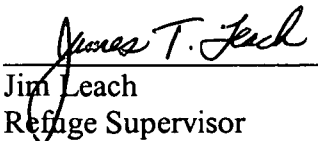


**Sherburne National Wildlife Refuge
Zimmerman, Minnesota**

**Annual Narrative Report
Fiscal Year 2003**

 04/08/04
Anne Sittauer
Refuge Manager Date

 4-30-04
Jim Leach
Refuge Supervisor Date

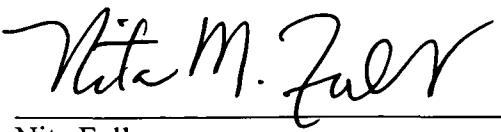
 4.21.2004
Nita Fuller
Regional Chief, National Wildlife Refuge System Date

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Credits

Appendix (RCAR Summary)

INTRODUCTION

The scattered, gnarled oaks posed as sentinels as the wagon moved ever onward. Bison, elk, rabbit, grouse and squirrels were commonplace while the more secretive wolves, foxes and badgers lurked in the distance and countless wild flowers filled the air with savory odors. Myriads of waterfowl swarmed about the marshes while beaver busily constructed dams to create new wetlands. At long last, a place to settle was selected. The year was 1857 and the European pioneers were not aware that man had begun inhabiting the area at least 5,000 years earlier.

Geologic processes had been shaping the landscape for eons. A glacier had deposited sandy outwash over the area about 12,000 years earlier which would eventually develop into soil. Mixed with the outwash were large ice blocks of various sizes and shapes which, when melted, would form the numerous wetlands, many of which exist today. The sandy soils had poor water-holding capabilities. During wet periods vegetation grew profusely yet when rain failed to fall for an extended period of time, the soils and vegetation would quickly dry and fires would rampage over the countryside consuming virtually everything in the way. As a result, a unique biotic community evolved which would eventually become known as oak savanna.

An oak savanna contains portions of the woodland plant community and the prairie plant community. Only the highly fire-tolerant plants survived in abundance. Those plants which were not very fire-tolerant were held in check awaiting the wet years to prosper.

After the arrival of the pioneers in 1857, settlement progressed rapidly. Within 50 years most of the land was under private ownership with agriculture the primary industry. Fields were cleared and the sod was broken. In an attempt to gain more farm land, an extensive network of drainage ditches was constructed beginning in the early 1900's. Some of the wetland drainage did create additional farm land but much of it merely reduced the wildlife values of the wetland. Fire suppression allowed forest lands to develop and the oak savanna which had developed over thousands of years almost vanished over a period of less than 100 years.

Local sportsmen recognized the decline in wildlife populations and in the late 1930's began to promote restoration and development of the area for wildlife through the Minnesota Department of Conservation. Studies were conducted to determine the feasibility of establishing a wildlife refuge. The Minnesota Department of Conservation recognized that the financial demands of establishing a refuge of some 48 square miles were too great for them to undertake and requested assistance from the U.S. Fish and Wildlife Service (USFWS). After several years of negotiations with local, state and federal governmental agencies, approval for establishment of Sherburne National Wildlife Refuge was granted. On May 18, 1965, Sherburne National Wildlife Refuge was established under the authority of the Migratory Bird Treaty Act. Its legislative purpose as stated at the hearing before the Migratory Bird Conservation Commission is "...for use as an inviolate sanctuary, or for any other management purposes, for migratory birds".

Sherburne's major objectives as derived from its legislative purpose are:

- To enhance waterfowl production and maintenance.
- To restore and maintain native vegetation and wildlife.
- To provide and enhance habitat for wildlife diversity.
- To provide the public with wildlife-oriented opportunities in interpretation, recreation, and outdoor classrooms when compatible with the resource and other Refuge objectives.

Land acquisition began shortly thereafter. Nearly 300 landowners were involved. By 1975, land acquisition for the Refuge was essentially complete but some land exchanges to resolve inholding did occur thereafter. Funds for the land acquisition came from proceeds of duck stamp sales. Also during this period, a master plan for management of the Refuge was developed. In essence, the goal of the master plan was to return the landscape to a condition similar to that which existed at the time of settlement by Europeans.

When land acquisition was completed, development of the Refuge could move forward. Farm buildings were sold and moved. Foundations were buried and basements were filled. Farm fields were seeded to grasses (native prairie grasses when funds were available) and wetland restoration was begun. When permanent vegetation had been established in the fields to stabilize the soil, removal of pines, which were not native to the area, was begun (pine trees had been planted following the dust bowl era of the 1930's to retard soil erosion). Fire, a primary factor in development and maintenance of oak savanna, could be used to restore oak savanna once the pine trees were removed. Wetland restoration took a major step forward in 1978 when the Bicentennial Land Heritage Program, originated by President Ford and perpetuated by President Carter, provided funding for development of refuges throughout the United States. Under this program, which ended in 1981, over 6,000 acres of wetlands were restored or created on Sherburne Refuge. Development to accommodate public use was also undertaken.

Today, Sherburne Refuge provides a place for the ever expanding human population to observe and enjoy nature. The Old Schoolhouse, which was constructed very early in this century, is used by many of the local schools as a center for environmental education. Two trails are available for hiking or cross country skiing, depending upon the season. An auto tour route provides visitors with an opportunity to observe and interpret habitat management practices and view wildlife. The goal of returning the combination of wetlands, grasslands, and oak savanna to pre-settlement conditions has not yet been reached, but the process has is well on the way.

HIGHLIGHTS

- Eight Bald Eagle chicks fledged from five nests this summer.
- A record of 2600 sandhill cranes staged on the Refuge in fall 2002.
- St. Francis River assessment (water quality and stream classification) was initiated.
- Possible nesting pair of Loggerhead Shrikes.
- Increased number of American Bitterns reported on the Secretive Marsh Bird Survey.
- Forb production plots were started for six new wildflower species.
- Volunteers donated 606 hours collecting wildflower seeds.
- Prescribed burning was conducted on 6,604 acres.
- Chad Loreth hired as a Regional Wildland Urban Interface Coordinator stationed at Crane Meadows NWR.
- Brad Ehlers, Assistant Manager, retired on April 1 after 33 years of federal service.
- Four new, never before burned units were added to the burn plans.
- Plans were initiated to get volunteers involved in Refuge invasive species control program thanks to Volunteers and Invasive Species Grant money.
- Our list of habitat restoration partners continues to grow. This year we teamed up with Anoka County Conservation District to restore 35 acres in that County.
- A total of 276 law enforcement incidents were recorded.
- A record 111,151 visitors came to Sherburne; 25,000 visited the Wildlife Drive and nearly 23,000 on the foot trails, both of which were records.
- The Centennial of the National Wildlife Refuge System was celebrated at all events.
- A Time Capsule Dedication was held on March 14 to honor the centennial of the National Refuge System.
- The third annual Habitat Day at Crane Meadows NWR was attended by 350 people. Sherburne was among the multiple partners.

CLIMATIC DATA

Overall the year of 2003 was warmer and dryer than normal (Table 1)*. Seven months of the calendar year had above average temperatures. Eight of the twelve months had below normal precipitation. In fact, there was a deficit of precipitation going into the year 2004.

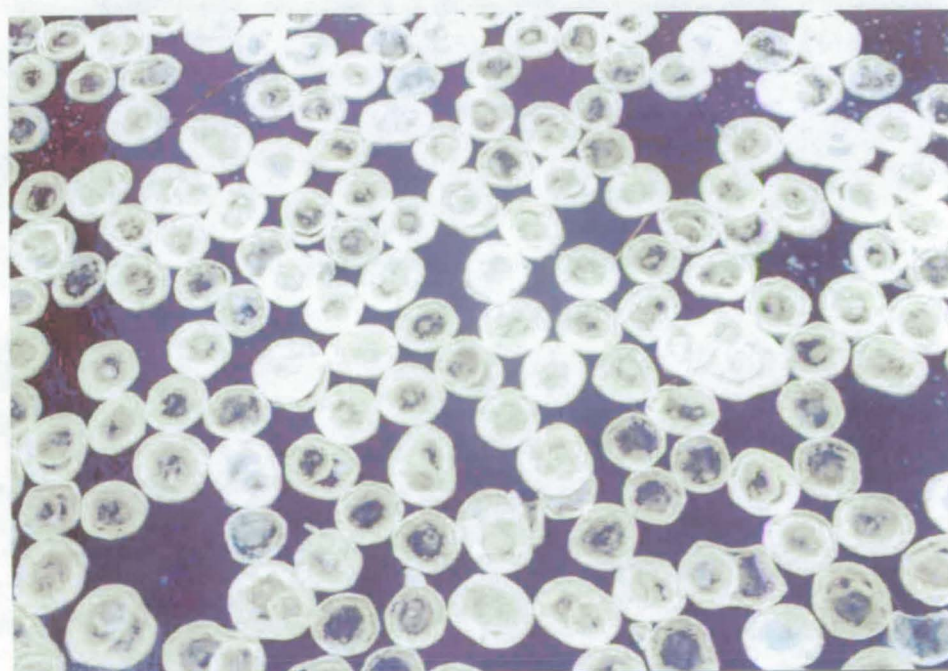
First quarter temperatures, particularly from January 10 – March 10, were influenced by a blocking high pressure zone located on the British Columbia coast which forced cold air masses south into Minnesota. The first several days of January were unseasonably warm and the St. Francis River remained open for much of the winter. In fact a Hooded Merganser was observed on the St. Francis River at the County road 5 bridge on January 6, 2003. From January 10 onward, temperatures for the month averaged two degrees colder than normal, but were not cold enough to offset the warm start. February and March had average temperatures below normal. All three months of the first quarter had below normal precipitation. January is normally the snowiest month of the year in this area, however, only 3.1 inches of snow fell. February had 8.8 inches of snow; most of this (7.0 inches) fell during the evening of February 3. March would have fallen well short of its precipitation deficit if not for a thunderstorm on March 18 which contributed 0.97 inch to the monthly total. This lack of snow and cold temperatures plagued many rural landowners. The ground frost drove down to freeze many septic systems in the region.

The second quarter of 2003 was colder and wetter than normal. April came in as a desert and went out as a swamp. Total April precipitation was 4.73 inches, more than double the normal. All of the precipitation came during a seven day period in mid-April, which meant there were plenty of warming days to create warmer than normal temperatures. Area lake ice-out came in mid-April. May was also wet, however, the precipitation was spread out over the month. The cloudy days account for the month's cooler than normal temperatures. June ended this quarter with cooler, drier conditions.

Just after the ice had gone out of the wetlands and lakes in early April, an interesting phenomenon was observed, behind the radial gates at St. Francis Pool. On this particular morning, most of the wetlands had a skim of ice over the top of them that formed overnight. The ice behind the water control structure had formed into circles, ranging from 10-12 inches in diameter with a bigger build up of ice around the edges resembling hoarfrost. These ice circles were floating around individually, but congregated in one spot in the backwash eddies behind the structure. We sent in the pictures to "Natural Curiosities" column for the *Minnesota Conservation Volunteer* magazine published by the Minnesota Department of Natural Resources (MN DNR). We were informed by the state climatology office that the circular ice formations are called pancake ice. They form when slush in turbulent water starts to freeze together. Our question, picture, and their answer were published in the *Minnesota Conservation Volunteer*.



Pancake ice downstream of radial gates at St. Francis Pool (AR 4/03)



Close-up of pancake ice in St. St. Francis Pool. (AR 4/03)

The third quarter of 2003 was warmer and drier than usual. Of the three months, July had closest to normal weather statistics. The month was slightly cooler than normal due to the frequent threat of showers and thunderstorms on 18 out of the 31 days. Eleven of the 18 days had measurable precipitation which contributed to the slightly above normal precipitation. August was hot and dry. The only significant rainfall occurred on August 3 when 0.53 inch fell. This made August 2003 the fourth driest in Saint Cloud history and

the driest in 30 years. Average temperatures for August were above normal. The hot/dry combinations were disastrous for many area crops. Finally, September was a month of abnormal weather patterns. Days in the first half of the month were hotter than mid-July. Days near the end of the month were as cold as mid-November. There were as many 90-degree days as frosty mornings. More than a whole month's average rainfall fell in two days. The dry conditions which plagued this area since mid-July are partly to blame for these extreme conditions.

The final quarter had temperatures warmer and drier than normal. A warm pattern dominated the first 24 days of October with a mean temperature of 51.9 degrees Fahrenheit. Even though warm temperatures dominated October, the growing season came to an abrupt end on October 2 with a low temperature of 19 degrees Fahrenheit. October's monthly precipitation total was cut by more than half below normal. This combination lead to many grass and brush fires in the area. By November the precipitation deficit which began on July 15 reached nearly six inches. The precipitation for November was nearly a half inch below normal. In November most of the precipitation fell in the form of snow, totaling 13.2 inches. Temperatures were slightly below normal. December was abnormally mild, eight degrees above normal. In fact, this marks the sixth time in seven years that December temperatures were above normal. Precipitation for December was below normal.



	Temperature - ° Fahrenheit				Precipitation	
Month	Max.	Min.	Average	Depart. from Normal	Precip. (Inches)	Depart. from Normal
January	54	-16	12.5	3.7	0.17	-0.59
February	43	-22	11.0	-5.0	0.39	-0.20
March	66	-17	27.2	-1.2	1.47	-0.03
April	89	14	44.5	0.9	4.73	2.60
May	83	32	55.2	-1.3	3.81	0.84
June	89	39	64.7	-0.4	3.63	-0.88
July	92	48	69.6	-0.2	3.43	0.09
August	96	41	70.6	3.4	0.69	-3.24
September	93	29	58.6	1.2	3.94	1.01
October	86	19	48.2	2.9	1.10	-1.14
November	53	-1	28.0	-0.8	1.05	-0.49
December	43	-5	22.4	8.0	0.28	-0.41
AVG./ TOTAL			42.7	11.2	24.69	-2.44

Table 1. 2003 Weather Information from the St. Cloud Area.

Source: Minnesota Extension Service Agricultural Meteorologist and the MNDNR Climatology Office.

