

J. Clark Salyer National Wildlife Refuge
&
J. Clark Salyer Wetland Management District

Upham, North Dakota

Annual Narrative Reports

Calendar Year 2005

U.S. Department of the Interior
Fish and Wildlife Service
National Wildlife Refuge System

REVIEW AND APPROVALS

J. Clark Salyer National Wildlife Refuge
&
J. Clark Salyer Wetland Management District
Upham, North Dakota

Annual Narrative Reports

Calendar Year 2005

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December 7, 2006
Date

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12/14/06
Date

Richard A. Coleman
Regional Office Approval

12/14/06
Date

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INTRODUCTION

J. Clark Salyer National Wildlife Refuge is located along the Souris River in Bottineau and McHenry Counties of north-central North Dakota. The Refuge was established by Executive Order 7170 on September 4, 1935, as a refuge and breeding ground for migratory birds. The 58,700-acre refuge extends from Canada southward for approximately 45 miles. The nearest town is Upham located about three miles from the headquarters.

The entire Refuge lies within an area which was once Glacial Lake Souris. The surrounding area is old lake bottom with extremely flat topography which contains a high density of temporary wetlands. These are important for waterfowl production and natural flood storage which improves water quality in the Souris River. Unfortunately, a substantial portion of the original wetlands on private land have been drained.

Wetland habitats include high value managed deep and shallow marshes within the Souris River flood plain. Five large dikes with water control structures have storage capacity for 23,000 acres of open water, marsh, and wet meadow habitat.

The Refuge includes 36,000 acres of upland habitat composed of native and introduced grasslands, thick woodlands, shrub thickets and old cropland. The northern portion is mixed grass prairie confined to the river valley as a narrow band of upland habitat. The southern portion of the Refuge contains about 16,000 acres of native prairie interspersed with aspen and brush covered sandhills and 4,200 acres of wooded river bottom.

The climate is typical of the northern Great Plains with warm summers, cold winters, and marked variations in seasonal precipitation, which averages 18 inches a year. Temperatures can exceed 100°F in the summer and may drop to -45°F in winter. Spring is generally the windiest period with velocities commonly exceeding 30 miles per hour.

The Refuge contains a very diverse population of birds with more than 250 species of known occurrence and over 125 species nesting, some in great numbers. Up to 17,000 Franklin's gulls and large colonies of double-crested cormorants, great blue herons, and black crowned night herons are found. In an average year about 18,000 ducklings are produced including northern pintail, mallard, gadwall, northern shoveler as well as 15 other species. Resident birds vary due to the diverse habitat with turkey and ruffed grouse in the wooded portions, and sharp-tailed grouse, Hungarian partridge and ring-necked pheasant in the grasslands. White pelicans are present all summer, while thousands of sandhill cranes, tundra swans, and geese (snow, white-fronted, Canada, Ross's) and occasional whooping cranes use the Refuge as a feeding and resting area during migration.

From 1937 to 1941 a Civilian Conservation Corps camp existed on the Refuge. Their workers completed several conservation projects and constructed dams, dikes, roads, fences and built many of the buildings. Their contribution to the initial operation of the Refuge cannot be overstated.

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A. HIGHLIGHTS

- March-Major waterfowl migration on the 30th (G.3)
- Large localized rainstorms cause flooding (F.2)
- Flood destroys overwater nesting (F.2)
- New additions to our refuge family (J.3)

B. CLIMATIC CONDITIONS

A refuge weather station was maintained during 2005 as an official weather record for the National Oceanic and Atmospheric Administration.

Overall the winter of 2004-05 was more on the mild and dry side. January was the only typical month with over three weeks of sub-zero temperatures and a foot of snow recorded. Sub-zero temperatures were recorded on 40 days from November through March. The coldest temperature of the year was a minus 38 on January 5. A snow-water measurement on February 28 showed only six inches of snow on the ground with a water content of 1.3 inches. Due to mild weather the snowmelt was completed by March 10 with generally little runoff occurring. With dry weather continuing through most of the spring small wetlands remained in fair to poor condition until early June when the flood season began.

Ice went out of the last refuge pool on April 10. Last frost in the spring was 25 ° F on May 15.

Heavy rains during June broke a 114-year record for that month. At headquarters we recorded 11.49 inches which surpassed the previous record of 9.86 inches set in 1944. Some areas of Bottineau County received over 20 inches for the month which resulted in extensive flooding. Much of this water eventually made it to the Refuge to compound already high water problems.

By July the weather returned to a more normal pattern. The high temperature for the year was 93 degrees on August 1. A total of six days during the summer had temperatures at 90 degrees or higher.

Hot weather during the first week of August was followed by mild weather which stayed with us generally for the rest of the year. An early snowstorm on October 5 brought over a foot of heavy, wet snow to many areas. Electrical power was lost for up to four days in some areas due to downed power lines.

The first killing freeze was 19 degrees on October 6. Lakes and ponds froze solid on November 16. The year ended with two inches of snow on the ground. Total precipitation for 2005 was 24.41 inches or 7.80 inches above the normal of 16.61 inches. Total snowfall was 32.1 inches for the winter of 2004-2005.

Table 1. High, low temperatures and total precipitation by month at J. Clark Salyer NWR Complex, 2005

Month	High (F)	Low (F)	Precipitation
January	40	-38	0.80
February	45	-17	0.02
March	56	-4	0.71
April	80	19	0.26
May	85	14	2.26
June	89	43	11.49
July	92	43	2.89
August	93	41	2.46
September	88	30	0.44
October	76	19	1.20
November	62	-5	1.38
December	44	-14	0.50
Total			24.41

D. PLANNING

1. Master Plan

Work continued on a combination Comprehensive Conservation Plan (CCP) for the Souris Loop Refuges (J. Clark Salyer, Upper Souris, Des Lacs). A list of alternative actions had been developed for all the refuges, and most of the documentation was complete, and writing of the plan was 95% done by the end of the year. All that remains is a compilation of all the various sections and it can go out for internal review.

3. Public Participation

Late June brought record rainfall to Bottineau, Rolette and northern McHenry counties and the accompanying localized flooding. The impact of these floods was felt from the Canadian border in the Turtle Mountains down through the counties following creeks and drainages to the eastern side of the Refuge, and into Manitoba. The Governor declared a disaster and flew into the area to observe the damage. A public meeting was held in Bottineau to review the problem and decide what to do. Although we were not invited to attend the meeting, we came any way. Gutzke and Erickson were surprised to learn, upon entering the gathering, that we were on the agenda to explain why the refuge was causing the flooding! The local farming interests, who had drained thousands of acres of wetlands in the past, were now blaming the refuge for not getting rid of all that water quick enough. They felt that the Scenic Trail, and the Willow Creek Bridge, found along the trail were the main culprits behind all the flooding. After a few hours of listening to adulterated rhetoric the Governor stepped in and created the Tri-County Flood Task Force to work on alleviating the immediate threat of flood waters to home owners, and investigate what had happened and how the flooding could be avoided in the future. Gutzke volunteered to sit on the task force and spent a lot of time throughout the year working with all parties concerned with the subject.



The Willow Creek bridge on the scenic trail that local farmers blame for the flooding of private land. Note that the water never topped the bridge, and this was during the peak of the flood. (TWG)

5. Research and Investigations

Recent Publications

Murphy, R. K., T. A. Grant, and E. M. Madden. 2006. **Prescribed fire for fuel reduction in northern mixed grass prairie: influence on habitat and population dynamics of indigenous wildlife.**

Executive Summary: The entire report to the Joint Fire Science Council can be accessed at <http://www.fws.gov/jclarksalyer/>

An average of roughly 10,000 ha of grasslands, primarily northern mixed-grass prairie, is treated annually with prescribed fire on the U.S. Department of the Interior's National Wildlife Refuges (NWRs) in the Dakotas and eastern Montana. This management continues despite sparse information on effects of fire on wildlife, introduced and native plants, and wildlife-habitat relationships in the northern mixed-grass prairie ecosystem. To address basic information gaps, we assessed direct and indirect, short and long term impacts of fire or fire suppression on vegetation and wildlife population dynamics at 4 NWRs in northwestern and north central North Dakota during 1997-2003; most work was conducted at Des Lacs NWR and J. Clark Salyer NWR. Funding from the Joint Fire Science Program during the final 2 years of our work helped us expand the inferential value of our studies while giving land managers a novel chance to more clearly identify opportunities and limitations with prescribed burning in relation to the mission and goals of their respective NWRs. Our chief

goals were to document effects of prescribed burning of northern mixed-grass prairie on the abundance, productivity, and nest site selection of migratory birds especially grassland songbirds; measure influences of major sources of woody fuels and habitat edges (e.g., woodland, cropland, wetland) on occurrences and productivity of common bird species; and assess relationships between fire history and vegetation composition and structure on several spatial and temporal scales.

Our study area lies within a cool-season (C_3)-dominated, needlegrass-wheatgrass (*Stipa-Agropyron*) association. However, the contemporary prairie we studied on the NWRs is invaded by introduced, cool-season grasses and native shrubs and trees, as are most other prairie tracts managed by the U.S. Fish and Wildlife Service and other conservation agencies in the northern Great Plains region. We used 2 basic approaches to examine fire effects on vegetation and wildlife. First, we designed short-term (<10 years) field experiments to test specific hypotheses regarding fire effects on vegetation structure, plant community composition, and wildlife abundance and productivity. Secondly, we assessed long-term (60-100 years) changes in plant communities associated with changes in fire disturbance regimes during and after settlement of the region by persons of European descent. To address study objectives, we used standard methods to collect, analyze, and report data.

