

Neal Smith

National Wildlife Refuge

Prairie City, Iowa
Fiscal Year 2001

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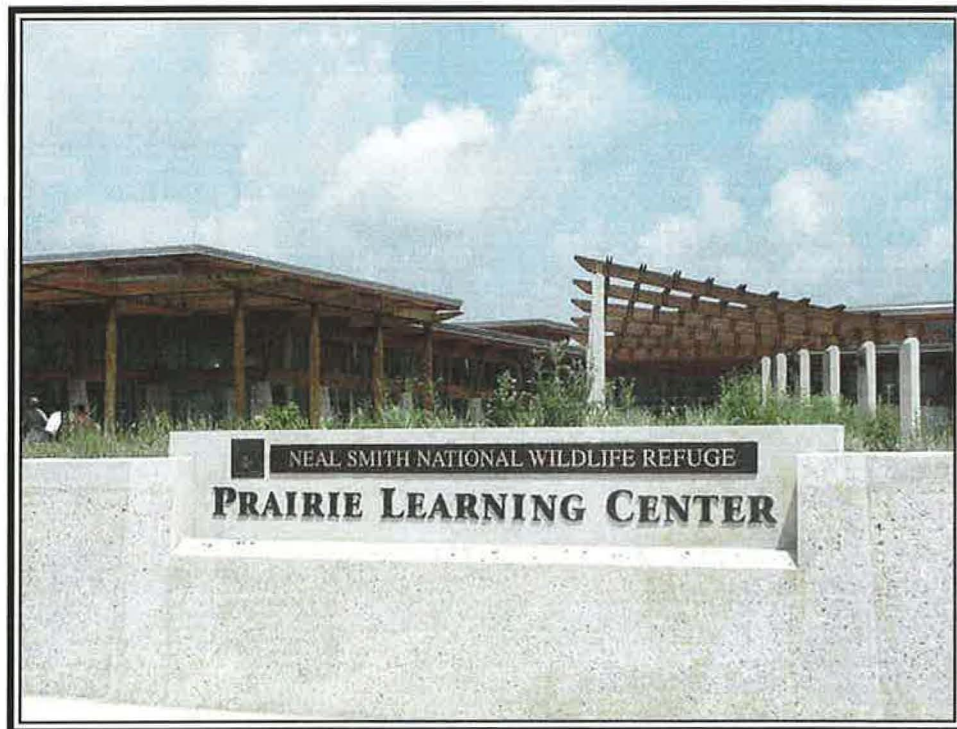
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INTRODUCTION

The Neal Smith National Wildlife Refuge and Prairie Learning Center is among the most unique and valued initiatives in restorative landscape ecology in the United States. The Refuge is located in Jasper County, Iowa, approximately 20 miles east of Des Moines. Prior to Euro-American settlement, the rolling landscape of this portion of Iowa was dominated by tallgrass prairie with islands of oak savanna.

Establishment of the Refuge by the U. S. Fish and Wildlife Service was authorized by Congress on May 25, 1990 for the purposes of restoring native tallgrass prairie, wetland, and woodland habitats; serving as a major environmental education center providing opportunities for study; providing wildlife dependent outdoor recreation benefits to the public; and providing assistance to local landowners to improve their lands for wildlife habitat.

The 8,654 acre project is unlike any existing refuge in that it has been established by Congress to restore a major expanse of tallgrass prairie. The Refuge is the largest prairie reconstruction effort in the country and is symbolic of a growing national and international interest in healing the environment.



HIGHLIGHTS FOR 2001

- First annual butterfly count accomplished with 209 individuals counted
- Henslow's sparrow population is on the increase
- Results from Iowa DNR hydrology study continues to fascinate us
- Bison food habits study is initiated
- Approximately 16,000 pounds of bulk seed is harvested in FY 2001
- Hydra-axe from Region 3 proves useful
- Surveys of FmHA easements are begun
- A 160 acre tract of land is secured for purchase
- Environmental education programs are provided for 18,483 students, scouts, and visitors
- Refuge is officially open seven days a week
- Iowa State Fair booth is visited by over 300,000 people
- Visitor Center floor is repaired using "Electro-Osmotic Pulse" technology
- Volunteers contribute over 16,000 hours
- Friends of the Prairie Learning Center continue to be an invaluable asset

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Monitoring and Studies

1.a. Surveys and Censuses

The Neal Smith NWR Research Program consists of short- and long-term monitoring projects as well as discrete investigative projects. The Research Advisory Committee consists of scientists and land management professionals and provides a diversity of expertise and perspectives about research in ecological restoration on the Refuge. This committee reviews research proposals, assists in developing research priorities and assists in promoting the research program at the Refuge. Current members include: Pauline Drobney, Refuge Biologist; Nancy Gilbertson, Project Leader; Dennis Keeney, former Director of the Leopold Center for Sustainable Agriculture; Erv Klaas, Professor Emeritus at Iowa State University (former Unit Leader of the Iowa State University Research Cooperative Unit); Jim Mattsson, Region 3 FWS Regional Biologist; Jim Pease, Iowa State University Animal Ecology Professor; Jerry Selby, Director of Science and Stewardship, The Nature Conservancy, Iowa Field Office; Keith Schilling, Iowa Geological Survey, Iowa DNR, and Daryl Smith, University of Northern Iowa, Biology Department Professor. The Research Advisory Committee guides the research process at the Refuge through formal meetings and via telephone and e:mail.

Breeding Bird Point Count

The breeding bird point count data on the Refuge has been collected for the last 8 years, starting in 1994. Over 120 randomly selected points were established with an approximate equal number of points in each of the 4 habitat types defined on the Refuge: riparian, crop, woody, and grassland. Eighteen of the points are in the bison confinement area. The observer stands at the point for 10 minutes documenting the birds seen and heard within 0-25, 25-50 and >50 meter distance of the point.

As the crop ground is converted to prairie plantings, the birds associated with crop ground are becoming less common and prairie or grassland birds are becoming more prevalent. For example, there were very few horned larks and vesper sparrows seen or heard in the crop areas this year. Conversely, Henslow's sparrows have been recorded on two new grassland points. The increased number of Henslow's observations suggests the prairie plantings are developing well into what was once pristine Iowa landscape. Also, the fact that this species is not common makes this trend more important to document.



Hatchlings in a prairie grass nest
 Photograph by Ron VanNimwegen

The red-winged blackbird (RWBL) is such a generalist that it appears in all 4 habitat types and is consistently the most abundant species present. For the 2001 count, there were 122 RWBL counted on 53 different points. A grassland bird, the dickcissel, was also quite common and also the American goldfinch. The most common introduced bird on the Refuge is the ring-necked pheasant. However, they were not recorded very frequently this year and sitting broods were also down from the previous year. A harsh winter and a cool, wet June were the likely reasons numbers appeared to be reduced. Ten species were detected only on a single count: American crow, cedar waxwing, eastern meadowlark, eastern phoebe, great-crested flycatcher, horned lark, loggerhead shrike, purple martin, rufous-sided towhee, and red-tailed hawk. There was a total of 55 species identified in this year's count.

Fourth of July Butterfly Count

On July 22, 2001, the first Fourth of July Butterfly Count was taken at the Refuge by Erma Selser and Stephanie Shepherd. This survey was part of a volunteer nationwide count similar to the Christmas Bird Count, and is conducted to contribute to a nationwide overview about the numbers of butterflies and butterfly species present from year to year. By identifying butterflies at the Refuge, we hoped to update the list of butterflies present and increase the public's interest in insects and other invertebrates.

Specific rules and reporting of the data can be found at www.naba.org. Sites surveyed on the Refuge included the Savanna Trail, Tallgrass Trail, Basswood Trail and Lone Oak remnant. Participants walked these trails and areas noting any butterflies and numbers present over a four hour period on one of the hottest days of summer. There were 209 total individuals found. This included: 5 Papilionidae (swallowtails), 51 Pieridae (whites and sulfurs), 90 Lycaenidae (hairstreaks), and 63 Nymphalidae (brushfoots). No Hesperidae (skippers) were found.

The most numerous single butterfly species were the more common ones. Among the Pieridae were: *Eurema lisa* Little Yellow (21), *Colias philodice* Clouded Sulfur (11),

Pieris rapae Cabbage White (10), and *Colias eurytheme* Orange Sulfur (9) were found. Among the Lycaenidae were: *Everes comyntas* Eastern Tailed Blue (68), and *Celastrina landon* Spring Azure (20). The most numerous species among the Nymphalidae was *Phycoides tharos* Pearl Crescent (37). Lower numbers of individuals were spread among another 6 species from the family. It was surprising that no Hesperidae were found. The fact that the count took place on a hot afternoon with the temperature above 95 degrees Fahrenheit probably affected the species and numbers seen. The data from next year's count will provide more information about species and number of butterflies present.

Refuge Butterfly Transects on Plantings

A second butterfly survey ran from May 19 through August 13, 2001, by Erma Selser and Stephanie Shepherd. This survey compared the difference in butterfly number and species from one reconstructed prairie site to others planted in different years. Because different butterflies may use different flower sources for food, there should be a difference in butterflies at different sites due to age.

Transects 100 meters long by 10 meters wide were established and flagged at 15 different planting sites. Two sites were set up for each year. Every 10 meters were marked so butterfly presence could be identified. The butterfly and flower association were noted. Photographs were taken to document butterfly presence and plant association when deemed necessary. Analysis of the results is ongoing and will be completed in winter, 2001.



Henslow's Sparrow singing at Neal Smith NWR

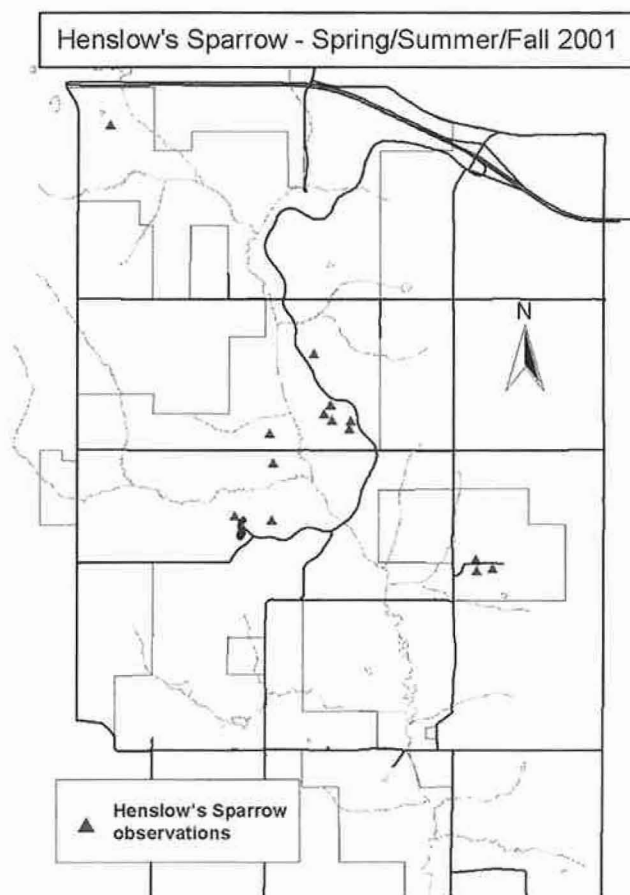
Photograph by Ron VanNimwegen

Henslow's Sparrows

This was an exciting year for our bird enthusiasts working in the field as the rare Henslow's Sparrow (*Ammodramus henslowii*) made a record-breaking number of appearances. This secretive little grassland species did not show up on any yearly point counts until 1999, when it was observed only once. In 2000, the annual count produced two observations, and this year that number climbed to three. These are the official results generated by the out-sourced point counts performed yearly by Bret Geisler from Des

Moines. The remarkable news from this year, however, came from the many observations from Refuge employees, interns, and visitors.

Two territorial males were first observed in early spring just off the entry road northeast of the Learning Center. Over the next month, several more were heard along the entry road north of the first sighting. Throughout the rest of the season, Bio Tech Paul Charland and Biology intern Ron VanNimwegen continued to see and hear Henslow's Sparrows in several other parts of the Refuge. The old interim office produced several observations and one was heard near the Learning Center by visiting birder Don Hollsums from Colorado. Finally, the official point count found two individuals in the bison enclosure and one as far north as Highway 163.



Henslow's Sparrow Observations

Since we did not have this many eyes and ears tuned to the sparrow in previous years, we cannot know if the actual population has only recently increased. However, these birds have been shown to prefer large uninterrupted tracts of habitat, and it is safe to say that since the first plantings of 1992, we have greatly increased the extent of that very type of landscape.

1.b. Studies and Investigations

NO₃-N, Cl and SO₄ Transport from Paired Agricultural and Restored Prairie Watersheds

(Summary of research presented at the 9th National Nonpoint Source Monitoring Workshop, Monitoring and Modeling Nonpoint Source Pollution in the Agricultural Landscape, Indianapolis, Indiana, August 27-30, 2001. A full research paper has been submitted to Journal of Environmental Quality and is currently in review. - Principal investigator Keith Schilling, Iowa Geological Survey, Dept. of Natural Resources.)

A five-year record of streamflow and chemical sampling data was evaluated to determine NO₃-N, Cl and SO₄ loads attributable to baseflow inputs from paired 5,000 ha watersheds located in Jasper County, Iowa. Water quality conditions have been monitored to evaluate changes resulting from conversion of large tracts of land from row crop to native prairie in the treatment watershed (Walnut Creek) compared to a highly agricultural control watershed (Squaw Creek). Since 1993, land use changes have been implemented on 22.4% of the Walnut Creek watershed, most of which are located in the watershed core.

Hydrograph separation on streamflow data collected at upstream and downstream sites on Walnut Creek and a downstream site on Squaw Creek was performed to determine daily baseflow discharge. Over a five-year period, nearly 100 water quality samples were collected at each site on days when streamflow corresponded to 100% baseflow or a combination of baseflow and stormflow. A USGS load estimator model (Cohn et al. 1992) was used to estimate (1) the total chemical load using all discharge and concentration data, and (2) the baseflow load using only discharge and concentration data collected on days when streamflow consisted of 100% baseflow. The difference between the two load estimates was attributable to stormflow inputs.

Total export loads of NO₃-N, Cl and SO₄ from both watersheds were similar, averaging 125 to 134 tons/yr of NO₃-N, 166 to 183 tons/yr Cl and 310 to 314 tons/yr SO₄. The percentage of total loads due to baseflow inputs was also similar, ranging from 62 to 68%. Baseflow load inputs were greatest during the later summer and fall seasons whereas stormflow loading contributions increased during high streamflows associated with winter snowmelt and early spring rainfall.

When upstream loads are subtracted from downstream loads in Walnut Creek, areas of prairie conversion are isolated and baseflow discharge was reduced from 52 to 61%. Normalizing flow and chemical load data between the two watersheds indicated minor differences in discharge but significant differences in chemical loads. Whereas the Squaw Creek watershed and upper Walnut Creek watershed exported 28 to 34 kg/ha per year of NO₃-N, the portion of the Walnut Creek watershed containing the restored prairie exported 18.8 kg/ha per year. Differences in NO₃-N export with baseflow were equally pronounced, averaging 18.4 to 22.4 kg/ha per year in Squaw Creek and upper Walnut Creek and 11.6 kg/ha per year in the lower Walnut Creek watershed. Similar differences were noted for

chloride, a common component of fertilizer, whereas no differences were noted in SO₄ loads, a compound with little agricultural input in either watershed.

Flow-weighted concentrations showed higher concentrations associated with baseflow than stormflow inputs. Average flow-weighted concentrations calculated for both watersheds compared favorably with long-term average concentrations. Average flow-weighted concentrations of NO₃-N were > 10mg/L in Squaw Creek and upper Walnut Creek but were < 6.2 mg/L in lower Walnut Creek (Table 4). Similarly, concentrations of Cl were >13 mg/L in Squaw Creek and upper Walnut Creek but <8.3 mg/L in lower Walnut Creek.

Walnut Creek Watershed Monitoring Project: Monitoring Effects of Prairie Restoration on Watershed Water Quality

(Summary of research presented at Agriculture and the Environment: State and Federal Water Initiatives. Iowa State University, Ames, Iowa, March 5-7, 2001 - Principal investigator Keith Schilling, Iowa Geological Survey, Dept. of Natural Resources.)

The Walnut Creek Watershed Monitoring Project was established in 1995 to monitor the effects of large-scale prairie restoration at the Neal Smith National Wildlife Refuge on water quality in the Walnut Creek watershed (Jasper County). The monitoring project utilizes a paired-watershed approach (Walnut and Squaw creeks) as well as upstream/downstream comparisons (Walnut Creek only) for analysis and tracking of trends (Figure 1). The Walnut Creek watershed is paired with Squaw Creek watershed, which shares a common basin divide with Walnut Creek, to minimize precipitation variation. Basin characteristics of the Walnut and Squaw Creek watersheds are similar and make them well suited for a paired watershed design. Walnut Creek drains 5,822 ha and discharges into the Des Moines River at the upper end of the Red Rock Reservoir. The Squaw Creek drains 4,744 ha above its junction with the Skunk River. Both watersheds are located on the Southern Iowa Drift Plain, a pre-Illinoian glacial landscape characterized by steeply rolling hills and well developed drainage. Monitoring results reported for nitrate, atrazine and fecal coliform are highlighted for the main stem sampling sites (water years 1996 to 2000) and offer a glimpse of the magnitude of water quality improvements that can be expected from this watershed-scale restoration project.

Statistical analyses were performed according to the guidelines of Grabow et al. (1998, 1999). To test for the gradual change a multiple linear regression analysis was performed. The equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

where, Y is either the water quality variable or log of the variable for the treatment watershed (Walnut Creek), X₁ is the same water quality variable (or log) for the control watershed (Squaw Creek), and X₂ is elapsed time (in weeks) and β_0 , β_1 , and β_2 are regression parameters. The estimate of β_2 indicates the magnitude of change over time in units per week. By having a control watershed (variable X₁), the analysis blocks out

much of the hydrologic variability, and the change should be isolated to treatment effects which in this case is being modeled as time (X_2).

In some cases, seasonality was present even when data were paired with a control watershed.. In this case a class variable denoting a season can be brought into the analysis. The resulting equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_{3i}$$

where β_{3i} is the parameter estimate for season i . If the year was broken down into months, there would be 12 values for β_3 , if broken down into growing season and non-growing season, there would be 2 values for β_3 .

Nitrate -N concentrations have ranged between 0.8 to 13.0 mg/l at the downstream Walnut Creek station (WNT2) and 2.1 to 15.0 mg/l at the downstream Squaw Creek stations (SQW2) (Table 1). Both basins show a similar temporal pattern of detection and an overall reduction in nitrate-N concentrations from upstream to downstream monitoring sites. Higher concentrations are noted in the spring and early summer months coinciding with periods of application, greater precipitation and higher stream flows.

At-test found a significant difference between the nitrate concentration means of the Walnut and Squaw Creek data sets from 1995 to 2000 ($n = 97$, $p < 0.05$) with the overall mean nitrate concentration in Walnut Creek substantially lower than Squaw Creek (8.19 mg/l and 9.20 mg/l, respectively). Regression analysis was performed to determine if a change has occurred over time in the relationship of nitrate concentrations in the treatment watershed (Walnut) and the control watershed (Squaw) (Table 2). The parameter β_2 is the parameter for elapsed time and therefore indicates the magnitude of change. A negative value indicates a decrease and a positive value an increase over time. Nitrate has decreased by 0.0028 mg/l/week over 326 weeks, equivalent to 0.912 mg/l over the entire sampling period. Using a mean value of the control watershed (9.20 mg/l) for X_1 in Equation (1), nitrate has decreased from 9.19 mg/l to 8.28 mg in the treatment watershed over the entire sampling period during the growing season (May-August), and from 8.06 mg/l to 7.15 mg/l during the non-growing season.

When analyzed as an upstream/downstream design, Equations (1) and (2) are still used. In this case Y is the downstream station value and X_1 is the upstream value. This analysis on the Walnut Creek watershed for nitrate indicated that the downstream concentration was decreasing over time while considering the upstream value; however it was only significant at the 80% confidence interval ($p=0.194$).

Table 1. Summary of water quality analyses

	n	range	mean	sd	25th	Quartile 50th	75th
Nitrate-Nitrogen (mg/l)							
WNT1	99	2.3-17	11.1	3.3	9.1	11	14
WNT2	99	0.8-13	8.2	3.1	5.9	8.8	11
SQW1	90	5.2-17	12.4	2.5	10	13	14
SQW2	97	2.1-15	9.2	3.0	7.2	9.5	11
Atrazine (ug/l)¹							
WNT1	50/59	<0.1-3.4	0.47	0.63	0.20	0.29	0.46
WNT2	47/59	<0.1-5.0	0.57	0.81	0.22	0.33	0.54
SQW1	45/60	<0.1-7.7	0.73	1.33	0.29	0.36	0.59
SQW2	50/60	<0.1-8.1	0.69	1.26	0.23	0.34	0.60
Fecal Coliform (counts/100 ml)							
WNT1	98	<10- 7,600,000	105,300	780,291	410	1200	3700
WNT2	98	10- 150,000	7,988	24,992	288	980	2875
SQW1	91	10- 250,000	9,048	39,400	165	570	1100
SQW2	99	10- 13,000,000	138,425	1,306,493	350	870	2250

¹Summary statistics for detections only.

Atrazine

Atrazine was by far the most frequently detected pesticide compound, as is true across Iowa, with the frequency of detection ranging between 75% to 85% in the main channels (Table 1). Concentrations ranged between <0.1 to 5.0 ug/l at Walnut Creek and <0.1 to 8.1 ug/l at Squaw Creek, with median concentrations at the downstream stations nearly equal (0.33 ug/l vs. 0.34 ug/l, respectively).

Table 2. Regression parameter estimates.

	β_0	P	β_1 Control	P	β_2 Elapsed time	P	β_3	P	Comments
Nitrate ¹	.0545	.405	.8697	.0001	-0.0028	.034	1.132	.0001	β_3 , growing season
Nitrate ²	-.626	.233	0.7673	.0001	-0.00198	.194	1.157	.0003	β_3 , growing season
Atrazine	.0427	.475	1.0056	.0001	-0.00038	.107	-	-	Log values
Fecal Col.	1.137	.0024	.5724	.0001	-0.00128	.047	varies	.0001	Log values. β_3 , 12 values one for each month
Fecal Col.	0.834	.0002	.65079	.0001	-0.00107	.077	.626	.0001	β_3 month 5-8, other 0.0

¹ paired watershed design² upstream/downstream design (Walnut)

For statistical analyses of atrazine concentration data, concentrations reported as <0.1 ug/l were considered to be one-half the detection limit (0.05 ug/l). Atrazine data were highly skewed and required log transformation before regression analyses were conducted. Sampling was done primarily in the summer, so no effort was made to stratify the values into growing and non-growing seasons. The negative value of β_2 (parameter on time) indicates a general decrease in atrazine at the outlet of Walnut Creek while adjusting for the control, however, the trend over time is not significant at $\alpha = 0.05$ (95% significance) (Table 2). It is nominally significant at a 90% significance ($p = 0.10$). The mean decrease over the entire sampling period is -0.126 log units. Using the mean log value of Squaw Creek (-0.551) as X_1 , and taking the antilog to obtain an untransformed answer, atrazine decreased from 0.3080 to 0.230 ug/l over the entire 326 week sampling period while adjusting by the control watershed.

Fecal Coliform

Fecal coliform counts varied widely among sampling sites and water years, ranging from less than 10 counts/100 ml to 13 million counts/100 ml at SQW2 (Table 1). In general, highest levels of fecal coliform bacteria occurred in spring and early summer months during high stream flow periods associated with rainfall runoff. When looking for a trend in time as per Equation (1) there was no statistically significant trend in fecal coliform over time ($p = 0.246$). However when using Equation (2) and using month as a class variable, there was a statistically significant decrease in fecal coliform over time while adjusting for the control (Table 2).

Attempting to base the regression analysis on greater seasonal variability, Equation (2) was again used with months 5-8 (May-August) and months 9-12; 1-4 grouped into "grazing" versus "non-grazing" seasons. This was nominally significant ($p = 0.07$). A bit of "statistical cheating" was involved since observation of the monthly values obtained previous indicated that this grouping followed the most obvious split. However, this

appears to reflect what is happening on the ground since the parameter estimates for months 5-8 were higher than the other months, generating higher predictions of fecal coliform.

These two methods resulted in a reduction of .39 and .35 log units of fecal coliform respectively over the sampling period (326 weeks). For the second method, this translates to a average change (using average value of Squaw for X_1) from 3.444 to 3.095 log units during the "grazing season" and a change from 2.828 to 2.468 during the "non-grazing" season; 2780/mpn/100 to 1245 mpn/100 to 1245 mpn/100 and 673 mpn/100 to 294 mpn/100 respectively.

When evaluated as an upstream/downstream design using Equation (1) there was no statistically significant trend in fecal coliform over time ($p=0.60$). The same holds true when month was introduced into the analysis.

Conclusion

The Walnut Creek Watershed Monitoring Project began with the expectation that conversion of row crop to native prairie and improved cropland management would result in measurable improvements in surface water quality. Water quality improvements were hypothesized because substantial land use conversions have decreased nitrogen fertilizer and pesticide applications on refuge-owned lands. Completion of the first five years of full-scale monitoring (WY 1996-2000) has shown statistically significant reductions in common agricultural pollutants (nitrate, atazine and fecal coliform) in the Walnut Creek watershed in relation to Squaw Creek. The Walnut Creek Monitoring Project clearly demonstrates the need to follow projects for several years in order to begin to see changes. Only by establishing a long-term monitoring record can the effects of BMPs on water quality in watersheds be fully evaluated and quantified.

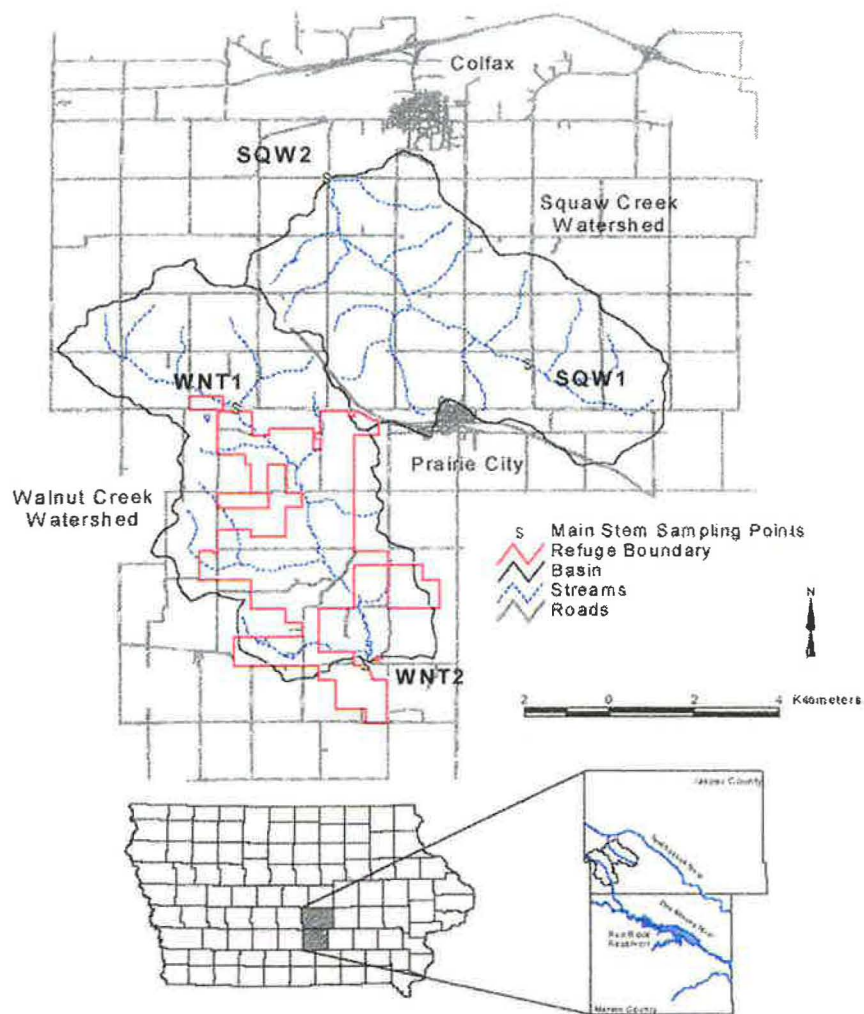


Figure 1. Location map.

An Investigation of Groundwater/Surface Water Interaction in a Riparian Corridor Dominated by Reed Canary Grass: Implications for Monitoring Hydrologic Changes as the Corridor is Restored to Native Vegetation - Principal investigator Keith Schilling, Iowa Geological Survey, Dept. of Natural Resources.

In May 2001, a hydrologic investigation was initiated in a riparian corridor at the Neal Smith National Wildlife Refuge. The objectives of this investigation were to 1) document the Holocene alluvial stratigraphy; 2) evaluate the interaction of groundwater and surface water in a typical southern Iowa riparian corridor dominated by reed canary grass; and 3) monitor potential hydrologic changes as the area is restored from reed canary grass to native floodplain vegetation.

A series of 35 shallow, nested groundwater monitoring wells were installed in a transect across the Walnut Creek floodplain. The entire transect of wells spans a distance of 1800 feet from upland landscape positions on both sides of the floodplain (Figure 1). A series of wells were installed at regular intervals from the upland positions to locations in close proximity to the Walnut Creek channel. Most of the wells were nested, that is, several wells were installed side-by-side at different depths, to evaluate vertical hydraulic gradients and the three-dimensional groundwater flow system. The locations of the wells were positioned on either side of the floodplain to be mirror equivalents. This was done in order to establish a paired groundwater study, so that hydrologic effects brought on by actions taken to eradicate reed canary grass on one side of the riparian corridor may be compared to a control on the other side of the corridor. In addition to the wells located along the transect, a three-well nest is located off the line of the transect on both sides of the stream in order to establish horizontal groundwater flow directions and gradients.

Most of the wells nearest the stream channel were installed using hand augers in May and June. Upland wells (5,6 and 7 well clusters) were installed in August using a Geoprobe, a truck mounted hydraulic probing unit. In November, a deeper monitoring well (W2 location) was installed using the Geoprobe on the west side of the floodplain to a depth of 40 feet.

Water levels have been monitored in the wells on a weekly to biweekly basis since their installation. From wetter conditions in May and June, through dry conditions in late summer and fall, water levels have fluctuated substantially (Figure 2). An interesting aspect of this study is the role that the incised Walnut Creek channel plays in the relation of water table depths in the riparian corridor to the elevation of the stream. Water levels at the locations 1 and 2 nearest the stream were relatively high in May and June in relations of the stream level when conditions were wet; during the subsequent dry months, groundwater contained in these alluvial sediments apparently drained to Walnut Creek at different rates (see the spreading of the range of water level elevations over time).

Results at this stage are exceedingly preliminary. We have only recently completed all well installations and are continuing to gather baseline water level data. The baseline data will be critical in the future to establish baseline conditions between treatment and control

sides of the floodplain. In the spring of 2002, we anticipate burning the west side of the riparian corridor and taking other actions to eradicate reed canary grass on this side of the channel. Hydrologic conditions will then be monitored to detect possible changes in groundwater levels and flow. Other research in this area will involve installing continuous water level recorders in several of the wells in the transect in the spring to monitor the effects of high streamflows on the groundwater flow and quality in the riparian zone.

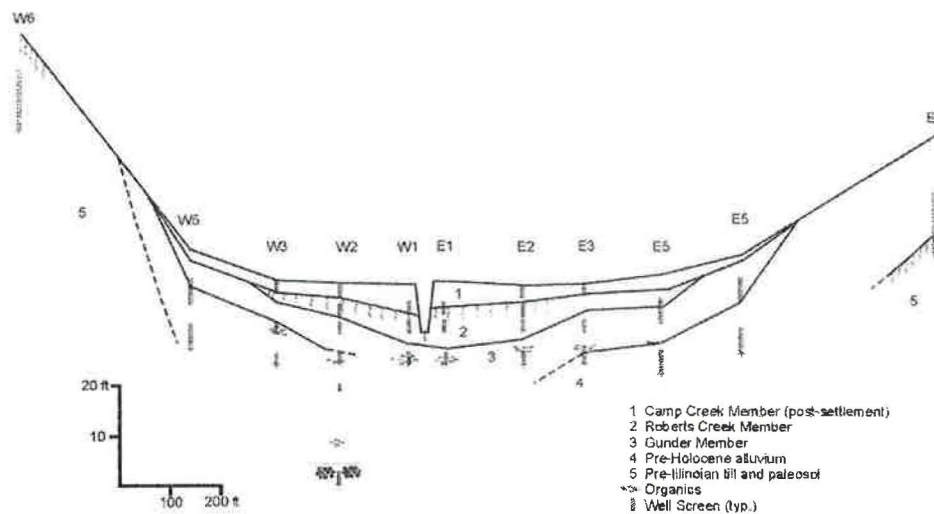


Figure 1. Cross-section of well transect showing alluvial stratigraphy and monitoring wells.