MONITORING AND STUDIES

1a. Surveys and Censuses

Endangered and/or Threatened Species

a. Bald Eagle (Threatened)

The 2003 field season began with six active Bald Eagle nests, including one recently discovered nest on the north end of Long Pool. Five of these nests incubated and fledged young for a total production of eight; the Bergerson Pool and St. Francis River nests each fledged one eaglet, while the Stickney, Carpenter, and Long Pool nests each fledged two eaglets. The Durgin Pool nest incubated and hatched at least one eaglet which did not survive to fledging. The Brande Road, St. Francis Pool, and Nikko Road nests never incubated, although the eagle pair was observed on the St. Francis Pool territory throughout the nesting period.

The "new" nest on the north end of Long Pool was first reported by a duck hunter during the fall of 2002. It was located in the spring of 2003. Judging by its size it appeared to be at least two years old. It is thought that this may be a second nest for the pair that previously occupied the Brande Road nest. 2003 marked the second year the Brande Road nest was not occupied. It is possible that if the pair shifted to the Long Pool nest, they may have produced young in 2002 without us knowing it. The oldest standing Bergerson Pool eagle nest, built in 1998 and occupied by Great Horned Owls for the last two years, blew down this spring. In addition, the Bergerson nest built in 2000 to replace the 1998 nest, blew down this fall. A new nest was under construction in October in the same area of Bergerson Pool. The Carpenter Pool nest also fell down this fall after one of the supporting branches for the nest broke off, presumably due to the weight of the nest. This nest was established in the spring of 1995, with nesting beginning in 1996. The Carpenter Pool pair hatched young in this nest every year since 1996 for a total production of 14 in those eight years, including one year where three eaglets were raised to fledging. A new Carpenter Pool nest was under construction in late fall 2003 in the same area.

b. Gray wolf (Threatened)

The gray wolf continues to be listed as federally threatened in the western Great Lakes states. However, special regulations -- known as "section 4(d) rules" -- are now in place for all Midwestern wolves. These regulations allow U.S. Fish and Wildlife Service (Service), state, and tribal authorities to trap, move, or kill wolves that are preying on domestic animals throughout the Midwest. Similar regulations have been in place for Minnesota wolves since 1978. Indications are that the Service plans to initiate the federal de-listing process for the Midwestern distinct population segment in 2004. The State of Minnesota is conducting a 2003-2004 Timber Wolf Survey beginning September 30, 2003 until complete snow melt in the spring of 2004 to obtain current data on wolf

distribution and abundance. Locally, the observance of wolf sign and sightings on the Refuge continues to be occasional and limited to solitary individuals.

Waterfowl

Waterfowl were surveyed weekly during spring and fall migration and roughly bi-weekly between migration times. The 2002 fall peak for total waterfowl was 29,700. This number is down 32 percent from the five-year average, despite the Canada Goose peak being about five percent above the five-year average. Diver numbers and Mallards were down from the five-year average. This may be in part due to an early freeze-up. Most birds left area when the majority of the Refuge wetlands iced over on morning of October 24, 2002. A five-year summary of peak fall waterfowl is presented in the table below.

YEAR	Peak Total Birds	Change from 5-yr average	Peak Mallard	Change from 5-yr average	Peak Canada Goose	Change from 5-yr average	Peak Ring-necked Duck	Percent Change from 5-yr average
2002	29,700	-32.05	12,300	-19.61	9,000	4.77	2,400	-39.70
2001	25,400	-41.88	10,800	-29.41	4,800	-44.12	2,500	-37.19
2000	54,800	25.38	14,100	-7.84	12,150	41.44	1,300	-67.34
1999	73,500	68.17	20,800	35.95	10,000	16.41	8,500	113.57
1998	35,100	-19.62	18,500	20.92	7,000	-18.51	5,200	30.65
5-year Average	43,700		15,300		8,590		3,980	

Table 2. Fall peak numbers for total waterfowl and select species, Sherburne NWR, 1998-2002.

We came into the spring of 2003 with limited spring runoff and a below normal water table. Spring rain and flood events combined to bring the water table depth back up to slightly above average. Schoolhouse Pool was reflooded with spring rains and provided good food resources for spring migrating waterbirds. Most of the flooding was limited to the St. Francis River and its floodplain, creating good nesting conditions outside the immediate floodplain.

The spring peak for waterfowl migration was recorded on April 21. Approximately 18,200 birds were present on the Refuge with representatives from 17 species, including Coot, Canada Goose, Mallard, Blue-winged and Green-winged Teal, Northern Pintail, Wigeon, Bufflehead, Lesser Scaup, Common Goldeneye, Hooded Mergansers and Wood Ducks. Duck and Canada Goose production was up from both last year's production and the ten-year average. Canada Goose production was 2,690. This was up 47 percent from 2002 and 17 percent from the ten-year average. Mallard production was 885, which was up 55 percent from 2002 and 0.7 percent from the ten-year average. Blue-winged Teal production was 810. This was up four percent from 2002 and 35 percent from the ten-year average.

Trumpeter Swans continue to utilize the Refuge as a migration stopover and summer resting area without any production. Swans were recorded on 11 of our 23 managed impoundments in either the spring and/or fall. Peak numbers of trumpeters in the late

summer were 27 and 23 individuals on Durgin and St. Francis Pools, respectively. For the second year, the traditional Refuge swan pair, MN DNR patagial tag number 16 and its mate, were not seen on the Refuge or on their traditional wintering area in Monticello, MN. Their fate is unknown.

Several groups of Tundra Swans utilized the Refuge this fall as a quick stopover before continuing further south. A peak of 200 was recorded on St. Francis Pool. In addition, many flocks were observed overflying the Refuge. Snow geese were also observed during the fall migration, with a peak of 16 birds on St. Francis Pool.

Marsh and Water Birds

Marsh and water birds were recorded during the Waterfowl Survey, the Secretive Marsh Bird Survey and also by volunteer roving interpreters on the Wildlife Drive, and incidental observations by staff. We made several minor changes to the Secretive Marsh Bird Survey protocol this year to make the sampling regimen consistent with the draft national protocol. The biggest change was the addition of 18 new points. We also added several new secondary species to the survey, bringing the total to 21, and added Yellow Rail into the survey as a primary species. In addition, we updated the call playback system to include standardized equipment and calls provided by Dr. Courtney Conway, Arizona Cooperative Fish & Wildlife Research Unit, who is coordinating the national effort.

The 2003 sampling was conducted at a total of 56 stations. Records were kept for primary and secondary species heard and seen during the sampling timeframe. Although this survey cannot be interpreted to estimate total Refuge populations of the primary or secondary species, it is informative occurrence and trend data for the breeding pairs at the sampling locations. The survey was conducted four times; during the last week of April, the second full week of May, and the first and fourth weeks of June. During the four surveys a total of 485 records for the primary species were obtained. No Yellow Rails were observed. However, 204 Soras, 169 Pied-billed Grebes, 64 Virginia Rails, 43 American Bitterns, and five Least Bitterns were recorded. American Bitterns peaked during the first survey at 23 individuals. Soras and Virginia Rails peaked during the second survey with 106 and 19 individuals being recorded, respectively. Least Bitterns peaked at four during the third survey and Pied-billed Grebes peaked at 46 individuals during fourth survey.

The maximum number of individuals recorded at each station was added together to get an estimate of the total number of breeding pairs for the species at these points. These numbers are summarized in the table below. The stations that were the same in 2003 and 2002 are compared to last year's data in the table below. The number of breeding pairs increased for American Bittern, Virginia Rail, and Pied-billed Grebe. It was interesting that many American Bitterns were actually seen this year, both during the marsh bird survey and incidentally while performing other duties. They were seen at five separate locations on St. Francis Pool. In addition American Bitterns were seen on Big Bluestem, Muskrat, Nelson, and Bergerson Pools and a natural wetland north of Big Bluestem Pool.

Distribution of the primary marsh bird species can be examined by looking at the number of points where a species is recorded. The distribution of the primary species on the Secretive Marsh Bird Survey is compared to last year at the 38 points these surveys had in common in the table below. Overall distribution of the primary species across all 56 of the 2003 stations is comparable to their distribution for the 2002 stations. Specifically, 82.1 percent for Sora, 73.2 percent for Pied-billed Grebe, 46.4 percent for Virginia Rail, 37.5 percent for American Bittern, and 8.9 percent for Least Bittern.

SPECIES	Total Records (all stns)	Total Records @ 2002 Stns	Number Breeding Pairs	Breeding Pairs @ 2002 Stns	% Change in Breeding Pairs	Total Records	Number Breeding Pairs
Least bittern	5	3	5	3	-25.0	4	4
Virginia Rail	64	49	45	36	80.0	26	20
Sora	204	131	123	75	-17.6	172	91
American Bittern	43	30	30	21	90.9	15	11
Pied-billed Grebe	169	111	85	55	27.9	102	43

Table 3. Abundance of primary marsh bird species from Secretive Marsh Bird Survey Data

SPECIES	2003		2002		2002 to 2003
	Number of Stations	Percent of Stations	Number of Stations	Percent Stations	Percent Change
Least bittern	3	7.9	4	10.5	-25.0
Viginia Rail	19	50.0	14	36.8	35.7
Sora	32	84.2	34	89.5	-5.9
American Bittern	14	36.8	10	26.3	40.0
Pied-billed Grebe	26	68.4	22	57.9	18.2

Table 4. Presence of primary marsh birds at survey points common to 2002 and 2003 Secretive Marsh Bird Survey

Fall 2002 set another record for the number of Greater Sandhill Cranes staging on the Refuge peaking at 2,607 birds on October 31, 2002. The last cranes were seen leaving on November 28, 2002. The first breeding cranes were observed returning on March 17, 2003. There were an estimated 35 active Sandhill Crane nesting territories on the Refuge as documented by data from the annual spring unison call survey, marsh bird survey and staff observation.

Adult Common Loons were observed on Big Bluestem, Little Bluestem, Bergerson, Nelson, Stickney, St. Francis, Schoolhouse, Carpenter, Deer and Durgin Pools. Later in the summer, young were observed on St. Francis and Bergerson Pools. In spite of the number of observations, no reproduction was documented for Common Loons this year.

Horned Grebes were observed in the spring. In the late September, 37 Pied-billed Grebes were observed feeding in a shallow bay in Bergerson Pool.

White Pelicans were observed in the spring of the year on St. Francis Pool, peaking at 30 birds. Non-breeding white pelicans arrived in mid-July. A peak number of 150 birds was observed on St. Francis Pool.

Great Egrets and Great Blue Herons continue to use the Refuge for a feeding area. In August receding water levels on St. Francis Pool and Nelson Pool concentrated the fish food source and provided good water levels for feeding. During this time, a peak of 57 Great Egrets and 20 Great Blue Herons was recorded on St. Francis Pool and a peak of 130 Great Egrets was recorded on Nelson Pool. Double-crested Cormorants also continue to use Nelson Pool for a night roosting area. They peaked at 116 birds during this same period.

Shorebirds, Gulls, Terns, and Allied Species

Black Terns were observed on Pool 31, and on Stickney, Schoolhouse, Little Bluestem, Big Bluestem, Bergerson, Josephine, Nelson, Durgin, South Josephine, St. Francis, and Deer Pools this year. Peak numbers and time periods are the following: 30 on Bergerson Pool in late May; 30 on Durgin in late June; and 75 on Stickney Pool and 25 on Nelson Pool in mid-July. A highlight was seven Common Terns observed by Biological technician Zodrow on Schoolhouse Pool on May 7.

Other Migratory Birds

Sherburne's 14th Annual Breeding Bird Survey (BBS) non-random route was conducted this year by Robert Janssen and Jay Hamernick, on June 21. A total of 501 individuals were recorded from 80 species. The Red-winged Blackbird was the most abundant bird with 153 records. This was followed by the Canada Goose (128 birds recorded), Common Yellowthroat (53 records), Yellow-headed Blackbird (40 records), and Morning Dove (39 records). Looking at the number of stations at which a bird is recorded can give an indication of how widespread a species is on the Refuge. Common Yellowthroat is the most widespread bird, recorded at 34 of the 50 stations (or 68%). This was followed by Red-winged Blackbirds and Yellow Warblers, each recorded at 26 stations (52%); Mourning Dove at 25 stations (50%); Song Sparrow at 24 stations (48%) and Brown-headed Cowbird at 21 stations (42%).

A highlight of the 2003 field season was the sighting of two loggerhead shrikes on the south loop of the Wildlife Drive during breeding season. Although no young were ever seen to confirm breeding, it is encouraging to see a pair of such a rare bird back in their habitat. Loggerhead shrikes are openland oak savanna birds that have suffered drastic declines in their populations throughout their range and are listed by the State of Minnesota as a Threatened species.

Invertebrates

A butterfly and moth survey was conducted by a Refuge volunteer on 16 separate days during the late summer/fall flight season. A total of 31 butterfly and 43 moth species were recorded. There are about 20 additional moth species still being identified.

Resident Wildlife

a. Mammals

The scent post survey was conducted twice in FY2003. First on October 1, 2002 and then on September 30, 2003. Across the four routes for the survey conducted in 2002, coyote tracks were identified at five stations, red fox at two, raccoon at six, domestic cat at three, white-tailed deer at six, squirrel at two, cottontail rabbit at one, mink at one. Across the four routes for the survey conducted in 2003, coyote tracks were identified at three stations, red fox at four, raccoon at two, domestic dog at two, white-tailed deer at two, wild turkey at four, squirrel at one, and mink at one. This information is provided to the Minnesota Department of Natural Resources (MN DNR) to assess long-term regional patterns in the transition zone of Minnesota.

Interesting mammal observations reported by staff on the Refuge and from within the local area are opossums, which continue to be more common at bird feeders and as road kills.

A small mammal survey was conducted by Dr. Marco Restani and members of his Wildlife Populations class from St. Cloud State University (SCSU) as part of state-wide survey in accordance with the protocol established by the 1854 Treaty Authority, which coordinates the survey. Six transects, consisting of ten stations each, were established on the Refuge and run for two consecutive trap nights. The survey recorded 32 individuals from the *Perymyscus* genus (i.e., white-footed mouse or deer mouse), two red-backed voles, four eastern chipmunks, one northern water shrew, and one meadow jumping mouse. This information was submitted to the 1854 Authority for inclusion in their state-wide database.

b. Reptiles and Amphibians

The Frog and Toad Calling Survey was conducted for the seventh year since 1996 on the Refuge following the protocol developed by the State of Minnesota. The survey was performed on April 14, May 21, and July 5. Nine frog and toad species were recorded this year, compared to eight last year, when surveys did not record wood frogs. Seven of these nine species were also recorded on another Frog and Toad Survey Route set up by a private individual (Route #50129) that includes portions of the Refuge. Cope's gray treefrog and wood frogs were not recorded on this route.