Fire is a fundamental ecological process in the evolution and maintenance of northern grasslands. In summarizing our objectives, our collective studies generally indicate the following for northern mixed-grass prairie.

- (1) **Avian occurrence/abundance and nest densities:** Most species of breeding grassland birds are adapted to recurring fire (i.e., every 4-6 years) in northern mixed-grass prairie, returning to pre-burn levels of abundance and nest density following declines the first growing season after burning and by nesting in unburned patches.
- (2) **Fire effects on nest survival:** Fire had almost no discernable impact on nest survival for all species of grassland birds examined, except Savannah sparrow (*Passerculus sandwichensis*) nest survival was reduced in the first post-burn growing season, a decrease that mainly was the result of increased nest parasitism by brown-headed cowbirds (*Molothrus ater*). In contrast, survival rates of mallard (*Anas platyrhynchos*) and gadwall (*A. strepera*) nests were highest during the first post-fire growing season.
- (3) **Fire effects on nest site selection:** Fire consumed most residual vegetation. Despite reductions in plant litter, "skips" (i.e., unburned patches) remained after burning and these typically were sites where songbirds and ducks nested. For example, litter depth at nests of clay-colored sparrow (*Spizella pallida*) and Savannah sparrow were similar among study units the first, second, and third post-fire growing seasons after burning even though litter within these units nearly was absent, on average, during the first post-fire growing season.

- (4) **Fire effects on small mammals:** Deer mice (*Peromyscus maniculatus*) were 5-6 times more abundant during the first post-fire growing season, when litter was mostly absent. Most other small mammal species were much less common during the first post-fire growing season than during 2-5 growing seasons after fire, over which time residual vegetation was incrementally more abundant.
- (5) **Fire effects on vegetation composition and structure – short term effects:** The structure of contemporary northern mixed-grass prairie vegetation is markedly influenced by fire during the first, second, and third post-fire growing seasons after burning, or by the interaction between numbers of burns and time since the last fire, but the composition generally is unchanged over the short term (< 10 years). Among major introduced grass species, fire probably reduces the frequency of Kentucky bluegrass (*Poa pratensis*), but smooth brome (*Bromus inermis*) may be unaffected or slightly decrease with fire. However, frequencies of native herbaceous flora do not increase with prescribed burning in loamy soils dominated by smooth brome and Kentucky bluegrass, at least in the short term.

Fire effects on vegetation composition and structure – long term effects:

(a) influence of fire suppression on distribution of trees and tall shrubs:

Significant changes occurred in the extent of woodland cover across the 4 present-day NWRs during the 1800s and 1900s. Woodlands were rare when the region was settled by Europeans in the early 1900s, but expanded in river valleys mainly during the early- to mid-1900s, and in sandhills and a terminal moraine during mainly the mid- to late-1900s, changing much of the mixed-grass prairie to parkland and woodland edge.

(b) influence of long-term suppression of fire and grazing disturbances on prairie floristics:

We sampled the general floristic makeup of prairie on 2 NWRs (4300 ha total) that had been managed mainly by rest since the 1930s. The prairies were moderately to severely invaded by the introduced grasses, smooth brome and Kentucky bluegrass. Plant assemblages composed of native species were rare. We also sampled floristics on nearby, privately-owned prairies that had been grazed annually for decades. Native herbaceous flora was prevalent on grazed prairie near 1 of the 2 NWRs. The findings demonstrate pitfalls of managing disturbance-dependent grasslands as relatively static, late-succession systems for many decades, without basic inventory and monitoring to comprehend and address associated ecological changes.

- (6) **Influences of tall woody fuels and habitat edges on productivity:** We detected no relationships between nest survival and prevalence of woody fuels at the nest site and nest patch scales. Survival of nests of 1 of 2 common sparrow species we studied increased as patches of tall shrub and trees decreased in the landscape, validating the importance of reducing these fuels for grassland bird management.

- (7) **Predictive models for land managers:** Land managers typically apply prescribed fire to try to emulate the region's natural fire regime. We provide models that forecast abundance, nesting density, and nest survival among breeding grassland bird species, and for the physiognomy (structure) and composition of grassland vegetation at several spatial and temporal scales, relative to successive, post-treatment seral stages and other potentially interacting factors (e.g., weather, landscape effects).
- (8) **Occurrence and productivity of uncommon grassland bird species:** In addition to examining fire history relationships for species of birds that commonly nest in northern mixed-grass prairie, we amassed a database that includes roughly 5000 nests of 35 less common bird species that use grasslands as breeding habitat. The data will provide new insights on species breeding biology, including nest site selection and nest survival relative to various temporal and spatial scales of habitat and disturbance. Basic natural history data will be supplied for species for which such information is scarce, such as Le Conte's sparrow (*Ammodramus leconteii*), Brewer's blackbird (*Euphagus cyanocephalus*), and Sprague's pipit (*Anthus spragueii*).

Our data support the notion that bird species native to northern mixed-grass prairie are well adapted to frequent defoliation by fire. In general, decreases in species abundance and nesting density during the first growing season after burning are offset by increases in following years, compared to pre-burn levels; nest survival appears unaffected. Short term unavailability of breeding habitat probably is outweighed by long term benefits from using fire to restore and maintain vegetation structure and manage fuel loads (i.e., reduce accumulating litter and woody vegetation) in northern mixed-grass prairie. Our data also indicate that occurrence and survival of nests of at least some bird species is negatively associated with the extent of trees and tall shrubs in the landscape; efforts to reduce these fuels via prescribed burning seem warranted for improving the productivity of grassland birds, as well as addressing other prairie restoration objectives.

To date, our work has resulted in 7 technical publications in peer-reviewed journals, another 7 manuscripts currently in review for publication or soon to be submitted for publication, 1 graduate (M.S.) thesis, 15 presentations at various professional conferences and symposia, and a web page available through 2 NWR web sites.

Grant, T. A., E. M. Madden, T. L. Shaffer, P. J. Pietz, and N. K. Kadrmas. 2006. **Nest survival of clay-colored and vesper sparrows in relation to woodland edge in mixed-grass prairies.** *Journal of Wildlife Management* 70(3): *In press*.

Abstract: The quantity and quality of northern mixed-grass prairie continues to decline because of conversion to agriculture, invasion of woody and exotic plants, and disruption of important ecological processes that shaped grasslands. Declines in grassland bird populations in North Dakota have coincided with these largely anthropogenic alterations to prairie habitat. In grasslands of north-central and northwestern North Dakota, woody plants have increased due primarily to fire

suppression, extirpation of bison (*Bos bison*), and wide-scale planting of tree shelter belts. In northern grasslands, effects of woody vegetation on survival of grassland birds are poorly understood, and conclusions are based mainly on studies conducted outside the region. We examined nest survival of clay-colored sparrows (*Spizella pallida*) and vesper sparrows (*Poocetes gramineus*) relative to the distance nests were located from aspen (*Populus tremuloides*) woodland edges and relative to other habitat features near the nest. Clay-colored and vesper sparrow nest survival was higher for nests located near woodland edges, for nests with greater cover of Kentucky bluegrass (*Poa pratensis*), and for nests more concealed by vegetation. Vesper sparrow nest survival increased as the percent cover of tall shrubs near the nest increased. Based on video camera data, the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*) was the most common predator of sparrow eggs and young. Thirteen-lined ground squirrels were more common far from woodland edges than near and this pattern may, in part, explain clay-colored and vesper sparrow nest survival in relation to woodland edges. In contrast to our results, studies conducted in other grassland systems generally report lower nest survival for grassland birds nesting near trees and shrubs. This disparity in results demonstrates the need to identify specific nest predators and their distributions with respect to important habitat features, because these data can be important in explaining, and perhaps predicting, patterns of nest predation.



Grasshopper sparrow nest and eggs (TAG)

Grant, T. A., T. L. Shaffer, E. M. Madden, and P. J. Pietz. 2005. **Time-specific variation in passerine nest survival: new insights for old questions.** *Auk* 122:661–672.

Abstract: Understanding nest survival is critical to bird conservation and to studies of avian life history. Nest survival likely varies with nest age and date, but until recently researchers had only limited tools to efficiently address these sources of variability. Beginning with Mayfield, many researchers have averaged survival rates within time-specific categories (e.g. egg and nestling stages; early and late nesting dates). However, Mayfield's estimator assumes constant survival within categories, and violations of this assumption can lead to biased estimates. We used the logistic-exposure method to examine nest survival as a function of nest age and date for Clay-colored Sparrows and Vesper Sparrows breeding in north-central North Dakota. Daily survival rates increased during egg-laying, decreased during incubation to a low shortly after hatch, and then increased during brood rearing in both species. Variation in survival with nest age suggests that traditional categorical averaging using Mayfield's or similar methods would have been inappropriate for this study; similar variation may bias results of other studies. Nest survival also varied with date. Survival was high during the peak of nest initiations in late May and early June and declined throughout the remainder of the nesting season for both species. Based on our results, we encourage researchers to consider models of nest survival that involve continuous time-specific explanatory variables (e.g. nest age or date). We also encourage researchers to document nest age as precisely as possible (e.g. by candling eggs) to facilitate age-specific analyses. Models of nest survival that incorporate time-specific information may provide insights that are unavailable from averaged data. Determining time-specific patterns in nest survival can improve our understanding of predator-prey interactions, evolution of avian life histories, and aspects of population dynamics that are critical to bird conservation.

