNC to private lands.

## **8. Other**

### **a. Meetings**

[Type text]

Nenneman organized the annual prairie grouse wing bee with NGPC and USFS. The wing bee was held on 17 Feb 2011 at the Valentine NWR bunkhouse. The prairie grouse hunting season was extended until the end January beginning with the 2010/2011 season.

The annual fisheries coordination meeting was held at the Ft. Niobrara NWR conference room on 11 Feb 2011.

Nenneman and Lindvall attended the Nebraska Chapter of the Wildlife Society Meeting in Hastings, NE on 24-25 Feb 2011. Nenneman is currently serving as Past-President, and Lindvall as Treasurer.

Nenneman attended a joint meeting of the Association of Field Ornithologists, Cooper Ornithological Society, and the Wilson Ornithological Society in Kearney, NE March 9<sup>th</sup>-12<sup>th</sup>. This was a large meeting with presentations on current avian research from across the country.

Nenneman and Lindvall attended the Central Mountains and Plains Section meeting of the TWS. The meeting was held in Gering, NE, and focused on big game and predators. There were many interesting paper presentations and the meeting was well attended.

#### b. Training

The following training was completed by Refuge staff.

##### Lindvall

Annual Fire Refresher on March 25  
annual records/privacy/security training  
Basic First Aid and CPR  
EEO training  
No Fear Training  
USERRA training

##### Kime

Annual Fire Refresher on March 25  
security awareness/privacy/record management training  
Basic First Aid and CPR  
No Fear Training

##### Nenneman

training the trainer for ATV/ORV  
Annual Fire Refresher on March 25/pack test  
EEO training via webinar on April 20.  
security awareness/privacy/record management training  
Basic First Aid and CPR  
No Fear Training  
defensive driving

[Type text]

credit card

Nenneman attended an ATV/ORUV instructor training course in Rapid City, SD on 29-30 March. This course covered the current status of the USFWS policy on ATV/ORUV use and provided instructors with more guidance on how the service would like to have ATV/ORUV training presented to employees. There will be a new on-line refresher course required for ATV/ORUV users coming soon, and will need to be taken every 3 years to keep certifications current.

On 26 May, Nenneman provided ATV safety training for seasonal employees from the Ft. Niobrara/Valentine NWR Complex. The course emphasizes safe use of ATVs and ORUVs for conducting a variety of refuge jobs. The course also covers proper tie down procedures for transporting ATVs and ORUVs. A total of 4 employees were provided instruction in ATV/ORUV use. New training guidelines limit class size to 4 students/instructor.

Nenneman attended a NCTC statistics course "Environmental Sampling and Monitoring Using R". The course was held in Denver Dec 12-16. This course was a useful reminder of many of the basic concepts and pitfalls one may encounter in designing a monitoring program, and covered a broad range of sampling designs. It also had several opportunities to work with other students to tackle a monitoring problem. Course notes were provided for students to take back to their home stations, as well a binder with lecture notes and examples of data analyses in R.

#### Suhr

security awareness/privacy/record management training  
the boating safety class  
Basic First Aid and CPR  
No Fear Training

#### Bachelor

Basic First Aid and CPR  
Security Awareness training

#### Teters

Basic First Aid and CPR  
Security Awareness training

#### Coleman and Nelson

Basic First Aid and CPR  
Security Awareness training.

## **F. HABITAT MANAGEMENT**

### **1. General**

The 71,772 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 59,000 acres. Native grasses provide the dominant vegetation cover, although some areas have been invaded by Kentucky bluegrass and smooth brome. Other exotic plants of concern include small areas of leafy spurge, Canada thistle, Garrison creeping foxtail and spotted knapweed. Low water in larger lakes and wetlands during the past few years has allowed Canada thistle and cottonwood trees to proliferate in the wetland margins. Grassland management is accomplished using permittee grazing and haying, prescribed fire, rest, and weed control.

### **2. Wetlands**

Abundant rainfall combined with last year's moisture has filled refuge wetlands and lakes. All lakes are at capacity and flowing out. The School Lake Cut Across Road and the east half of the Pelican Lake Road were closed due to flooding. The East End Access Road east of "21" Lake remained closed all year.

Water was released from Pelican, Whitewater, Hackberry, Dewey, and Clear Lakes from June 10 – 24. Some boards in the water control structures were removed on June 10 to increase flow out of the lakes. All the lakes but Clear were lowered. On June 24 the boards were replaced. In June we received 6.5 inches of rain. We were attempting to pass water down through the system to reduce the amount of water going off the refuge in July when neighboring ranchers are putting up hay. With the large amount of rain, this was only partly effective.

A beaver guard using an electric fencer was placed on the Hackberry Lake water control structure. Beaver had been plugging the screens there.

Game and Parks surveyors were out and marked reference points for a Lidar survey of the refuge fishing lakes that they are doing for the refuge. The survey will be flown next spring.

There are 37 major wetland/lake areas on Valentine NWR that comprise about 13,000 acres. Lakes and wetlands on Valentine NWR started the year with higher than average water levels, and water levels remained above average as the area received good moisture throughout the year. Based on measures of lake levels (Table F.2.1) and USGS groundwater wells (Table F.2.2), the groundwater on Valentine Refuge has recovered from the dry years in 1999-2004.

[Type text]

Seven lakes on Valentine NWR have had elevations recorded more or less continuously since 1988. While 20+ years of data is hardly a long term data set, it does provide a basis for comparison, and there has been a period of higher than average precipitation and lower than average precipitation during these years. An exception in this data is for Willow Lake, where the water control structure washed out in 1997. Elevations reported here for Willow Lake are those recorded after 1997. Lake elevations have fully recovered from drought as the spring elevations of the seven lakes were 8.75 inches above the average spring elevation. Only Dewey Lake was slightly below average (< 1 inch below average); the other 6 lakes were 3.96 to 10.68 inches above average, and Willow Lake was over 2 feet above its average. This represents a big turn-around from spring of 2008, when all seven lakes had elevation measures lower than average (mean difference from average -1'1.3"). Fall lake elevations remained high, and even increased in their difference from the average fall elevations; all seven lakes were above their fall average, and were 13.56 inches above average. The difference between spring and fall average levels is 9.63 inches, but due to good moisture conditions in 2011, the lake elevations fell only 4.82 inches from spring to fall in 2011. These high water levels should provide a positive benefit to fish as emergent vegetation has flooded again after being out of the water during the early part of the decade. This vegetation provides more spawning habitat and escape cover, and likely helps provide habitat for aquatic invertebrate prey.

Table F.2.1. Lake elevations recorded on Valentine NWR, 2011. For all lakes, average spring elevations are based on the highest elevation recorded in Mar-May from 1988-2003, and the average fall elevations are based on the lowest elevation recorded in Aug-Oct from 1988-2003. No elevations were recorded in 2004. From 2005-2011, spring and fall elevations are based on one reading taken in April, and one reading taken in September or October.

Lake	Spring 2011	Fall 2011	Spring Average	Fall Average
Clear	2917.72	2917.08	2916.83	2915.99
Dewey	2924.24	2923.72	2924.31	2923.25
Hackberry	2924.86	2924.79	2924.33	2923.72
Pelican	2942.92	2942.9	2942.59	2942.00
Watts	2924.18	2923.52	2923.73	2922.82
Whitewater	2928.96	2928.52	2928.21	2927.44
Willow*	2913.25	2912.79	2911.03	2910.20

\* Average elevations for Willow Lake are only from readings taken after 1997, when the water control structure washed out.

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.

USGS well readings were completed and sent to the USGS office in Lincoln. Dwain Curtis ([dlcurtis@usgs.gov](mailto:dlcurtis@usgs.gov)) has taken over the position of collecting well data from remote locations. All 2011 data collected on Valentine NWR have been sent to Mr. Curtis. As with lake elevations, groundwater levels were generally higher than average.

[Type text]

Spring levels were 8.49 inches above average across the 31 wells. Thirteen wells were within 6 inches of their average, 4 wells were > 6 inches but < 9 inches above average, 12 wells were >9 inches above average, and 2 wells were > 9 inches below average. For the year, most groundwater elevations were higher than average. By late summer, well readings were 10.62 inches above average for all 31 wells, with 3 wells > 6 inches below average, and 25 wells > 6 inches above average. The difference between average spring and fall well readings is 8.7 inches, so wells varying from average by 6 inches or less can probably be considered within a “normal” range.

Table F 2.2. Spring and fall USGS groundwater well readings, and the spring and fall averages as recorded from 1970-2011. Groundwater elevation is given for all wells for which the elevation is known. For wells that the elevation is not known, an index value based off of 100’ is used.

Well No.	Well Location	Spring	Spring Ave	Fall	Fall Ave
1	N. East Long	2876.23	2874.62	2874.03	2873.40
2	SE corner S. Marsh	2896.43	2894.69	2894.23	2893.22
3	SE corner Pony	2899.67	2899.51	2898.57	2897.52
4	SE corner Cow	2921.29	2919.43	plugged	2918.56
5	Calf Camp & Hwy 83	2896.35	2896.39	2895.75	2895.13
6	Calf Camp West	2915.63	2915.57	2914.53	2913.73
7	Little Hay West	2917.34	2916.16	2917.44	2916.09
8	Little Hay & Hwy 83	2898.78	2899.24	2898.28	2898.17
10	W. Pony & Hwy 83	2925.41	2923.03	2924.61	2922.57
13	S. Willow	2918.35	2917.21	2918.15	2917.11
14	E. McKeel	2921.57	2920.26	2920.37	2919.13
15	S. East Sweetwater	2926.97	2925.25	2926.17	2924.74
16	SE Trout	2899.27	2898.89	2898.27	2897.58
17	E. Crowe Headquarters	98.3	95.69	99.4	95.77
20	S. Watts	2925.36	2924.76	2924.86	2924.09
21	E. Pony Pasture	2925.54	2924.89	2925.14	2924.41
22	Hackberry-Dewey Canal	2923.89	2923.75	2923.29	2923.02
23	Badger Bay	2924.09	2923.73	2924.39	2923.77
25	E. Pelican	2942.52 <sup>a</sup>	2943.49	2942.52 <sup>a</sup>	2943.22
26	E. West Long	2964.88	2964.95	2965.68	2964.89
27	Dad’s Recreation Area	2957.29	2957.47	2957.09	2956.35
29	NW Pelican	2948.69 <sup>a</sup>	2948.39	2948.69 <sup>a</sup>	2947.67
30	S. Dewey Marsh	2940.34	2940.43	2939.94	2939.39
31	W. Dewey Marsh	95.7	97.88	95.8	98.11
32	N. Pelican	2942.15	2941.64	2941.75	2940.89
33	NW West Long	2979.7	2979.74	2979.2	2978.85
34	Hwy 83 & W. King Flats	2927.19	2924.20	2926.19	2924.01
35	SE “21” Lake	98	96.34	96.9	95.49
36	W. Sweetwater & Hwy 83	2926.97	2926.95	2927.17	2926.38
38	SE West Twin	2921.14	2920.56	2920.74	2919.81
39	SW Hassle Place	96.5	94.51	96.1	94.19

[Type text]

<sup>a</sup> These wells held no water, only damp sand at the bottom.

The annual Valentine NWR water use report for 2010-2011 was completed and signed in April. This report provides information on water measurements taken on the refuge during 2010, and describes planned water management for 2011. Summary data on lake level measurements and USGS groundwater monitoring wells is provided, as well as planned water use activities for the year (report found in C:\Documents and Settings\nennemanm\My Documents\mel\Work files\USGS wells and lake levels\water use reports).

## **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 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.

### Vegetation Monitoring

Background and methods: Grazing is the primary grassland management tool on Valentine National Wildlife Refuge. Grazing treatments are generally geared toward maintaining the growth and vigor of native grasses and forbs, while suppressing non-

[Type text]

native grasses (see discussion of grazing treatments). In the Valentine NWR CCP, specific grassland structure objectives are provided for both upland and meadow habitat types, in both grazed (disturbed) and rested units. In uplands, the acceptable range for visual obstruction readings (VOR) is 1-10", with an average of 3" for grazed units. In units rested for 1 or more years, the range goes to 1-18", with a mean greater than 6". For grazed meadows, the desired VOR range is again 1-10", with a 3" average. In meadows with one or more years of rest, the VOR range increases to 2-24", with an average of 10-12". The CCP also provides some recommendations for the amount of treatment (disturbance) for uplands and meadow. In the 48,755 acres of upland, the CCP suggests that about 45% of those acres should be grazed, mowed or burned. For the 13,106 meadow acres, about 40% should be disturbed on an annual basis. These guidelines provided for about 50% of the refuge acres remaining as undisturbed cover. Recommended composition of plant cover for subirrigated meadow is 75-85% grass, 5-10% grass-like plants, 5-10% forbs, and 5% shrubs. In sands and choppy sands range sites (uplands), guidelines for plant species composition include providing 80-95% grass, <5% grass-like plants, 10% forbs, and less than 5% shrub cover.

In an effort to determine if these objectives were being met, 202 random transects were established in 2003 across Valentine NWR to monitor vegetation. One hundred fifty-six transects were located in upland (sands and choppy sands) sandhills units, and 46 were located in subirrigated meadow units. To improve the sample size in meadows, an effort was made to target sampling in meadows that had received SGT. In 2009, several additional transects were selected in the same manner as the original 2003 transects (grid overlays and random selection of x-y coordinates). These transects were then located in the field, but fiberglass posts were not left as markers on these new transects. GPS coordinates should allow these transects to be revisited in the future, although the placement will not be as exact as if the start and end posts were left in place. The new transects will allow for a better assessment of the current year grazing treatments. Collectively, these transects were designed to monitor long-term vegetation changes and to gauge if refuge management objectives are being met. The monitoring protocol uses 30-m transects randomly placed within habitat units. Since vegetation differs between aspects (Bragg 1998), transects were stratified by aspect (NE facing, SW facing, hilltop, swale or interdunal flat). To ensure that sampling points were well distributed, the refuge was stratified into seven management areas (Fishing Lakes, Wilderness, Hay Flats, Marsh Lakes, Pony Lake, King Flats, and East End), and a grid system was placed over each area. The grid system was used locate random points for the start of each transect. Once the random point was reached in the field, the nearest appropriate aspect (in the order NE, SW, hilltop, interdunal flat) was selected. On NE and SW facing slopes, transects were placed perpendicular to and across the middle portion of the slope. For hilltops and flats, a random compass bearing determined the transect direction. To avoid disturbance caused by cattle or bison rubbing on the transect marker, vegetation measurements start 15-m away from the marker (the corner of the Daubenmire frame sits at 15-m, 30-m, and 45-m from the marker). On each transect, plant species composition and cover was assessed in three, 1-m x 0.5-m vegetation frames (Daubenmire 1959). Vegetation frames were placed on the right side of the tape, with an exception for transects on slopes, where it is simpler to place the frame on the downhill side of the tape. Within the vegetation

[Type text]

frame, each plant species was identified and assigned a percent cover value (1 = <1%, 2 = 2-5%, 3 = 6-15%, 4 = 16-25%, 5 = 26-50%, 6 = 51-75%, 7 = 76-95%, and 8 = >95% [Modified from Elzinga et al. 1998]). Vegetation visual obstruction (Robel et al. 1970) and litter depth were measured at the center of each vegetation frame. Litter depth was recorded to the nearest centimeter with the following exceptions: if the measuring dowel was resting on bare ground, a zero was recorded. If the dowel was resting on or in contact with horizontal vegetation from a previous years growth, but the total accumulation was <0.5 cm, a half-centimeter was recorded. A measure of vegetation disturbance (grazing or fire) was also recorded within each vegetation frame. Disturbance by fire was described by the percent of the plot burned using the cover values described above. Additionally, plant groups (Appendix A) were identified within a narrow belt (0.1 m) at every half-meter interval along the 30-m transect (Grant et al. 2004). This methodology provides two measures of plant composition for each transect – percent cover within three Daubenmire frames on each transect, and frequency of plant group occurrence on the belt transects. The two methods provide slightly different results, but provide data on plant composition that can be related to CCP objectives. Daubenmire frames tend to have more forb cover recorded as the leaves of forbs tend to be broader than grasses, whereas the narrower belt transects tend to put more focus on the dominant grass cover.

**Results and Discussion:** In 2011, 82 of the 202 permanent transects were completed (Table 7.1). Transects that fell in units grazed in 2011 were selected, and then transects were selected in units that were rested to roughly equal the number and aspects of transects in the grazed units. Grazed units in both hills and meadows reflected VOR that were greater than CCP objectives, while VOR in rested units in both habitats were lower than objectives (Table 7.2). In hill units, the mean VOR for SD-S treatments was 3.72”, and for ES-SD treatments was 3.62”. Mean VOR for rest units in both habitat types was lower than objective levels. The mean VOR for rest hill units was higher than in both of the grazed treatments sampled (ES-SD and SD-S), and had a higher percentage of its VOR measures >6” than either of the grazed treatments. In meadow units, the mean VOR was nearly identical between grazed units and rest units. The total amount of disturbed cover (e.g. grazed, burned, hayed) on the refuge was considerably lower than objectives listed in the CCP. In uplands, the CCP objective is to graze or burn approximately 45% of the total upland acres. In 2011, about 22% of these acres were grazed, and an additional 2% were burned with prescribed fire. In meadows the objective is about 40% disturbed cover, and in 2011 about 21% of these acres were grazed, with an additional 9% hayed and prescribed burned. Percent cover values measured by the Daubenmire frame and in belt transects indicate that these values are similar to CCP objectives. Percent cover of grass in both hill and meadow units was a bit lower than objective values, while cover of grass-like plants is somewhat higher. Cover values for forbs and shrubs were similar to CCP objectives.

Dry native warm season grasses (category 32, Appendix 1) and dry cool season natives (category 31) comprised most of the plant cover recorded on belt transects (means of 62% and 17%, respectively). Small pockets of meadow (category 34), native forbs (category 37), and bare ground (category 91) made up the remaining cover in most

[Type text]

instances, with shrubs being an occasionally important component. Kentucky bluegrass (category 41) was found on 13% of the upland belt transects, with a mean frequency of occurrence at 3% across all upland transects (2.4% in rest units, 2.7% in ES-SD, and 5.2% in SD-S). On meadow transects, Kentucky bluegrass tended to be the most frequent vegetation cover recorded on belt transects, with a mean occurrence of 56% across all transects. Meadow, tallgrass prairie grasses (category 33), and dry warm season native grasses made up most of the remaining cover.

The VOR results are somewhat surprising since 2011 had above average precipitation, especially in May and June, which should have created conditions ideal for producing high VOR measures in rest units. However, VOR measures in both upland and subirrigated units that received rest were lower than objective levels. In subirrigated sites, this result may have occurred because of the prevalence of Kentucky bluegrass, which does not tend to produce high VOR. In upland units, only the interdunal flats in rested units exceeded the CCP objective of 6" VOR. Since the CCP was written and approved, it has become much easier to rest habitat units on the refuge as the number of permittees using the refuge has dwindled. Between 1986 and 1997, the number of permittees dropped from 13 to 9, and the AUM usage dropped from approximately 9,000 to 6,000 AUM. In 2011, only 4 permittees grazed cattle on the refuge, and just over 3,000 AUMs were used on the refuge. Given the prevalence of Kentucky bluegrass in subirrigated meadow units, it is possible that current grazing levels are not high enough for SGT to effectively curb the prevalence of this species, and maintain the vigor of native grasses. Reduced grazing levels may also be the reason that VOR in upland rest units was low in spite of good soil moisture, as periodic disturbance can enhance grassland vigor.

[Type text]

Table 7.1. Transect sample size by slope and aspect by treatment for hill units, and sample size for meadow units by treatment, for transects completed in 2011.					
HILLS	Aspect				
Treatment	NE	SW	Hilltop	Interdunal	Total
ESSD	3	1	4	2	10
SDS	6	6	7	9	28
Rest	7	6	7	6	26
SGT	1	1	0	1	3
MEADOW					
SDS					6
Rest					8
SGT					1

Table 7.2. Vegetation sampling on Valentine NWR in 2011, with values compared to CCP objectives. VOR presented are the mean (range) in inches. Percent cover values shown for the 2011 sample are results from Daubenmire frame, results from belt transect.			
		CCP objective	2011 Sample
Hills	VOR Grazed	3" (1-10")	3.7" (0-24")
	VOR Rest	>6" (1-16")	4.8" (0-18")
	Disturbed acres	21,900 ac	10,909 ac
	% cover grass	80-95%	71.4%, 89.6%
	% cover grass-like	<5%	14.0%, NA
	% cover forb	10%	12.8%, 2.3%
	% cover shrub	<5%	1.8%, 3.4%
Meadow	VOR Grazed	3 (1-10")	7.9"(2-26")
	VOR Rest	10-12"(2-20")	7.9"(1-16")
	Disturbed acres	5,200 ac	2,720 ac
	% cover grass	75-85%	66.3%, 99.0%
	% cover grass-like	5-10%	23.3%, NA
	% cover forb	5-10%	8.3%, 0.1%
	% cover shrub	5%	2.2%, 0.0%

[Type text]

Appendix 1. Plant associations used for belt transects in fall 2010.

**Fort Niobrara-Valentine Upland Plant Associations (Belt Transect)**

September 22, 2010

**NATIVE SHRUB and TREE TYPES**

**low shrub (generally <1.5m tall)**

- 11 Yucca
- 12 Western sandcherry
- 13 Poison ivy
- 14 Rose
- 15 Leadplant
- 16 Other (e.g. Snowberry, skunkbrush sumac, buffalo currant, dogwood, cactus, etc.) – user defined

**tall shrub/tree (generally >1.5m tall)**

- 21 Chokecherry, wild plum
- 22 Smooth sumac
- 23 False indigobush, sandbar willow, meadow willow
- 24 Cottonwood, peachleaf willow
- 25 American elm, green ash, hackberry, box-elder, ironwood
- 26 Bur oak
- 27 Ponderosa pine

**NATIVE GRASS-FORB TYPES \***

*a* = <10% non-native/invasive or *b* = 10-25% non-native/invasive followed by non-native/invasive plant code

- 31 Dry cool season (sedges, need-and-thread, prairie junegrass, western wheatgrass, forbs)
- 32 Dry warm season (little bluestem, sand bluestem, prairie sandreed, grama sp., forbs)
- 33 Mesic cool-warm season mix (big bluestem, switchgrass, Indiangrass, wildrye, forbs)
- 34 Meadow (reedgrass, prairie cordgrass, foxtail barley, wet sedges)
- 35 Wetland; robust emergent vegetation or open water (cattail, bulrush, phragmites)
- 36 Clubmoss/lichen
- 37 Forbs

**NON-NATIVE, INVASIVE OR PLANTS OF MANAGEMENT CONCERN \***

*c* = 25-60% non-native/invasive or *d* = >60% non-native/invasive followed by native grass-forb code

- 41 Kentucky bluegrass
- 42 Smooth brome
- 43 Cheat grass
- 44 Reed canary grass
- 45 Phragmites
- 46 Other grass – user defined
- 47 Leafy spurge
- 48 Canada thistle
- 49 Sweet clover

[Type text]

- 50 Other forb – user defined
- 51 Eastern red cedar
- 52 Locust (honey, black)
- 53 Russian olive
- 54 Other shrub/tree – user defined
- 55 Non-native mix

**OTHER**

- 91 barren, unvegetated (bare soil, gopher mound)
- 92 other (rock, manure, hole, ant hill)

*\* Use sub-code (a, b, c, or d) only if “non-associated” plant type is present in the belt segment. (e.g. 33a41; 43c32)*

**7. Grazing**

In 1985 the refuge habitat management program was changed and short-duration grazing started. Prior to 1985, much of the refuge grassland was grazed on a six week rotation. Authorized AUMs for each of the permittees have remained about the same when compared to 1997 levels. The number of permittees has declined over the years. One long time permittee dropped out of the program this year. He grazed in the north- west part of the refuge where we had a large amount of prescribed fire planned. We did not look for a replacement but may do so next year. Several years ago he sold his fall cows and then brought yearlings. He has now sold his yearlings and now has no stock to bring down to the Refuge. He was a good cooperater and will be missed.

A review of how we issue grazing permits was conducted and we decided to allow present permittees to allow their sons who are partners in ranches to sign permits. We also offered the person who has gotten the bid grazing for the past 3 years the option of coming on as a permittee which he did. We will continue with this method until the Refuge Comprehensive Conservation Plan is re-done in 2014.

Grazing rates are reduced to compensate permittees for the added expense of moving cattle for short duration grazing. The program was similar to previous years with emphasis on spring grazing treatments in meadows and short-duration grazing in hill units.

**Grazing fees for 2011 were:**

spring grazing treatment	\$22.30/AUM
short-duration grazing	
1 day in unit	\$14.98/AUM
2 days in unit	\$20.48/AUM
3 days in unit	\$22.30/AUM
4 days in unit	\$23.04/AUM
5 days in unit	\$23.40/AUM
6 days in unit	\$24.77/AUM

[Type text]

	7 days in unit	\$25.14/AUM
	8 or more days in unit	\$25.60/AUM
fall		\$25.60/AUM
winter		\$25.60/AUM

(for feeding refuge share of hay on refuge at 3AUMs/ton)

The full rate of \$25.60 for 2011 is an increase of \$.80 per AUM from the 2010 fee and is based on a rate survey conducted by USDA and published in Nebraska Farm Real Estate Market Developments. The different classes of animals were also changed in 2003 and we now use the US Department of Agriculture Statistics Board conversion factors. Mature cow stayed at 1.00; mature cow with nursing calf went from 1.25 to 1.32; yearling went from .75 to .70; bulls from 1.00 to 1.50; and horse from 1.00 to 1.20.

Permittees also had their grazing bills reduced for weed control, and improvements and repairs to wells, fence, tanks and other facilities needed for the program. In 2011 \$62,511 was spent on improvements and deducted from final billings. 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 five permittees. They were paid \$40.00 per hour for a crew of two, and supplied their own gas, tools, vehicle, and equipment. Total fees collected for the 2011 grazing season were \$23,495.

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 F7a.

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 two weeks. Cattle eat or trample almost all of the residual cover. They also over graze 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, such as Kentucky bluegrass, are suppressed and native warm seasons, such 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 five years following treatment. In 2011, 18 habitat units totaling 2,843 acres received a spring grazing treatment and included some areas that were later hayed.

[Type text]

b. **Spring Short-duration Grazing**

Spring short-duration grazing (ES-SD) is grazing a unit for less than two weeks during May. Generally the cattle are in the unit for only three to five 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 2011, 9 habitat unit totaling 3,053 acres had spring short-duration grazing. Where possible units grazed later in summer the previous years 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 two weeks. Most units are grazed only three to five 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 2011, 31 habitat units totaling 8,505 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 re-growth 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 two weeks or longer. In 2011 no habitat units were summer grazed. When we do summer grazing it is usually in 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. Fall grazing eliminates both winter cover and nesting cover in the following year. Some units were fall grazed in 2011 that will be given a spring grazing treatment in 2012. In 2011, 2 habitat units totaling 1,017 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. 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

[Type text]

the form of fertilizer. Hay is cut in the meadows. Resident wildlife also utilizes waste grain from the feeding operation. In 2011, 6 habitat units totaling 367 acres were winter grazed.

**g. Fire**

Prescribed fire (P) and natural or wildland fire (N) are discussed in the fire section H-9.

<b>Treatment</b>		<b>Units</b>	<b>Acres</b>	<b>AUMS</b>
<b>Rest</b>	rest (R)	244	45,339	----
<b>Spring</b>	spring grazing treatment (SGT)	18	2,843	711
	early spring short duration (ES-SD)			
	ES-SD 1-6 days	5	1,696	248
	ES-SD 7-10 days	4	1,357	230
<b>Summer</b>	short duration summer (SD-S)			
	SD-S 1-3 days	7	1,326	204
	SD-S 4-7 days	24	7,179	1,053
	SD-S 8-14 days	0		
	summer (S) 15-27 days	0		
<b>Fall</b>	fall (F)	2	1,017	387
<b>Winter</b>	winter (W)	6	367	744
<b>Hayed</b>	hayed (H)	10	466	----
<b>Fire</b>	prescribed fire (P)	4	619	----
	natural fire (N)		0	----
*Note: some habitat units received double treatment, primarily hayed units that were also spring grazed (SGT) or fall (F) grazed units, or rest (R) units that had N or P fires.				

**8. Haying**

About 466 acres of sandy, sub-irrigated, and wetland range sites were mowed and yielded 580 tons of hay. All or parts of 9 habitat units were mowed and hayed. GPS based measurements for hayed acres were not obtained this year. GPS information from 2006 was used. The area hayed is fairly close from year to year.

The method of charging for permittee hay was changed in 2001. Now hay is put up on a 50/50 split with the permittee taking half home and feeding the other half back on the refuge at the full rate of \$25.60/AUM in the winter treatment. Thirty five large round bales of the refuge share of hay was hauled up to Fort Niobrara NWR for horse feed. 233 small bales were also hauled up to Ft. Niobrara NWR. These were cut on a 50/50 split.

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 produced. In general we try to mow low sites with mostly reed and cord grasses.

[Type text]

Haying is used to provide fire protection for facilities, browse areas for Canada geese, sandhill cranes, prairie grouse, and deer and to provide hay to Fort Niobrara NWR. Mowing can also open up small wetlands for waterfowl pair habitat. Hay is also used in the winter treatment described under the grazing section of this report.

Areas to be hayed, in which we have found the endangered prairie white-fringed orchid in the past, were searched on foot. Searches were done when the plant was in bloom. Plants found were marked with lathe with orange tops and they area not mowed. Haying may be of some benefit to the orchid as some of the plants found on the refuge are in areas that are annually hayed.

## **9. Fire Management**

There were no wild fires on the refuge in 2011.

The Hackberry Lake prescribed fire was completed on April 6. The area burned was on the north side of the lake from refuge headquarters to the east boat ramp between 16B and the Little Hay Road and the lake. Units burned included 3B 144 acres, Pony Pasture including the road ditches 42 acres The burn was conducted to control cedar trees and deciduous trees. The burn was 196 acres and started at 11:30 AM at a temperature of 56 degrees F, 42 relative humidity, and a 6 to 9 mph wind.. A high percentage of the cedar trees were killed including many large trees. Some of the larger cedars were green following the burn but turned brown within a few days. Other burns planned were not conducted due to the wet, windy, and even snowy weather.

The Watts Lake prescribed fire was done on May 5. Almost all of Habitat Units 2A (363 acres burned) and 3A (70 acres burned), as well as the unfenced area along the county road (102 acres burned) for a total of 535 acres. The unit was burned to control cedar and Kentucky bluegrass. Transects to monitor blue grass were run prior to the burn and were repeated in the fall. The weather at the start of the burn at 11:00 AM was 57 degrees F, rh 35 percent and wind 12 mph. The weather at 5:00 PM was 65 degrees F, rh 17, and wind 9 mph. Only a few cedars in the tree row along the west boat ramp access road burned.

The Iowa Conservation Crew was here at the end of April and were to help with prescribed fires which unfortunately were not done due to weather. They worked at both Ft. Niobrara and Valentine. At Valentine they cut unburned cedars in the Hackberry burn, did more cut a stuff of cedars in Habitat Unit 5B1, and cleared downed tree limbs in the office area.

[Type text]



Figure F-9. Blackliner machine was tested for use in the Sandhills. MLL

A test of a blackliner machine was conducted at Valentine National Wildlife Refuge located in the Sandhills of North Central Nebraska on the afternoon of 24 March 2011. The blackliner we used was equipped with a lead trailer with propane and water sources, a burner and an afterburner (photo attached). The afterburner was not equipped with burners. The burn chambers were manufactured by Firebreak Equipment Company ([www.firebreak.co.za](http://www.firebreak.co.za)). I contacted them and the cost for the burner units we used is \$29,000 delivered to the nearest U.S. port. We pulled the unit with a large all wheel drive tractor at speeds of .6 to .8 mph. Weather for the test was 32 degrees F with 52% Rh at 12:45; 40 degrees F with 36% Rh at 14:30; and 42 F and 32% Rh at 15:30. Straight water without foam was run in the unit. The machine was run in sub-irrigated meadow with tall grasses and heavy thatch, low sand sites with tall grass and little thatch, a previously mowed line with thatch from the mowing operation, and sandhill sites with steep terrain and sparse grasses with no thatch.

The machine was able to produce a good line in the sub-irrigated meadow with heavy thatch but the chances for escape were high as the thatch was not all consumed by the time the unit passed. There was still smoldering and active fire strung out behind the unit. The thatch that was wetted and packed by the runners of the unit also smoldered for quite some time. In one instance a small fire escaped from the line but was quickly suppressed with an engine. A mop up crew and extra suppression equipment would be

[Type text]

needed to operate in heavy grasses with thatch. Operation at a higher temperature and lower humidity may have resulted in more complete consumption of the thatch but would also possibly increase the chance and quick spread of any escape. Installing the propane burners in both the lead and following chambers may have also helped in consuming the thatch. Another possibility would be to add some kind of rake that would lift the thatch off the ground and possibly break up and separate the thatch before it entered or while it was in the burn chamber. This would have to be configured so the thatch below the runners was also directed to the burners. An additional option for use in these sites would be to graze the area heavily to reduce thatch before the black lining operation. Lines could also be planned that mostly avoid areas of heavy thatch or areas of heavy grass and thatch could be mowed high and then raked and finally black lined.

The machine worked well in low sand sites with tall grasses and little or no thatch. All the grasses were consumed by the fire before exiting the second burn chamber. There was very little smoldering or fire behind the unit. Quite a bit of line could be blackened with a smaller crew in this area.

The machine also worked well in the sand sites with sparse vegetation. All the grasses were consumed by the fire before exiting the second burn chamber. There was very little smoldering or fire behind the unit. Quite a bit of line could be blackened with a smaller crew. The tractor had no problems pulling the unit in the sandy soils in relatively steep terrain. The skids dug into the sand some but did not leave deep ruts.

The machine also worked in a previously mowed line with thatch from the mowing operation. A good line was produced. Thatch from the mowing operation smoldered quite a bit but the line was easily tended by the crews as there was short grass on both sides of the black line. The black line added some security to the line.

Quite a bit of water was needed to fill the pumper that supplied water to the black liner. Adding foam to the water might reduce the amount of water required. The water also needs to be clean water as water with debris plugs the spray nozzles. Finding clean water to supply the unit could slow line production if the tanker had to travel some distance to refill. The possibility of filtering the water also exists. The nozzles were plugged on several occasions which slowed the operation. This was the first time it had been used this year and there may have been some rust in the lines. Copper lines might solve this problem.

We operated the unit for about 5 hours and produced about 1.8 miles of line. Once familiar with the unit and with a few of the bugs worked out, I am sure we could make line at a greater rate. I think the black liner has some potential for use on Valentine NWR, especially if the thatch problem could be resolved. I see its greatest value to be in conducting prescribed burns in remote parts of the refuge. Historically, we have prescribe burned mostly in areas where we have roads or lakes to act as fire breaks on at least part of the burn unit. If we could get a good black line established, we could expand our prescribed burns to more remote areas of the refuge without roads or lakes. A wide line can be produced by making two passes with the machine and then burning out between the lines. Line prep may take more time and personnel but we would have secure lines established, especially important in remote locations. I think the unit would

[Type text]

work very well at Fort Niobrara NWR. Most of this refuge is annually grazed and thatch production is much less than that found in sub-irrigated meadows at Valentine NWR. With the water turned off on one side, the unit would also work well as a lighter for prescribed fires.

## **10. Pest Management**

Cedar trees continue to increase on the refuge and other prairies in Nebraska. We probably have a head start on the number of cedar trees due to plantings made on the refuge by the Civilian Conservation Corps and others. Cedar control was done using prescribed fire, shearing, and shredding. Prescribed fire information can be found in Section F-9 of this report.

Pesticide use reports and proposals were completed. We used 3.5 gallons of Milestone at 5 oz per acre for thistle and 3 gallons of Plateau at 8 oz per acre for spurge. All known spurge locations were sprayed. Using the application rate to figure acres treated yields 90 acres of thistle and 48 acres of spurge treated. We used 5 gallons of Pasture Guard to spray locust re-sprouts, and 3.5 pints of Rodeo to spray invasive phragmites, purple loosestrife, cottonwood and willow re-sprouts.

Several large groves of locust trees were cut using the forestry grinder attached to the Bobcat. The groves were located in Habitat Units 2B3(B), 2B3(C), 1A2, and 1B2. These groves have slowly been expanding into adjacent grasslands. They were cut in the winter and spring and then the re-sprouts sprayed with Pasture Guard in the fall. The grove we cut in 2009 along Dewey Lake in habitat unit 3D re-sprouted and was sprayed with Pasture Guard.

Common mullen plants were hand pulled in the following locations; 7A1(S) by parking lot 35 plants, 4 in Clear Lake Parking Lot 15 plants, 15A along road 14 plants, 4 Dewey East Boat Ramp Parking Lot, and 2A Watts Lake West Boat Ramp Parking Lot 50 seedlings. Hand pulling this biennial has worked in reducing plant numbers on the refuge. The seed source is most likely from gravel used on the roads and parking areas. This is not a noxious weed in Nebraska but is in some states.

The location where one clump of yellow bedstraw, a new noxious weed for the refuge, was found along the Pony Lake Road in Habitat Unit 31A (N42 28.952 W100 30.338) in 2010 was checked and no new plants found.

Progress in controlling leafy spurge is reported on in the following report compiled over 3 years of monitoring.

Leafy Spurge (*Euphorbia esula*) monitoring on Valentine National Wildlife Refuge (June-July 2011; report compiled Sept 2011 by Nenneman)

## **INTRODUCTION**

[Type text]

Leafy Spurge (*Euphorbia esula*) is a noxious weed originally from Eurasia that occurs across much of the northern Great Plains. It invades prairies, pastures, meadows, and other open areas. Once this invasive plant is established, eradication is very difficult.

Leafy spurge has been documented on Valentine National Wildlife Refuge since at least 1957 in refuge narratives, when refuge staff estimated that there was 0.25 acres of spurge. Since then, estimates of the number of acres of leafy spurge have varied year to year, with an estimated high of 56 acres in 2008. Monitoring and management efforts have not been well documented over the years, so it is difficult to determine if prior management activities have had an impact on leafy spurge infestations on the refuge. It appears that early on, documentation of spurge was done primarily while conducting other field work. Beginning in 2002, spurge locations were recorded using Global Positioning Systems (GPS) technology, which has improved the targeting of management activities. In 2009, Trimble GPS units were used to map leafy spurge polygons across the refuge. This provided accurate spatial data on the extent of leafy spurge, and provided the first measured total acreage of leafy spurge on Valentine NWR.

Refuge managers have used various methods of treatment to control the spread of leafy spurge. The use of angora goats, clipping the plant heads, chemical herbicide, and three types of Aphthona beetles have been used. Chemical application seems to be the most common, with the chemicals 2,4-D, Tordon 22k, Dicamba, and Plateau being used. Documentation of the effectiveness of these treatments appears to have been done mostly via anecdotal observation. Some data were collected on stem densities following grazing treatments by goats but this management activity ended after 4 years. Reports on early chemical treatments were generally accompanied by a statement indicating that “good control was obtained”, which apparently meant that leafy spurge was not spreading, since the same areas were often treated the following year.

#### STUDY AREA AND METHODS

Valentine NWR occurs in the Sandhills of Nebraska. This area is mainly grasslands with rolling sand dunes and interdunal valleys. Most leafy spurge infestations have been found in subirrigated meadows, with some patches extending into low hills. The majority of the landscape surrounding the Refuge is in private ownership which is mainly used for ranching. Leafy spurge is also known to occur on several private land areas near Valentine NWR.

Beginning in 2009, efforts have been made to better document the full spatial extent of this leafy spurge on the refuge, which should allow for a better assessment of the effects of chemical treatments on leafy spurge. This data can be used to determine if the total extent of spurge cover changes from year to year, and allow managers to determine if chemical treatments are effectively reducing leafy spurge acreage, or if another management strategy should be employed. Since 2008, leafy spurge locations have been documented by the refuge biologist and seasonal biological science technicians from the end of June through the middle of July. Mapping takes place during this time frame because most plants are flowering and are highly visible. All known areas of spurge on Valentine National Wildlife Refuge have been mapped using Trimble data loggers. All

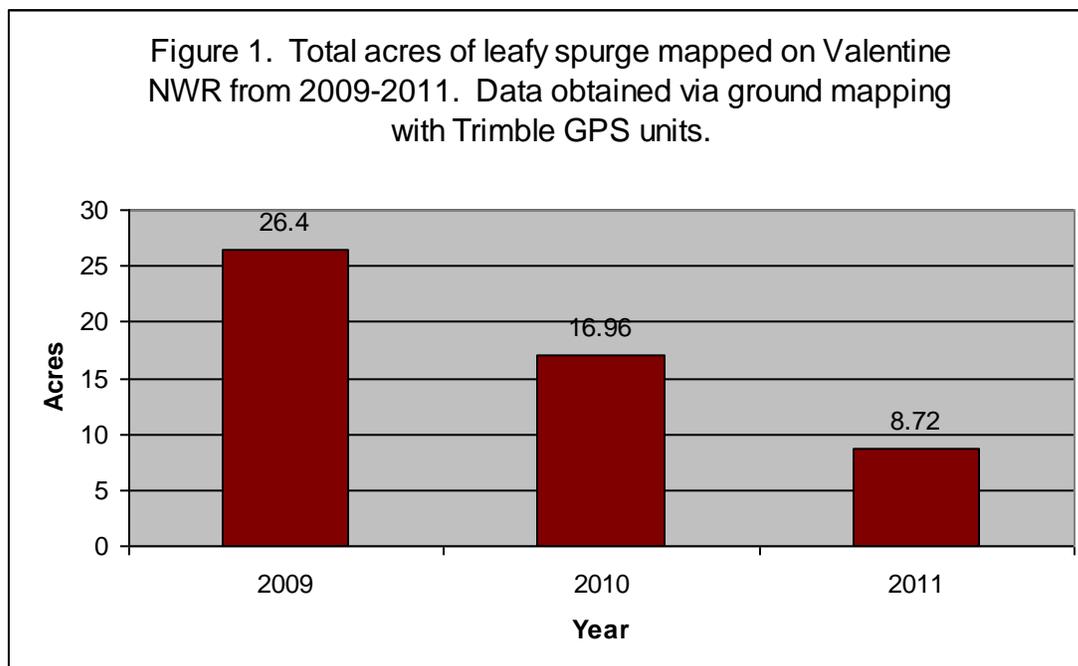
[Type text]

habitat units that are known to have leafy spurge infestations are searched using ATV's, UTV's, and on foot. The perimeters of leafy spurge patches are walked to spatially display acreage, configuration, and location of plants.

In 2010, after the spurge locations were mapped, each site was marked with painted wooden lath. In 2011, spurge locations were marked with a painted wood lathe at the time the locations were mapped. This was to help ensure that even small patches were visible for the contract sprayer. Leafy spurge locations were then converted from a polygon shape file to a point file. This point file was then sent to the contract sprayer to be uploaded for a Garmin handheld GPS unit. In addition to GPS points and spurge patches being marked with wooden lath, refuge maps displaying all known locations were given to the contract sprayer. These measures are being taken to help the contract sprayer find all of the patches of leafy spurge, as chemical treatment with Plateau appears to be effectively killing spurge when it is sprayed.

## RESULTS

Mapping leafy spurge polygons took approximately six days for one bio-tech (with help from the biologist on one day) to complete. A total of 8.72 acres was mapped in the 2011 (Figure 1). This was a decrease of 8.24 acres from 2010, and continues a declining trend in total acres mapped from the initial mapping in 2009. There were a total of 296 polygons mapped in 2011, which was a decrease of 38 locations from 2010 (Table 1). Polygon size varied from containing only a few individual plants to 1.02 acres in size. Mean polygon size has decreased each year, from 0.075 acre in 2009 to 0.05 acre in 2010, 0.029 acre in 2011. The contract sprayer treated spurge with chemical during the month of September. Plateau herbicide was applied to leafy spurge at a rate of 8oz/acre. Needs update when after McCall sprays this year - A total of 4 gallons of chemical was used, which should have been able to treat a total of 64 acres of leafy spurge.



[Type text]

Habitat Unit	2009		2010		2011	
	# Polygons	# of Acres	# Polygons	# of Acres	#Polygons	# of Acres
15A	3	0.26	7	0.32	8	0.37
15B	4	0.02	2	0.01	5	0.02
15C1	53	2.98	51	1.45	39	1.07
15C2	10	0.53	15	0.47	18	0.39
15C3	83	7.8	79	2.34	72	1.64
15C4	62	6.8	64	3.57	82	2.59
13A	4	0.25	5	0.15	7	0.05
8E2	4	0.37	1	0.02	4	0.08
8E 3S	14	0.43	12	0.53	9	0.39
Beel's Camp	2	0.01	2	0.03	1	<0.01
8E1	2	0.09	2	0.06	2	0.06
8D3	0	0	1	0.08	1	0.09
31A	30	0.65	40	0.7	21	0.24
2B1	3	0.03	2	0.03	1	0.10
2B2	5	0.05	8	0.06	4	0.11
2B 3D	30	1.6	18	2.15	9	0.30
2B3A	0	0	1	1.3	1	1.02
34E2	10	0.63	5	0.32	0	0
34CT	8	3.25	7	2.55	0	0
34C1	3	0.1	2	0.17	1	0.05
34E Trees	3	0.29	2	0.17	0	0
35AS	1	0.09	1	0.1	1	0.11
35 Camp	15	0.17	7	0.05	10	0.05
<b>Totals</b>	<b>349</b>	<b>26.4</b>	<b>334</b>	<b>16.63</b>	<b>296</b>	<b>8.73</b>

## DISCUSSION

Mapping leafy spurge polygons from 2009-2011 has allowed for a documented decrease in total leafy spurge acreage on Valentine NWR over the last three years. This also allows for the closing of the feedback loop in a simple example of adaptive resource

[Type text]

management. The management action of spraying leafy spurge with Plateau herbicide in September is thought to be an effective control measure. Mapping polygons around patches of spurge allows the manager to see if the chemical application is reducing the acres of spurge, and the impact on the spatial extent of spurge. Continuing this monitoring effort will determine if Plateau application continues to reduce the acreage of spurge on the refuge, and should allow for the detection of new patches of spurge, or if the plant reinvades areas where the chemical previously killed it off. This information can then be used to determine if any adjustment needs to be made in application of Plateau, or if another management option should be considered. With three years of complete mapping done, it does appear that Plateau is continuing to reduce the total spatial extent of leafy spurge found on the refuge down, as all measures (total acres, mean patch size, number of polygons) of spurge have declined over the three years.

The spatial data for Leafy Spurge is located on the GIS computer in the RLGIS folder (C:\RLGIS\Vegetation Monitoring\Invasives\LeafySpurge2010). The data exists in Invasive Plant Monitoring Polygon. Other invasive species occur under this file, so a query will need to be done for 'Leafy Spurge' and the year.

We received grant money and did the following EDRR project.

### **2011 Report on Early Detection Rapid Response Project 60181BJ563**

Mapping and Control of Purple Loosestrife and Invasive Phragmites In and Around Valentine National Wildlife Refuge (NWR), Nebraska

Submitted by Mark Lindvall, Refuge Manager, Valentine NWR and Barb Good-Small, Cherry County Weed Superintendent, Sandhills Weed Management Area Representative

#### Introduction

Purple loosestrife and invasive phragmites have been found in small patches on both Valentine NWR and in the surrounding area. Both are state listed noxious weeds. Large infestations of loosestrife are located about 30 miles north of the refuge along the Niobrara River. Similarly, large infestations of invasive phragmites and purple loosestrife are located along the Platte River about 90 miles south of the refuge. For years the plants were found only along the rivers. It appears that they are now moving out into Sandhills wetlands including those on the refuge. The goal of this early detection and rapid response project is to locate and spray with herbicides small patches of both invasive phragmites and purple loosestrife both on and adjacent to Valentine NWR. The surveys also gave us an idea of the extent of these invasives in the area and will hopefully prevent costly future control expense by treating the plants before they spread.

#### Methods

[Type text]

The Sandhills Weed Management Area contracted with a weed sprayer to survey areas adjacent to Valentine NWR. The contractor was trained in identifying invasive phragmites and purple loosestrife. He was supplied with leaflets describing the plants. He contacted ranchers adjacent to Valentine NWR for permission to search and spray. He provided leaflets to ranchers that had photos of both plants. He kept a daily log and marked areas searched on a map. Surveying for purple loosestrife was conducted from August 8 -26, 2011 when the plant was in bloom and easily spotted and identified. He logged 126 hours; 1,409 pickup miles; and 344 miles on an all terrain vehicle searching for purple loosestrife. Surveying for invasive phragmites was conducted from September 14 – October 5, 2011. At this time the invasive was in bloom and more easily identified. He logged 130 hours; 1,307 pickup miles; and 459 miles on an all terrain vehicle searching for invasive phragmites. He kept a daily log and marked areas searched on a map.

Valentine NWR refuge staff conducted surveys for purple loosestrife on Valentine NWR from July 27 – August 28. Surveys were conducted by airboat, all terrain vehicle, and pickup. Airboat surveys were conducted by driving the boat along the entire shoreline of a lake. Surveys by pickup were used to search wetlands adjacent to public use roads and boat ramps. All terrain vehicles were used to search wetland areas and in some cases driven along lake shorelines. Areas searched and the search date were marked on a map. No log of vehicle miles or search hours was kept but all or parts of 10 days were spent searching. Surveys for invasive phragmites were conducted from August 30 – September 22, 2011 using the same methods as for loostrife. All or parts of 7 days were spent searching for invasive phragmites.

Refuge staff and Nebraska Game and Parks staff also used an airboat to search for purple loosestrife and invasive phragmites on Ballard’s Marsh, Rat, Beaver, and Big Alkali Lakes. The search was conducted on August 16, 2011.

## Results

### Purple Loosestrife

The off refuge search found one purple loosestrife plant. The one purple loosestrife plant was found in the Highway 83 right of way near where Goose Creek crosses the highway. The plant was sprayed with glyphosate herbicide. This location is 1 mile south of the refuge boundary.

Two locations for purple loosestrife were located outside of our search areas. These were either reported to us or located by refuge staff while conducting other activities. Purple loosestrife in the Valentine Mill Pond was sprayed with glyphosate in 2010 and again this year by refuge staff using an Argo in 2010 and an airboat in 2011. Glyphosate herbicide was used. This infestation is outside of the Sandhills. An infestation of purple loosestrife within the Sandhills along the Cowboy Trail (N 42 30.867; W 100 40.547) was known to the Cherry County Weed Superintendant and has been sprayed in the past. We used grant monies to spray this patch in 2011. Purple loosestrife in the ditches along the Cowboy

[Type text]

Trail near this location has also been sprayed in the past and was sprayed in 2011 by a contractor paid by Nebraska Game and Parks. Small patches of purple loosestrife found along Highway 20 in the road ditch in this area have also been sprayed by the Nebraska Department of Roads for the past several years.

The on refuge search located one patch of purple loosestrife (photo 1) in the Highway 83 right of way near Habitat Unit 21B1 (N 42 30' 07.6; W 100 32, 14.1). The patch was about 12 feet by 6 feet. It was sprayed with glyphosate herbicide.

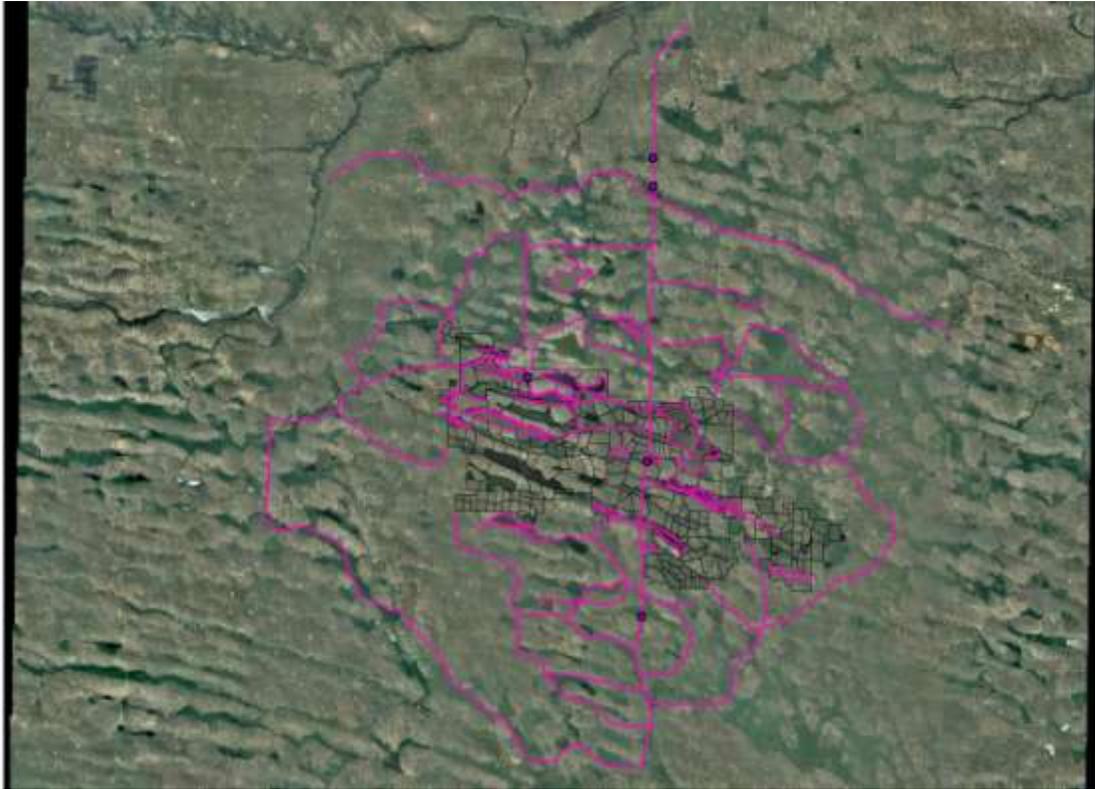


Photo 1. Purple loosestrife located on Valentine NWR, 2011.

The first confirmed record of purple loosestrife on Valentine NWR was in 2010 near the Hackberry Lake East Boat Ramp. This is a public boat ramp and the plant or seed most likely came in on a boat trailer or boat. In 2009 5 clumps of purple loosestrife were hand pulled in a small wetland on the west side of Highway 83 near mile marker 201 (T32N R28W Section 24). This is 11 miles north of the refuge. In 2010, we located plants in this same location and sprayed them with glyphosate. In 2010 several purple loosestrife plants were noted on private lands about 8 miles north of Valentine NWR along US Highway 83 (T32NR28W Section 36). These were also sprayed.

[Type text]

Areas searched for purple loosestrife and known locations of purple loosestrife in the vicinity of Valentine NWR are shown on map 1. All purple loosestrife plants located to date have been sprayed with herbicide.



Map 1. Areas searched (purple lines and blocks) and known locations of purple loosestrife (dots) in the vicinity of and on Valentine NWR.

### Invasive Phragmites

The off refuge search found invasive phragmites along the east side of Highway 83 in a mitigation wetland south of mile marker 178 (42°22'57.79"N, 100°32'32.71"W). The patch was estimated to be ½ acre in size and sprayed with glyphosate using the refuge airboat. This location is just south of where the Nebraska Department of Roads has been spraying for invasive phragmites in the road right of way for the past several years.

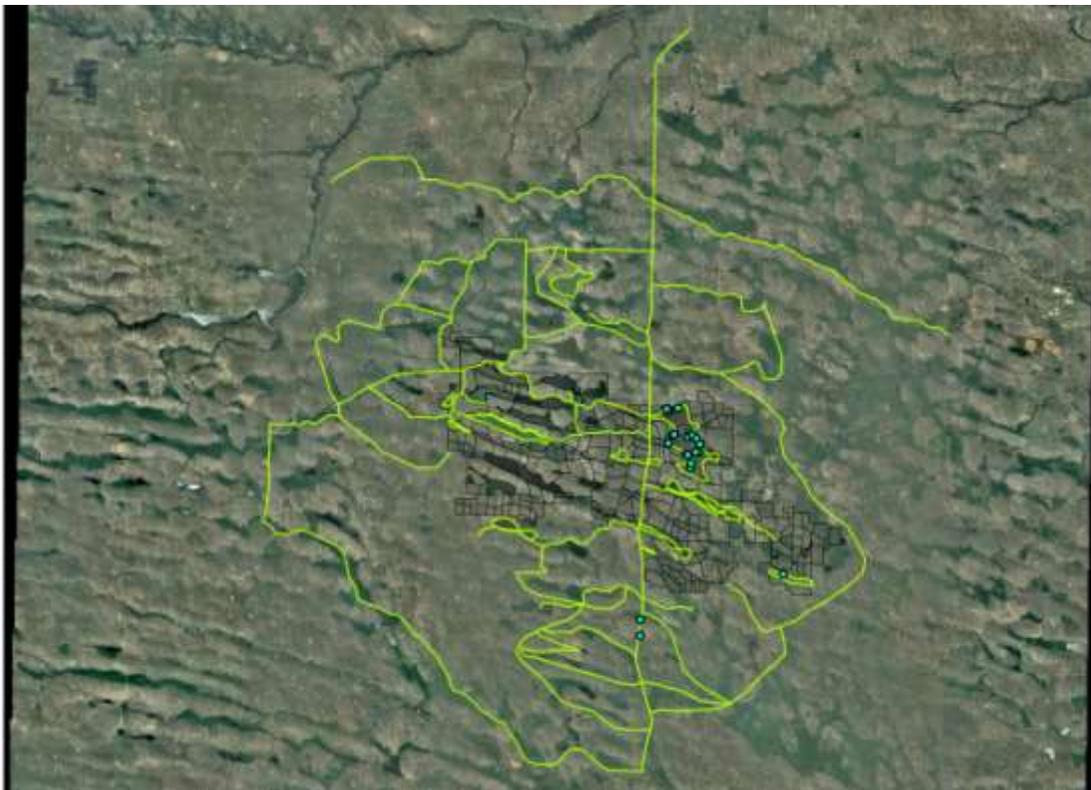
Refuge staff located invasive phragmites in the Valentine Mill Pond (42°52'49.12"N, 100°33'40.63"W). This location was outside of our search area. The Mill Pond is on the Minechaduza Creek which flows into the Niobrara River. This is a significant find as it is the first located this far west in the Niobrara River Drainage. This patch was estimated to be ¼ acre in size and was sprayed in 2011 with glyphosate herbicide by refuge staff using the refuge airboat.

[Type text]

The on refuge search found one new location for invasive phragmites on the north shore of East Long Lake (N 42 25'40.517; W 100 24' 26.936). This a fairly large patch estimated at 150 feet by 60 feet. This patch was sprayed with glyphosate herbicide.

Refuge staff used an airboat to check the Marsh Lakes on Valentine NWR for invasive phragmites on August 28, 2011 and again on September 22, 2011. No invasive phragmites was found. This is encouraging as prior to 2011, the Marsh Lakes was the only known location for invasive phragmites on the refuge. Also of note was that it appeared that the native phragmites was stressed, perhaps by continued high water levels. Stands were thin and seed heads not robust. In 2009 the invasive form of phragmites was found in 19 locations on the Marsh Lakes. All were relatively small patches ranging from 10 by 10 feet to 100 by 30 feet for a total of an estimated .4 acres and were sprayed with glyphosate. In 2010 we located 17 of these sites again and had complete control in 12; 95 percent control in 3; and poor control in 1. Follow up spraying was done. In 2010 we also found 21 patches of invasive phragmites on the Marsh Lakes. The patches ranged in size from 400 to 3,750 square feet and totaled an estimated .7 acres. All were sprayed with glyphosate. We had more difficulty locating and identifying the invasive phragmites in 2010 as the cattails appeared much taller and some of the invasive phragmites had not produced seed heads.

Areas searched for invasive phragmites and location of invasive phragmites in the vicinity of Valentine NWR are shown on map 2. All areas have been sprayed with herbicide.



[Type text]

Map 2. Areas searched (green lines and blocks) and known locations of invasive phragmites (dots) in the vicinity of and on Valentine NWR.

While spraying the invasive phragmites at East Long Lake on the refuge on October 13, 2011 it was noted that the invasive phragmites was much more robust and green than the native variety which had already turned brown (photos 2 and 3). This was notable from a distance and may make it feasible to detect invasive phragmites from an airplane. This would make wide scale surveys in the Sandhills much easier. Visiting suspected sites from the ground might be necessary to confirm sites identified from the air.



Photo 2. Invasive phragmites, E. Long Lake, Valentine NWR, October 30, 2011.

[Type text]



Photo 3. Native phragmites, E. Long Lake, Valentine NWR, October 30, 2011

### Discussion

Purple loosestrife was found in two new locations in and around Valentine NWR as a result of this survey. Our search covered many roads but also areas distant from roads but located purple loosestrife only along roadways. The 2011 locations and locations from the past few years indicate that purple loosestrife may be invading Sandhills wetlands from road ditches and in one case a boat ramp. Our searches indicated that purple loosestrife is present but rare in and around Valentine NWR. Treatment of small patches of a few plants with glyphosate appears to eliminate the plant.

The first record of invasive phragmites for Cherry County was along Highway 83 in 2009. In the same year we located 13 small patches of invasive phragmites on one lake on the Refuge. These phragmites sites were the only records for the county. In 2011 we found two additional locations, one on and one nearby to the refuge. All the patches of phragmites located to date have been relatively small and we have had success in controlling them with herbicide. The pathway of invasion is unclear but could be through contaminated boats and trailers, placement of fill or rock, construction equipment, or vehicles. Natural spread is also suspected as the invasive phragmites on East Long Lake

[Type text]

on the refuge is distant from any roads. Discarded boat blind material using native phragmites was found at Watts Lake on the refuge (photo 4). Some hunters may also be using invasive phragmites for boat blind materials and then travelling to the refuge or other locations in the Sandhills to waterfowl hunt. Our searches indicated that invasive phragmites is present but rare in and around Valentine NWR.



Photo 4. Native phragmites used as boat blind material, Watts Lake, Valentine NWR.

The contractor doing the off refuge survey spoke to many ranchers in the course of his work. He noted that many were aware of both purple loosestrife and invasive phragmites and were monitoring their lands for these plants. This is a positive finding and it is likely that ranchers who locate these plants will take action to control them before they become widespread.

The threat to Sandhills wetlands from both invasive phragmites and purple loosestrife is imminent. Valentine NWR has 11,000 acres of wetlands which would be affected by these invasive plants. The 19,000 acre Sandhills region has many thousands of acres of wetlands that could potentially be affected. Native vegetation would be replaced and wildlife habitat degraded. A larger early detection and response project to search for and

[Type text]

treat invasive phragmites and purple loosestrife in the Sandhills region would be beneficial.

### Funds

The grant received by the Sandhills Weed Management Area was for \$10,000. In 2011 the following expenses were paid out of the grant funds;

Labor and chemical to spray on private lands	\$ 484.05
Labor, mileage, and chemical to search for and spray purple loosestrife on private lands	\$3,093.70
Labor, mileage, and chemical to search for invasive phragmites on private lands	\$2,815.78
Total grant funds spent in 2011	\$6,403.53
Remaining funds	\$3,596.47

### Plans for 2012

The Cherry County Weed Superintendant will do follow-up visits on off refuge sites and refuge staff will do follow-up visits of refuge sites. Refuge staff will search refuge lakes and wetlands that were not searched in 2011.

The remaining funds will be used by the Sandhills Weed Management Area to spray invasive phragmites and purple loosestrife in any Sandhills location within their weed management area.

An article on this project will be written for "The Weed Watch," a joint publication of 4 weed management areas.

### Appendix 1. Known Locations of Invasive Phragmites on or near to Valentine NWR, Cherry County, NE

#### Marsh Lakes, Valentine NWR

42.52237N 100.49939W sprayed in 2009  
42.52.72N 100.49511W sprayed in 2009  
42.52155N 100.49118W sprayed in 2009  
42.51745N 100.48833W sprayed in 2009  
42.51742N 100.48798W sprayed in 2009  
42.51196N 100.49200W sprayed in 2009  
42.51191W 100.48875W sprayed in 2009  
42.50088N 100.49660W sprayed in 2009  
42.50417N 100.49574W sprayed in 2009  
42.51008N 100.49875W sprayed in 2009

[Type text]

42.51012N 100.49957W sprayed in 2009  
42.51052N 100.50009W sprayed in 2009  
42.52338N 100.51429W sprayed in 2009  
42.52400N 100.51260W sprayed in 2009  
42.54240N 100.50937W sprayed in 2009  
42.54188N 100.51987W sprayed in 2009  
42.54184N 100.51933W sprayed in 2009  
2 locations not GPS'ed sprayed in 2009  
42.53125627N 100.51549399W sprayed in 2010  
42.54172032N 100.51820336W sprayed in 2010  
42.54181302N 100.51868708W sprayed in 2010  
42.54200949N 100.51943533W sprayed in 2010  
42.54200698N 100.51943324W sprayed in 2010  
42.54199524N 100.51787077W sprayed in 2010  
42.54259556N 100.51265303W sprayed in 2010  
42.54251610N 100.51162608W sprayed in 2010  
42.54245566N 100.51107933W sprayed in 2010  
42.54080946N 100.50374935W sprayed in 2010  
42.49321617N 100.49082270W sprayed in 2010  
42.50440283N 100.49571781W sprayed in 2010  
42.50607753N 100.49568957W sprayed in 2010  
42.50848448N 100.49708071W sprayed in 2010  
42.51080803N 100.49590456W sprayed in 2010  
42.51517843N 100.51222069W sprayed in 2010  
42.52369378N 100.51377654W sprayed in 2010  
42.52623039N 100.50873960W sprayed in 2010  
42.52354332N 100.50277429W sprayed in 2010  
42.53032655N 100.51411140W sprayed in 2010  
42.53091814N 100.51501237W sprayed in 2010

East Long Lake, Valentine NWR  
42 25' 40.517N 100 24' 26.936W sprayed in 2011

Mitigation Wetland Highway 83, Mile Marker 178, East Side  
42°22'57.79"N, 100°32'32.71"W sprayed in 2011

West Road Ditch south of where Goose Creek crosses Highway 83  
Not GPS'ed, sprayed by Nebraska Dept. of Roads

Appendix 2. Known Locations of Purple Loosetrife on or near to Valentine NWR,  
Cherry County, NE

East Hackberry Boat Ramp, HU 3C1, Valentine NWR  
42 deg 33' 34.6N 100 deg 39 05.5W sprayed in 2010

[Type text]

Highway 83 right of way Habitat Unit 21B1, Valentine NWR  
42 30' 07.6N; 100 32, 14.1W sprayed in 2011

West side of Highway 83 near mile marker 201 (T32N R28W Section 24)  
not GPS'ed hand pulled in 2009 sprayed in 2010

West side of US Highway 83 near mile marker 199 (T32NR28W Section 36).  
Not GPS'ed sprayed in 2010

Goose Creek Crossing with Highway 83  
not GPS'ed sprayed in 2011

## **11. Water Rights**

In 2009, a letter from our Regional Office was sent to the Nebraska Department of Water Resources requesting that the Calf Camp water storage permit be negated. We now receive storage opening and closing notices for water storage here. The notices are based on flows in the Niobrara River. The calls for water are mute since the water would only leave the refuge at times of unusually high precipitation. At other times the water goes out of the Calf Camp Marsh and flows into the Marsh Lakes which is normally a closed basin. We have not yet received a reply.

## **12. Wilderness and Special Areas**

The refuge became a Registered Natural Landmark in 1979. National Landmarks were designated by the old Heritage Conservation Recreation Service. The program is now administered by the National Park Service ([www.nature.nps.gov/nnl](http://www.nature.nps.gov/nnl)).

Heather Germaine from the National Park Service's National Natural Landmark program visited the refuge on August 2. Valentine National Wildlife was designated as a landmark in 1979. This is the first visit or correspondence we have had in many years concerning the program. Heather gave us background information on the program and encouraged us to use the landmark status in applying for grants through the program.

In 2005, Valentine National Wildlife Refuge was designated a Nebraska Important Bird Area by the Audubon Society. The IBA program is an inventory of the key sites within a state that support significant numbers and high diversity of birds. The IBA program is a conservation and education effort of the National Audubon Society and has no regulatory authority. Our application was reviewed by a technical committee which commented on the high diversity of species and the large population of greater prairie chickens found on Valentine National Wildlife Refuge.

The refuge is also recognized as an Important Bird Area by the American Bird Conservancy ([www.abcbirds.org](http://www.abcbirds.org)).

[Type text]

The south west part of the refuge is also a proposed wilderness area. The area designated is about 15,937 acres in size. An intern was assigned to produce a wilderness monitoring plan for the area but a final report was not received here.

### **13. Easement Monitoring**

Four FmHA easements (Mead – 2 parts, Wagner, Yellowthroat (aka Tower), one development easement (Colburn) are managed out of Valentine National Wildlife Refuge. We also have a road easement to access the Yellowthroat Wildlife Management Area (fee title parcel).

#### Mead FmHa Easement 221 acres (Keya Paha County)

The Mead Easement land in Keya Paha County sold to a new landowner. The new landowner lives adjacent to the easement. A grazing plan for the Mead Easement was prepared. The landowner built a fence along the river and a division fence to divide the easement into east and west pastures. The refuge supplied fencing materials. Fall and spring grazing will be allowed and alternated between the 2 pastures. The permit covers 3 years. The grazing should decrease invasive brome and Kentucky bluegrass and increase native grasses. Cedar tree removal was also included. The landowner requested that we build a new fence on the property line on the east side and part of the north side where the fence is off line. We said we would supply materials and clear trees along the line if he would build the fence. We have not heard back on this.

#### Wagner FmHa Easement 349 acres (Knox County)

The Wagner Easement was not visited this year. On one portion of the easement (north of the county road) we have a management plan using grazing, fire, and tree clearing to bring back the prairie here. The Natural Resource Conservation Service is cost share funding with the landowner to do the work. Only parts of the plan have been completed.

The portion of the easement south of the county road has a less restrictive easement that allows grazing and haying at the landowner's discretion.

#### Yellowthroat FmHA easement also known as Tower Easement 440 acres (Brown County)

This easement has a new landowner who lives and ranches nearby. The easement land had been in the Conservation Reserve Program but came out in 2010. We met with the new landowner and with the assistance of the Natural Resource Conservation Service developed a 3 year grazing plan. As per the easement, the plan was signed by the landowner, FWS, and NRCS. The area has 4 pastures which will be grazed in a rotation starting in the spring of 2011. We supplied materials and the landowner improved the boundary and division fences on the easement. The easement was checked following the growing season and acceptable levels of grassland cover were present.

[Type text]

### Yellowthroat Access Road Easement 17 acres (Brown County)

We also have an access easement from the highway into the Yellowthroat WMA. This easement was purchased so the public could access the WMA. Land adjacent to the WMA was sold for recreational use and we informed the landowner several times that he could not use our road and easement to access his property. He continued to use the road this year. He has a separate access easement that is separate from our easement but there is no road on it.

### Colburn Burying Beetle Easement

The Fish and Wildlife Service also has an easement on 1,324.25 acres of land that was formerly part of Valentine NWR. This land was traded away for other lands in what we refer to as the Colburn exchange. The easement was habitat units 24B1, 24B2, 12B3, 24D (N), 24D(S), 12B4, and 12B5 which were traded for habitat units 38A, 37B, and 37C which are now part of the refuge. The easement was placed on the land to protect the endangered American burying beetle. The easement restricts development on the site. We go buy this land as we do refuge work and noted no developments.

## **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 is 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. A bison vertebra, with the long spine that extends into the buffalo hump, was found along the dry shoreline of the Marsh Lakes at Valentine NWR in 2002, and a partial buffalo skull was found during the renovation of Hackberry Lake in 2004.

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

[Type text]

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

### a. Bald Eagle

Three bald eagle nests located on or near Valentine NWR were observed in 2011. Eagles have nested in a cottonwood on the west side of Vrinder's swamp just south of Valentine NWR for at least 3 years. This nest produced 3 young in 2009, was not active in 2010, and produced at least one fledgling in 2011. The nest is on land owned by Blaine Sherman, and was observed 3 times from vantage points on the county road. A second off-refuge nest is located west of the refuge and can be easily observed from State Hwy 97. A pair of adults was observed at this nest two times, and a single adult once, but apparently this was an unsuccessful nest in 2011. On the refuge, a pair of adult bald eagles returned to the nest in the 34C trees that was used in 2010. No young or evidence of young (e.g. whitewash under the nest) were observed during several visits to the nest in 2011.

### b. Peregrine Falcon

Migrating peregrine falcons are usually observed traveling through Valentine NWR in the spring (generally April) and in the fall (generally Sept-Nov). None were observed in 2011.

### c. Whooping Crane

No observations of Whooping Cranes on Valentine NWR in 2011. These cranes are sporadic refuge visitors, stopping occasionally at refuge wetlands and meadows during migration.

### d. Western Prairie Fringed Orchid

Western prairie fringed orchid (*Platanthera praeclara*) survey on Valentine National Wildlife Refuge (Aug 2011 mpn).

## INTRODUCTION

The western prairie fringed orchid (*Platanthera praeclara*) was federally listed as a threatened species on September, 28 1989. It has experienced rangewide population decline of about 60% from historic levels. This decline can most likely be attributed to the conversion of native grasslands to cropland. The fertile wet meadows where orchids grow also have soil that is ideal for agricultural crop production. Currently, there are 175 known sites of western prairie fringed orchids in North America. These locations occur in six states and Canada.

[Type text]

Western prairie fringed orchids have been counted on Valentine National Wildlife Refuge since 1981, when the first orchid was documented in the habitat unit 32B2 in the Pony Lake Valley. For a few years after, sites were documented where orchids were found but numbers of plants were not counted. In 1998, orchid plants and blossoms were inventoried in Sweetwater Valley in cooperation with Marge From, UN-L/Henry Doorly Zoo, to determine pollination rates and development of seed capsules.

## STUDY AREA AND METHODS

Valentine NWR occurs in the Sandhills of Nebraska. This area is mainly native grasslands with rolling sand dunes and interdunal valleys. The refuge is also has many scattered lakes and wet meadows. The majority of the surrounding landscape is in private ownership, which is mainly used for cattle ranching.

All habitat units where western prairie fringed orchids have been located on Valentine NWR were surveyed by one to four refuge staff members from 08-15 July 2011. A few areas containing potentially suitable habitat have not been searched, and were not checked this year. Plants were found by systematically searching these meadows. Refuge staff spread out approximately 30 meters apart and walked back and forth until the entire habitat unit was searched. Four sites were searched using an ORUV with a driver and passenger both looking for orchids as transects were driven back and forth across the habitat unit. Tall vegetation in several units makes locating orchids difficult, and there is a possibility that some flowering orchids may have been overlooked. The flowers mostly occurred in wet meadows, with some flowers occurring in up to 10 cm of water. Several orchid locations are known on private lands, and these are scanned from the public roadway.

Surveys provide a count of flowering and vegetative western prairie fringed orchids on the refuge. Most vegetative orchids are located near a staked plant from the previous year, as they are difficult to spot growing among other green vegetation. The height of each orchid was measured and the total number of flowers and buds were counted on each flowering plant. GPS coordinates were also taken at all orchid locations. In meadows that are hayed, a painted wooden lath was placed next to the plant so the permittee could hay around the orchids. This prevents the orchids from being cut during haying operations, and allows the orchids to produce seed.

## RESULTS

Orchid surveys took about 6 days, accomplished primarily by two observers. Seventeen habitat units and other locations (e.g. south of Sweetwater information kiosk) were searched for orchids on the refuge, and an additional six sites were checked off refuge. A total of 138 orchids were located on Valentine NWR, including 107 flowering plants and 31 vegetative plants (Figure 1). Seven additional flowering plants were spotted on private lands near the refuge. The number of flowering orchids found on Valentine NWR in 2011 declined by 93 from the 2010 survey (Figure 2). Seven of the eighteen refuge locations had orchids in 2011 (Table G2d1), and most orchids were found in HU 24C4, a

[Type text]

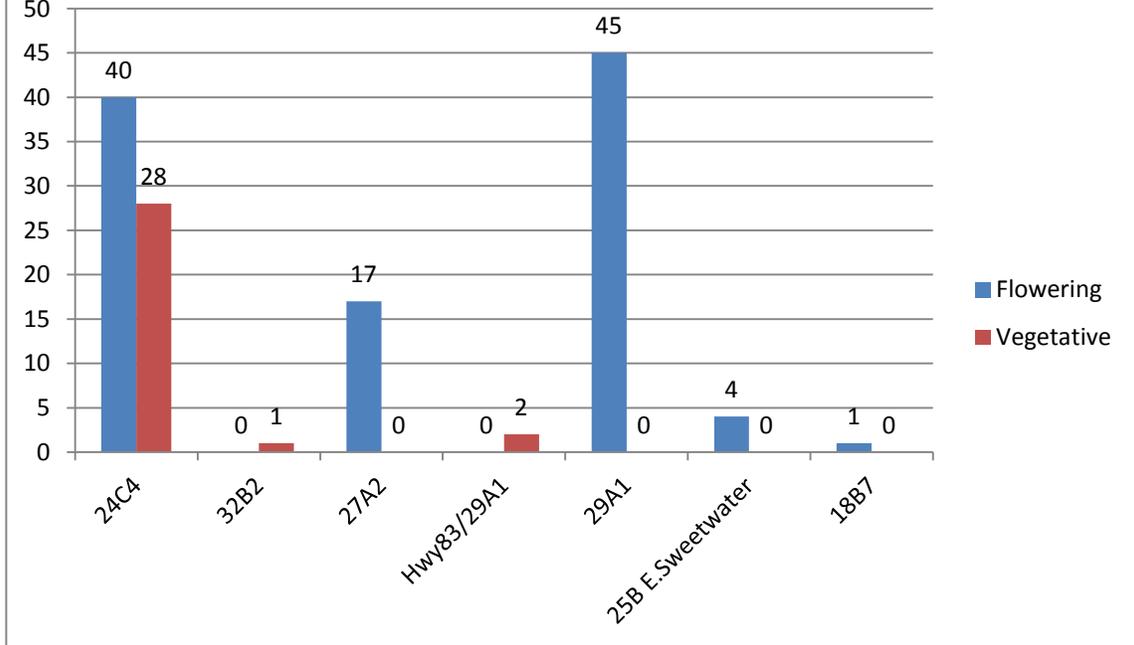
meadow that has a long history of use for haying. We were aided in locating vegetative orchids in this unit by looking near stakes from orchids found in 2010. The north side of Sweetwater in HU 29A1 also had a good year, with 45 flowering orchids located. In HU 27A2, another hayed meadow, a total of 17 flowering orchids were located in 2011, which is up from the 1 orchid found last year. The remaining four orchid locations had only a handful of orchids this year.

## DISCUSSION

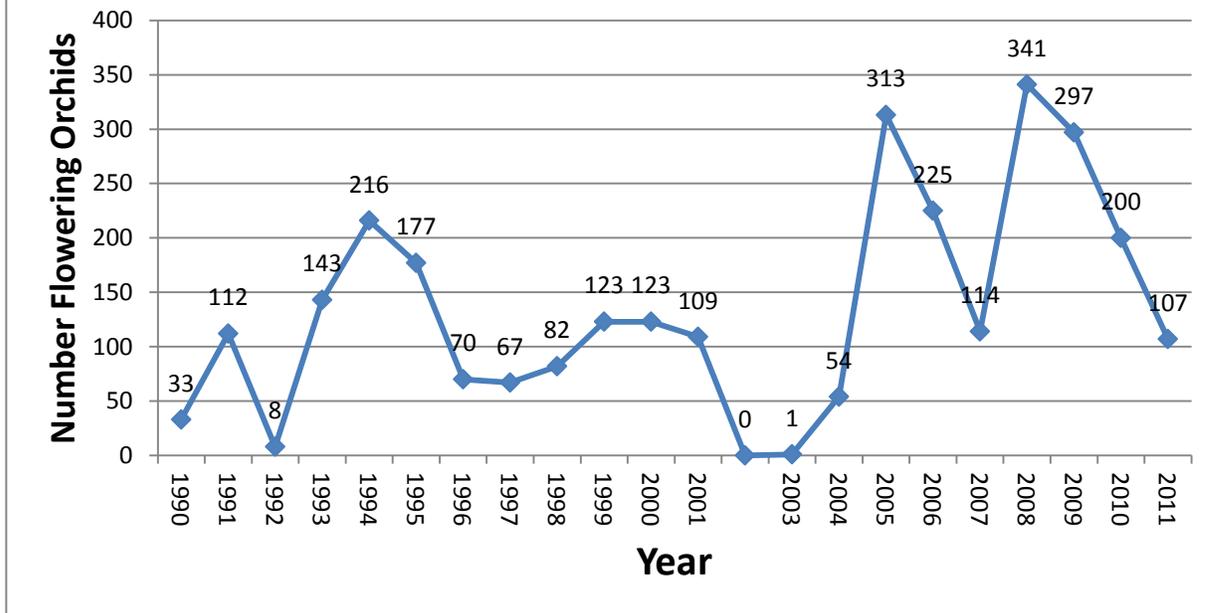
Orchid numbers on Valentine NWR declined for the third consecutive year, but does not appear to be out of the ordinary for this to occur. The Sweetwater Valley on the refuge continues to be where the orchids seem to be most persistent and most abundant. The number of orchids found in HU 24C4 did drop considerably from the number located in 2010 (176 flowering and vegetative found in 2010, 68 flowering and vegetative found in 2011). Currently, little seems to be known about what factors drive orchid germination and development from year to year. There does not seem to be a pattern in the Valentine NWR data, as numbers are variable from year to year within units and across the refuge. HU 24C4 has likely been a hay meadow from when (or before) the refuge was established. Across the highway, HU 29A has not been hayed for a number of years, and was most recently treated with a spring grazing treatment in 2010. Hail may have impacted orchid development in two units on the refuge in 2011 (HU 32B2 and HU 16E4). Only one orchid was found in these two units, and it was an orchid that would have flowered, but was so damaged that it would have no chance to produce seed capsules. Variability in orchid emergence and lack of clarity about the life history of the orchid make determination of management impacts difficult to assess. On Valentine NWR, management of units where orchids occur has ranged from annual haying to periodic grazing to rest, and the number of orchids seems to vary independently from the management actions. Hail in mid to late June does seem to have a very negative impact on orchids or at the very least our ability to locate orchids. All known orchid locations have had at least one year when our orchid searches found no orchids. Drought conditions in 2002 and 2003 seemed to drive the low number of orchids for these two years. As moisture returned in 2005, the number of orchids located increased dramatically, producing one of the largest orchid counts for the refuge. Since 2005, annual precipitation has been near or above average, and orchid numbers do not seem to be closely tracking annual precipitation.

[Type text]

**Figure 1. Number of flowering and vegetative orchids and the habitat units where the plants were located on Valentine NWR, July 2011.**



**Figure 2. Counts of flowering WPFO on Valentine NWR, 1990-2011**



[Type text]

Table G2d1. Location, number of orchids found in the last 5 years at each site.					
Habitat Unit	2007	2008	2009	2010	2011
32B2	22	64	1	10	1
29A1	8	9	42	12	45
24A2	NA	2	12	0	0
24C2	NA	3	1	0	0
24C4	25	133	220	176	69
25B Sweetwater	0	2	2	3	4
25B Cow Lake	0	0	0	0	0
Hackberry HQ ROW	0	0	0	0	0
Hwy 83 ROW/29A1	5	6	7	4	2
18B7	0	15	0	2	1
36A	0	0	0	0	0
21A3	0	16	0	1	0
21A4	2	3	0	1	0
16E4	39	75	3	14	0
7A2	0	0	0	0	0
15C3	5	1	0	0	0
13A	8	12	13	3	0
27A2				1	17

e. Blowout Penstemon

Survey of blowout penstemon (*Penstemon haydenii*) on Valentine National Wildlife Refuge (M. Nenneman, 2011).

INTRODUCTION

Blowout penstemon (*Penstemon haydenii*) was listed as an endangered species on September 1, 1987. At the time of listing, the plant was known only in the Nebraska Sandhills, although a population has since been located in southeastern Wyoming. The common name of the plant refers to the round or conical shaped, wind-derived depressions in sand dunes that are largely devoid of vegetation. These open, sandy environments are the habitat occupied by blowout penstemon and other pioneer plant species. Along with blowout grass, it is one of the first plants to grow and start stabilizing these blowouts. The waxy leaves of blowout penstemon, and its propensity to

[Type text]

root at nodes covered by blowing sand allows the plant to survive in the harsh conditions in the blowouts. Once the blowout begins to stabilize and other plants begin to colonize, blowout penstemon tends to decline as it cannot compete with other plants. Research also suggests that the plant needs the sandblasting effects of wind and sand to thrive. Due to changes in management of the Sandhills, the amount of available habitat has decreased through the 20<sup>th</sup> century.

As part of the recovery plan, blowout penstemon seedlings have been transplanted into blowouts across the Sandhills. Transplants of blowout penstemon on Valentine NWR were started in 1996, with 2000 seedling plants transplanted into three blowouts. Seedlings were grown by Dr. James Stubbendieck at the University of Nebraska-Lincoln. Seedlings have been transplanted on the refuge from 1996-2001, and from 2004-2008, with a total of nearly 17,000 seedlings placed on the refuge. Seedlings have been transplanted by Stubbendieck and his students, refuge staff, and volunteers. A total of 70 blowouts across the refuge have had penstemon transplanted since 1996. Transplant blowouts have been monitored annually since 1999, with the number of vegetative plants, flowering plants, and flowering stalks recorded for each blowout.

## STUDY AREA AND METHODS

The 71,772 acre Valentine National Wildlife Refuge lies in the Sandhills of Nebraska. Habitat on the refuge is similar to much of the Sandhills, with rolling, grass covered sand dunes interspersed with lakes, wetlands, and meadows in the valleys. A number of blowouts exist across the refuge, although many are either small and/or healing. The majority of the surrounding landscape is in private ownership which is mainly used for ranching, so the native grasslands are mostly intact.

Blowout penstemon was surveyed on Valentine NWR by the biologist and one seasonal biological science technician. All known locations across the refuge were surveyed during the blowout penstemon flowering period in June. Each blowout that has had penstemon (either transplants or native plants) was systematically searched and flowering

[Type text]

and vegetative plants were counted. During the counts, a tally is kept for the number of vegetative plants, flowering plants, and total flowering stalks. Counted plants are marked with a scrape in the sand. If more than one person is counting plants in a blowout, each person keeps a tally, and the total number of plants is recorded for the blowout. It took about 8 days to complete blowout penstemon surveys in 2011 – five full days (10 person days) and three partial days.

## RESULTS AND DISCUSSION

All 70 of the transplant blowout locations were searched for the presence of blowout penstemon in 2011, and 2 blowouts with naturally occurring penstemon were surveyed. There are seven locations that at one time had naturally occurring blowout penstemon. Three of these did not have a native plant located for a number of years, and have since had seedlings transplanted into the blowout (HU 3D, HU 16C, and HU 19A). In units 3D and 16C, there was one known blowout penstemon which died in 2006. In 19A, the last native blowout penstemon was documented in 1999. Two of the blowouts that were reported to have native blowout penstemons have not been checked because their location is poorly documented (8B and 10B(W)). Blowouts in 22B2 and 34A2 both contain some native plants.

A total of 1,355 blowout penstemon plants were documented in the 56 transplant blowouts (Fig. 1). No blowout penstemon plants were located in 14 blowouts that have had seedlings planted in them. An additional 42 plants were located in two units with native plants. Blowout penstemon numbers have been tracked on the refuge since 1999 (Fig. 2), and the number of plants located has varied considerably. In 2011, the total number of plants increased by 193 plants from the previous year. The number of vegetative plants located increased considerably, while the number of flowering plants and flowering stalks fell. Since blowout penstemon can shift from a flowering adult to a vegetative adult from one year to the next, this observation is not unexpected. Looking across all of the years of monitoring data on the refuge, the number of flowering stalks

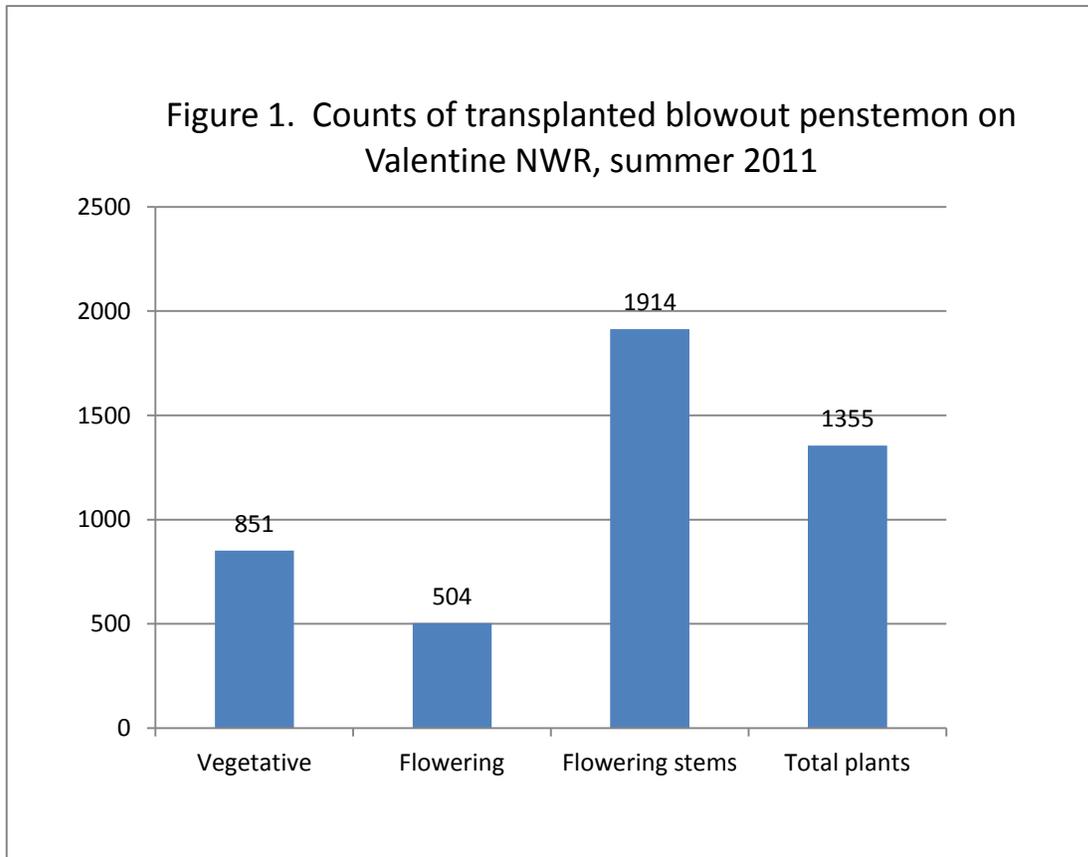
[Type text]

per plant (average 3.7 flowering stalks/flowering plant) is similar to the average of 3.5 flowering stalks/flowering plant that Kottas (2008) described.

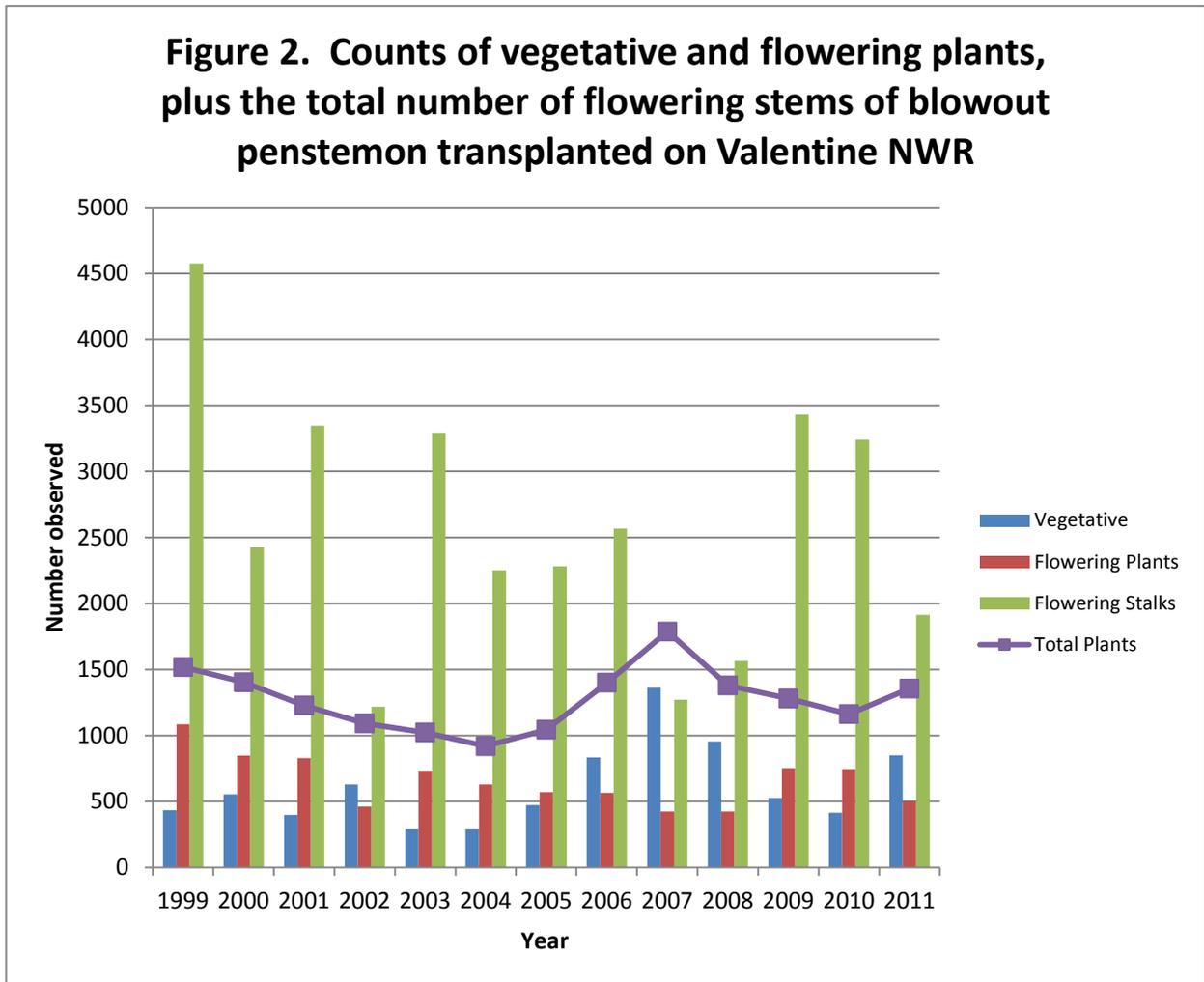
While there is currently over 1,300 blowout penstemon on the refuge, there are several reasons to remain concerned about the continued existence of the plant on the refuge. One potential issue is that many of the blowouts that currently have plants have only a small number of penstemon, and the blowouts themselves are small. Of the 56 blowouts that had blowout penstemon plants in 2011, only 6 had at least 50 plants. The Valentine NWR CCP has an objective of maintaining a minimum of 5 blowouts with a population of at least 100 plants. In 2011, there were 3 blowouts that met the 100 plant minimum.

The data for blowout penstemon are stored on the GIS computer, in an Excel file named 'Blowout penstemon database' (C:\RLGIS\Vegetation Monitoring\Penstemon\Blowout penstemon database). There is also spatial data in RLGIS under Endangered Species Critical Habitat Designation. This data is also located in (C:\RLGIS\Vegetation Monitoring\Penstemon\penstemon2010). This spatial data shows where all the blowouts occur on the refuge, what their acreage is, and what their respective names are. An Excel spreadsheet 'Blowout penstemon database' found on the refuge biologist's computer (C:\Documents and Settings\nennemanm\My Documents\mel\Work files\Vegetation monitoring\Blowout penstemon) has all of the penstemon survey data.

[Type text]



[Type text]



e. Wolves

Wolves were extirpated from Nebraska in the mid- to late 1800's. There is an occasional wolf sighting documented in Nebraska, but none near the refuge.

f. American Burying Beetle

The endangered American Burying Beetle (ABB) has been documented on Valentine NWR, and trapping in 2005 and 2010 provided some measure of their distribution across the refuge. No trapping or observations of ABB were made in 2011.

3. **Waterfowl**

Waterfowl pair and brood counts were again conducted on West Long, Hackberry, Pony, Center, and "21" lakes, the Marsh lakes, and at Yellowthroat Wildlife Management Area.

[Type text]

Pair counts were conducted 16 May – 08 Jun, while two brood count surveys were done 23 June – 06 Jul and again 27 Jul -01 Aug. On the refuge portion of the survey, there were 174 indicated pairs of blue-winged teal observed, 152 indicated pairs of mallards, 404 indicated pairs of dabbling ducks, 16 pairs of diving ducks, and 67 pairs of American coots. A simple extrapolation of these numbers based on the percentage of wetland area surveyed provides an estimate of 1490 dabbling duck pairs and 59 diver pairs for the refuge. While these estimates do not account for observer differences and the problem of ducks present but not detected, they do provide a basis for comparison from year to year, and serve to show that waterfowl breeding populations are well below desired levels. Valentine NWR CCP objectives for waterfowl include providing habitat to support greater than 4000 pairs of dabbling ducks, and 700 pairs of diving ducks, with a brood:pair ratio greater than 20%. Across the six refuge lakes surveyed, only 13 duck broods were observed. A simple extrapolation of this number for the refuge provides an estimate of 48 total broods, with a brood:pair ratio of 3.1%. While data collected on waterfowl pairs and broods very likely have problems associated with different observers and detection biases, they still serve as an index of current waterfowl use and production. Comparison of observations on the Marsh Lakes in 2011 to past data indicates that the number of pairs and number of broods has declined rather dramatically over the years (Table G3a1). It is thought that the entry of common carp into the lakes has greatly impacted the suitability of Marsh Lakes for waterfowl through the reduction of available invertebrate biomass, changes in and loss of submergent and emergent aquatic vegetation, and decline in water quality. However, other lakes included in the surveys also have fewer duck pairs and lower numbers of broods seen than in past surveys, so carp may not be the only factor driving the reduced waterfowl use.

	BWTE	MALL	Dabbling	Diving	Coot	Broods
2000	420	560	1406	53	196	87
2001	190	338	732	42	214	NA
Average*	397	222	805	135	300	NA
2008	39	41	125	18	4	1
2009	75	79	156	4	1	7
2010	75	59	157	4	3	2
2011	137	109	301	12	54	6

\*Average is pair counts on Marsh Lakes from 1968-2001, excluding 1972-1977

b. Geese

No surveys were conducted specifically for Canada geese in 2011. General observations indicated that pairs of Canada geese have spread out across the refuge as holes open up in the ice. With the return/rebound in muskrats on the refuge, muskrat huts are providing an abundance of suitable nesting locations for geese. Good numbers of goose broods were observed on West Long and “21” lakes during duck brood surveys. Canada geese, usually in pairs and family groups, can generally be found on the refuge throughout the year when there is open water, but large flocks were not observed using refuge wetlands in 2011.

[Type text]

c. Trumpeter Swan

Trumpeter swans began arriving back on the refuge in early March as open water became available in refuge lakes. The refuge staff keeps anecdotal observations of swans through the year. There were 4 swan broods observed on the refuge in 2011. In July, a pair of swans with 5 cygnets was observed on Center Lake. In August, pairs were observed on East Sweetwater, East Long, and Watts lakes. These pairs had 5, 2, and 2 cygnets, respectively. The observation of 4 presumed nesting pairs and 14 cygnets represents the best know reproductive effort for Trumpeter swans on Valentine NWR.

The following article was prepared for *Trumpetings*, the newsletter of the Trumpeter Swan Society and documents the return of swans to the refuge.

A Short History of Trumpeter Swans at Valentine National Wildlife Refuge (NWR)

By Mark Lindvall, Refuge Manager, Valentine NWR

The 72,000 acre Valentine NWR lies in the Sandhills of north-central Nebraska. The many wetlands found in the Sandhills and on the refuge provide habitat for trumpeter swans to nest and rear their broods. Rivers both in and bordering the Sandhills are used as wintering areas. Every year since 1935, when the refuge was established, managers have written an annual narrative reporting on activities and happenings on the refuge. The following history was gleaned from these annual reports.

In 1960 trumpeter swans from Red Rock Lakes NWR were released at La Creek NWR and a restoration flock started. These birds moved into the Sandhills and on to Valentine NWR. The first mention of trumpeter swans appears in the 1966 Annual Narrative. It is a bittersweet entry. "Evidence has shown that a few of the trumpeter swans from the La Creek Refuge have been pioneering into the Sandhills Area....This year, further evidence of this pioneering tendency was shown by observation of the trumpeters on the Valentine Refuge." The next paragraph states "In early December, 3 trumpeter swans were shot on and near Schoolhouse Lake, some 32 miles west of refuge headquarters.... He was fined \$705 in Cherry County Court."

Swans were observed on the refuge in 1967 and again in 1968 and then in 1969 the first nest was recorded. The 68 Narrative reads "It was quite disappointing that no successful nests evolved, but maybe next year" and the 69 Narrative exclaims "Success at last! A pair of Trumpeter Swan nested and produced two cygnets on the refuge this year." This pair returned in 1970 and raised 4 cygnets. The pen was shot in the fall of 1970 but the cob acquired a new mate and this pair nested on "21" Lake in 1970 (4 cygnets), 1971 (2cygnets), 1972 (0, nest flooded), 1973 (2 cygnets) and 1974 (2 cygnets). The 1973 narrative laments "Our faithful pair of Trumpeter Swans returned to "21" Lake to nest again this year. Last year they were unsuccessful, their nest flooded out by a June rainstorm. This year two cygnets hatched, but only one made it to flight stage."

[Type text]

“Trumpeter swans experienced a landmark in 1976 with both nesting pairs having a successful nest.” states the 76 Narrative. The pair on “21” Lake produced 4 young and were joined by a successful pair on North Marsh Lake that hatched two.

The landmark was followed in 1977 by an unsuccessful nest on “21” Lake and in 1978 with four cygnets raised to flight stage. The period from 1979 – 1992 saw no trumpeter swans successfully nesting on Valentine NWR. The narratives from these years show “unsuccessful – flooded, single adult lone immature observed, pair summered on “21” Lake but nesting activity did not occur, infrequent observation of a single bird, lone neck collared bird observed, and attempting to nest but not confirmed.” Trumpeter swans were observed every year but evidence of both nesting and production was not recorded.

The 14 years of no successful nesting was ended in 1993 when 2 cygnets were produced. The 1994 – 1997 narratives are incomplete and provide no information on trumpeter swans. In 1998 a brief mention is made of 2 pairs of swans successfully nesting on Center and Middle Marsh Lakes. The 1999 and 2000 narratives are again incomplete and the 2001 narrative mentions an unsuccessful nest on Center Lake. The Center Lake pair produced 3 young in 2002. In 2003 there were 3 nesting pairs but only 3 cygnets were raised. In both 2004 and 2005 swans nested successfully on Willow and Center Lakes producing 5 cygnets each year. These same pairs were both unsuccessful in 2006. In April of 2007, eight pairs were noted on wetlands of which 2 went on to nest here and had 11 young including a brood of 8 on East Long Lake. In 2008 the Center Lake pair again had two cygnets and in 2009 there were no successful nests. In 2010 a pair on Center Lake had a brood of 2 and a brood of 5 was seen on Watts Lake. In 2011 a refuge record was set in both the number of successful pairs and number of cygnets produced with 11 cygnets from pairs on Center, Watts, East Long, and East Sweetwater Lakes.

Looking back there have been periods ups and downs in nesting success for the Valentine NWR trumpeters, but the trend has been from no swans, to one successful pair, then to sometimes two or three, and last year four successful nests. The High Plains flock has also followed this pattern of gradual increase. There are still many suitable wetlands both on and off the refuge that should allow the population to continue to increase over time.

#### 4. Marsh and Water Birds

##### Great Blue Heron

A great blue heron rookery established in the cottonwood grove in HU 34E Trees. A complete count of nests was not attempted, but there was an estimated 50 to 60 nests in the trees, and young birds were seen in many of the nests.

##### Sandhill Cranes

A sandhill crane was seen on the refuge throughout the summer. We had heard reports of the bird and saw it feeding in the road ditch near Pony Lake. It appeared relatively tame. Cranes are a common migrant but rarely seen in the summer.

[Type text]

No Sandhill Cranes were observed 23-25 March during the annual spring crane survey. This annual survey is done to assess Sandhill Crane numbers, and is conducted to capture most of the birds while they stage on the Platte River. Cranes are usually not seen migrating through this area until the second week of April. In the fall, cranes were observed migrating south during mid-October.

#### 5. **Shorebirds, Gulls, Terns and Allied Species**

With warming temperatures and open water in March, more gulls were observed on the refuge. It appears that most of these are ring-billed gulls, but no close observation has been made to determine species. Ring-billed gulls, black and Forster's terns are the most observed species on the refuge through the summer. Black and Forster's terns are known to breed on the refuge, although no nesting colonies were located in 2011.

#### 6. **Raptors**

Three to four pairs of kestrels have been observed around tree groves on the refuge, and likely indicate breeding pairs. They have been seen at the 32A tree grove, north of Tom's Lake, by the Dewey Lake main boat launch, and at Hackberry HQ. Four great horned owl nests were noted across the refuge – one in HU 33 east of "21" Lake, one in the trees south of Calf Camp road in HU 16E3, one in HU 2B, and in a cottonwood tree at Hackberry HQ. Observations of raptors through the breeding season suggest that red-tailed hawks, Swainson's hawks, northern harriers, American kestrels, and great horned owls all breed on the refuge, although nests were not located for all of these species. Other secretive and less common species potentially breeding on the refuge include sharp-shinned and Cooper's hawks, long-eared, short-eared, and eastern screech owls. Short-eared owls are most often observed on the refuge during the non-breeding season.

#### 7. **Other Migratory Birds**

In 1991-1992, a Breeding Bird Survey (BBS) route was implemented on Valentine NWR as part of the biological inventory conducted by National Biological Service (Bogan 1995). This route has been completed every year since 2003. In 2011, the route was completed on 14 Jun, with 1241 individual birds of 62 species detected. The average number of individuals and species observed for this route is 1010 individuals of 59 species. The most commonly observed bird was the Red-winged Blackbird, which comprised 45% of the total observations. Five other species (Marsh Wren, Mourning Dove, Dickcissel, Western Meadowlark, and Yellow Headed Blackbird) had greater than 30 observations. BBS routes are useful for detecting trends in the more common species observed, and providing some information on the presence/absence of less common species. There were 28 species detected in the 1991-1992 surveys not detected in 2011, and nine species detected in 2011 not detected in 1991-92, with 55 species in common between the two time periods. At least 18 of the 28 species from the 1991-92 surveys not detected in the 2011 BBS route were know to be on Valentine NWR in 2011, and the remaining 10 species may have been non-breeders. The 1991-92 BBS routes were

[Type text]

conducted in late May and early June on two consecutive days, which likely increased the number of species detected by 1) catching some late migrants (e.g. Least Flycatcher and Blackpoll Warbler), and 2) providing an additional amount of time to detect species when they are present. Of the nine species not detected in 1991-92, the European Starling is an undesirable exotic associated with humans and tree cavities. The Trumpeter Swan has been expanding its range in recent years, with 4 breeding pairs documented in 2011, which likely provides more opportunity to detect them than the single pair known in 1991-92. Great Horned Owls are an adaptable species, and likely have expanded their range with human settlement, due to the increased availability of nest sites that accompanied settlement. Northern pintails are not readily detected by auditory cues in June, nor are waterfowl sampled well by BBS techniques. Western grebes have been a common breeding species on Valentine NWR in recent years (especially on the Marsh Lakes), increasing the likelihood of detection. Dickcissels are a somewhat nomadic species that can vary greatly in abundance from year to year, and have been fairly common at Valentine for the past 7 years. The remaining species detected in 2011 not detected in the early surveys are tree/shrub associated, and may have increased over the last 20 years, although none of these (Great-crested flycatcher, Chipping sparrow, and Spotted towhee) are very common.

## 8. Game Mammals

### a. Deer

No refuge deer surveys were conducted in 2011. Aerial deer surveys were conducted annually from 1968-1988, and were not repeated until 2005 and 2008, when concerns about CWD prompted some funding to determine deer numbers across the state. During the aerial surveys, the average number of deer seen was 166 (range 70-280). In the first three years of the survey, mule deer outnumbered white-tailed deer by about 2 to 1. More recently, white-tails have become the more abundant species, outnumbering mule deer about 4 to 1.

Rifle deer hunting is a popular activity on Valentine NWR, with most hunters focusing on antlered deer (Table F8.1). Of the 93 deer reported as harvested on the refuge in 2011, all were white-tailed deer. This is the first year where no mule deer have shown up in the refuge harvest. The number of mule deer on the refuge did seem to be down, as few mule deer were observed on the refuge. Harvest pressure continues to be heavier in the Sandhills unit, with 64 deer coming out of this unit, and only 20 out of the Calamus West unit. Hunters are taking some nicer deer, as 27 (29%) of bucks were recorded as 3.5 years old, and an additional 9 (10%) bucks were unaged, but presumably were older deer that were being kept for taxidermy mounts. Thirty six (39%) bucks were aged at 2.5 years old, which seems to be the age that most hunters find to be an acceptably large buck (e.g. has enough antler).

Table F 8.1. Deer harvest on Valentine NWR during the 2011 deer season. Harvest information based on deer reported to the state check
---

[Type text]

stations. Archery and muzzleloader deer are now checked via telecheck, so some deer harvested on the refuge may not be included in these totals. Muzzleloader and archery harvest are now added anecdotally when we get reports.				
	White-tailed Deer		Mule Deer	
Unit	Buck	Doe	Buck	Doe
Calamus W	20	0	0	0
Sandhills	55	9	0	0
State buck	3	0	0	0
Muzzleloader	1	0	0	0
Statewide youth	4	1	0	0
Archery	0	0	0	0

b. Muskrat and other furbearers

No muskrat house counts were conducted in 2011, but anecdotal observations indicate that muskrats were still quite abundant across the refuge, and many smaller wetlands had muskrat houses. It is likely that the muskrats were responding well to increased water levels and the availability of food. Rat houses provide nesting sites for many waterbirds, as well as loafing areas. Muskrat feeding activity also serves to open up dense patches of cattail and bulrush, creating openings that other wildlife use. There was enough interest expressed in harvesting muskrats that three permits were issued for trapping on the refuge. Unfortunately, none of the trappers submitted the trapping logs that their permit required them to do, so no records of the number trapped exists.

10. Other Resident Wildlife

a. Prairie Grouse

Greater Prairie Chickens (GPCH) and Sharp-tailed Grouse (STGR) 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. Leks were checked in mid-March for placement of grouse viewing blinds, and blinds were placed on the east side of Tom's Lake in HU 30A2 (STGR), and to the north of McKeel Lake in HU 16B2 (GPCH). Comments on the sheet placed in the blind are generally very positive, and most people really seem to enjoy spending an early morning with the grouse.

In the Valentine NWR CCP, the established objective for prairie grouse densities is to maintain a 5 year average of 1 prairie grouse lek/1.6 mi<sup>2</sup> within the State Survey Block, with a total of 15 GPCH leks and 13 STGR leks. In 2011, the 5 year average (2007-2011) was 1 prairie grouse lek/1.64mi<sup>2</sup>, with 12 GPCH leks and 15 STGR leks. For 2011, there was 1 lek/1.8 mi<sup>2</sup> with 12 GPCH leks and 12 STGR leks. Thus in 2011 the

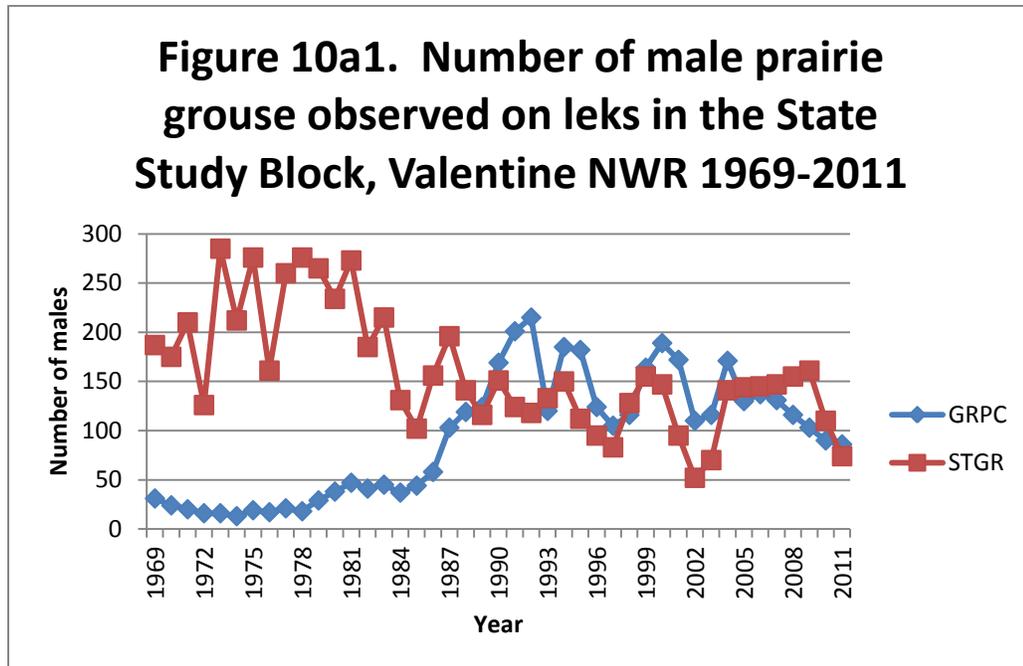
[Type text]

lek density was lower than desired, and the number of GPCH leks was three less than CCP objectives. The total number of males observed on leks declined for both prairie grouse species in 2011 (Fig 10a1). Both grouse species saw low numbers on leks in 2002, which was an extremely dry year. STGR numbers increased quickly in the two years following, and then have shown a steady to slowly increasing count, but have declined the last two years. GPCH numbers also increased sharply in 2004, but then declined and numbers have declined over the last five years.

Wing boxes were placed out at 5 locations on Valentine NWR to allow hunters to voluntarily submit wings from harvested grouse. Wing returns provide some measure of hunting success and an indication of the grouse harvest (we have no way of knowing the percentage of hunters who don't submit harvest information). In addition, the wings are used to determine the species composition of birds harvested, and allows the ratio of juvenile birds:adult birds to be calculated as an index of grouse production for the year. The CCP objective is to achieve a minimum sample of 350 prairie grouse wings, with a harvest ratio  $\geq 2.5$  juveniles per adult. In 2011, there were 132 hunters reported on submitted envelopes, with 136 prairie grouse harvested (124 STGR, 11 GPCH, 1 unknown). The juvenile:adult ratio was 2.1:1.

Overall harvest was well below the CCP objective, even with the hunting season extended by a month. This was the second season that grouse hunting was extended through the end of January, which allowed for the harvest of an additional 4 prairie grouse. The juvenile:adult ratio for 2011 was below objectives found in the CCP, suggesting that reproduction was below that necessary to maintain a healthy population. Juvenile:adult ratios on McKelvie and Halsey NF were only 1.0 and 1.5 juvenile:adult, respectively, which suggests nesting grouse fared poorly on the NF lands in 2011. A component of not meeting the CCP harvest objective is undoubtedly a reduction in the number of grouse hunters. In the 20 years leading up to the completion of the CCP (1980-1999), the average number of hunters was 321 and the average grouse harvest was 445. Since 2000, the average number of hunters dropped to 188 and the average harvest dropped to 240. The average number of birds/hunter during these two time periods has changed little (1.38 birds/hunter 1980-1999, 1.26 birds/hunter 2000-2011), so hunter success remains relatively unchanged. Changing demographics in grouse hunters and perhaps prairie grouse populations may make the CCP objectives for the sample of prairie grouse wings unattainable in most years.

[Type text]



b. Ring-necked Pheasant

Pheasant season was open on Valentine NWR through the end of the January. No records of pheasant hunting are kept, but it is thought that the pheasant harvest may be similar to the grouse harvest numbers. Late in the season, pheasants seem to gather in large numbers in a few places on the refuge, generally where food resources are adjacent to good thermal cover. This year was apparently a poor year for pheasant production and perhaps adult survival, as it was difficult to find these birds during the fall hunting season.

c. Merriam's Turkey

Tom turkeys begin to strut and gobble in March and early April. Turkeys are not overly abundant on Valentine NWR, and their activities are generally confined to areas where they have access to trees. They are most commonly observed on the south side of Hackberry Lake, near the Pelican Lake sub-headquarters, near the main boat launch on Dewey Lake, and in the vicinity of the Pony Lake sub-headquarters. No surveys are done to document turkey populations on Valentine NWR. No hunting of turkeys is allowed on the refuge.

d. Gray partridge and Bobwhite Quail

Bobwhite quail are not common on Valentine NWR, so seeing them is a noteworthy event for refuge staff. The refuge likely does not provide the best habitat for quail, as they probably fare better where there are more shrubs in the landscape. No observations of quail or gray partridge were made in 2011.

[Type text]

e. Reptiles, amphibians, and others

Calling Amphibian Monitoring Conducted on Valentine NWR in 2009 and 2011.  
M. Nenneman, Mar 2012.

In 2009, three calling amphibian survey routes were established on Valentine NWR to provide information on the distribution and relative abundance of these amphibians on the refuge. The protocol used follows the North American Amphibian Monitoring Project protocol, which utilizes a series of randomly selected survey routes along existing roads with listening stops every ½ mile. Since there are only a few roads on Valentine NWR, survey points were established along almost all readily traveled roads. In most places, stops were established every ½ mile, except where roads passed through sandhills with no wetland habitat; here stops were spaced farther apart to skip these areas. The survey routes are called the Little Hay route, designated as stops 1-27; the Calf Camp route, with stops 28-52, and the Pony Lake route, with stops 53-69 (Appendix 1). A shapefile of these survey points is located on the Valentine NWR GIS computer in C:\RLGIS\temp\Amphibian survey route.shp. Timing of the surveys is still evolving, and three complete surveys have not been attempted in a single year.

In 2009, a single run of all three routes was completed in August. This is somewhat later than routes would ordinarily be done, but it was noted that bullfrogs were still actively calling. All routes were started  $\geq$  ½ hour after sunset, and were completed by 1:30 am. Survey dates were 10-12 August. The minimum temperature for all three days during the surveys was 65°F, and winds were all below a Beaufort 3, which meets the protocol standards for temperature and wind. All survey points were done by biological technician Matt Stephenson.

In 2011, survey routes were completed two times, once in mid-June and once in mid-July. An attempt was made to conduct these surveys when most amphibians would be actively calling. All routes were started  $\geq$  ½ hour after sunset, and were completed by 1:30 am. Survey dates were 10, 23, and 25 June, and 18-20 July. The ending temperature for the first Calf Camp route on 25 June fell to 40°F, which is below the recommended survey temperature for any time period. Temperatures for all other routes were above NAAMP recommendations. Wind conditions for the second survey for the Little Hay and Calf Camp routes were both on the high end of acceptable (Beaufort 4, 13-18 mph). Biological technician Ethan Teter conducted all surveys except the second Pony Lake survey route was conducted by Nenneman.

In 2009, bullfrogs (*Lithobates catesbeianus*) were detected at 55% of the 69 stops on the amphibian survey routes (Table 1 and Fig. 1). The calling index average at stops where these frogs were detected indicate that they are abundant where they occur on the refuge, with an average index at these stops of nearly a full, continuous chorus. In 2011, bullfrogs were heard at nearly as many locations (Table 1 and Fig. 2), but the average calling index indicated that abundance was somewhat reduced. The June surveys in 2011 were successful in documenting Northern leopard frogs (*L. pipiens*), Boreal chorus frogs

[Type text]

(*Pseudacris maculata*), and Woodhouse's toad (*Anaxyrus woodhousii*). Boreal chorus frogs were very abundant and widespread, detected at nearly all stops and with a high calling index (Table 1 and Fig. 3). Northern leopard frogs were fairly widespread, but generally not abundant in any location where they were heard (Fig. 4). In contrast to leopard frogs, Woodhouse's toads were not very widespread, but were abundant when they were detected, based on the calling index (Table 1 and Fig. 5).

Bullfrog distribution and abundance was very similar in 2009 and 2011, with most bullfrogs found in the northwestern portion of the refuge. Bullfrogs are thought to be native only in southeastern Nebraska, and were likely introduced on Valentine NWR as part of stockings that occurred across much of the state in the 1900's (Fogell 2010). No bullfrogs were detected east of Hwy 83 during these surveys, although they were detected in the Little Hay Valley in 2011, which may represent an eastward expansion. Although there seemed to be a decrease in bullfrog abundance (as measured by calling index), it may be that wind conditions during the 2011 survey caused the observer to record lower index values. Two surveys in 2011 were conducted with estimated winds at a Beaufort 4, which are the highest acceptable wind conditions to complete surveys. Another possibility is that the observers interpreted the calling index differently.

Data collected on northern leopard and chorus frogs, and Woodhouse's toads reflects somewhat anecdotal observations. During April and May, chorus frogs often seem nearly ubiquitous in any small pond, and produce a seemingly deafening chorus. Northern leopard frogs can be seen almost anywhere on the refuge, but don't seem very obvious until just after the tadpoles transform into adults, when it is not uncommon to see hundreds of recently metamorphosed frogs when walking along the shore of a wetland. Woodhouse's toads are often heard on warm summer evenings at Hackberry HQ, and during penstemon transplanting, were often uncovered in the sand. It may take several more surveys to better understand their distribution on the refuge. Surveys during 2011 indicated a relatively sparse distribution across the refuge, but that they were relatively abundant where they were detected. It may be that timing the surveys to occur within 3 days of a rainfall event may improve detections for Woodhouse's toads and for plains spadefoots, which were not detected.

#### Recommendations

Possibly split existing routes so they can be completed before 1:00 am. The Little Hay route could be split into two routes with 13 and 14 stops, and the Calf Camp route could be split into two routes with 12 and 13 stops. The Pony Lake route has 17 stops, and can be completed before 1:00 am. The North American Amphibian Monitoring Program protocol recommends that each route have only 10 stops. If routes were split, there would be 5 survey nights instead of 3, which may reduce the likelihood of completing all routes 2-3 times per year (increases the number of nights surveying from 6-9 to 10-15). Try to conduct surveys after a rainfall event, especially for Woodhouse's toads and plains spadefoots. Spadefoots should be on the refuge, but were not detected during any of the calling amphibian surveys in 2009 and 2011. The NAAMP protocol specifically recommends that surveys should occur within 3 days of a rainfall event in the Great Plains.

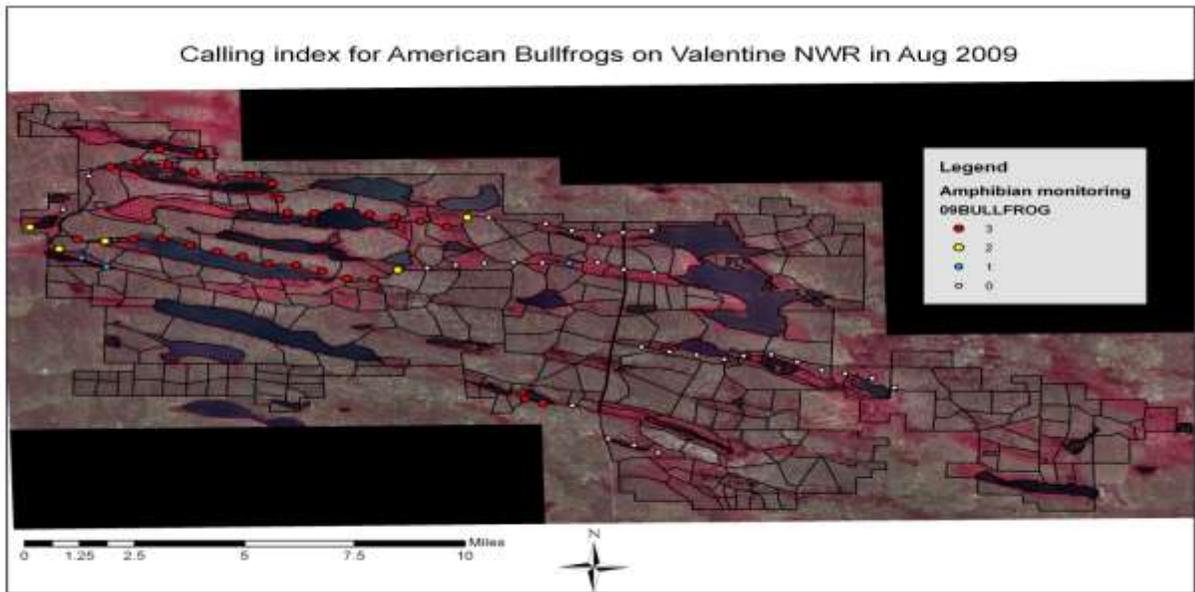
[Type text]

Consider other areas on the refuge where routes of 10 or so points could be placed, and then randomly select routes. Routes could include existing windmill service trails, or go through valleys on the refuge (e.g. East Sweetwater or Cow Lake/King Flats). This would provide data to be more representative of the whole refuge (data could be extrapolated to the refuge as a whole). The current routes are basically a convenience sample, which limits the scope of inference to the areas surveyed. The current routes can be safely completed by employees in the dark, and are providing good information on the distribution and abundance of calling amphibians in the areas surveyed. Other routes and survey points scattered more widely across the refuge could introduce more hazards associated with travel (e.g. driving cross country at night on an ATV, navigating by GPS), and could take more nights to complete.

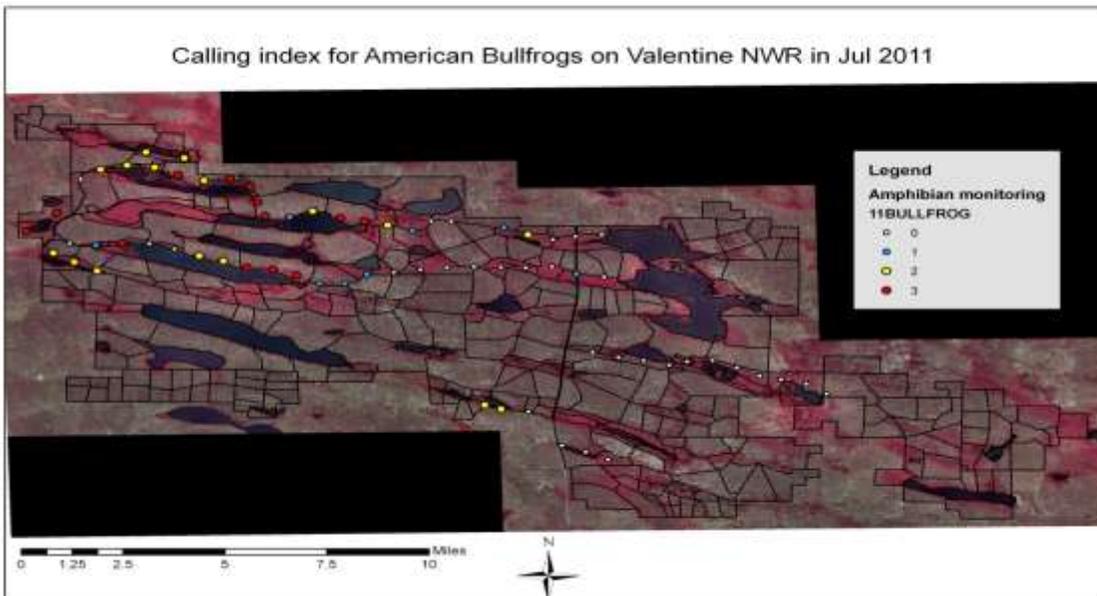
Table 1. Calling amphibians on Valentine NWR in 2009 and 2011. The percentage of stops heard provides an indication of how widespread a species is, and the average calling index (0= no frogs or toads heard, 1 = individual frogs can be counted and there is a gap between calls, 2 = individuals can be distinguished but there is some overlapping of calls, 3 = full chorus, calls are constant, continuous, and overlapping) provides a measure of how abundant the species are on the refuge. The calling index with locations where a species was detected provides a measure of abundance where the species were found.

Species	Year	Percent of stops heard	Average calling index	Average calling index where species was detected
Bullfrog	2009	55	1.49	2.71
Bullfrog	2011	54	1.14	2.14
Northern Leopard Frog	2011	65	0.78	1.20
Boreal Chorus Frog	2011	96	2.67	2.79
Woodhouse's Toad	2011	22	0.46	2.13

[Type text]



**Figure 1. Distribution and calling index for bullfrogs on calling amphibian survey routes at Valentine NWR in 2009.**



**Figure 2. Distribution and calling index for bullfrogs on calling amphibian survey routes at Valentine NWR in 2011.**

[Type text]

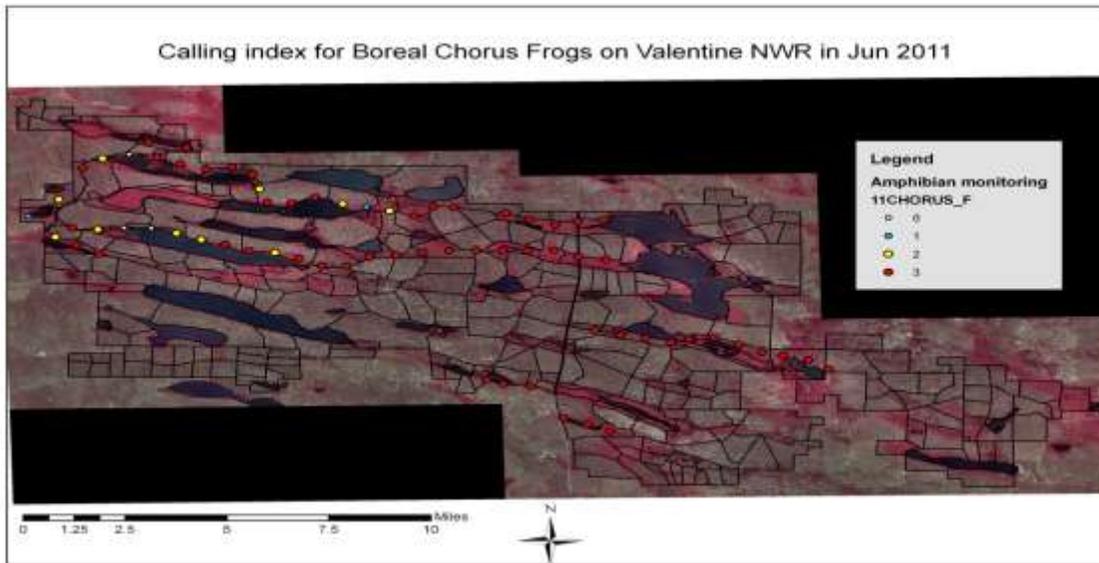


Figure 3. Distribution and calling index for boreal chorus frogs on calling amphibian survey routes at Valentine NWR in 2011.

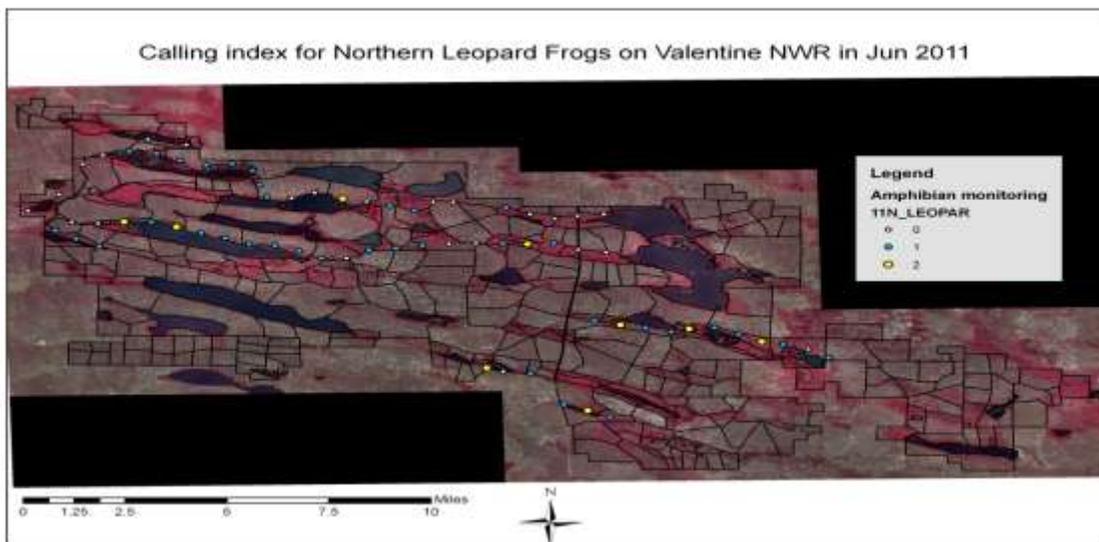


Figure 4. Distribution and calling index for northern leopard frogs on calling amphibian survey routes at Valentine NWR in 2011.

[Type text]

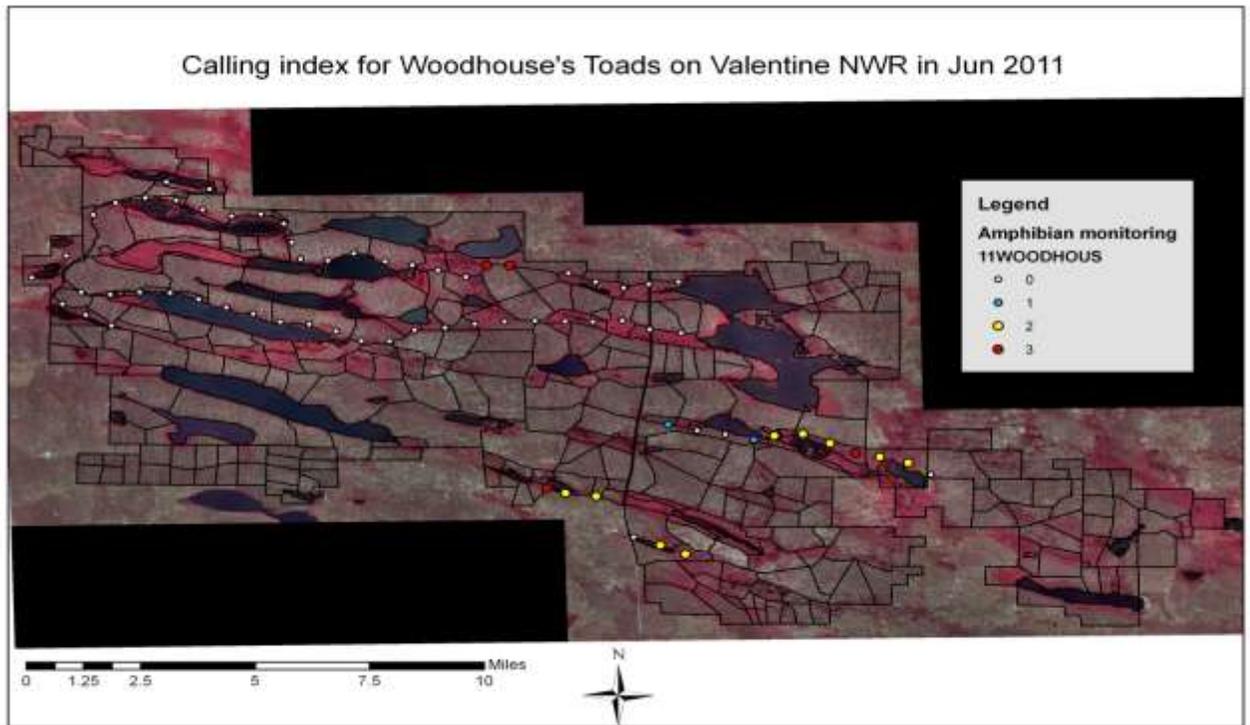
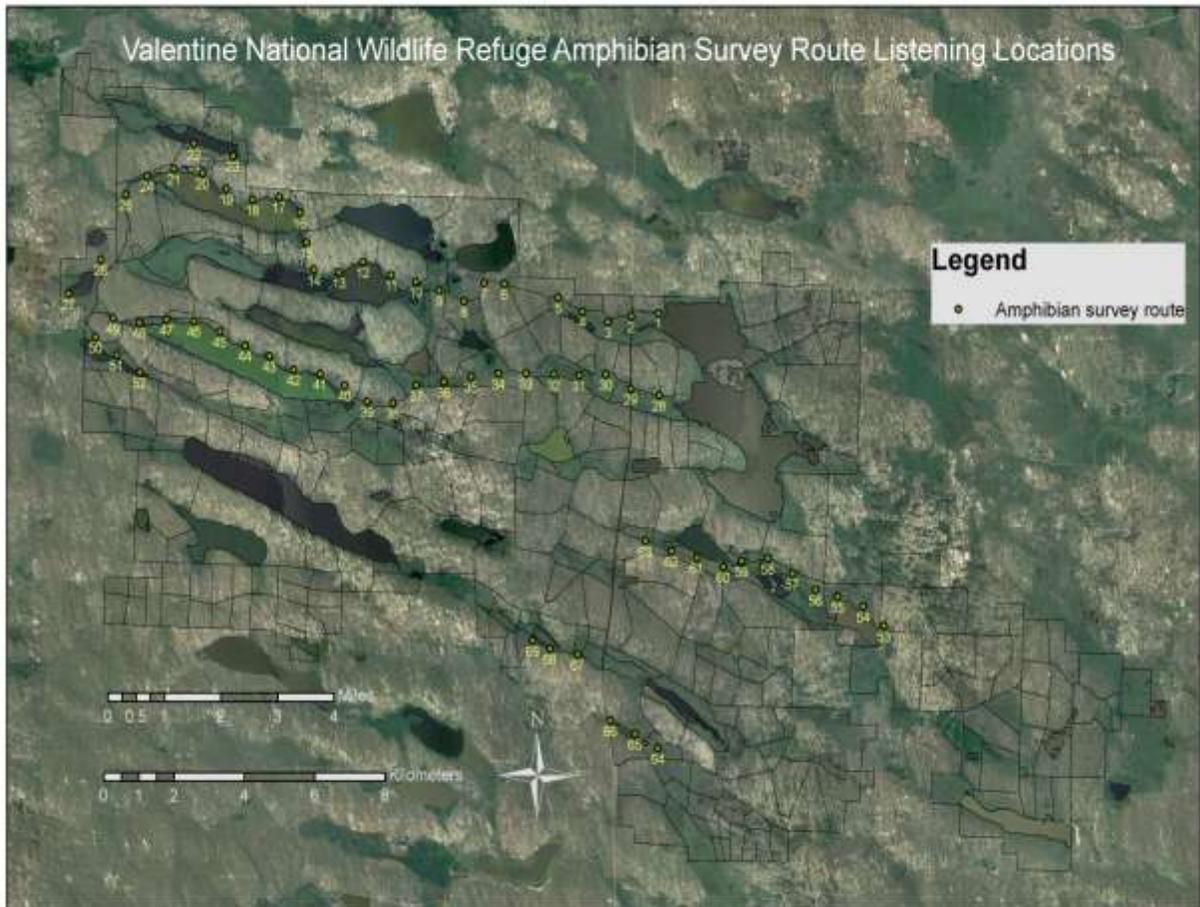


Figure 5. Distribution and calling index for Woodhouse's toads on calling amphibian survey routes at Valentine NWR in 2011.

Appendix 1. Amphibian survey routes on Valentine NWR. The Little Hay route includes stops 1-27, the Calf Camp route stops 28-52, and the Pony Lake route stops 53-

[Type text]

69.



Other observations of reptiles and amphibians are anecdotal. Bull snakes, garter snakes, yellow-bellied racers were all observed on the refuge through the summer, with bull snakes and garter snakes the most commonly observed. A few yellow mud turtles are typically seen on the roads in April. Snapping and painted turtles are readily observed in June as they come ashore to lay eggs. During blowout penstemon surveys, prairie and earless lizards are often observed, as well as the occasional prairie racerunner.

## **11. Fisheries Resources**

Biologist from the USFWS Great Plains Fish and Wildlife Conservation Office in Pierre, SD were down to survey the fishing lakes at Valentine NWR in both the spring and fall. They prepared a report “*2011 Fisheries Surveys Conducted on the Valentine National Wildlife Refuge, Nebraska*” by Dane Shuman and Robert Klumb. Summaries, for the lakes that were surveyed in 2011, follow.

[Type text]

#### Clear Lake

Common carp numbers are at record highs as a result of successful spawning in 2009. There are good numbers of northern pike 28 inches and larger. Black crappie have become established as a result of stocking and successful spawning and some are nearing sizes preferred by anglers. Bass, bluegill, and perch numbers remain low.

#### Dewey Lake

The common carp population is dominated by large adults and there is little recruitment taking place. Northern pike numbers are at high levels, the highest of refuge lakes sampled, and have a good mix of sizes. Bluegill successfully spawned in 2012 and are recruiting into the population. Bass numbers remain low. Multiple year classes of perch were evident and should provide good angling.

#### Hackberry Lake

Common carp catch per unit effort declined but remains highest for the large refuge lakes. There is little evidence of recruitment. Numbers of northern pike continue to increase but are still low. Abundance and size of both bluegill and perch increased and should provide excellent angling. Size structure for bass continued to improve.

#### Pelican Lake

Common carp abundance remains low but trending upwards. Pike numbers remained fairly constant with some fish growing into the memorable category. Bluegill numbers and size both improved. The bass population is dominated by larger fish but there are fewer fish in the smaller sizes. Perch numbers are good with fish in the larger size classes.

#### Watts Lake

Common carp density remains low with no evidence of recruitment. Pike numbers are stabilizing. Bluegill numbers continued to increase and the population has a balanced size structure. Bass numbers are the highest of all refuge lakes but the numbers of larger fish has declined. No saugeye were collected during the last 2 samplings and it appears that the population is gone.

We received a request for permission to use our design for solar powered self cleaning fish screens (see 2010 Narrative). Smith-Root Company would like to produce them commercially. Information was sent to the solicitor's office so we could hopefully grant permission to the company to use the design. Our intent is that the design be available to all who would like to build the screens. After much back and forth it was determined that the design was in the public domain and available for Smith-Root to use. They were however prohibited from saying or implying that the USFWS endorsed their product and we were prohibited from consulting with them on production and design changes. They built a prototype which they displayed at the National Fisheries Society Meeting.

An article, on the solar powered self cleaning fish screens that we installed last year, appeared in the Field Notes section of *The Wildlife Professional* magazine. Several

[Type text]

refuges and private individuals have requested information about building the screens as a result of the article.

The following report on fish spawning by the Valentine Fish hatchery crew was received.

West Long - We ran nets a total of 4 nights with 10 nets set each night.

**Yellow Perch** We put 25 pair of YEP spawners into Rice Lake. We should have some extra eggs this year, so once we meet our request for YEP eggs we can drape some eggs over vegetation in Rice also. We brought 150 pair of YEP here to the hatchery for spawners and returned them following use.

**Bluegill** We removed 124, 5-7 inch BLG from W. Long for our brood needs here at the hatchery.

**Largemouth Bass** We removed 49 LMB ranging from 8 to 15 inchers. Fifteen of the smaller fish went to the Aksarben Aquarium for their display. The remainder 34 we kept here at the hatchery to replace some of our aging and larger brood. Once we sort our LMB brood the culls (Big Fish) were returned to W. Long.

**Northern Pike** In the 4 net nights on W. Long we removed 16 NOP. We had 3 fish that were over 20 inches, the remainder were more than likely one year olds, about 12 inches long. Eight of these smaller fish went to the Aksarben Aquarium for their display needs, and the remainder were placed in Pelican Lake.

**Black Bullhead** Five BBH were removed from W. Long and sent to the Aksarben Aquarium for their display needs.

At Pelican we ran nets a total of 3 nights with 15 nets each night.

**Northern Pike** - Catches of NOP were way up this year. We caught a total of 1134 NOP this year in those 3 nights, which calculates out to about 25 fish per net per night. That is way up from the last several years, and was very encouraging to see. Seems like we hit the spawn right at the start with most females running eggs the first day. We had only 6 green, and 1 partly spent. We could not get on Merritt on Monday to set nets, so our first day egg take we used males from Pelican and Goose Lake, which is south of ONeil. We did get on Merritt Tuesday, so we were able to use Merritt males the rest of the week. We also took histological samples from 3 males from both Merritt and Pelican. We returned all NOP from Pelican back to the lake on Friday. We still had many ripe females, and the reason the egg take amounts went down after Monday is we just wanted to mainly use males from Merritt for our main egg take. We still did use Pelican males to give us a comparison and to see how the eye up compares with previous years and with Merritt males. Preliminary numbers still showed Merritt males giving us better results.

The Valentine Fish Hatchery stocked the following during the year.

On April 22 they put 290,000 perch eggs into Rice Lake. In the fall they stocked the following.

[Type text]

Lake Code	Waters Stocked	Size	Live #	Weight	#/lb	Date
2755	Rice Lake (FWS)	1.5"	24,215	48.2	502	09/27/11
2755	Rice Lake (FWS)	4"	225	11.5	19.5	09/27/11
2770	Willow Lake (FWS)	1.2"	149,400	170.0	830	09/28/11

## 17. Disease Prevention and Control

Due to changes in funding priorities, avian influenza surveillance was not conducted in 2011. Refuge staff still keep an eye out for wildlife disease or mortality on the refuge while conducting other work, even though no specific disease surveillance is being conducted. The only significant wildlife mortality observed on the refuge in 2011 was on the Marsh Lakes during duck brood surveys at the end of June. During this survey, a number of dead birds were observed including the following: 44 American white pelicans, 10 double-crested cormorants, 14 western grebes, 7 Forster's terns, and a wood duck. These deaths were attributed to a heavy hail storm that moved through the area on 26 June. None of these birds were submitted for necropsy since hail damage to vegetation was evident all around the lake.

## H. PUBLIC USE

### 1. General

A news release, *Regulation Changes at Valentine National Wildlife Refuge*, was sent out to area news outlets. The release outlined several changes to Valentine NWR refuge regulations that took effect on January 1, 2011. Alcohol will again be permitted and the refuge was opened to bull frog fishing. Refuge Manager Lindvall was a guest on the KVSH Radio comment show to explain the change in regulations.

An article, on the solar powered self cleaning fish screens that we installed last year, appeared in the Field Notes section of *The Wildlife Professional* magazine. Several refuges and private individuals have requested information about building the screens as a result of the article.

A news release *Trees at Valentine National Wildlife Refuge Being Removed to Benefit Grassland Birds* was prepared and sent out to area radio stations and newspapers.

The 2012 Nebraskaland calendar features 2 photos taken on Valentine NWR, a scenic shot and an ice fishing photo. An article on fishing and duck hunting also appeared in one of the 2011 Nebraskaland Magazine issues.

A draft of a refuge map for possible sale by the Sandhills Prairie Refuge Association to refuge visitors was produced. Several hunters stopped in the office and said they would buy one and offered suggestions to improve the map.

[Type text]

## 2. Outdoor Classrooms - Students

Biologist Nenneman and Bio Tech Teter hosted 13 local country school students for an environmental education day at the refuge on May 13. They did an activity with owl pellets and hiked up to the fire tower.

Refuge Manager Lindvall taught the muzzle loader section of the Nebraska Game and Parks Hunter Education Class to 25 students on August 3 in Valentine.

A Kid's Fishing Day was held at Fort Niobrara NWR on September 24. Forty five children came out to fish, for the casting contest, to make fish print t-shirts, for picture with a fish, and to learn how to clean and cook fish. The Sandhills Prairie Refuge Association provided funding for cooking supplies, prizes, and snacks, Nebraska Game and Parks trout and loaner poles, and 15 adult volunteers supervision and activities. The fish and weather cooperated and the kids caught about 100 trout.

Lindvall and Nenneman attended the Nebraska Chapter of the TWS meeting and hosted part of the Student Conclave. We brought down both pheasant and grouse crops and the students did a short food habits analysis. The crops were from birds harvested on the refuge during the hunting season. The students seemed to enjoy picking through the crops and identifying the various seeds, fruits, and insects found in the crops. One of the professors took crops with that he plans on using in his teaching.



[Type text]

Figure H-2. Wildlife students doing grouse food habits analysis at the TWS Student Conclave. MLL

Nenneman taught a section on avian anatomy and physiology for a Wildlife Short Course held at Chadron State College. The course featured a day each on birds, mammals, reptiles and amphibians, and fish biology, with instructors drawn from wildlife professionals from across NE and SD. Nenneman stayed only for the day on birds, and assisted with a field portion on bird identification around the CSC campus.

#### **4. Interpretive Foot Trails**

The Civilian Conservation Corps Nature Trail goes from a parking area on the west end of Hackberry Lake to the old fire tower constructed by the CCC. An observation deck is located inside the legs of the tower and interpretive panels teach about the geology, habitats, and wildlife of the Sandhills. There are 15 interpretive signs located along the trail. This year plant identification markers were put up along the trail. The Sandhills Prairie Refuge Association donated the markers to the refuge.

A handicapped accessible nature trail is located at the Marsh Lakes Overlook. This short trail goes from the Overlook to the top of a small hill which offers a great view of the Marsh Lakes, the largest wetland complex in the Sandhills. An outdoor viewing scope and bench are located at the end of the nature trail.

Staff from Federal Highways were out and surveyed and inventoried the CCC Tower Nature Trail and the Marsh Lakes Overlook Trail.

#### **5. Auto Tour Routes**

Brochure boxes and markers were put up for the Auto Tour Route which is nine miles long and has 17 stops. The road that the auto tour road is on is a one lane gravel that badly wash boarded. The poor condition of the road may dissuade some visitors from taking the tour.

#### **8. Hunting**

Waterfowl hunting is permitted on Watts, Rice, and Duck Lakes. Seasons and bag limits are the same as those set by the state. Duck season opened on October 8 with only a few hunters out. Hunting pressure was low throughout the month and for the rest of the season which ended on January 11, 2012. There was not a split season this year. Interest in waterfowl hunting also appears to be on the decline here.

[Type text]

Pheasant season opened on October 29 with quite a few hunters out including folks from Colorado, Minnesota, Kentucky, Wisconsin, and Nebraska. An estimated 20 groups were out. Most shot a few roosters and grouse. Hunting for grouse and pheasants has been poor so far this year. The pheasant season ran through January 31, 2012 with a limit of three roosters. No counts were made of the number of hunters and we do not use the wing boxes for monitoring as we do with grouse. An estimate of 300 visits by pheasant hunters is made. Some people combine a pheasant hunt with a grouse, duck, or deer hunt.



Figure H-8. A successful grouse hunt. DT

Grouse season opened on September 1 which is a new and earlier by about 2 weeks. The dove and grouse openers are now the same. The season was extended last year and ran through January 31, 2012 with a bag limit of 3. The season end date now coincides with the end date for pheasant. These extensions will probably not result in many visits as most grouse hunters quit hunting in November and it is generally too hot in early September. This year it was too hot for most of September for grouse hunting. Most of the refuge is open to grouse hunting except the natural areas and around building sites. We do get quite a few out of state hunters. Hunter harvest is reported through voluntary wing collection boxes placed at five locations on the refuge. In 2011 we had 132 hunter days. Reported harvest was 136 prairie grouse including 11 chickens, 124 sharp-tails, and 1 unknown or hybrids. This lower than normal harvest is the result of low bird

[Type text]

numbers and declining interest in grouse hunting. More complete information on grouse harvest can be found in section G10a.

The refuge is also open for dove hunting but few hunters come here specifically to hunt doves. A few are shot by grouse and pheasant hunters.

Rifle deer season opened on November 12 and ran through November 20. It did not appear that we had as many hunters this year as last. We counted 41 vehicles in the Sandhills Unit on the refuge and 27 in the Calamus West Unit. This is probably not a complete count. We had hunters from 14 states; Nebraska, Wisconsin, Missouri, Iowa, Colorado, Pennsylvania, Michigan, Illinois, Maryland, Minnesota, Oregon, Montana, Texas, and Idaho. An article appeared this fall in Field and Stream Magazine touting the Sandhills and specifically Valentine NWR as a good place to shoot a trophy mule deer. We again did not allow hunters to shoot a white tailed doe on the bonus tags that they received with their permits. We have done this for several years and most hunters now seem aware of the regulation.

A one page flyer was made up and posted to inform deer hunters about deer regulations pertaining to doe harvest on the Refuge. In an effort to reduce crop depredations, Game and Parks has is selling October Antlerless and Seasons Choice whitetail doe tags. They also are including bonus whitetail doe tags with archery, muzzleloader, rifle deer, statewide buck, and statewide youth permits. The doe tags are being issued in an effort to reduce crop depredation. At our request, Game and Parks has not included the refuge as open to these doe permits. The refuge receives high hunting pressure, has low deer densities, and does not have a crop depredation problem on or adjacent the refuge. We also feel that additional doe harvest might reduce the herd and hunting opportunities on the Refuge.

A total of 92 deer was recorded as harvested during the rifle season. This includes deer taken under Sandhills and Calamus West general permits, state wide buck permits, and statewide youth permits. The state conservation officer also seized one white tail buck and one white tail doe that were taken illegally on the refuge. More complete information on deer harvest can be found in section G8. Numbers come from records obtained at Nebraska Game and Parks check station. Of great interest is that no mule deer were checked in and recorded as shot on the refuge. This is the first time ever that this has occurred. Game and Parks indicated to us that mule deer harvest was down all over the state. Ironically, an article appeared in the September 2011 issue of Field and Stream touting Valentine NWR as a great spot to get an over the counter license and harvest a trophy mule deer buck.

All of the refuge west of Highway 83 is in the Sandhills Deer Hunting Management Unit and all east of the highway is in the Calamus West Unit. In 1995 Nebraska Game and Parks removed Valentine NWR from the area where doe only Sandhills permits were valid. Starting in 1997, a statewide bucks only permit was also available. Starting in 2006 there were also youth statewide permits available. The refuge probably receives about the heaviest hunting pressure of any location within the units.

[Type text]

The refuge is also open for muzzle loader deer hunting. The season ran from December 1-31. A muzzle loader permit allows the harvest of both bucks and does of either mule deer or white-tailed deer. This year Nebraska Game and Parks included a bonus tag for an additional white-tailed doe with every muzzle loader permit. Bonus tags were not valid on the refuge. We will not know how many deer were harvested during this season as hunters must check deer in via the internet or by phone. Neither request information on where the deer was shot. This information was available from check station in the past. We did get some spill over hunters from Ft. Niobrara NWR which was opened for the first time to archery and muzzle loader deer hunting. We did not appear to have as much hunting pressure as last year which was the first year scopes were allowed on muzzle loader rifles in Nebraska. One white-tailed buck was known to have been shot on the refuge.

The refuge is also open to archery deer hunting which runs from mid-September through the end of December. Archery deer hunting was permitted during the rifle deer season for the first time in Nebraska this year. This year crossbows were also made legal for archery hunting. Only a few hunters were known to have visited the refuge for archery hunting. This year Nebraska archery permits again included a bonus tag for an additional white-tailed doe. This bonus tag was not valid on the refuge. In 2009 regulations on deer check in for archery were also changed to allow hunters to check in deer on the phone or via the internet as well as at check stations. Hunters using the new method were not asked if the deer were harvested on public or private land or the name of the public land area. This information had been collected in the past at check stations. We know of 1 deer that was taken during the archery season.

Coyotes can be hunted on the refuge from December 1 through March 15. A free permit is required. There is no charge for the permit. Running coyotes with dogs is not permitted. For the 2010-2011 season, 60 permits were issued and 12 returned for a 20 percent return rate. Successful hunters reported taking 10 coyotes. It is felt that successful hunters are more likely to return the cards. Many of the coyotes on the refuge and in the surrounding area have mange. Some have only hair left on their heads.

## **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. Not enough counts were made to provide a good estimate for fishing visits. An estimate of 20,000 visits is made.

Spring fishing was good and many fishermen were out catching both bass and pike on refuge lakes. Two roads were closed due to flooding but all lakes were still accessible by alternate routes. The lakes are very full and people have been launching large boats including a pontoon boat. Few fall fishermen were out this year. This used to be a popular time to fish on the refuge.

[Type text]

The first ice fishermen of the year were out on December 9, 2011. Fishing for perch and bluegill was very good on Hackberry Lake with a lot of limits taken. Word got out and fishing pressure was steady throughout the winter. The last ice fishermen of the year were out on March 15, 2011 and the boat fishermen showed up the next day! Ice fishing was particularly good this year for panfish on Duck, Hackberry, and Watts Lakes.

Refuge size limits remained the same with a 15-inch minimum on bass and northern pike with a 28-inch maximum size limit (pike greater than 28-inches must be released). The state has a 15-inch minimum on bass for most public waters including the refuge. Minnows are prohibited on refuge lakes to prevent introduction of exotic fish. Gas powered boats are not allowed. Nebraska Game and Parks lowered the panfish limit from 30 to 15 fish starting on January 1, 2011. The aim of the regulation change is to spread out the harvest in time and among anglers, to encourage fishermen to release smaller panfish, and to standardize regulations across the state. It may have some positive effects here on the refuge where a lake with good fishing can receive very heavy fishing pressure.



Figure H-9. Students sent “Flat Puddles” to visit the refuge and we sent them a photo.  
MLL

## 11. Wildlife Observation

[Type text]

Blinds were placed for observation of both sharp-tailed grouse and prairie chickens. The blinds were put on leks in Habitat Units 30A2 and 16B2. People come from all over the country and even a few from foreign countries to watch the grouse display. We have a reservation system for the blinds. The two blinds were booked for 23 mornings. Several groups also used the blinds without reservations. Quite a few people cancelled due to snow storms.

## **12. Trapping**

An Annual Trapping Proposal was submitted to the Regional Office for approval in November. The proposal was not approved so we could start trapping in December as planned. When we received approval, we sent out a news release announcing the opening of the refuge to trapping and how to get an application to trap. A public drawing will be held on January 9, 2012 and 3 trappers were selected and assigned specific areas of the refuge to trap. They started trapping the same day.

The proposal follows.

Trapping as outlined in the Valentine National Wildlife Refuge Fur Management Plan provides for harvest of a renewable natural resource, minimizes property damage, and increases waterfowl production via marsh management and predator control. Public trapping is included in the Valentine National Wildlife Refuge Comprehensive Conservation Plan and the Compatibility Determinations approved in 1999. The refuge has a history of high muskrat populations followed by die offs from Tizzer's disease. Trapping helps reduce the muskrat population before disease outbreaks occur. Populations of nest predators such as raccoon, skunk, coyote, and mink exist on the refuge and can be reduced by trapping. Beaver plugging water control structures and digging in dikes can also be controlled using trapping.

The refuge had an active trapping program from 1981 up until 1992. The last trapping by the public on the refuge took place in 1992 when one permit was issued. Prior to 1992, many trappers applied for the 3 permits that were issued each year for trapping on the refuge. No trappers applied for permits in 1993 and 1994. In 1995 the Project Leader discontinued trapping by the public. In 2010 the muskrat population increased dramatically and the price of furs, especially muskrats rose. We received several requests for trapping and decided to restart the public trapping program on the refuge.

A news release will be sent out advising interested individuals that the refuge will again be opened for trapping. An application will be required (Application for Refuge Trapping Permit OMB N0. 042-R1523) and three individuals will be selected by public drawing for the three trapping units on the refuge. A \$20.00 application fee will be charged and successful applicants will be required to pay an additional fee of \$100.00. Trappers will keep 100 percent of furs. Special use permits will be issued to successful applicants and each successful applicant will be allowed a helper.

A State trapping license will be required and all trapping will be carried out in accordance with State regulations applicable to public lands except that the season on the

[Type text]

refuge will be from December 1, 2011 – January 31, 2012. Trapping will be allowed for muskrat, weasel, mink, raccoon, possum, skunk, badger, and coyote. Nuisance beaver trapping only will be allowed in areas designated by the refuge manager. Motorized travel will be permitted only on public use roads. Trappers will be required to keep a daily log which will be provided to the refuge manager at the end of the season. The log will include both target and non-target take. Trappers will keep leg hold traps out of public view from roads, allowed to carry a 22 or smaller caliber firearm, and notify the refuge manager when they start and end trapping on the refuge. Use of snares will not be allowed unless the snare is set completely underwater. Conibear type traps with a jaw-spread of greater than 5 inches may be used only when placed under water or at least 6 feet above ground.

## **17. Law Enforcement**

Refuge Officer Lindvall submitted a request to relinquish law enforcement authority after 30 plus years of being a refuge officer. The request was approved and took effect on January 31, 2012.

Refuge Officer Lindvall logged 532 hours of law enforcement for fiscal year 2011.

Refuge Officer Lindvall attended the annual law enforcement refresher held at FLETC in Artesia, NM.

Refuge Officer Lindvall attended the annual law enforcement firearms requalification and refresher held at Kirwn NWR on August 25 and 26.

Law enforcement patrols were increase during the Nebraska rifle deer season. Refuge officers wrote one violation notice for spot lighting deer (\$175) and warnings for no hunter orange on head (3), not immediately validating tag, unsigned permit, and no license on person. One case of shooting in a closed area is under investigation. One case of shooting off the road was investigated but no violation notice written. The local conservation officer wrote one ticket for no hunter orange and one for not validating a tag on the refuge. The state conservation officer also seized one white tail buck and one white tail doe that were taken illegally on the refuge. Evidence was noted that indicated that someone shot a deer in the closed area prior to the season opening.

Refuge Officer Lindvall assisted with law enforcement for the opening weekend of the new muzzle loader deer hunt at Fort Niobrara NWR.

We received the night vision goggles that were acquired as surplus property from the military. They are brand new and work well.

Our airboat went up to North Dakota in the Fargo area and used in the flood relief effort there. Several stress cracks in the cage were repaired while it was up there.

[Type text]

Refuge Officer Lindvall was in Minot, ND from June 16-25 assisting with flood relief efforts as an airboat operator. The levees protecting the city held for a while but heavy rain in Canada caused water levels to rise and over top the levees. About 4,000 homes were flooded. The bottom of the airboat was scraped up while operating in the urban environment and will require repairs.

All notice of violations written in 2011 at Valentine NWR were logged into IMARS, the refuge LE database. In calendar year 2011, there were 7 Notice of Violations issued for violations occurring on Valentine National Wildlife Refuge. Numbers and categories are listed below. Officers Lindvall, Bowser, and Damico made the cases.

Fish size limit violation – 1  
Illegal take of wild turkey - 2  
Spotlighting deer – 1  
No hunter orange - 1  
Speeding – 2

Total fines, liquidated damages, and costs assessed by year's end \$1,125  
Total fines, liquidated damages, and costs collected by year's end \$1,125

The no hunter orange case went to court and the violator was given community service.

The following warning tickets were issued;

Fish size limit violation – 1  
Fishing without license on person - 2  
Hunting without license on person – 2  
Use of bonus doe tag on refuge – 1  
Speeding – 1  
Daylight use only – 5

## **18. Cooperating Associations**

The Complex has a friends group, The Friends of the Sandhills Prairie Refuges, which does projects on Valentine NWR. The group sponsors the book and souvenir sales at the Fort Niobrara Visitor Center and has a quarterly newsletter. Refuge Manager Lindvall attended the quarterly board meetings and provided articles for the newsletter.

## **I. EQUIPMENT AND FACILITIES**

### **1. New Construction**

Engineer Mike Crocker was out on December 8 to go over floor plans, building specs, and location of the new office building for Valentine NWR. The building will be located

[Type text]

at Pony Lake and be similar to an office build at Marias des Cygenes NWR. The building will be constructed in 2012.

## **2. Rehabilitation**

Major repairs to the School Lake Cut Across road (1.6 miles) were completed by refuge staff. The road bed was raised and leveled, ditches formed, and low spots filled. The road had been closed due to flooding and is now open again. Hay was placed on top of the road bed to prevent wind erosion. Trees growing alongside the road were removed.

Crushed rock was hauled from the stockpile at Hackberry Lake and spread on the graveled portion of the West Long Lake access road (.5 miles). The spreader was used to place rock only in the wheel tracks. This reduces the amount of rock needed.

Survey needs for the replacement of the Willow Lake and Hackberry Lake water control structures were provided to Nebraska Game and Parks. They plan on sending a crew up to do a survey sometime this spring or summer. The survey will be useful in determining the type and location of structures.

We received \$125,000 in Refuge Roads Funds to work on 7.4 miles of the Pelican Lake Road. The portion of the road worked on was from the rock boat ramp on Pelican Lake and going east all the way to Highway 83. The road was upgraded from a dirt 2 track to a 2 track with gravel in the wheel tracks. This is a type 2 road in our site plan. We used most of the funds to buy gravel which was spread in the wheel tracks of the road. A great deal of time was spent in making these repairs and improvements. Low spots were filled with sand, culverts installed, and the road surface leveled. Three inch rock was then placed in the wheel tracks as a base. Two A rock was purchased and stockpiled at either end of the road but was not placed as time ran out. This work will be done in 2012. We received quite a few compliments on the improvement in the road. It had been closed due to flooding and was very rough prior to the repairs.

A planning meeting for our Boating Access Visitor Facilities Enhancement project was held on August 30. Refuge, Regional Office, and Game and Parks staff went over specs for docks, parking pads, boat ramps, and walkways and visited the 6 project sites. The improvements will be designed and contracted for start of work in the spring of 2012. Game and Parks has offered to help with funding for the project.

A new sewer system was completed for the Pony Lake Quarters under contract. The cost was \$9,600. The system included a new tank and drain field, new hardware for the lift station, and separation of the sump and sewer systems.

## **3. Major Maintenance**

[Type text]

Barrier posts were added to the Willow Lake parking lot to prevent people from driving out of the lot toward the lake. We also filled in the large sand trap in the parking lot and placed road hay over the sand. The lot is now usable rather than being a vehicle trap. We need to develop a boat access point for this lake. High water has filled the lake and fishing is again good here.

The furnace room in Quarters 2 Bunkhouse was painted.

About 90 percent of the refuge boundary was posted with new boundary signs. The entire refuge boundary was gone around and faded or missing boundary signs replaced. This is probably the first time in 25 years that the 100 plus miles of boundary has been properly posted with signs.

The stamped concrete at the Marsh Lakes Overlook was sealed. Repairs were also made to the surface and edge rails of the nature trail.

Refuge staff filled in holes on the turtle fences along Highway 83. Dirt has eroded from under sections of the fence, allowing turtles to pass and get on the highway. Several large holes were marked and will be filled by the Nebraska Department of Roads using dump trucks.

Flanges were put on the culverts that carry the flow out of 21 Lake. Rip-rap was also added both up and downstream of the culverts. High water has been eroding them. Smaller rock was also added to the rock road crossing that serves as an overflow.

#### **4. Equipment Utilization and Replacement**

We received a used Chevy pickup from LaCreek NWR which will replaced a pickup that the transfer case was going out of. We will sold the truck we had through GSA.

Small equipment funds were used to order a small scraper to replace and older non-working scraper. The old scraper was sold through GSA..

#### **7. Energy Conservation**

The house trailer and the Trappers Shack were all winterized. To save energy, we do not heat these buildings. We also turn the heat down in the office at the end of the work day and turn the air conditioning off when we go home for the day.

### **J. OTHER ITEMS**

#### **3. Items of Interest**

The 480 acre Yellowthroat WMA in Brown County is managed from Valentine NWR. The area has an excellent mix of grassland and wetland. There is a water control

[Type text]

structure located between the marsh and lake on the area. The land was acquired in fee title from the Farmers Home Administration. Much of the sandy soil on the area was farmed under center pivot irrigation prior to acquisition. All has been seeded back to native grasses. The area is open to public use including hunting and fishing. Fishing was good this year with nice catches of bluegill and perch made during the winter.

We visited the area throughout the year and noted that an adjacent landowner continues to use our access easement road to get to his trailer located south of the area. He was sent a letter advising him that he is not to use the road and that future use may result in trespass charges. The fence around the WMA was repaired in the spring and the water gap put up. Water levels were high and water went around the water control structure which was plugged by beaver.

There is a water level gauge on the water control structure. The top of the gauge reads 10.12 and is even with the top of the angle iron on the structure. This is a reference should the gauge be destroyed. The gauge is not tied to an elevation above sea level. Readings for 2011 were 9.80 on April 5, 9.70 on May 12, and 10.14 on July 29. The July reading was above the gauge. Muskrat or beaver have clogged the water control structure and we will need to put in an electric beaver guard here if we want to lower the water level. When the water control structure is plugged and the water is high, water runs around the dike on the north side.

A contract sprayer sprayed Canada thistle with Milestone and leafy spurge with Plateau in the fall.

The new tear sheet leaflet for Yellowthroat WMA was received.

#### **4. Credits**

Refuge Manager Lindvall wrote sections A; D-1 and 4; E-1,4,5,6,8; F-7,9,10,12,13; G-11, H- all; I- all; J-3; K: Biologist Nenneman wrote sections B; D-5; F-1,2,5, 7 (monitoring); G-1,2,3,4,5,6,7,8,10,17. Photo credits; Mark Lindvall - MLL; Mel Nenneman – MN;

#### **K. FEEDBACK**

We intend on continuing writing the annual narrative even though it is no longer required. It is the only historical record of what is done on the refuge and will hopefully be useful to future managers. The numerous databases that we feed will surely not tell the story of what happened on the land. Reports will be filed and eventually get lost or thrown out. Over the years I have often told people to put it in the narrative if you want it to be available at some time in the distant future. We often refer back to old narratives to answer questions and I hope we can learn from those who went before us.