Observations of State listed herptile species are being collected from the staff and entered into a point coverage and accompanying database. Several Blanding's turtle and gopher snake observations were recorded this year. Since 2001, Blanding's turtles are being measured and marked when possible. This year three new turtles were marked and one turtle marked in 2001 was recaptured. The marked turtles will help give us additional data regarding the Blanding's turtle population on the Refuge.

c. Birds

Winter birds have been monitored annually during the Christmas Bird Count since 1970 with the exception of 1985. The 2002 Christmas Bird Count was administered by the Friends of Sherburne and conducted on December 14. On this day, 17 observers in nine parties logged 320 miles, including six miles on foot, and recorded 1544 individual birds from 35 different species. This was a decrease from 2001 when 1676 individuals from 39 species were recorded. Looking more long term, this is 13 percent above the ten-year average of 31 for the number of species observed and seven percent below the ten-year average of 1653 individuals. The Canada Goose was the bird seen in greatest abundance with 497 individuals recorded. This was followed by the American Crow with 237 individuals recorded. The Black-capped Chickadee, Dark-eyed Junco, and Blue Jay rounded out the top five with 123, 120, and 82 individuals being recorded, respectively. The day was mild (high of 42°F) with no snow cover and some open water on area lakes and the St. Francis and Elk Rivers. Unusual sightings were two Northern Shrikes, one Great Blue Heron, three Common Mergansers, and a Herring Gull.

Wild Turkeys continue to prosper. There are regular observations of several broods ranging from eight to 12 poults, larger bachelor groups, and other mixed groups. Turkey gobbling records are recorded during the spring Sandhill Crane unison call count. This year gobbling records continued their increasing trend by reaching a record high of 73. This is the largest increase recorded within one year. It is a 152 percent increase from last year's 29 gobblers. In addition, the MN DNR surveyed antlerless deer hunters for observation of turkeys during the 2002 deer hunting season. Seventy-three percent of the respondents reported seeing a turkey. This is a significant increase from the MN DNR's previous survey in 1999 when 20 percent of the respondents reported observing a turkey. We have come a long way from 1997 when an observation of a single Wild Turkey on the Christmas Bird Count was sent in to the Minnesota Ornithological Union as a rare sighting.

Cooperative Surveys

Cooperative programs enhanced several wildlife surveys again this year. Dr. Marco Restani and his wildlife classes at SCSU cooperated to provide many hours of volunteer service on many surveys including the Predator Scent Post Survey, deer registration station, waterfowl bag checks, waterfowl migration counts, and the spring Sandhill Crane Unison Pair Survey. Several Refuge volunteers assisted with the eagle watch, spring crane census, and the waterfowl and water bird surveys. Sherburne hosted several students from Princeton High School in cooperation with their career development programs. As "job shadows" these students, interested in a wildlife management careers, provided assistance with waterfowl surveys.

Additionally, Sherburne staff and volunteers participated in cooperative surveys off Refuge in support of the Division of Migratory Birds. These activities included the

Mourning Dove Survey, American Woodcock Survey, ground-truthing the May aerial waterfowl pair counts (Buffalo Route), and the Mid-Winter Waterfowl Survey.

For a sixth year, the Refuge cooperated with the Mille Lacs County Weed Inspector to allow “harvest” of purple loosestrife plants for use as nursery plants for their loosestrife biological control program. After the biological control agents reproduce, the new generation are released on loosestrife infestations in Mille Lacs County.

The Refuge also continued its partnership with SCSU Ethnic Studies Program and their summer Advanced Program in Technology and Science. Students in the programs were acquainted with the wildlife management techniques and challenges through a tour of the Refuge and discussion. The students from this program complete scientific experiments and present their results as a scientific report and poster.

1b. Studies and Investigations

Bur Oak Reintroduction

Monitoring of the 1997 bur oak reintroduction site south of the Old School House continued. In accordance with the study design, tree heights and root collars were measured at the end of the growing season. Last year shelters were removed from the remaining sheltered trees. This coming year (2004) will mark the eighth growing season, after which fire is scheduled to be reapplied to the study site to evaluate the impact of fire on the trees in the different treatment regimes. At the end of 2003 the survivorship of the trees is 37 percent. Of the survivors, 57 percent were fertilized and 88 percent were sheltered for at least one year. The mean height is one meter, with the largest tree reaching 5.4 m.

Prickly Pear Reintroduction

Monitoring of prickly pear (*Opuntia fragilis*), reintroduced in 1998, continued. The number of transplants present at each site remains unchanged from 2002. At the Brande Road and County Road 4 site, 11 of 14 and 15 of 15 transplants have survived, respectively. Both sites had new pads (i.e., cladodes) near the transplanted mat indicating that the prickly pear population is increasing via asexual reproduction.

Tamarack Restoration Monitoring

Monitoring of the twenty plots established in the tamarack restoration project, which began in 2000, continued this year. However, the plots established in 1999 were not monitored due to the protocol for collecting plot information at 1, 2, 3, 5, and 10 years after the trees were planted. The plots showed 13 percent mortality from 2002 (30 percent survival since 2000). The plots had an average of 2.3 trees per plot with an average height per plot ranging from 1.3 to 4.9 feet and a mean height of 2.1 (i.e., +.20 change) across all plots. Eight of the ten plots planted in 2000 had eight or more inches

of standing water in them. It appears that the higher water levels are contributing to an increase in tree mortality and reduced tree growth.



Tamarac seedlings transplanted in 1999 continue to thrive. (SZ 6/03)

Water Quality Monitoring

The Sherburne Refuge Vision calls for a functional St. Francis River riparian system, with clean water flowing into and out of the Refuge. The main objective for initiating this monitoring program is to determine the status (i.e., functional or nonfunctional) of the riparian system. Additional reasons for implementing this program include developing baseline characterization data, documenting water quality changes over time, and providing an educational opportunity.

Jessica and Nancy Jones, volunteering as biological assistants, conducted the water quality monitoring from mid-April through the end of September on the St. Francis River near the Santiago, County Road 5, and Brande Road bridges. This educational experience provided Jessica Jones, a home-schooled student, with an opportunity to learn about watersheds and water quality sampling techniques. Water quality monitoring was geared to screen for potential water quality problems related to the main watershed land use (i.e., cropland). The chemical pollutants associated with this source of pollution are turbidity, phosphorus, nitrates, temperature, and total solids. The aforementioned parameters were monitored plus the following three basic parameters: dissolved oxygen and biological oxygen demand, temperature, and pH. Minnesota Pollution Control Agency's Citizen Stream Monitoring Program was also used to provide information on transparency (i.e., transparency corresponds to turbidity), stream stage, precipitation, recreational suitability, and stream appearance.



Jessica Jones, Refuge volunteer, collected water samples and conducted water quality tests as home-school project. (NJ 4/02)

St. Francis River Inventory and Assessment

The main objective for initiating the river inventory and assessment is to find the baseline of existing physical conditions of the stream channel. Additional reasons for implementing this program include monitoring trends in fluvial and geomorphic condition over time, assessing stream response to management, contributing to regional databases, and enhancing the incorporation of companion analyses (e.g., studies of fisheries, mussels, and water quality) at levels compatible with the morphological information.

The hierarchy of river inventory and assessment is comprised of four levels that vary from a broad geomorphic characterization down to a detailed-specific description. The assessment process for this project included Level I and Level II of the hierarchy of river inventory and assessment. Level I provides a broad geomorphic characterization that integrates landform and fluvial features of valley morphology with channel relief, pattern, shape, and dimension. The St. Francis River's landform and soils are described as broad valleys with terraces, in association with floodplains, and alluvial soils. It is also slightly entrenched with a well-defined meandering channel and has riffle-pool bed morphology.

Level II provides a morphological description which incorporates the general character of channel form and related interpretations. The objective of this level is to delineate homogenous stream types that describe specific slopes, channel materials, dimensions and patterns from "reference reach" measurements. The stream characteristics used to differentiate the 7 major stream types include entrenchment, width/depth ratio, and sinuosity. The St. Francis River's defining characteristics were slightly entrenched (>2.2), moderate to high width/depth ratio (>12), and high sinuosity (>1.2). Following the classification key, the St. Francis River is a **stream type C**.



The middle inventory and assessment site of the St. Francis River located east of the Brande Road bridge. This downstream view of the cross-section shows the riffle-pool bed morphology. (JH 7/03)

Each major stream category is delineated into six additional types using channel materials (i.e., bedrock to silt/clay) along a continuum of gradient ranges. With a sandy substrate and a slope of $< .001$, the upper and lower sites of the St. Francis River would be classified as a **C5c-**. The middle site of the St. Francis River would be classified as a **C4** since it has a gravel substrate, and its slope falls within the range of $.001-.02$. In summary, the St. Francis River is described as low gradient and meandering. Its features include point-bars, riffle/pools, and alluvial channels with broad well-defined floodplains.

Patterns in Bird Community Structure Related to Restoration of Minnesota Dry Oak Savannas

Leakhena Au, a Master's candidate at the University of Minnesota, Department of Fisheries, Wildlife and Conservation Biology, completed and successfully defended her thesis which characterized habitat-bird relationships in relative to oak savanna restoration efforts. The abstract from her thesis reads as follows:

“Throughout the upper Midwest, various projects are underway to restore what is left of what was once the most common habitat type in the region.

We examined the relationship between bird communities and some environmental variables, including vegetation characteristics and site prescribed burn frequencies, across a habitat gradient from prairie to closed canopy oak woodland to determine if and how remnant dry oak savanna habitats were distinctive. During the breeding seasons of 2001 and 2002, we conducted 10-minute fixed radius point counts ($n = 120$) within habitats with either a prairie ground cover or a predominately oak canopy. We described canopy and ground cover characteristics within 2-11 m² plots at a sub-sample ($n = 28$) of non-prairie points, and collected canopy and woody species diversity data for all points. We also obtained average burn frequencies over the last 20 years for all points. Canopy cover and burn frequency were most strongly associated with observed patterns in bird communities. Most remnant savanna points had bird communities that were distinct, even from areas recently undergoing restoration. Savanna points with bird communities most similar to those found in oak woodlands were in areas managed by periodic cutting rather than burning. If feasible, we recommend that future and ongoing restorations of dry oak savannas in the region include periodic prescribed burning.”

Eighty of the 120 point counts were performed on the Refuge. Others were performed on Sand Dunes State Forest, Cedar Creek Natural History Area, and Helen Allison Nature Conservancy Preserve. A full copy of the thesis is on file in the Refuge office. In 2001 and 2002, she conducted point counts for summer-resident birds across prairie, historic savanna, oak woodland, and burned oak woodland habitats on the Refuge and Sand Dunes State Forest.

The Dispersal of Biological Control Agents for Purple Loosestrife

Brian McCornack, researcher at the University of Minnesota, Department of Entomology continued his three-year study of the dispersal of biological control agents for purple loosestrife (*Galerucella* sps.) at one of our existing release sites on the north end of Josephine Pool. The rate at which these species disperse into a wetland has never been systematically studied and is useful information for understanding and evaluating future biological control releases on the Refuge and at other similar sites.

Distribution and Abundance of River Otter at Sherburne National Wildlife Refuge

Scott Gonnion, Master's candidate at SCSU, continued his graduate study of river otter. The purpose of the present study is to provide information about the distribution and abundance of river otters in the Refuge. Three otters were live-trapped and implanted with a 100g radio transmitter in their peritoneal cavity. Radio-telemetry was used to

monitor the movement and locations of these marked otters. Their habits, including territory size, distribution, and food habits, were documented through radio-telemetry techniques.

HABITAT RESTORATION

2b. Upland Restoration: On-Refuge

Restoration of several small parcels created a total of 14 acres of upland restored on the Refuge. These areas were disturbed due to earth work such as erosion control problems following County Road 1 improvements, Refuge road reconstruction and water control structure maintenance.

Forb Seed Collection Program

Forty volunteer seed collectors, were active this year, donating a total of 606 hours of their time to collect prairie forb seeds. They collected approximately 24 pounds of ecotype seed from 28 different species, for a total market value of approximating \$5300. The seed will be used to augment seed purchased for on-Refuge upland restorations next year.

Forb Production Plots

Six new Forb Production Plots were established on the Refuge with the help of a grant from the National Fish and Wildlife Foundation. Seedlings of six local ecotype forbs were purchased from a local vendor. The species chosen are considered a priority for augmentation into our seed mixes. They were: heath aster (*Aster ericoides*), azure aster (*Aster oolentangiensis*), harebell (*Campanula rotundifolia*), prairie smoke (*Geum triflorum*), golden aster (*Heterotheca villosa*) and prairie violet (*Viola pedatifida*). These seedlings were planted into 15' X 3' production beds established near the School House and subsequently weeded and watered by Refuge volunteers. Nine volunteers donated 119 hours of their time to bring these plants to maturity so that their seeds could be harvested and used for native grassland plantings on the Refuge. The plots will provide a long-term consistent and cost-effective source of local ecotype forb seed to be used in the restoration of native oak savanna habitats on the Refuge into the future and are expected to be augmented by more plots in FY2004.





Refuge volunteers, JoAnn and John Stark, plant seedlings into a forb production plot. (NH 6/03)

Oak Savanna Demonstration Area

An Oak Savanna Demonstration Area is being developed at the first wayside on the Wildlife Drive. Practices are being undertaken to hasten the restoration of oak savanna in this area because it is easily accessed by the public which allows the oak savanna habitat and management practices to be observed and interpreted. This demonstration area will help visitors understand the larger oak savanna restoration project on the Refuge. The first step in this process was performed during the winter of 2003 when 30 red oaks were removed by mechanical means from the small woodlot at this site.

In addition, native wildflowers are being planted and eventually will be interpreted. During the summer of 2003, a Centennial Grant from the National Fish and Wildlife Service facilitated the wildflower portion of the demonstration area. Over 140 seedlings from 18 wildflower species were placed in nine tilled plots, three feet by fifteen feet in size, and then were weeded and watered by ten volunteers during the growing season. Next fiscal year additional wildflower seedlings will be planted and the grant will be completed.

2c. Wetland Restoration: Off-Refuge

Twenty-five wetlands were restored on private land totaling 89 acres (see table A). Most of the demand continues to be in Isanti County. The program is selling itself through word of mouth.