Grant, E. M. Madden, T. L. Shaffer, P. J. Pietz, G. B. Berkey, and N. J. Kadrmas. 2005. **Nest survival of clay-colored and vesper sparrows in relation to woodland edge in mixed-grass prairies.** *Journal of Wildlife Management: In press.*

Abstract: The quantity and quality of northern mixed-grass prairie continues to decline because of conversion to agriculture, invasion of woody and exotic plants, and disruption of important ecological processes that shaped grasslands. Declines in grassland bird populations in North Dakota have coincided with these largely anthropogenic alterations to prairie habitat. In grasslands of north-central and northwestern North Dakota, woody plants have increased due primarily to fire suppression, extirpation of bison, and wide-scale planting of tree shelter belts. In northern grasslands, effects of woody vegetation on survival of grassland birds are poorly understood and conclusions are based mainly on studies conducted outside the region. We used the logistic-exposure method to examine nest survival of clay-colored sparrows and vesper sparrows relative to the distance nests were located from aspen woodland edges and relative to other habitat features near the nest. Clay-colored and vesper sparrow nest survival was higher for nests located near woodland edges, for nests with greater cover of Kentucky bluegrass, and for nests more

concealed by vegetation. Vesper sparrow nest survival increased as the percent cover of tall shrubs near the nest increased. Based on video camera data, the thirteen-lined ground squirrel was the most common predator of sparrow eggs and young. Thirteen-lined ground squirrels were more common far from woodland edges than near and this pattern may, in part, explain clay-colored and vesper sparrow nest survival in relation to woodland edge.

Grant, T. A., and R. K. Murphy. 2005. **Changes in woodland cover on prairie refuges in North Dakota, USA.** *Natural Areas Journal* 25:359–368.

Abstract: Detailed case histories of long-term successional changes in vegetation are crucial for assessing ecological integrity and developing restoration objectives on prairie preserves in North America's northern Great Plains. Such documentation generally is lacking, however. We used aerial photo measurements plus records from land surveyors and other sources to document change in extent of woodland across four National Wildlife Refuges in northern North Dakota during the 1800s and 1900s. Woodlands were rare when the region was settled by Europeans in the early 1900s, except green ash-American elm woodland occurred within the floodplain of the Souris River, and stunted copses of quaking aspen-bur oak occurred along fire-protected scarps of sandhills prairie in north central North Dakota. Ash-elm woodland expanded in the Des Lacs and Souris River valleys especially along adjoining, intermittent tributaries (coulees) of the Souris River, mainly during the early- to mid-1900s. During mainly the mid- to late-1900s, aspen woodland expanded in sandhills of the Souris Lake Plain and in the Missouri Coteau, changing much of the mixed-grass prairie to parkland. With settlement by people of European descent, large herbivores were extirpated from the region and natural and anthropogenic fires were suppressed, and these changes are implicated in expansion of woodland into native prairies.

Kadrmaz, Neil. J. 2005. **Community dynamics of terrestrial vertebrates in aspen parkland-mixed grass prairie habitats at J. Clark Salyer National Wildlife Refuge in North Dakota.** Thesis, University of North Dakota, Grand Forks, North Dakota.

I initiated a preliminary survey of the study area to identify different habitats for sampling small mammals. Five different habitats typical of the area were identified: aspen/mixed woodland, gallery/riparian woodland, meadows, mixed grass prairie, and a sandhills complex. Trapping grids were established within these interior habitat types, as well as across edge or transition zones.

Edge/transition zones are defined as those areas showing changes in habitat structure and vegetative composition. Transition zone small mammal communities are typically composed of specialist species both interior habitat types as well as generalist species able to exploit all habitats. I predicted small mammal communities in edge/transition zone habitats would have higher species richness and diversity than interior habitats, but interior habitats would include specialist species not found in transition zones. I also expected lower densities of specialist species in transition

zones and lower densities of generalist species in interior habitats. Our results indicate that the predictions were correct; species richness was consistently lower in interior habitats for all habitat complexes, except for the 2002 mixed-grass prairie/mixed woodland transition zone. The overall species richness was highest for combined edge and interior habitats for all habitat complexes. In 2002, species diversity was consistently low in interior habitats for all but one habitat complex, mixed-grass prairie/mixed woodland. In 2003, overall species diversity was highest for the combined edge & interior habitats for all complexes except the meadow/riparian woodland habitat pairing.

Small mammal relative abundance increases from early summer to late summer with the onset of an increase in forage availability, an increase in fitness, and a more suitable climatic environment. I attempted to identify the correlation between several habitat factors and relative abundances of small mammals in order to determine their distribution across different habitat types. I assigned each small mammal capture to one or an average of two to four habitat plots, each containing an average number associated with each microhabitat variable according to the location of the capture within the grid. I then distributed a weighted value for each individual small mammal species to each microhabitat variable for each habitat plot. To identify microhabitat affinities for each species, I used a principal component analysis to plot each species along eigenvectors to associate them with habitat types. From these analyses we could identify which species were specialists and which were generalists.

Murphy, R. K., and T. A. Grant. 2005. **Land management history and floristic integrity in mixed-grass prairie, North Dakota, USA.** *Natural Areas Journal* 25:359–368.

Abstract: Opportunities for conserving native plant diversity in the northern Great Plains should be found on National Wildlife Refuges (NWRs), but floristics of these areas are largely undocumented. During 1998–2002, we used 25-m belt transects (n=713) to measure the general floristic makeup of northern mixed-grass prairie on 4300 ha of glacial drift plain soils at Des Lacs NWR and J. Clark Salyer NWR in North Dakota. These prairies had been managed mainly by rest since the 1930s. For comparative purposes we also measured about 1200 ha of nearby, privately owned prairies (n=154 transects), which had been annually grazed since at least the mid-1900s. Vegetation dominated by low (<1.5 m) native shrub was common on both NWR prairies and on grazed prairies near Des Lacs NWR, occurring roughly in a 1:3 ratio with herbaceous-dominated vegetation. Nearly all prairies were moderately to severely invaded by introduced plant species, mainly smooth brome and Kentucky bluegrass on NWRs, and Kentucky bluegrass, almost exclusively, on adjacent grazed prairies. Plant assemblages composed of native species were encountered rarely (3–6%), except they occurred fairly often (16%) on grazed prairie next to J. Clark Salyer NWR. Our data convey difficulties inherited when managing northern mixed-grass prairies for one end of a successional spectrum and ignoring dynamic processes that shaped the system, especially when introduced plant species are in the mix.

Presentations at Professional Meetings

Grant, T. A., E. M. Madden, T. L. Shaffer. 2005. **Fire effects on avian occurrence and nest survival in northern mixed-grass prairie.** The Wildlife Society 12th Annual Conference, Madison, Wisconsin.

Grant, T. A., and R. K. Murphy. 2005. **Changes in woodland cover on prairie refuges in North Dakota.** Invasive Species Workshop, Bismarck, North Dakota.

Grant, T. A., T. L. Shaffer, and S. K. Davis. 2005. **Time-specific variation in passerine nest survival: new insights for old questions?** Cooper Ornithological Society 75th Annual Meeting, Humboldt, California.

Neil Kadrmas and R. Switzer. 2005. **Small mammal community dynamics in mesic and xeric grassland to woodland habitat ecotones and implications for biodiversity, management, and conservation at J. Clark Salyer National Wildlife Refuge, North Dakota.** ND Chapter of The Wildlife Society 2005.

Murphy, R. K., and T. A. Grant. 2005. **Land management history and floristic integrity in mixed-grass prairie, North Dakota.** North Dakota Chapter of the Wildlife Society, Mandan, North Dakota.

Murphy, R. K., and T. A. Grant. 2005. **Land management history and floristics in mixed-grass prairie, North Dakota.** Invasive Species Workshop, Bismarck, North Dakota.

Shaffer, T. L., and T. A. Grant. 2005. **Logistic-exposure model for avian nest survival and nest parasitism rates.** Cooper Ornithological Society 75th Annual Meeting, Humboldt, California.

Current and Ongoing Projects

Evaluation of sedimentation rates in the riverine impoundments of National Wildlife Refuges on the Souris River in North Dakota (J. Clark Salyer, Des Lacs, and Upper Souris NWRs).

Description – estimate the amount and rate of sediment accrued in impoundments on each refuge since establishment.

Status – Sediment cores collected summer 2004 and winter 2005 (Lake Darling). Analysis and reporting 2006-07.

Contact Person/Partners – Murray Laubhan and Robert Gleason (USGS-NPWRC), T. Grant.

Use of satellite imagery and GIS to cover map woody vegetation on J. Clark Salyer NWR

Description – use new software and imagery to distinguish among woodland types, tall shrub types, and brush communities on J. Clark Salyer NWR.

Status – Summer and fall satellite images purchased and georectified in 2004-05. Ground reconnaissance completed in 2004. Final report spring 2006.

Contact Person/Partners – T. Grant and L. Strong (USGS, NPWRC).

Scan and georectify 1938-42 vegetation cover map and 1938 aerial photos

Description – aerial photo and original vegetation cover map scanned and georectified for use in GIS and for mapping current vegetation and assessing vegetation changes since refuge establishment. Completion spring 2006.

Partners – T. Grant and L. Robinson (USGS-Madison).

Baseline vegetation inventory of NWR in north central and northwestern North Dakota.

Description – Used the belt transect method to inventory plant composition of drift prairie, choppy sandhill, prairie parkland, meadows, and seeded grassland regions of the refuge.

Status – data in NW and NC North Dakota collected 2001-2006. Study expanded to Long Lake NWR Complex and Huron Wetland Management District for summer 2006. General summaries completed with multivariate analysis to follow (2006-07).

Contact Person – T. Grant.

A new method for assessing rates of nest parasitism by brown-headed cowbirds

Description – apparent rates of nest parasitism are underestimated because nest searchers do not find many nests that are parasitized in the laying and early incubation stages. This is analogous to correcting apparent rates of nest survival using the Mayfield method. We used the logistic-exposure method to adjust apparent parasitism rates and account for nests that fail before they can be found.

Status – manuscript prepared winter-spring 2005.

Contact person – T. Grant and T. Shaffer (USGS-NPWRC).

Nest site selection by grassland birds in northern mixed-grass prairie

Description – measured vegetation attributes at 268 total nests for three focal species: clay-colored sparrow, savannah sparrow, and blue-winged teal. Compared habitat selection at the nest, territory, and field level.

Status – thesis completed 2003, manuscripts being prepared for publication 2006-07

Contact Person/Partners – M. Nenneman (USFWS-Valentine NWR), T. Grant, and D. Buhl (USGS-NPWRC).

How do grassland birds partition available habitat in northern mixed-grass prairie?

Description – measure nest site vegetation structure and community composition for 12 grassland bird species including ducks, hawks, shorebirds, and songbirds on J Clark Salyer NWR. Determine how these species use available grassland habitat, based on attributes measured at 642 total nests 1998-2001.

Status – complete field work in 2004, reporting by 2006-2007.

Contact Person – T. Grant and M. Nenneman (USFWS-Valentine NWR).



Newly hatched Savannah sparrow (grey down) and brown-headed cowbird young (white down). Brown-headed cowbirds lay their eggs in the nests of other grassland songbirds. (TAG)

Landscape influence of woodland invasion on avian nest success and brood parasitism rates on J. Clark Salyer NWR

Description – comparison of grassland songbird productivity near and far from woodland edges, and of productivity of songbirds nesting in a parkland landscape (includes aspen woodlands) to those nesting in the drift prairie (far from trees).

Status – manuscript preparation in 2006-07.

Contact Person/Partners – T. Grant, E. Madden (USFWS- Medicine Lake NWR), R. Murphy, and T. Shaffer and P. Pietz (USGS-NPWRC).

Relationship between woodland-grassland edge and the productivity of woodland songbirds on J Clark Salyer NWR

Description – monitored the fates of songbirds nesting in aspen woodlands. Compared predation and brood parasitism rates of nests in woodland interior, woodland edge, and grassland.

Status – field work completed 2003. Analysis and manuscript preparation in 2006.

Contact Person/Partners - P. Pietz (USGS-NPWRC) and T. Grant.

Wetlands and waterfowl use of wetlands in the Turtle Mountains of North Dakota

Description – contemporary inventory of wetlands in the Turtle Mountains. Waterfowl use of wetlands and nest success on area grasslands and islands.

Status – field work completed. Prepare publication in 2006-07.

Contact Person – T Grant and T. Shaffer (USGS-NPWRC).

Waterfowl use of nesting islands on J. Clark Slayer NWR, and effects of predator control on nesting success

Description – waterfowl use and nest success in relation to island attributes, based on data from >2500 nests.

Status – data collected, analysis and manuscript preparation in 2006-07.

Contact Person – T. Grant and T. Shaffer (USGS-NPWRC).

Amphibian and reptiles of the Drift Prairie and their response to prescribed fire

Description – general inventory of amphibians and reptiles within grasslands that differ in burn history.

Status – data collection 1998-2003, reporting in 2007.

Contact Person/Partners – T. Grant and N. Kadrmas (Univ. North Dakota).

Nesting biology of Sprague's pipit

Description – describes and compares nests and nest cycle of pipits in North Dakota, Montana, Manitoba, and Saskatchewan.

Status - compilation of existing data in 2004, analysis and manuscript preparation in 2006.

Contact Person/Partners – S. Davis (CWS), S. Jones (USFWS-MBO), and T. Grant.

Le Conte's sparrow nesting in mixed-grass prairies

Description – describes nests, nest sites and nesting cycle for one of the least studied grassland bird species.

Status – complete ms in 2006-07.

Contact person – T. Grant, G. Berkey, and M. Nenneman (USFWS-Valentine NWR).

Adjunct Research

Prevalence of West Nile virus exposure in mallards, American widgeon, and northern pintail

Description – determine the prevalence of WNV exposure in northern pintail, mallard, and American widgeon.

Status – blood sampled collected from > 800 ducks during preseason waterfowl banding. Completion in 2006.

Contact Person – C. Franson and D. Goldberg (USGS, National Wildlife Health Center).

Richardson's ground squirrel/burrowing owl project research

Description – Refuge staff reviewed a list of landowner contacts and provided bunkhouse space this summer.

Contact Person – Marsha Sovada (USGS, NPWRC).



SCEP Student Neil Kadrmas (currently stationed at Charles M. Russell NWR) processing a juvenile thirteen-lined ground squirrel (TAG)

A landscape approach for grassland bird conservation in the Prairie Pothole Region

Description – model occurrence of grassland birds (16 species) relative to landscape features to predict habitat suitability for the same area as those created for ducks in the Prairie Pothole Region of Montana, North Dakota, South Dakota, Minnesota, and Iowa. The Refuge provided a vehicle for each field season, and logistical support.

Status – completion in 2006.

Contact person/Partners – F. Quamen and D. Naugle (Univ. of Montana).

Maternal effects link individual behavior and physiology to population states.

Description – investigate post-hatching survival of coot chicks on J. Clark Salyer NWR.

Contact person – Mark Clark and Wendy Reed (North Dakota State University).

E. ADMINISTRATION

1. Personnel

Table 2. J. Clark Salyer NWR Complex staff, 2005.

A	Tedd Gutzke, Refuge Manager	GS-14	PFT
B	Gary Erickson, Deputy Refuge Manager	GS-13	PFT
C	Lee Albright, Wetland Management District Manager	GS-12	PFT
D	Todd Grant, Refuge Biologist	GS-12	PFT
E	Dan Duchscherer, Partners for Fish & Wildlife Biologist	GS-11	PFT
F	Gary Eslinger, Biological Technician	GS-8	PFT
G	Wanda Opdahl, Administrative Officer	GS-9	PFT
H	Jason Hill, Administrative Support Assistant	GS-6	PCS
I	Bob April, Automotive Mechanic	WG-10	PFT
J	Marlene Welstad, Engineering Equipment Operator	WG-8	PFT
K	Jim Bohl, Engineering Equipment Operator	WG-8	PFT
L	Colette Guariglia, Biological Technician	GS-5	Term
M	Chase Marshall, Fire Management Officer	GS-11	PFT
N	Joe Guariglia, Prescribed Fire Specialist	GS-9	PFT
O	Dom Mardsen, Supervisory Range Technician	GS-7	PFT
P	Andy Randall, Fire Dispatcher (NDFDC)	GS-9	PFT
Q	Jerry Bahn, Range Technician	GS-5	PCS
R	Damien Marsden, Range Technician	GS-4	Temp
S	Ted Snyder, Biological Technician	GS-5	Temp
T	Melissa Wolf, Biological Technician	GS-5	Temp
U	Michele Prsaek, Biological Technician	GS-5	Temp
V	Jerick Hensen, Biological Technician	GS-4	Temp
W	Craig Erickson, Biological Technician	GS-4	Temp
X	Luke Black, YCC Enrollee		Temp
Y	Justin Heth, YCC Enrollee		Temp
Z	Kaylene Opdahl, YCC Enrollee		Temp

Table 3. J. Clark Salyer NWR Complex staffing levels, FY 2001-2005.

Fiscal Year	Permanent Staff	Seasonal Staff	Temporary Staff	FTE's
2005	13	3	6	16.50
2004	13	4	12	18.00
2003	12	3	17	19.00
2002	12	5	25	20.75
2001	13	4	13	18.25



***J. Clark Salyer National Wildlife Refuge Complex Staff
(Back) Gutzke, Duchscherer, Albright, April, Welstad, Opdahl,
Damien Mardsen, Bohl, Grant, Randall; (Front) Erickson, Eslinger,
Hill, C. Guariglia, Marshall (not pictured J. Guariglia, Dom Mardsen).***

Permanent Position changes:

Lee Albright accepted a position in August as the Project Leader of the Browns Park National Wildlife Refuge in Colorado. His vacant position will not be filled until next year.

Seasonal Staffing

Damian Marsden began his job as a Range Technician in the spring of 2002, and returned again this year. He is a native North Dakotan from Bottineau.

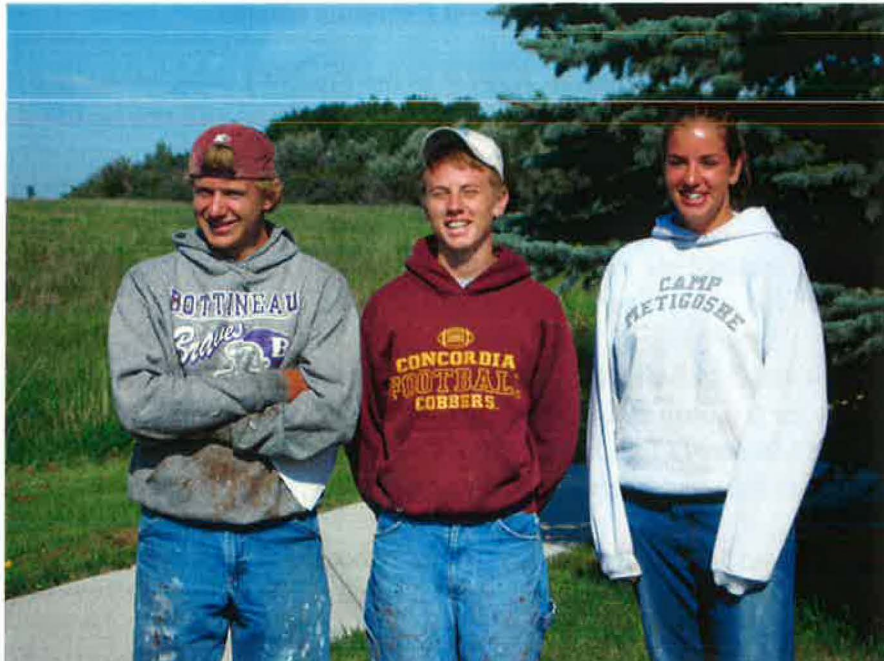
Melissa Wolfe and Ted Synder are Master's graduates from the University of Wisconsin and worked for us for a month in September. Michele Prsaek hailed from the buckeye state and was a recent graduate of Ohio University. Together they ran the waterfowl banding operation for a month and helped to complete some vegetative surveys.

Craig Erickson, and Jerick Hensen are from the local area and worked as Biological Technicians handling mostly GIS mapping of the Refuge and miscellaneous maintenance duties.



Lee Albright with his final goodbye as he prepared for his move to Browns Park NWR (TWG)

2. Youth Programs



Youth Conservation Corps enrollees, Heth, Black, and Opdahl. (TWG)

The refuge has participated in the Youth Conservation Corps (YCC) program for the past 22 years. Three enrollees were hired this summer beginning June 1st and working until August

13th. Luke Black was a high school senior in from Towner, Justin Heth was a sophomore from Bottineau and Kaylene Opdahl was a junior from Newburg . They worked on projects including buildings and grounds maintenance, waterfowl banding, vegetative and wildlife surveys.

4. Volunteer Program

Several school and college classes volunteered time to assist with the fall banding operation (See Section G.16), while staff family members volunteered time for public use and maintenance activities. A total of 840 volunteer hours were donated to the Refuge this year.

5. Funding

J. Clark Salyer NWR and WMD have combined funding, which was adequate for accomplishing refuge programs this year. Table 4 indicates budget targets received for the fiscal year. During the year we received money from a North American Wetlands Conservation Act (NAWCA) grant (subactivity 3720) which was used primarily to purchase wetland and grassland easements in McHenry County. The 1971 subactivity is money received from a research grant to conduct studies on fire effects on the mixed grass prairie, and was used to hire temporary Biological Technicians. Actual expenditures were within a few dollars in each of the subactivities.

Table 4. Funding for J. Clark Salyer NWR Complex, FY 2001-2005.

	2005	2004	2003	2002	2001
1121	77,000	46,000	41,500	55,500	60,000
1230	4,500	5,500	6,500	32,700	24,900
1261	748,800	818,200	797,200	695,900	581,200
1262	198,396	390,700	403,000	815,500	269,000
1971	41,321	70,500	70,100	140,100	54,100
2111	-	-	-	-	32,200
3720	383,288	582,300	-	-	-
6860	8,000	8,000	8,000	8,000	7,800
8610	11,693	10,300	10,300	14,700	8,000
9100	158,898	105,000	-	-	-
9200	215,659	230,000	414,700	397,600	344,500

F. HABITAT MANAGEMENT

2. Wetlands

The Souris River, the main water course in the basin, originates near Weyburn in southeastern Saskatchewan and enters the United States in the northwest corner of Renville County, North Dakota. It flows southeast to Velva, North Dakota, prior to turning north and entering southern Manitoba northeast of Westhope in Bottineau County, North Dakota. The river, which is perennial, discharges into the Assinniboine River, which discharges into the Red River at Winnipeg.

Prior to settlement, the Souris River valley supported numerous riverine and palustrine wetlands and the river in many areas was broad and very deep with a gentle current. The riverine system apparently was very dynamic, characterized as sinuous and susceptible to overbank flooding, a view supported by current aerial photos and satellite imagery that reveal numerous relict meander scars, oxbows, and abandoned channels within the valley. With settlement the Souris River was significantly modified by drainage and channelization, where major stretches of the river were dredged and channelized to promote cultivation. River flows were unregulated until the 1930s, when numerous lowhead dams were constructed to regulate flooding or to restore or augment wetland management on the Refuge.



Aerial view of the Souris River at the southern portion of the Refuge after recent storms during June in the Minot area brought silt laden water (GAE).

Five main water units were developed during the 1930's consisting of earthen dams, spillways, and a set of three radial arm gates (Table 5). These water control structures were

upgraded in the mid 1990's by the Corps of Engineers as mitigation for a flood control project on the Souris River. Most of the concrete structures were raised, and all were refitted with new radial arm gates with electrical control and heating elements so they can be operated during all seasons. All of the spillways were rebuild in concrete, except for Dam 320, which remains an earthen structure.

Table 5. Specifications of major dams on J. Clark Salyer NWR.

	320	326	332	341	357
Dam Construction	Earthen	Earthen	Earthen	Earthen	Earthen
Dam Width	16'	16'	16'	16'	16'
Dam Length	15,575'	9,572'	4,916'	3,312'	3,360'
Dam Crest Elevation (MSL)	1428.0	1426.2	1422.0	1421.2	1424.75
Height above Streambed	13'	12.6'	14.3'	14.2'	16'
Hydraulic Height	10'	9.6'	12.3'	11.2'	12.2'
Pool Area Capacity (acre-feet)	12,831	26,382	10,378	12,238	35,774
Pool Surface Capacity (acre)	4,678	5,994	4,259	3,225	5,775
Structure Type	Concrete	Concrete	Concrete	Concrete	Concrete
	3-Bay	3-Bay	3-Bay	3-Bay	3-Bay
	Tainter	Tainter	Tainter	Tainter	Tainter
	Gate	Gate	Gate	Gate	Gate
Gate Crest Elevation (MSL)	1425.2	1423.2	1419.6	1418.2	1415.0
Invert Gate Elevation (MSL)	1415.2	1414.2	1408.6	1407.2	1405.0
Gate Size (width x height)	16' x 10'	16' x 11'	16' x 11'	16' x 11'	16' x 10'
Width at Control Section	48'	48'	47'	48'	48'
Spillway Type	Earthen	Concrete	Concrete	Concrete	Concrete
Spillway Length	700'	694'	701'	580'	700'
Spillway Crest Elevation (MSL)	1425.8	1423.2	1419.6	1418.2	1418.0

Information based on 7/31/1996 SEED reports and 4/30/1998 water capacity tables.

Inflow

Good conditions through the fall of 2004 and an abundant snowmelt produced high spring runoff. Total Souris River flow at Bantry through the first five months was 50,027 acre-feet. This provided sufficient water to meet our management objectives and allowed the passage of excess water into Manitoba.

The situation changed dramatically in mid-June when cool temperatures and localized record precipitation delivered flood waters from ephemeral creeks. This started the beginning of June when a heavy rainstorm flooded the town of Souris and the surrounding area. These waters began to enter the Refuge at Pool 357 from Boundary Creek on June 3 with flows exceeding 2000 cfs. We immediately began discharging water from Pool 357 into Manitoba. Discharge rates began at 1,300 cfs on June 3 and increased to 2,420 by June 8. The rate remained over 1,000 cfs until June 21 when flood waters diminished from Boundary Creek.





Boundary Creek changed from a slow moving ephemeral creek to a raging river in a matter of hours. (TWG)

We were able to decrease the discharge rate to around 500 cfs for the remainder of the month. However, this changed in early July when several heavy rainstorms hit east of the Refuge and up into the Turtle Mountains and southern Manitoba. Record summer flood waters passed through the series of lakes from Manitoba to North Dakota and finally into Lake Metigoshe where serious flooding occurred. These waters were passed to the Refuge from the Turtle Mountains through Oak Creek to Willow Creek, which caused extensive flooding in the Willow Creek drainage. It was compounded by additional ephemeral creeks to the northeast flowing through Ox Creek into Willow Creek. Flow rates in Willow Creek reached 2,670 cfs on July 11 and flooding occurred until August 23. To compound the problem heavy rains in the Des Lacs River watershed exceeded 1000 cfs which reached Verendrye gauging station on July 2 with a peak of 2,480 cfs. As these waters worked their way down the Souris River to the Refuge they arrived just before the flood waters for Willow Creek joined the Souris River. This stacked up water at this location and exasperated an already bad situation. All water control structures were opened to allow maximum flows through the Refuge. It was not enough to compensate for the heavy volume of water and resulted in the topping of most emergency spillways. We were able to maintain control of Pool 357 by early releases of water we knew was coming from the Willow Creek drainage area, consequently, water reached the top of the spillway, but did not flow over.