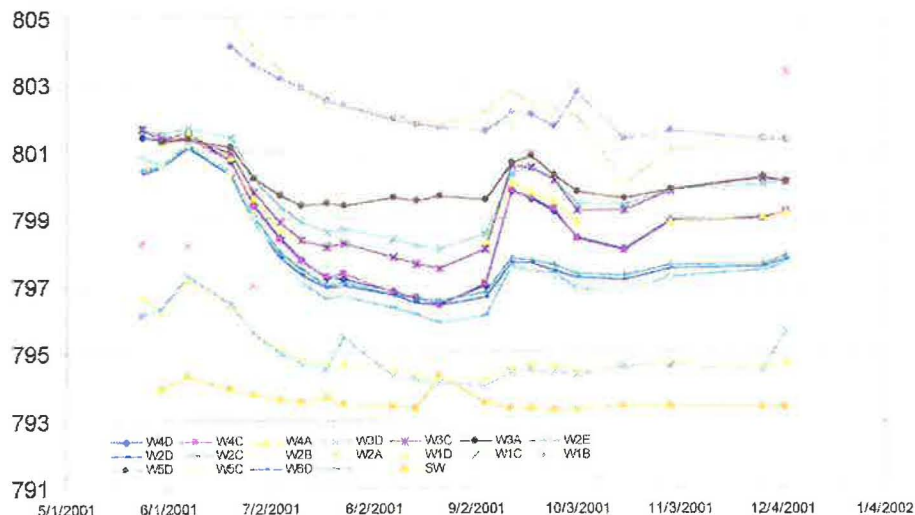


Figure 2. Water level fluctuations monitored on the west side of the riparian corridor.

Regal Fritillary Butterfly Reintroduction. Principal Investigator: Dr. Diane Debinski, Iowa State University. M.A. Graduate Researcher: Stephanie Shepherd.

Violet Plots: Until now, 20 violet host plant plots for the Regal Fritillary butterfly reintroduction had been established. Each plot consists of 99 plants and violet survival is being monitored under four treatments (burned, grazed, unburned sparse and unburned dense) across the Refuge. Initial results show that after three years, the violets are doing better on the burned as compared to the unburned dense, but the unburned sparse plots (violets planted into sparse prairie restoration plantings) are also doing very well. The bison-grazed sites seem to have fared the least well, but we think that this is more an effect of planting time rather than bison impact. During the spring of 2001, four additional violet plots (of 99 plants each) were planted in the visitor center area. These plots will serve an important environmental education function given their close proximity to the visitor center trails.

Regal Reintroduction: In late August to early September, 2001, three Regal females were brought to the Neal Smith NWR. The later date was used in response to this new information regarding time required for egg maturation and time of egg-laying. Two of these individuals were from Ringgold Wildlife Management Area and one originated from Rolling Thunder State Preserve. The females introduced at Neal Smith NWR were put in 6X6 foot cages on two of the violet plots. These plots will be surveyed for caterpillars starting in early May 2002 when the violet plants begin to grow. Two female Regals were also brought in from Ringgold Prairie to the insect zoo at Iowa State University to attempt captive rearing. Many of the caterpillars died at early instars, but we have learned quite a bit about captive rearing techniques and hope to attempt additional rearing next year.

Educational Programs: I (Debinski) was asked to participate in the development of a Natural Resources Conservation Service (NRCS) video training module entitled *Understanding the Landscape*. This portion of the video focused on examining habitat fragmentation issues in prairie ecosystems with a particular focus on the Regal Fritillary reintroduction efforts at the Neal Smith NWR.

Overview of C Sequestration Work Completed from 2000-2001 at Neal Smith National Wildlife Refuge. Principal Investigators: Cindy Camberdella, National Soil Tilth Laboratory; Keith Schilling, Iowa Geological Survey (Iowa DNR); Thomas Isenhardt, Iowa State University.

Description of Work:

Specific objectives:

- estimate carbon sequestration within similar soils under different vegetation (annual row crops, restored/reconstructed prairie, remnant prairie, and savanna)
- determine the effect of time since prairie reestablishment on soil carbon accumulation
- assess the effect of burning as a prairie management strategy on soil carbon accumulation

All sampling sites were located within the Refuge. Sampling sites within each treatment were blocked by common soil type to reduce variability. Geographic Information System

(GIS) coverages of all possible sampling locations were created and an Arcview area grid and random number generator were used to select exact sampling locations, which were distributed Proportionally to the size of the site. Global Positioning System (GPS) coordinates of sampling locations were used to locate and mark sampling sites. Soil cores were collected during the week of May 22-26, 2000, except for the prairie remnant, which was sampled on July 27, 2000. Samples were collected to a depth of 120 cm using a truck-mounted Giddings soil sampler or a hand-held, modified Giddings soil sampler in areas that were not accessible by truck. Soil cores were sectioned into five depth increments (0-15, 15-30, 30-60, 60-90 and 90-120 cm) in the field and stored in plastic bags at 4°C until processed.

Results and Discussion:

Total soil carbon to a depth of 120 cm for the restored prairie and cultivated sites on Tama/Otley soils ranged from 80.3 to 123.0 Mg per hectare with a mean of 96.7 Mg per hectare averaged across all sites. Variability in soil C content was relatively high despite the stratified sampling design. Coefficients of variation, a coarse estimate of variability, ranged from 24.6 to 45.7% for the restored and cultivated sites. The remnant savanna and prairie sites on Ladoga soil had 100.9 and 77.9 Mg C per hectare respectively to a depth of 120 cm. Coefficients of variation ranged from 2.7 to 15.2% for the remnant sites. There was no consistent difference between burned and unburned restored sites within any given year or averaged across all years.

We hypothesized that the amount of total carbon stored in the soil profile to 120 cm would increase with time since prairie restoration. The remnant prairie/savanna sites and the cultivated sites were meant to constrain the upper and lower data thresholds respectively. We did not observe a consistent positive change in soil carbon contents in the prairie restoration chronosequence with time since restoration. In addition, the cultivated or remnant sites did not have consistently less or more soil carbon than the restoration sites. This is not surprising since landscape scale changes in total soil carbon are difficult to detect over the short term, primarily due to landscape scale spatial heterogeneity in soil carbon contents and inconsistent impacts of historic management practices on current soil carbon stocks. We were unable to assess soil carbon content for each restoration site prior to reestablishment of prairie and, as a result, had no “true” baseline for comparing changes in soil carbon contents with time in the restoration sites. In the future, prior to the establishment of new restoration sites on the Refuge, we will collect baseline soil carbon data as a basis of comparison. We will also test the feasibility of using intermediately-labile, biologically-active organic matter (turnover time of 10-50 years) as short-term indicator of longer-term changes in total soil organic C storage potential resulting from prairie reestablishment.

Completed Research Projects:

The Role of Small-scale Disturbances in Structuring the Plant Community of Native and Reconstructed Prairies. (Abstract for Doctor of Philosophy dissertation). Kelly S. Wolfe-Belin, PhD Student, Iowa State University. Major Professor: Kirk A. Moloney.

Understanding the link between pattern and process is an important goal in ecology, and much research has focused on how small-scale disturbances act to produce spatial patterns in plant communities. In this research, I investigated the role of small-scale disturbances in structuring the plant communities of native and reconstructed prairies, with an explicit emphasis placed on understanding how spatial and temporal patterns in disturbance production affect seedling recruitment.

Two studies investigated the spatial and demographic relationships between gopher mound production and four plant species in a native prairie. The spatial distributions of three species were positively related to the pattern of mound production, while the spatial distribution of one perennial grass species was unrelated. Seedling survivorship of all species was generally greater when growing directly on the mounds than off mounds. Survivorship by seedlings growing on mounds was unrelated to the rate of neighborhood mound production, while survivorship by seedlings growing off mounds was negatively related. These studies provided evidence that mounds serve as sites for seedling recruitment into grasslands. Because mound production is spatially and temporally autocorrelated, these small-scale disturbances directly contribute to the formation of spatial patterns in native prairie plant communities.

Two additional studies were conducted as part of a large, landscape-level experiment to explicitly investigate how the spatial and temporal patterns in the production of small-scale disturbances affect seedling recruitment into reconstructed prairie. Seeds of forb species were planted on and off small-scale soil disturbances to mimic gopher mounds. As predicted, seedling recruitment was greater on mounds than off mounds. However, there was no evidence that seedling recruitment was affected by the spatial or temporal patterns of mound production. In addition, there was some evidence that selective herbivory by small mammalian herbivores reduced the diversity of recruited seedlings, but herbivory pressure was approximately equal on and off mounds. The vegetation structure of the reconstructed prairies was different from that of native prairies, making it difficult to draw conclusions about the effects of disturbance production patterns on seedling recruitment into native prairies. Nevertheless, the studies provided important insights as to the similarities and differences in function of small-scale soil disturbances in native and reconstructed prairies.

Small-scale spatial patterns of vegetation on remnant tallgrass prairies in southern Iowa. Katie Lenore Monsen. M.S. Thesis, Iowa State University. Major Professor: Thomas W. Jurik.

Are small-scale spatial patterns evident in remnant tallgrass prairies? If so, can we use those patterns to help restorationists plan and evaluate prairie reconstructions? I analyzed

Sheeder, Bundt, and Morris Prairies of southern Iowa in 2000 to determine if strong spatial patterns exist and whether they can be applied to prairie reconstructions. I collected species presence/absence data in contiguous 0.25-m² quadrats on 50-m transects (n = 11 over the three prairies) and I also analyzed soil P (ppm), K (ppm), pH, and percent organic matter (% OM) on each transect.



Katie Monsen investigated several prairies in the Neal Smith NWR local ecotype range

The prairie vegetation was highly diverse at the scale studied. Overall, 71% of the 85 taxa identified were present in 20% or less of the quadrats, while only two taxa were present in 80% or more of the quadrats. Simpson's index and the Shannon-Weiner index of diversity were high, indicating high species richness and evenness with no dominant species. The mean number of taxa per quadrat overall was 13.7 (s.d. = 2.7). The vegetation was also highly heterogeneous. The dissimilarity between quadrats (measured by Manhattan distance) was slightly related to how far apart the quadrats were physically. A modified one-dimensional Ripley's K statistic was used to estimate the distances at which clusters of individual species were evident: these distances varied by species and prairie. The relationship between the frequency of each species and soil P, pH, and % OM also varied by species, with few clear trends. There were few species that co-occurred more or less frequently than expected by chance, with no clear trends based on functional groups. Because of the high heterogeneity at this local scale, it does not seem feasible to recommend that reconstructed prairies be seeded to create specific patterns on a small spatial scale. Rather, planting a highly diverse seed mix over a relatively uniform site or part of a site may be the best method to reconstruct highly diverse prairies. My data also provide a reference against which diversity and species composition of reconstructed prairies in southern Iowa could be evaluated.

Microhistological Analysis of Bison Diets in Central Iowa on Reconstructed Prairie of Neal Smith National Wildlife Refuge. Principal Investigator: Christy Smith, Neal Smith National Wildlife Refuge, ROS.

Neal Smith National Wildlife Refuge introduced bison to newly reconstructed prairie in 1998. The bison were released within a 750 acre enclosure in order to contribute to biotic interactions that would normally take place in tall grass prairie habitats. Prairie in the process of reconstruction is fragile due to the lack of deep sod development and low diversity of plant species present. It is vital to closely monitor the impacts of bison on the prairie and to monitor bison activities and behavior, including diet preferences, within the enclosure for effective prairie management.

Currently available literature suggests that bison are grazers consuming primarily grasses and sedges with a preference for sedges when available (Coppedge, et al 1996, Pfeiffer and Hartnett, 1995, Van Vuren 1984). A vital aspect of managing these animals and protecting rangelands from degradation is a thorough understanding of seasonal food habits. Neal Smith National Wildlife Refuge provides a unique opportunity to study the food habits of bison during tall grass prairie reconstruction and provide a sound basis for bison management in prairie environments. The initial development of a 2-year study began in fall, 2001. The objectives of the study will be to determine within the 750 acre enclosure diets of bison, identify key seasonal forage plants of bison and to determine forage production and percent botanical composition

Twenty-five fresh fecal samples, 50 grams each, will be collected from bison each month. A monthly composite sample will be made from the twenty-five samples. Composite samples will be grouped by season and year for comparison. Seasons will be designated as fall (September 22 through December 21), winter (December 22 through March 21), spring (March 22 through June 21) and summer (June 22 through September 21). Diet differences may exist between different age and sex groups so it will be necessary to attempt to collect samples that represent the entire herd structure; calves/yearlings, cows and bulls. Fresh feces will be collected immediately after animals have moved away from an observed area. Permanent vegetation transects will be placed on a north/south axis through the enclosure at approximately 100 meter intervals. One meter quadrats will be randomly placed along each transect to determine cover, density and percent botanical composition throughout the enclosure (Bonham 1989). Clip plots will be used to estimate forage production within the enclosure (Bonham 1989). Vegetative data will be collected during the spring, summer and fall seasons to represent floral communities available to bison through the year. Weather permitting, vegetation surveys will also be conducted in the winter. These data will establish the availability of forage species which will aid understanding of diet selection and determination of key forage species. Key species are those species which serve as an indicator to the degree of use of associated species (Holechek et al. 1989).

Diets will be determined using fecal microhistological analysis which is as reliable and useful as rumen macroanalysis (Kessler et al. 1981). Each fecal sample will be oven-dried then ground in a Wiley cutting mill using a 1 mm screen. A composite sample will be

made by measuring equal portions of each of the twenty-five samples collected each month. Five slides will be prepared from each composite sample using the method developed by Sparks and Malechek (1968) as modified by Holechek (1982) using Permount Solution as a mounting medium. The slides will be analyzed using 20 fields from each slide for a total of 100 fields. Percent composition and frequency of occurrence will be determined for each plant species using the formula $PC = A \times 100/B$ where A is the occurrence of each plant species and B is the occurrence of all plant species (Sparks and Malechek 1968).

ROS Christy Smith began the preliminary planning and design of the study this year. An extensive literature review was begun. With the help of Volunteer Jonathan Yentis, 17 plant species were collected to be prepared as a microscopic reference and training slides. Smith and Yentis have completed fecal collections for the months of October, November and December and have begun preparing them for microscopic analysis. Smith will prepare the slides and will train Yentis in microhistological techniques.

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2

Habitat Restoration

2.a. Wetland Restoration

On-Refuge

Nothing to Report

Off-Refuge

Nothing to Report

2.b. Upland Restoration

On-Refuge

Summary of prairie seed harvested by machine from plantings on Neal Smith National Wildlife Refuge, Fall, FY 2001.

Planting Site Number	Major Crop	Number of Minor Crops	Bulk wt. (lbs.)	Wt. (lbs.) Viable Seed	% Viable by Weight
22	Indian Grass	13	976	177	18.1
18	Big Bluestem	15	1930	90	4.7
42	Big Bluestem Indian Grass	15	2418	472	19.5
23	Big Bluestem Indian Grass	9	1910	297	15.5
17	Little Bluestem Indian Grass	3	532	190	35.7
22	Indian Grass Partridge Pea	17	1960	382	19.5
70	Canada Wild Rye	7	4794	2366	49.3

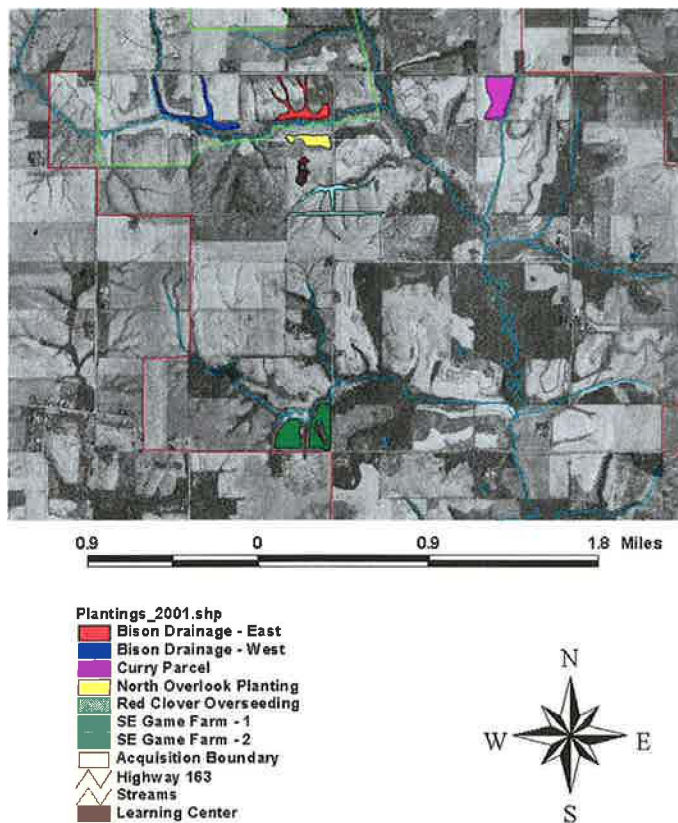
Machine Harvest

Approximately 16,000 bulk lbs. of seed were harvested on-site. Sites were harvested in a timely manner after the Refuge Biologist inspected units and verified seed readiness. The Operations staff then harvested and processed the seed with the assistance of available personnel from Iowa Department of Natural Resources (Iowa DNR). Seed was dried and cleaned at the Refuge and kept in Refuge storage facilities. Of this harvest, the Refuge retained 7,000 bulk lbs. and the Iowa DNR received 9,000 lbs.

Spring Planting

Seven sites were selected for planting during FY2001 that included a total of 77.5 acres. Two sites were within the bison enclosure along the drainage areas. These areas were already covered with brome and were broadcast seeded, then mowed. Other sites were located around the 2 Mile Trail and entry road areas. These areas were sprayed with chemical (Round Up and 2,4-D) prior to planting. The final sites were soybean stubble crop fields that were also broadcast seeded without any preparation.

PLANTING SITES FY2001



Friends' Biological Interns

The Biology Department had the good fortune of having two dedicated and hard working interns, sponsored by the Friends. Ron VanNimwegen, a student at Iowa State University and Joe Heffron, a student at Drake University, were an integral part of biological operations over the summer and participated in all department activities, including invasive species control (both earned non-commercial pesticide applicator certification); hand seed collecting: needle grass (*Stipa* sp.) and blue-eyed grass (*Sisyrinchium campestre*); seed cleaning; butterfly survey transect layout; and bluejoint grass (*Calamagrostis canadensis*) potting.

Greenhouse Re-skinning

In August, Refuge staff and interns removed the old skins from the production greenhouse and installed new skins. The old plastic layers had hail damage from previous seasons which needed to be replaced before the fall/winter conditions of 2001/2002. Scaffolding was erected at the ends of the building, enabling staff to unclasp the old skins and hoist up the new.

Bluejoint Grass

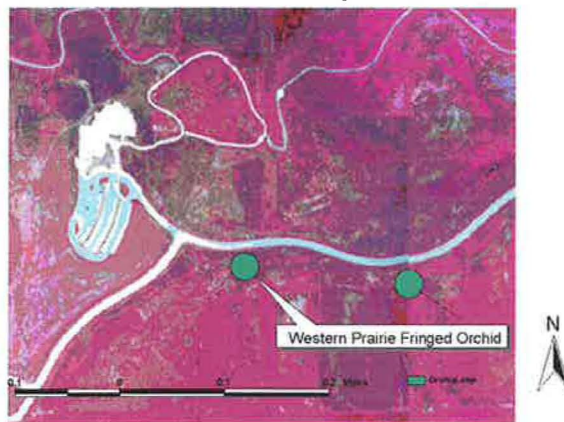
During the course of the summer Biology staff potted over 200 clumps of bluejoint grass (*Calamagrostis canadensis*) collected from the yard of volunteer seed collectors Dan and Laurie Fenimore. A native moist soil species, the plants will be used to fight reed canary grass and for gully and streambank stabilization. The potted plants were placed in trays and have been housed in the research greenhouse. The trays are kept full of water to maintain sufficient soil moisture and the plants are thriving in this controlled environment. There was a limited number of trays without holes, so we were not able to maintain all the plants in standing water. Those without water are soaked each morning and although still very healthy, they do not appear to be quite as vigorous as those with constant access to water.

Western Fringed Prairie Orchid Introduction

On July 14, volunteers assisted the Refuge biologist in transplantation of seedlings of the federally threatened western fringed prairie orchid (*Platanthera praeclara*) to sites on the Refuge.

These plants were the result of a propagation project instigated by orchid researcher, Margaret Fromm. Dr. Fromm is the only individual who has successfully propagated western fringed prairie orchid from seed in the lab. Propagation is accomplished using sterile conditions and methods similar to tissue culture. The Refuge is the recipient of the orchids at the request of the Iowa Department of Natural Resources who has been tracking progress of Dr. Fromm's propagation efforts.

Location of Orchid Transplants



On August 8, six more seedling orchids were transplanted to a second site. Seedlings existed as a single green shoot or leaf per plant. Though the shoot stayed green on some orchid plants, some were not relocated later in the year. Orchid growth or mortality will be tracked through 2002.

Volunteers Karen Balmer and Lynn Huebler worked through the summer on a project to concentrate plant diversity and accelerate ecological development in an area of high visibility to the public near the Prairie Learning Center. As a result, they transplanted a variety of forbs and some grasses from the greenhouse to an area adjacent to the Overlook Trail. Karen and Lynn took great care in the transplantation of the seedlings, placing stakes near each plant and monitoring the condition. In addition to transplants, they collected seed from appropriate prairie seed sources and interseeded their area. All activities and seed/plant sources and numbers or amounts planted are carefully documented.

During drier weeks, they watered all of the transplants by hand, daily if needed, and less frequently if the soil was moist. Already the dedicated work and strange tags along the trail have attracted attention, fulfilling another of Karen and Lynn's goals, that is of interpretation. This couple has become an important interpretive tool for the Refuge, explaining their work while carefully tending their planting.

Jonathan Yentis continued his dedication to the Refuge this year, perfecting the art of seed cleaning and providing guidance to others as a Seed Cleaning Team Leader. Jonathan has been incorporating some of the mid-sized machines from the maintenance building in his seed cleaning work and finding more efficient ways for us to clean our large and small quantities of hand-collected seed. Also Jonathan provided the Friends with "Gentle Breezes from the Prairie" email updates about stewardship events and Friends' activities. In addition, Jonathan has been the instigating force behind the fourth Thursday Stewardship events.



Volunteers clean seed in the labs at Neal Smith NWR

LaVerne Collister and Dan and Laurie Fenimore have continued their hard work and dedication as Seed Team Leaders. These folks coordinate schedules with volunteers and landowners off-refuge to provide approximately 130 species of prairie seed for propagation and for increasing diversity directly into fields. With their keen plant identification skills and a willingness to adventure into the prairie remnants of surrounding counties, these and many other seed collectors have contributed greatly to the diversity and quantity of hand-harvested local ecotype seed. The Fenimores have also provided the production greenhouse with several flats of species they germinated in their home.

Texas native and Grinnell College master's student Malinda Slagle volunteered her talents and considerable knowledge with the Biological department for two weeks during July. A former U.S. Park Service employee with experience in invasive species, Malinda proved to be a tremendous help in our war on switch grass cultivars and sweet clover in Coneflower Prairie. In addition to her help with these and other activities, Malinda brought a positive attitude and good sense of humor which helped us to keep working at some tedious tasks during the hottest part of the summer.

Another familiar face in the biology labs and in plantings was Glen East. Glen was a valuable resource to our seed cleaning projects this year. His dedication to the often-tedious work of cleaning the hand-harvested seeds was coupled with a willingness to interpret his work to volunteers, students, and casual visitors while working.



Cardinal flower (Lobelia cardinalis), is one of many species whose seed is collected and cleaned by volunteers.

Volunteers who assisted with ecological work this year are too numerous to mention all the names. However, without the passionate efforts of the many volunteers, biology staff would not have been able to make so much progress this year, and we are deeply grateful for their help.

Monthly Biology Stewardship Activities

The Refuge Friends group holds volunteer stewardship activities on the second Saturday of each month and a smaller yet equally dedicated group of volunteers turns out on the last Thursday. The Second Saturday stewardship days are focused on the Friends' Prairie area of the Refuge which provides the Friends with an opportunity to develop a sense of ownership and responsibility for a piece of the Refuge. The work days also serve as an educational and recreational connection to the reconstruction process. The Second Saturday stewardship days have proven to be effective tools for harnessing the power of a dedicated work force to accomplish Refuge needs and goals. Though a crew of 6 to 60 people of all ages is possible, a dedicated core of regular attendees helps coordinate activities efficiently with Refuge staff. Their knowledge of Refuge needs and goals allows them to work more independently and accomplish more.

The Thursday evening events were requested by Refuge volunteer Jonathan Yentis as an alternative time for those not able to regularly attend the Saturday events. We also try to have a member of the staff take part to incorporate an educational program related to the work to be performed. Fewer volunteers are able to attend, but a smaller group allows us to interact more personally with them and increase the educational value of the experience. Many of those who attend the Thursday evening programs also attend the Saturday events and they have been able to assume leadership roles for less experienced volunteers.

Some of the efforts for which the volunteers have played a key role include seed collection and processing, invasive species removal, brush clearing, and bluejoint grass potting. These fun and educational events have become a focal point for volunteer activities.

Off-Refuge

Approximately 9,000 lbs. of bulk seed was transferred to Iowa DNR as part of the partnership for using local eco-type seed on Iowa restoration sites.

2.c. Deepwater/Riverine Restoration

On-Refuge

Nothing to Report

Off-Refuge

Nothing to Report

3

Habitat Management

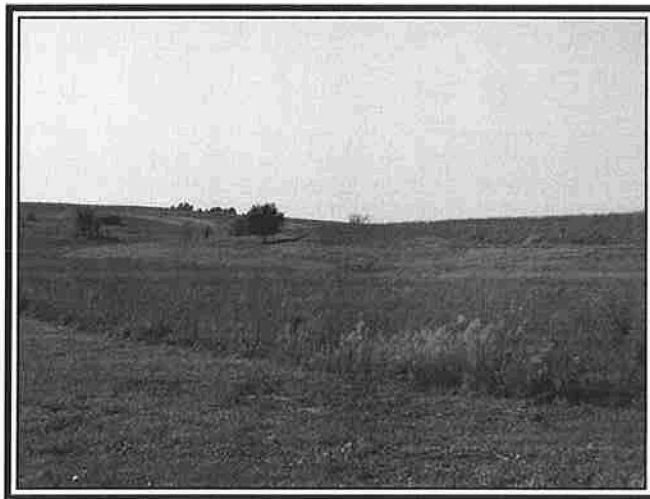
3.a. Water Level Management

Nothing to Report

3.b. Moist Soil Management

Nothing to Report

3.c. Graze/Mow/Hay



Planting site within the bison enclosure

The Refuge is currently able to support 35 head of bison and 15 elk within its 750 acre enclosure. These herds are on a continuous grazing regime and the enclosure is estimated to produce approximately 1,125,000 to 1,500,000 pounds of forage annually. Combined forage consumption by the animals is estimated to be no more than 450,000 pounds each year. The newly established prairie within the enclosure is barely capable of sustaining the

current herd size at a 35 to 40% utilization rate, without slope corrections. Bison herd reductions will be made in October, 2001 and as needed each year to prevent habitat damage while still playing a vital role in the establishment and ecology of the prairie. (See 4.c. Reintroductions)

Mowing is an integral part of prairie reconstruction at Neal Smith NWR. Mowing takes place as a first and second year management tool on new prairie plantings, and is used to control broadleaf weeds and woody vegetation to promote native growth. Approximately 840 total acres were mowed in FY01, consisting of prairie plantings, firebreaks, demolition sites and weed management sites. Several of these areas were mowed more than once.



Trees can quickly establish themselves and become dominant on the landscape



Area mowed to control the invasion of trees in CRP

3.d. Farming

Nothing to Report

3.e. Forest Management

Nothing to Report

3.f. Fire Management

The Refuge Biologist completed the Prescribed Fire Planning and Implementation course for Burn Boss certification. There was some difficulty completing the final Task Book sign-off due to the frequency of high winds and rain, making it difficult for a certified Burn Boss to assist in the process. During one attempt, fire was ignited and rain began within 10 minutes of ignition, extinguishing the fire. In order to complete the task, Ms. Drobney went to De Soto NWR and served as Burn Boss. Special thanks to Mindy Sheets, De Soto Burn Boss, and all the staff who helped facilitate completion of this vital task.

Unfortunately, weather unfavorable to burning continued throughout the spring season, with only three days actually recorded as being in prescription. Of these, two occurred on Sunday, which were considered days off for burning. As a result, during the Spring, no burning occurred except a small area less than an acre in size that was extinguished by rain.

Burn Plans

Burn plans for all areas of the Refuge were revised this summer. The boundaries for each prescribed fire were re-drawn to incorporate more natural firebreaks and enhance the safety of each burn. Rewriting of the plans was carried out by the Refuge Biologist, with many hours contributed by Fire Tech Angela Sokolowski, Bio Tech Charland, and Dan Angelo, Region 3 Fire Specialist. GIS mapping assistance was provided by volunteer Ron VanNimwegen.

Wildfire

No wildfires occurred this year.

3.g. Pest Plant Control

Canada thistle is a problem throughout the Refuge and is treated using TransLine and early mowing. Strategies to eliminate this problem species are being explored by the Refuge Biologist. Reed canary grass is a problem in dry creek bottoms and will be treated with well timed mowing and spraying sequences using Round-Up. Approximately 300 acres of invasive plants were controlled during FY 2001.



Site with thistle invasion was treated with Transline and later mowed

Maintenance Mechanic Brian Boot took possession of the Hydra-axe for several weeks and took out about 40 acres of larger trees and brush areas. The dramatic change was evident from day to day as the face of the prairie landscape began to emerge in many areas.



Maintenance Mechanic Boot preparing to use the Hydra-axe



Before Hydra-axe



After Hydra-axe

The Biology Department had an active and productive year in controlling unwanted and invasive plant species. Control measures took many forms and were species specific. Yellow sweet clover (*Melilotus officinalis*) and white sweet clover (*M. alba*), were targeted by manual removal and to very good effect. Several full days of pulling eliminated a large percentage of the potential seed crop. Reed canary (*Phalaris arundinacea*) patches in the Friends' Prairie and on the Interpretive Trail through the Thorn Valley Savanna were chemically treated with Round-up, as were crown vetch (*Coronilla varia*) and an exotic species of *Rubus* in the Game Farm remnant. We used both manual removal and herbicide on a switchgrass (*Panicum virgatum*) cultivar invasion in the Coneflower Prairie remnant.



After invasive woody species are cut by volunteers, they are treated with herbicide by a staff member.

We closed out the year by turning our attention and our backpack sprayers on woody invaders, with black locust (*Robinia pseudoacacia*) the most numerous target. Some were given basal bark treatment but the majority were stump treated following cutting.

4

Fish and Wildlife Management

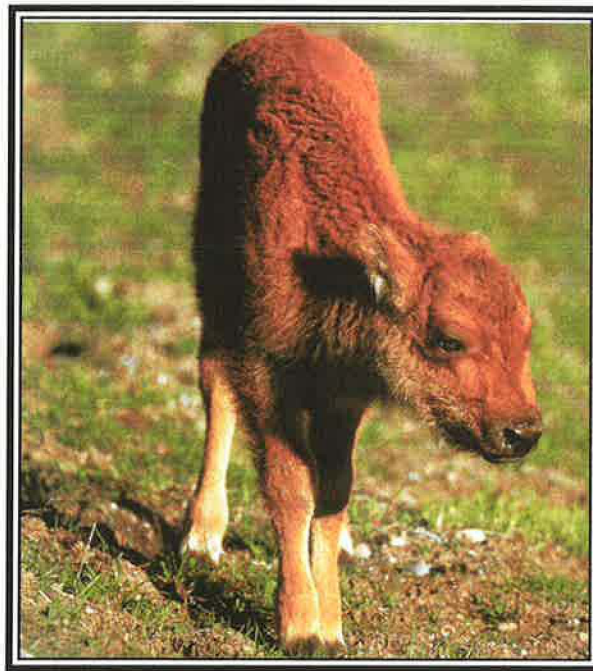
4.a. Bird Banding

Nothing to Report

4.b. Disease Monitoring and Treatment

Nothing to Report

4.c. Reintroductions



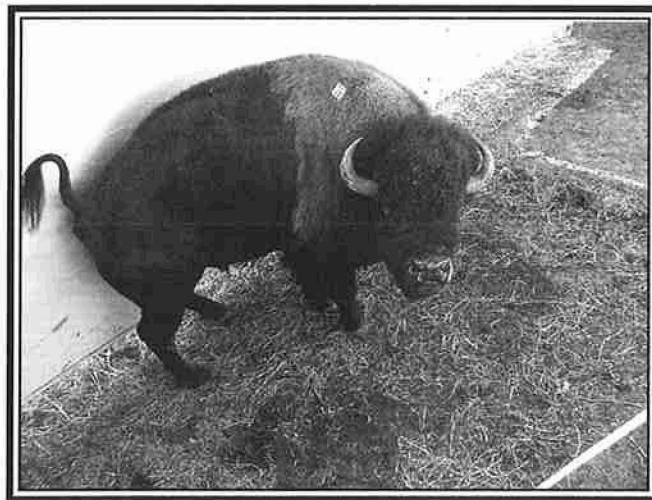
Bison calf

No new animals were introduced to the bison or elk herd this year. The bison herd of 38 increased to 53 with the births of 15 calves in the spring of 2000. This count was confirmed during the fall roundup. No herd reductions were made during the roundup but genetics and other health information was gathered on each animal. All animals were checked for previously placed pit tags or given new tags. During Spring, 2001, an additional 15 calves were born bringing the herd size to 68 animals.

Neal Smith NWR staff conducted its second bison roundup on November 1, 2000. Operations coordinated the effort with Montana State University, the National Bison Range in Montana and Fort Niobrara NWR in Nebraska. All the necessary repairs and preparations to the bison handling facility were completed and the horses readied.

Dr. Tom Roffe, DVM and two assistants from Montana State University collected genetic data and gave the animals a general physical. The bison were tested for various common bovine diseases and treated for eye injuries sustained from the tall grasses.

The Bison Range sent Loren Clary and Fort Niobrara NWR sent Mark Purdy and Casey McPeak to lend us a hand. These cowboys joined ROS Heisler and used their horses to drive the herd into the handling facility. It was an exciting roundup with folks on horses and the rest of us closing gaps and getting up close and personal to the bison using an old Chevy Blazer and a Jeep Cherokee. It took only half a day to process all the animals once they were in the holding pens. The rest of the staff worked the handling facility gates and pushed the bison through the facility. It was a great experience and fun for all who were involved.



Bison in the handling facility

Planning the next roundup began in August, 2001 with repairs and revisions to the handling facility. The temporary drive fence that was built before the last roundup was modified and strengthened with 8" diameter poles and 8' bison fencing. Since animals

would be excessed for the first time, the biologist carefully went through the records and selected which animals would be removed from the Neal Smith herd. Approximately 25% of the animals would be donated to Native American tribes and the rest would be put out on auction to the general public. Letters for sealed bids were sent out and contacts were made with Native American Tribes including the Inter-Tribal Bison Committee for bison recipients. Fish & Wildlife Service herds have been genetically tested to be "pure" bison. This makes acquisition of FWS bison especially appealing.

ELK

The elk herd was diminished by the loss of a cow and an older bull at the end of winter. The cow was found with a fetus intact. Necropsy information showed that the animals died of no exact cause. It is believed that this winter was colder with more snow pack than previous years and may have played a role in food availability. The last count on the elk herd in the fall of 2001 totaled 14 head.

See 1.c. Studies and Investigations for Regal Fritillary Butterfly Reintroduction information.

4.d. Nest Structures

Nothing to Report

4.e. Pest, Predator and Exotic Animal Control

House sparrows and mice have been an intermittent problem in the seed storage facility and trapping was an on-going effort. The purchase of plastic seed storage boxes has so far eliminated the need for this action by removing a food source. We will continue to monitor the situation.

5

Coordination Activities

5.a. Interagency Coordination

See 2.b. Upland Restoration for Introduction of the Western Fringed Prairie Orchid.

Coastal Prairie Conservation Workshop

On June 26-27, Biologist Drobney participated in a Coastal Prairie Conservation Workshop as one of two invited speakers at the National Wetlands Research Center in Lafayette, Louisiana. This facilitated meeting, jointly sponsored by The Nature Conservancy Louisiana Field Office and the USGS National Wetlands Research Center was held in response to the urgent need to preserve the globally endangered ecosystem, Coastal Prairie. These prairies have been reduced in Louisiana from a former 2.5 million acres to only 200 acres. The meeting was held to provide forum for discussion of the many issues, opportunities and concerns related to coastal prairie restoration; and to develop goals for restoration of coastal prairies. An attempt was made to identify the systems and conservation targets of concern (e.g., native prairie variants, animals, plants) and to develop strategies for conserving native biodiversity of coastal prairies.

Iowa DNR's Local Ecotype Seed Production Development Assistance

Project Leader Nancy Gilbertson, and Biologist Pauline Drobney provided guidance and cooperation in development of the Iowa DNR local ecotype seed production program by participating in two meetings with the Iowa DNR, Iowa Department of Corrections, and other cooperators to discuss methods of prairie seed increase and appropriate sources and harvest of seed. Ms. Drobney provided continued consultation to DNR staff and to the Iowa Department of Corrections Greenhouse Caretaker as a project to propagate seeds collected from high quality prairies by inmates progressed.

In addition to advice and information, the Refuge provided lab space and made seed cleaning and scarification equipment available to the DNR for preparing a few small selected seed lots for germination procedures. All seed handled by DNR staff in Refuge facilities came from the NSM local ecotype zone. In return, DNR staff provided small lots of seed for Refuge propagation purposes. This seed represents new gene pools for the Refuge propagation program.

As a member of the Habitat Management Program (HMP) Training Promises Team, Biologist Drobney, participated in several meetings and conference calls to develop a training tool for refuge biologists and project leaders engaged in HMP writing. During meetings, it became clear that wording of portions of the Refuge Management Chapter 1 (Part 620 FW1) were likely to inhibit fullest participation in HMP development by refuges that are wilderness, ecosystem preservation or ecological restoration oriented. In late December, Ms. Drobney was asked by the team to provide alternative wording to this section involving resources of concern, to be proposed as changes to the HMP Chapter development committee in Washington. Suggestions were incorporated in the final document.

Invasive Species Conference, Steering Committee and Bus Tour

On October 6-7, 2000, Biologist Drobney attended a symposium on Invasive Plants and animals in Iowa, hosted by the Iowa Academy of Science. This symposium focused on major plant and animal invasive species issues facing natural resource professionals in Iowa. Pauline subsequently became a member of the Iowa Invasive Species Steering Committee that will form the basis for an Iowa Invasive Species Council. In the past year, the Iowa Invasives Species Steering Committee met several times and developed priorities for the program. Of utmost importance is an education campaign. Another high priority is to develop a statewide database of invasive species in the state. The Committee seeks interdisciplinary support and launched a program to educate state legislators, business people, natural resource managers, and those interested in recreation to develop a unified front to combat or prevent spread of highly invasive species.

Prairie City, USA

Biologist Drobney has participated in several meetings during the past year as a Prairie City USA Committee member. Prairie City USA is an emerging new program modeled after the Tree City USA program developed by the Arbor Day Foundation. Prairie City USA is being designed to provide certification to municipalities or individuals who are doing high quality prairie plantings or preserving prairie remnants for aesthetic, scientific, hydrologic, for soil erosion control, or any of a number of other reasons to use or preserve prairie. This certification is a matter of civic pride and can be used to leverage grants for additional civic improvements.

Iowa Grassland Alliance

The Iowa Grassland Alliance is an organization of individuals and groups and agencies that seek to find commonalities in the use of grasslands in the state of Iowa. As a result, the Farm Bureau, Fish and Wildlife Service, the Nature Conservancy, and many other organizations that are often in very different philosophical camps, come to the table to discuss how grasslands, both native and constructed, can be used, created, and preserved in the best way with the greater good in mind. NSM hosted a meeting, Refuge Biologist presented information about the Refuge and led a field trip for the group.

5.b. Tribal Coordination

Initial contacts were made with the Inter-Tribal Bison Cooperative (ITBC) for bison donations. Other contacts included tribes not affiliated with ITBC. Donations were open to all Native American Tribes that were interested in obtaining pure bison genetic stock for building tribal herds. Other organizations eligible as bison recipients included local county conservation boards and other educational facilities with the means to care for the bison to use them to educate the public about the history of the tallgrass prairie.

5.c. Private Land Activities

ROS Heisler worked closely with the Natural Resources Conservation Service (NRCS), the Farm Services Agency (FSA), various Pheasants Forever chapters, county conservation boards, and private landowners to improve the Partners for Fish and Wildlife Program.

Through the Partners for Fish and Wildlife program approximately 30 site visits were conducted. Agreements were established for five of these. The remaining landowners were given technical assistance. This assistance effort affected approximately 620 acres. The agreements protected 43 acres consisting of 3 wetland acres and 40 upland acres. The restoration cost to the FWS was approximately \$5,000 for dirt work and seed purchase. In addition, partners donated time, money, equipment, goods and services.

Neal Smith NWR is responsible for 21 Farm and Home Administration easements scattered throughout 11 counties in the south/central part of Iowa. Although these easements have been under the charge of the Refuge for about 8 years, this was the first year staff had begun inspecting the easements. Surprisingly, those surveyed did not yield any glaring violations.

6

Resource Protection

6.a. Law Enforcement

The Refuge Officer during FY 2001 was Park Ranger John Below who completed ROBS in October, 2000. Compliance checks of pheasant and deer hunters are the main duties of LE Officer at the Neal Smith NWR. A special thanks to Kevin Stephenson (Laguna Atascosa NWR) who helped for a month during October/November. Walt Kocal (Special Agent) and Brent Taylor (DeSoto NWR) also helped check over 300 hunters the opening day of the pheasant season.

The recurring problem with hunters parking in field entrances and driving on fields was solved by making parking areas around the Refuge. Signs were posted saying "No Vehicles Beyond This Point" to mark the boundaries of the field entrances and parking areas. The parking areas were also noted on the hunting map. Of the ten notice of violations issued, the majority were violations for no blaze orange, not removing deer stands, hunting non-game species and not having a hunting license. Twenty-nine warnings were issued, mainly for parking along the main entrance road.

Dumping of meth lab materials is still a problem on the Refuge. The sheriff's department reported seven dump sites on the Refuge during this period. Staff members found two of those sites.

Vandalism to signs and a Refuge vehicle occurred on two separate occasions. No suspects were found. Jasper County Sheriff's office has taken the cases.

6.b. Permits and Economic Use Management

Seven local farmers farmed 851 acres of Refuge lands under Special Use Permits. Agricultural lands are kept in crops until the Refuge is ready to convert them to prairie. The farming program is designed to allow the permittee a reasonable rent on the land while giving the government a good return on the operation. Permittees are required to use "no-till" farming practices and reduce the amount and kinds of chemicals applied to the land. Rent ranges from \$60 to \$75.00 per acre which is comparable to rents collected in the area for similar ground. Rent was collected in two installments with 30% due in May, and the balance due in December. Final rent figures are based on the Report of Planted

Acres which each permittee submits to the Farm Services Agency (FSA). Deductions from rent figures include the cost of crop scouting at \$5.00 per acre, the cost of Precision Ag Services at \$7.50 per acre, mowing costs for buffer strips at \$12.00 per acre, and any chemical application in preparation for ground being planted back to native plants by the Refuge.

Crop Scouting was utilized as a part of the Integrated Pest Management (IPM) program on the Refuge. The Farmers Co-Op Exchange of Prairie City was used as in previous years. As noted above, the cost of this service was paid by the permittees and then deducted from their cash rent. Success of this program has been very good, giving both the Refuge and the cooperating farmers sound information and recommendations regarding the condition of the crops. Sometimes crop pests go above the allowable "threshold" levels and a chemical application needs to take place, thereby preventing further losses for the farmer and neighboring farms.

In addition to the Special Use Permits issued to individual cooperative farmers, one permit was issued for entry on the Refuge to perform research, and one permit provided Refuge access for photos for the Centennial Book "Wild America Takes Refuge".

6.c. Contaminant Investigation

Nothing to Report

6.d. Contaminant Cleanup

Nothing to Report

6.e. Water Rights Management

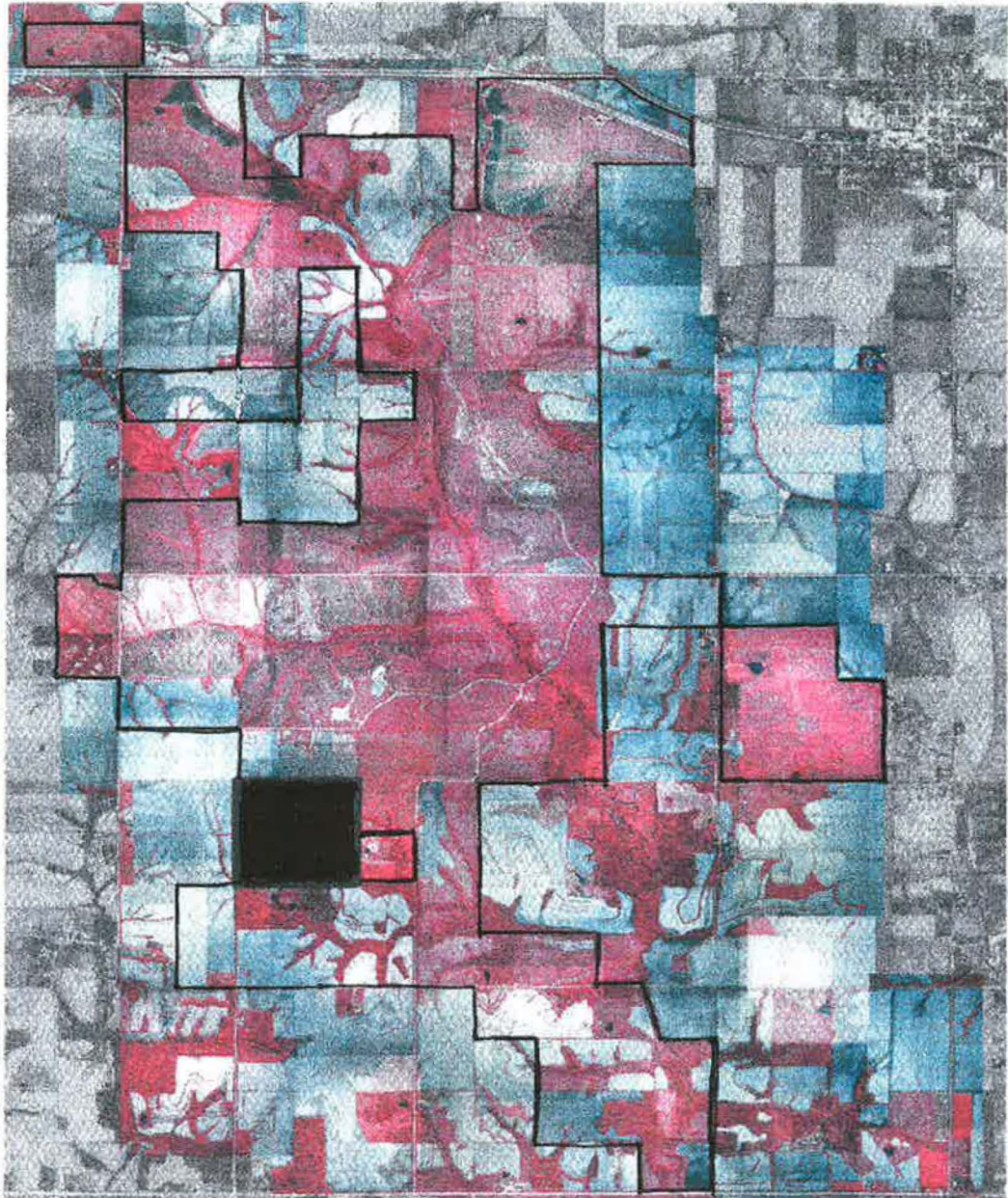
Nothing to Report

6.f. Cultural Resource Management

Nothing to Report

6.g. Land Acquisition Support

Land and Water Conservation Funds in the amount of \$500,000 were available in FY 2001 for land acquisition. Negotiations were underway early in the fiscal year for three tracts of land. One landowner signed an agreement for sale. The land was appraised and final payment will be made early in FY 2002. This 160 acre tract of land will connect two other large tracts and will be vital to controlling the vast erosion problem on Refuge lands on the east boundary of this tract.



The newest addition will bring total acres to 5,385

6.h. Threats and Conflicts

Nothing to Report

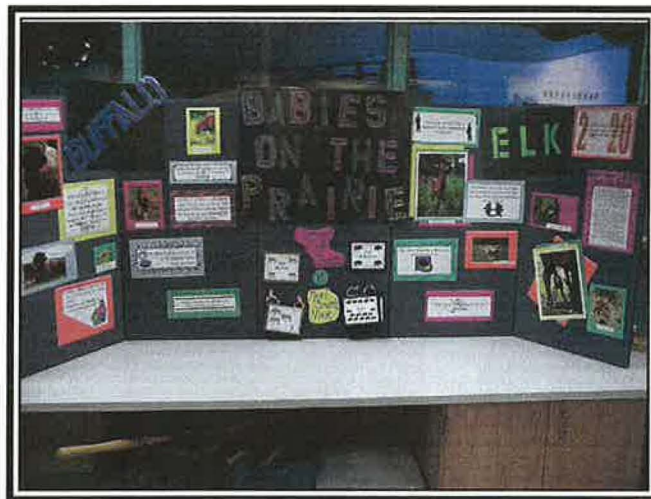
7

Public Education and Recreation

7.a. Provide Visitor Services

Public Education and Recreation

Friends of the Prairie Learning Center funded two summer interns for the Public Use program. Lacey Naaktgeboren and Ben McConville each completed the 9 week commitment to the Refuge and proved to be valuable assets to Refuge environmental education and outreach missions.



Lacey prepared this display for the State Fair booth

The Refuge recorded over 122,500 visitors in FY 2001. The majority of over 33,000 Prairie Learning Center visitors participated in scheduled educational programs, events or tours. Public use staff provided 3,296 environmental education programs for 18,483 students, scouts, and visitors during this period.

Public use staff conducted 40 guided tours of the Prairie Learning Center and Refuge for 1,200 visitors. Over 91 scheduled groups learned about the Neal Smith NWR and Prairie Learning Center during meetings and events held in the Center's conference rooms and

auditorium. The Center received over 19,790 walk-in visitors. The winter of FY2001 was extremely harsh with many days where visibility and road conditions were very poor. The Prairie Learning Center was shut down for repairs in January and February 2001. Both the harsh winter and the repairs to the exhibit hall negatively influenced the visitor counts.

Exhibits and Facilities

In April, the hours of the Prairie Learning Center were changed from being closed on Mondays to being open Monday through Saturday from 9 a.m. to 4 p.m. and Sundays from noon to 5 p.m. all year long. This change accommodates the general public and allows the center to be open on holidays such as Martin Luther King Day, Presidents' Day, Columbus Day and Veterans Day, all of which are observed on Mondays.

The multipurpose and conference rooms at the Refuge were utilized well during FY01. Numerous societies, networks, clubs and organizations held annual meetings or their own particular special event at the Refuge. All these groups were presented the Refuge video and toured the exhibits.

A collection of Native American cultural objects was donated to the Friends of the Prairie Learning Center along with a \$200,000 endowment to construct a Native American/prairie connection theme exhibit in the Prairie Learning Center. During FY01, Native American cultural objects were selected from the collection and exhibit planning went into full swing. Jeanne Herald, the NCTC Museum curator, visited the Refuge and gave us valuable information on cleaning and maintaining the collection.



Native American Cultural Objects

Environmental Education Activities

Project Bluestem

The Project Bluestem curriculum continues to gain in popularity and notoriety. In August, a request to provide a workshop in Belvedere, Illinois was made and Public Use Staff accommodated by traveling to their site and presenting to 20 teachers and 5 area

naturalists. During FY01, 130 teachers participated in five Project Bluestem (PBS) workshops. To date, over 544 teachers have attended PBS workshops, which introduces participants to the PBS curriculum and the Refuge.

School Programs

Approximately 11,620 students of all ages from 200 schools participated in scheduled activities at the Refuge. Over 90% of the school groups visiting the Refuge participated in day-long programs that utilized the PLC, trails, and public use staff. Following is a breakdown of environmental education customers by age groupings:

Level	# of Groups	# of Students
Elementary	88	6,775
Middle	30	2,511
High School	13	403
College	25	544
Day Cares	36	1,122
Home School	6	265
Teachers	12	167



Thousands of children visit our Learning Center

Special Events

Annual special events continue to be an important program element at the Refuge. These events draw large crowds of people who might not otherwise visit the Refuge. Following is a list of events held at the Refuge in FY01 during which over 1,500 visitors attended:

- National Wildlife Refuge Week
- Buffalo Day
- Wings and Wild Oats/ Junior Duck Stamp Awards
- Discover Iowa Tour with Lt. Gov. Sally Pederson
- Earth Day/Prairie Rescue Day
- Region 3 Friends Network Weekend

With Mother Nature providing the perfect day and the buffalo grazing on the hillside, the fourth annual Buffalo Day at Neal Smith National Wildlife Refuge on June 9 was a huge success. Refuge staff counted approximately 900 visitors to the Refuge, the best attendance yet for the celebration. Activities throughout the day included flint knapping demonstrations, raku pottery demonstrations, and hide scraping techniques. Indoors, children and parents were treated to stories by professional storytellers, made craft projects, and participated in fun activities. Buffalo burgers and hot dogs were sold by the Friends of the Prairie Learning Center and the Prairie Point Bookstore gave away buffalo nickels to the first 1,000 visitors. The Friends provided funding for the travel and fees for several of the speakers and entertainers.

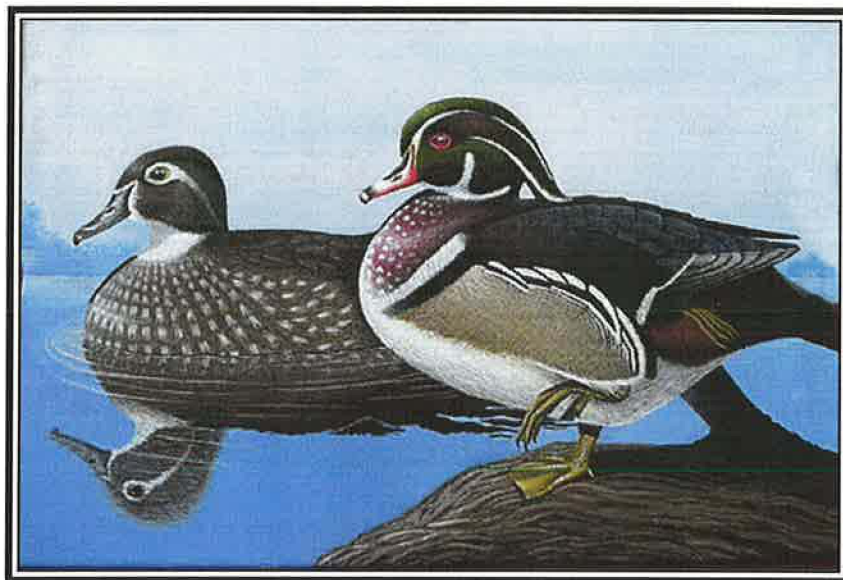


The craft booth during Buffalo Day was a hit

Birds, bagels, and brew were the talk of the day during Neal Smith National Wildlife Refuge's annual "Sow Your Wild Oats" celebration. The day began and ended with peaceful and relaxing tones where early visitors shared warm bagels and freshly brewed shade grown coffee. Throughout the day visitors read up on backyard habitat, shade grown coffees, and learned about the Cats Indoors Campaign while others enjoyed nature hikes highlighting grassland birds and their connection to shade grown coffee plantations. Junior Duck Stamp awards were presented during a morning ceremony. There were 34 schools all across the state providing 183 entries. Capping the day was a wonderful celebration that allowed visitors to participate in replanting a part of their tallgrass prairie heritage. Guitar music and song accompanied people while they sowed seeds on the prairie. Friends of the Prairie Learning Center provided funding for the music, the brew, and the bagels!



International Migratory Bird Day Planting on the Prairie



Winner of the Iowa Junior Duck Stamp

For the second year, the Refuge and O.P.E.N. (Organization Promoting Everlasting Neighbors) sponsored the Iowa/Ukraine art exchange. The program is based on the Junior Duck Stamp contest. Artwork from Iowa duck stamp winners is displayed in Cherkasy, Ukraine for part of the year and the Ukrainian artwork is displayed here.



Ukrainian winner

Lieutenant Governor Sally Pederson presented Representative Neal Smith and the Neal Smith National Wildlife Refuge certificates during her eight day Iowa tour to cities and special sites in recognition of valuable contributions to arts, culture and tourism in Iowa. The Friends of the Prairie Learning Center were vital in helping us provide a “crowd” at 8 o’clock in the morning for Ms. Pederson’s media coverage.



Sally Pederson presents Neal Smith a certificate

Scouting

Approximately 871 Girl and Boy Scouts and Cub Scouts and Brownies participated in on-site activities in FY01. Most scout groups participated in programs that include:

- Endangered Species
- Animals and Habitat
- Animal and bird migration
- Conservation

Brownies participated in animal, habitat, and watching wildlife programs; Jr. Girl Scouts studied Wildlife and Ecology; Sr. Girl Scouts took part in Wildlife and Stewardship activities; Webelos came for forestry and naturalist badges; Bear Scouts learned about "Sharing your World" and craft projects; Wolf Scouts participated in "Your Living World" and bird programs; and Boy Scouts worked on stewardship activities and helped to develop a 10 kilometer trail with an Eagle Scout project on the Refuge.



Scouts and volunteers work together

7.b. Outreach

Traveling Educational Trunks

The Refuge utilizes the Prairie, Elk, and Songbird Traveling Educational Trunks as outreach materials. Both the Prairie Trunk and the Elk Trunk were sent out four times, and the Songbird Trunk traveled twice.

Off-Site Programming

Refuge staff presented over 50 programs to off-site groups during FY01. These groups included conservation agencies, natural resources professional groups, and service organizations, sports and vacations shows, community events, parades, and the Iowa State Fair for an outreach of over 390,500 contacts.



Prairie City Old Settler's Parade Float

The parade theme was based on "Racing into the new Millennium". The Refuge bison was dressed in racing "clothes", and was heading toward the finish line which is the reconstructed prairie. Refuge staff, each representing a specific area of operation such as biologist, naturalist, fire fighter, and law enforcement officer, walked along-side the float distributing candy to the crowd.

The 2001 Iowa State Fair booth was a success. Partnering with the Friends of the PLC, the Neal Smith NWR occupied a 20' x 20' booth located next to the Governors' booth. Volunteers and staff teamed up to provide information 12 hours a day for the 11 days of the fair. The booth highlighted: the National Wildlife Refuge System with a display showing the refuges in Iowa, Minnesota, Missouri, Ohio, Illinois, Indiana, Michigan, and Wisconsin; Prairie in Progress, demonstrating native seed collection, cleaning, and planting; Babies on the Prairie, featuring the elk and bison calves; the "Friends" website running on a computer along with a number of photos of the Refuge on a screen saver; and "the ultimate crowd pleaser", our wonderful stuffed bison.



More than 300,000 people visited our booth at the Iowa State Fair

8

Planning and Administration

8.a. Comprehensive Conservation Planning

Nothing to Report

8.b. General Administration

Refuge Funding

<i>Fund</i>	<i>FY 2001</i>	<i>FY 2000</i>	<i>FY 1999</i>	<i>FY 1998</i>	<i>FY 1997</i>
1261	845,369	804,702	755,997	710,595	557,788
1261 (VOL)	7,000	4,900	6,400	8,900	2,500
1261 (LE)	500				
1262	30,000	80,000	62,700	17,200	18,750
1121	7,000	7,000	7,000	10,000	14,000
1230/1231	1,000				3,300
9110/9251	3,000	5,400	5,400	5,400	3,587
9263	15,522	10,659	11,660	44,375	
TOTAL	909,391	912,661	849,157	796,470	599,925

Funds in 1261 included \$713,069 for salaries, \$98,000 for operating expenses and \$7,000 for volunteers. A RONS project totaling \$34,000 for one GS-5 Outdoor Recreation Planner to provide visitor services was funded but we were unable to hire an individual during the fiscal year for this project. In late July, we received an additional \$500 for law enforcement equipment.

1262 funding consisted of \$30,000 for annual maintenance. We received non-game bird conservation funding of \$1,000 to assist with costs associated with printing a Refuge Bird List for our Refuge.

Major property purchases included a Kawasaki Mule and a GIS computer with a 21" monitor.

Refuge Staffing



Refuge staff, front row from left: John Below, Christy Smith, Pauline Drobney, Eric Van Zee; back row: Don Jorgensen, Jack Heisler, Nancy Gilbertson, Paul Charland, Amy Kelp, Angela Sokolowski, Heidi Rieck, Carla Dykstra, Scott Van Ryswyk, Doreen Van Ryswyk and Brian Boot

Below is a list of employees who were staff members at Neal Smith NWR during FY 2001:

<u>Permanent Full Time</u>	<u>Grade</u>	<u>OD Date</u>
Gilbertson, Nancy M. Refuge Manager	GS-13	09/98
Jorgensen, Donald E. Park Ranger	GS-12	02/01
Smith, Joyce C. Refuge Ops. Specialist	GS-12	06/00
Drobney, Pauline M. Wildlife Biologist	GS-12	03/92
Charland, Paul Bio Science Technician	GS-5	06/01
Boot, Brian A. Maintenance Mechanic	WG-9	10/92
Heisler, John E. Refuge Op Specialist	GS-9	04/95
Dykstra, Carla J. Administrative Tech.	GS-7	05/91

Below, John J. Park Ranger	GS-7	04/98
Park Ranger (Volunteer Coord.)	GS-9	07/01
Courtright, Callie Le'au	GS-9	09/99
Park Ranger (Volunteer Coordinator)	Transferred	01/01
Rieck, Heidi G. Park Ranger	GS-7	12/00
Van Ryswyk, Doreen D. Secretary (OA)	GS-5	08/97

Student Career Experience Program

Kelpe, Amy J.	GS-4	01/01
Student Trainee (General)	Terminated	08/01

Student Temporary Experience Program

Quijano, Christian F. Bio Science Technician	GS-4	05/98 Terminated 05/01
Corcoran, Adam C. Park Ranger	GS-4	12/99 Terminated 04/01
Klauke, Therese M. Park Ranger	GS-4	01/00 Terminated 04/01
Sokolowski, Angela J. Bio Science Technician	GS-4	10/99
Van Ryswyk, Scott Bio Science Technician	GS-3	06/01
Van Zee, Eric Bio Science Technician	GS-3	06/01

The Operations staff increased with hiring two STEPs. Eric Van Zee is a Criminal Justice major at University of Nebraska at Kearny, NE. Scott Van Ryswyk is a business major at Des Moines Area Community College. Both are very bright, enthusiastic and motivated young men who really made a difference in our work force this summer. Due to their efforts we were able to accomplish projects that had been put on hold due to lack of staff. We look forward to great accomplishments next year!

The Biology staff grew with the addition of a Biological Technician. Paul Charland joined our station, leaving the Detroit Lakes Wetlands Management District in Detroit Lakes MN. Paul previously worked at four other refuges in four regions with the Service and with the Bureau of Land Management. He is an avid bird watcher and we welcome the opportunity to incorporate more bird research and monitoring in our program. Paul has jumped in with enthusiasm, excellent work, and a strong sense of teamwork and is a welcome addition to our staff!

Public Use staff changes during FY2001 included Park Ranger Callie Leau Courtright transferring to Desert NWR in Las Vegas, Nevada. Callie started with us as a SCEP student and was later hired as the Refuge's first official volunteer coordinator. Heidi

Rieck and Don Jorgensen joined the Public Use staff as Park Rangers. Don heads up the Public Use Program. STEP's Adam Corcoran and Terese Klauke graduated from college and went on to pursue their respective careers in May. Amy Kelpie resigned her SCEP position in August.

Building Repairs

When the Prairie Learning Center was completed there were many problems discovered. Moisture began seeping through the floor. The roof began to leak. If that were not enough, the road developed an uneven surface. The floor was the first issue dealt with in FY2000 and repaired in 2001.

The floor of the Learning Center was built without a moisture barrier under it. Water that percolated through the loess soils would reach a less permeable soil layer then move sideways directly under the Center. Water would then seep through the concrete slab by capillary action causing the carpet in the exhibit areas and rubber flooring in the labs to loosen. Mildew and mold developed under the floor coverings creating a potential respiratory health problem.

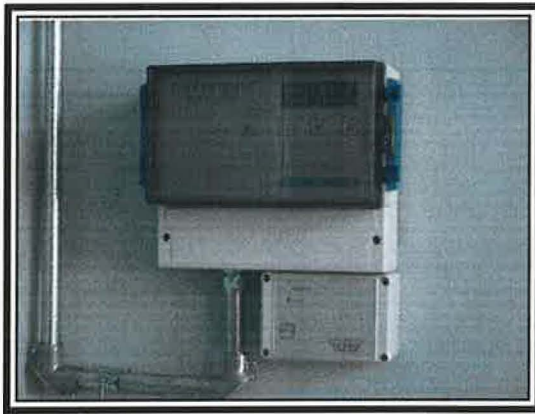
After months of investigation and discussions with the RO Engineering Department, Denver Engineering and our staff, it was decided that there were four solutions to the floor problem: 1) Tear out the entire concrete floor, install a moisture barrier and pour a new concrete floor; 2) Remove the floor covering, apply a concrete sealer and re-install floor covering; 3) Leave the floor alone but remove the rubber-backed carpeting and rubber flooring and replace it with a jute backed carpet and tile that would allow the floor to "breathe", or; 4) Install a technology that would dry the floor out and repel water away from the building, and replace the carpet.

The cost of tearing the concrete floor out was too great and too disruptive. Using a concrete sealer might create other problems or would not last very long requiring re-applications year after year. Re-applying floor sealant would disrupt the Center periodically and would be costly. If the floor was not repaired and a different floor covering laid on allowing the concrete to "breathe", the floor would still pull moisture through it eventually deteriorating the integrity of the floor and the walls of the building. The fourth solution was chosen because it would allow us to "fix" the problem without the higher cost of replacing the concrete floor.

The "Fix" - Electro-Osmotic Pulse Technology (EOP)

EOP technology has been endorsed by the U.S. Army Corps of Engineers and other federal government facilities across the country. It was originally developed in Europe during the 1980's. ROS Smith visited a facility in South Carolina where EOP had been installed in a mechanical room of a barracks. The room would flood periodically with water levels reaching 2 to 6 feet deep. It had been a little over a year since EOP installation when ROS Smith inspected the facility. After installation of EOP the room had not had a single flood event and the walls were dry enough to feel "dusty" to the touch. The Operations staff at the facility praised the technology for its effectiveness and no maintenance needs.

After removing the floor covering from the Learning Center, grooves were cut into the concrete and wires (anodes) were imbedded into the grooves and patched over with concrete. Copper grounding rods (cathodes) were inserted into the surrounding earth. EOP Central Control Units (CCUs) were mounted on the walls and the wires from the anodes and cathodes attached to them. The CCU delivers a series of low voltage pulses to the anodes and cathodes. These pulses create an electric field inside the floor that causes water to move from the dry side (interior) to the wet side (exterior). The electric current allows the water to flow against the direction of flow induced by the hydraulic gradient. The EOP system also reduces humidity which eliminates the source for mold, mildew and fungus. Once the EOP was installed, new floor covering was installed.



Central Control Units (CCU)



Grooves being cut into concrete floor



Before



During



AFTER!!!!

The wood arbors around the front of the Prairie Learning Center were re-vitalized with 3+ new coats of stain. A little maintenance goes a long way in waking up the appearance of a building.

Volunteer Program

Volunteers at the Neal Smith National Wildlife Refuge-Prairie Learning Center are continuing to be a useful tool in restoring the tallgrass prairie and helping with environmental education and special events. Volunteers contributed 16,389 hours to the Refuge this past year. As one of the largest tallgrass prairie reconstruction projects in the United States, our volunteers donated 6,912 hours working on upland restoration, 728 volunteers hours helping with mowing and pest plant control, 6,788 hours providing visitor services and outreach and 1,961 hours with Surveys, Censuses and Investigations.

Highlights this year include:

- Volunteer Recognition and Awards Banquet, which was attended by eighty volunteers
- Stewardship Saturdays
- Buffalo Day
- Earth Day
- New Recycling Program
Twice a month volunteers take our recyclable bags to the Artistic Waste Services and cash in our refundable cans and bottles.
- School groups also aid in donating time and energy. Sixty school groups donated over 5,000 hours collecting seeds, cleaning seeds, and removing brush.
- Volunteer Committee was formed to help with forms, data, training opportunities, and the recognition dinner.
- Bookstore volunteers averaged over 50 hours per week.

The volunteers can be broken into the number of volunteers by age:

Under 18	5,000 (School and Scout groups)
18-35	30
35-61	66
Over 61	37

Friends of the Prairie Learning Center

The Friends continue to be an invaluable asset to the Refuge. They provided funding and “extra hands” for a number of activities the past year. In November, the Friends along with the National Wildlife Refuge Association hosted a Region 3 Friends’ Networking workshop at the Refuge. In February, the Friends helped to make our Annual Volunteer Banquet a huge success by assisting with the decorations and musical entertainment. In April, the Friends helped with the Wings and Wild Oats Festival and provided bagels and shade grown coffee for the visitors. The Friends hosted a Region 3 Friends’ Networking Meeting in May at the Refuge and provided breakfast, lunch, snacks, and dinner for the two day event. The Friends supported Buffalo Day in June with entertainment and guest speakers. The Friends’ Prairie Point Bookstore funded four internships as they have done in past years. In August, the Friends helped with half of the \$3200 rental of the Iowa State Fair booth and provided pencils with the refuge name to hand out.

This year, the Friends undertook a project to build an exhibit in the Visitor Center through a generous donation from a widow whose husband was an avid collector of Native American

objects. She wanted to provide the collection as an educational tool for school age children and donated the items along with funding to build an exhibit. The design company who had done the original Refuge exhibits had formed a new company and was contracted by the Friends for this project. The exhibit will be completed in FY 2002.

The Friends' website www.tallgrass.org gets over 6,000 hits per month and is updated by one of their board members. The Refuge uses this website extensively to get information out quickly and efficiently.

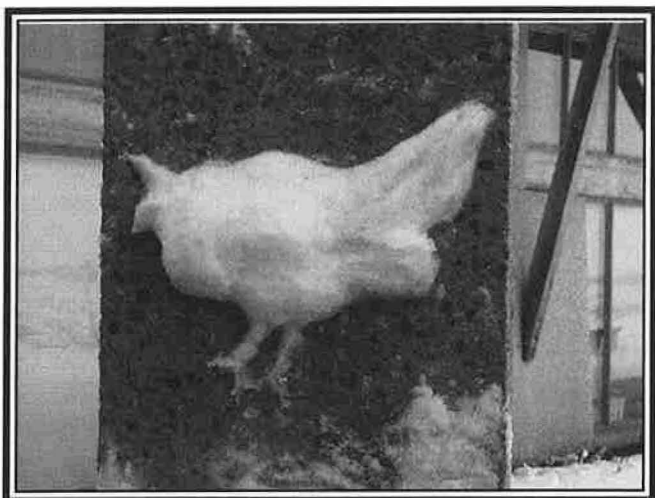
The monthly Stewardship Saturday and Thursday evening are hosted by the Friends for volunteers. Although a Refuge staff member is present to assist, it is generally a Friends' member who organizes and leads the program.

The Refuge continues to benefit greatly from the "Friendship" of this organization.

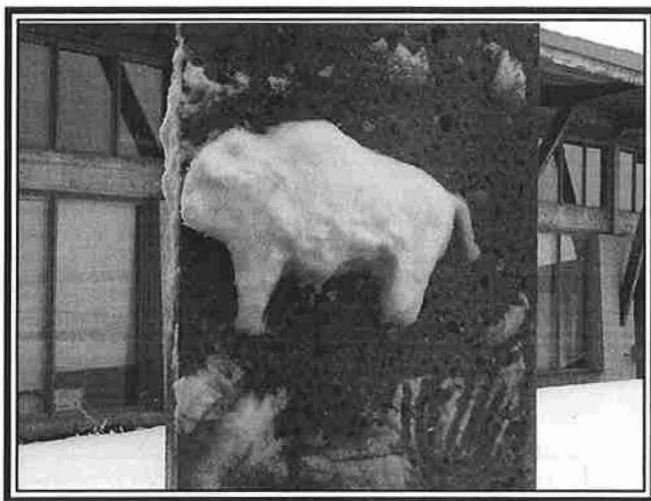


Region 3 Friends' Networking group takes a lunch break

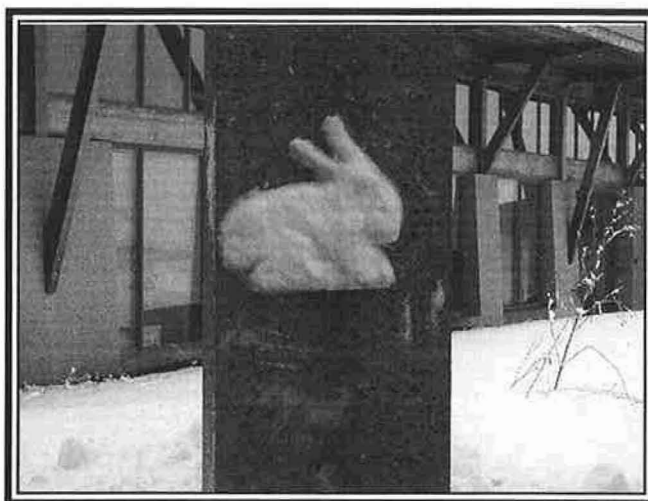
I would like to thank all the staff members who contributed to this narrative and to end this year's narrative on a playful note with some photos showing the staff's artistic abilities. During the winter of 2000/2001, Iowa had record snowfall and one of the "longest" winters in awhile. The staff took advantage of one of the post-snow storms to create some snow art on the posts leading to the Visitor Center.



Prairie Chicken



Bison



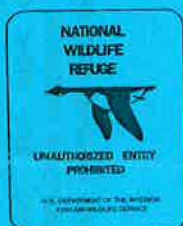
Rabbit

Neal Smith National Wildlife Refuge Hunting Map 2001-2002

*Refuge Signs -
Know Their
Meaning!*



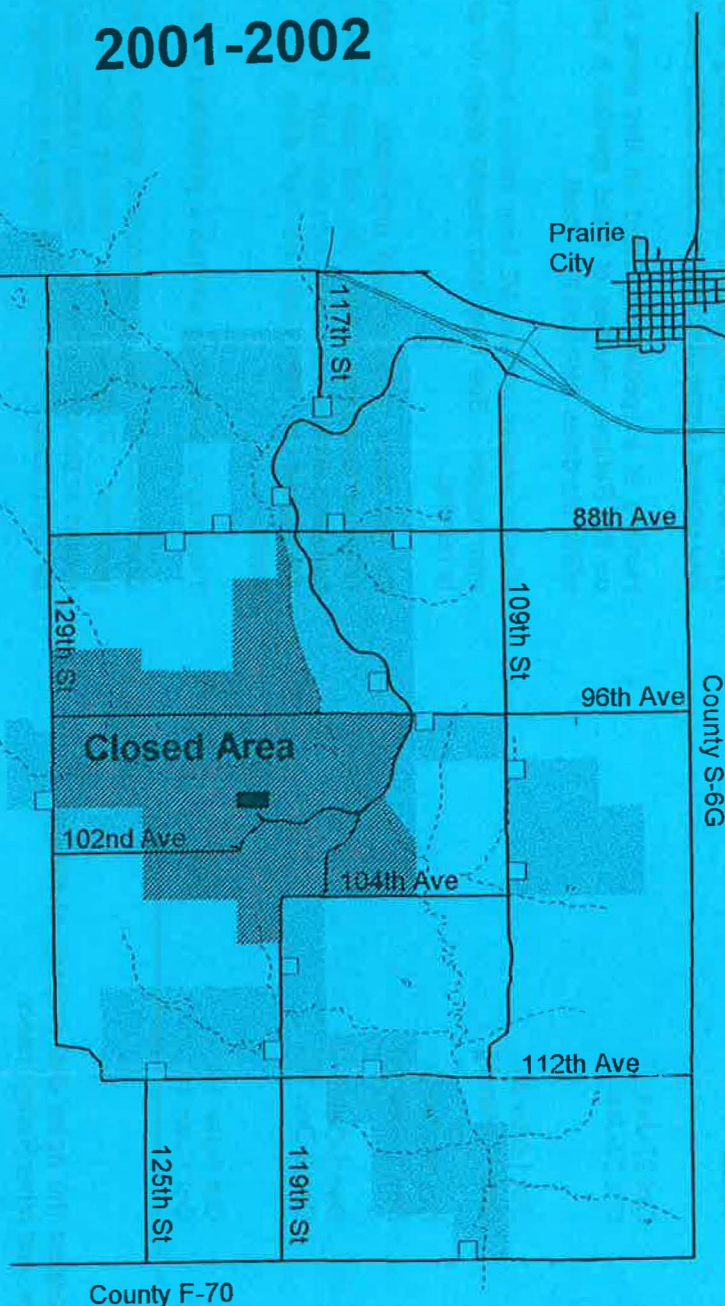
*Hunting
Prohibited*



*Refuge
Boundary*



*No Public
Entry*



- Parking areas
- Prairie Learning Center
- Roads
- Streams
- Closed area
- Refuge Boundary

Neal Smith National Wildlife Refuge Hunting Seasons 2001-2002

Note: All hunting on the Refuge ends January 10, 2002.

<u>Game</u>	<u>Dates</u>
Upland Game Birds	
Rooster Pheasant	Oct 27-Jan 10
Bobwhite Quail	Oct 27-Jan 10
Whitetail Deer	
Bow	Oct 1-Nov 30 Dec 17-Jan 10
Muzzle Loader	Oct 13-Oct 21 Dec 17-Jan 10
Shotgun	Dec 1-Dec 5 Dec 8-Dec 16
Small Game	
Squirrel	Oct 1-Jan 10
Cottontail Rabbit	Oct 1-Jan 10

Hunter Ethics

- Ethical hunters respect the rights and property of Refuge tenants, neighbors, and other Refuge users.
- Be alert for trespassing. Watch for boundary and closed area signs, as shown on the map side of this sheet. Please be aware of the litter problem. Everything you brought to the Refuge must go with you when you leave.

Hunting Regulations

Please refer to the State of Iowa Hunting Regulations for shooting hours, definition of approved weapons, clothing, bag limits, license requirements and other important information. Contact the Iowa Department of Natural Resources at (515)281-5145.

Special Refuge Regulations

Below are regulations specific to hunting on the Neal Smith National Wildlife Refuge. These do not include all applicable regulations. Direct any questions to a Refuge Officer.

- **Non-toxic shot is required for the hunting of small game and upland game birds for the 2001-2002 season.**
- Hunting of a species not listed on this sheet is prohibited on the Refuge. Hunting of listed species is permitted only within the dates listed on this sheet.
- Refuge access is from 1/2 hour before sunrise to 1/2 hour after sunset. See map and posted signs for areas closed to hunting.
- Do not block roads or field entrances. Do not drive into fields or grassland areas. Do not park on Refuge roads, including entrance road and auto tour loop. Parking lots are designated on the map; do not drive past the yellow posts.
- Trapping of fur-bearing animals is prohibited on the Refuge.
- Construction or use of permanent stands or ladders is not permitted. Portable stands may be used but must be removed at the end of the day. Steps, ladders, and stands will be constructed in a manner that does not damage trees.
- All persons engaged in gun hunting activities are **required** to wear an article of solid blaze orange outerwear or a hat.
- When hunting deer with firearms, refer to the State of Iowa Hunting Regulations regarding clothing.
- **Report all accidents and injuries to Refuge Headquarters:**
Neal Smith National Wildlife Refuge
P.O. Box 399
Prairie City, IA 50228
Telephone: (515)994-3400



U.S. Fish & Wildlife Service Neal Smith National Wildlife Refuge

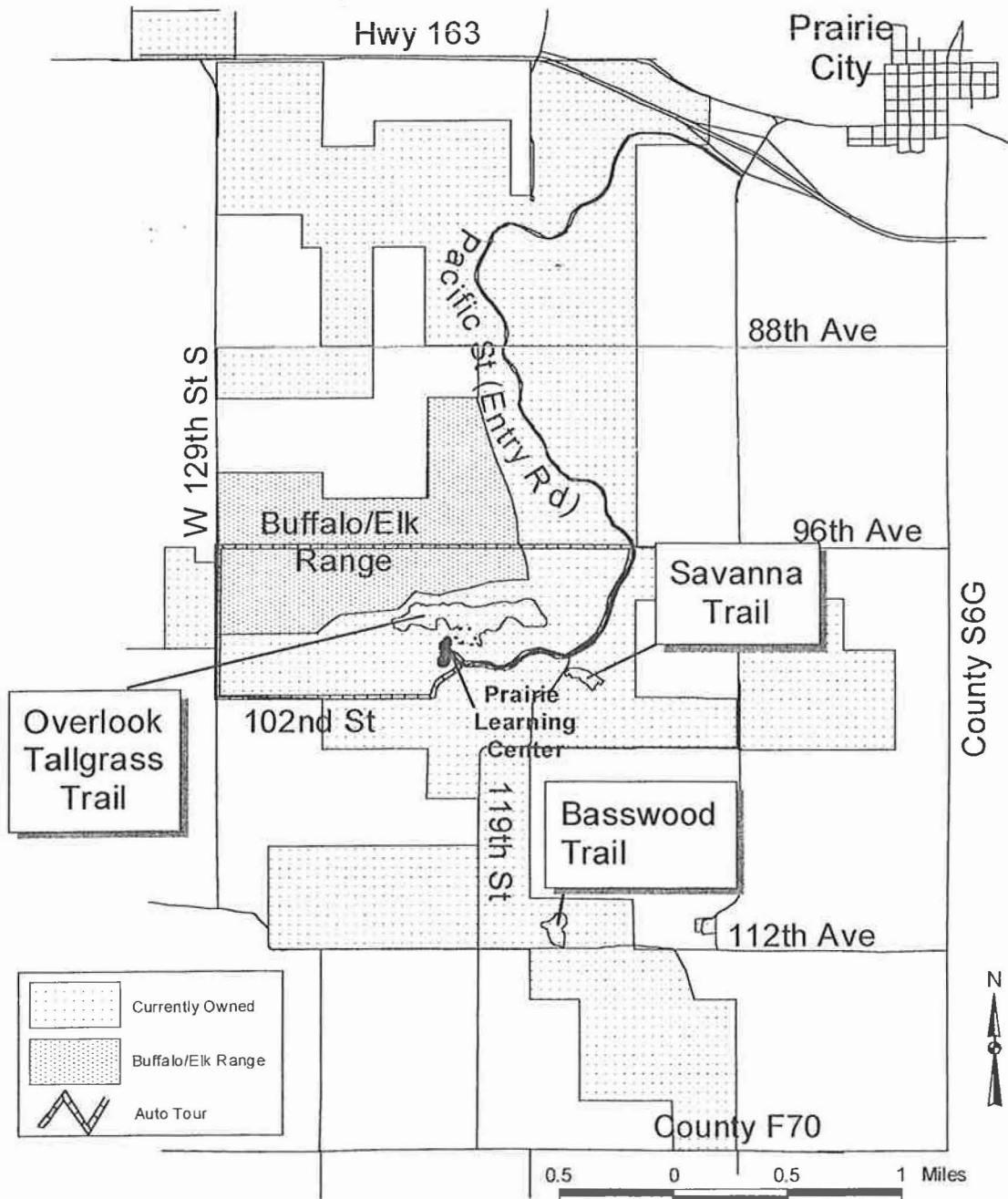
PO Box 399, Prairie City, IA 50228 (515) 994-3400

Prairie Learning Center hours:

Mon. – Sat. 9 am – 4 pm

Sunday 12 pm – 5 pm

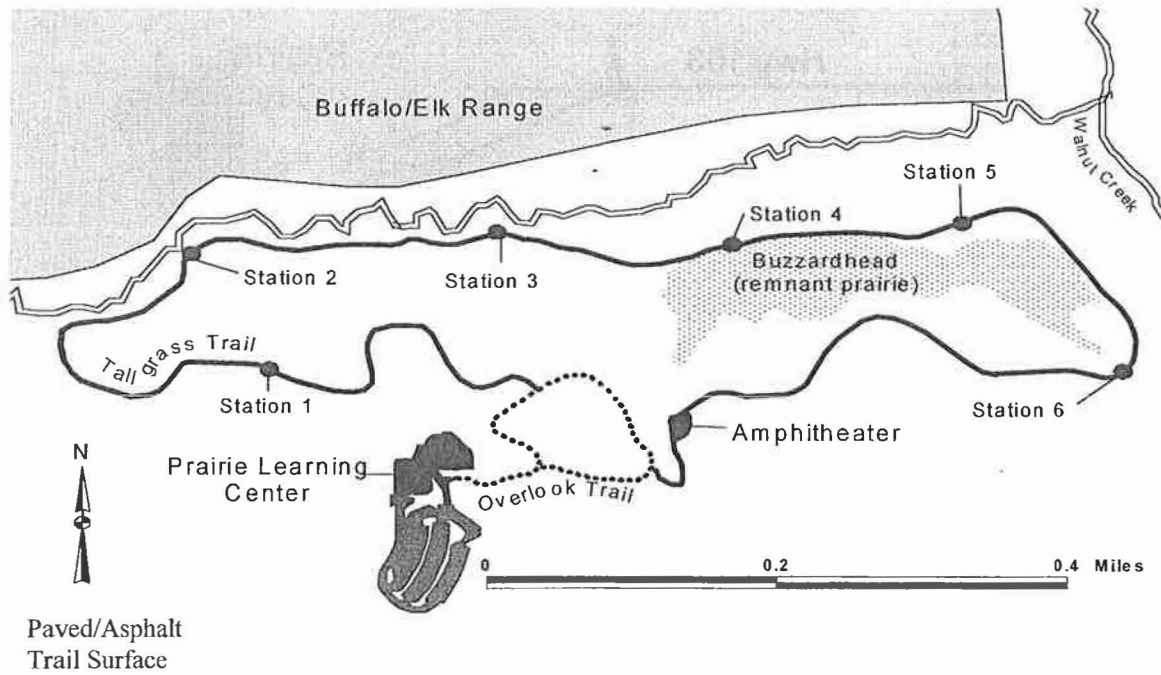
Auto Tour Route and Trails: Daylight hours



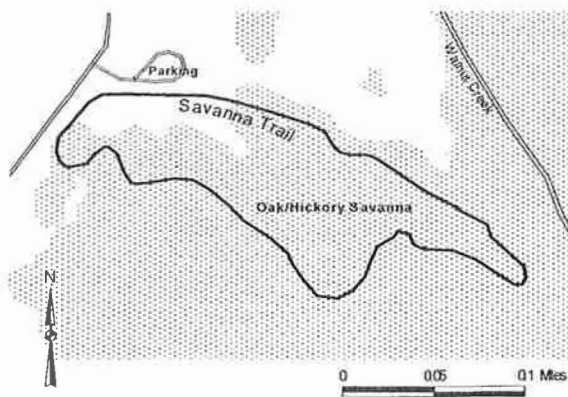
Neal Smith NWR Trail System

Trails are open for foot traffic only during daylight hours.

Overlook/Tallgrass Trails

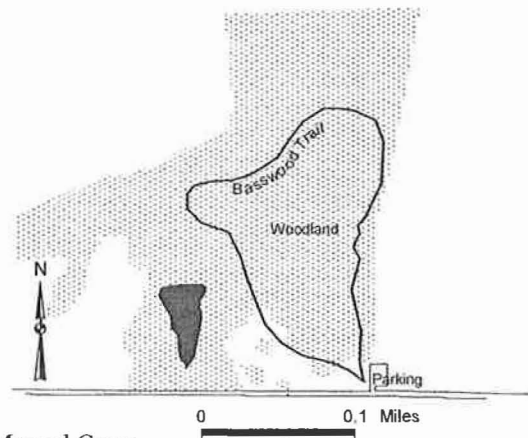


Savanna Trail



Graveled/Woodchip Trail Surface

Basswood Trail



Mowed Grass Trail Surface

PRAIRIE WIND

VOLUME 7 - NUMBER 4

WWW.TALLGRASS.ORG

WINTER 2000

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The Manager's Corner -- Crop Circles ?

By Nancy Gilbertson

Crop circles? Giant gopher mounds? Do you ever wonder what the heck we are doing with the prairie when you visit the refuge?

It sometime looks as though the tractor operator was asleep at the wheel when he or she mowed the fields. The mowing patterns aren't uniform like those found in an agricultural field. Because the outcome of our planting is to have a healthy native prairie, we sometimes "spot" mow only the troublesome areas, whereby saving the well-established areas to do their thing. Spot mowing is a part of a program to control plants such as Canada thistle and sweet clover. It may look like crop circles but it's no mystery and eventually we won't have to do it.

Onto the next mystery – those big brown defoliated areas. This is a product of herbicide application to, again, reduce certain "weedy" non-native plant species. For a variety of reasons – poor soil condition, unusual weather patterns, low viability of seed – certain plantings are not as successful and develop more weeds. The solution may be to apply one or more of these treatments including herbicide application, mowing, and/or burning. In the case of the herbicide applications along the entrance road, we are in the process of replanting these areas.

Number 3: "What are all those flags

doing out there? It looks like a circus!"

The flags are a necessary part of a monitoring program. Once the projects are completed, the flags will be removed. We are gathering information on such projects as monitoring the prairie violets that were planted in conjunction with the regal fritillary butterfly reintroduction study; marking tree stumps that need to be treated with an herbicide; locating vegetation transects (we establish transects and monitor the vegetation to measure the condition of our prairie reconstruction efforts); and so on.

Are you wondering about the "gopher tunnel" around the back of the building? We installed some drainage tile along the building and back-filled the ditch. We had been waiting for some rain (remember when we were in a drought?) to compact the soil. Now that it has rained, and the soil is "settled" we will finish packing the soil and contouring the area to match the surrounding site this fall. In this way, we hope to avoid it caving in, causing an unsightly dip.

I can't tell you how many times in my life I have driven by something and wondered, "why are they doing that?" I'll bet that most of the time, if I had stopped and asked they would have gladly explained. If you ever have a question about what's going on, give us a call, write, email, or stop by and ask. We are always glad to unravel yet another mystery of the refuge system!

PRAIRIE WIND

Fall 2000

Volume 7/Number 3

Published by the
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Prairie Wind is a newsletter about the activities of the Friends of the Prairie Learning Center/Neal Smith National Wildlife Refuge. To subscribe, send your name and address to Friends of the Prairie Learning Center, P.O. Box 399, Prairie City, Iowa 50228. Visit our website at www.tallgrass.org.

Prairie Wind is printed on recycled paper using soy-based ink.



Know Your Prairie Plants, *In Winter*

by Penny Thomsen

Winter is approaching and with it will come a change in our view of the prairie. Gone will be the purple of New England Aster and the yellow of Stiff Goldenrod. This will be replaced with the brown twisted shapes of the past seasons' growth.

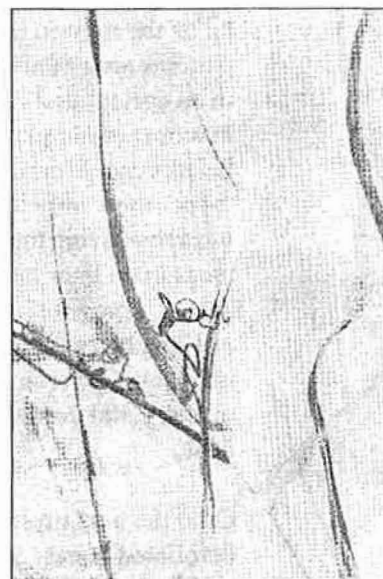
The lower picture of **Compass Plant** (*Silphium laciniatum* L.) which was featured in the summer issue, now shows a different but very distinct look. The leaves, which grew to a length of one foot are now a curled and smaller version of its summer glory. Yet its leaves cannot be mistaken for any thing but compass plant. Even in its dormant state it is still a flagship of the winter prairie.

This second picture is of **Indian grass**: *Sorghastrum nutans*.

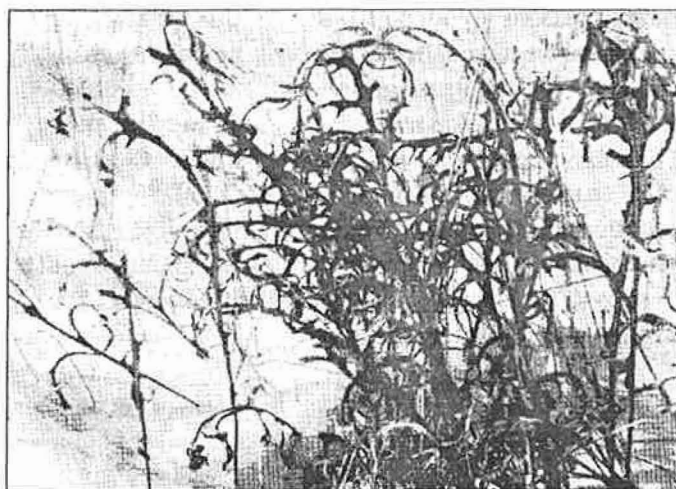
Indian grass shares the prairie with big bluestem, although it likes more mesic sites. It can compete with Big Blue in height, growing as much as eight feet, the stems are stout, erect and unbranched. Scaly rhizomes, which form an extensive root system, are just one way it reproduces. The leaves are less than 2 feet

long and spread at a 45 degree angle from the stem. As the seed matures the tip begins to nod. Indian grass is nutritious forage, which can be used as hay. It also makes a great border for wildflower gardens. Looking at this picture it is hard to imagine that this plant once towered above most of its prairie neighbors.

Get out and discover the winter images that the prairie has to reveal. Hope to see your tracks in the snow along with mine.



Indian Grass



Compass Plant

Intern Update

The following are reports from our summer interns, Jennifer Bovee and Rene Richter.

Butterfly Project - Summer 2000 Jennifer Bovee

My internship at the Neal Smith NWR has been a great learning experience. Before I began, I had no idea what to expect. I was hired to work on the butterfly re-introduction that was being led by Dr. Diane Debinski from Iowa State University. I soon found that there was a lot of preparation to be done before we brought a rare butterfly, the Regal Fritillary (*Speyeria idalia*), to the Refuge.

The Prairie Violet (*Viola pedatifida*) is one of the host plants for the Regal Fritillary larvae. Over the past two years, thousands of violets have been planted on the Refuge in twenty-five plots in five different locations. Each plot is eight meters by ten meters and each contains 99 plants. In the spring when the violets were blooming, they were counted to find out how many had survived. The violet mortality ranged from 50% on the bison plots, to 94% on the burn plots.

The Regal Fritillary usually emerges in July, with the males emerging about two weeks before the females. We have taken four collecting trips to look for Regals this summer, but we only brought butterflies to the Refuge from two of them. We have placed a total of four female butterflies on the prairie, all of which came from Ringgold Prairie in southern Iowa. Once we brought the butterflies to the refuge, they were placed in a mesh cage on top of a violet. We added nectaring flowers and we moved the cage daily in hopes that the female would lay her eggs near more than one violet. We have also seen Regals on the prairie! I have had two sightings of a female and Pauline Drobney, the Refuge biologist, saw a male Regal in the savanna parking lot in June.

As an intern, I also had the opportunity to be involved in many different

learning experiences. I had the opportunity to attend the North American Prairie Conference in Mason City, banded Canada Geese at Union Slough NWR, and I learned about prairie plants from Pauline. I also did a lot of stewardship work around the prairie, especially in the area of weed suppression. I really appreciate the opportunity that I have been given to spend the summer working at the Refuge.

The Canada Thistle Suppression Study Rene Richter

This is the second summer of the Canada Thistle Suppression Study. The first intern, last summer, was Angela Sokolowski. She was able to obtain and gather biological and physiological data on the Canada Thistle. She was also able to decide where the study should be performed; it was on a site south of the Learning Center and a rough estimate of where the thistle populations were the densest.

My internship is a spin-off of Angela's, because my main objective was a little different. I was to find some background data, the perimeter of the plots and to set up how the rest of the experiment was to go. I accomplished the first goal with a lot of help from volunteers and Angela. We went out into the field and measured and used the global positioning system machine or GPS to record the points. We also recorded the area of our cores on two-foot contour topography maps. The second goal is what took the longest, after many weeks of looking for thistles in the tall grass we finally were able to complete a map of all the populations of thistles. This was especially difficult because we would think that we had two separate populations within fairly close proximity of each other, but then later realize that there was a small corridor

of thistles connecting the two. In fact, the area was so heavily infested that one population just about took over our entire map. My final goal, setting up the rest of the project was accomplished with much brain storming and idea refining with the help of Pauline Drobney, Steve Holland and Angela Sokolowski. The project now involves five techniques for extinguishing the thistle, including the control. These techniques involve different timing of mowing, burning and spraying. Monitoring the different techniques invoked different problems, which by the help of Phil Dixon and Tom Jurik, I think we were able to solve. Each treatment will have three study areas and each study area will have two permanent belt transects, ten meters long. One transect will be put in a dense patch and another in a very sparse patch. Percent cover will be used to show variations in thistle density and species diversity.

My aspirations for the future intern include: setting up the transects within the fifteen areas, gaining a percent cover for the area prior to treatment, and bagging treatments. Monitoring will hopefully continue for two to three growing seasons, when there will be enough data to find the best Canada Thistle technique for Neal Smith National Wildlife Refuge.

These internships were funded with proceeds from the Prairie Point Bookstore. Thanks to all the volunteers who work in the store and all of you shoppers!!

Did you know?

Friends' members receive a discount at the Prairie Point Bookstore!

Friends' members with a current membership card and at least \$25 giving level -- 5% on consignment items and 10% on all other items. No credit card sales.

Refuge Staff -- 5% on all items. If Friends' member, then Friends' discount only applies. No credit card sales.

Prairie Point Staff who are not Friends -- Same discount as Friends if worked more than 30 hours in 1999.

Browsing with Mary -- *An update from Prairie Point Bookstore*

With the holidays rapidly approaching, thoughts of gift giving crowd into our minds. With 400 titles from which to choose, Prairie Point is the perfect place to buy a gift of reading for everyone on your list. However, don't forget the vast array of non-book gifts which Prairie Point offers, ranging from just a dime to just under one hundred dollars.

Any hostess would enjoy receiving some of our "Song Shade Coffee" which environmentalists approve; we have both bean and grind in six flavors. Help your friends start the new year right with a colorful 2001 calendar: we have designs featuring wildflowers, wolves, butterflies or herbs. Other unique gifts include pottery by Joel Geske, framed and matted wildflower arrangements by Marilyn McGlothlen and mounted geodes from Mike Blair.

Collectors of all kinds will be pleased with gifts from our store, such as Neal Smith NWR thimbles, bison and eagle figurines in several sizes, buffalo plates and spoons, plus elk spoons. Hand-

carved wooden wildlife miniatures and bird pins by the Wheats and carved wooden bison 3-pieces "puzzles" make attractive gifts for the person who has everything. A great many of these gifts are priced under ten dollars.

Stuffed bears are popular with both young and old, so you can't go wrong with the new "T.R." Bear complete with Teddy Roosevelt eyeglasses, made to help the U.S. Fish and Wildlife Service celebrate its Centennial in 2003.

Don't forget those stocking stuffers: ladybug and butterfly rings, "How Sweet It Is" chocolates, and the newest hit, "Cricket Licket" suckers will make Santa's work so much easier!

This Christmas make it books, videos, cassettes and unforgettable gift items from Prairie Point, that "little bookstore on the prairie".

Come Grow With Us

The power of a Friends group is its members. We represent a variety of interests, talents and financial support allowing the Friends of the Prairie Learning Center to meet its mission and goals. We encourage you to renew your support or become a new Friend by completing the membership form below. Friends of the Prairie Learning Center is a nonprofit organization and all donations are tax deductible.

\$25 -- Big Bluestem Friend

\$100 -- Savannah Saver

Other -- \$ _____

\$50 -- Buffalo Buddy

\$250 -- Prairie Patron

Please circle one.

New Member

Renewal

Be sure to check and see if your company matches contributions....

Name _____

Address _____

City _____

State _____

Zip _____

Phone _____

Date _____

E-mail _____

Circle your donation level and mail to Friends of The Prairie Learning Center, PO Box 399, Prairie City, Iowa 50228

Callie's Corner

This section is written by Callie Le'au Courtright, Park Ranger/Volunteer Coordinator for the Neal Smith National Wildlife Refuge-Prairie Learning Center. Callie's Corner will be updates from her or a feature article on a volunteer.

It's that time of year when we give thanks for all the wonderful things that grace our lives. So many times we let people slip in and out of our lives, never stopping to let them know how much they have meant to us. Volunteers are a constant presence. Many times they try to slip in and slip out unnoticed, quietly changing the future of this place. They put in countless dedicated hours alone working with seed until their hands are numb, waiting for the next visitor to come in, entering data into computers, or simply waiting to observe a bird. Our volunteers are numerous and so are their acts of kindness. We want you to know all the work you do does not go unnoticed. We give thanks for each and everyone of you. Thank you for the limitless hours of volunteer work you put in. We appreciate all that you have done and continue to do.

Since 1994, the Refuge has been blessed with an outstanding volunteer named Jonathan Yentis. His sparkling personality and bubbly sense of humor make him a shoe-in as our Friend's Board Membership Chair and resident chili-maker. Jonathan's regular job, if you find him at work, is for the Tone's Spice Company. Not too many people are as passionate about seeds as Jonathan is. He spends numerous hours collecting and cleaning seed for us, as well as serving on the Botanical Center Board and volunteering as the Food Logistics Chair for the National Association for Interpretation's 2001 National Interpreter's Workshop.

An agronomist by training, he grew up in Virginia and after much moving, growing and learning he ended up in good ol' Iowa. He has two sons, a daughter and a loving wife that he often abandons to volunteer with us. Jonathan has been wonderful for our public relations and could be seen at the Des Moines Downtown Farmer's Market in our buffalo costume this summer. We are so grateful to have someone so dedicated that can enrich our lives and our stomachs as well as work tirelessly to help us achieve our goals. Thank you Jonathan.

HELP WANTED

-- *Prairie Point Bookstore volunteers to work weekends. Contact Mary Jordan, Prairie Point Manager, directly for more information, at 515-994-3400.*

-- *Calling all Authors! We need writers for the newsletter. Example articles include human interest stories, articles on staff members, board members and volunteers or articles about the plants of the tallgrass prairie and oak savanna.*

Volunteer Calender

The volunteers at the Neal Smith National Wildlife Refuge-Prairie Learning Center give a large amount of their personal time to aiding our mission. In order to achieve our mission, the Refuge volunteers need to be well trained and recognized appropriately for their efforts. Anyone may attend Stewardship Saturday hosted by the Friends of the Prairie Learning Center.

Please call Callie at (515)994-3400 if you would like to join our volunteer program, register for orientations, classes or training. All dates and times are subject to change or cancellation, please call to verify and receive current information.

The following is a schedule of volunteering opportunities, orientations and classes.

December 9 and January 13 - Stewardship Saturday

9:00 a.m.- 12:00 p.m.

Join the Friends of the Prairie Learning Center for a fun-filled morning working on the Friends' Prairie. Activities may include collecting prairie seeds, planting prairie plants, cutting brush and cleaning seeds.

November 18-Volunteer General Orientation

8:00 a.m.-12:30 p.m.

Join new & old volunteers for an exciting and entertaining introduction to the National Wildlife Refuge System. Go on a behind-the-scenes Refuge tour. Play Refuge Jeopardy to test your knowledge. Coffee & donuts provided.
Registration deadline: November 14

December 17-Holiday Meet & Eat 12:00 p.m.-1:00 p.m.

Join staff and volunteers for a prairie potluck. A chance to refresh your Refuge memory and renew friendships.

January 19-Annual Volunteer Recognition Banquet

6:00 p.m.-9:00 p.m.

Join the Friends of the Prairie Learning Center and the Staff of the Neal Smith

National Wildlife Refuge in celebrating the achievements of our volunteers over the past year. Count on a fun evening of dinner, awards and educational entertainment.

Invitations will be sent out. Please RSVP by January 5, 2001.

January 13, 14, 20- EE Volunteer Training

9:00 a.m.-3:30 p.m.

Have you ever wanted to change the world? Enroll in training to become an Environmental Educator. It's your chance to educate the public, help them appreciate and care for our history and our future. Training will include identification of plants, birds, mammals and insects. Volunteers will learn teaching and learning styles as part of their training. Bring a sack lunch. (Must also enroll in a Project Bluestem training within the year)

Registration deadline: December 15, 2000

Bison Gathering

November is a time when the bison at Neal Smith NWR realize that it is better to be seen than to be "herd." Refuge staff interacted with other Fish & Wildlife professionals on November 1, 2000 to gather the buffalo in the tall grass prairie. Employees from the National Bison Range in Montana and Fort Niobrara in Nebraska provided their "cowboy" expertise while Tom Roffe, D.V.M. of the U.S. Geological Survey collected biological data.

The herd size for this gathering was estimated at 53 animals but only 36 animals were captured. Each bison was checked for overall health; a micro-chip was placed under the skin behind each animal's ear which can be read with an electronic scanner and will identify individual animals for future research and reference (in this way we don't have a

need to mark with brands or plastic cartags); blood was drawn to document genetic history and diversity of the herd. These samples will be important in determining the health factors of the herd. Please note that no animals will be sold or removed from the herd this year.

Christy Smith, Senior Refuge Operations Specialist for the refuge coordinated and participated in the bison gathering and is looking forward to the new information the effort has brought. Smith said, "Everything went smoothly. I was anxious to get to know these animals "up-close" so that I would be more familiar with their behavior."

Look for more information and pictures in up-coming editions of the Prairie Wind newsletter.

Friends Prairie Update

September Workday 9-9-2000

Over thirty people came to the workday including a group from Grinnell College, class of middle school kids from West Des Moines and a bunch of individuals from all over. Smaller groups were formed to; hand harvest in the production plots, plant seeds north of the Prairie Learning Center, clip silver plume grass and dock seed heads, tree clearing, gather plants for a labeled identification display and scratch and sniff display of native grasses and forbs and set up a seed cleaning display. What a variety to choose from!

October Workday 10-14-2000

A big BIG thank you to the 26 plus volunteers that came for a really nice day of seed collecting and cleaning. Since it had rained the night before, the group started in the seed lab cleaning seeds. At 10:00 a group went outside to collect prairie seeds for a couple of hours. They collected at least eight different species. Much to Jonathan Yentis' surprise, there were not many wet bags of seed. After drying and labeling the seeds, the total count was 28 pans. Way to go collectors!!!

NEXT WORKDAY Nov 11th.

A Message from the Friends President

by Dave Penning

Friends Mission

Increase public awareness and appreciation of the Refuge

Encourage public participation in prairie restoration and preservation

Promote public use and enjoyment of the Refuge

Over the past three years I have used this column to encourage people to become more involved with Friends and Neal Smith NWR. There are many opportunities available for people to use their talents and develop new ones. It is especially rewarding to watch someone accept a challenge in an unfamiliar area and grow as they learn new skills. Many people have ventured into new areas and their individual accomplishments have contributed tremendously to the success of Friends and the refuge.

I want to thank two groups of volunteers for their contributions, the Prairie Point Bookstore staff and your Friends board members. Mary Jordan's leadership has guided Prairie Point into becoming a wonderful source of information about prairies and restoration. Mary and her husband, Larry, were recognized this year by the Fish and Wildlife Service for over 2500 hours of service. Many other people have contributed to Prairie Point's success and all of you

should be proud of the store and its financial performance. Your efforts are greatly appreciated.

Your Friends board works behind the scenes to support the refuge and our organization. I want to thank two retiring board members for their many hours of work over the years. Penny Thomsen was the founding force for Friends and served as our first President. Her leadership started Prairie Point and has helped this newsletter grow. Phyllis Johnson has developed our intern program and guides the Friends workdays every second Saturday morning. Their wisdom and guidance have made significant contributions to our success. Thank you!

It has been observed that volunteer organizations begin to take on a life of their own. Friends has truly evolved to this point and I am confident that Tom Prall's leadership will guide us into the future. Remember there will always be many opportunities to serve Friends and the refuge. Please continue to help return the tallgrass prairie to Iowa.

Friends of



the Prairie Learning Center

Neal Smith National Wildlife Refuge
P.O. Box 399
Prairie City, Iowa 50228
515-994-3400

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PRAIRIE WIND

VOLUME 8 - NUMBER 1

WWW.TALLGRASS.ORG

SPRING 2001

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America's National Wildlife Refuge System

By Nancy Gilbertson

"The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

March 14, 2003, marks a milestone in the history of wildlife conservation in America – the centennial anniversary of the National Wildlife Refuge System.

President Theodore Roosevelt created this legacy when in 1903 he set aside tiny Pelican Island in Florida as a refuge to protect birds from poachers and plume hunters. From there the National Wildlife Refuge System grew and now includes more than 530 refuges spanning nearly 100 million acres across the United States and its territories.

The National Wildlife Refuge System is America's only network of federal lands dedicated specifically to wildlife conservation. It safeguards plants and animals of virtually every variety, from cactus to caribou, butterflies to bison, and salmon to songbirds. AND while it is dedicated to the conservation of animals and plants, it permits other activities, primarily wildlife-dependent recreational uses such as wildlife observation, fishing, hunting, nature photography, environmental education and interpretation to the extent that they are compatible with the purposes for which that refuge was established.

"What are those purposes?" you might ask. For the Neal Smith Refuge, those purposes are to restore native tallgrass prairie, wetland, and woodland habitats for breeding and migratory birds and resident wildlife; to serve as a major environmental education center providing opportunities for study; to provide wildlife-dependent recreational benefits to the public; and to provide assistance to local landowners to improve their lands for wildlife habitat.

How does the Neal Smith National Wildlife Refuge fit into the big picture of the Refuge System? While we are but one thread in this vast fabric of refuges, we are a thread like none other in the System. This refuge represents the largest prairie reconstruction project in the country and is symbolic of a growing national and international interest in healing the environment.

While the refuge system contains more acres than the National Park Service and is found in every state in the Union, the majority of Americans have yet to discover the National Wildlife Refuge System. For those of you who know about us, please help us spread the word and for those who don't, we would love to tell you more and show you where the other 500+ refuges are located. Call the refuge at 515/994-3400 or log onto <http://refuges.fws.gov> for additional Refuge Centennial information.

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Spring 2001
Volume 8/Number 1

Published by the
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The Federal Junior Duck Stamp Contest

Times New Roman 10

Each year tens of thousands of budding young artists from all across the United States compete in the Federal Junior Duck Stamp Contest. Each state is judged separately and the Best of Show from each state compete against each other for the national honor of the next year's collectors' item, the Federal Junior Duck Stamp. Proceeds from the sale of the stamps support conservation education scholarships.

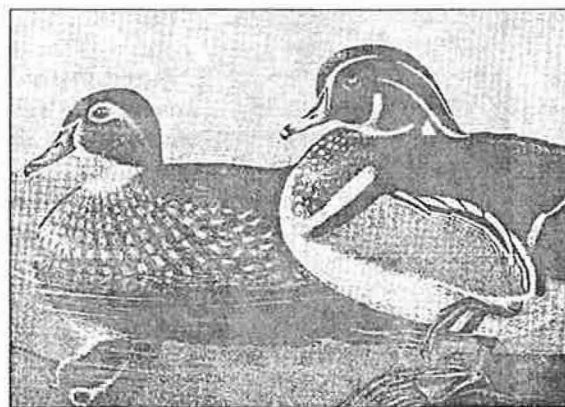
The goal of the Junior Duck Stamp Contest is to instill an appreciation for waterfowl and wetland conservation in young people. The entries are judged in groups: kindergarten through third grades, fourth through sixth grades, seventh through ninth grades, and tenth through twelfth grades. The judging occurs at the Neal Smith National Wildlife Refuge/Prairie Learning Center.

This year's Iowa Best of Show is awarded to David Schmitz, of Ionia, Iowa. He is 16 years old and attends Charles City Community Schools. His acrylic painting of wood ducks is titled "Wood Duck Pair." David was

awarded honorable mention in the national contest in Washington, D.C.

The Award Ceremony for the Iowa competitors was held at the Neal Smith National Wildlife Refuge/Prairie Learning Center on May 12, in conjunction with the "Migratory Bird Day" festival. All winning and honorable mention entries were on display in the gallery.

For additional photos and winners' names, visit <http://www.tallgrass.org>.



Callie's Closing Comments

On January 26, 2001, almost exactly two years from the day I began working at the Refuge, I departed the prairie to a much drier (not to mention warmer) desert oasis in Las Vegas, Nevada at the Desert National Wildlife Refuge Complex, as the Outdoor Recreation Planner/Volunteer Coordinator.

My job is to establish a public use program for our Complex including: Establishing an environmental education program, volunteer program, partnerships with cooperating associations (Audubon, Friends, OLVF, etc.), community, etc. to educate, encourage and entice people of Las Vegas to use their federal lands. There is wonderful support from locals in Las Vegas, as well as other federal agencies, for protection of and education about federal lands. This year we plan to move into an office building with other agencies including the Bureau of Land Management, National Park Service, and the U.S. Forest Service. In order to meet all of our agencies needs and utilize our varied talents, we have combined our individual Friends' support groups into one large group, the *Outside of Las Vegas Foundation (OLVF)*, that will support all federal lands surrounding Las Vegas. The *Outside Las Vegas Foundation* will help all four agencies provide for the long-term protection and appropriate use of these lands. Part of my job is working with the three full-time *OLVF* employees and helping them build their foundation. They hope to be modeled similar to the Golden Gate National Parks Foundation, in San Francisco, which has approximately 200 employees and brought in \$14 million last year to support the National Park.

The Refuge Complex is made up of four Refuges: Desert National Wildlife Range, Pahrangat National Wildlife Refuge, Ash Meadows National Wildlife Refuge, and Moapa Valley National Wildlife Refuge.

The Desert National Wildlife Range, located just outside of Las Vegas, encompasses 1.5 million acres of the diverse Mojave Desert in southern Nevada and is the largest National Wildlife Refuge in the lower 48 states. The range is large enough to cover the state of Rhode Island twice, and still have room left over for over a quarter of a million football fields.

Continued on Page 6

Know Your Prairie Plants

By John Jennings

This winter was a particularly long and snowy one at the Neal Smith National Wildlife Refuge. Life on the prairie can seem cheerless, with its endless hills of brown grasses covered with frost and snow. The beauty is still there but it takes diligence to find. But spring is here, a time of growth and renewal, and as the temperatures rise, so do our spirits. With the rains come the green buds, and many prairie plants don't waste any time showing off their beautiful blooms.

WILD STRAWBERRY

The wild strawberry, of the rose family, is one of those early bloomers, from April through July. This ground-hugging plant produces open clusters of white flowers with five individual rounded petals. The flowers generally occur below the level of the leaves, which are hairy and divided into three sharp-toothed leaflets.

The wild strawberry is found growing in colonies throughout the prairie in many types of habitats, on dry soils near woodland edges and in the open woods.

The berry develops in June or July, and is generally about one half inch in diameter. Many say the fruit of the wild strawberry is even sweeter than the domesticated varieties.

Wild strawberries were a favorite of native Americans as well as the early pioneers. Settlers utilized the fruit for preserves, and created a beverage from the dried leaves of the plant.

GROUND CHERRY

A member of the nightshade family, the ground cherry is found in dry woodlands and in rather sandy parts of dry prairies. The plant has a long flowering time, from late May through August.

Arial 11

Usually about a foot tall, the ground cherry has long, stalked leaves, and dull yellow, bell-shaped flowers with a brown center. The berry, when completely ripe in late summer or early fall, is edible, and is completely enclosed in a paper-like husk which many say resembles a Japanese lantern.

Native Americans and early settlers ate the ground cherry fruit raw as well as cooked, as a sauce or preserves. Although the nightshade family contains some poisonous species, other family members include the tomato, potato, eggplant and red and green pepper.

The ground cherry is also a source of late fall nutrition for many prairie dwellers, such as birds, rodents and insects.

BEDSTRAW

Found throughout the prairie and on woodland edges, bedstraw is a rather inconspicuous plant with small, white flowers which bloom from May through June.

The height of bedstraw can vary from a few inches to four feet or more, bedstraw has rather weak stems and is usually found sprawling over the ground. The bristles on the plant make it a nuisance for hikers, as they can often stick to shoes and clothing.

Bedstraw was once used as filler for home-made mattresses. Young plants can be used as greens. A member of the madder family, which also includes the coffee plant, bedstraw seeds have been used as a coffee substitute, and the leaves have been used to curdle milk in the making of cheese.

Did you know?

Friends' members receive a discount at the Prairie Point Bookstore!

Friends' members with a current membership card and at least \$25 giving level -- 5% on consignment items and 10% on all other items.
No credit card sales.

Refuge Staff-- 5% on all items. If Friends' member, then Friends' discount only applies.
No credit card sales.

Prairie Point Staff who are not Friends-- Same discount as Friends if worked more than 30 hours during a year.

Browsing with Mary -- An update from Prairie Point Bookstore

By Mary Margaret Jordan

Publishers' catalogs filled with new book titles make for delightful reading and also make the selection of resources for Prairie Point Bookstore a real challenge. One of those new titles that has brought raves from the Refuge staff is *The Sibley Guide to Birds* from the National Audubon Society. It describes 810 species and 350 regional populations and contains 6,000 illustrations by the author, David Allen Sibley. It is a terrific book, well worth its \$35 price.

Birders will also be glad to know that the *Golden Field Guide to Birds of North America* has been revised and updated. This guide to field identification is now in hardcover at \$19.95. St. Martin's Press is now publishing all Golden Guides and is coming out with new editions with more attractive covers.

A new title which will interest readers who enjoy classics of ecology is Thomas Berry's *The Great Work: Our Way To The Future*. One reviewer has called it "the modern equivalent of the biblical book of Revelation". Berry is one of the most eminent cultural historians of our time and his message is not one of doom but of hope.

The Rose's Kiss by Peter Bernhardt may sound like a romance but is actually a natural history of flowers. The author is able to rekindle our sense of wonder at plant life around us with his fascinating, wide-ranging look at the facts and stories, history, folklore and legends about flowers from the beginning of time. This is a very readable and entertaining book.

A helpful guide of prairie lovers is *Field Guide to the Grasses, Sedges and Rushes of the United States*. First written by Edward Knobel in 1899, this book has been updated and revised by Mildred Faust and will help make you an expert at the identification of over 370 common species. It's a real bargain at \$4.95.

Many of our customers are looking for advice and help to turn their ditches into miniature prairies. With them in mind, we now offer *Roadside Use of Native Plants* edited by Bonnie Harper-Lore and Maggie Wilson. This book opens with 18 essays on the principles of restoration and management, followed by 500 pages of state-by-state listings. This is a resource of the first rank and sells for \$25.

We have new titles arriving each week, so be sure to stop in and browse awhile in our bookstore. It's the greatest prairie resource in Iowa!

Come Grow With Us

The power of a Friends group is its members. We represent a variety of interests, talents and financial support allowing the Friends of the Prairie Learning Center to meet its mission and goals. We encourage you to renew your support or become a new Friend by completing the membership form below. Friends of the Prairie Learning Center is a nonprofit organization and all donations are tax deductible.

\$25 -- Big Bluestem Friend

\$100 -- Savannah Saver

Other -- \$ _____

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Circle your donation level and mail to Friends of The Prairie Learning Center, PO Box 399, Prairie City, Iowa 50228

Executive Director's Notes

This section is written by Tor Janson, Executive Director

Hello! My name is Tor and I am the Friends' new Executive Director. I am helping the Friends with various projects, including grant writing and coordinating volunteers for the bookstore. I have met some of the Friends already and I hope to meet many more of you in the future. For now, though, I'll introduce myself, the Executive Director position and explain a bit about some of the things I'm working on.

I grew up in Toledo and Iowa City and I recently graduated from Grinnell College with a major in biology. The Friends created the Executive Director position to strengthen the organization. The Executive Director works on projects designated by the Friends' Board and Friends' President. The addition of this job should allow the Friends to complete more projects and better fulfill their mission to bring the prairie to the public.

An important project that I'm working on (with bookstore manager, Mary Jordan) is coordination of bookstore volunteers. The Friends earn a substantial portion of their funds from bookstore proceeds and volunteers give visitors a friendly welcome to the Refuge. The Refuge staff

appreciates it when bookstore volunteers can staff the welcome desk. For all those reasons, bookstore volunteers are very important people! Our goal is to have the bookstore open whenever the Refuge is open and we'd like to staff two volunteers for busy summer shifts—one for the bookstore and one for the welcome desk. To help us reach our goals, we've started a Bookstore Support Team—volunteers who are helping by taking bookstore shifts that otherwise might not be filled. Sometimes, somebody who normally takes a shift needs a sub, and sometimes we have open bookstore shifts. Bookstore Support Team members are helping the Friends fill those slots. When we have an opening that needs to be filled, we can call support members and let them know that shift is available.

I'm also recruiting new volunteers. If you are interested in volunteering at the bookstore, please let me know! You can call me at 641/236-0788 or email me at exdir@tallgrass.org. We especially need volunteers for busy weekends! And you'll have a good time—it's fun to chat with visitors about the bison herd and sell "Cricket Lickets" to kids.

HELP WANTED

Prairie Point Bookstore needs volunteers. Contact Tor Janson for more information at 641/236-0788 or email exdir@tallgrass.org.

Welcome, Don!

By John Jennings

Don Jorgensen joined the staff at Neal Smith National Wildlife Refuge on Feb. 26. He will be serving as Supervisory Park Ranger, overseeing the public use program.

Jorgensen received a BA in art from the University of Northern Iowa, then continued to take science and biology classes at the school over a period of ten years, earning a master's degree in Natural Resources Management.

He worked at Hartman Reserve Nature Center in Cedar Falls, where he gave interpretive history programs, then spent 10 years with the Corps of Engineers. He worked for a while as a park ranger in the Fresno, CA. area, then as a biologist at the Corps of Engineers' District Office in Rock Island, IL., where he performed environmental restoration and insured compliance with the National Environmental Policy Act (NEPA).

Jorgensen's duties here as Public Use Specialist involve law enforcement, signage on prairie land, upkeep of the interpretive trails, volunteer coordination, and working with the Refuge's educational materials. A Native American exhibit will be coming to the Refuge soon, and Jorgensen has been involved in integrating that material into the Refuge's Project Bluestem, an environmental education program for children created by Neal Smith National Wildlife Refuge staff and others.

Jorgensen has been married to Amy for 24 years and the couple have three daughters, Dana, a high school senior, Amanda, a sophomore, and Inga, in seventh grade. The family will be joining him here at the end of the school year.

Jorgensen said it will be difficult giving up his rural Maquoketa home, but is looking forward to the new path his career is taking at the Refuge.

COMING ATTRACTIONS

Watch for photos of new Refuge employees in the next issue.

Saying "Hello" to Heidi

By Karin Beschen

The Neal Smith NWR is pleased to introduce the new addition to their staff. Heidi Rieck, Park Ranger, began her employment in early December and is off to a fantastic start! Heidi feels that her decision to move to Iowa and develop into the exciting endeavors of Environmental Education was an opportunity she could not refuse. Her family lives in Omaha, which made the decision much easier in being closer to home. Heidi feels at home at Neal Smith NWR and in Prairie City. She is getting her feet on the ground, acclimating to the newness of the Refuge, which is much different than national parks.

Heidi recently moved from Kentucky where she was a Park Ranger at Cumberland Gap National Historical Park. Her primary focus at Cumberland Gap N.H.P. and her other Park Ranger positions was law enforcement. In addition to her law enforcement experience, Heidi managed one of the nation's busiest campgrounds in Sequoia National Park. Her favorite memories of Sequoia were of families having their first camping experience and all of the children's happy faces. Heidi says Sequoia National Park is the most fantastic place she has ever lived. Those were the days before she had a permanent, full time job and although they were often stressful, they are also some of the greatest and happiest times of her life. People in the Park's community played down the importance of acquiring material possessions and were really able to focus on personal growth and life experiences. But, Heidi says, I reached a point at which I thought how nice it would be to have my own bed. Then a few bookcases crept into the scene somehow, then a set of dishes. Now it's like a flood of consumer goods coursed through all my wonderful, empty space! "So now I have to buy a house," she laughs.

Heidi is excited about upcoming events and involvement and was busy working on Migratory Bird Day which was held May 12. "I'm so glad to be starting a new endeavor with such a wonderful agency. The U.S. Fish and Wildlife carries on such an amazing role for the protection and research of natural resources. I really am very pleased to be aligned with those who have chosen careers that protect public lands for the plants and wildlife and fish and bring the conservation message to all people."

One passion that Heidi has is her affiliation with the master program of "Leave No Trace", which is a program that teaches environmental ethics for all outdoor recreation activities including climbing, horseback riding, hiking, canoeing and several other fun activities. The U.S. Fish and Wildlife Service is an agency sponsor of the program and Heidi hopes that she can be an advocate for this program using her current focus of Environmental Education. "Leave No Trace" programming is really flexible so Heidi can structure the program for any group. In order to receive a certificate, though, there is a two day curriculum that must be completed. It's very apparent that Heidi is enjoying her first couple of months at the Refuge! We look forward to learning about the great opportunities and development in Environmental Education.

Callie's Closing Comments continued . . .

Ash Meadows National Wildlife Refuge provides a valuable and unprecedented example of desert oases that are now extremely uncommon in the southwestern United States. The refuge is in the habitat restoration stage and will remain so for many years.

The Moapa Valley National Wildlife Refuge was established to secure habitat for the endangered Moapa dace, a small fish commonly found throughout the headwaters of the Muddy River system. Currently, due to its small size of 58 acres, fragile habitats, on-going restoration work, and removal of unsafe structures, the refuge is closed to the general public. It is anticipated that the refuge will be open to the public in the future.

Pahranagat National Wildlife Refuge was established to provide habitat for migratory birds, especially waterfowl. Pahranagat comes from the Paiute Indian word meaning "Valley of Shining Waters." Pahranagat's lakes and marshes, originating from large springs north of the Refuge, are a rare sight in this part of Nevada. For more information about the Desert National Wildlife Refuge Complex, visit <http://www.r1.fws.gov/desert/default.htm>.

No longer will winter months be filled with school cancellations or horrible road conditions. I've traded in mosquitoes for rattlesnakes and poison ivy for cacti. Iowa has always been home and the wonderful people that I have worked with there will not easily be forgotten. The volunteers, students and teachers I have worked with have been outstanding. As they have learned about us, I have learned about them. Thank you for all the memories. I miss you all and in the words of the King himself, "Viva Las Vegas."

A Prairie Canary Tale (or is it tail?)

By Laurie Fenimore

Seed Collector's Rule #1 from the Prairie Canary:
You can never bring along too much water.

It was a sweltering hot day in early July, with a slight to non-existent breeze. A group of us had been up and down the hills at Edge Prairie, searching for ripening seeds of spring blooming species, prairie violet, oxalis, golden alexanders, and whatever else we could find.

After several hours of walking, crawling, and searching, we decided it was time to leave. As we headed up the last steep hill, I checked on my water supply. To my dismay, there were only a few sips left. I had a few choices: drink it all now, or drink one sip now and one or two sips halfway up the hill, or drink it all at the top of the hill.

I knew we still had quite a trek through the bean field, so I decided to wait and drink the last of my water at the top of the hill.

We straggled on up the hill, Dan in the lead. As I took the tail end, I remember thinking to myself, "Why is he going so fast? What's the hurry?"

Halfway up the last hill, there are a few trees that provide just enough shade to be considered an "oasis". We paused here to catch our breath and held a short discussion, deciding that the next time it was this hot and humid and NO breeze, we should plan to leave much sooner and that just possibly we should have skipped going out on a day like this.

Soon we realized that there was absolutely no breeze here, the air was dead still.

"This must be what's known as the prairie doldrums," someone joked.

The group meandered on up the hill, Dan again leading the "charge". As I took the end of the line, I began to feel a bit strange, almost cool. "Oh good, there's a breeze, everything will be okay," I thought to myself as Dan and the rest pushed on ahead.

But I soon realized that what I was feeling was not a breeze, it was the beginning of heat exhaustion. With each step I took, I looked more forward to the sips of water I'd promised myself once I reached the top of the hill and the edge of the bean field. Even though I just wanted to sit or lay down, I kept going up the seemingly endless hill.

Finally, I reached the edge of the bean field. Everyone else was already quite a ways ahead, carefully walking between the rows of almost waist high bean plants.

Kim looked back and said, "Are you OK?" I nodded and gave the thumbs up sign. On they went, as I entered the bean field and drank the last of my water.

I looked down at the rich, black soil beneath my feet, and thought of the prairie forbs and grasses that had grown here for thousands of years, of the Native Americans that may have walked this same path. I also thought it would be so nice to just sit down in between the bean rows. Maybe these bean plants would provide me with a little cooling shade. And besides, I felt just a little light-headed and nauseous.

It simply would not do to faint in the bean field, so I sat down. I then put my head between my knees, waiting for the beans to shade me and for the breeze that never came.

Someone began shouting my name. I raised my hand and weakly shouted, "I'm OK. I'm just gonna sit here a bit." For some reason, they didn't believe me.

Very soon, Kim and Phyllis were standing beside me, offering their water and fanning me with their hats. After a short rest, feeling much better, I was ready to go on and we started off.

We decided as we headed to our cars, that none of us should have stayed out in the heat as long as we had. I laughed and said, "Yeah, I guess I'm like one of those canaries that the miners used to take with them into the mines. When the oxygen level is too low, the bird faints, and the miners know it's time to leave."

And that, my friends, is how I got the nickname of "The Prairie Canary."

A Message from the Friends' President

I'm Tom Prall,
the new
president of the
Friends of the
Prairie Learning

Center. I succeeded Dave Penning at our January Board meeting. I want to thank Dave for his three years of leadership on the Board. In my two and half years involvement with the Friends, I've watched the Board and the organization grow from a diverse group of prairie and ecological enthusiasts to a strong determined group of Friends and volunteers dedicated to helping the staff restore the prairie ecosystem. Dave remains on the Board and is expanding his role as senior advisor to other Board Members and is working on building a network of Friends groups from the various Midwest refuges.

The Friends' support of the Refuge mission continues to grow. Through the effort of our bookstore volunteers, we are able to fund four college interns this year – two for the biological area and two for the environmental education or operations area. Besides giving the refuge staff needed hands, the experience gained in habitat restoration and public education may help the interns shape their individual careers.

The prairie has now recovered from one of the coldest winters on record in Iowa and shows significant new growth and is an indicator of the Friends' sustained growth and development. I'm proud to lead this organization and would like to thank all of you for your continuing help and support.

Friends' Mission

*Increase public
awareness and
appreciation of the
Refuge*

*Encourage public
participation in prairie
restoration and
preservation*

*Promote public
use and enjoyment
of the Refuge*

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VOLUME 8 - NUMBER 2

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SUMMER 2001

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2001 Iowa State Fair a Success

By Nancy Gilbertson

"Can I touch his eye?" "Is he real?" Yup, the bison was a big hit again at the Iowa State Fair. Thanks go to the Friends of the Prairie Learning Center who helped us pay for a 20 x 20 foot booth, that I might add was next to the Governor's booth again! We had another successful season getting the word out about the Refuge and this year, all the Iowa refuges and the National Wildlife Refuge System. Hats off to all the volunteers who provided a total of 132 hours of time to help staff the 12 hour days for 11 days. (We couldn't have done it without you!) I would also like to extend a thank you to the Refuge staff who made up the other 132 hours.

Our booth highlighted:

- the National Wildlife Refuge System with a display showing the refuges in Iowa, Minnesota, Missouri, Ohio, Illinois, Indiana, Michigan, and Wisconsin;
- the Prairie in Progress, demonstrating native seed collection, cleaning, and planting;
- Babies on the Prairie, featuring the elk and bison calves;
- the "Friends" website running on a computer along with a number of photos of the Refuge on a screensaver;
- and "the ultimate crowd pleaser", our wonderful stuffed bison!

A picture is worth a thousand words so I'll stop here and let the pictures tell you the rest of the story.



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Prairie Wind is printed on recycled paper using soy-based ink.



Buffalo Day

By John Jennings

With Mother Nature providing the perfect day and the buffalo grazing on the hillside, the fourth annual Buffalo Day at Neal Smith National Wildlife Refuge on June 9 was a huge success. Refuge staff counted approximately 900 visitors to the Refuge, the best attendance yet for the celebration.

Activities throughout the day included flint knapping demonstrations by Mike He Crow of Des Moines; a raku pottery demonstration by potter Joel Geske; and hide scraping techniques by Mark Wagner of the Jasper County Conservation Board.

Indoors, children were treated to stories by professional storytellers. Tom and Connie Dreesman of the Iowa Bison Association were on hand to answer questions about raising bison in Iowa, and a rousing game of buffalo chip throwing rounded out the afternoon.

Buffalo burgers and hot dogs were sold by the Friends of the Prairie Learning Center and the Prairie Point Bookstore gave away buffalo nickels to the first 1,000 visitors.



Just A Picking' & A Grinning'

By Laurie Fenimore

(Seed Collector's Rule #2: Always remember to bring along your sense of humor, you never know when it will come in handy.)

There are times when you don't want to leave the prairie, even after a long day of seed collecting, even if the mosquitoes have been biting you, or the wind has been fierce, or the trail has been long and soggy. Sometimes you come to a cozy place, away from the bugs, out of the wind, and there are plenty of seeds to collect to keep you occupied.

It was just such an afternoon as we were finishing up a day of seed collection at Triangle Seep Prairie. I was only half-heartedly collecting some sedge seeds when Dan said, "Hey, Laurie, come look at this."

In between the soggy hummocks, he had found a crawfish hole. It looked like a towering mud volcano. But the really neat thing about it, as he cleverly demonstrated, was that if you stepped down on a hummock on either side of it, black, oozing, mud would spurt out.

"This clearly demonstrates the peaty soil we're standing on," Dan declared. We were both very amused and entertained by the sight of it. Press down, watch the peaty slop ooze up and out, chuckle. Repeat.

We called over the rest of our troupe – Angela, Rick, and Jeanne. Dan demonstrated again, stepping down and the fluid mud bubbled out.

Jeanne smiled and began to sing, "Come and listen to the story 'bout a man named Jed, poor mountaineer, barely kept his family fed. Then one day he was shootin' at some food, and up through the ground, came a bubblin' crude!"

Everyone cracked up at this point, some of us laughing so hard that tears came to our eyes! And as our little group walked up the hill toward the setting sun, we all had grins on our faces, as we finished the song, "Oil, that is, Texas 'T'...well, the next thing you know, old Jed's a millionaire..."

Know Your Prairie Plants

By John Jennings

Ah, summer! This is the time of year the prairie really shows its stuff. The harsh winds and snows of winter are only a vague and fleeting memory, and autumn is a mere concept in these blazing hot and glorious days. The prairie is alive now with color and activity, and will reward any visitor with a barrage to each of the senses. Just as one prairie flower finishes its blooming, another comes on to take its place. It's summer on the prairie and life is good.

Here's a couple of prairie plants showing off beautiful colors now:

BEE BALM

Also known as horsemint or wild bergamot. The Latin name for this plant is *Monarda fistulosa*, named in honor of the Spanish botanist Nicolas Monardes, who wrote extensively on plants with medicinal qualities in the New World.

The bee balm is found in abundance throughout the central tallgrass prairies, particularly on rich, moist soils and along woodland edges. The flowers last from July into September.

Its slender pink and purplish tube-shaped flowers clump together in dense, ragged heads more than an inch in diameter. The plant can grow up to five feet tall on a square, sturdy stem, typical of many others of the mint family. The leaves and stem have a rich, minty aroma which can last well into the winter months.

Bee balm's medicinal qualities were well-known to the native Americans. The Navajos as well as the early European settlers made a tea of the plant to treat a variety of complaints, including fever, headaches, colds and sore throats. A tea made from the roots of bee balm was used for the treatment of stomach disorders.



BUTTERFLY MILKWEED

There are at least 16 different species of milkweed found in the tallgrass prairie, but none are as spectacularly showy as the butterfly milkweed. Other names for this plant include pleurisy root, orange swallow-wort, Indian posy and chigger flower. Found throughout the tallgrass biome, this plant loves dry, open areas or the sides of old country roads. Flowers last from June to September.

Flowers are usually bright orange, but can be yellow on occasion. The plant's stems are normally clumped and can grow up to two feet high. The leaves are rough-pointed, grow up to six inches long, and alternate along the stem. The sticky, milky sap, typical of milkweed species, is lacking in the butterfly milkweed.

The flowers attract a wide variety of insects, but are intended to attract the larger, flying pollinators, such as butterflies. For that reason, smaller, crawling insects often become immobilized by the sticky pollen on the flower head.

The spindle-shaped pods grow to about five inches, and each contain hundreds of seeds, each with their own feathery plume for dispersal by the wind.

In the past, the butterfly milkweed was believed to be a cure for pleurisy, and early doctors ascribed the plant with laxative, astringent and anti-rheumatic qualities.

Did you know?
Friends' members
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Browsing with Mary -- An update from Prairie Point Bookstore

By Mary Margaret Jordan

If you haven't browsed in the bookstore lately, you have missed a great number of new books and gift items; we now have over 450 book titles and new ones will keep coming! Let me tell you about just a few of them.

Carl Kurtz has been "into" prairies since 1975. He shares what he has learned in his latest book *A Practical Guide to Prairie Reconstruction* which sells for \$12.95. And "practical" it is with just the right information for someone just getting a start with reconstruction of prairie land. Carl's own wonderful color photographs add to the value of this "must have" book.

If you are a teacher or just an enthusiast looking for prairie resources, you'll want to have *Stories From Where We Live: The Great North American Prairie* edited by Sara St. Antoine. This collection of stories and poems by people who grew up or now live on the American prairie sells for \$19.95 and offers a wide variety of writing. Whether they tell of driving a sled through a Colorado blizzard or navigating the endless rows of harvest-time corn in Iowa, the selections all paint a word picture of what the word "prairie" means. If you need another reason to buy this exceptional book, you'll find Ann Lynn's poem "How to Replant a Prairie" which is subtitled "Neal Smith National Wildlife Refuge" on page 170!

The Des Moines Register recently highlighted Stan Tekiel's new book *Birds of Iowa* with facts and descriptions of 112 birds found in our state. Arranged by color for easy use, this title is now available in our bookstore for \$12.95.

It's not too early to be Christmas shopping, and there is nothing better for the kids on your list than a good book. Let me recommend *Bluestem Horizon* by Evelyn Lee which is a beautiful picture book telling of one year in the life of a prairie buffalo. The book which sells for \$5.95 is special by itself, but you can also get it attractively packaged with a soft stuffed buffalo, a \$16.95 combination which would be great for a gift.

A picture book with a touch of the unusual is Diane Pomeroy's collection of potato prints put together in *Wildflower ABC*. You'll find A is for aster and Y is for yarrow plus 24 more wildflowers making the alphabet very special. The price is just \$6.00.

If it's stocking stuffers you need, look no further. For just a dollar you can buy *Little Wildflowers*, a hand-sized coloring book which will appeal to little folks on your list. Have you seen our bigger-than-life stuffed green tree frogs hanging around the store? Why not hang one by the stocking of your favorite youngster?

There's always something new at Prairie Point, so come in and browse awhile.

Come Grow With Us

The power of a Friends group is its members. We represent a variety of interests, talents and financial support allowing the Friends of the Prairie Learning Center to meet its mission and goals. We encourage you to renew your support or become a new Friend by completing the membership form below. Friends of the Prairie Learning Center is a nonprofit organization and all donations are tax deductible.

\$25 -- Big Bluestem Friend

\$100 -- Savannah Saver

Other -- \$ _____

\$50 -- Buffalo Buddy

\$250 -- Prairie Patron

Please circle one.

New Member

Renewal

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Circle your donation level and mail to Friends of The Prairie Learning Center, PO Box 399, Prairie City, Iowa 50228

Buffalo Herd

Interview with Christy Smith, Neal Smith NWR Assistant Manager, Written by John Jennings

It's perhaps not a decision that will be popular with some fans of the Neal Smith National Wildlife Refuge, but the Refuge staff says the decision is absolutely necessary. Beginning this fall, the Refuge will begin a systematic culling program of the bison, reducing the herd by about half.

Christy Smith, Refuge Operations Specialist, said the reduction in the size of the herd at Neal Smith was necessary to ensure the health of the bison, as well as the health of the prairie ecosystem.

"How many ponies can you put in your backyard?" Smith asked. "In the 750-acre bison enclosure, the herd animals need a certain amount of forage to sustain themselves. We needed to know what they eat, and how much."

Smith crunched some numbers and concluded that bison and elk consume approximately two percent of their body weight per day in forage. That amounts to 22.75 pounds per day, or 8,304 pounds per year for the bison, and 5,110 pounds per year for each elk. An estimate of the tallgrass prairie forage production is 2,000 pounds per acre.

Bison will not eat every type of plant that grows in their enclosure. That must be taken into account, and sloping areas of the prairie will erode much quicker under heavy grazing. The Refuge is still young and fragile in prairie terms, and many of the plants are susceptible to grazing. Consideration must be given to periods of drought, as well.

With this information, Smith concluded that the herd must be reduced to about 38 animals, a figure that will be maintained at the Refuge as long as the bison enclosure remains at 750 acres. Expansion of the bison enclosure is possible, but not in the immediate future.

Another alternative would be to supplement the bison's natural prairie plant diet with alfalfa hay. That, however, would introduce other non-native plants to the prairie, something the Refuge staff works hard to eliminate.

Smith said another consideration that went into the decision to decrease the herd was the logistics of handling a large herd of bison. There are 71 animals at the Refuge now, and they are extremely powerful and somewhat unpredictable. Smith said the Refuge does not have easy access to people with the skill and expertise to handle them safely. For that reason, the Refuge has not allowed volunteers to participate in their annual bison roundup to check the health of the herd.

Refuge Biologist Pauline Drobney will work with Smith to determine the age and sex structure of the bison herd necessary to maintain a healthy group of animals, and select the animals which will be kept at the Refuge.

Culling of the herd will begin this fall. Some will be donated to Native American tribes, others will go to various county conservation boards and educational organizations for establishing new herds or fortifying existing herds. A stipulation of the gift of a bison will be that the recipient keep the animal for at least one year. The rest of the animals will be auctioned, and the exact method has yet to be determined. An auction of at least a few animals each year thereafter is anticipated.

Mark Wagner of the Jasper County Conservation Board said he will be receiving a bison cow from the Neal Smith National Wildlife Refuge when the culling begins sometime in October. Mariposa Park near Kellogg has had as many as seven bison, but in recent times two have been on display at the park. Over last winter, the cow at Mariposa died, so only a bull, about five years old, remains. Wagner told the Refuge staff he would like to have a bison cow for Mariposa, but transportation was a problem. Luckily, Black Hawk County will be receiving two bison, so arrangements were made for them to pick up an extra female for transport to Mariposa.

Smith said she realized the reduction in the size of the bison herd will not be a popular one, but asked visitors to consider prairie history.

"How many bison do you think the early travelers saw as they passed through Iowa in their covered wagons? Probably not many, because the animals had such vast areas to roam. The smaller herd will be more like what the early settlers saw. Less is more," Smith said.



New Exhibit at Prairie Learning Center

By Robin Fortney

As the prairie land at Neal Smith National Wildlife Refuge continues to grow and mature, visitors gain an ever-increasing sense of what this place was before the first European settlers. The native American tribes who lived on the prairie and interacted with the plants and animals are missing though, and can never be restored. A new exhibit being planned for the Prairie Learning Center at the Refuge, however, will help visitors better understand that human-prairie interaction. Charles Peterson of Rockwell City was an investment banker and had a longtime interest in the native Americans. He had an extensive collection of native American artifacts, and when he died about three years ago, his widow, Mildred Peterson, herself a fan of the Neal Smith National Wildlife Refuge, began making plans to donate some of her husband's collection to the Refuge for display. Robin Fortney, a charter member and past president of the Friends of the Prairie Learning Center board of directors, and chair of the development committee, was contacted by the Petersons concerning the native American artifacts, several of which were of a sacred nature. Refuge Project Leader Nancy Gilbertson and then Public Use Specialist, Tim Bodeen, saw the opportunity to utilize the artifacts in the Refuge's Project Bluestem curriculum for teaching middle and high school students about the prairie.

In December 1999, Fortney invited an exhibit design company, Split Rock Studios of Minneapolis, to develop ideas for exhibiting the artifacts in the Prairie Learning Center. A second design firm was invited to submit bids, but in the end the bid went to Split Rock. Ideas for display designs were discussed throughout last summer and fall. Fortney knew that a native American voice was needed in the planning process in order to provide the proper

interpretation for the artifacts. She contacted the Iowa State Historical Society, state archeologists and Drake University in order to create a native American advisory committee. Fortney met with Maria Pearson, cultural resources consultant with Iowa State Historical Society and a Yankton Sioux living in Ames. Pearson and Fortney took a tour of the Refuge and the Prairie Learning Center last fall and talked about the project. Pearson put together an advisory committee consisting of herself, Irma White, of Iowa State University, and Jerry Steuben of the ISU Extension Service. The committee met last November with the Refuge staff and Peterson family members to determine which artifacts might be used for the exhibit and the best way to display them. The Friends of the Prairie Learning Center received a check from Mildred Peterson last fall for \$200,000.

In July, Fortney, the advisory committee and Don Jorgenson, the Public Use Supervisor at the Refuge, made a trip to Rockwell City to choose the native American pieces that will ultimately be used in the exhibit. About 60 pieces were chosen, including clothing, bows and arrows, toys, utensils, hide scrapers and parfleches, a leather container for storage and carrying small items. Split Rock Studios will start on the exhibit in the Prairie Learning Center this fall with completion anticipated for March 2002.

In addition, work on an elk sculpture outside the theater will begin sometime in November. Fortney said the exhibit should be of interest to many visitors to the Refuge. "The job of the Friends of the Prairie Learning Center is to help the Refuge do things they couldn't do otherwise. This exhibit will create a good learning experience," she said.

Introducing New Employees

Back row: Heidi Rieck, Park Ranger; Amy Kelpe, Park Ranger (student); Eric Van Zee, Bio Tech (student); and Don Jorgensen, Public Use Specialist.

Front row: Scott Van Ryswyk, Bio Tech (student) and Paul Charland, Bio Science Tech



Intern Report

By Ben McConville

My name is Ben McConville. I was an intern with the Public Use Department at Neal Smith NWR this summer. I am from Pella and am currently a senior at Northwest Missouri State University in Maryville. I have a BS in Geography and a minor in Geographic Information Systems and will be finishing a Computer Science minor during the fall semester, graduating in December.

I had only been to Neal Smith NWR one other time before my first day on the job. Last winter, a friend and I saw the sign as usual while traveling to Des Moines. We got into a conversation about what the heck was back there and a couple of miles later we were doing a U-turn onto the east bound lane headed back to the Prairie City exit. Turning onto the entry road and winding our way towards the Learning Center, we began to see pieces of prairie. "I heard that there were buffalo at this place," my friend commented. Not knowing that they were in a fenced area, I started stretching my neck searching the landscape at random for any sign of buffalo. Finally, the Learning Center came into view as we reached the second stop sign. "That must be it. Wow! Quite a place they have back here." I said. I must say I was very impressed with the facility. I had been expecting a little ranger station and maybe a small building to house equipment. I was further amazed after going inside. When we finished wandering through the exhibits, we drove the auto tour and were stopped twice. Once by the buffalo herd and once by the elk herd. "You know I should really check about an internship out here." I thought aloud.

Before I knew it, I was on the phone with Don Jorgenson talking about coming to work with the Public Use staff for the summer. I arrived on June 11 and met Don, Heidi, John, and Amy that morning. All was well, the staff members were friendly and very helpful showing me the ins and outs of the Prairie Learning Center while explaining to me what everyone was doing here at Neal Smith NWR.

The entire duration was a learning experience for me. One of my first tasks was to redo the trail maps that are handed out at the front desk. I also produced a map of the 10k-trail route. Perhaps my biggest task was to develop a map of the area around the Tallgrass Trail and Prairie Learning Center that divided it into workable stewardship areas. This will hopefully provide a better organized plan to accommodate volunteer groups and staff that wish to perform stewardship activities. I learned how to use the PGLR GPS unit in correlation with ArcView; something I had never had a chance to do. I also participated in a couple of different stewardship activities around the Tallgrass Trail. Day camps, boy scouts, girl scouts, and other groups came all summer long and I was able to present several programs and even lead a few hikes around the Tallgrass Trail. I believe I benefited a great deal from all of these tasks. In addition, I helped John Below with the Iowa State Fair booth which was a very enjoyable time. And of course I performed the usual Prairie Learning Center tasks like watching the front desk, cleaning, opening and closing.

All in all it was a great summer at Neal Smith NWR. I met many great people and developed a definite appreciation for tallgrass prairie and the mission at Neal Smith. I would like to thank everyone for the excellent opportunity I was given and especially the Friends of the Prairie Learning Center organization for making it possible. Thanks again and good luck with the tallgrass prairie!

Back on Track: An Intern's Return to Wildness

by Ron E. VanNimwegen

Only a handful of people actually realize their childhood dreams; otherwise, the world would be overrun with firemen and ballerinas¹. For as long as I can remember, I've always wanted to work at a wildlife refuge, but at some point in my early adulthood that dream became derailed and I "ended up" becoming a restaurant owner. Even though I was considered successful, I still felt I had some unfinished business in the spiritual fulfillment department. So at age thirty-seven, I returned to Iowa State University, nearly twenty years after attending my first class there in 1980. It's hard to describe how I felt walking to that first class on my first day back, but I survived it and soon my dream had gotten "back on track".

As an Animal Ecology major, I was required to fulfill a practical work experience requirement for graduation and for many students this entailed landing a summer job in some biology-related field. For me, who had forgotten how to land a job, it meant volunteering for a summer at the Neal Smith National Wildlife Refuge. I began as a biology intern's helper but later found I could contribute in other ways as well. I must have proven myself useful, because I continued to work through the winter and was officially hired by the Friends of the Prairie Learning Center as a paid intern.

I expected my internship to be somewhat similar to my experiences last summer, and in many ways it was: hard work, hot weather, sore muscles, all the things people love to whine about, including me. It was quite different, however, in the knowledge and understanding I acquired – knowledge of the people, organizations, and administrations surrounding environmental work, as well as an understanding of the science, restoration, and ecology of native prairie ecosystems.

Most of our physical chores centered on the control of exotic species and the maintenance and care of our beloved native species. We became licensed pesticide applicators and mercilessly unleashed this newfound power on Reed Canary Grass, Crown Vetch, Rubus, non-native Switch grass, and a variety of thistles. When necessary, we donned gloves, armed ourselves with shovels, and dispatched the likes of sweet clover and Queen Anne's Lace. We attended the *Invasives Bus Tour*, where we shared pertinent information with fellow soldiers from around Iowa, in an attempt to prepare for the imminent advance of Leafy Spurge, Spotted Knapweed, Purple Loosestrife – the list goes disturbingly on. When hail and age threatened our greenhouse, we re-skinned it, and when moss caps deprived our containers of water, we decapitated them. When our sweat was dripping more than could be imagined, KCCI-TV was there to film it.

On a more proactive note, we harvested seed from Blue-eyed Grass and Starry Campion. We cared for our greenhouse seedlings as they awaited transplanting. We potted some native Switchgrass donated by the Fennimorees. We also took a leap of faith by planting the endangered Western Prairie Fringed Orchid in hopes of paving the way for more. Finally, on a practical and fun note as well, we learned to operate a handful of the less commonly used Refuge vehicles, such as the ATV, six-wheeler, and TrakTruck.

I felt especially fortunate to be included in some administrative aspects of the Refuge as it operates within its governmental framework. In order for a refuge to operate cohesively, each department must be specialized, yet be able to coordinate and overlap to some extent. All interns were invited to weekly staff meetings, we helped write and assemble an annual refuge narrative, and we took part in preparing a prescribed burn plan. We also developed a simple graphical message center consisting of laminated maps with dry erase legends and used these to share areas of concern and interest with the rest of the Refuge staff. Such areas included invasive outbreaks, erosion areas, and significant wildlife sightings. In addition, we took part in a number of outreach activities: our annual Buffalo Day, our Volunteer Showcase Day, our state fair booth, and a visit from our Lieutenant Governor and Neal Smith himself.

A few of my personal hobbies turned out to be of value to the Refuge as well. I tried to keep my camera with me at all times in order to graphically document our activities for future narratives. In addition, my hours of computer tinkering had made me somewhat proficient at working with Geographic Information System (GIS) software, and I was able to use those skills to make maps for a variety of departments and purposes.

Continued on Page 9

Field trips and morning meetings became the core of our educational experience. We discussed the ecological roles of the plants we had learned to identify throughout the summer. We discussed *floristic quality assessment* and its applications in restoration. We learned what to consider when formulating a good seed mix. When Refuge Biologist Pauline Drobney leads an ecological discussion, one cannot help but develop an understanding of, as well as a connection with, the prairie as a whole – as an entity so to speak. We also attended the Iowa Prairie Conference and listened to experts speak on a variety of prairie restoration topics. We took part in a brainstorming session to help Marcus Mueller develop a management plan for the fen he discovered in his employer's hog lot in Blackhawk County. Our best field trip was spent at the Union Slough NWR to help with a goose banding operation. This, of course, was the highlight of the summer for *this* aspiring wildlife ecologist, to be literally hands on and eye-to-eye with such magnificent creatures.

Altogether, it seemed the diversity of my activities was only surpassed by the diversity of life in the fields beyond our parking lot. While this is the end of an internship for me, it certainly is not the end of my time and effort here. I'll continue to contribute whenever and however I can. Obviously, my internship at Neal Smith offered me a wide variety of experiences and benefits. I can drop names that will weigh quite favorably on my grad-school applications and resumes.

Beyond the many practical benefits, however, I learned that there is still hope for the natural world. I learned what can be accomplished when a group of dedicated and talented people take a step outside of themselves and speak for those without a voice. The staff and volunteers here are the best people I know – every single one of them, and I look forward to the time I'll spend with them now and in the future. And finally, as a restaurateur-turned-scientist, having actually worked on a wildlife refuge, I can say that I am living proof that it's never too late to start over.

¹ Please forgive the typecasting; I grew up in a suburb in the '60s.



L to R: Lacey Naaktgeboren, Joe Heffron, Ron VanNimwegen, and Ben McConville

The Buffalo Ranch on the Way to Des Moines

Lacey Naaktgeboren
Public Use Intern

So, where are you working this summer Lacey?

I am working in Prairie City at the wildlife refuge there.

There is a wildlife refuge in Prairie City?

Yes, it's the largest prairie restoration in the U.S.; they have elk, buffalo, and many other native species.

Oh, you mean the buffalo ranch on the way to Des Moines!

Yes, believe it or not this is the conversation that I had with many of my friends about my summer internship. Living in Pella, I really thought that people knew about such a great place like Neal Smith NWR, but I learned that most people see the sign and do not even know what goes on here.

By being able to know exactly what goes on at Neal Smith NWR, I got to share everything that I knew about this wonderful place with my friends. Many of them came to visit, and by the time they left they thought that I had the coolest summer internship ever!

Not only did I get to share Neal Smith NWR with my friends, but also as a Public Use intern, I got to communicate with people of all ages. I answered kids' questions about the buffalo and elk. They all loved to see the stuffed ones and could hardly believe how big they were. We talked about the other animals that lived in the prairie, and how important they are to the ecosystem. I took them on prairie hikes and we talked about the native prairie plants that were living in the area, and how all of the land that is now planted used to be farmed. So many things were learned by both the visitors as well as me. I learned new things every day.

One day I was asked to do a program about careers. I was going to explain the different kinds of majors and types of careers that were possible in this field. As I was talking, a kid raised his hand and asked me what I wanted to do when I was out of school. This truly made me think a lot.

So, this is kind of what I told him.

I will be a junior at Iowa State University with a major in Animal Ecology. As an Animal Ecology major, you must choose to specialize in a field. The options are Wildlife, Pre-Vet and Wildlife Care, Interpretation of Natural Resources, Fisheries and Aquatic Sciences, Ecology or Aquaculture. Finishing up my sophomore year I was bound and determined to be a pre-vet and wildlife care major. I thought that it would be great to be a wildlife biologist or a wildlife rehabilitator and help injured wildlife. So, this summer I took this internship and was assigned as a public use intern. I was given the task of teaching thousands of people from the ages of 4 to 95 about the Refuge, and answer any questions that they might have. At first, I must admit I was pretty nervous. I had no idea how I was supposed to learn all of this information. What if I didn't know? What if I said the wrong thing? Luckily, I had great, very patient teachers. Heidi Reick, John Below, and Amy Kelpie were very understanding; they helped me in every way that they could. It wasn't long before I was leading groups with no trouble by myself. And as the summer went on, I realized that I kind of liked what I was doing, in fact I really liked it. It was fun to see that people came to a place where they were learning something and they were excited to see the buffalo, just like I was. So, I thought now what am I going to do, change my major? As the summer went on, I decided that I would do whatever made me happy. Sometime in my future I hope to do some kind of environmental education. I am going to discuss my options with my advisor and hopefully he can guide me in the right direction.

I truly believe that an internship is a wonderful tool. It puts you out into the real world into a job, and it is for you to decide if it is something that you could do for the rest of your life. I hope to find another internship before I graduate so that I can be sure that I am making the right decision.

As for the buffalo ranch on the way to Des Moines...

I hope that I spread the word out enough to all of the people that I talked to, many of them have come to visit and have come back to tell me and everyone that they know what I wonderful place this is.

My experience here has been amazing. I have learned more in these nine weeks than I have ever learned in a lecture, not just about buffalo but about life and responsibility and what the U.S. Fish and Wildlife Service is all about. I am very proud of what has been started here and the progress that is being made. I can honestly say that I worked with a great organization and a great group of people this summer. The Refuge is so lucky to have the wonderful support from volunteers, they truly do some of the best work around. I became great friends with many of them and I will miss them dearly. The staff was wonderful. They never gave up on me and were always there to help me whenever I had a question, and I truly appreciate all of their help.

To the Friends group, thank you so much for this amazing opportunity. It is because of you that I was given this experience.

What i did on my summer vacation

By Joe Heffron

When i saw the desert in arizona for the first time, my immediate thought was that all the museum dioramas of the southwest I had ever seen were completely accurate. Regardless of what those dioramas depicted in the foreground—a cowboy on horseback, rearing high above the sagebrush before a coiled rattler, a dusty mercado, a jackrabbit burrow—everything beyond was invariably painted on the wall mere feet from the viewer. That lack of realism had always disappointed me. However, in the actual desert, while everything within five yards of me shone with the high contrast of the sun and clear atmosphere above, everything beyond five yards rapidly slipped from reality and positioned itself on the fresco of mesas and sky painted just beyond reach.

Driving down the entry road on the first morning i worked at the refuge was reminiscent of that phenomenon as creamy, dark droplets circled me in the cockpit of my minivan and the prairie-in-progress whirled by, an amorphous blur on the flat pane of my windshield. It had been the first time in many months that i had woken before 8 o'clock, and even the five yards around me seemed a bit hazy at first. I was forgetting sequences, trying to remember which way time flowed. (Did 6:45 mean fifteen minutes until work began or that i'm fifteen minutes late?) I opened a small bottle of iced coffee from casey's and looked at the lid. "Shake well before opening." About three seconds after i started shaking/agitating the coffee, a bit of time and order returned, and the space around me became crystal.

The shock of cold coffee mist at 6:45 notwithstanding, it is common to feel distant from the outside world while driving (which is a bit unnerving for pedestrians). The space you interact with is tiny compared to the space you affect, and the other cars, that thin yellow line, are mere taboos, symbols that the very back of the brain associates with death, pain, and other bad things. Even from outside, looking in, you can sense that isolation. At the sound of an approaching car, you straighten your back and raise your head—a programmed action from a long line of ungulates and browsers—and leaning into the bank of the ditch, you strain your eyes to pick out the cool, dark interior of the passing vehicle, elusive as your own blind spot between the broad rays of noon on sweat-covered eyes. The momentary distraction past, you bow your head and return to the twin stalks of sweet clover clenched in your gloves. Cross-eyed, you feel the entire day lose focus to the drop of perspiration that has been licking the tip of your nose for the past two minutes. It finally loses its grip and tumbles through stale greenhouse air to the cone-tainer in your hands (thin, cone-shaped seedling pots—cone + (con)tainer = cone-tainer!). Paul stands next to you and sings a little song about baptisia, and hours pass while your fingers stir the rim of cone-tainers and pry out every strand of moss from the weepy seedlings that fawn and swoon like olive oyl. Spoiled step-children of human effort, the seedlings are privileged and limited in their cozy house; when they trade their two-inch plastic girdle for the borderless expanse of the 'real world', they will clash in the ground that nourishes them like that already-initiated baby orchid. After you cross over the sunken rives, their ditches hidden by reeds and sedges, on the way to the orchid's den, you peel back the layers of wet paper that protect it from heat and drought with quick fingers—half out of anticipation, half anxious to avoid any contact with the variety of spiders whose temporary home you're disturbing. Beneath it all, the orchid emerges like a paper horn. Though every plant begins the same, this orchid and the babies in the greenhouse are anomalies; for all their fragility, they exert tremendous force against the tacky earth in which they stand, like pushing a car back onto the road on an icy morning, or the last few steps sisyphus takes at the top of the hill (angela fumbles and laughs), or like forcing an atv with no differential to turn, straddling it and throwing your weight against it into crunching gravel—feeling it grunt with torque and getting the distinct impression that you're doing something very wrong—something nectary with sex and power that violates the fundamental laws of the physical universe, yet complies with the natural world. Nothing like gliding through a goose round-up at union slough, where the water and wood ducklings all slide in even lines parallel to your canoe. No, the seedling struggle is closer to the cloacal wrestling that comes after all the geese are penned. You kneel with a bundled goose between your legs, twist its tail violently downward and fumble with the small pink volcano to see directly underneath—to see the part of the bird that sphincter is determined to keep you from seeing. You justify the invasion with a half-baked notion of greater good and try not to think about what you're doing or remember how close those powerful, clawed feet passed down from the dinosaurs are to your own genitals.

But all the geese are processed, and none die, and after eating a doughnut with surgical precision to avoid touching it with lava-stained hands, you amble back to the van, where the day's flapping and honking settles into a cool layer of down, where Ron waxes black bears, improbability drives, greek army food, and Paul about living on the boat and earth, where Angela sleeps in her wedge between seat and window. There, everything softens below your head, the window a taut bedsheet, the seatback a pillow, and you think about sleeping, but then you open your eyes and you've slept. No sooner do you realize this than you open your eyes to find you've slept again, like on the jet over the pacific, where you opened your eyes to see a tray of food in front of you, and as if there were another pair of eyelids below the first, opened them again to find the curried tofu completely gone, a few bites missing from the kim chi as well, opened them again onto venice beach where the only trace of where you've been is the woman next to you and the loose pants she's wearing, opened them to the van's spinning wheels over undulations of cracked land with spry vetch springing up like nematodes squirming from a host body, opened them onto vibrant fen where Pauline high-steps through tussocks and names plants as she walks, shaking each to separate it from the others. flat-topped aster. self-heal. mountain mint. boneset (probably named for its ability to cure 'break-bone fevers' instead of any ability to set bones, which is unfortunate considering the terrain). Ron's boots reverberating through the peat underfoot, your steps wobble over the gummy hummocks and skid into the network of snaking rivulets between. The contour of this small patch of land rolls like your ankles, like the convolutions of a giant brain that remembers unblemished landscapes, when the concept of time did not exist, and the cold mist of necessity kept humans aware of sequence and change, just as with elk and bears and salamanders, when humans were first coming onto the continent, floating on log rafts, shoring down the pacific coast, never pressing into the mainland for fear of the giant predators, and realizing only the five yards around them, along the coast, and around the immediate. I guess that's how our memory is, too. Only conscious of five yards around the present, our minds paint the rest in flashbulb illuminations whose limited spheres overlap to create something that much more resembles a landscape on canvas than personal experience, a background in which to frame generalizations. Years are ground to nothing between the points of clarity, so hoping for more than a few from any experience is probably futile; i guess i would say (to answer the question i'm supposed to address) that, besides practical knowledge and various certifications and all that boring stuff, working at the refuge has given me a handful of flashbulbs.

A Message from the Past Friends' President

Friends' Mission

*Increase public
awareness and
appreciation of the
Refuge*

*Encourage public
participation in prairie
restoration and
preservation*

*Promote public
use and enjoyment
of the Refuge*

LADIES!

Friends and the staff of Neal Smith NWR want to thank two wonderful ladies for their many years of leadership. Penny Thomsen and Phyllis Johnson have both served in key leadership positions on the Friends' board. While they no longer are on the board, they continue to support our prairie.

Penny Thomsen was the founding force behind Friends. When she learned about the Refuge from Dick Birger, our first Project Manager, Penny asked "What do you need?" Dick's response was a Friends group. Penny's leadership and determination were guided by Dick's vision and our organization was born.

U
She served as the first board president, started Prairie Point Bookstore and was the Prairie Wind Newsletter editor in 2000.

Phyllis Johnson helped develop Project Bluestem, the Refuge's educational guide for teachers who wanted prairie-related curriculum. She served on the Friends' board as our Secretary and led the Biodiversity Support efforts. Phyllis started the Prairie Builders Intern program and Friends' Stewardship Saturdays, often treating us to homemade cookies.

Thank you ladies for your years of service and leadership. Your many talents are missed but your impact will continue to contribute for years to come.

David Penning, Past President

Friends of



the Prairie Learning Center

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Duck Banding Assignment

By Jack Heisler

Hi! I am Jack Heisler, Refuge Operations Specialist at the Refuge. I fulfilled my two year duck banding assignment this year in Inuvik, NWT, Canada. This is an annual cooperative effort of the Canadian Wildlife Service, the U.S. Fish & Wildlife Service, and several of the Provinces, Territories, and States of our cooperating countries.

Our three person crew banded primarily northern pintails, although we did band a few American wigeon, mallards, green winged teal, and lesser scaup as well. Waterfowl banded on the summer breeding grounds are recovered from locations throughout North America as well as areas of Central America, South America and the Caribbean. The data resulting from band recovery will provide invaluable information for properly managing the waterfowl resources that are an important part of our natural and cultural heritage.

I kept a journal starting the day I left Monroe, IA. I will shorten that down tremendously and give you a quick recap. This was a job I will never forget. I flew to SEATAC airport and met the rest of the crew. We continued north via a 40 ton truck. About 2,500 miles later we finished the trip to Inuvik. After a few days in Inuvik it was time to go to bush camp and start banding. We started out into the waters of the Mackenzie River with a 16 foot Lund powered by a 15 hp motor and arrived at "our" cabin about three hours and 52 miles later.

We spent seven days at the cabin before flying back to town for a shower and to wash clothes. Then it was back to camp for another eight days. We had a Cessna 206 float plane most of the time and used it to ferry bait, food, water, and gasoline. After trying to sleep through many darkless nights, seeing one August snow storm, a few moose, and many other birds (pacific loon, gray jay, etc.) it was time to depart for home.

The Dempster Highway completed in 1978 (I think) is 500 miles of gravel road leading you into (or in this case, out of) Inuvik, the Alaska Highway (built in 1942), and the Cassiar are all beautiful adventures in themselves. We saw gorgeous scenery, black bear, moose, ptarmigan, stone sheep, grizzly, woodland caribou, etc. Then finally we were back on American soil and continued to Vallejo, CA, where we caught a shuttle to San Francisco and flew back to Des Moines. So, driving about 3,800 miles from Inuvik to San Francisco and then flying another 2,000 miles to Des Moines made this about a 11,600 mile round trip.

The past two banding trips have been wonderful. I would go again if called upon. I would like to thank the staff for taking up any slack I may have left behind during my absence. If you are visiting the Refuge and have any questions or comments, look me up. I would be happy to talk about my experiences in Canada and share some pictures and stories.

PRAIRIE WIND

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Seed Collection Serendipity

(Prairie Seed Collector Rule #3: Be flexible, try new paths.)

By Laurie Fenimore

With another year of scouting and seed harvesting winding to a close, I find myself reflecting on this and previous years' experiences. So many things come to mind . . . sighting the first prairie violet of the year, walking through the early morning dew to our favorite remnants, picking seed in a frenzy before an impending storm.

These are all very exciting and pleasurable activities, but the driving force that keeps us coming back for more is the serendipity of it all, the unexpected discoveries of new treasures . . .

One day in July, Dan and I followed our usual "path" to Edge Prairie. We trudged down the dirt road, up the clay hill, across the field and entered the prairie via an old tractor path. As we started down the first hill and began to turn toward the right, as was our custom, something to the left caught Dan's eye. He stopped and said, "What's that?" He was pointing to a splash of pink in a small clearing. I looked toward the small copse of trees and squinted, thinking to myself that I'd always wanted to explore this little glade and here was our chance. "I'm not sure," I answered as we started toward the as yet, unexplored area.

What we found was some kind of *Liatris*. At the time, we only knew it was a *Liatris* and that it seemed to be blooming rather early. We plucked a leaf and went on to our usual spots to compare it with the *Liatris aspera* (rough blazing star) that grew on the next hill. After some discussion and a Peterson guidebook as a reference, we concluded that it was *Liatris pycnostachya*, aka Prairie Blazing Star.

We were pleased to have found a "new" species but the story doesn't end there. On subsequent visits to check on the *Liatris pycnostachya*, we also came upon yellow prairie flax, field milkwort and tall white indigo.

Then one sterling day, Dan found a rarity near the other "new" species. It appeared to be some kind of a lovely pink foxglove-type flower. Out came the guidebooks again and after some comparison and discussion, we agreed that it was an eared false foxglove (*Tomanthera auriculata*), a rare species for central Iowa!

So, you see, Robert Frost was right . . . when you take the path less traveled, it makes all the difference.

Visitor Center Is a Busy Place!

Visitation counts are coming in as traffic and people counters are put back on line. Total visitation for September was 17,814. The Prairie Learning Center was open every day of October with over 1,940 unscheduled visitors touring the Prairie Learning Center exhibits. Ranger-led bus tours totaled close to 50 for October. Some 575 people attended conferences and toured the exhibits as well. School visitation continued in October with 1,721 students taking part in 163 programs and demonstrations every weekday through to the end of the month. Six college groups came to the Refuge for programs and tours of the facility.

Large group activities included annual meetings conducted at the Refuge by the Iowa Archeological Society, and the Iowa Prairie Network with visitation 120+ and 85 respectively. Centennial week was sparked by the Audubon Society Recognition of the National Refuge System and a volunteer day held at the PLC. About 100 participants attended as well as other groups utilizing the PLC facilities and a separate volunteer workday from "Friends" engaged a force of 30 in stewardship activities. The Public Use staff gave programs to 220 Scouts who came to the Refuge for programs and badge earning activities.

Did you know?

Friends' members
receive a discount at
the Prairie Point
Bookstore!

Friends' members
with a current
membership card
and at least \$25
giving level -- 5% on
consignment items
and 10% on all other
items.
No credit card sales.

Refuge Staff -- 5%
on all items. If
Friends' member,
then Friends' dis-
count only applies.
No credit card sales.

Prairie Point Staff
who are not Friends
-- Same discount as
Friends if worked
more than 30 hours
during a year.

Browsing with Mary -- An update from Prairie Point Bookstore

By Mary Margaret Jordan

The holiday season is upon us and it's time to be thinking about gift shopping. The Prairie Point Bookstore is the perfect place to bring your list because we have something for everyone on it, no matter how young or old.

A newly arrived book which would be perfect for any nature lover is a new edition of *A Sand County Almanac*, the classic by Aldo Leopold. This edition contains lots of wonderful colored photographs of the Sand County places associated with Leopold. It is a truly beautiful book and sells for \$35.00. Other classics which would make timeless gifts are Thoreau's *Walden* and *A Sense of Wonder* and *A Silent Spring* both by Rachel Carson.

For the travel lover, you can choose *Guide to the National Wildlife Refuges* recommended by both The Audubon Society and the National Wildlife Federation. It is arranged first by region and then by states and lists all of these over 475 remarkable places covering 91 million acres in the United States, all for just \$16.95.

Among the newest of our books is one entitled *Botany in One Day*. It is arranged much like a textbook and is filled with line drawings. I paged through this book when I unpacked it and decided it was just what I needed to finally understand what Pauline has been talking about!

We have a wonderful selection of children's books including the board book series called *Portable Pets*. We have four of these books which are shaped like the "pets" they represent: *Butterfly*, *Frog*, *Lady Bug* and the newest one, *Grasshopper*. They sell for \$6.95 and would be just right for the youngest on your list.

In addition to books as gifts, why not consider one or more stuffed toys to delight the young and young-at-heart. We have a lying down elk and a red-eyed frog that loves to hang around. And, of course, we have buffalo in many sizes ranging in price from \$5.00 to \$17.00. My favorite is the puppet which you can move with your hand. Ask John Below to demonstrate one. If you have a teddy bear collector on your list, pick up our 2001 issue of the T.R. bear complete with glasses and a refuge uniform. These bears will help celebrate the 100th birthday of the National Wildlife Refuge System in 2003. T.R. sells for just \$25.00.

And for stocking stuffers, we have new budget-friendly, patriotic star-shaped sunglasses in red and blue and also one-use cameras. Every adult on your list should have the newest edition of our own Neal Smith NWR lapel pin collection. These artistic pins have been designed using the brass medallions by Mark Muller which grace the entrance to the Learning Center. The 2001 pin has a green background and pictures the bur oak leaf. Actually, they are so inexpensive that you may wish to purchase the set of four which includes the 1998 elk, the only one of the set that has "Walnut Creek" on it, the red highlighted butterfly milkweed from 1999 and the black silhouetted Indiana bat from 2000.

And remember, the bookstore carries a full line of grown-in-the-shade coffee, in both bean and grind choices. Why not buy a pound for yourself as a treat for doing your holiday shopping at Prairie Point!

Come Grow With Us

The power of a Friends group is its members. We represent a variety of interests, talents and financial support allowing the Friends of the Prairie Learning Center to meet its mission and goals. We encourage you to renew your support or become a new Friend by completing the membership form below. Friends of the Prairie Learning Center is a nonprofit organization and all donations are tax deductible.

\$25 -- Big Bluestem Friend

\$100 -- Savannah Saver

Other -- \$ _____

\$50 -- Buffalo Buddy

\$250 -- Prairie Patron

Please circle one.

New Member

Renewal

Be sure to check and see if your company matches contributions....

Name _____

Address _____

City _____

State _____

Zip _____

Phone _____

Date _____

E-mail _____

Circle your donation level and mail to Friends of The Prairie Learning Center, PO Box 399, Prairie City, Iowa 50228

Friends of the Prairie: Web Site, E-mail, and Membership

Friends of the Prairie Learning Center membership is approaching the point where almost fifty percent of the membership have access to the Internet. The ability to retrieve information and rapidly correspond with each other has become very easy at a very low cost in time and money. The enjoyment of Friends' membership is greatly enhanced by reading, learning, and volunteering to participate in the many activities available at the Refuge.

Go to the Friends' web site at www.tallgrass.org every week or two and look at News/Events. Recent additions provide for information on the monthly Friends' Stewardship Saturday (2nd Sat. of the month) as in the past, and now articles on/by the Refuge staff, and excerpts from the monthly report on staff and volunteer activities. In late November, Jack Heisler discussed his five weeks of bird banding north of the Arctic Circle this past summer. There were short presentations on the total pounds of seed collected, and prescribed burns on the Refuge. At any time you might think, "these are interesting to me", contact the Refuge and see if there is a volunteer opportunity. We always look for more membership participation, volunteers, and even new board members. Sometimes these things turn into careers for our children or us.

As our E-mail list has grown, we have used it to rapidly communicate with our membership. It allows us to provide additional information or opportunities that can bring people together on a more timely basis, or to summarize information that will no longer be up to date for the next quarter's **Prairie Wind**. All Friends' members and those receiving our **Gentle Breezes** E-mail should be aware of the following:

1. We do not share/sell our mailing list or E-mail list with any organization!
2. All members receive the **Prairie Wind** quarterly publication of the Friends of the Prairie Learning Center, and other mailings of notice of events such as the annual meeting and various annual "happenings", and other special activities.
3. All E-mail distribution is done as a "blind copy" to you. That means your privacy is ensured to the best of our ability.
4. Membership renewals are sent out in the month prior to expiration.
5. If you have access to the Internet and E-mail, please let us know. We think you will enjoy the information on the **Gentle Breezes**.
6. If you move or change your E-mail address, please let us know.



Volunteers' Field Trip

In appreciation for all the volunteers' hard work, the Refuge offered volunteers a field trip by "luxury" bus to the De Soto and Boyer Chute National Wildlife Refuges. The trip included lunch and lots of interesting conversation! The participants toured De Soto's Bertrand Steamboat Museum and were given a tour of Boyer Chute by the manager.

Head 'Em Up and Move 'Em Out!

By John Jennings

For the staff at the Neal Smith National Wildlife Refuge, watching the bison roundup might be a little like seeing family members move away from home - family members with gigantic appetites who were cleaning out the refrigerator.

Since it is now impossible to enlarge the bison enclosure, Refuge Operations Specialist, Christy Smith, determined that a culling of the herd was necessary, and after several months of research, decided that a herd of about 38 would be ideal for the 750-acre range. The arrangements were made and the date set. The morning of October 29 dawned clear and warm, nearly a perfect day for working with the woolly bulldozers, and by 10:00 a.m. all but ten animals had been brought to the heavy-duty corral on the north side.

"Everything went well. Nobody got hurt," said Refuge Project Manager, Nancy Gilbertson.

Due to the size of the herd at the Refuge, the staff felt it was necessary to bring in the experts. Loren Clary, Bob King and Skip Palmer, from the National Bison Range in Montana, provided the expertise to safely and effectively gather the herd from across the enclosure and into the heavy-duty corral for sorting and testing. The Montana men routinely work with a herd of 400, so the 74 animals here provided little challenge.

The men on horseback, communicating via radio, were assisted by Refuge staff, including Christy Smith and Jack Heisler, Refuge Operations Specialists; Biological Technician Paul Charland; Maintenance Mechanic, Brian Boot; Refuge Biologist, Pauline Drobney; and two Refuge temporary student employees, Angela Sokolowski and Scott Van Ryswyk.

The powerful and unpredictable animals were separated in the elaborate series of pens and eventually found themselves in a holding chute where blood and hair samples were taken for DNA testing. Veterinarian Tom Roffe, from the U.S. Geological Survey in Bozeman, Montana, and Tri-County veterinarian, Tim Yoder, from Pella, checked the general health of the animals and those going to Minnesota were tested for tuberculosis. The animals were then either released back on the range or sent to a holding pen for shipment.

The bison herd at the Neal Smith National Wildlife Refuge began in 1996 with the introduction of 25 head. Within five years, the herd has

grown to 74, too many to be sustained by the current bison enclosure. After a study of the eating habits of the bison and prairie grass, it was determined to reduce the herd for their health as well as the continued health of the prairie.

"We're not in the business of raising bison. We want to maintain the prairie ecosystem as well as the bison herd," Smith said. Although the Refuge has conducted previous roundups of the bison herd for health inspections and testing, the culling process will be conducted yearly as well. Smith anticipated about eight to ten animals being sold in succeeding years.

The Red Lake tribe of Chippewa in Minnesota took possession of 16 bison, 17 went to the Winnebago tribe in Nebraska, one has been delivered to the Jasper County Conservation Board for Mariposa Park, two have been sent to Black Hawk County, and one to Buchanan County.

As a sad footnote to the roundup, one of the young bulls awaiting shipment to Minnesota was seriously gored by another bull later in the week, and required euthanization. "We thought about just leaving the bison out on the prairie, but since it was not a natural death, the staff decided to butcher it and donate the meat to charity," Gilbertson said. Unfortunately, the Fish and Wildlife Service which oversees the Refuge, could not allow payment for butchering of the animal in order to donate the meat, so Refuge staff donated their own money for the processing fees. The meat was donated to Teen Challenge of the Midlands in Colfax, the faith-based program which helps people overcome their drug and alcohol addictions.



Volunteer View

By John Below, Volunteer Coordinator

Last fiscal year (October 1, 2000 to September 30, 2001) we recorded over 16,389 volunteer hours. I would like to extend a big thanks to all of you who have volunteered at the Neal Smith NWR. Without your help, we would not be able to accomplish as much as we do. The hours that you contributed equal seven full-time employees.

A volunteer committee, consisting of Jim Pease, Tor Jansen, Jim Almquist, Connie Maxwell, and Elaine Haugen, has been established to help the refuge organize and guide our Volunteer Program. The committee has designed new time sheets, modified several forms and is in the process of helping create evaluation sheets to assist in improving our program. The next goal will be to create training sessions and to plan the volunteer recognition banquet. Volunteer opportunities have been evolving and growing in the past few months and we need your suggestions for training and programs to better help you, the volunteer.

New shirts have been ordered and Julie Karl has sewn on the patches for you. Thank you, Julie, for a job well done. It was very much appreciated. We are asking you to wear your volunteer shirts or vest whenever you are working at the Refuge. This will help ensure that visitors will be able to find a refuge representative if they have questions or need assistance. Shirts are available upon request after you have contributed 50 hours. Torn, stained, or lost shirts will be replaced as needed.

Lots of new opportunities are occurring at the Refuge, please keep in touch and keep up the good work.

Mark your calendars, the Volunteer Recognition Banquet is scheduled for January 26th starting at 5:30 p.m. Invitations will be sent out later.



Refuge Harvests Prairie for 2002 Planting

This fall, five prairie harvest sites were selected within the Refuge, checked for harvest-readiness, and coordinated for harvest sequence. Approximately 4,000 pounds of bulk seed were harvested, dried, cleaned, stored, and inventoried in October by Operations and Biology staff. Approximately 3,000 pounds of seed were retained by the refuge for future plantings and 1,000 pounds of bulk seed were provided to the Iowa DNR as part of a cooperative partnership between the Fish and Wildlife Service and DNR. There is an effort underway by the Fish and Wildlife Service and Iowa DNR to establish and promote local ecotype prairie plantings on lands under their jurisdiction.

Prairie Burning Sets a Record This Fall

by John Jennings

As if a bison roundup weren't enough for one week, Refuge staff began a series of six prescribed prairie burns which eventually charred 773 acres, setting a record at the Refuge for fall burns.

Prairie burns favor native flowers and grasses with their intricate root systems, and provide an excellent method of eliminating non-native species. Refuge biologist, Pauline Drobney, said the fall burns indicate a change in thinking about when to burn restored prairie areas. Most of the burning has taken place in the spring, but Drobney said research indicates that repeated spring burnings can weaken spring flora and decrease their numbers. Spring burning also tends to stimulate grass production and is harder on prairie forbs.

An autumn burn, when the plants are going into their dormant state allows for a greater diversity of forbs among the new growth. In addition, the blackened areas from a fall burn absorb sunlight more readily, warming up faster in the spring, which creates a longer growing period. Also, the charred ground allows for a more gradual seepage of moisture into the ground.

Near ideal weather during November allowed for the successful series of burns. Drobney said there are many conditions to be considered before calling for a prescribed burn. Very specific criteria must be met for a burn, including humidity, surface winds, as well as wind speeds at about 1,000 feet, the "mixing height" where the smoke mixes with winds aloft. Drobney talks directly to the National Weather Service in Des Moines for a spot weather forecast, and consults with the Refuge's own weather station. From the local weather station, Drobney receives fuel stick moisture information, which indicates moisture levels on grasses, shrubs and trees. That information tells her how long flammable material on the prairie is likely to burn.

The Neal Smith National Wildlife Refuge is divided into 24 burn units, with a specific burn plan for each unit. Neighbors within a one-mile radius of the Refuge are notified before the burn begins and smoke spotters, often volunteers from the public are utilized during the burn, and Refuge roads are closed during burning. Everyone on the burn crew has received training on prairie burning and has passed a rigorous physical fitness test.

Once the prairie burn begins, Drobney is the boss and she keeps a close watch on the progress of the fire, maintaining radio contact and repositioning crew members as needed.

Drobney said that burns are an absolutely critical part of prairie management. Native Americans understood the importance of burning the prairie and historical documents indicate that they utilized prairie burns in their environment. For that reason, the first European settlers didn't encounter great numbers of trees on their trek toward the west.

Although the Native Americans didn't have access to critical information during their prairie burns, Drobney said the more climatic information she has on burn day, the better she likes it. "We don't like surprises when we're burning. We like nice, predictable fires," Drobney said.

Friends' Annual Meeting

The Friends held their annual meeting on October 27th. Mildred Petersen was presented the Pride of the Prairie Award. The award recognizes Mrs. Petersen's vision of enhancing the environmental education program at the Refuge. The donation of Native American objects and the funds to build an exhibit, develop an educational program and continued support of the reconstruction efforts was a very generous contribution to the Friends.

Staff members from the areas of Operations, Public Use, and Biology each gave a short synopsis of what had been happening at the Refuge during the past year. Two speakers from Iowa State University rounded out the evening with presentations on the Regal Fritillary re-introduction and the Refuge's GIS program.



A Message from the Friends' President

Friends' Mission

*Increase public
awareness and
appreciation of the
Refuge*

*Encourage public
participation in prairie
restoration and
preservation*

*Promote public
use and enjoyment
of the Refuge*

I want to thank
all the board
members for
their support and
help in my first
year as the

Friends' president. We've accomplished a lot this year and have a lot more to do in the coming year. By increasing the support to four interns from three, we were able to provide two public use interns this year and two biology interns. The Refuge staff says the interns are an invaluable asset to the Refuge. The profits from bookstore sales fund the internship program. A big thanks to the bookstore volunteers for all the hours they invest in this activity.

Dave Penning, Refuge staff and I attended networking workshops with our fellow Midwest Friends Groups. In these meetings, we share our

successes with other groups and gather new ideas from their successful programs.

With Jonathan Yentis' leadership, we have established a work-night program on the fourth Thursday of the month. This stewardship and learning experience has been well received by people who cannot attend the Saturday workday or who want another Refuge learning opportunity. Jonathan sends out two e-mail notifications about the workday and night each month. If you are not on his mailing list and would like to be, send him an e-mail at

Yentisjon@aol.com

Just because it's almost winter, don't hibernate at home, visit or volunteer at the Refuge. Volunteers are always needed and the winter months are a good time to enjoy the opportunities offered at the Refuge.

Friends of



the Prairie Learning Center

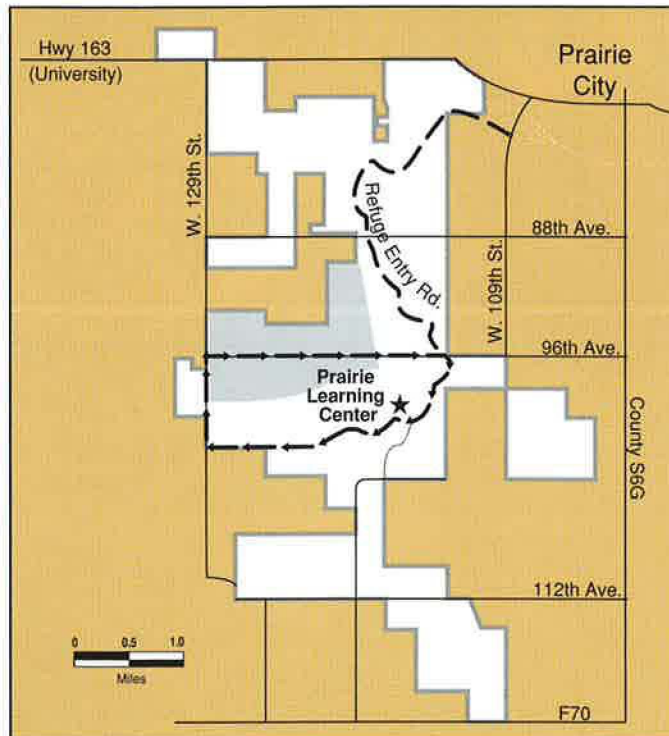
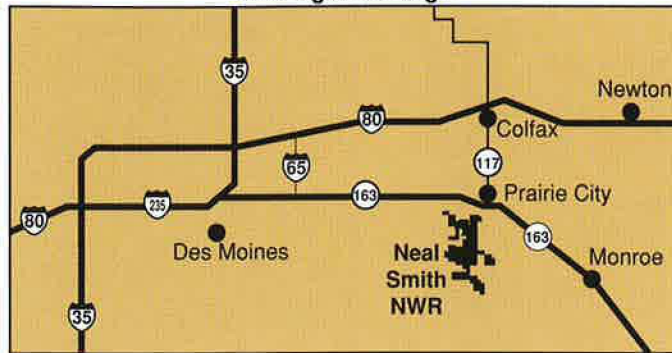
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Prairie City, Iowa 50228
515-994-3400

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Finding the Refuge



Bison and Elk Enclosure

- Refuge Entry Road
- Refuge Boundary
- Roads
- Bison and Elk Range
- ← Auto Tour Route

Neal Smith National Wildlife Refuge
Prairie Learning Center, Box 399
Prairie City, IA 50228-0399

Phone: 515/994 3400

Web address:
<http://www.fws.gov/r3pao/walnut/>

U.S. Fish & Wildlife Service
1 800/344 WILD



U.S. Fish & Wildlife Service

Neal Smith National Wildlife Refuge

American bison
USFWS photo

Welcome back
to the Tallgrass
Prairie!



Neal Smith National Wildlife Refuge

Over the last 150 years, we have converted the prairies to gravel roads and highways, to towns and cities, to farms and industries. We transformed it to the Midwest we have today. The tallgrass prairie that once covered part or all of 13 states is almost gone.

One hundred fifty years ago, tallgrass prairie covered 85% of Iowa's 36 million acres. *Today, only one-tenth of one percent of that prairie remains!* That's why Neal Smith National Wildlife Refuge exists -- to bring back some of the plants and animals that were the tallgrass prairie.

*Paths of wind,
Patterns of rain*

If you travel across the Rockies from the west on Interstate 80, you climb the tree-rich and well-watered western slopes. As prevailing westerly winds rise up over the mountains, they release most of their moisture in the form of rain. By the time these winds blow down the eastern slopes and spill out onto the Great Plains, they are dry. The plants of these plains are low-moisture plants -- prairie grasses and other flowering plants. The Great Plains stretch out to the east in a nearly treeless landscape. This short-grass prairie is typical of the western portion of what is called the "prairie wedge."

As the winds proceed toward the east across the Plains, they collide with the moisture-rich winds sweeping up from the Gulf of Mexico and rainfall grows more plentiful. As more moisture becomes available, the prairie species gradually change -- from mixed-grass species in Nebraska to the tallgrass species of Iowa.

The U.S. Congress authorized the acquisition of 8,600 acres -- land purchased from landowners willing to sell. Within those acres, there are several miles of surfaced trails to wander and an auto tour to drive; both provide good opportunities to see bison, elk, deer and other prairie wildlife.

Prairie Learning Center



The Prairie Learning Center is at the heart of it all, teeming with fascinating exhibits for all ages -- a place to see prairie research in action and the place to begin your visit.

As early Euro-American pioneers gazed across the seemingly endless prairie, they reasoned that "*If it can't grow trees, it must be poor ground,*" so they passed it by. Later, however, Iowa was found to contain some of the richest soils in the world.





Some day it may all look like this. But for now...



Meadowlark
B. Angus, USFWS

The tallgrass prairies provided a diversity of wild life – hundreds of plant species – over 350 species of birds – nearly 100 species of mammals – scores of amphibians and reptiles and fish – and uncounted thousands of insect species.

Often dry and unpredictable? To be sure. Lifeless and dull? Hardly.

Neal Smith National Wildlife Refuge offers a rare peek at this incredible collection of life we call the tallgrass prairie.



Canada Wild Rye
USFWS Photo

Lead plant
USFWS photo



*Adaptation –
the key to
prairie life.*



Coyote
USFWS photo

Take a driving tour through this developing remnant of our history. Search for the bison and elk herds in their native tallgrass habitat. Wander through the myriad of prairie blooms with a new show each week during the growing season. Lend a hand by helping plant prairie seeds in the spring. Take a walk among the open-grown oaks of the oak savanna with the ghosts of thousands of elk.

In the shortgrass prairies, trees were few, restricted almost entirely to the river bottoms. In tallgrass prairies, trees grew also in savannas – those scattered oases of tree groves with prairie plants beneath that dotted the tallgrass landscape. The trees were often oaks, burr oaks especially – trees with thick bark that could withstand the prairie fires. Their spreading branches provided welcome shade to the bison and elk that roamed these lands.

The plants and animals growing and living in prairies are adapted to the hot summers, cold winters and endless cycles of floods and droughts. They also adapted to fires that often swept over them. The plants and animals in the prairie are strong survivors.

Saving the Pieces

“The first law of intelligent tinkering is to save all the pieces.”

Aldo Leopold, 1948



*Prairie chickens
may someday be
a part of the
landscape of Neal
Smith NWR.*

While we won't be able to save all the pieces, Neal Smith NWR is saving as many as possible by:

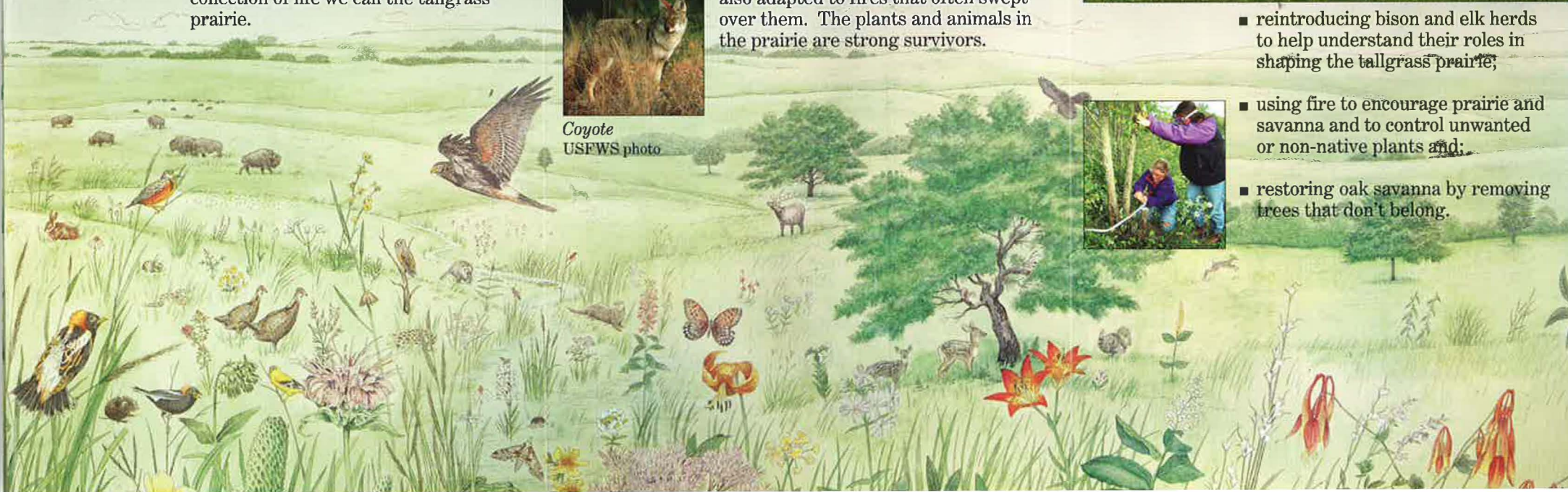
- restoring small prairie remnants that were left, including some savannas;
- reconstructing prairies by planting prairie seeds, many collected by volunteers from tiny remnants in cemeteries, roadsides, and railroad tracks in south-central Iowa;



- reintroducing bison and elk herds to help understand their roles in shaping the tallgrass prairie;

- using fire to encourage prairie and savanna and to control unwanted or non-native plants and;

- restoring oak savanna by removing trees that don't belong.





*Stiff tickseed
(left)*
USFWS photo

Neal Smith NWR is one of the *National Wildlife Refuge System's* 520 refuges which manage more than 93 million acres throughout the United States.

Goals of Neal Smith NWR

- to increase biodiversity by restoring and reconstructing tallgrass prairie and savanna habitats;
- to increase public knowledge and understanding of prairie through environmental education;
- to increase scientific knowledge and understanding of the prairie and savanna through ongoing research; and
- to provide diverse wildlife-related recreational opportunities.

Some day...



*Great Spangled
Fritillary
Butterfly*
Alex Theirman

It is possible that elk, prairie chickens, great spangled fritillary butterflies, northern harriers, upland sandpipers, short-eared owls, glass lizards, sedge wrens, pocket mice, speckled king snakes, and spotted skunks will all once again call Neal Smith NWR home.

For now, we are just beginning. But already Neal Smith NWR may be more than you ever imagined. Then we can all say "Welcome back!"

Refuge Information

- Bison are wild, unpredictable animals. Remain in your vehicle.
- Designated trails are for foot traffic only.
- For additional or specific regulations contact the Refuge.
- Visitor Center hours are Tuesday-Saturday from 9am-4pm and Sunday from noon to 5pm.
- Refuge trails and auto tour route are open daily from sunrise to sunset.



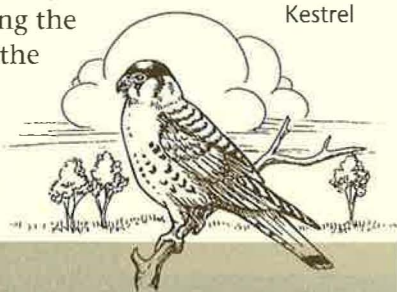
American bison
USFWS photo

The Refuge and the Prairie Learning Center are located south of Highway 163, just 20 miles east of Des Moines and 8 miles south of I-80.

This steep, rocky hillside has never been plowed. Some prairie plants survived here, along with invading non-prairie plants. Because fires didn't burn here, trees and brush gradually took over.

When this Refuge was established, this whole creek bottom was lined with trees and shrubs. The suppression of prairie fires in the last 100 years allowed them to grow up here. In addition, the rich prairie soils that once were on the surrounding hills had filled this creek bed over 20 feet deep! The creek has steep sides and a silt bottom. The Refuge has now removed the trees, reshaped the creek bottom, and reestablished prairie plants along the creek.

Prairie detective work helped us to discover this prairie remnant. Prairie soils differ from woodland soils in color, texture, and makeup. The soils here were typical of prairie. Also, despite the competition from the invading trees and shrubs, some tough prairie plants survived. Knowing what to look for, prairie managers were able to tell that this spot was, indeed, a prairie remnant. Since 1994, we have been removing the trees so that the land can gradually be restored to prairie.



Kestrel

Watch for

- kestrels hovering overhead (watching for insects and mice to eat)
- little bluestem grass
- skipper butterflies
- pocket gopher mounds
- purple spikes of blazing star

Station 5

If you were looking for a place to live on the prairie, where would you go? What would you, as a pioneer settler, need to survive? Shelter, food, fuel, and water. This place has it all! Wooded streamsides and oak savannas have been favored by many cultures over many centuries and many countries. Native American groups camped in the shelter of trees and hunted game in the open prairies.

James Elliot, the first settler of Prairie City, built his

Butterfly milkweed



Watch for

- nests of red-tailed hawks in trees across the creek
- turkey vultures and red-tailed hawks soaring overhead
- black-eyed Susans
- butterfly milkweed
- bats along the stream at dusk
- prairie crab-apple

cabin across the stream from here, too. Many animals also favor these spots. Indiana bats, a federally endangered species, live in the savanna and woods near open water and eat flying insects. They like to roost under the loose bark of shagbark hickory, in the hollows of burr oaks and other trees, allowing them to adjust their temperature when they want simply by moving to the bark on the other side of the tree. Each spring, pregnant females leave wintering caves in Missouri and return to here to raise their young.

Elk also used the savanna and prairie. Now found mainly in the western

United States, elk (called "wapiti" by Native Americans) once were numerous here. This area was perfect for them: water from the creek, shrubs to browse beneath the savanna, and prairie plants on which to graze. As for so many creatures, prairie and savanna provided the resources they needed. Perhaps someday they also will return.

Station 6

Prairie conjures up many images in people's minds. For some, it is an unending expanse of grass with little diversity. In only a short distance, however, you have seen that there was much diversity here. Prairie changes from place to place and from season to season. As you've followed this trail, have you noticed how it changes? This spot provides a good place to see the diversity. You can see woods along a stream and the wet prairie beside it. To the south-east, you see the open-grown trees with large lower branches typical of an oak savanna. And, you are now sitting or standing in the middle of a dry, or "xeric," prairie. About 150

years ago, Iowa was like this: a patchwork quilt of natural communities.

Big bluestem



Watch for

- wild turkey
- badger holes in the hillside
- dragonflies catching other insects over the wet prairie
- big bluestem grass
- Canada wild-rye

Open prairie near oak savanna is perfect habitat for wild turkeys. They may nest in the dense brush along the creek, hunting insects in the prairie and acorns in the savanna. Unregulated hunting and habitat loss drove wild turkeys from Iowa by 1900. Today, resource managers are shifting the odds, bringing back prairie and the critters that lived there.

The diversity of life that was once tallgrass prairie is on the way back here at Neal Smith National Wildlife Refuge. Its history has been varied, with many different plants, animals, and people inhabiting it. What more changes will the future bring?

Keep following the trail. The Prairie Learning Center is about a half-mile up the trail.

REMEMBER: Buffalo are wild, unpredictable animals. They may look like domestic cattle, but they are NOT tame and may be dangerous. DO NOT try to approach them!

Neal Smith National Wildlife Refuge
Prairie Learning Center, Box 399
Prairie City, IA 50228-0399
Phone: 515/994-3400
WEB address:
<http://www.tallgrass.org>

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U.S. Department of the Interior
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Neal Smith National Wildlife Refuge
Prairie Learning Center, Box 399
Prairie City, IA 50228-0399

Neal Smith's website address:
<http://www.fws.gov/r3pao/walnut>

U.S. Fish & Wildlife Service
1 800/344 WILD
<http://www.fws.gov>

Deaf/hard of hearing individuals may
reach Neal Smith NWR through the Federal
Information Relay System at 1 800/877 8339.

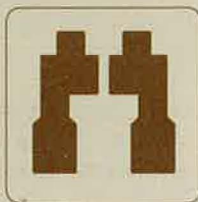
Available in alternative formats upon request.



U.S. Fish & Wildlife Service

Neal Smith

National Wildlife Refuge Bird Checklist





The "Blue Goose" symbolizes the National Wildlife Refuge System, a network of over 500 refuges protected and managed for wildlife, habitat and people.

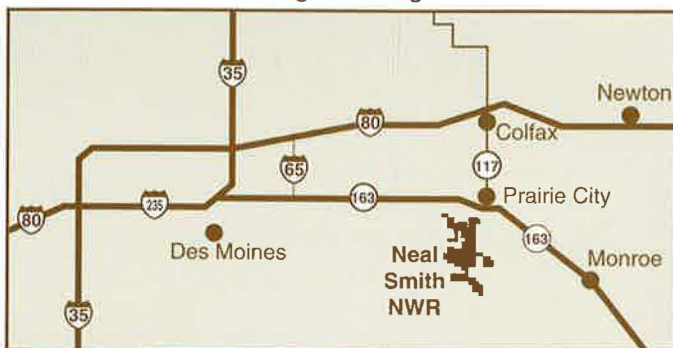
Neal Smith National Wildlife Refuge Bird Checklist

Approximately, 85% of pre-settlement Iowa was once blanketed by native tallgrass prairie. Today, less than 1% of that prairie remains in small isolated fragments. As the tallgrass prairie disappeared, grassland bird populations associated with this prairie ecosystem also disappeared or greatly declined. Birds like the greater prairie chicken, once a common sight, are now merely a memory.

Over the past several years much of the Neal Smith National Wildlife Refuge landscape has been transformed from crop land to tallgrass prairie. The reconstructed and restored prairies and savannas are providing food, cover, and breeding habitat for local and migratory birds. Each year, ornithologists conduct singing bird surveys and the results have shown that more and more grassland-dependent bird species are using the refuge.

Primary sources for this list include refuge personnel, local ornithologists, university researchers, and Iowa bird literature. Not all species listed have been observed within the refuge at the time this list was compiled, but regional distributions of species indicate that they may be observed in the future.

Finding the Refuge



Symbols used are as follows:

* indicates nesting on the refuge
has recently occurred

Sp March-May

S June-August

F September-November

W December-February

a abundant: a common species
which is very numerous

c common: certain to be seen or
heard in suitable habitat, not
in large numbers

u uncommon: present but not
always seen

0 occasional: seen only a few times
during the season

r rare: seen every 2 to 5 years

*Birdwatching is encouraged! For more
information, or to report any unusual
sightings, please contact refuge personnel.*

Short-eared Owl
©Jim Brandenburg



	Sp	S	F	W
Grebes				
___ Pied-billed Grebe	c	u	u	
___ Red-necked Grebe	r		r	
___ Western Grebe	r		r	
Pelicans				
___ American White Pelican	o		r	
Cormorants				
___ Double-crested Cormorant	u		o	
Hérons and Bitterns				
___ Least Bittern	r	r		
___ Great Blue Heron	c	c	c	
___ Cattle Egret	o	r		
___ Green Heron	u	r		
___ Black-crowned Night-Heron	r			
Vultures				
___ Turkey Vulture*	u	u	u	
Swans, Geese and Ducks				
___ Snow Goose	o		r	
___ Canada Goose	c	c	c	o
___ Wood Duck	u	u	u	
___ Gadwall	o		r	
___ Mallard*	c	u	c	u
___ Blue-winged Teal*	c	c	u	
___ Northern Shoveler*	u	r	o	
___ Green-winged Teal	o		o	
___ Ring-necked Duck	o		o	
___ Lesser Scaup	o			
___ Ruddy Duck	o		o	
Hawks and Eagles				
___ Osprey	r		r	
___ Bald Eagle	o	o	o	o
___ Northern Harrier*	u	r	u	r
___ Sharp-shinned Hawk	o		o	o
___ Cooper's Hawk	o		o	o
___ Broad-winged Hawk	o		r	
___ Swainson's Hawk	o		o	
___ Red-tailed Hawk	c	c	c	c
___ Rough-legged Hawk	o		o	o
Falcons				
___ American Kestrel*	c	c	c	u

	Sp	S	F	W
Upland Game Birds				
___ Ring-necked Pheasant*	a	a	a	a
___ Wild Turkey*	u	u	u	u
___ Northern Bobwhite*	o	o	o	o
Rails and Coots				
___ Sora	o	o		o
___ American Coot	c	o		o
Cranes				
___ Sandhill Crane	r	r		r
Shorebirds				
___ Black-bellied Plover	r	r		r
___ American Golden-Plover	r			
___ Semipalmated Plover	r			r
___ Killdeer*	a	a		a
___ Greater Yellowlegs	r			r
___ Lesser Yellowlegs	o			o
___ Solitary Sandpiper	o	r		r
___ Spotted Sandpiper	o	r		r
___ Upland Sandpiper*	r	r		r
___ Least Sandpiper	r	r		r
___ Pectoral Sandpiper	o	r		o
___ Short-billed Dowitcher	r			
___ Long-billed Dowitcher	r			
___ Common Snipe*	u	o		o
___ American Woodcock*	u	u		u
___ Wilson's Phalarope	r			
Gulls and Terns				
___ Franklin's Gull	o			
___ Bonaparte's Gull	r			r
___ Ring-billed Gull	o			o r
___ Herring Gull	o			o o
___ Black Tern	r			
Doves				
___ Rock Dove*	c	c		c c
___ Mourning Dove*	c	c		c u
Cuckoos and Roadrunners				
___ Black-billed Cuckoo	o	r		r
___ Yellow-billed Cuckoo*	u	u		u

	Sp	S	F	W
Owls				
___ Eastern Screech-Owl*	o	o	o	o
___ Great Horned Owl*	u	u	u	u
___ Barred Owl*	u	u	u	u
___ Short-eared Owl*	r	r	r	o

Nighthawks and Nightjars

___ Common Nighthawk	u	c	u	
___ Whip-poor-will	r	r		

Swifts

___ Chimney Swift*	u	c	u	
--------------------------	---	---	---	--

Hummingbirds

___ Ruby-throated Hummingbird*	u	u	u	
--------------------------------------	---	---	---	--

Kingfishers

___ Belted Kingfisher*	u	u	u	
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Woodpeckers

___ Red-headed Woodpecker*	u	u	o	o
___ Red-bellied Woodpecker*	c	c	c	c
___ Yellow-bellied Sapsucker*	o	u	o	
___ Downy Woodpecker*	c	c	c	c
___ Hairy Woodpecker*	u	u	u	u
___ Northern Flicker*	c	c	c	u
___ Pileated Woodpecker	r	r	r	r

Flycatchers

___ Olive-sided Flycatcher	o		r	
___ Eastern Wood-Pewee	c	c	c	
___ Yellow-bellied Flycatcher	o	r	o	
___ Acadian Flycatcher*	r	r		
___ Alder Flycatcher*	r	r		
___ Willow Flycatcher*	r	r		
___ Least Flycatcher*	o		o	
___ Eastern Phoebe*	o		o	
___ Great Crested Flycatcher*	u	c	u	
___ Eastern Kingbird	u	c	u	

Shrikes

___ Loggerhead Shrike*	u	u		
___ Northern Shrike	o	o	o	o

Vireos

___ White-eyed Vireo	r	r		
___ Bell's Vireo*	r			
___ Solitary Vireo	o	o	o	

	Sp	S	F	W
___ Yellow-throated Vireo*	o	o		
___ Warbling Vireo*	u	c	u	
___ Philadelphia Vireo	r			
___ Red-eyed Vireo*	u	c	u	

Jays, Magpies and Crows

___ Blue Jay*	a	a	a	a
___ American Crow*	a	a	a	a

Larks

___ Horned Lark*	c	c	c	c
------------------------	---	---	---	---

Swallows

___ Purple Martin*	r	o	r	
___ Tree Swallow*	c	c	u	
___ Northern Rough-winged Swallow*	o	o		
___ Bank Swallow*	o	o		
___ Cliff Swallow*	o	u		
___ Barn Swallow*	c	c	c	

Chickadees and Titmice

___ Black-capped Chickadee*	a	a	a	a
___ Tufted Titmouse	u	u	u	u

Nuthatches

___ Red-breasted Nuthatch	o	r	r	o
___ White-breasted Nuthatch*	a	a	a	a

Creepers

___ Brown Creeper	u		u	u
-------------------------	---	--	---	---

Wrens

___ House Wren*	a	a	c	
___ Sedge Wren*	u	u	u	
___ Marsh Wren	o	o		

Kinglets, Bluebirds, and Thrushes

___ Golden-crowned Kinglet	o	o	r	
___ Ruby-crowned Kinglet	c	o	c	
___ Blue-gray Gnatcatcher	u	u		
___ Eastern Bluebird*	u	u	u	
___ Veery	o			
___ Gray-cheeked Thrush	o	o	o	
___ Swainson's Thrush	u	o	o	
___ Hermit Thrush	u		u	
___ Thrush	r	r	r	
___ American Robin*	a	a	a	o

Bobolink
S. Maslowski



	Sp	S	F	W
Mimics				
___ Gray Catbird*	u	a	a	
___ Northern Mockingbird	o	r		
___ Brown Thrasher*	a	a	u	
Starlings				
___ European Starling	c	c	c	c
Waxwings				
___ Cedar Waxwing*	o	c	e	r
Warblers				
___ Blue-winged Warbler	r		r	
___ Golden-winged Warbler	o	r	o	
___ Tennessee Warbler	c	r	c	
___ Orange-crowned Warbler	o		o	
___ Nashville Warbler	c		c	
___ Northern Parula	o			
___ Yellow Warbler*	c	u	u	
___ Chestnut-sided Warbler	u		u	
___ Magnolia Warbler	c		c	
___ Cape May Warbler	o		r	
___ Yellow-rumped Warbler	c		c	
___ Black-throated Green Warbler	o		r	
___ Blackburnian Warbler	u		u	
___ Yellow-throated Warbler	r			
___ Palm Warbler	c		c	
___ Bay-breasted Warbler	u		r	
___ Blackpoll Warbler	u		u	
___ Cerulean Warbler	r		r	
___ Black-and-white Warbler	c		u	
___ American Redstart	c	u	c	
___ Prothonotary Warbler	r			
___ Ovenbird	c	c	u	
___ Northern Waterthrush	o		o	
___ Louisiana Waterthrush	r			
___ Kentucky Warbler	r			
___ Connecticut Warbler	r			
___ Mourning Warbler	r			
___ Common Yellowthroat*	c	a	c	
___ Wilson's Warbler	c		c	
___ Canada Warbler	o		r	
___ Yellow-breasted Chat*	r			
Tanagers				
___ Summer Tanager	r			
___ Scarlet Tanager*	o	o	o	

	Sp	S	F	W
Sparrows, Buntings and Grosbeaks				
___ Eastern Towhee*	u	u	o	
___ American Tree Sparrow	c		c	c
___ Chipping Sparrow*	c	c	c	r
___ Clay-colored Sparrow	r	r		
___ Field Sparrow*	c	c	c	
___ Vesper Sparrow*	u	u		
___ Lark Sparrow*	r	r		
___ Savannah Sparrow	r			
___ Grasshopper Sparrow*	r	r		
___ Henslow's Sparrow*	r	r		
___ Le Conte's Sparrow	r	r		
___ Fox Sparrow	u		u	
___ Song Sparrow*	a	a	a	u
___ Lincoln's Sparrow	u		u	
___ Swamp Sparrow*	u	u	u	
___ White-throated Sparrow	c		c	r
___ White-crowned Sparrow	u		u	
___ Harris's Sparrow	u		u	
___ Dark-eyed Junco	c		a	a
___ Lapland Longspur	o		o	
___ Snow Bunting			o	
___ Northern Cardinal*	a	a	a	a
___ Rose-breasted Grosbeak*	u	c	u	
___ Indigo Bunting*	u	c	u	
___ Dickcissel*	o	c	c	
Blackbirds and Orioles				
___ Bobolink*	u	u	r	
___ Red-winged Blackbird*	a	a	a	r
___ Eastern Meadowlark*	c	a	c	o
___ Western Meadowlark*	c	a	c	o
___ Yellow-headed Blackbird	u			
___ Rusty Blackbird	o		o	
___ Common Grackle*	u	c	c	r
___ Great-tailed Grackle	r	r		
___ Brown-headed Cowbird*	c	a	a	r
___ Orchard Oriole*	o	o		
___ Baltimore Oriole*	u	c	u	
Finches				
___ Purple Finch	u		o	u
___ House Finch*	c	c	c	c
___ Pine Siskin	o		o	
___ American Goldfinch*	a	a	a	a
Old World Sparrows				
___ House Sparrow*	a	a	a	a

Neal Smith
National Wildlife Refuge



Prairie Learning Center

The Tallgrass Trail
Back to the Future?

This 2-mile long trail is paved and has benches about every 1/3 mile to rest and watch the prairie life around you. It has long, gradual slopes that will take you down by the stream and a buffalo enclosure that you can see from the top of the hill, just north of the Prairie Learning Center. This trail is accessible to everyone, including those who use wheelchairs, walkers or crutches — although it does require some endurance.

Please enjoy this trail and all of the Refuge and help protect it!

- Stay on the trails.
- Collecting plants or animals, building fires, or taking pets along are all prohibited.
- Please do not litter; pick up any litter you find that may have been left behind by others.
- To protect people on foot, no bicycles or skateboards are allowed on the Tallgrass Trail.

This trail will allow you to see firsthand some of the plants and animals you've learned about in the Prairie Learning Center (PLC). It will show you some reintroduced plants and animals. It will take you back to what the Tallgrass Prairie once was. It will also take you forward into what this Refuge will become. It will ask you to look, listen, and ponder. The six stations in this brochure refer to the six wide places in the trail with benches. You can locate them on the map below.

You may want to consider taking along:

- a bottle of water (it can be hot on the prairie on a summer day),
- binoculars to spot prairie birds or buffalo,
- a book on prairie wildflowers and plants, and
- a hat to protect you from the prairie sun.

Station 1

Probably it's already quieter than when you left the trailhead. Though the Learning Center is closeby behind you, you are lower on the slope and surrounded by restored tallgrass prairie. Listen and watch closely. You may hear the sweet calls of meadowlarks and see them landing in a patch of Indiangrass. Their black "necklace" on a yellow chest is often visible. Meadowlarks build their hidden nests on the ground at the base of clumps of plants. Unlike many native prairie birds, meadowlarks can also nest in agricultural landscapes. For reasons we do not yet fully understand, their populations have been declining in recent years. Hopefully, more habitat like this Refuge and other grasslands will help bring them back.

Look around you and other prairie life may be visible. Butterflies may be sipping the nectar of prairie wildflowers. Many prairie plants are coming back. Some have been hanging on here for many decades. This

hillside was difficult to farm. Over the years, it was seeded with non-native grasses, grazed, planted with corn, even bulldozed. But, because of their deep roots and adaptation to prairie weather, some prairie plants survived. Now this hillside is managed to preserve the native plants and encourage them to grow.



Meadowlark

Watch for

- compass plant
- roundheaded bushclover
- stiff goldenrod
- pheasants (the 20th Century replacement for native prairie chickens)
- monarch butterflies

Station 2

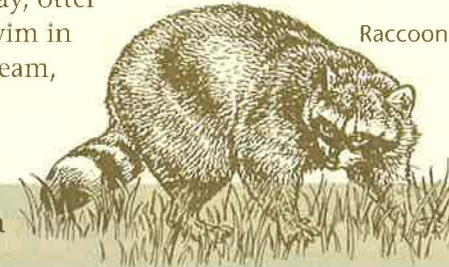
Creeks were the veins of water that flowed through and connected the prairie landscape. Like the one in front of you, they provided essential water for wildlife and plants. As a result, they were travel corridors for many animals.

"In every part of this whole District, beautiful rivers and creeks are to be found, whose transparent waters are perpetually renewed by the springs from which they flow." This was written by Albert Miller Lea, a man who explored this area in 1835. Much has changed since then. As prairie was broken by the plow, streams became muddy. Bringing prairie back slows erosion. One day this

stream may be clear again—and bring back the life that was once common here.

River otters, for example, were once common in Iowa. By 1900, they were gone because of unregulated trapping and loss of habitat. In the 1980s, otters were brought back to Iowa. Several now live in Red Rock Reservoir, downstream from this creek.

Someday, otter may swim in this stream, too.



Raccoon

With for

- cottonwood trees (right across the creek from you)
- damselflies
- tracks of skunks, rabbits, raccoons, or turtles in the mud
- cupplant
- Joe-Pye weed

Station 3

Large, hooved grazers were an important part of tallgrass prairie. Buffalo and elk once roamed here by the thousands. Unrestricted and unregulated market hunting destroyed those herds. If you're lucky, you may catch a glimpse of the Neal Smith NWR buffalo. Relatives of the few that were left, these buffalo have been brought back to view and help us understand the importance of these one-ton grazers to prairie. They eat prairie plants and trample them as well. But they are important to its survival. Their grazing and

trampling helps the prairie grow, often thicker because of them, and "selecting" certain species for survival over others.

Another prairie animal you may see here is the brown-headed cowbird. Cowbirds used to follow the nomadic buffalo herds, eating insects from buffalo backs and insects kicked up by buffalo hooves. During the spring, if cowbirds nested for several weeks like other prairie birds, they'd lose the buffalo herd. So, they evolved an adaptation of laying eggs in other birds' nests for the other birds to raise. Today cowbirds still lay eggs in others' nests, even though the buffalo herds are gone. This "nest parasitism" is an interesting problem for many grassland birds.



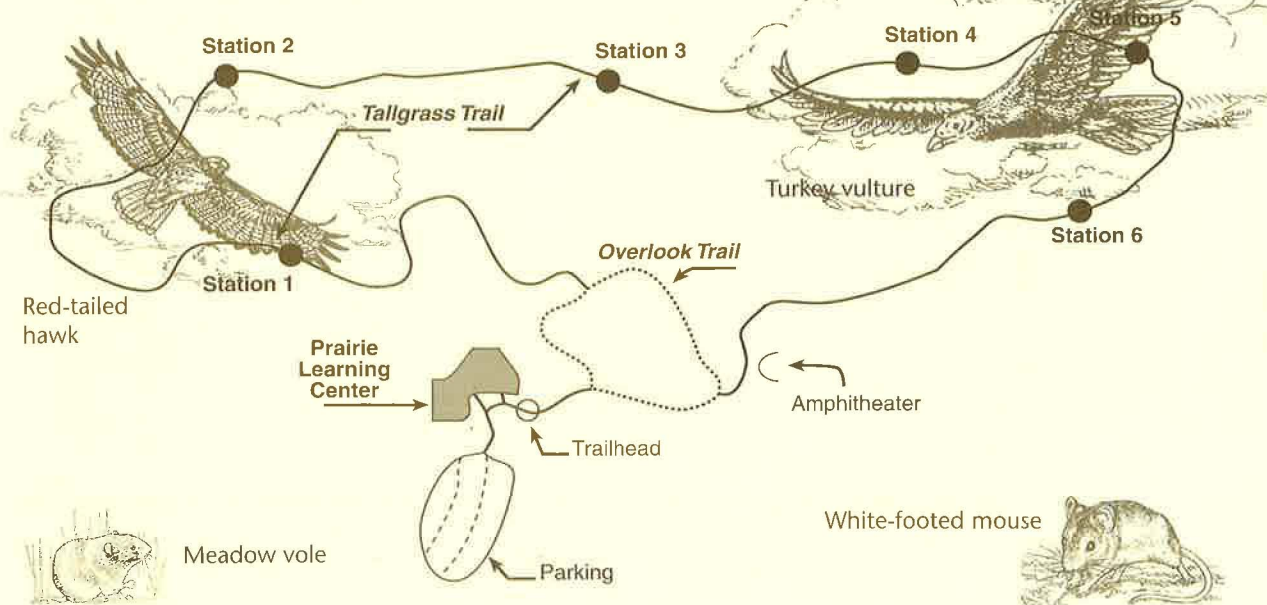
Fritillary butterfly

Watch for

- harriers (also called "marsh hawks") flitting up and down
- Indiangrass
- red fox tracks
- fritillary butterflies
- rattlesnake master (can you guess why this plant is called this?)

Station 4

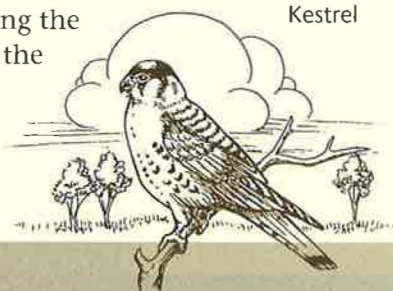
Neal Smith NWR is both a reconstruction and a restoration. We **reconstruct** areas, like fields that have been plowed for years, by planting prairie seeds. We **restore** areas like this, where some native plants still exist.



This steep, rocky hillside has never been plowed. Some prairie plants survived here, along with invading non-prairie plants. Because fires didn't burn here, trees and brush gradually took over.

When this Refuge was established, this whole creek bottom was lined with trees and shrubs. The suppression of prairie fires in the last 100 years allowed them to grow up here. In addition, the rich prairie soils that once were on the surrounding hills had filled this creek bed over 20 feet deep! The creek has steep sides and a silt bottom. The Refuge has now removed the trees, reshaped the creek bottom, and reestablished prairie plants along the creek.

Prairie detective work helped us to discover this prairie remnant. Prairie soils differ from woodland soils in color, texture, and makeup. The soils here were typical of prairie. Also, despite the competition from the invading trees and shrubs, some tough prairie plants survived. Knowing what to look for, prairie managers were able to tell that this spot was, indeed, a prairie remnant. Since 1994, we have been removing the trees so that the land can gradually be restored to prairie.



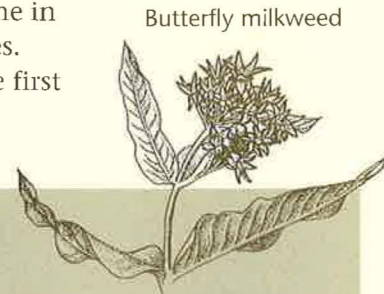
Kestrel

Watch for

- kestrels hovering overhead (watching for insects and mice to eat)
- little bluestem grass
- skipper butterflies
- pocket gopher mounds
- purple spikes of blazing star

Station 5

If you were looking for a place to live on the prairie, where would you go? What would you, as a pioneer settler, need to survive? Shelter, food, fuel, and water. This place has it all! Wooded streamides and oak savannas have been favored by many cultures over many centuries and many countries. Native American groups camped in the shelter of trees and hunted game in the open prairies. James Elliot, the first settler of Prairie City, built his



Butterfly milkweed

Watch for

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- turkey vultures and red-tailed hawks soaring overhead
- black-eyed Susans
- butterfly milkweed
- bats along the stream at dusk
- prairie crab-apple

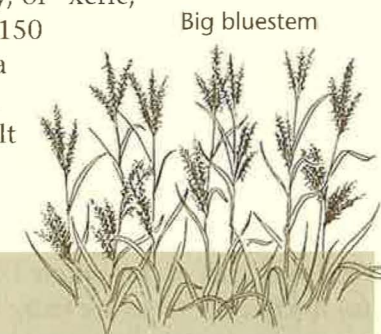
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United States, elk (called "wapiti" by Native Americans) once were numerous here. This area was perfect for them: water from the creek, shrubs to browse beneath the savanna, and prairie plants on which to graze. As for so many creatures, prairie and savanna provided the resources they needed. Perhaps someday they also will return.

Station 6

Prairie conjures up many images in people's minds. For some, it is an unending expanse of grass with little diversity. In only a short distance, however, you have seen that there was much diversity here. Prairie changes from place to place and from season to season. As you've followed this trail, have you noticed how it changes? This spot provides a good place to see the diversity. You can see woods along a stream and the wet prairie beside it. To the south-east, you see the open-grown trees with large lower branches typical of an oak savanna. And, you are now sitting or standing in the middle of a dry, or "xeric," prairie. About 150 years ago, Iowa was like this: a patchwork quilt of natural communities.



Big bluestem

Watch for

- wild turkey
- badger holes in the hillside
- dragonflies catching other insects over the wet prairie
- big bluestem grass
- Canada wild-rye

Open prairie near oak savanna is perfect habitat for wild turkeys. They may nest in the dense brush along the creek, hunting insects in the prairie and acorns in the savanna. Unregulated hunting and habitat loss drove wild turkeys from Iowa by 1900. Today, resource managers are shifting the odds, bringing back prairie and the critters that lived there.

The diversity of life that was once tallgrass prairie is on the way back here at Neal Smith National Wildlife Refuge. Its history has been varied, with many different plants, animals, and people inhabiting it. What more changes will the future bring?

Keep following the trail. The Prairie Learning Center is about a half-mile up the trail.

REMEMBER: Buffalo are wild, unpredictable animals. They may look like domestic cattle, but they are NOT tame and may be dangerous. DO NOT try to approach them!

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Prairie City, IA 50228-0399
Phone: 515/994-3400
WEB address:
<http://www.tallgrass.org>

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