This year two large projects came to a halt after several years of planning. The parties involved could not come to a consensus. Both basins would have been fantastic restorations; one a 35 acre basin, the other 56 acres. The basins were both co-owned and

located in Sherburne County. They fall into Project Area 8 of the Legislative Committee for Minnesota Resources (LCMR) Grant Project titled Restoring Minnesota's Fish and Wildlife Corridors and are in one of the fastest growing counties in Minnesota. It is unfortunate that both projects have been tabled.

County	Number of Basins	Wetland Habitat Acres
Isanti	21	42
Pine	3	44
Mille Lacs	1	3
Total	25	89

Table 5. Private Land Wetland Restorations FY 2003

2d. Upland Restoration: Off-Refuge

One hundred and three acres of upland prairie habitat were restored on private lands and one school site during FY 2003. Most of the work was conducted in Sherburne County (see table B). The emphasis was on areas surrounding the Refuge to help off-set fragmentation due to development and to compliment not only the Refuge habitat, but the habitat of other natural and scientific areas nearby. Several of the projects were cooperative efforts working with personnel other than the landowner. Cooperators included: City of East Bethel, Pheasants Forever, Anoka Conservation District, Sherburne Soil and Water Conservation District (SWCD) and Natural Resource Conservation Service (NRCS), Oak Savanna Land Preserve Advisory Committee, MN DNR and the Benton County School District. In addition to these areas that were seeded, the Service Truax drills were loaned out to the state and private sector for seeding state and Conservation Reserve Program (CRP) areas.

County	Number of Sites	Upland Habitat Acres
Sherburne	3	61
Anoka	6	35
Isanti	1	3
Benton	1	4
Total	11	103

Table 6. Private Land Upland Restorations out of the Sherburne District FY 2003

HABITAT MANAGEMENT

3a. Manage Water Levels

Because pool bottoms are not mechanically disturbed once they are dewatered, the Refuge does not have any pools that meet the definition of moist soil units. Therefore, water management activities, even those corresponding to traditional moist soil management, are addressed under this heading.

During FY 03 the amount of water used in the impoundment system was approximately double the ten year average. This season 1757 million gallons of water were diverted through water control structure 2A, and 237 million gallons of water were diverted through control structure 2B. Control structure 2A was operated from late March through mid-May to reflood Carpenter Pool, Durgin Pool via Carpenter, and Stickney Pool via the aforementioned two pools. Water was diverted through control structure 2B for a 10 day period beginning on March 25, 2003, and then again for one day in mid-April in order to reflood Muskrat Pool and Durgin Pool via Muskrat Pool.

Due to a scheduled spring drawdown of St. Francis Pool, water was shunted through control structure 2C from mid-April through July. This water management activity allowed the hydrological regime of the St. Francis River to be more "natural" (i.e., water was held back less). Spring pool elevations were .3 to .6 feet lower than 2002 water levels. Drawdown began in earnest in mid-May in order to allow for the manipulation of water levels more effectively following April's rain showers and to provide for nest success and rearing of young by cranes and geese. A decision was also made to provide mudflats for shorebirds in late summer.

St. Francis Pool was nearly dewatered by July 28, 2003. At this time the slide gate was removed to obtain several measurements for its repair and to complete the drawdown. With the exception of the river and several deeper areas within the pool, dewatering was completed by mid-August.

In the spring, the downstream side of control structure 2D was repaired. A collar was placed on the culvert, and fill, filter fabric, and riprap were placed around the collar. The control structure enhancement was undertaken to prevent erosion caused by the scouring action created by the significant change in elevation from the bottom of the culvert to ground level.

Long Pool had an initial spring elevation of 952.80 on March 18, 2003 (i.e., this was the first water level record of the season). Water levels rose steadily over the next month from snowmelt/runoff, and by mid-April this pool had been flooded to its target elevation of 958.00. The peak of spring flooding occurred on May 11, 2003, with this pool reaching a maximum elevation of 959.30 (i.e., .70 feet below the maximum elevation permissible). Pool elevations remained within a foot of the proposed target level through late June. Thereafter, water levels fell slightly for a two week period due to the decrease

in flow of water from St. Francis Pool. Pool elevations remained fairly stable through the remainder of the field season.



St. Francis Pool's drawdown in mid-July. (SZ 7/03)



St. Francis Pool's drawdown in late August. (SZ 8/03)

Snowmelt, spring precipitation, and supplemental water from Deer and Blue Hill Pools reflooded Schoolhouse Pool (dewatered in 2002) to its target goal of 963.00 by late April. A food source of aquatic invertebrates and seeds from moist soil plants were made

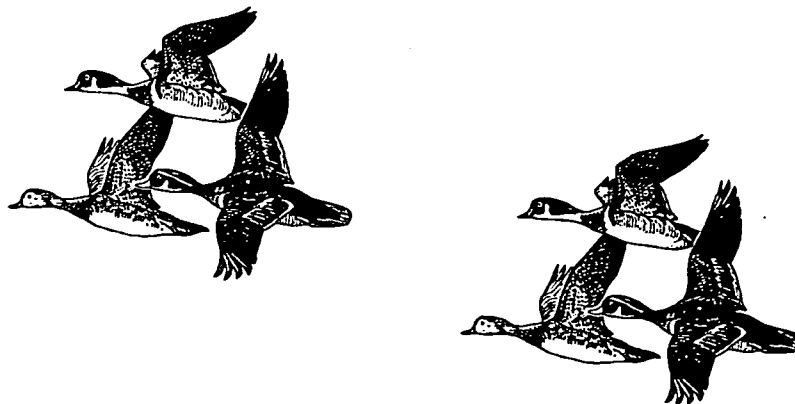
available for migrating birds as water levels increased. In May water levels were increased to 964.00 in order to take advantage of spring precipitation and supplemental water. Even with below normal levels of precipitation in late summer and fall, pool elevations remained fairly stable due to natural springs.

Shortly after ice-out in mid-April, water levels of Bohm Pool were increased 3 feet to provide additional protection (i.e., fire break plus high water levels) to the young tamarac stand during a prescribed burn of fire management units 33 and 34. Pool elevations were lowered once the prescribed burn was completed on April 10, 2003. Water levels remained near the target level of 960.00 (bottom of the stoplog bay) for the remainder of the field season. Bohm Pool's stable water regime is facilitating establishment of tamarack seedlings planted in 1999 and 2000. Some of the tamarack seedlings planted in 1999 are 6 feet high.

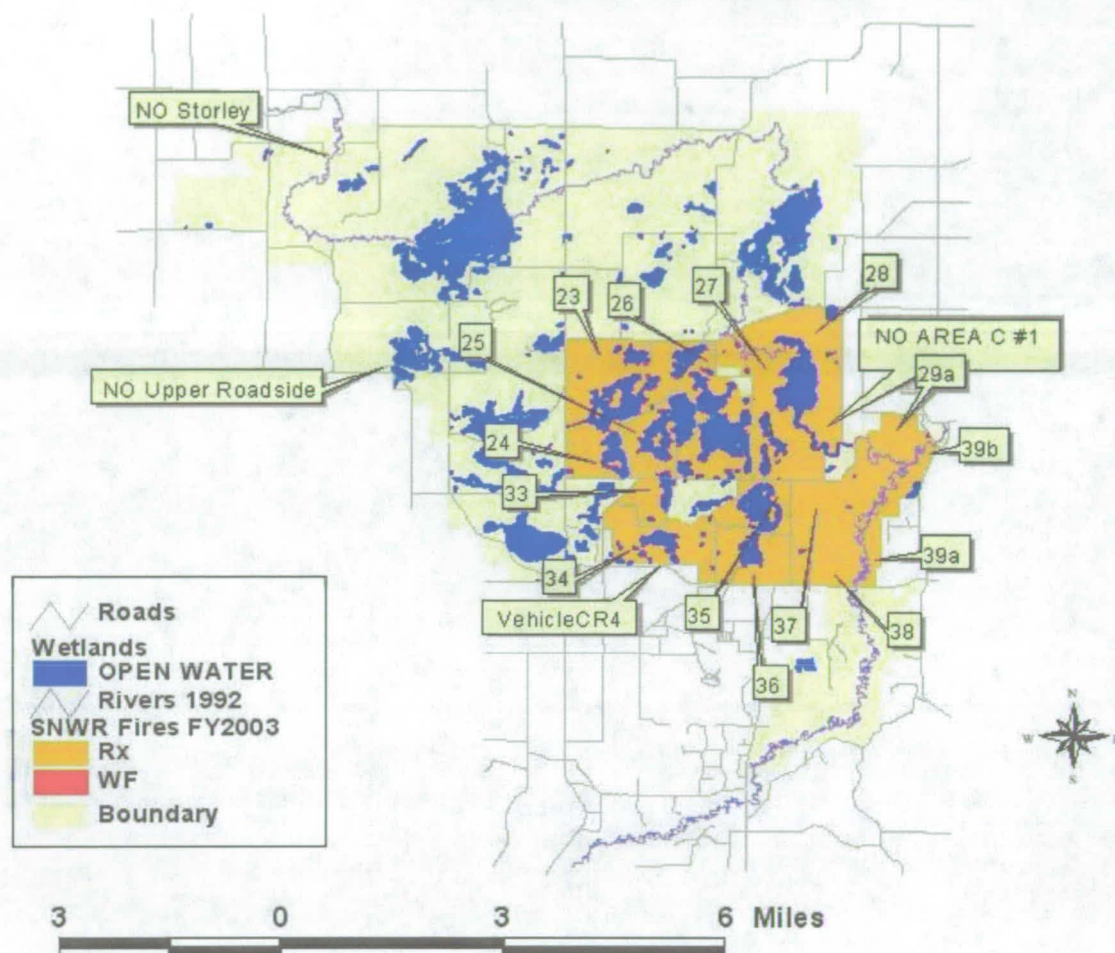
Chronic beaver problems (i.e., dams) at the outlet of Buck Lake maintained water levels higher resulting in a poor wild rice crop. Josephine Pool, Upper Roadside Pool, and Lower Roadside Pool were near full pool contributing to poor wild rice production. Schoolhouse Pool and Orrock Lake had fairly good wild crops, possibly due to a more stable water regime in the spring.

3f. Prescribed Fire

During FY2003 fifteen management units were burned totaling 6,604 acres. Prescribed fires are summarized in the following table. All prescribed burning during the period occurred during the spring of 2003. In addition to prescribed burning, 191 acres of firebreaks in fire prone areas were treated/constructed by mechanical means. Refuge fire staff also assisted Rice Lake NWR and Crane Meadows NWR with prescribed burning activities.



FY2003 Fires



Fire activity locations on Sherburne NWR for FY2003.

TYPE	NAME	DATE	UNIT#	PERIMETER (MILES)	FIRE#	ACRES
Rx	Units 27, 28 & 29a	4/25/2003	28	8.4	32550-9264-C088	1132.69
Rx	Units 23, 24 & 26	4/28/2003	24	6.3	32550-9263-C243	723.36
Rx	Unit 25	4/11/2003	25	6.2	32550-9263-C105	1046.95
Rx	Units 37, 38 & 39a	4/23/2003	37	6.6	32550-9264-C185	736.07
Rx	Units 37, 38 & 39a	4/23/2003	39a	6.2	32550-9264-C185	306.52
Rx	Units 35 & 36	4/9/2003	35	2.9	32550-9263-C093	298.13
Rx	Units 35 & 36	4/9/2003	36	4.4	32550-9263-C093	590.00
Rx	Units 33W & 34	4/10/2003	34	5.8	32550-9264-C092	672.12
Rx	Units 37, 38 & 39a	4/23/2003	38	3.9	32550-9264-C185	469.08
Rx	Unit 39b	4/24/2003	39b	1.8	32550-9264-C199	59.06
Rx	Units 33W & 34	4/10/2003	33	2.6	32550-9264-C092	230.50
Rx	Units 27, 28 & 29a	4/25/2003	27	8.5	32550-9264-C088	881.44
Rx	Units 23, 24 & 26	4/28/2003	26	4.8	32550-9263-C243	378.58
Rx	Units 27, 28 & 29a	4/25/2003	29a	3.5	32550-9264-C088	285.07
Rx	Units 23, 24 & 26	4/28/2003	23	8.9	32550-9263-C243	815.10
WF	NO Storley	5/31/2003		0.3	32550-9261-C419	2.00
WF	VehicleCR4	6/5/2003		0	32550-9261-C446	0.10
WF	NO AREA C #1	10/15/2002		0	32550-9261-3931	0.10
WF	NO Upper Roadside	8/31/2003		0	32550-9261-C511	0.10

Table 7. All fire activity information on Sherburne NWR for FY2003.