Total outflow measured at Westhope for 2005 was 469,257 acre-feet. Total outflow was 308,730 acre-feet more than total measured inflow on the Souris River at Bantry. Outflow

during the June 1 to October 31 period was 392,180 acre-feet, or 386,111 acre-feet above the 6,069 acre-feet (20 cfs instream flow) required minimum we must provide Manitoba each year. The lowest recorded daily mean flow to Canada during the period was 216 cfs on October 31.

Impoundment Operation

Gates were frozen in place and little water was being released to Manitoba at the beginning of the year. Outflow remained negligible through winter to conserve water. Movement of gates to maintain the Pool 320 draw down and bring other pools to target levels began on March 31. We were able to pass flows through the Refuge and maintain target elevations through May. On June 7 we began to close Dam 320 to hold the increased flows coming down the Souris River. This was done in an attempt to maintain the water level in Pool 326, which had a nesting colony of over 30,000 Franklin's gulls, thousands of eared grebes and other waterbird nesting, and the first known nesting colony on the Refuge of 100+ white-faced ibis. We sacrificed the drawdown of Pool 320 to protect these avian nesting colonies which were beginning to hatch their young.

As the floodwaters entered the Refuge from the Souris River and Willow Creek it soon became obvious that our attempt to save these birds were in vain. The high volume soon flooded out the nests and young alike. Mortality of hatchlings was extremely high with estimates of up to 100,000, and most of the years production was lost.

The high water in the summer had a negative effect on emergent vegetation, especially cattail. Most of the emergent vegetation in the Benson subunit was killed back by over three feet of high water, and a substantial amount of vegetation in Pool 326. Although the vegetation should rebound next year, the rapid negative effect observed on these plants provides future management implications for controlling emergent vegetation.

In an attempt to drawdown Pools 320 and 357 we continued to move water through the system after the flood waters had abated.



The rapid rise of two to three feet in the Benson Subimpoundment caused a quick die off of emergent vegetation, mostly cattail. (TWG)



By November we had Pool 320 back into a draw down condition. (TWG).

After concurrence with Manitoba Water Resources, we initiated the slow release of water from Pool 357 throughout the winter in an attempt to reach the summer 2006 drawdown goal. Releases were set to maintain approximately 50 cfs through the winter. Pool 357 dropped about four feet and is positioned for a completed drawdown in 2006. This action required the holding of water in the southern pools during the winter. It was predicted that about 50 cfs would continue through the Souris River during this time. However, flows in Willow Creek remained high, and a heavy snow fall in October, which later melted, contributed over 150 cfs in the system. These flows were captured at the other pools until they filled, and minimum flows from 50 to 150 cfs were required to release excess water. The total storage at the end of the year was 1,992 acre- feet more than the January 1 storage.

Outflow

Total outflow measured at Westhope for 2005 was 469,257 acre-feet which was 308,730 acre-feet more than total measured inflow. This is attributed to the heavy flows we received from ephemeral creeks which have no gauging system installed. Outflow at Westhope peaked at 3,260 cfs on July 20 while the lowest recorded daily mean flow during the April to December period was 37 cfs on December 14.



We released water throughout the winter in an attempt to get the water units set for 2006. (TWG)



View of Dam 2 as flood water from Willow Creek topped the structure during July and August. (TWG).

4. Croplands

There were 403 acres farmed this year to provide the grain needed to support the station's duck banding program. Much of that acreage is badly invaded with leafy spurge which would get worse if seeded to grass. So, if something has to be farmed, we have decided to let cooperators farm these acres and control the spurge with routine tillage and chemical applications, at their expense.

5. Grasslands

In April, a grazing variety of alfalfa was interseeded after light disking on units D-23 (21 acres), A-6 (50 acres), and A-31 west of the airstrip (49 acres). Fourteen acres in D-41 were also seeded to alfalfa.

In May, a native grass mixture of green needlegrass, Western wheatgrass, switchgrass, sideoats grama, and big bluestem was seeded in D-13 (80 acres); A-33 (20 acres); A-12 (34 acres); and A-3 (23 acres).

Seedbed preparation on several fields was delayed by the rain in June. It was much too wet to allow spraying or tillage and the weeds got away from us quickly. We started clipping them because they were too overgrown to spray. The good news is the wet conditions helped get a good catch on fields seeded this spring.

Fields clipped in July grew back with a robust stand of pigeongrass. By the end of the month we were able to start spraying Round-up but the wet conditions have delayed eventual grass seeding by at least a year.

Chemical seedbed prep was completed in September on all fields scheduled for grass seeding. A couple fields were also disced. The remaining fields were disced in October to partially compensate for the chemical control that could not get done because of weather conditions.

6. Other Habitats

Willows are a constant invasion problem in the hay meadows. Haying helps control them but after a series of wet years, willows can quickly become much too large for conventional haying equipment. We spent time in November and early December using a rotary mower and the Seppi drum chopper to clear willows in the parts of the H-17 and H-23 meadows.

We also used the drum chopper on Russian olive trees in G-37.

7. Grazing

Grazing fell out of favor 30-40 years ago and we are seeing the consequences of that decision. We are increasing the grazing in hopes of reversing the degradation that has occurred from overreliance on fire and rest to manage our grassland. Over 5900 acres were

grazed this year. Some general objectives include: manipulating vegetation structure, stressing brome grass that has invaded native prairie, and reducing litter accumulations to improve biological control of leafy spurge.

Smooth brome, a cool-season exotic grass, is posing a very serious threat to native prairie in the Drift Plain and to a lesser extent the Sandhills. Using fire to control this plant is not effective, probably because this area is dominated by mixed-grass prairie made up of mostly cool-season grasses so there are not very many competitors for brome. Grazing seems to keep it from establishing and may cause it to decline in areas already infested.

Grazing is briefly summarized in the following table.

Table 6: Grazing program on J. Clark Salyer NWR, 2004.

Unit	Acres	Objective	AUM's*
G-48	280	Vegetative Structure/Litter	121
G-42, 43b	500	Vegetative Structure/Litter	230
G-52a, 51SW	790	Vegetative Structure/Litter	263
G-34, 36	760	Vegetative Structure/Litter	222
G-39c	182	Vegetative Structure/Litter	227
G-13	352	Vegetative Structure/Litter	220
D-38	190	Vegetative Structure/Litter	176
G-7, 8	142	Vegetative Structure/Litter	206
D-33	48	Vegetative Structure/Litter	46
G-50	1,227	Vegetative Structure/Brome	268
Grassland Trail	680	Vegetative Structure/Litter	330
G-55/Nelson Prairie	320	Vegetative Structure/Litter	127
G-33a, b	380	Litter	115
Total	5,851		2,551

*AUM – Animal Unit Month: 1 cow = 1 AU, 1 calf = .32 AU, 1 bull = 1.5 AU, 1 yearling = .75 AU

Smooth brome is rarely found on private native grassland that has been grazed for many years. This is not the case for Refuge grassland where grazing and fire have been inconsistent while rest has been consistent over the years. The Grassland Trail unit has a history of prescribed fire but this has not prevented a serious smooth brome invasion. We are experimenting with grazing and fire in hopes of reversing the brome problem.

Many years ago, fences along the G-55/Nelson Prairie unit were built along the section lines, leaving a wide lane over 60' wide between the fences. Smooth brome is invading this lane which has not been grazed when the adjacent units were grazed. There is no brome in the adjacent grassland other than some small areas that may have been disturbed many years ago. We see the same thing on private land where the only place brome is found is between fences or in the road rights-of-way outside the pastures. We are grazing this narrow lane to see if we can stop and reverse the brome expansion. It looks like we are having some success here but it is still too early to tell for sure.

Staff prepared information and responded to a GAO grazing audit in April.

8. Haying

Haying every other year has proven to be the most practical way to control willow invasion in the meadows. But, this has changed as haying equipment became more expensive and permittees more reluctant to cut willows and risk damaging their equipment or the willows are too big to cut with today's conventional haying equipment. Wet conditions make haying very difficult and in many cases, impossible some years. This allows willows to grow an extra year making control more difficult. If a willow is not cut at least once during the semi-annual haying operation, it will be too big to cut with conventional haying equipment

Meadows were flooded throughout August and it looked unlikely all will be hayed. By late September, some permittees got into the meadows and did some haying but other meadows stayed too wet to cut this year.

Many hay meadows were too wet to hay on the August 1 starting date but some were cut by the end of September. The H-16/Willow Creek meadows and the Thompson Well area were the wettest and no haying was done on some of these. Fourteen of the 33 meadows were not hayed including all of the H-16 units; H-17 e, f, and j; H-18 b; H-22c and h; and H-23d. Of the remaining meadows, all had areas too wet to hay.

Refuge staff spent time in December with the drum chopper and rotary mower clearing willows in the H-17 and H-23 meadows. This was the last year of the current permit and a new lottery is scheduled for 2006. By cutting the willows that had grown too big for haying equipment, we hope to make it possible for the new permittees to control them most years.

Several fields were hayed to rejuvenate DNC or control annual weeds in new seedings. Haying on these fields is summarized below:

Table 7: Haying on J. Clark Salyer NWR, 2004.

Unit	Acres	Objective
A-38	100	Annual weed control in native seeding
A-36, D-15	50	Annual weed control in native seeding
D-10	50	Annual weed control in native seeding
320 Predator Fence	31	DNC rejuvenation
A-5, D-40	102	DNC rejuvenation
A-1	54	DNC rejuvenation
D-10	50	DNC rejuvenation
Total	437	

9. Fire Management

This year was another active season for the U.S. Fish and Wildlife Fire Management Program at J. Clark Salyer NWR.

The J. Clark Salyer NWR Fire Management Program is a complex consisting of J. Clark Salyer (JCR), Audubon (ADR), and Upper Souris (USR) National Wildlife Refuges and all associated complex acres. The following will only include accomplishments and activities associated with the J Clark Salyer Refuge.

Fuels treatment activities within J Clark Salyer NWR:

The Refuge target acres to burn during 2005 were 2,300 acres. The accomplished acres were 2048 acres burned in 10 individual burn units.

One mechanical treatment project was completed for 50 acres. This project consisted of maintenance of a previous contracted project completed in 2001 and 2002. This 2005 project was completed by using the station drum chopper to remove regrowth on five miles of constructed line through aspen parkland.

Planning and Preparation

The staff completed four Type 3 (low complexity), and 18 Type 2 (moderate complexity) burn plans in 2005 for a total of 4400 acres. The Fire Management Officer reviewed eight Type 3 burn plans and 15 Type 2 burn plans in 2005.

Fire Management staff completed mowed lines on 15 individual burn units for a total of 17 miles of fire break completed.



Prescribed burn at J. Clark Salyer Refuge (CM).

Fuels treatment activities outside of JCR District:

Fire staff assisted Knife River National Park to complete two burns for 72 acres. Assistance was provided to the Dakota Prairie National Forest with completion of three burns for 1245 acres. On one occasion fire staff assisted Arrowwood NWR to complete one burn for 300 acres. One day was spent by the fire staff assisting Lostwood NWR complete a burn for 5,200 acres.

Wild land fire activities within J Clark Salyer NWR:

Two fires occurred within the Refuge. CCC bailer for two acres, and Nermoe for five acres.

Wild land fire assists activities within zone:

Fire staff assisted the Black Hills National Forest with a pre suppression assignment located on the north zone of the Blacks Hills. While on this assignment staff assisted with suppression of four fires. Fire staff assisted with suppression of the Ricco Fire located in the Black Hills. Support was given as SOF3.

Wild land fire assist activities within the nation:

Assistance was provided as ICT3(t) to suppress the Cedar fire located in Idaho. District staff also assisted as HECM(t) with suppression of the Blackerby fire located in central ID. Staff assisted the BIA-Ute agency on a severity assignment as ICT4; seven fires were suppressed. A type four engine spent two weeks in Worland Wyoming assisting the BLM on a severity assignment; one fire suppressed. Assistance was given to FT Howes in Montana to suppress five fires while on severity.

Wild land urban interface activities:

None.

Prevention/Education:

Staff participated in fire wise presentations to elementary school groups from Towner, Granville and Upham at Denbigh days.

RFA Assistance:

FMO Marshall site visited Foxholm RFD, Mohall RFD and Westhope RFD to assist the rural assistance grant applications.



One result of our prescribed burning was the emergence of prairie lilies in our native grasslands (TWG).

Summary

The accomplishments outlined through out this document identify specific fire management achievements that the J. Clark Salyer Fire Management staff completed during its eighth year of having an established fire program. This report does not capture all accomplishments but is designed to provide a brief description and summary of accomplishments attributed to the fire program throughout the calendar year.

The opportunities for continued success will depend on support, leadership, direction and the tools provided. Continued improvements in program developments, improved efficiencies and interagency cooperation will provide opportunities to increase the accomplishments achieved during this calendar year.

Table 8. Individual burns completed J Clark Salyer Refuge

Date	Refuge	Fire Type	Fire Name	Acres Burned
4/16/2005	JCR	RX	West Gideon	120
4/16/2005	JCR	RX	G-33a	132
4/16/2005	JCR	RX	Latendresse	75
4/20/2005	JCR	RX	320 Cemetary	41
4/21/2005	JCR	RX	Natwick	485
5/3/2005	JCR	RX	G-50	630
5/25/2005	JCR	RX	357 Oil Wells	65
5/25/2005	JCR	RX	G-2	160
10/12/2005	JCR	RX	357 West	70
10/27/2005	JCR	RX	Atkinson	270
TOTAL				2,048

Table 9. Prescribed fires completed, J Clark Salyer Refuge, 2000-2005.

Year	2000	2001	2002	2003	2004	2005
No. of Burns	8	26	15	12	10	10
Acres Burned	980	3786	2326	2405	1430	2048

10. Pest control

Leafy spurge is still the most common noxious weed on the Refuge, just as it was over 40 years ago. Chemicals have not killed the plant but we continue to try and control it. Our efforts are prioritized on trying to keep small infestations from getting bigger, making sure to protect our most valuable native prairie areas and try to keep them free of spurge, and controlling spurge along our boundaries. There is a lot of spurge that is not treated. We don't have the money, staff, or time to get to it all.

Flea beetles, the kind that eat only spurge, not canola, have been released for over 10 years. Some releases have done well, others are barely holding on, and some are complete failures. Spurge beetle collections started slowly late in June and really did not improve much all summer. It is possible heavy rain during insect emergence may have drowned many beetles because some of the collection sites had standing water or saturated soil for several days.

We released an estimated 650,000 bugs on four Bottineau and five McHenry County sites compared to 30 releases of 2,290,000 bugs in 2004. Our best day of collecting occurred at Hawk's Nest southwest of Carrington.

The Sandhills still have few effective bug releases despite many attempts in that area. The sandy soils and possibly ants have greatly limited the use of flea beetles for spurge control.

If we can continue to collect large numbers of beetles, releases will continue to be made in that area in hopes of someday having a SUPERBUG that can survive in those conditions.

Grant and Erickson attended the Invasive Species Workshop in Bismarck on April 5th-7th. Gutzke attended two meetings in October with Project Leaders from Devils Lake WMD, Des Lacs NWR Complex and Tewaukon NWR Complex to come up with a plan to distribute \$500,000 targeted for North Dakota for an Invasive Species Strike Team. A plan was agreed to and delivered to the RO.

Canada thistle is a lesser problem, most often found in newly seeded grasses or along wetland edges. It seems to vary greatly with the weather conditions and haying, spraying and sometimes burning can control it. The same is true for absinth wormwood although this weed appears to be increasing slightly in some areas.

A relatively new weed is yellow toadflax. This has been sprayed the past few years and is found mainly in the Grassland Trail area. We believe it was introduced from equipment working on the two oil wells in that area. It has also been found at a few other locations and seems to be increasing on and off the Refuge. We have been spraying it regularly and have had some success, especially following a prescribed fire.

Spraying was difficult because of the wet conditions. We eventually quit after getting stuck many times in areas we never suspected would or could be wet. A more detailed summary of the pest control work is found in the station's IPM report.

A brief summary of our chemical control of noxious weeds follows:

Table 10. Chemical control of noxious weeds, 2005.

Noxious Weeds	Acres Treated
Leafy Spurge	486
Canada Thistle	80
Yellow Toadflax	20
Absinth Wormwood	20

G. WILDLIFE

1. Wildlife Diversity

J. Clark Salyer Refuge is among the most diverse refuges in the Prairie Pothole Region. This region of the northern Great Plains is highly complex, composed of plants associated with tallgrass, mixed-grass, and shortgrass prairies, eastern deciduous forests, northern and Rocky Mountain coniferous forests, and desert shrub communities. Because of the diverse array of habitats, we have a correspondingly varied suite of wildlife species – especially resident and

migratory birds. The Refuge also is located in an area where the ranges of eastern and western bird species overlap, further increasing richness of species found here.

Since 1936, many wildlife surveys have been initiated, modified, and/or dropped. Many were implemented based on politics of the day and/or were poorly designed. Most were only sporadically implemented. Even some well-designed surveys have become obsolete based upon modern analysis of the data. For example, a waterfowl brood survey was developed during the 1950s and improved and finalized during the 1960s. In a comprehensive analysis (1950-1992), we found that the number of duck broods counted in any year was a reflection of not only duck production but also water levels in the five pools surveyed. During low water years, more ducks were counted because they were concentrated in the river channel where they were more visible (i.e., ducks counted were inversely correlated with water levels). Thus, the survey did not function as an index of change in duck production.

Considerable staff time was spent each year conducting "wildlife" surveys, few of which provided any biological information useful for management. Concurrent with this approach has been a total lack of habitat and vegetation monitoring. As a result, many small, yearly incremental changes in vegetation communities and wildlife habitat have multiplied over the years resulting in large, wholesale shifts in habitat quality, ultimately impacting wildlife species. Many of these changes appear irreversible. Increases in woody vegetation and non-native plants (especially leafy spurge, smooth brome, and Kentucky bluegrass) were perceived as low-level chronic issues rather than the acute systemic problems revealed by recent vegetation-based research. As a result these findings, emphasis for the refuge biological program has shifted to long-term monitoring of vegetation composition and to short-term vegetation based research. We also conduct significant research on the relationships between trust wildlife species and their habitat. These data are much more useful in predicting wildlife response to vegetation and habitat management.

During this year, our staff has developed draft goals, objectives, and strategies for managing wildlife and wildlife habitats on J. Clark Salyer NWR. The final plan will be available during 2006. These goals and objectives emphasize management of communities as habitat for wildlife, especially migratory birds. Refuge goals and objectives are habitat-based rather than wildlife population-based because wildlife populations often respond to factors beyond the control of refuge management (e.g., disease outbreaks or habitat conditions on important staging or wintering sites can affect demographic variables for migratory birds). Furthermore, at the refuge-scale, management practices (e.g., fire grazing, haying, water level manipulation) are usually applied to vegetation communities rather than to wildlife populations. Habitat-based objectives emphasize monitoring of important vegetation attributes over time; in most cases wildlife population responses to habitat changes are not monitored. Rather, site-specific inventories, applied research, and literature reviews, allow reasonable predictions of wildlife response to habitat management.

2. Endangered and/or Threatened Species

The Dakota Skipper is a small prairie butterfly that became a candidate for the Endangered Species List in 2002. This species relies exclusively on native mixed-grass for its existence.

A plan to manage the Dakota Skipper in North Dakota is in development. A major thrust of the plan is to develop reasonable land management guidelines for dealing with Skippers. Within the Refuge Complex, we have inventoried existing tracts by measuring vegetation characteristics known to affect skipper occurrence. We should reasonably be able to predict where Skippers may be found.

3. Waterfowl

J. Clark Salyer is the largest waterfowl production and staging refuge in the Prairie Pothole Region. Waterfowl production can be tremendous, especially during drought years when wetlands that surround the Refuge are dry. The Refuge is an important regional brood marsh and also attracts significant numbers of molting mallards, northern pintails, shovelers, and other species. Spring and fall staging by ducks and geese can be tremendous – peak numbers routinely exceed 500,000 ducks and 200,000 geese in either the spring or fall.

A major waterfowl migration occurred on March 30th then gradually dropped off. The snow goose migration came and went quickly. Few birds were seen after the first week of April because there was no snow to stop them and no water to hold them.

The Four Square Mile breeding waterfowl survey began in May. Very few temporary wetlands held water during the first count and duck numbers appeared to be down from last year. The second survey was completed in June before the heavy rains. Very few temporary wetlands held water during the survey and duck numbers appeared to be down from last year.

Many of the overwater nesters lost their nests when Refuge pools flooded in July. Lots of late broods were seen, likely the result of late rains creating excellent wetland habitat. There undoubtedly flightless ducks for the opening of hunting season.

The fall snow goose migration continues to be later than that observed during the 1970s-1990s. By now, this later migration could be considered normal. Most geese appear to stay in Canada as food and water conditions allow, moving south only when blustery winter weather forces them out. Geese stayed for only a few days and were gone by the third week of November.

4. Marsh and Water Birds

Eared grebes are the most abundant marsh and waterbird on the Refuge. The breeding population fluctuates around 20,000 birds. Black-crowned night herons, cattle egrets, white-faced ibis, sora rails, American bitterns, pied-billed grebes, and American coots also are important breeding species. White pelicans are common in the summer months, feeding on the Refuge. A nesting colony of pelicans is found on Willow Lake National Wildlife Refuge located 30 miles northeast of J. Clark Salyer NWR. White-faced ibis began nesting in Pool 326, as many as 100 pairs established a colony in the southeast portion of the pool.

Pools 320, 326, and 332 provided the bulk of waterbird nesting habitat this year.

5. Shorebirds, Gulls, Terns and Allied Species

Many species of shorebirds use the Refuge for feeding and nesting. Franklin's gulls, common, black and Forster's tern are the most common breeding species. Willets, yellow-legs, sandpipers, godwits, and avocets among other shorebird species are also observed throughout the year.

Projected drawdown of Pool 320 was cut short as summer precipitation rendered this attempt futile. Some shallow water and mudflats were utilized in April and May by migrating shorebirds and waterfowl. Prolonged high water levels in all pools (resulting from runoff in the Willow Creek watershed) during late June through September likely reduced nest and chick survival of overwater nesting birds, especially gulls, terns, and grebes. Access to aquatic invertebrates also was reduced for young waterbirds as water levels remained high through the brood rearing period.

7. Other Migratory Birds

Nesting structure for bluebirds/tree swallows, Canada geese, and cavity-nesting ducks are rarely monitored and opportunistically maintained, usually with volunteer labor.

Bluebird Trail boxes included 77 useable nest boxes, two boxes with multiple nests. For all species combined, survival was 86% for 72 nests.



A peregrine falcon stopped by the headquarters one morning to rest on the memorial to the late J. Clark Salyer II. (TWG).

Table 11. Fate of 68 nests initiated in bluebird boxes in 2005.

	Boxes used	Successful nests	Failed nests
Bluebirds (Mountain and Eastern)	24	19	5
Tree Swallow	40	36	4
House Wren	8	7	1
Total nests	72	62	10

Six staff members completed the 106th Christmas bird count on December 22; 381 individuals of 25 species were tallied.

Table 12. Results for the 2004 Christmas Bird Count where 381 individuals of 25 species were observed.

Species	Individuals	Species	Individuals
Common Goldeneye	1	Black-capped Chickadee	44
Ring-necked Pheasant	41	White-breasted Nuthatch	2
Sharp-tailed Grouse	85	American Robin	4
Bald Eagle	4	Varied Thrush	1
Rough-legged Hawk	2	Bohemian Waxwing	95
Rock Pigeon	15	Cedar Waxwing	7
Great Horned Owl	3	American Tree Sparrow	8
Short-eared Owl	2	Dark-eyed Junco	20
Downy Woodpecker	3	Yellow-headed Blackbird	1
Hairy Woodpecker	2	Purple Finch	2
Northern Shrike	2	American Goldfinch	23
Blue Jay	1	House Sparrow	9

10. Other Resident Wildlife

There are many species of resident birds in and around the Refuge. The main game bird species are sharp-tailed grouse, ring-necked pheasant, grey partridge, wild turkey and ruffed grouse. The ruffed grouse index was up 30% compared to last year according to NDG&F surveys in April. Sharp-tailed grouse numbers were down from 2003. Other winter residents include raven, black-capped chickadee, white-breasted nuthatch, blue jay, and downy/hairy woodpecker.

Porcupine, coyote, red fox, red and fox squirrels, cottontail rabbit, white-tailed jackrabbit, snowshoe hare, Franklin's ground squirrels, thirteen-lined ground squirrels, weasel, and many other small mammals are common to the Refuge, as well as moose, which are resident breeders.

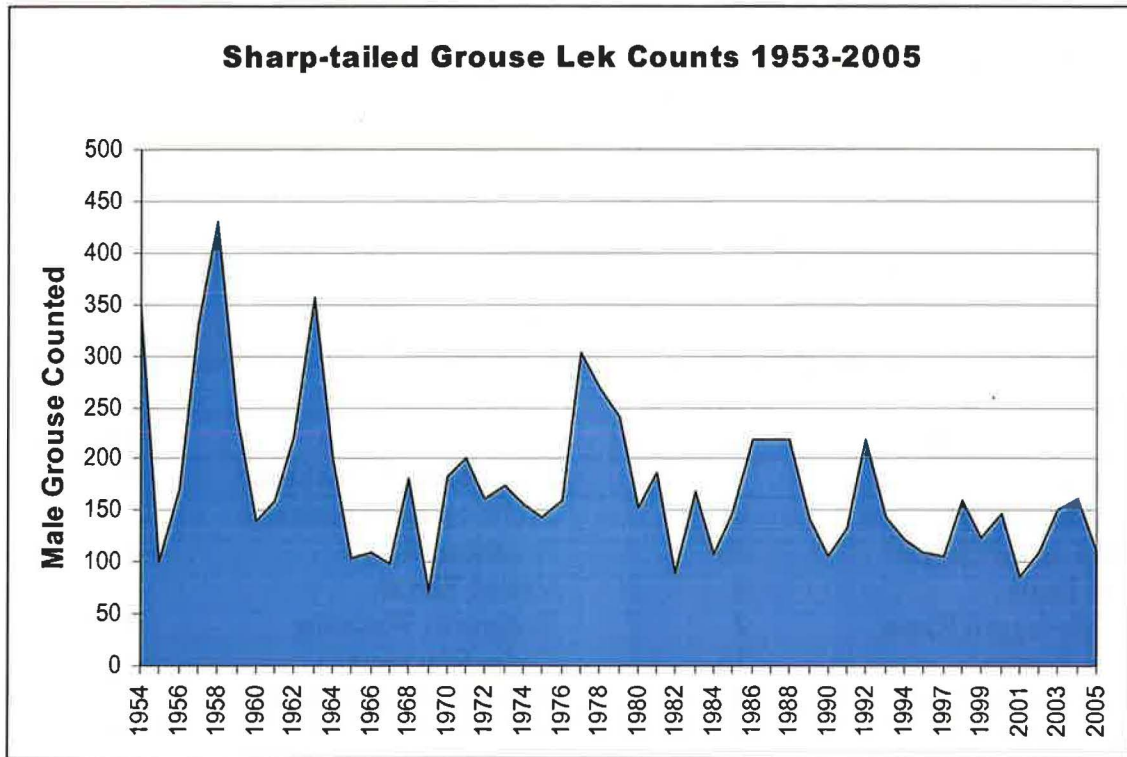


Figure 1. Long-term change in the number of male sharp-tailed grouse observed 1953-2005.

11. Fishery Resources

Northern pike, walleye, yellow perch, and bullheads are the primary fish on the Refuge.

16. Marking and Banding

Preseason duck banding proved frustrating this year. Neither the ducks nor the weather cooperated. Numerous school groups, volunteers, and staff from other refuges helped with banding; special thanks to MSU-Bottineau, Northwood, Hatton, TGU-Towner, TGU-Granville (2 classes), