VALENTINE NATIONAL WILDLIFE REFUGE

Valentine, Nebraska

Annual Narrative Report

Calendar Year 2009

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 subheadquarters 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).

A. HIGHLIGHTS

Large numbers of cedar trees invading prairies were removed mechanically and by prescribed fire. Sections F.9 and F.10.

Two solar powered fish screens were designed and constructed for placement on the outlets of Pony and West Long Lakes to prevent carp from entering the lakes. Section I.2

Rain returned to the Sandhills filling refuge lakes and wetlands. Section B

We were able to hire a good crew of summer workers who completed a number of maintenance projects. Section E-1.

The western part of the Pelican Lake Road was upgraded using funds received from Congress. Section I.2.

Repairs were made to the Pony and Watts Lake dikes. Section I-2.

The invasive form of phragmites was found on the Marsh Lakes. Section F-10.

Invasive trees were removed at the Wagner Easement and plans made for grazing and prescribed burning to restore this piece of prairie. Section F-13.

We purchased a new Bobcat skid steer and received an almost new front end loader off of surplus. Section I.4.

B. CLIMATIC CONDITIONS

No temperature records (high or low) were set in 2009, and total precipitation was 6.16" above the average annual precipitation at Hackberry Headquarters (data from 1945-2009, Table B1). There were several weather events of note recorded at Valentine NWR in 2009. Early in the year, the battle between warm and cold conditions resulted in on again/off again ice conditions. Ice was pretty well deteriorated and off of refuge lakes on 25 Feb, but then almost everything refroze with cold weather on 28 Feb. Ice was off the lakes by 6 Mar, but cold weather allowed the adventurous ice fishermen a chance to squeeze in some fishing 11-14 Mar. Warm weather on 15 Mar brought an end to ice fishing for the season. April brought a pretty substantial snowfall, with 9 inches of snow falling 4 Apr. May was considerably drier than average, which may have slowed the growth of cool season grasses. The biggest weather event in terms of its effect on wildlife and habitat occurred on 13 Jun, with a severe hailstorm hitting large parts of Valentine NWR. Hail up to quarter-sized fell, accompanied by strong winds and heavy rain. The hail lasted for about 20 minutes, and over 2" of rain fell in less than one hour.

Total rainfall for 13-14 Jun was 4.16". Hail is known to have impacted the NW part of the refuge around Hackberry HQ, and a wide swath of the eastern part of the refuge, starting at and just south of Pony Lake and continuing east was also hit hard. This hailstorm stripped leaves from trees, flattened grass and other herbaceous cover, and is known to have killed several birds around the Headquarters, and likely killed birds and perhaps other wildlife caught in its path across the refuge. In addition to this storm, 18 of the 30 days in Jun had measurable precipitation, and with almost 9 inches of precipitation, June was an unusually wet month. July was also wetter than average, and unusually cool with no days above 90°F. In August, another hailstorm came through the area, although damage from this storm was minimal. The hail was smaller (about nickel sized) and lasted for only about 5 minutes, although it was accompanied by an inch of rain. August was also the third consecutive month with higher precipitation than average. Precipitation was lower than average in Sept, then about average through the remainder of the year. A brief cold snap in Oct caused smaller wetlands on the refuge to briefly freeze over before opening back up by mid-month. In Dec, refuge lakes froze up on the 3rd, and had about 4-5" of ice by the 8th. Lakes remained frozen through the rest of the year. 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).

Table B1. Monthly weather data summary from the weather station at Hackberry Headquarters, Valentine NWR, during 2009.

	Precip.	Snow	Temperature (° F)			Record Temperature (° F)				
Month	(inches)	(inches)	Min	Ave	Max	Ave	Min	Year	Max	Year
Jan	0.37	6.2	-7	13.9	64	41.8	-38	1894	70	1974
Feb	0.92	5.2	-9	20.1	67	44.9	-37	1899	76	1982
Mar	1.06	7.6	-7	24.6	77	51.4	-28	1948	87	1946
Apr	2.98	9.5	14	34.8	88	58.4	-8	1936	97	1992
May	1.51	0	31	46.8	93	73.0	17	1909	102	1934
Jun	8.9	1[b]	45	54.8	91	77.4	30	1973[a]	107	1937
Jul	5.13	0	48	59.0	89	82.4	38	1971	111	1990
Aug	4.14	0.5	46	57.2	94	82.9	34	1935	108	1947[a]
Sept	0.88	0	39	52.2	86	75.5	12	1926	103	1952
Oct	1.39	1.5	15	33.0	80	51.8	-6	1925	96	1922
Nov	0.2	0.4	20	31.0	79	57.2	-36	1887	82	2005[a]
Dec	0.28	4.6	-10	10.7	54	28.4	-34	1907	76	1936
Total	27.76	36.5	Average precipitation (1945-2009)							21.60

[a] Indicates the most recent year record was observed.

[b] This was 1" of hail that remained on the ground for several hours after a severe storm on 13 Jun.

D. PLANNING

1. Master Plan

The deferred maintenance part of the SAMMS update was completed. The big change was placing a new refuge office and a new shop facility back into deferred maintenance. The top 5 projects for Valentine NWR are 1. repair of the Pelican Lake water control structure, 2. replace the office with a facility to be located at Pony Lake, 3. replace the barn roof, 4. Rehab Quarters 20 at Pony Lake, and 5. replace the shop with a new facility at Pony Lake.

The visitor facility enhancement projects for Valentine NWR were updated in SAMMS. The five projects are paving of the Marsh Lakes Overlook parking and road, adding gravel to the auto tour route, the Willow Lake Overlook, a prairie hiking trail, and a dock and parking pad at Clear Lake.

The annual RAPP update was completed. We met most of our FY09 goals with the exception of prescribed fire. FY2010 goals, similar to last year's were set.

The RPI and Heavy Equipment updates were completed. There were few changes needed.

2. Management Plan

4. Compliance with Environmental and Cultural Resource Mandates

Construction Pre-certification forms for repairs to the Pelican Lake water control structure and the Pelican Lake rock boat ramp were completed and sent on to the Corps of Engineers. The work will be done under Nationwide Permit 3 Maintenance. The information was also provided to the Nebraska Department of Natural Resources for 401 Water Quality Certification. Request for engineering form was provided to the RO for the Pelican Lake water control structure repair. Historical review forms for both these projects and the tornado shelter were provided to the regional archeologist and cleared. The tornado shelter and water control structure are Recovery Act projects and the boat ramp will be done force account. The tornado shelter was put out in 2009 and the Pelican Lake water control structure will be done in 2010.

5. Research and Investigation

b. Ongoing research at Valentine NWR

Dr. Robert Gibson (professor/researcher from University of Nebraska-Lincoln) visited Valentine NWR in April to collect some exploratory data on stress hormone levels in displaying Sharp-tailed Grouse. Dr. Gibson planned to trap 10-15 male and 5-10 female Sharp-tailed Grouse, and then collect a small blood sample from each grouse. These blood samples will be used to assay corticosterone levels and two measures of immune function. The proposal indicates that a blood sample would be taken immediately upon capture, and again after being held for 30 min. The second sample is planned to measure any increase in corticosterone levels resulting from capture and handling. Dr. Gibson is planning to use samples taken on the refuge to make some initial comparisons in corticosterone levels (i) between the sexes, (ii) between males trapped early and late in the season, and (iii) between males on smaller vs. larger leks. This research is a continuation of work done by Dr. Gibson on the ecology prairie grouse.

E. ADMINISTRATION

1. Personnel

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

Permanent Staff

Mark Lindvall	Refuge Manager	GS-12
Mel Nenneman	Wildlife Biologist	GS-11
Dave Kime	Maintenance Worker	WG-8

Temporary Staff

Evan Suhr	Biological Science Aid GS-0404-3	May 11-Aug 21
Levi Feltman	Biological Science Technician GS-0404-5	May 11-Dec 18
Matt Stephenson	Biological Science Technician GS-0404-4	May 18-Aug 21
Matt Coleman	STEP Biological Science Aid GS-0404-2	May 11-Aug 7
Troy Nelson	STEP Biological Science Aid GS-0404-2	May 11-Aug 7

Figure E 1. 2009 Valentine NWR staff (left to right): Matt Coleman, Troy Nelson, Evan Suhr, Levi Feltman, Matt Stephenson, Dave Kime, Mark Lindvall, Mel Nenneman. (AK)

Park Ranger Kim Chadwick completed her LE training and was transferred from her training station of Valentine NWR to her duty station of Marais des Cygnes NWR effective 15 February.

It is the first year in many that we have had this many summer workers and they were a great help in completing a wide variety of projects. Coleman and Nelson's positions are funded out of Recovery Act funds, Suhr out of deferred maintenance funds, Feltman out of RO grant funds, and Stephenson out of general operating funds. The amount of paper work and training for these new employees is daunting and has now been passed on down to refuge managers by the Business Units.

Evan Suhr worked alongside our maintenance worker to get a variety of projects done.

Matt Stephenson worked with the refuge biologist doing wildlife surveys and invasive plant mapping. GIS technician Levi Feltman assisted with many wildlife surveys and invasive plant mapping, and also worked on updating existing refuge GIS files.

Suhr and Kime received STAR awards for their work on the Pony Lake and West Long Lake dikes. Nenneman also received a STAR award for serving as an ATV instructor for the Complex and other nearby refuges.

Refuge Officer Dave Kime received a STAR Award for his 33 years as a refuge officer at Valentine NWR. Dave has served the public and refuge by going above and beyond the call of duty. During this time he lived on the refuge and was often the first called as he was close to the need. He contributed to many search and rescues. He has responded to many after hours reports of wildlife violations. He assisted many visitors who showed up at his door, helping them find lost companions, helping them get back to their vehicles, getting their vehicles pulled out, and often even offering a warm place and a meal. He worked many extra hours, usually for comp time. He made himself available to work weekends and after hours. He was out in all kinds of weather and his intimate knowledge of the refuge was a valuable asset in law enforcement and search and rescue. He made many fine cases and assured that Valentine National Wildlife Refuge was a safe place for wildlife and visitors. Dave is one of the few maintenance workers who chose to retain his law enforcement credentials. Dave kept current by attending training and refreshers and qualifying with firearms.

Lindvall received the Golden Hammer Award for the design of solar powered fish screens.

Individual development plans were updated for all permanent staff.

4. Volunteers

5. Funding

A proposal for avian influenza monitoring for 2009 was funded for $12,100. Work on this project is reported on in section G.17.

The contract for the interpretive panels for the viewing station was let for $58,015 in 2008. These were Visitor Facility Enhancement Funds. This was an IDIQ contract. Work was done on the design but no product was delivered in 2009.

Left over Visitor Facility Enhancement funds in the amount of $21,862 were made available to improve the nature trail at the Marsh Lakes overlook by adding curbs and stabilizing banks.

The road earmark funds for the repairs to the Pelican Lake Road were received in 2008. The earmark was for $300,000 and we received $269,000. The Cherry County Road Department did the repair and improvement work on the road from the Duck Lake County Road down to the rock boat ramp this year. We paid them under a cooperative agreement. We got a lot more done using this method versus contracting the work out.

They finished all but the seal coat on the asphalt section. They will do this when it warms up.

For FY 09 Valentine NWR received $59,000 in deferred maintenance funds that carried over from FY 08. The funds are to rehab the Pony Lake and West Long Lake dikes and water control structures. Carp barriers will be installed as part of the project. Part of the work on this project was completed in 2009 and is reported on in section I.2.

In 2008 the Complex received $28,000 in biological monitoring funds from the RO. The money was used to hire a term biological technician to do GIS work on Fort Niobrara and Valentine NWRs. This work will take place in 2009.

A Recovery Act proposal for tree removal was submitted for Valentine NWR. The proposal was submitted through the fire program. The cost was estimated at $200,000 to remove most of the cedar and deciduous trees that are invading refuge prairie. No funds were received.

Funding in the amount of $9,000 was received from the Director's differed allocation. The funds were to be used to spray Canada thistle at Valentine NWR with a helicopter. We needed to update our Integrated Pest Management Plan, prepare an EA on the plan, and do a Section 7 consultation. The work was put out for bid and lowest bid received was over $12,000. The funds were returned without doing any spraying.

Funding in the amount of $35,050 was received by the Complex from the Recovery Act Youth Employment Fund. At Valentine NWR part of the funds were be used to hire 2 STEP employees.

Valentine NWR received $10,000 in Recovery Act funds for a tornado shelter that was placed at Pony Lake sub-headquarters. We also received $26,000 in Recovery Act funds to repair the Pelican Lake water control structure and $10,000 for energy efficient updates for refuge buildings. The energy projects were completed in 2009 and the water control structure will be done in 2010.

An equipment rental request was prepared and sent in for 2010 funding. We would like to rent a Marsh Master set up with spraying equipment to control Canada thistle around the Marsh Lakes at Valentine NWR. Much of this is not accessible with standard equipment.

A large invasive proposal was submitted to control trees on Valentine NWR. The proposal was for over $200,000 and would include staff, equipment, and herbicides to combat a growing problem with trees invading refuge grasslands. No funds were received.

6. Safety

Four cold weather survival suits were purchased using avian influenza monitoring funds. We will also be able to use the suits for emergency response.

Safety topics were discussed on most Mondays during our coordination meeting.

7. Technical Assistance

In Sept, Lindvall and Nenneman worked at the fall bison round-up at Ft. Niobrara NWR. Nenneman assisted in collecting tail hair samples, nasal swabs, and some blood sample collection from calves. Other duties were writing down bison numbers as a back-up for the computer system, and learning to work the new hand-held computers.

In Oct, Nenneman traveled to Crescent Lake NWR to assist with the station review. The staff at Crescent Lake NWR presented an overview of management, biology, fire, and maintenance at the refuge, and the review team made recommendations to help the staff out. The biological program appears to be in good shape, and it appears that data is being collected to address most facets of refuge management.

8. Other

a. Meetings

Nenneman and Lindvall attended the Nebraska Chapter of The Wildlife Society annual meeting in Lincoln, NE on Feb 27-28. The topic of the meeting was wildlife diseases, with the student professional workshop held at the Veterinary Sciences Lab at UN-L. Presentations covered internal and external parasites and many wildlife diseases. The student professional workshop offered an inside look at the diagnostics lab at the University, as participants were able to observe some active necropsy work and see the lab where many deer CWD samples are processed. Presenters talked about how slides were made of brain stems and lymph nodes to determine if the deer was positive for the disease. Nenneman is President Elect and Lindvall Treasurer for the Nebraska Chapter.

On 03 March, Nenneman attended a one day meeting of the Soil Survey Team for Major Land Resource Area 65 (NE Sandhills). This meeting was mostly an update of the current status of the soil survey. Cherry County is up to date, having been completed in 2005.

Nenneman attended a meeting on the status of the Western Prairie Fringed Orchid (WPFO). The meeting was held at Neal Smith NWR in central Iowa on 18-19 March. The meeting covered the current population census and sampling efforts being conducted across the range of the plant. The 5 year review of the status of the WPFO is nearing completion, and a summary of progress toward attaining protection for 90% of WPFO was presented. The known population in the Nebraska Sandhills is only 35% protected,

which is not surprising given that over 95% of the Sandhills is in private ownership. Several populations (Red River Valley, MN and IA oak savannah, and the MO central dissected till plains) have >90% of the known WPFO on protected lands. The largest populations of WPFO are found along the Red River in ND, MN, and southern Manitoba. Some work has been done to identify the pollinators of WPFO, with 7 species of moths identified as pollen vectors. Based on range maps presented at the conference, it looks as though three of these are likely to occur in the Sandhills (*Sphinx drupiferarum*, *Eumorpha achemon*, and *Hyles lineata*). Research has shown that fruit set in WPFO may be as low as 5-10%, and in small populations hand pollination may be a good option for increasing outcrossing and thereby increasing the viability of seed produced. Across the range of the species, genetic variability is apparently quite low, although many orchid species persist with low levels of genetic diversity (both in rare and common orchids). Information on management effects to date shows no consistent effects on orchids. Most studies indicate that the annual variation in orchid growth often precludes determining the effect of management. Work on the Sheyenne National Grasslands in ND has indicated that neither grazing nor fire seem to be detrimental to orchid populations. In one study, fire had a negative effect in dry years and a positive effect in wet years. The end of the meeting produced a list of questions and issues that are thought to be important to the conservation of WPFO. The recovery team will look at these as the recovery plan nears completion.

We met with Craig Allen and Kevin Pope for the Nebraska Cooperative Wildlife Research Unit on January 16. Possible research discussed was the use of koi herpes virus to control carp, the use of prescribed fire for bull snake control, and the use of refuge grasslands as a research site on climate change and carbon sequestration. The possible use of the Hackberry buildings as a base for research in the Sandhills on climate change was also talked about.

The annual coordination meeting with Nebraska Game and Parks staff was held on May 12.

A Nebraska Project Leaders meeting was held in North Platte on August 19. It was a good opportunity to meet with our new Zone Sup and discuss projects and issues.

Refuge Manager Lindvall and Biologist Nenneman attended a symposium on grassland management hosted by the Nebraska Grazing Lands Coalition. Sessions on prescribed fire, grassland monitoring, timing and duration of grazing, and use of woody biomass were presented.

b. Training

On 27 May and 11 Jun, Nenneman provided ATV safety training for seasonal employees from the Ft. Niobrara/Valentine NWR Complex and LaCreek NWR. 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 10 employees were provided instruction in ATV/ORUV use.

Nenneman attended S-212 for chainsaw operation. The classroom portion has been completed, but the field work portion is yet to be completed.

Nenneman attended the Heavy Equipment Safety Training "Delivering a training session" in Tuscon, AZ from 26-29 Oct. The training is designed to help HEST trainers better prepare FWS employees to use equipment safely, and to make the training classes better for students. The course covered ways to avoid "death by powerpoint" and to integrate student participation (games, activities, hands-on training) that will make training more interesting for students. Nenneman attended the course to continue serving as an ATV/ORUV trainer for the area.

Dave Kime completed private applicator pesticide training on February 23 in Valentine.

Refuge Manager Lindvall completed the SAMMS transition course held in Huron, SD. It appears that they made a confusing program even more confusing.

Nenenman and Lindvall completed credit card, defensive driving, records management, privacy act, information security, and no fear training. Lindvall also did credit card approval and ethics training.

Lindvall, Kime, and Nenneman completed mandatory training classes in credit card, no fear, supervision, records management, and defensive driving.

Regular staff and the summer help completed most of the required training including Defensive Driving, Information Security, Privacy Act, No Fear, Credit Card, EEO, and Ethics.

Lindvall, Nenneman, Feltman, and Suhr completed the 8 hour annual fire refresher.

Manager Lindvall completed skid steer training held at Fort Niobrara NWR on June 10 and 11.

Refuge Manager Lindvall completed tractor safety 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

There are 37 major wetland/lake areas on Valentine NWR that comprise about 13,000 acres. Lakes and wetlands on Valentine NWR held started the year a little drier than average, but went into the fall with generally above average readings thanks to abundant rainfall through the summer months. Based on measures of lake levels (Table F.2.1) and USGS groundwater wells (Table F.2.2), the groundwater on Valentine Refuge is making a recovery from the dry years in 1999-2004.

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 continued their recovery toward average levels not achieved since the drought began in 1999. In spring of 2008, all seven lakes had elevation measures lower than average (mean difference from average -1'1.3"). By fall 2008, lake elevations had improved somewhat, with 6 of 7 lake elevations recorded below average, but with the mean difference from average dropping to -7.6". In spring 2009, 6 of the 7 lake elevations were still lower than average, but the mean difference from average was only -4.32". Lots of rain in Jun-Aug of 2009 made a very big difference in lake elevations. In Sept 2009, only 1 of the 7 lakes had an elevation below average, and the mean difference from average was +10". Clear and Willow lakes made the biggest gains in terms of elevation, thanks in part to discharge from Whitewater and Dewey lakes. Hackberry Lake also seems to be nearing recovery following its renovation in 2004. Increasing water levels should provide a positive benefit to fish by flooding aquatic and emergent vegetation that was out of the water during the early part of the decade, making more spawning habitat and escape cover available.

Table F.2.1. Lake elevations recorded on Valentine NWR, 2009. For all lakes, average spring elevations are based on the highest elevation recorded in Mar-May from 1988-2009, and the average fall elevations are based on the lowest elevation recorded in Aug-Oct from 1988-2009.

Lake	Spring 2009	Fall 2009	Spring Average	Fall Average
Clear	2916.68	2916.74	2916.74	2915.9
Dewey	2924.08	2923.52	2924.29	2923.23
Hackberry	2923.43	2923.75	2924.33	2923.75
Pelican	2941.84	2942.62	2942.59	2942.02
Watts	2923.54	2923.6	2923.68	2922.76
Whitewater	2927.7	2926.96	2928.2	2927.44
Willow*	2909.94	2912.71	2909.9	2908.98

* 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) has taken over the position of collecting well data from remote locations. All 2009 data collected on Valentine NWR have been sent to Mr. Curtis. For the year, most groundwater elevations were higher than average. In April, groundwater elevation in 19 of 31 wells was greater than 6 inches above average, while 4 were greater than 6 inches below average; the remaining 8 wells were within 6 inches of the average groundwater elevation. The late summer (Sept-Oct) groundwater elevations were similar, with 20 of 31 wells having elevations greater than 6 inches above average, while just 3 wells had elevations greater than 6 inches below average. Again, 8 wells had groundwater elevations within 6 inches of the average elevation. 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 average.

The annual Valentine NWR water use report for 2008-2009 was completed and signed in April. This report provides information on water measurements taken on the refuge during 2008, and describes planned water management for 2009. 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).

Table F 2.2. Spring and fall USGS groundwater well readings, and the spring and fall averages as recorded from 1970-2009. 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	2876.13	2874.527	2875.93	2873.341
2	SE corner S. Marsh	2895.83	2894.588	2894.23	2893.165
3	SE corner Pony	2899.97	2899.499	2898.87	2897.461
4	SE corner Cow	2921.29	2919.322	2920.39	2918.526
5	Calf Camp & Hwy 83	2896.55	2896.391	2896.15	2895.109
6	Calf Camp West	2916.33	2915.557	2915.33	2913.704
7	Little Hay West	2917.04	2916.096	2917.24	2916.029
8	Little Hay & Hwy 83	2898.68	2899.272	2898.78	2898.165
10	W. Pony & Hwy 83	2924.41	2922.91	2923.61	2922.474
13	S. Willow	2917.05	2917.15	2917.35	2917.071
14	E. McKeel	2921.77	2920.186	2921.27	2919.073
15	S. East Sweetwater	2926.57	2925.156	2925.87	2924.657
16	SE Trout	2899.87	2898.833	2898.17	2897.552
17	E. Crowe Headquarters	98.1	95.53333	99.5	95.55588
20	S. Watts	2925.26	2924.71	2924.96	2924.055
21	E. Pony Pasture	2925.44	2924.848	2924.84	2924.386
22	Hackberry-Dewey Canal	2924.29	2923.734	2922.89	2923.022
23	Badger Bay	2924.39	2923.709	2924.09	2923.748
25	E. Pelican	2942.52[a]	2943.539	2942.52[a]	2943.253
26	E. West Long	2963.78	2964.972	2963.38	2964.875
27	Dad's Recreation Area	2957.19	2957.468	2956.19	2956.311
29	NW Pelican	2948.69 [a]	2948.374	2948.69 [a]	2947.616
30	S. Dewey Marsh	2940.24	2940.437	2939.44	2939.371
31	W. Dewey Marsh	95.8	98.00294	95.8	98.23077
32	N. Pelican	2942.35	2941.607	2941.95	2940.85
33	NW West Long	2979.8	2979.727	2978.7	2978.848
34	Hwy 83 & W. King Flats	2925.39	2924.06	2925.59	2923.869
35	SE "21" Lake	97.7	96.25135	97.3	95.40263
36	W. Sweetwater & Hwy 83	2926.67	2926.953	2926.77	2926.346
38	SE West Twin	2921.44	2920.532	2921.04	2919.756
39	SW Hassle Place	95.3	94.37333	95.5	94.06296

[a] These wells held no water, only damp sand at the bottom.

3. Forests

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

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-native grasses (see discussion of grazing treatments in F7). In 2003, 202 random transects were established across Valentine NWR to monitor vegetation. These transects are 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). Within the vegetation 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 will be 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 will be recorded. A measure of vegetation disturbance (grazing or fire) was also recorded within each vegetation frame. Disturbance by fire will be 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). One hundred fifty-six transects were located in upland (sands and choppy sands) sandhills units, and 46 were located in subirrigated meadow units.

Transect sampling in 2009 was somewhat limited, as only 61 transects were completed. To improve the sample size in meadows, an effort was made to target sampling in meadows that had received SGT. These 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. Sample sizes for the two coarse habitats on the refuge were 32 transects in upland sandhills, and 29 transects in meadows. The 32 upland transects were split evenly between SDS and Rest treatments, while in the meadow there were 10 SGT transects and 19 Rest transects.

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 a 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.

Current sampling indicates that grazing treatments are meeting the suggested VOR ranges, with mean VOR's meeting or exceeding objectives (Table 7.1). In the uplands, both SDS units and rest units had mean VORs greater than 6" (6.2" and 6.8", respectively). In meadows units, rest units had a mean VOR of 13.7", and SGT units had a mean VOR of 14.8", both well above the CCP objective of 12". One potential problem with current VOR trends is that the bulk of the measurements are comprised of higher readings, indicating that the vegetation structure is relatively homogeneous. In uplands, 10% of VOR readings were <3" in height, while 57% were >6". In meadows, 65% of VOR readings were >12", with almost no VOR <3". This removes some of the structural heterogeneity from the grasslands that helps support a broader suite of grassland dependent birds. The amount of disturbance in the uplands was considerably lower than the CCP objective of disturbing approximately 45% of the acres on an annual basis. In 2009, only about 24% of upland acres were disturbed. In meadow units, the amount of habitat disturbed by grazing were nearly right on the refuge objective of 40% disturbed. Two measures of plant composition are done on transects – percent cover within three Daubenmire frames on each transect, and the belt transects. The two methods provide slightly different results, but indicate that plant composition is similar to the CCP objectives. Daubenmire frames tend to have more forb cover recorded as the leaves of forbs tend to be broader than grasses. For upland transects in Daubenmire frames, percent grass cover was about 70%, forbs about 20%, grass-like plants about 10%, and shrubs less than 5%. On the upland belt transects, grasses comprised just over 80%, forbs and grass-like plants about 5% each, and shrubs just under 5%. In the Daubenmire frames, the percent grass is lower than objective levels, and forbs and grass-like plants are higher than objective levels. In the belt transect sample, only forbs are slightly less than objective levels. Warm season native grasses dominated the belt transect sample in uplands, but Kentucky bluegrass did comprise 18% of rest samples, and 7% of SDS samples. In the meadow sample of Daubenmire frames, grasses comprised about 65% cover, followed by grass-like plants (about 20%) and forbs (about 15%) and shrubs (less than 2%). On meadow belt transects, grass comprised just over 80% of the cover, followed by grass-like plants (about 10%), forbs (<5%) and shrubs (<5%). Thus the Daubenmire measure of percent cover was about 10% low for grasses, and about 5% high for grass-like plants and forbs when compared to the CCP. On the belt transects, forb cover was slightly lower than the CCP objectives. One point to note here is that Kentucky bluegrass was a major component of the grass cover on meadow belt transects, comprising 50% segments on transects in rest units, and 39% in SGT units.

Table 7.1. Vegetation sampling on Valentine NWR in 2009, with values compared to CCP objectives. Percent cover values shown for the 2009 sample are results from Daubenmire frame, results from belt transect.			
		CCP objective	2009 Sample
Hills	VOR Grazed	3" (1-10")	6.2" (1-22")
	VOR Rest	>6" (1-16")	6.8" (0-28")
	Disturbed acres	21,900 ac	11,510 ac
	% cover grass	80-95%	68.5%, 81.9%
	% cover grass-like	<5%	10.1%, 3.9%
	% cover forb	10%	18.4%, 4.3%
	% cover shrub	<5%	3.1%, 3.3%
Meadow	VOR Grazed	3 (1-10")	14.7"(3-31")
	VOR Rest	10-12"(2-20")	13.7"(1-37")
	Disturbed acres	5,200 ac	5,219 ac
	% cover grass	75-85%	66.6%, 81.8%
	% cover grass-like	5-10%	17.4%, 11.1%
	% cover forb	5-10%	14.3%, 2.5%
	% cover shrub	5%	1.7%, 2.5%

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. In 2009, there were four permittees in the program. All have had permits for many years. Grazing rates are reduced to compensate permittees for the added expense of moving cattle for short duration grazing. One bid graze was also let. The program was similar to previous years with emphasis on spring grazing treatments in meadows and short-duration grazing in hill units.

In 2009 an additional permittee dropped out of the program. This leaves 4 traditional permittees and 1 part that we do under bid. This year's grazing is mostly spring grazing treatments in meadows and short-duration grazing in the hills (see pages 26-31 for habitat unit management). We will be doing some haying with the refuge share fed back on the refuge during the winter. A new contract fencer was found for the refuge west of the highway.

Permittees turned cattle on to the refuge in early May. All but one herd managed to at least partially leave the habitat units they were scheduled in. Some got out on the highway 8 miles from where they should have been. This has been a continuing problem since the employee who did this work retired some years ago.

Refuge permittee Bud Reece had 12 cows killed by lightening near West Long Lake. He also had one cow die of unknown causes and one steer was found dead when he hung himself in a tree crotch. FSA payed for the lightning struck cattle under a disaster program.

The water gaps on Devil's Punchbowl Lake were down and the neighbors' cattle were on the refuge for several days. The neighbor called to ask us to fix the water gap only after removing the cattle three times!

Cattle trespass grazed habitat units 36B and 36A for about 2 weeks. They broke down the water gap along East Long Lake to enter the refuge. This is about an annual event. Next year we will install both electric and barbed wire water gaps to keep them out.

Grazing fees for 2009 were:

spring grazing treatment		$20.71AUM
short-duration grazing		
	1 day in unit	$13.38/AUM
	2 days in unit	$18.88AUM
	3 days in unit	$20.71/AUM
	4 days in unit	$21.44/AUM
	5 days in unit	$21.80/AUM
	6 days in unit	$23.17/AUM
	7 days in unit	$23.54/AUM
	8 or more days in unit	$24.00/AUM
fall		$24.00/AUM
winter		$24.00/AUM

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

The full rate of $24.00 for 2009 is an increase of $1.00 per AUM from the 2008 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 2009 $57,417 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 2009 grazing season were $26,883.

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 suppress 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 may 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 2009, 26 habitat units totaling 4,449 acres received a spring grazing treatment and included some areas that were later hayed.

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 2009, 1 habitat unit of 349 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 2009, 48 habitat units totaling 11,510 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 2009 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 2009 that will be given a spring grazing treatment in 2010. Habitat unit 27A2 was fall grazed after being hayed. This adds fertilizer to the soil and eventually improves the quality and quantity of hay harvested. In 2009, 4 habitat units totaling 904 acres were fall grazed.

Table F 7a. 2009 HABITAT MANAGEMENT SUMMARY

Treatment		Units	Acres	AUMS
Rest	rest (R)	233	45,950	----
Spring	spring grazing treatment (SGT)	26	4,449	1,358
	early spring short duration (ES-SD)			
	ES-SD 1-6 days	1	349	52
	ES-SD 7-10 days	0	---	---
Summer	short duration summer (SD-S)			
	SD-S 1-3 days	24	3,350	597
	SD-S 4-7 days	20	5,432	622
	SD-S 8-14 days	4	2,728	386
	summer (S) 15-27 days	0	---	---
Fall	fall (F)	4	904	372
Winter	winter (W)	4	250	666
Hayed	hayed (H)	9	421	----
Fire	prescribed fire (P)	3	230	----
	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.

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

2009 Habitat Managment by Habitat Unit

habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
"A"	120	R	0	0	0	0	/ /	0	0.00	0.00	
01A1	105	R	0	0	0	0	/ /	0	0.00	0.00	
01A2	110	R	0	0	0	0	/ /	0	0.00	0.00	
01A3	10	R	0	0	0	0	/ /	0	0.00	0.00	
01A4	115	R	0	0	0	0	/ /	0	0.00	0.00	
01A5	74	R	0	0	0	0	/ /	0	0.00	0.00	
01B1(NW)	45	R	0	0	0	0	/ /	0	0.00	0.00	
01B1(W-E)	63	R	0	0	0	0	/ /	0	0.00	0.00	
01B2	376	R	0	0	0	0	/ /	0	0.00	0.00	
01C	188	R	0	0	0	0	/ /	0	0.00	0.00	
02A	506	R	0	0	0	0	/ /	0	0.00	0.00	
02B1	176	R	0	0	0	0	/ /	0	0.00	0.00	
02B1(FDL)	5	R	0	0	0	0	/ /	0	0.00	0.00	
02B2	45	R	0	0	0	0	/ /	0	0.00	0.00	
02B3(A)	140	SGT	0	0	0	43	06/01/09	25	24.67	0.18	REECE
02B3(B)	129	SGT	0	0	0	39	06/01/09	25	22.38	0.17	REECE
02B3(C)	150	SGT	0	0	0	46	06/01/09	25	26.39	0.18	REECE
02B3(D)	65	SGT	0	0	0	19	06/01/09	25	10.90	0.17	REECE
03A	106	R	0	0	0	0	/ /	0	0.00	0.00	
03B	240	R	0	0	0	0	/ /	0	0.00	0.00	
03C1	268	SD-S	0	0	0	146	06/08/09	7	23.46	0.09	REECE
03C1(W)	21	R	0	0	0	0	/ /	0	0.00	0.00	
03C1DIKE	29	R	0	0	0	0	/ /	0	0.00	0.00	
03C2	137	R	0	0	0	0	/ /	0	0.00	0.00	
03D	516	R	0	0	0	0	/ /	0	0.00	0.00	
04	350	SD-S	0	0	0	146	06/15/09	7	23.46	0.07	REECE
05A	666	R	0	0	0	0	/ /	0	0.00	0.00	
05B1	527	SD-S	0	0	0	145	06/29/09	7	23.30	0.04	REECE
05B2	30	R	0	0	0	0	/ /	0	0.00	0.00	
06	308	R	0	0	0	0	/ /	0	0.00	0.00	
07A1(N)	225	R	0	0	0	0	/ /	0	0.00	0.00	
07A1(S)	85	R	0	0	0	0	/ /	0	0.00	0.00	
07A2	20	R	0	0	0	0	/ /	0	0.00	0.00	
07B1	112	R	0	0	0	0	/ /	0	0.00	0.00	
07B2	152	R	0	0	0	0	/ /	0	0.00	0.00	
07B3(E)	25	R	0	0	0	0	/ /	0	0.00	0.00	
07B3(W)	66	R	0	0	0	0	/ /	0	0.00	0.00	
07C	105	R	0	0	0	0	/ /	0	0.00	0.00	
08A1	166	R	0	0	0	0	/ /	0	0.00	0.00	
08A2	155	SD-S	0	36	0	158	06/20/09	4	19.23	0.12	REECE
08A3	160	R	0	0	0	0	/ /	0	0.00	0.00	
08B1/2	373	SD-S	0	36	0	158	06/11/09	10	48.07	0.13	REECE
08B3	185	SD-S	0	36	0	158	06/16/09	5	24.03	0.13	REECE
08B4	185	R	0	0	0	0	/ /	0	0.00	0.00	
08C2	175	R	0	0	0	0	/ /	0	0.00	0.00	
08C3	170	SGT	0	15	0	64	06/01/09	24	47.06	0.28	REECE
08D1	120	SGT	0	11	0	45	06/01/09	24	33.44	0.28	REECE
08D2	250	R	0	0	0	0	/ /	0	0.00	0.00	
08D3	134	SGT	0	11	0	50	06/01/09	24	36.20	0.27	REECE
08E1	152	R	0	0	0	0	/ /	0	0.00	0.00	
08E2	137	R	0	0	0	0	/ /	0	0.00	0.00	
08E3(H)	100	R	0	0	0	0	/ /	0	0.00	0.00	
08E3(M)	187	R	0	0	0	0	/ /	0	0.00	0.00	
08F1	190	R	0	0	0	0	/ /	0	0.00	0.00	
08F2	211	R	0	0	0	0	/ /	0	0.00	0.00	
08G	206	R	0	0	0	0	/ /	0	0.00	0.00	
09A1	119	R	0	0	0	0	/ /	0	0.00	0.00	
09A2	133	R	0	0	0	0	/ /	0	0.00	0.00	
09A3	68	R	0	0	0	0	/ /	0	0.00	0.00	
09B1	153	SD-S	0	178	10	0	07/08/09	5	31.64	0.21	COLBURN
09B2	123	SD-S	0	177	20	0	07/08/09	5	33.93	0.28	COLBURN
09C1	75	SD-S	0	178	10	0	06/27/09	3	18.98	0.25	COLBURN

2009 Habitat Managment by Habitat Unit

habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
09C10	40	R	0	0	0	0	/ /	0	0.00	0.00	
09C2	85	SD-S	0	177	10	0	06/27/09	3	18.89	0.22	COLBURN
09C3	80	SD-S	0	178	10	0	06/24/09	3	18.98	0.24	COLBURN
09C4	80	SD-S	0	177	10	0	06/24/09	3	18.89	0.24	COLBURN
09C5	110	R	0	0	0	0	/ /	0	0.00	0.00	
09C6	90	R	0	0	0	0	/ /	0	0.00	0.00	
09C7	90	R	0	0	0	0	/ /	0	0.00	0.00	
09C8	70	R	0	0	0	0	/ /	0	0.00	0.00	
09C9	80	R	0	0	0	0	/ /	0	0.00	0.00	
10A1	640	R	0	0	0	0	/ /	0	0.00	0.00	
10A2	240	R	0	0	0	0	/ /	0	0.00	0.00	
10A3	160	R	0	0	0	0	/ /	0	0.00	0.00	
10B(C)	260	SD-S	0	355	20	0	06/09/09	4	50.49	0.19	COLBURN
10B(E)	275	R	0	0	0	0	/ /	0	0.00	0.00	
10B(W)	929	SD-S	0	355	20	0	07/18/09	10	126.23	0.14	COLBURN
11A1	126	SD-S	0	355	20	0	06/30/09	3	37.87	0.30	COLBURN
11A2	126	R	0	0	0	0	/ /	0	0.00	0.00	
11A3	118	R	0	0	0	0	/ /	0	0.00	0.00	
11A4	110	SD-S	0	355	10	0	07/03/09	3	36.39	0.33	COLBURN
11A5	126	R	0	0	0	0	/ /	0	0.00	0.00	
11A6	126	SD-S	0	355	20	0	06/19/09	2	25.25	0.20	COLBURN
11A7	114	R	0	0	0	0	/ /	0	0.00	0.00	
11A8	114	SD-S	0	355	20	0	06/21/09	2	25.25	0.22	COLBURN
12A1	83	SD-S	0	178	10	0	06/12/09	3	18.98	0.23	COLBURN
12A2	82	SD-S	0	177	10	0	06/12/09	3	18.89	0.23	COLBURN
12A3	83	R	0	0	0	0	/ /	0	0.00	0.00	
12A4	110	SD-S	0	178	10	0	06/15/09	3	18.98	0.17	COLBURN
12A5	80	SD-S	0	177	10	0	06/15/09	3	18.89	0.24	COLBURN
12A6	100	R	0	0	0	0	/ /	0	0.00	0.00	
12A7	110	R	0	0	0	0	/ /	0	0.00	0.00	
12A8	110	SD-S	0	355	20	0	06/17/09	2	25.25	0.23	COLBURN
12A9	82	R	0	0	0	0	/ /	0	0.00	0.00	
12B	290	SD-S	0	355	20	0	06/05/09	4	50.49	0.17	COLBURN
13A	709	R	0	0	0	0	/ /	0	0.00	0.00	
13B1	859	SGT	0	154	0	0	05/15/09	6	30.30	0.04	COLBURN
13B1	859	SGT	0	325	16	0	06/01/09	17	194.52	0.23	COLBURN
13B2	54	SGT	0	11	0	0	05/15/09	6	2.16	0.04	COLBURN
13B2	54	SGT	0	24	2	0	06/01/09	17	15.05	0.28	COLBURN
13B3	29	SGT	0	3	0	0	05/15/09	6	0.59	0.02	COLBURN
13B3	29	SGT	0	6	2	0	06/01/09	17	5.02	0.17	COLBURN
14A1	280	R	0	0	0	0	/ /	0	0.00	0.00	
14A2	294	R	0	0	0	0	/ /	0	0.00	0.00	
14A3	153	R	0	0	0	0	/ /	0	0.00	0.00	
14A4	200	R	0	0	0	0	/ /	0	0.00	0.00	
14B1	340	R	0	0	0	0	/ /	0	0.00	0.00	
14B2	340	R	0	0	0	0	/ /	0	0.00	0.00	
14B3	312	R	0	0	0	0	/ /	0	0.00	0.00	
14B4	260	R	0	0	0	0	/ /	0	0.00	0.00	
14B5	283	R	0	0	0	0	/ /	0	0.00	0.00	
15A	398	R	0	0	0	0	/ /	0	0.00	0.00	
15B	273	R	0	0	0	0	/ /	0	0.00	0.00	
15C1	93	R	0	0	0	0	/ /	0	0.00	0.00	
15C2	155	R	0	0	0	0	/ /	0	0.00	0.00	
15C3	175	R	0	0	0	0	/ /	0	0.00	0.00	
15C4	199	R	0	0	0	0	/ /	0	0.00	0.00	
16A1	44	R	0	0	0	0	/ /	0	0.00	0.00	
16A2	95	SGT	30	17	1	0	06/01/09	23	41.78	0.44	BID
16A3	149	SGT	47	27	2	0	06/01/09	23	66.22	0.44	BID
16B1	160	R	0	0	0	0	/ /	0	0.00	0.00	
16B2	317	R	0	0	0	0	/ /	0	0.00	0.00	
16B3	40	R	0	0	0	0	/ /	0	0.00	0.00	
16B4	175	R	0	0	0	0	/ /	0	0.00	0.00	

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habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
16C	524	SD-S	0	0	0	145	06/22/09	7	23.30	0.04	REECE
16E1	145	R	0	0	0	0	/ /	0	0.00	0.00	
16E2	71	R	0	0	0	0	/ /	0	0.00	0.00	
16E3	65	R	0	0	0	0	/ /	0	0.00	0.00	
16E4	266	R	0	0	0	0	/ /	0	0.00	0.00	
17	871	SD-S	210	120	12	0	06/10/09	9	116.94	0.13	BID
18A1	339	SGT	107	61	8	0	06/01/09	23	154.30	0.46	BID
18A2	163	R	0	0	0	0	/ /	0	0.00	0.00	
18A3	150	R	0	0	0	0	/ /	0	0.00	0.00	
18A4	220	R	0	0	0	0	/ /	0	0.00	0.00	
18A5	260	R	0	0	0	0	/ /	0	0.00	0.00	
18A6	290	R	0	0	0	0	/ /	0	0.00	0.00	
18B1	81	SGT	26	15	1	0	06/01/09	23	36.56	0.45	BID
18B10	40	R	0	0	0	0	/ /	0	0.00	0.00	
18B2(H)	93	R	0	0	0	0	/ /	0	0.00	0.00	
18B2(M)	83	R	0	0	0	0	/ /	0	0.00	0.00	
18B3(H)	112	R	0	0	0	0	/ /	0	0.00	0.00	
18B3(M)	95	R	0	0	0	0	/ /	0	0.00	0.00	
18B4(H)	103	R	0	0	0	0	/ /	0	0.00	0.00	
18B4(M)	42	R	0	0	0	0	/ /	0	0.00	0.00	
18B5	72	SGT	28	0	1	0	05/30/09	21	24.75	0.34	BID
18B6	69	R	0	0	0	0	/ /	0	0.00	0.00	
18B7(N)	76	R	0	0	0	0	/ /	0	0.00	0.00	
18B7(SE)	33	R	0	0	0	0	/ /	0	0.00	0.00	
18B7(SW)	85	R	0	0	0	0	/ /	0	0.00	0.00	
18B8	171	R	0	0	0	0	/ /	0	0.00	0.00	
18B8(W)	36	R	0	0	0	0	/ /	0	0.00	0.00	
18B9(H)	97	R	0	0	0	0	/ /	0	0.00	0.00	
18B9(M)	41	R	0	0	0	0	/ /	0	0.00	0.00	
18C1	216	R	0	0	0	0	/ /	0	0.00	0.00	
18C2	149	R	0	0	0	0	/ /	0	0.00	0.00	
19A	173	R	0	0	0	0	/ /	0	0.00	0.00	
19B	174	R	0	0	0	0	/ /	0	0.00	0.00	
19C	101	R	0	0	0	0	/ /	0	0.00	0.00	
20A1	120	SGT	47	0	2	0	05/30/09	21	41.87	0.35	BID
20A2	175	R	0	0	0	0	/ /	0	0.00	0.00	
20A3	160	SD-S	75	0	3	0	06/10/09	6	19.03	0.12	BID
20A4	203	SD-S	75	0	3	0	06/04/09	5	15.86	0.08	BID
20B1	340	R	0	0	0	0	/ /	0	0.00	0.00	
20B2	185	R	0	0	0	0	/ /	0	0.00	0.00	
20B3(E)	127	R	0	0	0	0	/ /	0	0.00	0.00	
20B3(W)	112	R	0	0	0	0	/ /	0	0.00	0.00	
20B4	185	R	0	0	0	0	/ /	0	0.00	0.00	
20B5	115	R	0	0	0	0	/ /	0	0.00	0.00	
20B6	155	R	0	0	0	0	/ /	0	0.00	0.00	
20B7	40	R	0	0	0	0	/ /	0	0.00	0.00	
21A1(A)	295	R	0	0	0	0	/ /	0	0.00	0.00	
21A1(B)	285	R	0	0	0	0	/ /	0	0.00	0.00	
21A1(C)	188	R	0	0	0	0	/ /	0	0.00	0.00	
21A1(D)	291	R	0	0	0	0	/ /	0	0.00	0.00	
21A1(E)	120	R	0	0	0	0	/ /	0	0.00	0.00	
21A2	134	R	0	0	0	0	/ /	0	0.00	0.00	
21A3(E)	149	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
21A3(E)	149	SGT	0	80	0	0	05/09/09	24	62.95	0.42	COLBURN
21A4	179	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
21A4	179	SGT	0	88	0	0	05/09/09	24	69.25	0.39	COLBURN
21B1	120	SD-S	0	320	0	0	06/26/09	2	20.98	0.17	LEE
21B2	106	R	0	0	0	0	/ /	0	0.00	0.00	
21B3	120	SD-S	0	320	0	0	06/24/09	2	20.98	0.17	LEE
21B4	128	R	0	0	0	0	/ /	0	0.00	0.00	
21B5	128	SD-S	0	320	0	0	06/22/09	2	20.98	0.16	LEE
21B6	143	R	0	0	0	0	/ /	0	0.00	0.00	

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habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
21B7	143	SD-S	0	320	0	0	06/20/09	2	20.98	0.15	LEE
21C1	120	R	0	0	0	0	/ /	0	0.00	0.00	
21C2	1170	R	0	0	0	0	/ /	0	0.00	0.00	
21C3	80	R	0	0	0	0	/ /	0	0.00	0.00	
21C4	127	R	0	0	0	0	/ /	0	0.00	0.00	
21C5	189	R	0	0	0	0	/ /	0	0.00	0.00	
22A1	360	R	0	0	0	0	/ /	0	0.00	0.00	
22A2	385	R	0	0	0	0	/ /	0	0.00	0.00	
22A3	372	R	0	0	0	0	/ /	0	0.00	0.00	
22A4	390	R	0	0	0	0	/ /	0	0.00	0.00	
22B1	240	SD-S	0	320	0	0	06/30/09	4	41.97	0.17	LEE
22B2	421	SD-S	0	320	0	0	06/09/09	5	52.46	0.12	LEE
22B3	40	R	0	0	0	0	/ /	0	0.00	0.00	
22B4	90	R	0	0	0	0	/ /	0	0.00	0.00	
22B5	171	R	0	0	0	0	/ /	0	0.00	0.00	
23A1	160	R	0	0	0	0	/ /	0	0.00	0.00	
23A2	231	R	0	0	0	0	/ /	0	0.00	0.00	
23A3	211	R	0	0	0	0	/ /	0	0.00	0.00	
23B1	121	R	0	0	0	0	/ /	0	0.00	0.00	
23B2	142	R	0	0	0	0	/ /	0	0.00	0.00	
23C	599	R	0	0	0	0	/ /	0	0.00	0.00	
24A1	96	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
24A1	96	W	0	25	3	0	01/13/10	51	49.33	0.51	COLBURN
24A1	96	W	63	0	6	0	03/05/10	51	144.62	1.51	COLBURN
24A2	80	W	0	25	0	0	01/13/10	51	41.80	0.52	COLBURN
24A2	80	W	63	0	0	0	03/05/10	51	129.57	1.62	COLBURN
24A3	67	R	0	0	0	0	/ /	0	0.00	0.00	
24A4	40	R	0	0	0	0	/ /	0	0.00	0.00	
24A5	40	R	0	0	0	0	/ /	0	0.00	0.00	
24A6	104	R	0	0	0	0	/ /	0	0.00	0.00	
24A7	54	R	0	0	0	0	/ /	0	0.00	0.00	
24A8	80	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
24C1	147	R	0	0	0	0	/ /	0	0.00	0.00	
24C2	97	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
24C2	97	SGT	0	28	0	0	06/15/09	37	33.97	0.35	COLBURN
24C3	54	SGT	0	17	0	0	06/15/09	37	20.62	0.38	COLBURN
24C4	82	R	0	0	0	0	/ /	0	0.00	0.00	
24C4	82	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
25A	258	R	0	0	0	0	/ /	0	0.00	0.00	
25B	410	SGT	0	320	0	0	05/29/09	16	167.87	0.41	LEE
25C1	82	R	0	0	0	0	/ /	0	0.00	0.00	
25C2	69	R	0	0	0	0	/ /	0	0.00	0.00	
25C3	161	R	0	0	0	0	/ /	0	0.00	0.00	
25C4	200	R	0	0	0	0	/ /	0	0.00	0.00	
26A1	335	R	0	0	0	0	/ /	0	0.00	0.00	
26A2	349	ES-SD	0	320	0	0	05/13/09	5	52.46	0.15	LEE
26B1	110	R	0	0	0	0	/ /	0	0.00	0.00	
26B2	115	SGT	0	106	0	0	05/20/09	15	52.13	0.45	ANDERSON/GRABHER
26B3	110	R	0	0	0	0	/ /	0	0.00	0.00	
26B4	125	R	0	0	0	0	/ /	0	0.00	0.00	
27A1	32	R	0	0	0	0	/ /	0	0.00	0.00	
27A2	267	H	0	0	0	0	/ /	0	0.00	0.00	ANDERSON/GRABHER
27A2	267	F	164	36	0	0	10/05/09	11	85.74	0.32	ANDERSON/GRABHER
27A2	267	F	76	31	0	0	10/12/09	7	28.57	0.11	ANDERSON/GRABHER
27A2	267	F	76	134	0	0	10/27/09	15	111.88	0.42	ANDERSON/GRABHER
27B1	57	R	0	0	0	0	/ /	0	0.00	0.00	
27B2	36	R	0	0	0	0	/ /	0	0.00	0.00	
27B3	37	W	0	90	0	0	02/01/10	51	150.49	4.07	ANDERSON/GRABHER
27B4	37	W	0	90	0	0	02/01/10	51	150.49	4.07	ANDERSON/GRABHER
28A1	158	R	0	0	0	0	/ /	0	0.00	0.00	
28A2	80	R	0	0	0	0	/ /	0	0.00	0.00	
28A3	80	R	0	0	0	0	/ /	0	0.00	0.00	

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habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
28A4	85	R	0	0	0	0	/ /	0	0.00	0.00	
28A5	75	R	0	0	0	0	/ /	0	0.00	0.00	
28A6	80	R	0	0	0	0	/ /	0	0.00	0.00	
28B1	289	R	0	0	0	0	/ /	0	0.00	0.00	
28B2	294	R	0	0	0	0	/ /	0	0.00	0.00	
28B3	280	R	0	0	0	0	/ /	0	0.00	0.00	
28B4	400	R	0	0	0	0	/ /	0	0.00	0.00	
28C	750	R	0	0	0	0	/ /	0	0.00	0.00	
29A1	90	SD-S	0	108	0	0	07/11/09	5	17.70	0.20	LEE
29A2	176	SD-S	0	212	0	0	07/11/09	5	34.75	0.20	LEE
29B1	99	R	0	0	0	0	/ /	0	0.00	0.00	
29B2	182	R	0	0	0	0	/ /	0	0.00	0.00	
29B3	69	R	0	0	0	0	/ /	0	0.00	0.00	
29B4	89	R	0	0	0	0	/ /	0	0.00	0.00	
29B5	376	R	0	0	0	0	/ /	0	0.00	0.00	
30A(T)	15	R	0	0	0	0	/ /	0	0.00	0.00	
30A1	458	R	0	0	0	0	/ /	0	0.00	0.00	
30A2	201	SD-S	0	320	0	0	07/03/09	3	31.48	0.16	LEE
30A3	410	SD-S	0	320	0	0	06/04/09	6	62.95	0.15	LEE
30A4	312	R	0	0	0	0	/ /	0	0.00	0.00	
30B1(E)	202	R	0	0	0	0	/ /	0	0.00	0.00	
30B1(W)	146	P 45	0	0	0	0	/ /	0	0.00	0.00	
30B2	256	R	0	0	0	0	/ /	0	0.00	0.00	
30B3	128	R	0	0	0	0	/ /	0	0.00	0.00	
30B4	135	R	0	0	0	0	/ /	0	0.00	0.00	
30B4	135	R	0	0	0	0	/ /	0	0.00	0.00	
30C1	328	R	0	0	0	0	/ /	0	0.00	0.00	
30C2	180	P 140	0	0	0	0	/ /	0	0.00	0.00	
30C3	134	R	0	0	0	0	/ /	0	0.00	0.00	
30C4	108	R	0	0	0	0	/ /	0	0.00	0.00	
30C5	188	R	0	0	0	0	/ /	0	0.00	0.00	
30C6	130	SD-S	0	320	0	0	07/06/09	3	31.48	0.24	LEE
31A	171	R	0	0	0	0	/ /	0	0.00	0.00	
31A(T)	15	R	0	0	0	0	/ /	0	0.00	0.00	
31B(T)	30	R	0	0	0	0	/ /	0	0.00	0.00	
31B1	555	SD-S	0	320	0	0	06/18/09	9	94.43	0.17	LEE
31B2	469	R	0	0	0	0	/ /	0	0.00	0.00	
31C	506	R	0	0	0	0	/ /	0	0.00	0.00	
32A	491	P 45	0	0	0	0	/ /	8	0.00	0.00	
32B1	257	R	0	0	0	0	/ /	0	0.00	0.00	
32B2	155	R	0	0	0	0	/ /	0	0.00	0.00	
32C1	314	R	0	0	0	0	/ /	0	0.00	0.00	
32C2	83	R	0	0	0	0	/ /	0	0.00	0.00	
33	840	R	0	0	0	0	/ /	0	0.00	0.00	
34A1	240	SD-S	190	115	0	0	06/19/09	2	22.87	0.10	ANDERSON/GRABHER
34A2	240	R	0	0	0	0	/ /	0	0.00	0.00	
34A3	222	SD-S	190	115	0	0	06/15/09	4	45.73	0.21	ANDERSON/GRABHER
34A4	219	SD-S	190	115	0	0	06/17/09	2	22.87	0.10	ANDERSON/GRABHER
34A5	160	R	0	0	0	0	/ /	0	0.00	0.00	
34A6	120	R	0	0	0	0	/ /	0	0.00	0.00	
34B1(E)	174	R	0	0	0	0	/ /	0	0.00	0.00	
34B1(W)	201	R	0	0	0	0	/ /	0	0.00	0.00	
34B2	306	SD-S	190	115	0	0	06/08/09	3	34.30	0.11	ANDERSON/GRABHER
34B3(N)	164	R	0	0	0	0	/ /	0	0.00	0.00	
34B3(S)	142	SD-S	190	115	0	0	06/11/09	3	34.30	0.24	ANDERSON/GRABHER
34C(T)	15	R	0	0	0	0	/ /	0	0.00	0.00	
34C1	202	SGT	50	34	0	0	06/01/09	12	37.57	0.19	ANDERSON/GRABHER
34C2	227	SGT	56	37	0	0	06/01/09	12	41.66	0.18	ANDERSON/GRABHER
34C3	155	SGT	42	22	0	0	06/01/09	12	28.98	0.19	ANDERSON/GRABHER
34C4	155	SGT	42	22	0	0	06/01/09	12	28.98	0.19	ANDERSON/GRABHER
34C5	155	R	0	0	0	0	/ /	0	0.00	0.00	
34D	231	R	0	0	0	0	/ /	0	0.00	0.00	

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habitat unit	acres	treatment	C/C	adult	bull	yearling	outdate	days	aums	aum/ acre	permittee
34E1	222	R	0	0	0	0	/ /	0	0.00	0.00	
34E2	310	R	0	0	0	0	/ /	0	0.00	0.00	
34E3	290	R	0	0	0	0	/ /	0	0.00	0.00	
34F	103	R	0	0	0	0	/ /	0	0.00	0.00	
35A(N)	224	R	0	0	0	0	/ /	0	0.00	0.00	
35A(S)	400	SD-S	190	115	0	0	06/05/09	4	45.73	0.11	ANDERSON/GRABHER
35B	322	F	150	14	0	0	09/14/09	11	71.59	0.22	ANDERSON/GRABHER
35BCAMP	38	F	16	0	0	0	09/14/09	11	7.10	0.19	ANDERSON/GRABHER
35C	277	F	156	14	0	0	09/24/09	10	67.50	0.24	ANDERSON/GRABHER
36A	229	R	0	0	0	0	/ /	0	0.00	0.00	
36B	615	R	0	0	0	0	/ /	0	0.00	0.00	
37A	340	R	0	0	0	0	/ /	0	0.00	0.00	
37B	340	SD-S	190	115	0	0	06/22/09	3	34.30	0.10	ANDERSON/GRABHER
37C	400	R	0	0	0	0	/ /	0	0.00	0.00	
8C1	275	SD-S	0	36	0	146	06/25/09	5	22.66	0.08	REECE
GWNA	922	R	0	0	0	0	/ /	0	0.00	0.00	
HACKBERRY	121	R	0	0	0	0	/ /	0	0.00	0.00	
NA#2	459	R	0	0	0	0	/ /	0	0.00	0.00	
PELICAN	136	R	0	0	0	0	/ /	0	0.00	0.00	
PONY	23	R	0	0	0	0	/ /	0	0.00	0.00	
SNOW ROAD	5	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN
SweetR	110	H	0	0	0	0	/ /	0	0.00	0.00	COLBURN

the form of fertilizer. Hay is cut in the meadows. Resident wildlife also utilizes waste grain from the feeding operation. Winter feeding can also be used to stabilize roads. In 2009, 4 habitat units totaling 250 acres were winter grazed.

g. **Fire**

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

8. **Haying**

About 421 acres of sandy, sub-irrigated, and wetland range sites were mowed and yielded 512 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 $24.00/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. Two hundred and twenty 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.

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.

The endangered western prairie fringed orchid is known to occur in some of the areas on the refuge that are hayed. These areas are searched on foot when the orchids are in bloom. Orchids found in these searches were marked with lathe with orange tops so that the permittees can mow around the orchids, allowing the orchids to produce seed. 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. **<u>Fire Management</u>**

There were no wild fires on the refuge in 2009.

The 230 acre Lee Lake prescribed fire was completed on May 6. The burn was in Habitat Units 30C2, 30B1(W), and 32A. The fire was done to control cedar trees and exotic cool

season grasses. A crew from Bessey National Forest assisted. This was the only burn done this year.

Burn piles from cedar removal projects were burned during the winter.

10. Pest Management

An Integrated Pest Management Plan, Environmental Assessment, and Section 7 for invasive plant and animal control at Valentine NWR were completed. This plan updates a plan prepared in 2004. A notice was placed in the local newspapers and copies of the plan provided to interested parties. Ecological Services requested that we consider impacts to the Northern leopard frog, a species of concern in our planning. This complicated things as the frog is found refuge wide and in the same habitat as some of the invasives we hope to control. A second draft of the Section 7 for our Integrated Pest Management Plan was sent to Ecological Services. Information of the northern leopard frog was added to the document. Additional buffers around the threatened prairie fringed orchid were also added. This Section 7 was signed as "not likely to affect, concur." The completed plan was sent to the Regional Office for signature. It also has to be signed off at the Washington Office.

Information on herbicide use for Valentine NWR for the years 1999-2001 and 2007 was provided for the regional Freedom of Information request. Information for a second Freedom of Information Act request on Section 7 compliance pertaining to weed control was provided to the regional invasives coordinator.

Pesticide use reports and proposals were completed. At Valentine NWR we put in proposals for leafy spurge, Canada thistle, tree, phragmites, and exotic cool season grass control. In 2009 we applied herbicides to Canada thistle, invasive phragmites, and spurge.

A contractor sprayed Canada thistle with Milestone at 5 oz per acre during October. A total of an estimated 51 acres was sprayed using 256 ounces of Milestone. Thistle was sprayed around Hackberry, Willow, McKeel, Dads, and Mule Lakes. Weather turned cold before all the spraying could be done on the east side of Highway 83. The contractor was paid using grazing receipts. Spraying locations were entered into RLGIS.

We received $9,000 from the Director's Fund to spray Canada thistle using a helicopter. The only bid for helicopter spraying of Canada thistle came in way over the funding available. A request to hold the money over into FY 2010 was made but denied. The funds were returned.

All known locations of leafy spurge were sprayed by a contract sprayer using ATV's and Plateau herbicide at 8 ounces/acre. All the labor and part of the herbicide costs were paid with grazing receipts. A total of 640 ounces of Plateau was used to spray an estimated 80 acres. We requested that the contractor spray one round outside of each

patch to control sprouts. This may account for some but not all of discrepancy between what we mapped and what the contractor estimated as acres sprayed.

All the known patches of leafy spurge on Valentine NWR were mapped into RLGIS. There are 349 patches in 21 habitat units totaling 26.4 acres.

Large patches of the invasive phragmites were located south of Valentine NWR near where Highway 83 crosses Goose Creek. This is only about 1 mile south of Valentine NWR. This was the first recorded site for this plant in Cherry County. We visited this site and then searched portions of Valentine NWR for the invasive phragmites.

In the subsequent search, the invasive form of pharagmites was found in 21 locations on the Marsh Lakes (Figure F10.1). All are relatively small patches ranging from 10 by 10 feet to 100 by 30 feet for a total of an estimated .4 acres. All were sprayed on September 24 with a 1.5 percent Rodeo solution with a surfactant. A total of 7 pints of Rodeo was used. Pony, Center, and 21 lakes were surveyed using the airboat and no invasive spotted. Other lakes need to be surveyed. This is the second known location in Cherry County. Follow up treatments on the known locations and searches for new locations on the refuge will need to be done in the future.

Figure F10.1. Flowering heads of native (left) and invasive phragmites. (MLL).

LaCreek NWR's Bobcat and tree shredder were borrowed and used to control invasive cedar trees in Habitat Units 34E1, 35A(N) about ½ of area, 34B1(E), 34B2, 35B, 35C, 35B Camp, Pony HQ, 30A1, 22B5, 30A2 about ¾ of area, and 30C1 about ½ of area. A total of about 2,418 acres was cleared of scattered trees. The machine worked well for the scattered trees of medium size found in these areas. Most of the trees were still in the size range that can be shredded with the machine. We purchased a Bobcat skid steer in 2009 and plan on getting a shredder in 2010. This equipment will help us get ahead of a growing problem of cedar invasion in grasslands.

Five clumps of purple loostrife were hand pulled in a small wetland on the west side of Highway 83 near mile marker 201. This is the furthest south we have seen this plant off refuge. It is quite common along the Niobrara River to the north and appears to be moving south. We have found and removed a few plants on Valentine NWR in the past.

Russian olive trees sprayed with a basil bark treatment of Garlon in the winter of 2008-2009 were inspected and appear unharmed by the herbicide.

Maintenance Worker Kime completed a tree wick for control of smaller deciduous trees. The wick was purchased and Dave set it up with a tank, controls, and support so it can be attached to a tractor bucket.

11. Water Rights

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.

12. Wilderness and Special Areas

The refuge became a Registered Natural Landmark in 1979. National Landmarks were designated by the Heritage Conservation Recreation Service.

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).

The south west part of the refuge is also a proposed wilderness area. The area designated is about 15,937 acres in size. A Minimum Requirements Worksheet was prepared for the use of mechanized equipment in the proposed wilderness for invasive control and appended to the Integrated Pest Management Plan.

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). All were visited during the year.

Mead FmHa Easement 221 acres (Keya Paha County)

The Mead easement was visited to investigate a report of trespass grazing. The area had been heavily grazed but no cattle were on the easement the day of the visit. The tenant was interviewed by phone and admitted grazing the easement area. The landowner was also contacted and was not aware of what the tenant had done. A violation notice was issued to the tenant who also grazes cattle on lands neighboring the Mead Easement. The fine was substantial and was calculated based on twice the average grazing fee charged in the area. The case had not been resolved by years end.

Wagner FmHa Easement 349 acres (Knox County)

The Wagner easement is actually made up of 2 different easements. The land north of the county road (160 acres) is in a more restrictive easement where USFWS controls haying and grazing. The land south of the county road (189 acres) is less restrictive. The easement lands are owned by 2 different landowners. These easements were visited on April 15 and found in compliance.

A special use permit was issued to the landowner of the 160 acre part of the Wagner Easement in Knox County. The permit is so he can enter into a Wildlife Habitat Improvement Program (WHIP) contract with the NRCS. The contract is to cut and spray invasive cedar and Siberian elm trees on the 160 acre tract. A prescribed burn and spring grazing treatments are also part of the program. All together it spans 4 years. This year the tree cutting and stacking was completed. The area will be burned next spring and then grazed in the spring. These practices are a big step forward in restoring this ¼ section of grassland. The tree removal was much needed and the burn and graze should reduce both brome and Kentucky bluegrass.

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

This easement is adjacent to the Yellowthroat WMA that USFWS owns in fee title. The land is presently enrolled in the Conservation Reserve Program and is only grazed when CRP is released. The CRP contract expires in September of 2010. The landowner is also in the process of selling this and other parcels he owns in the area. A new grazing plan needs to be written for this easement.

Yellowthroat Access Road Easement (Brown County)

In 2008 a letter was sent by the Regional Director to a landowner that purchased land just south of the Yellowthroat Wildlife Management Area. In the letter the landowner was told that he was not to use our access road easement or the road on the wildlife management area to get to his property. We checked at the Brown County Court House and the landowner has an alternate access route provided to him by the seller of the land. The landowner continued to use our road in 2009. He was sent a second letter and called back to say that he will pursue getting his alternate access route in.

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 by this land as we do refuge work and noted no developments.

Manger Lindvall went on WRP site visits with staff from NRCS and Game and Parks. We are making some progress in getting landowners to comply with the compatible use plans we develop. Trees, both cedar and deciduous, growing in the prairies on these easements is of particular concern. NRCS will pay 100 percent of the cost but landowners need to sign agreements and work with the contractors.

Manager Lindvall and Private Lands Biologist Graham met with a landowner about repairing an existing dam and water control structure to form a shallow wetland. The land is in Keya Paha County. A rough survey was conducted and we had a contractor visit the site to get a cost estimate. The landowner decided not to do the project.

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 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

A Bald Eagle nest with at least 2 eaglets was observed just south of Valentine NWR on 29 April 2009. The nest is located in a large cottonwood tree at the west end of Vrinder's Marsh. Follow up visits as the young grew larger indicated that 2 young eagles fledged from this nest.

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 2009.

c. Whooping Crane

No observations of Whooping Cranes on Valentine NWR in 2009. These cranes are sporadic refuge visitors, stopping occasionally at refuge wetlands and meadows during migration.

d. Western Prairie Fringed Orchid

On 19 May, at least three orchids were observed well emerged (8, 11, and 14 cm tall) in HU 16E4. This area is slated for a prescribed burn, and we wanted to determine how much potential impact there would be on the orchids if the burn was conducted. The emerged orchids would have been impacted by a fire, and the burn was not done this year.

Searches were conducted on all known orchid locations from 9-21 Jul. Technicians Feltman and Stephenson were both involved in this effort, and most of the orchids were found blooming in HU 24C4 (West Sweetwater; Table G2d1).

Table G2d1. Location, number of orchids found in the last 5 years at each site, and number of flowers in 2009 observed on Valentine NWR, July 2009.

Habitat Unit	2005	2006	2007	2008	2009	Flowers
32B2	73	101	22	64	1	5
29A1	60	3	8	9	42	353
24A2	NA	NA	NA	2	12	63
24C2	NA	NA	NA	3	1	9
24C4	86	22	25	133	220	1978
25B Sweetwater	2	1	0	2	2	25
25B Cow Lake	0	0	0	0	0	0
Hackberry HQ ROW	0	0	0	0	0	0
Hwy 83 ROW/29A1	3	8	5	6	7	65
18B7	0	3	0	15	0	0
36A	0	0	0	0	0	0
21A3	36	9	0	16	0	0
21A4	7	0	2	3	0	0
16E4	46	78	39	75	3	24
7A2	0	0	0	0	0	0
15C3	NA	NA	5	1	0	0
13A	NA	NA	8	12	13	113

Many (55) of the blooming orchids were found growing within the band of reed canary grass running through the center of HU 24C4 (Fig 2d1). HU 32B2 only had 1 flowering

orchid in 2009, with the number of orchids found potentially reduced as the result of June hail. Overall, 2009 was a good year for orchids, with 272 orchids located on sites known prior to 2004. The previous high count on these same sites was 230 orchids in 1994. Addition of several locations since 2004 brings the 2009 orchid total to 301, which is among the highest totals recorded for Valentine NWR. The biggest drawback to this year's total is that the bulk of the orchids (73%) were in one unit, making them susceptible to damage by a single storm event, as occurred in HU 32B2 this year. The small number of orchids in other sites also reduces the chance that a suitable pollinator will find these scattered plants.

Figure G2d1. Stakes showing a few of the many western prairie fringed orchids found growing in reed canary grass in HU 24C4. Figuring out how to manage this reed canary grass is complicated by having a threatened orchid growing within the boundaries of the canary grass. (MS)

e. Blowout Penstemon

Surveys of all know blowout penstemon locations were conducted in June by Nenneman, Stephenson, and Feltman. Seventy blowouts on Valentine NWR have had some blowout penstemon, either naturally occurring or transplanted into the blowout. The total number of penstemon counted in 2009 increased slightly from 2008, with a decrease in the number of vegetative plants, but an increase in flowering plants and stems (Table G2e1 and Fig G2e1). The naturally occurring plants rebounded after a very poor year in 2008 (only 3 plants observed); a total of 42 native plants were counted, with 15 vegetative, 27 flowering, and 73 flowering stems. The bulk of the native plants were observed in a blowout in HU 34A2, a population first observed in 2006. No transplants were planted

into refuge blowouts this year, and we do not anticipate planting more in the immediate future. Planning should be done to identify appropriate penstemon habitat, and management efforts undertaken to improve existing unoccupied blowouts prior to continued transplanting efforts. In 2007, there were 3 blowouts that appeared to have seedling blowout penstemon come up, presumably from seed deposited from existing plants. This was a promising sign, but the numbers did not carry over into 2008, so it remains to be seen if natural reproduction will take the place of hand-transplanting to maintain penstemon populations on Valentine NWR.

Table G 2e.1. Blowout penstemon (Penstemon haydenii) counts on Valentine NWR from 2005-2009. Most of these plants are the results of transplanted seedling penstemons begun in 1996. Annual surveys for blowout penstemon have been conducted since 1999.

Plant growth form	2005	2006	2007	2008	2009
Vegetative	474	833	1363	767	527
Flowering	570	567	424	408	753
Flowering stems	2282	2567	1271	1545	3430
Total plants	1044	1400	1787	1224	1280
Native plants	20	17	26	3	42
Transplants	2352	2548	2450	588	0

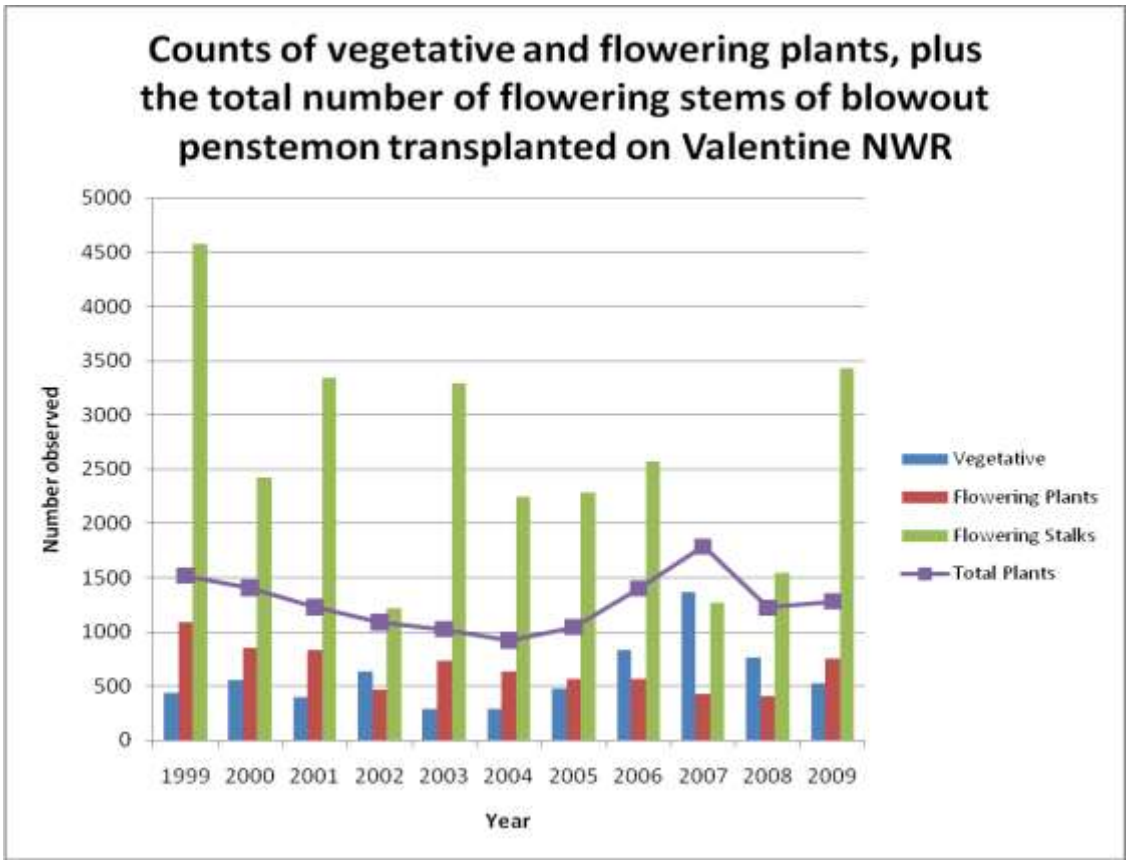

Figure G2e1. Blowout penstemon survey data on Valentine NWR, 1999-2009.

f. Wolves

Wolves were extripated from Nebraska in the mid- to late 1800's. There is an occasional wolf sighting documented in Nebraska, but none near the refuge. A group of deer hunters did report sighting a wolf on Valentine NWR in 2003, but this could not be confirmed.

g. American Burying Beetle

American burying beetles have been documented on Valentine NWR through anecdotal observation, and by a brief survey conducted in 2005. In 1992, six *Nicrophorus americanus* specimens were documented on Valentine National Wildlife Refuge. Prior to this, the refuge was considered outside of the range of the *N. americanus*. Between 1992 and 1999, 10 additional records of the beetle were made either on or near the refuge. A minimum of 58 ABB were captured during 15 trap-nights in 2005, as well as 6 other species of Nicrophorus beetles (see 2005 narrative for more detail).

3. Waterfowl

a. Ducks

Spring Migration - No waterfowl were spotted on the refuge during January. Some lakes partially opened up for a few days during a warm spell mid-month, but quickly froze over again with the return of cold weather. In February, a few ducks started to show up on refuge lakes as pockets of open water began to show up in the ice. Up and down temperatures marked February and March, so the spring waterfowl migration continued with many fits and starts during through at least the month of March. Many species of waterfowl had arrived at the beginning of the month, but were forced to seek open water elsewhere around the middle of March. Some ice was present off and on through the end of the month, but most species of ducks had been observed on refuge lakes by months' end. No surveys are conducted on total waterfowl use during the spring migration, but observations indicate that overall numbers have steadily increased during March. Peak numbers of waterfowl and total species generally occurs around the 2nd and 3rd week of April.

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. Pair counts were conducted 22 May – 03 June, while two brood count surveys were done 24-30 June and again 27-30 July. On the refuge portion of the survey, there were 116 indicated pairs of blue-winged teal observed, 125 indicated pairs of mallards, 275 indicated pairs of dabbling ducks, 5 pairs of diving ducks, and 16 pairs of American coots. A simple extrapolation of these numbers based on the percentage of wetland area surveyed provides an estimate of 1034 dabbling duck pairs and 18 diver pairs for the refuge. While these estimates do not account for observer differences and the problem on 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, a total of 16 broods were observed. A simple extrapolation of this number for the refuge provides an estimate of 59 total broods, with a brood:pair ratio of 5.27%. 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 2009 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.

Table G3a1. Pair and brood count data on the Marsh Lakes

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

Fall migration – Based on observations of waterfowl made during avian influenza surveillance on the Marsh Lakes and Dewey Lake, the first pulse of the waterfowl migration hit around the second week of Sept, then dropped off until the first week of Oct, when numbers climbed again. There was a general increase in duck numbers until the first week in Nov, after which the number of birds observed began to decline.

b. Geese

Hay was placed into three goose nesting tubs at the east end of Dewey Lake on 24 Feb 2009; no geese were observed using these structures for nesting this year. Pairs of Canada geese have spread out across the refuge as holes open up in the ice. Some geese did find alternative places to nest, and Calf Camp Marsh in particular seemed to be a good place for goose broods this year. Four goose broods were observed on this marsh in mid-May, and it is likely that these birds nested fairly close to or in the marsh.

c. Trumpeter Swan

A few trumpeter swans were seen on the refuge as water opened up in Feb, primarily at the west end of Hackberry Lake, but some were also seen at West Long and Duck lakes. The refuge staff keeps anecdotal observations of swans through the year, and there was not much to report in 2009. A pair was observed on Center Lake, but cygnets were not observed. The pair that had used the wetland south of Willow Lake was not observed on that wetland this year.

4. Marsh and Water Birds

a. Sandhill Cranes

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.

b. Other Water birds

Double crested cormorants again nested on a small island between Middle and South Marsh lakes. In 2008, the nests were all abandoned and/or depredated. This year, there were many young cormorants in the colony, but flooding was a problem, as many nests were underwater or nearly so as the chicks neared fledging (Fig G4.1). Some dead young were observed in the nesting colony, but it looked as though the cormorants had a pretty successful breeding season. It was estimated that about 200 juvenile cormorants would fledge off the island. Just north and west of this island, there was a large island of phagmities that hosted a nesting colony of cattle egrets, black-crowned night herons, and late in the year, about a dozen white-faced ibis (Fig G4.2). There were an estimated 75-100 pairs of cattle egrets, and 25-35 pairs of black-crowned night herons in the phragmities. It was difficult to count here as when approached, the adults would lift up and fly circles around the area. The white-faced ibis were not seen in the colony until late in July, although they did appear to nest. Nesting continued until late in the year, and some cattle egret mortality was noted (09 Oct) as the adults began to migrate before the young were ready to fledge.

Figure G4.1. A few of the approximately 200 young Double Crested Cormorants observed on the Marsh Lakes on 25 June. Note flooding around the nests. (MS)

Figure G4.2. A nesting colony of cattle egrets and black-crowned night herons was located in a patch of phragmities on the Marsh Lakes, 25 Jun 2009. This colony had an estimated 100 pairs of cattle egrets, and 30 pairs of black-crowned night herons. (MS)

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. Higher water levels on most refuge lakes and wetlands limited the amount of open shoreline habitat available, so the number of shorebirds observed throughout the year was fairly low. Killdeer, common snipe, upland sandpipers, and willets are known to breed on the refuge, and are commonly observed throughout the summer. Spotted sandpipers, Wilson's phalaropes, long-billed curlews, American avocets, and black-necked stilts have also been documented as breeding birds on the refuge when nesting habitat conditions are right.

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. It also looks like there is an active red-tailed hawk nest in the tree grove north of Tom's Lake. A pair of great horned owls nested in a cavity of a cottonwood tree next to Hackberry Lake at Hackberry Headquarters. The young were heard food begging throughout the summer, and were sometimes observed flying just before dark. 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. This route has been completed every year since 2003. In 2009, 1053 individual birds of 60 species were detected on the route. This compares favorably with the average from previous routes, with 946 individuals comprised of 59 species. The most commonly observed bird was the Red-winged Blackbird, which comprised 35% of the total observations. Six other species (Marsh Wren, Mourning Dove, Western Meadowlark, Mallard, Ring-necked Pheasant, 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. No significant upward or downward trends have been observed in bird numbers on the refuge BBS route. There were 27 species detected in the 1991-1992 surveys not detected in 2009, and six species detected in 2009 not detected in 1991-92. At least 14 of the 27 species from the 1991-92 surveys were know to be on Valentine NWR in 2009, and the remaining 13 species may have been non-breeders. Of the six species not detected in 1991-92, one is an undesirable exotic (European Starling). The Trumpeter Swan has been expanding its range in recent years, so the species may not have been on the refuge 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. It is somewhat surprising that this species was not seen in the earlier survey. Northern pintails are not readily detected by auditory cues in June, nor are waterfowl sampled well by BBS techniques. Chipping sparrows are not common in the Sandhills, and are restricted to areas with some coniferous trees. 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 6 years.

8. Game Mammals

a. Deer

No refuge deer surveys were conducted in 2009. 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 72 deer reported as harvested on the refuge, 14 were mule deer and the remaining 58 were white-tails. Harvest pressure continues to be heavier in the Sandhills unit, with 50 deer coming out of this unit, and only 17 out of the

Calamus West unit. Hunters are taking some nicer deer, as 12 bucks were recorded as 3.5 years or older, and an additional 7 bucks were unaged, but presumably were nicer deer. Many 2.5 year old deer are harvested, with 28 deer falling in this age range. Given the hunting pressure, especially on opening weekend, it is not too surprising that many 2 year old bucks are shot.

Table F 8.1. Deer harvest on Valentine NWR during the 2009 deer season. Harvest information based on deer reported to the state check stations.

	White-tailed Deer		Mule Deer	
Unit	Buck	Doe	Buck	Doe
Calamus W	14	2	1	0
Sandhills	31	6	12	1
State buck	4	0	0	0
Muzzleloader	0	0	0	0
Statewide youth	0	0	0	0
Archery	1	0	0	0

b. Muskrat and other furbearers

Although muskrat house counts have been discontinued, there was a very dramatic increase in muskrat activity on Valentine NWR in 2009. During avian influenza surveillance on the Marsh Lakes on 01 Nov 2009, 46 muskrat houses were counted. Large numbers of rat houses were noted on "21" Lake and on Calf Camp Marsh west of Highway 83. 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.

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^2 within the State Survey Block, with a total of 15 GPCH leks and 13 STGR leks. In 2009, the 5 year average (2005-2009) was 1 prairie grouse lek/1.5 mi^2, with 14 GPCH leks and 16 STGR leks. For 2009, there was 1 lek/1.6 mi^2 with 12 GPCH leks and 16 STGR leks. The objective for lek density is being met, but the number of GPCH leks is less than the stated objective. The

total number of male GPCH was down in 2009, while the number of male STGR increased slightly (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. GPCH numbers also increased sharply in 2004, but then declined and numbers have declined over the last three years.

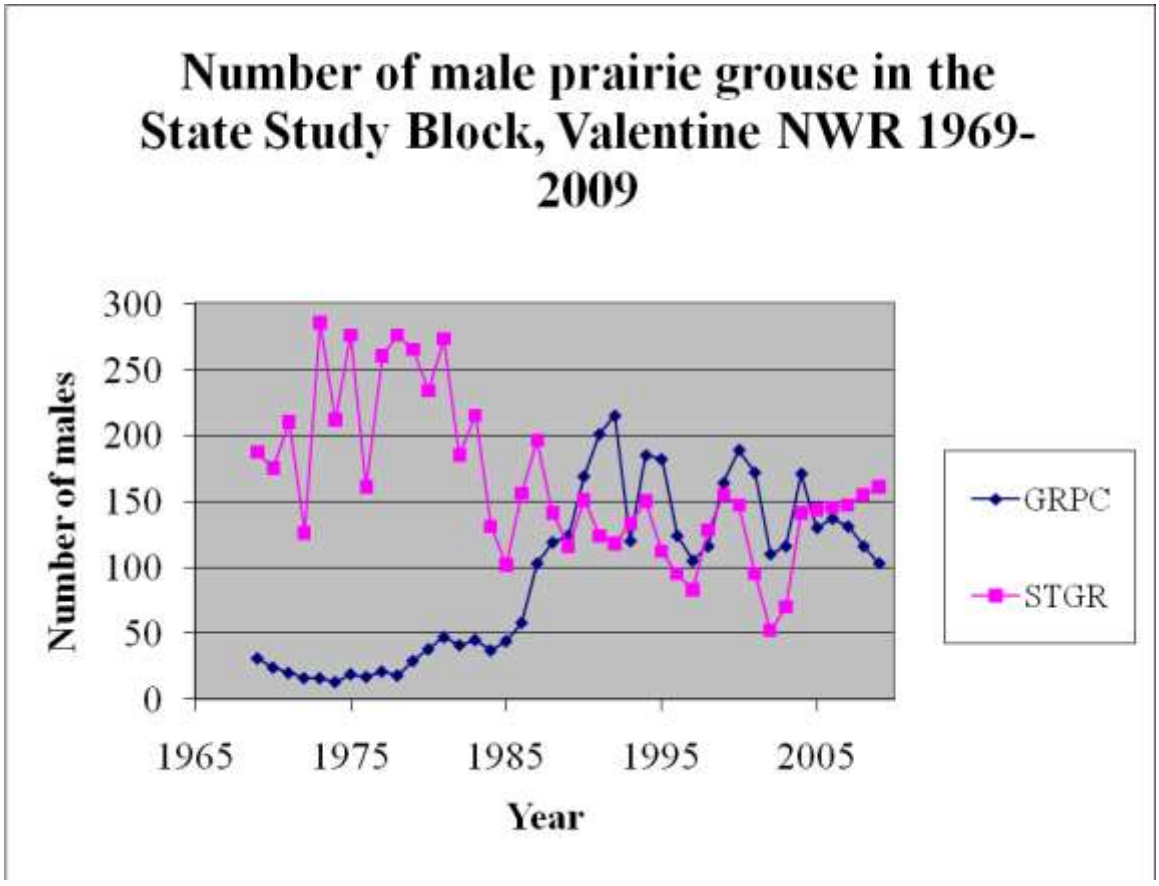

Figure 10a1. Total number of male prairie grouse observed on the State Survey Block at Valentine NWR. In 2009, 103 Greater Prairie Chickens were observed on 12 leks, and 161 male Sharp-tailed Grouse were observed on 16 leks.

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 some 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 2009, there were 142 hunters reported on submitted envelopes, with 187 prairie grouse harvested (161 STGR, 19 GPCH, 7 unknown). The juvenile:adult ratio was 1.45:1. Overall harvest and juvenile:adult ratios are well below the objectives found in the CCP. Part of this may be due in part to

changing hunter numbers, as the average number of hunters and birds have both decreased in recent years (Fig 10a2). 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. Over the next decade (2000-2009) the average number of hunters dropped to 200 and the average harvest dropped to 253. 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. The mid-June hailstorm experience this year likely had a negative impact on prairie grouse production, which is reflected in the relatively poor juvenile:adult ratio observed this year. Many cool, rainy days, especially in early June, may have also negatively affected grouse productivity across the refuge.

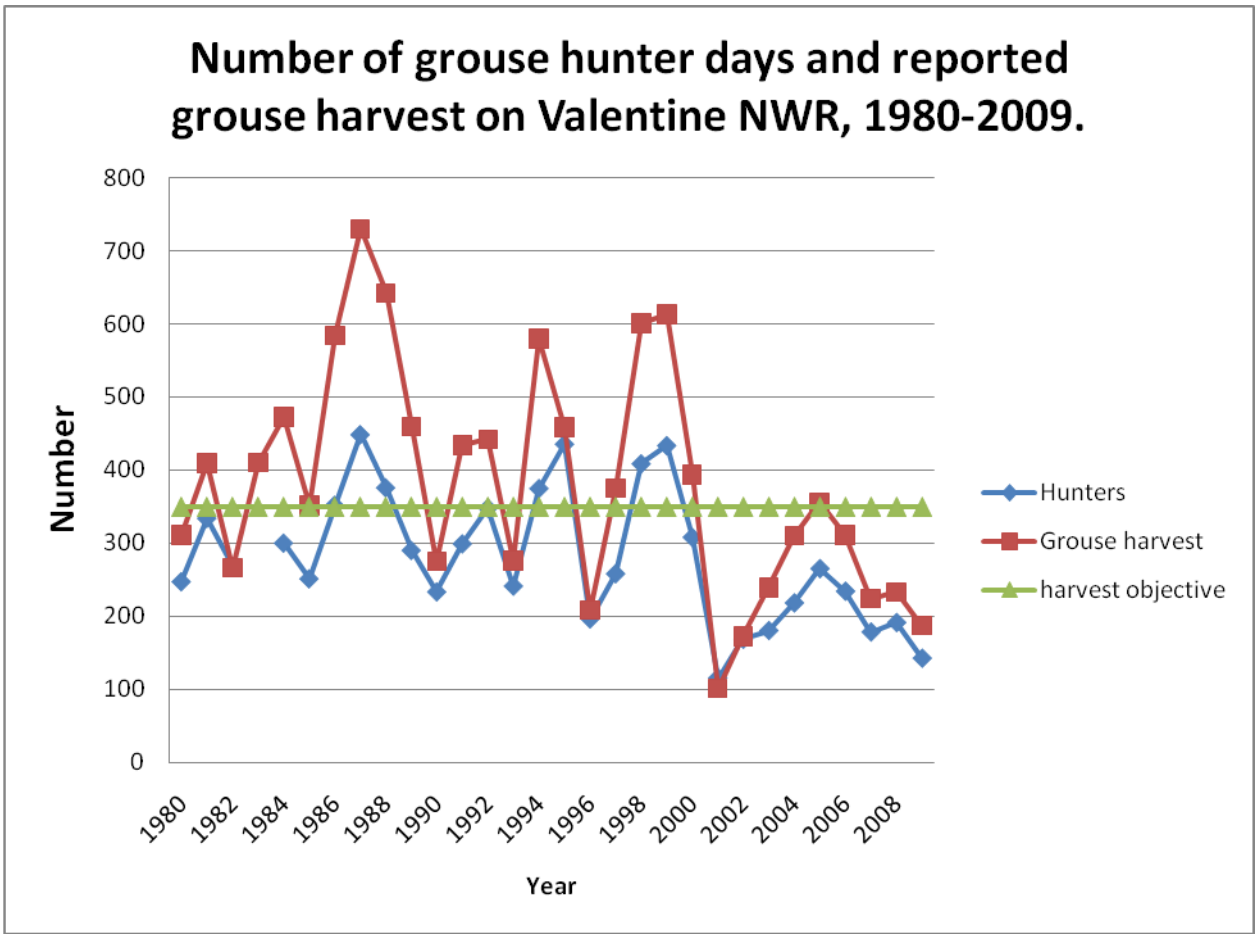

Fig 10a2. Prairie grouse harvest and number of grouse hunters on Valentine NWR. Green harvest objective line represents the target sample size for grouse wings established in the 1999 Comprehensive Conservation Plan for Valentine NWR.

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. It is not uncommon to flush groups of 10 or more roosters in these areas. Anecdotal observations of pheasants through January seem to indicate that the pheasant population is faring well on the refuge. Crowing roosters were often seen along refuge trails in April, and several hens with broods were spotted in June. There is no active survey for pheasants on Valentine NWR.

c. Merriam's Turkey

Tom turkeys begin to strut and gobble in March. 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. Anecdotal observation would suggest that the turkey population has decreased somewhat in recent years.

d. Gray partridge and Bobwhite Quail

A covey of Bobwhite Quail was seen twice at Hackberry Headquarters during January. A complete count of this covey has not been accomplished when the birds flush, but there appears to be around 8 birds. It is possible that this small group will survive through the winter if weather conditions don't get too harsh. 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.

e. Reptiles, amphibians, and others

A few observations of herps out early were made in 2009. On 07 Feb, a garter snake was observed in the yard at Hackberry HQ. On 24 Feb, a bullfrog was observed moving slowly across the ice on Dewey Lake. By late March, chorus frogs were heard singing on warm days. A couple of cold days would shut them down until the next warm day. The chorus frogs reached a peak in activity in April. Garter snakes also became more active in late march as the weather warmed, although cold days interspersed with those warm days limited their activity.

In August, biological technician Stephenson conducted a trailside survey for bullfrogs across Valentine NWR. Three routes were run, using most available trails on the refuge. Stops were established every half mile, and a three minute listening period was used. Counts were conducted between 9:00 pm and 1:30 am. Bullfrogs were detected at 38 of 69 stops (55%), but detections were mostly associated with the fishing lakes. Bullfrogs were not detected in the Little Hay Valley, and most of Calf Camp Valley had no detections (a call index of 1 – individual frog calls can be counted with space between calls – was recorded at the Duck Unlimited dike). No bullfrogs were detected east of Highway 83 (16 listening stops, North and Middle Marsh lakes, Pony, Center, and "21" lakes, Cow Lake). A full chorus (calling index 3) of bullfrogs was recorded at Homestead Lake, the farthest south and east they were detected.

In Sept, Nenneman responded to a request from the ES office in Grand Island for information regarding the status of the Northern Leopard Frog on Valentine NWR. This species is of concern in many areas due to declining populations, and the ES office was working to compile as much information as possible on the status of the species before taking any action on federal lands. A copy of the information request is presented below.

Northern Leopard Frog Request for Information

1. Survey/Presence-Absence Data:

   a).Northern Leopard Frogs (NLF) are known to be present on Valentine NWR, Ft. Niobrara NWR, and Yellowthroat Wildlife Management Area in the Ft. Niobrara/Valentine NWR Complex. Seier NWR is a relatively new addition to the complex, and very little biological work has been conducted at this site; based on habitat availability, NLF should be present as Seier as well.

   b).Captures of NLF as part of amphibian monitoring efforts in 2003 and 2007 indicate that healthy populations of NLF exist on Valentine NWR. In 2003, over 60 recently metamorphosed NLF were captured and examined for abnormalities at a wetland near Hackberry Headquarters. In 2007, 50 recently metamorphosed NLF were captured for an analysis for potential contaminants, with Valentine NWR acting as a control site. Anecdotal/incidental observations of NLF on Ft. Niobrara and Valentine NWRs, and Yellowthroat WMA were made in 2009. NLF were observed at a pond near the bison corrals at Ft. Niobrara NWR on 12 Sept during a Kid's Fishing Day event, and along the Niobrara River during a river cleanup day. At Valentine NWR, large numbers of recently metamorphosed NLF were observed on the shore of Rice Lake on 21 July, and large adults have been observed in several meadows during Sept (north of East Long Lake, south of East Sweetwater Lake, east of Pelican Lake, east of Hackberry Headquarters). At Yellowthroat WMA, the manager reported seeing NLF while conducting other management activities.

   c).Data are limited for all refuges in the complex. A biological inventory of Ft. Niobrara and Valentine NWRs conducted in 1991-1992 documented NLF on both refuges. NLF were also documented at both refuges in 1942 (Hudson 1942) and 1985 (Lynch 1985). In the Biological inventory report, NLF were captured at nine sites on Valentine NWR, and three sites on Ft. Niobrara NWR. Surveys conducted during the biological inventory were limited to parts of two years, and the number of captures was also limited, however capture sites indicates the species is fairly widespread on both refuges. Authors of the Biological inventory indicated that the construction of fish-rearing ponds at Ft. Niobrara NWR increased habitat availability for NLF, although fish reduce the suitability of these ponds for NLF. At Valentine NWR, the introduction of game fish in nine refuge lakes probably reduced the populations of NLF as the frogs are most abundant in shallow waters without fish.

Hudson, G. E. 1942. The amphibians and reptiles of Nebraska. Nebraska Conservation Bulletin 24:1-146.

Lynch, J. D. 1985. Annotated checklist of the amphibians and reptiles of Nebraska. Transactions of the Nebraska Academy of Science 13:33-57.

Corn, P. S., M.L. Jennings, and R.B. Bury. 1995. Amphibians and Reptiles. Pages 32-59 *in* A biological survey of Fort Niobrara and Valentine National Wildlife Refuges, M. A. Bogan, editor. U.S. Dept. of Interior, National Biological Service, Ft. Collins, CO.

2. Habitat Data

a). No habitat data have been collected at sites occupied by NLF on any of the refuge lands in the Ft. Niobrara/Valentine NWR complex.

b). All refuge lands in the Ft. Niobrara/Valentine NWR complex contain wetland habitat that represents potential leopard frog habitat. Valentine NWR has the most potential wetland habitat, with 12,957 wetland acres. Yellowthroat WMA contains about 475 wetland acres, Ft. Niobrara NWR about 337 ac, and Seier NWR about 109 acres. On Valentine NWR, these wetland acres break down as approximately 7083 ac. permanent wetlands, 4621 ac. semi-permanent wetlands, 837 ac. seasonal wetlands, and 415 ac. temporary wetlands. Breakdown of wetland acres at other sites is as follows:
Yellowthroat WMA 257 ac. permanent, 154 ac. semipermanent, 46 ac. seasonal, and 18 ac temporary.
Ft. Niobrara NWR 212 ac permanent, 17 semipermanent, 70 ac seasonal, and 37 ac temporary.

Seier NWR 0 ac permanent, 18 ac semipermanent, 12 ac seasonal, and 80 acres temporary.

11. Fisheries Resources

For information on carp control efforts see section G.15. Animal Control.

Lindvall and Nenneman got the airboat into Hackberry Lake on 24 February 2009 and looked for winter killed fish. The eastern part of the lake was open water and we went around the perimeter of the open water and ice. We saw 2 small bluegill dead on the ice. We saw no other dead fish of any other species. There were 2 eagles and several gulls sitting on the ice. Lindvall's best guess is that there was a slight winter kill on Hackberry.

Fifty-two bluegill were transferred from Duck and West Long to Pony Lake and a subsample of 191 largemouth bass were transferred from West Long to Pony. The game fish were transferred to Pony Lake as part of the SDSU research on effects of fish communities on water quality and invertebrates. Due to difficult logistics it was decided to not treat Pony Lake with rotenone in an attempt to create a fish free lake.

In March the Valentine Fish Hatchery took 7.5 quarts of pike eggs from Dewey. All of which died. They then collected 41 quarts from Pelican and changed the technique and got 41 percent hatch. They trapped 6 male pike in West Long and transferred them to Clear Lake. It appears that the trap and transfer of pike at West Long is working as the catch is way down and perch are doing well in this lake. They took 53 bluegill, 54 perch, and 1 bullhead to AKSARBEN aquarium and took 273 bluegill, 454 perch, and 19 bass to the hatchery for brood stock. In April they took 70 bass from West Long and Pelican to the hatchery for brood stock. These fish will be returned to the lakes after use as brood stock.

Water depth was measured in Willow Lake and was generally between 6 and 6.5 feet deep. This is sufficient to support fish and a request was made to Nebraska Game and Parks to stock the lake. On September 17, 2009 Nebraska Game and Parks stocked 35,750 yellow perch 2.9 inches long @ 110 per pound in Willow Lake. This lake is open to fishing but has not had fish in it due to low water as a result of the drought. Good rainfall this summer has raised the water level to where it should support fish.

A special use permit was issued to a researcher from Missouri University at Lincoln to collect up to 300 bluegill from refuge lakes. The fish will be used in a research project to compare growth rates of bluegill from different geographical areas.

The annual fisheries meeting was held in conjunction with the Nebraska Game and Parks and South Dakota State University on 19 February. We had a good turnout with 20 biologists present. Highlights of the meeting are: 1) Pony Lake will again be renovated in cooperation with Nebraska Game and Parks. We will use better rotenone and pumping in an attempt to get a complete kill. This plan was later scrapped due to logistical problems. 2) Pike appear to be controlling carp in refuge lakes. Carp trapping in 2008 appeared to have been effective. A mark/recapture study will be done to further investigate the effectiveness of trapping. 3) The memorandum of understanding between

FWS and Game and Parks will be updated. 4) Game and Parks is willing to help fund a fish barrier on West Long Lake.

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 "*2009 Fisheries Surveys Conducted on the Valentine National Wildlife Refuge, Nebraska"* by Greg Wanner. The following excerpts are taken from Greg's report.

Clear Lake

Carp trapping in Clear Lake the spring of 2008 appeared to have been effective. There was a strong year class of carp produced in 2009. Pike abundance was the second highest since surveys began and the lake continues to have the highest abundance of larger pike. Black crappie, bluegill, bass, and yellow perch are present in low numbers and with a small size structure.

Dewey Lake

Carp trapping in Dewey Lake in the spring of 2008 appeared to have been effective and carp relative abundance remains low. Pike numbers are decreasing. The lake should provide excellent opportunities for bass and perch fishing.

Hackberry Lake

There is a strong year class of common carp in Hackberry Lake. The 2004 renovation was not complete. Northern pike were found in 2008 even though none were ever stocked. None were captured in 2009 indicating a low population. Bluegill and perch are present in good numbers and size and should provide good fishing. Bass are abundant and the size structure is improving.

Pelican Lake

Pelican Lake continues to have a low relative abundance of carp. Pike numbers remain stable. Bluegill numbers increased but with few of the large fish present. Bass numbers and size are both good. Perch numbers continue to be low.

Duck Lake

Duck Lake should provide the best fishing for bluegill with large numbers of bigger fish. Bass numbers increased and perch are low in number but dominated by larger fish. Pumpkinseeds were detected in low numbers in the survey.

Watts Lake

No carp were detected in the 2009 surveys. Pike numbers are starting to stabilize. Bluegills were at the highest density of all refuge lakes with few fish in the preferred length category. Bass numbers continue to improve and recruitment is good. Yellow perch abundance decreased but multiple year classes are present with some in the preferred length category.

Carp were captured in Dewey Lake and marked for a capture/recapture population estimate. Most of the carp caught were very large, in the 20 pound range. One weighing 36 pounds was caught. This fish is about 3 pounds larger than the state record. The study will help us determine the effectiveness of our carp trapping efforts in the spring. Refuge, Game and Parks, and Fisheries Assistance staff did the surveys. Most of the carp caught were in shallow water in phragmites, bulrush, or wild rice. Electofishing was used for the capture. Greg Wanner with the USFWS Great Plains Fish and Wildlife Conservation Office in Pierre, SD prepared a report on the study entitled *Common Carp abundance, biomass, and removal from Dewey and Clear lakes on the Valentine NWR: Does trapping and removing carp payoff??* The population abundance and biomass estimates for common carp in Dewey Lake were calculated as (N) = 4,462 plus or minus 1,635 and (B) = 31,790 kg plus or minus 11,723.

14. Scientific collections

See section G17 for information on waterfowl collected for Avian Influenza surveillance.

15. Animal control

A carp trap was placed in the canal connecting Whitewater and Dewey lakes on 07 May. The trap was constructed by Dave Kime, and has one-way fingers on the bottom that the carp push their way through, and above the fingers is a screen that can be removed for cleaning. On 20 May, weld wire was added on the bottom and sides of the trap to provide a barrier where water was scouring sand out from the bottom of the trap and fence wires. On 29 May, the carp trap was lowered about 3" to fully submerge the fingers in the water. Boards were pulled on the Whitewater structure on 7, 20, and 29 May to increase water flow. The trap was kept in place until 22 Jun, when the trap was removed. At one point in June, several hundred carp were observed near the mouth of the canal between Whitewater and Dewey, but they did not go up into the trap. No carp movement was observed between Clear and Dewey Lakes. The only carp trapping that worked in 2009 was the placement of a fence across the marsh below the Pony Lake water control structure that trapped between 200 and 300 carp that had run up from Center Lake.

16. Marking and Banding

No activity to report

17. Disease Prevention and Control

Avian influenza surveillance continued through February with surveys conducted at Merritt Reservoir. In Jan, weather conditions varied from temperatures in the single digits to in the low 50^{o}F. Trumpeter Swans were observed every week, with a low of 13 swans, and a high of 48 swans. Mallards were also seen every week, and lesser numbers of several other waterfowl species were observed. No sick or dead birds were observed during Jan. A large number of Bald Eagles were observed sitting on the ice of the main reservoir on 10 Jan. Avian influenza surveillance continued at Merritt Reservoir through the 22nd of Feb. The number of Trumpeter Swans observed bounced around a bit in Feb, but was generally declining from the higher numbers observed in Jan. The number of Canada geese and waterfowl using Merritt Reservoir increased considerably through the month. No dead waterfowl were observed or collected at Merritt Reservoir this winter. In 11 weeks of observation, 290 Trumpeter Swans were seen. The range in the number of swans seen any given week was from 0 to 57. Common Mergansers, Canada Geese, and Mallards were the most abundant waterfowl observed, and Mallards were the most consistently observed (Mallards were seen on every survey).

On Valentine NWR, avian influenza surveillance monitoring on the Marsh lakes and Dewey Lake started on 24 Aug and continued through 7 Nov. Surveys were conducted weekly, with one missed week (24 Oct). During avian influenza surveillance, no major mortality was noted. In August, two dead pelicans were observed on the Marsh lakes, but they were already decomposing and were not collected. No sick or dead birds were observed on Dewey in Aug. In Sept, two injured birds were observed but not collected on the Marsh lakes: a double-crested cormorant was observed unable to fly due to a wing injury, and an American white pelican with an injured foot was seen. One dead western grebe was seen, but it had been dead for too long when found to submit for testing. It may have been killed by a predator, as its head was missing and its upper breast was torn open. A recently dead ring-billed gull was collected on the Marsh lakes, and an injured blue-winged teal was captured on Dewey Lake. The gull and teal were submitted to the National Wildlife Health Lab in Madison. Reports from the lab indicated that the gull was in good nutritional condition and that the pale liver suggested aflatoxicosis. The report for the teal found no other abnormalities, and the cause of the leg trauma could not be determined. Follow-up reports on tissue samples on these two birds were not received. In Oct, no sick or dead birds were observed on Dewey Lake. On the Marsh lakes, two sick ducks were observed, but they were healthy enough to avoid capture. There were a number of young cattle egrets observed dead in the cattle egret colony in south end of Middle Marsh Lake, but none of these were collected. Almost all of the adult cattle egrets were gone when these young were observed, and these would probably not have fledged before cold weather set in. November also saw very few observations of sick or dead birds – none were seen on the Marsh Lakes, and one flightless hen mallard was collected at Dewey Lake. Once in hand, the observers determined that the mallard was a flightless young with developing primaries, so the bird was not submitted to the Wildlife Health Lab.

The migration of American coots peaked on both lakes during the survey the second week of Oct. This is the same week that the last of the American white pelicans and cattle egrets were seen. The last black-crowned night herons and great blue herons were seen the third week of Oct. Waterfowl numbers on surveyed lakes increased markedly by the second week of Oct, then peaked the first week in Nov, decreasing by half the following week.

H. PUBLIC USE

1. General

Changes for reprints to the Valentine NWR general and hunting and fishing brochures were submitted so the leaflets can be reprinted. The leaflets were not received by year's end.

2. Outdoor Classrooms - Students

A Kid's Fishing Day was held at the corral pond at Fort Niobrara NWR. About 35 children accompanied by 15 adults came out for the day (Figure H2). Refuge Manager Lindvall organized the event. Three refuge staff and seven volunteers helped with the fishing, snacks, fish prints, casting contest, and cleaning and cooking. The Sandhills Prairie Refuge Association funded the event and Nebraska Game and Parks provided trout and loaner poles.

Figure H2. A few of the participants at Kid's Fishing Day. (MPN)

Biologist Mel Nenneman served as a judge for the Valentine Rural High School Science Fair. Students conducted experiments, wrote up results, and presented their findings to the judges. Some of the students will go on to the regional and possibly state competition.

On 03 Oct, Nenneman met with a group of students from Concordia University physical geography and geology class. Their instructor, Dr. Joel Helmer, had asked if someone from the refuge could discuss the relationship between groundwater, wetlands, and the importance water to wildlife in the Sandhills. Nenneman met the group near the Duck Unlimited dike in Calf Camp to discuss the general geology of the Sandhills, the flow of groundwater through the hills and its close ties to surface water, and stressed the importance of surface water to wildlife on the refuge.

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 were placed at the end of the nature trial at the new Marsh Lakes Overlook. The items were purchased by the Sandhills Prairie Refuge Association. Curbs were also added to the trail this year.

5. Auto Tour Routes

In 2008, we received a $2,800 in a visitor services grant to do the auto tour route. A draft auto tour brochure was completed and sent to the RO for desk top publishing. We are still awaiting the final product. We installed large signs to go at the ends of the tour route and purchased fiberglass numbered signs to mark the stops along the route. The tour route follows the Little Hay Road and should be operational in 2010.

7. Other Interpretive Programs

The Marsh Lakes Overlook was completed in 2008. The Overlook is designed to draw travelers from Highway 83 to the refuge. It has parking, a large open kiosk with places for displays, and offers a great view of the Marsh Lakes and Sandhills. While the structure was completed in 2008, we still await the completion of the displays.

During the year, interpretive themes and content outlines were written and sent to the contractor who did the writing and layout for the panels. The contractor provided several drafts which we reviewed. By year's end the final designs were completed. They look really nice and will provide visitors with a lot of useful information on the refuge and activities here. The contractor will fabricate the panels and install them in 2010.

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. The 2009 season was October 10 - January 13. There was not a split season this year. The season also opened one week later than it has the past several years. Only 2 groups of hunters were out at Valentine NWR for the opener. Yellowthroat WMA was also checked and had 3 groups of hunters. There were quite a few waterfowl in the area for the opener. Hunting pressure has been light during the season.

Grouse season opened on September 12. Participation in grouse hunting continues to decline. As in recent years, hunting pressure was light. The local conservation officer checked about 15 hunters who averaged 1 bird each. The season continued through December 31. Most of the refuge is open to grouse hunting except the natural areas and around building sites. Nebraska Game and Parks estimated that grouse hunter numbers declined from 20,000 in 1987 to 6,200 in 2002. We 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 2009 we had 142 hunter days. Reported harvest was 187 prairie grouse including 19 chickens, 161 sharp-tails, and 7 unknown. More complete information on grouse harvest can be found in section G10a.

Pheasant season opened on October 31. Hunting pressure was moderate. Hunters had good success. There were a fair number of pheasants around for most of the season. On the opener, fifteen vehicle license numbers were recorded and included 6 from Cherry County plus out of state hunters from Illinois, Minnesota, Wisconsin, and Colorado. Hunters averaged about 1 bird a piece plus a few sharp-tailed grouse. It is unusual to see so many local folks hunting on the refuge. It seems as if interest in pheasant hunting is staying up even as interest in grouse hunting is declining. The pheasant season ran through January 31, 2010 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.

Nebraska firearm deer season ran from November 14 – 22. Again many of our hunters were from out of state. The fact that season choice permits are not good on Valentine NWR was included in the state brochure this year. These permits are for 2 does and are designed to reduce the deer herd to alleviate crop depredation. We did not have a check station on the refuge this year.

Most of the deer hunting takes place on the opening weekend of the season. Some hunters reported seeing lots of deer and others few. We again also seemed to have more people that have 2 rifle deer permits valid on the refuge. This is in part due to the fact that statewide buck permits are now unlimited in number. We also say some statewide youth permits.

A total of 72 deer was recorded as harvested during the rifle season. This includes deer taken under Sandhill and Calamus West general permits, state wide buck permits, and statewide youth permits. More complete information on deer harvest can be found in section G8. Numbers come from records obtained at Nebraska Game and Parks check station.

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 but a quality hunt is possible especially if opening day is avoided. Nebraska is trying to reduce the deer herd in the state to control depredation problems. They have done this by increasing numbers and types of permits available. Access on private land has however become more difficult over the years resulting in more hunting on public lands such as Valentine NWR.

The refuge is also open for muzzle loader deer hunting. The season runs from December 1-31. Hunting pressure for this deer season was light. 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. In 2009 regulations on deer check in for muzzle loader were changed to allow hunters to check in deer on the phone, via the internet, or at a check station. Hunters using the phone or internet 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. No deer were reported as harvested on the refuge during the muzzle loader season through the check stations. We do not know the total number of deer taken on the refuge by muzzle loader hunters in 2009.

The refuge is also open to archery deer hunting which runs from mid-September through the end of December. Archery deer hunting is not permitted during rifle deer season. Only a few hunters were known to have visited the refuge for archery hunting. This year Nebraska archery permits included a bonus tag for an additional white-tailed doe. 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. One archery deer was checked in for the refuge at a check station. We do not know the total number of deer taken on the refuge by archery hunters in 2009.

Coyotes can be hunted on the refuge from December 1 through March 15. A free permit is required. The permit is a postcard that the hunter returns at the end of the season. There is no charge for the permit. Running coyotes with dogs is not permitted. For the 2008-2009 season, 45 permits were issued and 22 returned for a 49 percent return rate. Successful hunters reported taking 15 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.

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.

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. Willow Lake had a complete winter kill in the winter of 2002 – 2003 and there was a partial summer kill on Rice Lake in 2003. These lakes were open to fishing but received no fishing visits. Rice Lake went dry during the summer of 2007. Willow Lake presently has enough water in it to sustain a fishery and perch were stocked here in 2009. Hackberry Lake was renovated in 2004 and the fish are now large enough and fishermen have started fishing here again. Most of the visitation for the refuge is for fishing and a good share of the visits are for ice fishing. Not enough counts were made to provide a good estimate for fishing visits. An estimate of 15,000 visits is made.

Figure H9. World class carp from Dewey Lake. (MLL)

There was sufficient ice for ice fishing from December 7, 2008 through February 9, 2009. The last sane ice fishermen were out on February 9. Poor ice conditions after this date kept most folks off of the ice although 2 were seen out on thin ice on February 24. Ice fishermen had good success with panfish on Duck and Watts this year. Pike fishing was also good on Pelican Lake.

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.

11. Wildlife Observation

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 30 days.

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

12. Trapping

The refuge has a trapping plan and is open to trapping. No recreational trapping took place on the refuge in 2009. Muskrat numbers were up and several trappers inquired about trapping them. This is the first year we have seen any number of huts on the refuge for quite some time.

17. Law Enforcement

Refuge Office Lindvall attended the law enforcement refresher held in Marana, AZ from January 26-30 and the mid-year LE requalification held at Kirwin NWR on August 27 and 28.

Kim Chadwick successfully completed all the required training to become a refuge officer. She was in the SCEP program, went to FLETC, then ROBs, then field training, and finally back to Valentine NWR. She will now go on to the refresher at Marana and then to her duty station, Marais des Cygnes.

Refuge Officer Dave Kime gave up his law enforcement credentials effective January 31, 2009. Dave served for 33 years as a refuge officer at Valentine NWR. His contributions to law enforcement have been great and he will be missed.

A shotgun, pistol, and rifle were transferred from our property to the Federal Law Enforcement Training Center. The guns are from Dave Kime who gave up his LE Authority.

The permanent LE Officer position for the Complex was vacant for most of the year as Officer Jim Neely transferred to Alaska in May.

Matt Fisher from Alamosa Monte Vista NWR Complex came over on a law enforcement detail for the rifle deer season which ran from November 14 – 22. He made an excellent deer case which resulted in fines of over $1,300.

The Mead easement was visited to investigate a report of trespass grazing. The area had been heavily grazed but no cattle were on the easement the day of the visit (Figure H17). The tenant was interviewed by phone and admitted grazing the easement area. The landowner was also contacted and was not aware of what the tenant had done. A violation notice was issued by our special agent to the tenant who also grazes cattle on lands neighboring the Mead Easement. The fine was substantial, ($5,472) and was calculated based on twice the average grazing fee charged in the area. The case had not been resolved by year's end.

Figure H17. Trespass grazing was evident on the Mead easement. (MLL)

Five horses were abandoned on Valentine NWR at the beginning of April. We contacted neighboring landowners, the sheriff, the brand inspector, the sale barn, and placed notices on the radio two separate times. No one claimed the horses. There are reports of people abandoning unwanted horses on both public and private lands and this appears to be what happened. This is primarily due to laws that now prohibit the slaughter of horses in the US. A rancher was found who agreed to come and catch and remove the horses. We provided him with a transfer of property so he could sell them. He received very little money at the sale so it might be hard to get him to come back if this happens again.

Dave Kime went to North Dakota at the end of March and the first week in April to assist with flood relief efforts. He took our airboat and assisted where needed. The airboat went back up to North Dakota in mid April and was returned at the end of the month. It was used by USFWS crews in flood assistance.

In calendar year 2009, there were 12 Notice of Violations issued for violations occurring on Valentine National Wildlife Refuge. Numbers and categories are listed below.

Loaded shotgun in vehicle – 2
Possession of toxic shot – 2
Transporting pheasant without evidence of sex attached – 2
Possession of alcohol -2
No deer permit on person – 1
Failure to tag deer – 2
No small game hunting license – 1

Total fines, liquidated damages, and costs assessed $3,800
Total fines, liquidated damages, and costs collected $2,625
Dismissed fines by US Attorney for failure to tag, including liquidated damages $1,175

18. Cooperating Associations

The Complex has a friends group, the Sandhills Prairie Refuge Association, 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.

The Association hosted an appreciation banquet for refuge volunteers in October. Volunteers were treated to a fine meal, recognition speeches, and given memberships to the Association.

This year, at Valentine NWR, the Association funded a bench and viewing scope for the Marsh Lakes Overlook and plant id markers for the CCC Nature Trail.

I. EQUIPMENT AND FACILITIES

1. New Construction

Four foot wide pipe gates were placed a parking locations around the refuge. The pipe gates are easier to open than the adjacent wire gates that were often left open by visitors. The gates were put up at 15 locations. The pipe gates also better delineate where vehicle traffic is allowed.

A rolling dock that was received in 2008 was placed at Pelican Lake. It is 60 feet long, is handicapped accessible, and has a bench and rod holders. The dock cost $14,774. We will need to pour cement for a parking pad and approach to make the dock handicap accessible.

A prefab tornado shelter was placed a Pony Lake Sub-headquarters (Figure I1). The shelter was funded with Recovery Act dollars. The shelter was put in on Thursday and in use on Saturday when a tornado passed just west of the Sub-headquarters.

Figure I1. A tornado shelter was installed at Pony Lake Sub-headquarters. (MLL)

Plastic lumber was used to form curbs on the nature trail located at the newly constructed visitor contact station along Highway 83 at Valentine NWR. Hardware cloth was also dug in below the plastic lumber to keep rodents from burrowing into the trail. The curbs were put in to make the trail wheelchair compliant.

"Caution Steep Ditch" signs and speed limit signs were placed on the recently rebuilt sections of Pelican Lake Road.

A new office space for the Valentine NWR maintenance worker was made by remodeling a storage room into office space. Work included new windows, adding heat and ac, painting, adding additional electrical outlets, and running phone and computer lines.

2. Rehabilitation

Rehabilitation of the Valentine NWR office restroom was completed. The project included new linoleum, sink, cabinets, and paint. The sidewalk to the office was also made wheelchair accessible.

The Pony Lake Dike and Water Control Structure rehab project was mostly completed. The high rainfall and water table added to the work. The culvert was replaced with a 30 inch and longer one, fill hauled on the dike, the dike was shaped, and hay was spread onto the dike. Rock and gravel was placed on the top of the dike. Rip rap rock was placed at both ends of the culvert. At the same time the road leading to and past the dike was repaired and hayed. The solar powered fish screens were built and will be installed in the spring of 2010. This is a deferred maintenance project being done force account.

Repairs to the West Long Lake Dike were also completed. Rock was placed on the roadway over the dike and rip rap was placed at both ends of the culvert. A solar powered fish screen will also be placed here in 2010.

Solar powered self cleaning fish screens for West Long and Pony Lakes were designed and constructed. First a prototype made of plywood was tested in a stock tank using an outboard motor to provide current (Figure I2a). The test showed the screen to be feasible. Two were constructed at a cost of about $3,000 for materials and $3,000 labor each. The units fit over the end of a culvert and are self cleaning via a conveyor belt. The conveyor belt is powered by a gear motor powered by a 12 volt battery. The battery is charged by a solar panel. A timer is used to cycle the unit on at set intervals. A fuse blows and stops the unit should it become jammed. Basically an angled conveyor belt acts as a fish barrier and carries debris in the water stream over the top and dumps it back in the stream. This type of screen will hopefully work well in low head situations. These will replace fixed screens that had to be manually cleaned every other day when flows were high. They were be set out this winter on the ground for a test run and worked fine (Figure I2b). The high school drafting class has volunteered to make shop drawings for us. They posted the plans on Google Sketchup on the internet. These will be useful should other locations decide to use this design.

Figure I2a. Field testing the prototype self-cleaning fish screen. (MLL)


Figure I2b. Solar-powered, self-cleaning fish screens for installation at the Pony and West Long lake outlet culverts. (MLL)

Substantial repairs were made to the East End Access Trail. Sand was hauled into muddy areas, culverts installed, the road bed built up in places, and hay placed on the sand. The road was impassible prior to the repairs. This trail is the only public access to the east end of the refuge. Repairs were also made to the road east of Pony Lake Sub-headquarters. High rainfall had also made this road almost impassable. The roadway was built up and several culverts were installed.

Cherry County Road crews completed most of the work on the west part of the Pelican Lake Road. They placed and packed millings on the part of the road from the county road to Pelican Lake Quarters. Due to cold weather they were not able to armor coat this section. They will come back and do this in the spring. From Pelican Quarters east to the Rock Boat Ramp they pulled up the road bed, smoothed the road, applied base course, and then finish rock. The road is a vast improvement over the old one. The work was done under a cooperative agreement using funds from a Congressional earmark. We were able to get much more work done working with the County than if it had been contracted out (Figures I2c and I2d).

Figure I2c. Improvements made to the dirt section of the Pelican Lake Road. (MLL)

Figure I2d. Repairs made to the asphalt section of the Pelican Lake Road. (MLL)

3. Major Maintenance

Extensive repairs were made to the Watts Lake floating dock. Ice had damaged the dock and then wind broke it loose and it floated out into the lake. It is now usable again. This is a plastic composite dock and is a maintenance headache. Leaving it in for the winter causes problems and pulling it out without damaging it is difficult. The steel rolling docks we have used are a much better product.

Twenty six new signs ordered last year were framed and placed around the refuge. Almost all of the old damaged signs on the refuge have now been replaced with new signs and better frames. Some missing signs were also replaced. All faded sign posts around the refuge were also stained. The three information kiosks on the refuge were also stained and repaired.

4. Equipment Utilization and Replacement

A surplus Case 721 C loader was received from Medicine Lake (Figure I4a). The loader came with a bucket, snow plow, forks, and a lifting boom. It has only 321 hours and appears to be in good shape. It replaces a military surplus loader that we sold last year. We plan on mounting a tree shear and forestry protection on the loader and using it to get after our growing tree problem.

Figure I4a. A Case loader was received off surplus from Medicine Lake NWR. (MLL)

A sheep's foot was borrowed from LaCreek NWR to punch in hay to stabilize sand used to build up refuge roads. LaCreek does not use it and they transferred it to us.

The Argo all terrain vehicle was loaned to Flint Hills NWR for seeding moist soil areas. They want to try one out before making a purchase.

We borrowed the LaCreek NWR Bobcat and forestry cutter for about 2 months. We were able to shred a large number of invasive cedar trees on the refuge. See section F-10 for more information.

A new T300 Bobcat was ordered and received (Figure I4b). It was ordered using consolidated ordering arranged by the Washington Office. It did not come with the forestry protection package that was supposed to be on it. At the time of ordering we questioned this and were told it would come with the package. We now have to spend an additional $2,000 plus to get the skid loader retrofitted with the necessary safety equipment.

Figure I4b. A T300 Bobcat was purchased and will be fitted with a forestry cutter for cedar control. (MLL)

6. Computer Systems

Repairs to the phone system were made and a fax detector was placed on the phone line. We can now receive faxes without changing the phone lines to different jacks. We got a used fax machine on surplus that works much better than the antique we were using.

7. Energy Conservation

The house trailer and the Trappers Shack were all winterized. To save energy, we do not heat these buildings.

High efficiency water heater was installed in Quarters 1 and Pony Lake Quarters. A energy efficient, on demand water heater and a high efficiency heater/air conditioner were installed in the Pony Lake Office. New insulated garage doors were installed on the three overhead doors on the Pony Lake Shop. Radiant heating to replace an inefficient electric heater for the Pony Lake Shop was ordered but not installed by the end of the year. All these projects were done using Recovery Act Funds.

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 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.

Yellowthroat WMA was visited on July 8. Part of the boundary fence was repaired. It was noted that an adjacent landowner had been using our access road to get to the trailer he has placed on his land. The landowner was contacted and stated that he plans on building an access road across private land to reach his property. We checked at the Brown county Court House and he has an easement to do so. See also section H-17.

A contractor sprayed Canada thistle with Milestone. Due to high water he was not able to access the entire area in July. Leafy spurge was sprayed in the fall with Plateau.

Much of the area that we have been spraying for Canada thistle is now vegetated with dense stands of reed canary grass.

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 2008 and 2009 are; 9 May 2008, 7.05 water flowing through culvert; 28 May 008 7.3 water flowing through culvert; 30 June 2009, 8.26 flowing through structure added board; 8 July 2009, 8.32 no flow plugged; 3 September 2009, 8.32; 10 October 2009 8.70, flowing, added 2 pcs 2 by 4; 15 September 2010, 9.60, flowing, about max before going around to emergency spillway.

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: 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 – MPN; Annie Kime – AK; Matt Stephenson – MS;