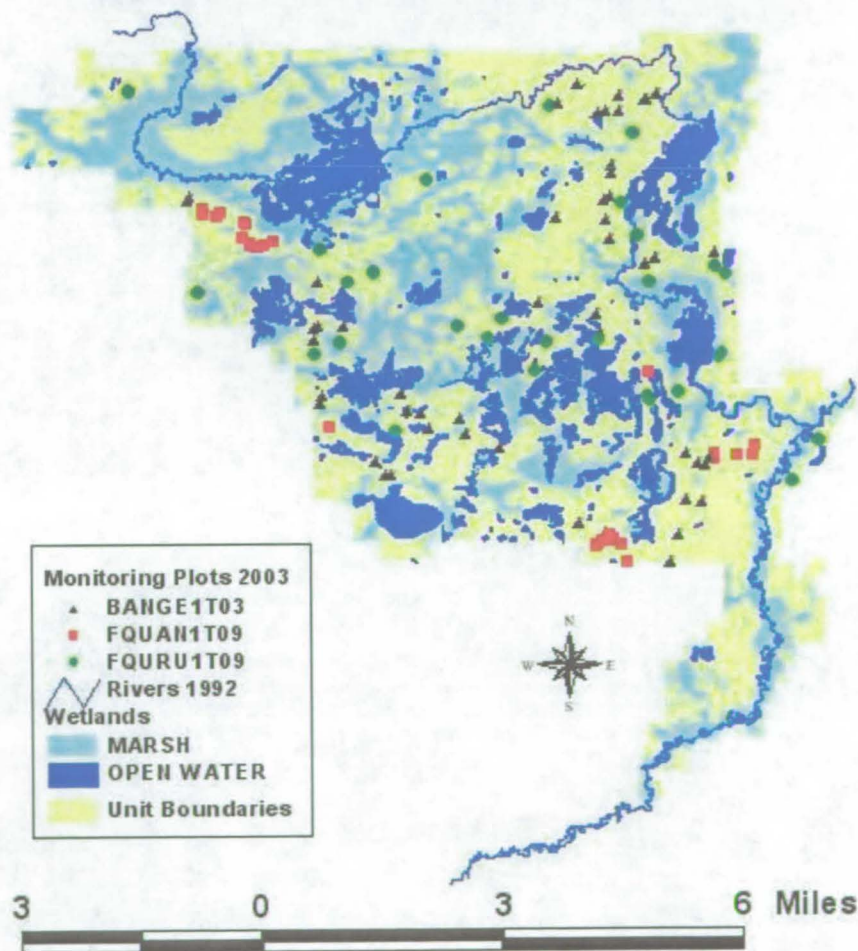
Morning briefing before implementing a prescribed fire. L-R: C. Blair, B. Strong, W. Belanger, C. Hanson, L. Au, N. Haugen, P. Soler, C. Klick, J. Holler, T. Marcouiller, P. Molitor, S. Zodrow, R. Johnson, C. Mursu, R. Beam (AR 5/03)



Lighting of a prescribed fire on the Wildlife Drive's south loop. (RRJ 5/03)

Fire monitoring continues at Sherburne NWR on 107 permanent transects/plots located in native prairie, bur oak savanna, and dry oak forest habitats. The fire monitoring program uses National Park Service FMH protocols adapted for Sherburne to capture data on long-term change in plant populations and habitat in relation to the prescribed fire program. Range technicians spent over a month collecting data, collecting voucher specimens, updating herbarium records, and completing data entry for 100 transects/plots at Sherburne NWR and 8 transects/plots at Crane Meadows NWR. An addition was made to Sherburne's plant list as *Bromus japonicus* Thunb. Ex Murr. (Japanese Chess) was identified on bur oak savanna plot 12 (FQUAN1T09 12). Anita Cholewa, from the University of Minnesota Bell Museum, assisted Refuge staff in the verification of voucher specimen identification.

SNWR Fire Monitoring 2003



Fire monitoring plot locations throughout Sherburne NWR. This includes 50 grassland transects (BANGE1T03), 28 bur oak savanna plots (FQUAN1T09), and 29 dry oak forest plots (FQURU1T09).

3g. Control Pest Plants

Biological Control of Purple Loosestrife (*Lythrum salicaria*)

Four release sites (i.e., Long Pool, Muskrat Pool, Josephine Pool, and Battle Brook) were monitored again this year following the national protocol. At the sites where *Hylobius transversovittatus*, the root-boring weevils, were released in 1996, these insects were not observed during monitoring due to the fact that they are nocturnal. *Hylobius* feeding damage to the leaf margins was observed at the Long Pool site this year and in past years. However, *Galerucella spp.* (i.e., leaf-eating beetles) feeding damage is practically nonexistent at the Long Pool site. Severe defoliation from *Galerucella spp.* has been observed at the remaining monitoring sites. Also, native vegetation (i.e., mainly cattails) is becoming reestablished on the east transect of Battle Brook

Nine release sites (i.e., Battle Brook, Bergerson Pool, East Bergerson Pool, Josephine Pool, Long Pool, Muskrat Pool, and three Type 4 wetlands), with a total of eleven photo points, were monitored for the sixth year. Except for a few flowering plants on the Type 4 wetlands, Long Pool east transect, and East Bergerson, severe defoliation from *Galerucella spp.* has been observed. Muskrat Pool, followed by Battle Brook and Bergerson Pool, were the first sites (i.e., within 3 years) to show control of purple loosestrife.

In 2001 and 2002 evaluations were performed at thirty-five release locations following the MN DNR protocol. The release locations were ranked on a scale of one to five with one being the best. The number of insects, distance from the release point, and plant damage were the factors used to determine the location's ranking. The average score for the release locations was 3.2. Biological control agents have established reproducing populations at 83 percent of the locations visited. Twenty-two release locations (36 percent) have not yet to be evaluated.

This year reconnaissance missions were performed with the airboat on the west side of Carpenter Pool and Durgin Pool and at Crane Meadows NWR. No new infestations were observed at these locations. Currently, purple loosestrife infestations range in size from a few plants to approximately 400 acres (i.e., Long Pool) with the larger infestations occurring on the eastern half of the Refuge. Purple loosestrife has become established on approximately 835 acres of the Refuge; the exotic plant can be found on 13 of our impoundments, Rice Lake, Buck Lake, Type 2/3/4 wetlands, Battle Brook, and the St. Francis River. However, some of the impoundments contain less than a quarter of an acre of infestation.



Loosestrife Infestation at Battle Brook in August 1998. (SZ 8/98)



Battle Brook Site in August 2003. (SZ 8/03)

To date, an estimated 187,000 leaf-eating beetles have been released at 62 locations including thirteen private land sites. Twenty-eight hundred root-boring weevils have also been released at five locations including one private land site. Beetles were unexpectedly found within the St. Francis River watershed at locations that had unmanaged purple loosestrife infestations.

Biological Control of Leafy Spurge (*Euphorbia esula*)

In 2002 we switched to the Minnesota Department of Agriculture protocol for monitoring the biocontrol release sites. In 2003 flea beetles were recovered at all of our field insectory release locations, including the slop-over location just west of the insectory. Overall, at least 90 percent of the target weed has been suppressed at the insectory. Biological control agents were present at four of the other eight release locations.

This year we received 50,160 flea beetles, a mixture of *Aphthona lacertosa* and *nigriscutis*, collected at the Upgrala site on Minnesota Valley National Wildlife Refuge. The flea beetles were released at three sites having a combined total of 8.0 acres of target weed. Thirty thousand beetles were released on the south side of Bergerson Pool at a 7.0 acre infestation found in 2003. Fifteen thousand beetles were released on several small patches of leafy spurge located northeast of Carpenter Pool found in 2002, and the remaining 5,160 were released on a patch of spurge north of the Bohm Pool ditch/outlet. To date, we have released 128,710 flea beetles at 27 locations. Approximately 24 of 29 acres of infestations have been treated with biological agents. The main target area for leafy spurge is in the vicinity of Bergerson, Bohm, and Josephine Pools where the invasive plant appears to be spreading.

A decision was made to use an integrated pest management approach for leafy spurge. In September of 2002 the chemical Plateau was used to treat small patches (i.e., < 2500 square feet) of leafy spurge. Except for native grasses, complete burn outs of the treated areas were observed in 2003. Small leafy spurge infestations totaling 3.6 acres and the leading edges of larger patches totaling 7.9 acres were treated in the summer and fall of 2003 (total 11.5 acres). In June (i.e., peak bloom), at the time of chemical application, the spurge patches were inventoried, and its associated GIS coverage was updated.

Spotted knapweed (*Centaurea maculosa*)

Spotted knapweed was observed on the Refuge for the seventh consecutive year. Plants were found and handpulled at the traditional areas adjacent to the parking lot on County Road 3 at the Brande Bridge (about 500-600 plants), and along the south side of the outlet ditch from Orrock Lake (about 50 plants). The Brande Bridge site appears to be expanding somewhat into the ditchbanks along the parking lot's west side. Last year only about 100-200 plants were observed and pulled. No plants were found along the Wildlife Drive this year. This invasive plant remains at low levels and is not widely distributed on the Refuge. The Refuge will continue to be monitored for future occurrences of this invasive, exotic plant.

Exotic Trees

Black locust, Siberian elm and box elder are the three main invasive woody species on the Refuge uplands. It is doubtful that these species will ever be able to be controlled, especially box elder since it is present in the lowlands. Burning helps in some instances, but does not alleviate the problem since what the adjacent landowners are growing on their property cannot be controlled by the Refuge. In some cases Refuge staff has assisted landowners with control, but it does not seem to eradicate the undesirable species from that area. Most areas have been treated for the second or third time. Mechanical removal does not prevent resprouting. Currently there are no biocontrols to combat these species, therefore we are left with chemical control. We have been diligently working to reduce the spread of these species. In FY 2003 400 acres of invasive woody species were chemically treated. The primary mode of chemical application is cut/stump treatment.

Stanley Olson, a local logger removed several small patches of conifers south of Orrock Lake at the request of the Refuge. On the south spur of the Refuge, the Barko drum cutter was used to open some of the native grass fields overtaken with exotic trees. The Barko was also used to delineate the boundaries around several large pine plantations. Plans for the years to come are to commercially eliminate all of the conifer plantations and return the area to oak growth.

FISH AND WILDLIFE MANAGEMENT

4a. Bird Banding

The FY 03 wood duck banding quota for Sherburne Refuge was 100 (i.e., 25 after hatch year male, 25 hatch year male, 25 after hatch year female, and 25 hatch year female). This year 64 wood ducks were banded (i.e., 10, 18, 6, and 30, respectively.). A total of 89 birds were trapped of which 22 were recaptures. Wood duck banding was conducted from 8/4/2003 to 9/25/2003 at the following sites: St. Francis Pool (3 locations), Long Pool, Bergerson Pool, Upper Roadside Pool, and East Bergerson Pool. St. Francis Pool (2 locations) and Upper Roadside Pool were our most productive sites with 3.0 and 1.25 birds banded per trap-night, respectively. Several incidental species were also captured including two spotted sandpipers, common snipe, flycatcher, muskrat, and 10 raccoons. Raccoons effected our banding operation on the east side of Refuge at both Bergerson Pools.

4b. Disease Monitoring and Treatment

West Nile Virus and Chronic Wasting Disease (CWD) two wildlife diseases in the limelight the past couple of years.

CWD is a transmissible spongiform encephalopathy (TSE) known to infect cervids, specifically white-tailed deer, mule deer and elk.. Similar progressive neurological diseases or TSEs are known to effect cattle (mad-cow disease), sheep (scrapie), humans (Cruetzfeld-Jacobs disease) and other mammals. CWD is always fatal. It was first discovered in Colorado in 1967 and has been present in an "endemic" area in that state, Nebraska and Wyoming ever since. To date, CWD has been detected in Colorado, Wyoming, Nebraska, Kansas, South Dakota, Oklahoma, Montana, New Mexico, Alberta, Saskatchewan, Wisconsin and very recently in Minnesota. The disease has been detected in both free-ranging and captive cervids. Wisconsin and Minnesota are the only states in Region 3 where CWD has been detected. In Wisconsin, CWD has been detected in the free-ranging whitetail deer population in the Mount Horeb area (Dane County). In Minnesota, CWD has been detected in a captive elk herd in the Aitkin area (Aitkin County). During the 2003 Firearms Deer Season the Refuge will be sampling for Chronic Wasting Disease as part of a statewide effort. Results of this sampling effort will be reported in the FY2004 narrative.

West Nile Virus (WNV) is an exotic pathogen first identified in North America in New York in 1999. The virus is transmitted by mosquitoes and can cause illness in birds and mammals, including humans. Since its initial discovery, WNV has moved steadily west and south following bird migration routes. WNV, like native mosquito-borne viruses such as St. Louis and Equine Encephalitis, is primarily a virus that infects birds. WNV is most virulent in American Crows, in which it is almost always fatal. Other species of corvids are also highly susceptible as well as many raptors. It is of great concern to the Raptor Center at the University of Minnesota which is seeing a large incidence of the disease in birds admitted to their clinic, especially in Great Horned Owls. Humans and other mammals are incidental hosts and play no role in the spread of the disease. Less than one percent of humans who become infected become seriously ill.

Refuge action regarding these diseases, as well as all other potential wildlife diseases, is the same. It consists of surveillance and reporting of unusual wildlife mortality and serving as a source of information on these diseases for public inquiries. In addition, for the last two years, we have distributed information to hunters regarding the safe handling of game relative to WNV and CWD.

4e. Predator and Exotic Control

As in past years nuisance beaver were removed by a trapper under a Special Use Permit. A total of 27 (i.e., 10 more than the previous year) beaver were removed at the following sites: Iron Pool (2), Deer Pool (2), Stickney Pool (5), Muskrat Pool (4), East Bergerson Pool (3), Pool 31 (2), Orrock Lake (6), and Buck Lake (4).

COORDINATION ACTIVITIES

5a. Interagency Coordination

The Refuge staff are involved on a regular basis with other agencies coordinating activities in every work area (law enforcement, habitat restoration, planning, environmental education, fire, etc.). For example, Refuge staff work with Sherburne County Public Works Department regarding road work, right-of-way issues, and signing. Service law enforcement personnel work closely with state conservation officers and the Sherburne County Sheriff's Department in resource protection. The Comprehensive Conservation Plan (CCP) planning process brought together members from numerous agencies. Refuge biologists coordinate various wildlife surveys (woodcock, loon, frog, waterfowl) with state personnel, as well as exotic species biological control on, and to some extent, off the Refuge. Habitat restoration projects typically involve multiple partners. Each year in September the Refuge co-sponsors with four other agencies the Environmental Education Days for students in grades 5 and 6 in Sherburne County. Refuge staff also participates in the Morrison County Water Festival. The staff is in close contact with state fire personnel and assists them during periods of high fire danger in and around the Refuge.

5b. Tribal Coordination

Several contacts were recorded with the Mille Lacs Band with sage collection as the only use requested in FY 2003. In addition to collecting sage, past activities by tribal members have included collecting wild rice and hunting white-tailed deer.

5c. Private Land Activities

In FY 2003 the Refuge partnered on a variety of habitat restoration projects. At Foley High School we worked with the Benton County School District, Benton SWCD and the MN DNR on developing a prairie educational site on school property. In Sherburne County several agencies / organizations including the Sherburne SWCD and NRCS, Oak Savanna Land Preserve Advisory Committee, Pheasants Forever, Sherburne County Park and Forestry, came together to help reestablish oak savanna habitat. In Anoka County we partnered with the Anoka County Conservation District, City of East Bethel, MN DNR and Pheasants Forever on developing a wildlife corridor (green space) between the Helen Allison Oak Savanna Natural Area (near Cedar Creek Natural History Area) and the Gordy Mickelson Wildlife Management Area. Refuge staff also worked closely with the MN DNR on a variety of wetland restoration projects.

The Refuge works closely with area NRCS, SWCD and MN DNR offices on wetland and upland restoration projects. In areas where their programs fall short, we can assist and vice versa. Our joint activities from the past year include the loaning of our Truax drills for CRP seedings. The Refuge seeds small parcels of land not covered by CRP contracts.

The NRCS, SWCD and MN DNR have all seeded areas for the FWS that were long a haul for Service equipment, but closer to their respective offices. MN DNR has a Pine County private lands specialist who has assisted us by doing initial contacts to perspective wetland restoration sites. This has helped us since some project areas in Pine County are more than a two hour drive from the Refuge. His assistance as a "*go between*" has been greatly appreciated. These good working relationships have restored more wildlife habitat than the Sherburne Office could accomplish on its own.

Two of our larger off-Refuge interagency coordination habitat restoration projects fell through this past summer. Both of these wetland projects were located in Project Area # 8 - The Big Woods North Corridor. This habitat corridor is part of a multi-agency LCMR Grant Project titled Restoring Minnesota's Fish and Wildlife Habitat Corridors. Sherburne County is one of the fastest growing counties in Minnesota. We hope to protect as much habitat as possible before it is lost to development. Both restorations that were tabled involved 35+ acres of wetland habitat. Needless to say many hours went into planning these projects. Among the agencies we worked with were: the MN DNR, Sherburne SWCD and NRCS, and the Minnesota Waterfowl Association.

The third Annual Habitat Day was held on March 23 at Crane Meadows NWR. The event focused on wood ducks and bluebirds. The general public was invited to learn more about both of these wildlife species, then build a nest box they could take home. Numerous agencies/organizations were involved; three USFWS offices (Sherburne NWR, Crane Meadows NWR and the St. Cloud Private Lands Office), Minnesota Waterfowl Association (MWA), Ducks Unlimited (DU), MN DNR, Camp Ripley Environmental Office, four area Sportsman's Clubs (Little Falls, Randall, Big Lake and Royalton), Little Falls and Royalton High Schools, the St. Cloud Area Environmental Council, Central Minnesota Audubon Society and Great River - Great People. The Program was a success with 325 people attending the five-hour program and 200 wood duck boxes and 180 bluebird boxes being built.

The Partners for Wildlife Program sells itself through word of mouth. Phone calls continue to come in at a steady rate. We still have a backlog of wetland restoration projects, but this helps us plan in advance and gives us a little latitude regarding work areas.



Refuge Manager, Charlie Blair, assists visitors with bluebird box assemble at the Crane Meadows NWR Habitat Day. (LW 3/03)

5e. Cooperative/Friends Organizations

Friends of Sherburne NWR

July 1 marked the 10th Anniversary of the incorporation of The Friends of Sherburne as a 501(c)3 non-profit group. To involve their membership and the people of the local communities in their celebration, the Friends raffled a canoe donated by Bell Canoe Works, Inc. The drawing took place on July 19 netting the Friends nearly \$906.

David Martin and Judith Hidde represented the Friends at the Refuge Support Group Centennial Conference in Washington, D.C. on January 21 – February 2. Dave & Judy had the opportunity to meet with aides from the offices of Senator Mark Dayton, Senator Norm Coleman and Congressman Mark Kennedy.

The Friends partnered with the Refuge in two FWS Challenge Cost-Share Grants. One grant was directed toward the development of new trail map signs for the Mahnomen Trail and the other toward Refuge System Centennial events.

The Friends received a \$500 donation from Federal Cartridge with a request for it to be used to support the air rifle workshop at the Wildlife Festival. To honor this request, the

Friends purchases two 10 X 10 pop-up exhibit tents to provide protection for the air rifle workshop.

During the year the Friends received the following significant donations: Federal Cartridge Inc. \$500, Elk River Landfill \$500, David and Gretchen Martin \$500 and Wal-Mart in Elk River \$500.

The Friends became members of both the Zimmerman Chamber of Commerce and the Princeton Chamber of Commerce in an effort to increase their visibility in these two local communities.

The Friends co-sponsored six special events with the Refuge during the year: Wildlife Festival in October, the Christmas Bird Count in December, the Wildlife Film Festival in January, Winterfest in February, Spring Clean-up in April, and Migratory Bird Day in May. Jim Gelbman, aide to Senator Mark Dayton, visited the Friends during Winterfest in February.

The Friends partnered with the Refuge in celebrating the 100th Anniversary of the National Wildlife Refuge System by assisting in the planning of the Time Capsule Dedication Ceremony on March 14 and the Second Day Centennial Postage Stamp Cancellation event on March 15. Sally and Wally Nebel represented the Friends at the Refuge System Centennial celebration at Pelican Island NWR in Florida, the first Refuge, on March 14 & 15 and brought back Centennial postage stamp first day cancellation caches.

The Friends sent David Martin and Judith Hidde as their representatives to the Region 3 Friends Networking Conference held on May 17 – 18 at Neal Smith NWR.

The Friends provided funding for the purchase of wildflower seedlings for the landscape beds around the new addition to Refuge headquarters. Robin DeLong, Judith Hidde, and Marliss Bock planned the arrangement, planted the seedlings, and cared for the plants throughout the summer.

The Friends held a legislative lunch and tour on July 9. Aides from the offices of Senators Dayton and Coleman and Congressman Kennedy attended. The primary focus of this meeting was to seek funding for a new visitor center at Sherburne. The Friends asked the legislators to request an appropriation of \$500,000 in start up funds for a visitor center for the fiscal 2004 federal budget with the remaining funds, approximately \$2.5 million, in the 2005 budget.

In July the Friends launched a letter writing campaign to get local Friends members, Refuge volunteers, community members, town boards, community groups, chambers of commerce, and county boards to contact Senators Dayton and Coleman and

Congressman Kennedy expressing the need for a visitor center at Sherburne Refuge and requesting them to add funding to the 2004 federal budget.

The Friends co-sponsored a booth at the Mille Lacs County Fair on August 7 – 10. Bruno Gad coordinated the set up of the exhibit and staffed the booth during the entire event, with assistance from two volunteers and two Refuge staff.

Ted Bell was appointed to the board on April 28 bringing the total number of current board members to eight.

As of September 30, 2003, the Friends had 248 members and a net worth of \$25,816

RESOURCE PROTECTION

6a. Law Enforcement

Sherburne County continues to rank among the highest in Minnesota for growth development. Numerous housing developments have popped up around the Refuge. Most development has concentrated on the south and east boundaries. This year new developments started west of County Road 1, just north of County Road 42, and south of County Road 9, just east of County Road 1. Even though neither is directly adjacent to the Refuge, both are within a couple miles of the Refuge. Increased problems come with increased human activity.

Proactive efforts defray most potential problems. Refuge staff are active in the community. We continue to update our brochures and pamphlets on an annual basis. These handouts are located at each entrance kiosk, as well as outside the headquarters building. The staff and volunteers work weekends during high visitor use periods of the year. Regulatory signs are posted at over 20 sites on the Refuge.

Close to 300 incidents were recorded (see the Refuge Cost Analysis Report (RCAR) printout). Trespass, illegal deer stands and waste dumping top the list for most incidents documented. This year we were given the authority to issue written warnings. Prior to this only verbal warnings were issued and the incident was then tracked by whatever means the officer(s) deemed to use. Most of the warnings issued involved hunting infractions, i.e., no license in possession, no blaze orange while small game hunting, lead shot, etc. Twenty-seven notices of violations were issued.

6b. Wildfire Preparedness

During FY2003 four natural-out wildland fires were discovered on the Refuge, all of which were two acres or less in size (see figure in "*Prescribed Fire*" for locations). Refuge personnel also assisted Minnesota DNR on an unplanned wildland fire west of the Refuge in September.

Several days during the spring and fall experienced 'very high' or 'extreme' fire danger, with high temperatures and wind speeds combined with low relative humidity. During the months of August and September of 2003, the Refuge was in an area of moderate drought. Prescribed burning was canceled during this period as the dry conditions put all prescribed burn plans out of prescription. Work schedules were adjusted for some staff and AD firefighters to cover the Refuge later into each weekday and on weekends, due to the potential for wildfire occurrence during this time of drought.

Several fire staff and collateral duty firefighters went to Montana on severity engine assignments, while four temporary Range Technicians went to the Northern Rockies with 20-person Type 2 fire crews during the summer.

TYPE	NAME	DATE	PERIMETER (MILES)	FIRE#	ACRES
WF	NO Storley	5/31/2003	0.3	32550-9261-C419	2.00
WF	VehicleCR4	6/5/2003	0	32550-9261-C446	0.10
WF	NO AREA C #1	10/15/2002	0	32550-9261-3931	0.10
WF	NO Upper Roadside	8/31/2003	0	32550-9261-C511	0.10

Table 8. Wildfire activity information on Sherburne NWR for FY2003.

PUBLIC EDUCATION AND RECREATION

8a. Provide Visitor Services

Facilities

The final visitor center site selection meeting was held in May with a committee comprised of Donna Stanek, Dick Sorensen and Nick Palaia from the Regional Office, Nancy Haugen and Jeanne Holler from the Refuge staff, and Dave Martin from the Friends of Sherburne. The top two sites, chosen during the committee site review in October 2001, were looked at for their ability to provide short hiking trails from the building to oak savanna, prairie and wetland habitats for use by short-stay visitors and environmental education programs. The site south of Old School House on the east side of School House Pool was chosen.

A short section of the Blue Hill Trail on south side of Buck Lake was rerouted to higher ground during Spring Clean-up in April so it would not continue to be affected by flooding from the Buck Lake outflow ditch.

A short section of the Mahnomen Trail on the north side of the first loop was rerouted during Spring Clean-up in April into a wooded area to provide a more scenic route.

A 15'X 15' deck was constructed on the west side of the new addition to Refuge headquarters in July by 14 Telecom Pioneers, who are retired Qwest telephone employees.

Refuge headquarters received a fresh coat of stain in May from ten enrollees in the Sherburne County Sheriff's Department's Sentence to Service Program.



Telecom Pioneer volunteers and their project coordinator from the Refuge staff, Tom Marcouiller, after completing construction of the deck on the west side of Refuge headquarters. (NH 7/03)

Signs

In May the Mahnomen Trail had new fiberglass embedment trail map signs placed at the trail intersections. The signs were funded with a FWS Challenge Cost-Share Grant.

Refuge Visitation

Sherburne NWR received 111,150 visitors during FY03, a 15% increase from the 94,000 visitors in FY02 and the highest recorded in the past six years.

The Wildlife Drive closed for the firearms-deer hunt November 9 - 17 and then re-opened for eight more weeks due to a very light snow cover. The Drive closed on January 15 to

enable the eagles nesting on Stickney Pool to be free from disturbance during their pre-nesting courtship period and remained closed until April 12.

	FY98	FY99	FY00	FY01	FY02	FY03
Total Visitation	86,881	102,261	93,049	88,365	94,000	111,151
Wildlife Drive	18,000	20,654	19,445	16,977	18,547	24,942
Foot Trails	15,000	18,659	18,465	17,240	17,837	22,795

Table 9. Sherburne NWR Visitation

Special Events

Six special events were co-sponsored by the Refuge and the Friends of Sherburne during the year: Wildlife Festival in October, the Wildlife Film Festival in January, Winterfest in February, Spring Clean-up in April, Migratory Bird Day in May, and Christmas Bird Count in December. These events continue to provide an excellent avenue for public outreach and education.

SPECIAL EVENTS	FY 98	FY99	FY00	FY01	FY02	FY 03
Wildlife Festival	350	600	575	600	200	400
Wildlife Film Festival (3days)	228	111	83	38	87	99
Winterfest	700	800	500	425	375	500
Spring Clean-up Day	200	300	350	300	340	340
Migratory Bird Day	54	35	24	50	42	29
Christmas Bird Count	7	16	10	18	17	20
TOTAL	1539	1862	1542	1431	1061	1388

Table 10. Special Event Attendance, Sherburne NWR

a. Winterfest

Winterfest, the event at which the Refuge celebrates the Refuge System Birthday, began Sherburne's year-long celebration of the 100th Anniversary of the National Refuge System. Among the special activities offered to the 500 visitors attending the event were free anniversary cake, a Refuge System Quiz Board, blue goose mobiles to color and an opportunity to write down a special memory of the Refuge to be included in the Refuge time capsule. A 12 inch snowfall just six days before the event brought the perfect conditions for sleigh rides, snowshoe check-outs, and cross country skiing to be enjoyed by all.

b. Centennial of National Refuge System

The Centennial of the National Refuge System was celebrated on March 14 with a Time Capsule Dedication held at the Old School House. Sixty Refuge volunteers, Friends members, local citizens, teachers, students, and reporters joined Refuge staff for the program. Speaking on what the Refuge System meant to them were Charlie Blair, Refuge Manager, Brad Ehlers, Assistant Manager, and Alan Rife, Maintenance Worker. Two students from the Princeton Elementary 4th grade read their prediction of what the Refuge would look like 100 years from now. Sharon Clothier, curator from the Sherburne County Historical Society, spoke on the value of preserving history. The time capsule was packed with more than 100 items which included photos of facilities, habitat, staff and volunteers, uniform items from staff and volunteers, and many documents. After the cover was put in place, the oxygen in the capsule was replaced with argon gas as a preservative. The sealed time capsule was placed at Refuge headquarters in the exhibit area next to the Friends Gift Shop where it can be easily be seen by the visiting public. When a new visitor center is built the time capsule will be placed on permanent exhibit there.



Terry Andolino, volunteer, packs Refuge time capsule as Nancy looks on. (JH3/04)



Terry Andolino, volunteer, and Tom Marcouiller, seal the time capsule. (JH 3/04)

c. Second Day Cancellation

A Second Day Cancellation of the Refuge System Centennial Postage Stamp was held on March 15 at the Old School House. Zimmerman postmaster Joe Bodner brought postage stamps and the official cancellation stamp for Sherburne National Wildlife Refuge Station. Over 30 Refuge volunteers, Friends members, Refuge staff and the general public came to pick up free Centennial caches, purchase centennial stamps and received the second-day cancellation.



CELEBRATING A
CENTURY
of CONSERVATION



Joe Bodnar, Zimmerman Postmaster, hand cancels Centennial caches at the Second Day Cancellation of the Centennial Postage Stamp held at the Old School House on March 15. (NH 3/03)

Interpretation

A total of 4,012 visitors participated in interpretive talks, tours and demonstrations during the year. Interpretive programs included the following:

a. Volunteer Wildlife Interpreters

- 1) Interpretive hay rides and demonstrations at Wildlife Festival in October and Winterfest in February.
- 2) Roving interpreter contacts on the Wildlife Drive - April thru September.
- 3) Guided bird hikes in April, June and September.
- 4) Birding tours at Migratory Bird Day in May.

b. Refuge Staff

- 1) Presentations and demonstrations at Wildlife Festival in October and Winterfest in February.

2) A guided tour for a field trip group from The Nature Conservancy Annual National Trustees Meeting and Global Leadership Summit on October 3. Trustees from as far away as Chile, Brazil, Australia, Pompeii, Maine and Colorado were among the 30 participants in the two hour bus tour led by Jeanne Holler, Refuge Biologist.

3) A guided tour for Princeton Lions in October 21.



Jeanne Holler, Refuge Biologist, led 30 Nature Conservancy trustees on a tour of the Refuge during The Nature Conservancy Annual National Trustees Meeting and Global Leadership Summit in October. (NH 10/02)

c. Guest Presenters

- 1) Jim Gerhart presented Reptiles of Minnesota at the October Wildlife Festival
- 2) Staff from the Audubon Center of the North Woods presented "Bald Eagles and Other Birds of Prey" at Winterfest in February.

d. Oral History Project

An Oral History Project, funded through a Centennial Challenge Grant, took a major step toward completion this year when Sue Nelson, graduate student in history at SCSU, completed 30 interviews with 36 former residents of Refuge land before the Refuge was established. Nelson delivered to the Refuge audio cassette tapes of the 30 interviews along with digital and hard copies of each interview. The Refuge is archiving the

interviews in several formats; audio cassette tape, digital copy on compact disk (CD), hard copy printed on archival paper, and hard copy in a three-ring binder for the public to view. A digital CD copy of the 30 interviews was given to the Sherburne County Historical Society for their archives.

Environmental Education

The annual Sherburne County Environmental Education Days were held September 15-18 at Sherburne NWR and Sand Dunes State Forest. 825 fifth and sixth grade students from Elk River, Zimmerman, Otsego, Becker, Clear Lake and Foley each spent a half-day at the Refuge and a half-day at Sand Dunes State Forest participating in a variety of 20-minute environmental education programs conducted by staff from the Refuge, the University of Minnesota Extension Service for Sherburne County, the Natural Resource Conservation Service, Minnesota Department of Natural Resources, and the Sherburne County Soil and Water Conservation District. The Refuge was responsible for programs on Wildlife Management-the Bald Eagle and Friendly Fire. Seven Refuge staff and one Refuge volunteer each taught one full day of sessions during the week. This year the Friendly Fire program was revamped to include an activity that involved the students in a simulation of a prescribed burn and also used fire equipment as visuals during the discussion on prescribed burning.

Other staff-led environmental education programs included the following:

- 1) Jeanne Holler, Refuge Biologist, told twenty-seven students about careers in wildlife management at the Becker High School Career Day in January.
- 2) In April Jeanne Holler spoke about Refuge wildlife and Refuge hunting regulations to 27 Boy Scout in a Firearms Education course in Big Lake.
- 3) At Isanti Youth Day in May, Allan Rife spoke to 150 youth on the topic of wildlife and hunting safety.
- 4) The Scientific Discovery Program brought 15 students to the Refuge in July for an introduction to Refuge habitats led by Jeanne Holler and Nancy Haugen.
- 5) The Audubon Center of the North Woods brought 20 adult students from Hamline University to the Refuge in August for a full day tour led by Charlie Blair and Nancy Haugen as part of their graduate level course on Minnesota Biomes.

Notable school groups using the Refuge for teacher-led environmental education during the year included the following:

- 1) 120 fourth grade students from Princeton North Elementary came to the Refuge in October and February for oak savanna studies;
- 2) 65 youth in the Princeton Tiger Club came to the Refuge in July for a wildlife study on the Wildlife Drive;
- 3) 55 students from North High School in Minneapolis came to the Refuge in October for oak savanna studies.

	FY98	FY99	FY 00	FY 01	FY02	FY 03
Total number of volunteers	503	745	574	717	546	603
Total volunteer hours	8,866	8,662	8,001	8,733	7,752	8,603

Table 11. Total Environmental Education Participation, Sherburne NWR, FY2003

Volunteer Program

During FY03, 603 volunteers donated a total of 8,603 hours of service to the Refuge. Volunteers were actively involved in a wide variety of public use and biological programs which included litter pick-up, trail maintenance, roving wildlife interpretation, wildflower gardening, seed collection, wildlife surveys, and more. Their assistance is invaluable. The Refuge would be at a great loss without them. Al Roden completed his third full year as our Experience Works Maintenance Assistant in January. Experience Works strongly encourages participants to find a job in the work force after three years with their program, therefore Al left the program in August.

	FY 98	FY 99	FY 00	FY 01	FY02	FY 03
Staff/volunteer-led on-site	2,002	,539	1,359	1,092	1,037	1,233
Teacher-led on-site	3,517	1,331	1,591	1,421	1,694	1,145
Teacher workshop participants	0	16	49	17	9	7

Table 12. Total Number of Volunteers and Volunteer Hours, Sherburne NWR



During the Spring Clean-up ten Refuge volunteers worked with Paul Soler to reroute the north portion of the first loop of the Mahnomen Trail. (NH 4/03)

Hunting

	FY98	FY99	FY00	FY 01	FY02	FY 03
Waterfowl Hunting	1,334	1,425	1,608	1,479	1,438	1,764
Upland Game Hunting	951	1,054	1,182	1,196	1,844	2,435
Big Game Hunting	3,594	3,928	4,300	3,831	4,446	4,251

Table 13. Number of Hunting Visitors, Sherburne NWR

a. Waterfowl Hunting

A total of 1,746 hunters participated in waterfowl hunting on the Refuge during FY 03. Long Pool continues to be the most heavily hunted location on opening weekend. There were 44 hunters on Long Pool on Saturday, September 27 and 42 hunters on Sunday, September 28.

b. Upland Game Hunting

A total of 2,435 hunters participated in upland game hunting this Fiscal Year. This continues an on-going trend upward. Ruffed Grouse and gray and fox squirrels are the most commonly harvested species.

c. Big Game Hunting

Over 3,455 hunters participated in the firearms-deer hunt on the Refuge during the state season, November 9 - 17. Opening day saw nearly 900 hunters. No injuries were reported during the 10-day season. Violations were minimal. Illegal deer stands continue to be a problem.

The white-tailed deer is the most sought after game mammal. Based on population predictions from MN DNR's deer model and the continued mild winters, the Refuge staff decided to issue 650 antlerless deer permits. However, there were only 411 successful applicants for the antlerless lottery for our killblock. Therefore, MN DNR offered 303 management permits to antlerless permit holders in an attempt to reach the 650 target antlerless permits. The total harvest of deer in fall 2002 from all license types was 333. This included 146 adult males, 38 fawn males, 114 adult females, and 35 fawn females. The total firearms harvest in 2002 was 276 deer. Despite the fact that this is seven percent below the 2002 firearms harvest, all four sex-age components of the harvest were above the five and ten-year averages. A ten-year history of the firearms deer harvest is presented below. It was compiled from MN DNR records of registered animals.

A total of 52 deer harvested from the Refuge were registered at the Old School House and an additional 138 Refuge deer were registered at the Sandunes Stop in Orrock. The season totals for the Refuge killblock will be tabulated by the MN DNR as they gather

registration information from across the state. Of the 190 deer registered locally, 48 percent were adult males. The largest deer registered at the Old School House was a 9-point buck that weighed 194 pounds. Harvest pressure continues to be great with almost 900 hunters afield on opening day. The level of hunting pressure is also reflected in the age structure of the harvested animals with only 35 percent of the deer registered at the Old School House being more than two years old.

Harvest of white-tailed deer by archery increased to 24. This is a 60 percent increase from last year's harvest of 15. The harvest composition was ten adult male, three fawn male, nine adult female, and two fawn female.

YEAR	# of Antlerless Permits	ADULT MALE	FAWN MALE	ADULT FEMALE	FAWN FEMALE	TOTAL
2002	650	115	35	96	30	276
2001	450	150	26	90	30	296
2000	300	126	22	66	22	236
1999	300	132	33	63	25	253
1998	400	118	45	89	39	291
1997	128	92	17	40	14	163
1996	200	68	23	30	11	132
1995	275	85	21	86	28	220
1994	350	63	25	72	22	182
1993	250	73	16	51	20	160
5-year average		128.20	32.20	80.80	29.20	270.4
10-year average		102.2	26.3	68.3	24.1	220.9

Table 14. Ten-year History of Firearms Deer Harvest at Sherburne NWR, 1993-2002

In addition to the regular firearms and archery harvest figures summarized above, another 20 deer were harvested by all-season license holders. These license-holders can harvest a deer in any legal season. However, the harvest is not reported out on the basis of harvest method. The composition of this harvest was: ten adult males; eight adult female; and two fawn female. These deer are accounted for in the 333 total deer harvest by all means reported at the beginning of this section.

Fishing

A total of 1,958 anglers participated in fishing on the Refuge during FY03. Fishing is confined to six access points on the St. Francis River.

	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03
Anglers	1,991	2,095	1,670	1,420	1,341	1,958

Table 15. Number of Fishing Visitors, Sherburne NWR

Trapping Results 2001/2002Season

Furbearer harvest was allowed for raccoon, mink, and muskrat in accordance with state regulations and additional special conditions, during the mink and muskrat season. The table below summarizes the harvest and compares it to the previous season.

UNIT	ACCEPTED BID	MINK		MUSKRAT		RACCOON	
		2002/ 2003	2001/ 2002	2002/ 2003	2001/ 2002	2002/ 2003	2001/ 2002
1	\$100.00	3	--	12	--	11	--
2	\$100.00	0	11	0	1	0	0
3	\$101.00	8	7	3	9	18	12
4	UNSOLD	--	--	--	--	--	--
5	\$100.00	0	--	0	--	0	--
6	UNSOLD	--	--	--	--	--	--
7	UNSOLD	--	--	--	--	--	--
8	UNSOLD	--	--	--	--	--	--
9	CLOSED	--	--	--	--	--	--
10	UNSOLD	--	--	--	--	--	--
11	\$226.00	16	4	103	3	27	9
12	\$127.00	4	--	19	--	26	--
13	UNSOLD	--	10	--	72	--	42
14	UNSOLD	--	9	--	63	--	19
TOTALS:	\$754.00	31	41	137	148	82	82

Table 16. Summary of Furbearer Harvest by Trappers*

This fiscal year, the season ran from November 2, 2002 through February 28, 2003. The 2001/2002 season ran from October 27, 2001 through February 28, 2002. This year, after the first round of the competitive bidding process was complete, those trappers attending the bidding/trapper information meeting were allowed to bid on up to two additional units for a minimum of \$100. A total of six units were purchased by three trappers for a total of \$754.00.

8b. Outreach

Group Presentations

A presentation on the Refuge was given to the Princeton Chamber of Commerce by Nancy Haugen in May.

Exhibits

The Friends of Sherburne exhibit was displayed at the Mille Lacs County Fair in Princeton on August 7 – 9 and reached nearly 420 people with information on the Refuge.

The Purple Loosestrife tabletop exhibit was displayed in libraries in the following local communities: Elk River, Princeton, Becker, Big Lake, and Rogers. The exhibit reached a total of approximately 680 people with a message on this problem plant during the 12 days it was displayed at each location. Terry Andolino, a Refuge volunteer, coordinated this successful outreach venture.

Educational Trunks

The Prairie Trunk went out on loan to Princeton Tiger Club in June and to North Elementary in Princeton in September reaching a total of over 200 students.

The Wetland Trunk went out on loan to Princeton Tiger Club in June reaching over 60 students.

Media

The Refuge System Centennial received excellent coverage in local newspapers following the Time Capsule Dedication and the Second Day Centennial Postage Stamp Cancellation in March. Local newspapers and radio stations also gave good coverage for Wildlife Festival in October and Winterfest in February.

PLANNING AND ADMINISTRATION

9a. Comprehensive Management Planning

The Comprehensive Conservation Plan (CCP) for the Refuge continues to move forward. This year great progress was made to assimilate the information gained from the facilitated workshops and technical groups. This was done with the aid of biological and technical staff at of the USGS Upper Mississippi Environmental Science Center (UMESC) and the GIS CCP Tools developed by UMESC. These tools allowed the staff to map out, for each alternative, the ultimate endpoint for Refuge habitats, decide what was attainable during the 15 year life of the plan, and the consequences of these decisions. In addition, the goals and objectives were finalized and strategies developed for all alternatives.

9b. General Administration

Personnel - Permanent

Leakhena Au, Student trainee (Biology), GS-499-5, SCEP, EOD 1/12/2003
Ronald Beam, Maintenance Worker, WG-4749-8, PFT, EOD 3/25/1991
Wesley Belanger, Fire Technician, GS-404-5, Seasonal, EOD 4/06/2003
Charlie Blair, Refuge Manager, GS-485-13, PFT, EOD 12/23/1994
Brad Ehlers, Refuge Operations Specialist, GS-485-12, PFT, Retired 4/2003
Catherine Hanson, Biological Science Technician, GS-404-6, Seasonal, EOD 3/29/1995
Nancy Haugen, Park Ranger (Public Use Specialist), GS-025-11, PFT, EOD 10/29/1995
Jeanne Holler, Wildlife Biologist, GS-486-12, PFT, EOD 6/26/1994
Richard Johnson, Fire Management Officer, GS401-11, PFT, EOD 9/08/2002
Jean Kabella, Administrative Technician, GS-303-7, PFT, EOD 12/29/2002
Thomas Marcouiller, Maintenance Worker, WG-4749-7, PFT, EOD 7/29/2001
Chris Mursu, Fire Program Technician, GS-404-6, PFT, EOD 8/19/2001
Allan Rife, Maintenance Worker, WG-4749-9, PFT, EOD 6/19/1988
Paul Soler, Refuge Operations Specialist, GS-485-11, PFT, EOD 2/28/2000
Sally Zodrow, Biological Science Technician, GS-404-6, PFT, EOD 6/08/1997

Personnel – Temporary

Bill Strong, Fire Technician, GS-455-4, EOD 6/23/2002
Wesley Belanger, Fire Technician, GS-455-5, EOD 4/06/2003
Bob Bengson, Fire Technician, GS-455-5, EOD 6/23/2002
Christine Klick, Fire Technician, GS-455-3, EOD 7/07/2002
Scott Swanson, Fire Technician, GS-455-4, EOD 7/07/2002

Chris Mursu was converted to permanent full time, as a Fire Program Technician. Wesley Belanger was hired to fill the permanent Seasonal Fire Technician position. Leakhena Au

started at Sherburne as a Student Career Experience Program (SCEP) employee in January and completed her time here on June 27. She was hired on permanently as a Fish and Wildlife Biologist by the Green Bay Ecological Services Field Office, Green Bay, Wisconsin November 2, 2004. At the end of Fiscal Year 03 the Refuge Operation Specialist, GS-485-12 is vacant. Brad Ehlers, Refuge Operations Specialist retired on April 1, after 33 years of federal service



Refuge Staff. Back row from left: Scott Swanson, Jeanne Holler, Allan Rife, Paul Soler, Catherine Hanson, Chris Mursu, Ron Beam, Tom Marcouiller, Sally Zodrow, Bill Strong, Bob Bengson, Richard Johnson. Front row: Charlie Blair, Jean Kabella, Leakhena Au, Nancy Haugen, Wes Belanger. (Photo by: Nick Palaia 6/03)

9c. Safety

Safety is a high priority in the work place. It is the responsibility of everyone to maintain a positive safety attitude and identify potential hazards, then seek corrective action. The Sherburne / Crane Meadows Safety Committee is comprised of six staff members; Soler (Chairman), Beam, Holler, Haugen, Zodrow and Marcouiller. Safety committee meetings are held quarterly or as needed pending immediate action on a critical issue.

Each year the Safety Committee assigns a month to a staff member. It is the responsibility of that individual to arrange for a guest speaker or present material on a safety topic of their choice. The table below summarizes the monthly safety meeting topics. If the topic is blank beside the employee's name no program was presented.

Calendar Year 2003 Safety Presentations		
Month	Presenter	Topic
January	Soler	Hypothermia
February	Marcouiller	
March	Johnson	Annual Fire Fighting & Safety Refresher
April	Hanson	Fire Shelters, instructional & practical
May	Mursu	Fire Equipment, instructional & practical
June	Au	Basic First Aid
July	Strong	
August	Zodrow	Electrical Safety
September	Holler	Safety as a Core Value
October	Beam	Working in Cold Weather
November	Kabella	
December	Haugen	Handwashing

Table 17. Summary of Safety Presentations given during calendar year 2003.

There were three injuries required medical attention in FY 2003; on 10/2/02 a groin injury resulted from lifting an object, there was a puncture wound on 5/8/03 to the palm of the hand from a knife, and on 7/9/03 our first case of an employee with Lyme Disease was reported. None of these were emergency situations. All have been rectified. The employee bitten by the deer tick fortunately caught it early and was properly treated with antibiotics.

Credits

Haugen	5e, 8a, 8b, editing
Holler	1a, 1b, 2b, 4b, 8a, 9a,
Kabella	9b, assembly
Mursu	3f, 6b
Johnson	3f, 6b
Soler	Highlights, climate data, 2b, 2c, 2d, 5a, 5b, 5c, 6a, 9c, RCAR
Zodrow	1b, 3a, 3g, 4a, 4e

APPENDIX (RCAR SUMMARY)

Refuge Comprehensive Accomplishment Report, FY 03

	Obligations (\$000)					Staff Days			Volunteers			
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other	=Total	Vols.	Hours	Outputs	Outcomes
Monitoring & Studies												
Surveys & Censuses	50	12	62	1	63	178	8	186		614	4 habitat surveys 15 wildlife surveys 10% off refuge	5% TE 10% WF 30% OMB 15% RW 40% HEC
Eight bald eagle chicks fledged from five nests this summer.												
Fall 2002 set another record for the number of sandhill cranes staging on the Refuge, approximately 2,600 birds.												
A highlight of the 2002 field season was the sighting of two loggerhead shrikes on the south loop of the Wildlife Drive. Although no young were ever seen to confirm breeding, it is encouraging to see such a rare bird back in their habitat. Loggerhead shrikes, an openland oak savanna bird are listed on the State of Minnesota as a Threatened species.												
Studies & Investigations	40	10	50		50	140		140		555	7 studies or investigations 5% off refuge	20% OMB 20% RW 50% HEC 5% PED 5% PRC
Habitat Restoration												
Wetland Restoration	8	3	11	30	41	18	67	85			87 ac. off-refuge wetland acres restored	5% TE 30% WF 30% OMB 5% RW 20% HEC 10% PRC
Upland Restoration	6	3	9	23	32	19	70	89		1,031	14 refuge ac. restored 103 off-refuge ac. restored	20% WF 40% OMB 20% HEC 10% PED 10% PRC
With the aid of a grant from the National Fish and Wildlife Foundation forb production plots were started for six new native wildflowers this year. The plots were tended by volunteers that contributed over 120 hours weeding, watering and harvesting seed from the plants. The plots will enable a long-term consistent and cost-effective source of local ecotype forb seed to be used in the restoration of native oak savanna habitats on the Refuge.												
Sherburne NWR partnered with several other Sherburne County organizations in restoring a 30-acre Oak Savanna Land Preserve in Becker Township.												
Forty volunteers donated 606 hours of service collecting wildflower seeds for the upland restoration program on Sherburne NWR.												
Habitat Management												
Water Level Management	45	6	51	1	52	158	5	163			4000 existing ac. managed more	5% TE

	Obligations (\$000)			Staff Days				Volunteers				
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other =	Total	Vols.	Hours	Outputs	Outcomes
Improvements were made on the St. Francis Pool water control structure (WCS). A culvert apron, erosion control fabric and 40 cubic yards of rock were added at the discharge end of the structure. The WCS was installed early in FY2002 as a joint effort with the MN WMA and DU.												
Forest Management	6	2	8		8	21	3	24			10 ac. harvested	5% TE 40% OMB 15% RW 30% HEC 5% PED 5% PRC
Fire Management	37	25	62	233	295	130	1,247	1,377	36		6604 ac. of on-refuge prescribed burns 7 prescribed burns conducted 4 wildfires suppressed	5% TE 10% WF 30% OMB 20% RW 30% HEC 5% PED
The Refuge exceeded its prescribed burn goals with 6604 acres. Four new, never burned units were added to the burn plans this year. They contributed a little over 1,800 acres to the total. The first permanent full time fire technician was hired at the Refuge. Chric Mursu EOD November 2002 as the Fire Program Technician.												
Native Pest Plant Control	21	4	25	5	30	73	35	108			435 ref. ac. infested 188 ref. ac. treated chemically 66 ref. ac. treated mech./phys.	10% WF 40% OMB 5% RW 45% HEC
Invasive Plant Management	29	11	40	5	45	104	35	139			6200 ref. ac. infested 208 ref. ac. treated chemically 3 ref. ac. treated mech./phys. 600 ref. ac. treated biologically 857 ac. surv./mon. for invasive plant species	10% WF 40% OMB 5% RW 45% HEC
Plans were initiated to incorporate volunteers into the Refuge invasive species control program. This was made possible with the support from Volunteers and Invasive Species Grant money.												
Fish & Wildlife Management												
Bird Banding	9	3	12		12	30	2	32	4		64 waterfowl banded	50% WF 40% OMB 10% RW

	Obligations (\$000)			Staff Days			Volunteers				Outcomes	
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other =	Total	Vols.	Hours		Outputs
Native Pest Animal & Predator Control	9	1	10		10	30		30		48	31 mammals removed	5% TE % WF 5% OMB 5% RW 70% HEC 10% PRC
Coordination Activities												
Interagency Coordination	30	13	43		43	111		111			1250 ac. affected 40% effort for uplands 60% effort for wetlands 9 activities did not involve habitat issues	5% TE 25% WF 25% OMB 20% RW 10% FAR 5% HEC 5% PED 5% PRC
Tribal Coordination	1		1		1	5		5			500 ac. affected 50% effort for uplands 50% effort for wetlands 50% effort for uplands	5% TE 30% WF 30% OMB 20% RW 10% HEC 5% PED
Private Land Activities (excluding	1	5	6	12	18	4	60	64			69 landowners assisted 1035 ac. affected 40% effort for uplands 60% effort for wetlands	5% TE 30% WF 20% OMB 10% RW 5% FAR 10% HEC 10% PED 10% PRC
Our list of agency partners continues to grow. This year we teamed up with the Anoka County Conservation District in assisting with the prairie seeding of over 35 acres on several parcels of land.												
Resource Protection												
Law Enforcement	24	7	31		31	91		91			27 NOVs and State citations issued 4 cases assisted 145 other incidents 13 written warnings 87 other public contacts	5% TE 30% WF 15% OMB 25% RW 10% FAR 15% HEC

	Obligations (\$000)			Staff Days			Volunteers			Outputs	Outcomes
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other =	Total	Vols.	Hours	
Permits & Economic Use Management	7	5	12		12	26		26		33 permits issued 8 uses reviewed	5% TE 25% WF 20% OMB 20% RW 10% FAR 10% HEC 5% PED 10% PRC
Land Ownership Support	4		4		4	15		15		1 tracts involved 40 ac. involved	5% TE 25% WF 20% OMB 15% RW 10% FAR 10% HEC 5% PED 10% PRC

Public Education & Recreation

Provide Visitor Services	165	35	200	7	207	582	45	627	6,243		5% TE 10% WF 20% OMB 10% RW 5% HEC 25% SDA 25% PED
<p>The auto tour route had nearly 25,000 visitors during fiscal year 2003. The highest visitation month was May with over 5,700 visitors.</p> <p>Seventeen volunteers donated over 1100 hours of service as wildlife interpreters providing personal contact with over 1,200 of the visitors using the Wildlife Drive from mid-April through September.</p>											

Outreach	63	18	81	1	82	222	10	232	72	20 participants at group presentations 1450 people viewed off-site exhibits 14 news releases issued	10% TE 20% WF 20% OMB 20% RW 10% FAR 10% HEC 5% PED 5% PRC
<p>The Refuge partnered with several local and national organizations in conducting the Isanti Youth Day Program. Over 400 youth came to learn more about enjoying, conserving and managing our valuable natural resources.</p> <p>The third annual Habitat Day Program was held at Crane Meadows NWR. Sherburne was among two dozen plus partners that participated in the event.</p>											

Planning

Comprehensive Conservation Planning	18	3	21		21	65		65		25% of CCP completed this year 75% of CCP	5% TE 20% WF 15% OMB
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Obligations (\$000)			Staff Days			Volunteers			
Staff	NStaff	Total	Other	Total	1260 + Other = Total	Vols.	Hours	Outputs	Outcomes
1260 +	1260 =	1260							
								completed overall 1 stations covered	15% RW 5% FAR 10% HEC 10% PED 20% PRC

Refuge Comprehensive Accomplishment Report, FY 03

	Obligations (\$000)					Staff Days			Volunteers		Outputs	Outcomes
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other	=Total	Vols.	Hours		
Monitoring & Studies												
Surveys & Censuses	2	2	4		4	9		9		332	5 wildlife surveys 20% off refuge	10% TE 25% WF 55% OMB 10% HEC
Habitat Restoration												
Wetland Restoration	11	8	19	11	30	45		45			70 ac. off-refuge wetland acres restored	5% TE 25% WF 30% OMB 15% RW 5% FAR 10% HEC 5% PED 5% PRC
Upland Restoration	8	7	15	2	17	35		35		21	14 refuge ac. restored 53 off-refuge ac. restored	5% TE 20% WF 25% OMB 20% RW 5% FAR 15% HEC 5% PED 5% PRC
Habitat Management												
Farming						2		2			60 ac. farmed 100% of ac. cooperatively farmed	15% WF 60% OMB 25% RW
Fire Management	9	14	23	6	29	41		41		85	833 ac. of on-refuge prescribed burns 7 prescribed burns	5% TE 5% WF 10% OMB 50% DIAI
Through a cooperative agreement with the adjacent Pinnacle Hunt Club the Refuge was able to burn a record number of acres in FY 2003.												

	Obligations (\$000)			Staff Days			Volunteers		Outputs	Outcomes
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other =Total	Vols.		
Native Pest Plant Control	1	3	4		4	7	7		20 ref. ac. infested 13 ref. ac. treated chemically 10 ref. ac. treated mech./phys.	10% WF 20% OMB 5% RW 65% HEC
Invasive Plant Management	1	3	4		4	6	6		645 ac. surv./mon. for invasive plant species	10% WF 20% OMB 5% RW 65% HEC
Fish & Wildlife Management										
Nest Structures	1	4	5		5	6	6	257	20 bird nest structures erected 66 bird nest structures maintained	60% WF 40% OMB
Coordination Activities										
Interagency Coordination	7	12	19		19	31	31		1057 ac. affected 50% effort for uplands 50% effort for wetlands 6 activities did not involve habitat issues	5% TE 25% WF 25% OMB 20% RW 5% FAR 10% HEC 5% PED 5% PRC
Private Land Activities (excluding	5	9	14		14	23	23		70 landowners assisted 1551 ac. affected 75% effort for uplands 25% effort for wetlands	5% TE 20% WF 25% OMB 20% RW 10% FAR 10% HEC 5% PED 5% PRC
Resource Protection										
Law Enforcement	1		1		1	3	3		6 other incidents 12 other public contacts	

	Obligations (\$000)			Staff Days			Volunteers					
	Staff 1260 +	NStaff 1260 =	Total 1260	Other	Total	1260 +	Other =	Total	Vols.	Hours	Outputs	Outcomes
Permits & Economic Use Management						2		2			4 permits issued 2 uses reviewed	
Land Ownership Support	2		2		2	8		8			1 tracts involved 26 ac. involved	
The L. Wilkinson Property was acquired as a roundout to the Refuge property.												
Public Education & Recreation												
Provide Visitor Services	8	16	24		24	35		35	298		80% effort for wildlife obs./ photog. 10% effort for ed./ interp. 10% effort for non-prio. pub. uses	
Great progress was made on the Platte River Hiking Trail at Crane Meadows. The trail head was established, kiosk erected, interpretive signs ordered, and river overlook, driveway and parking area constructed during FY 2003.												
Outreach	2	13	15		15	7		7			20 participants at group presentations 60 people viewed off-site exhibits 3 news releases issued 1 TV/radio spots developed 1 other special events hosted	5% TE 15% WF 25% OMB 10% RW 5% FAR 10% HEC 25% PED 5% PRC
The third annual Habitat Day Program was held at Crane Meadows. The multi-agency sponsored program had an attendance of about 325 people. Over 400 wood duck and bluebird boxes were constructed.												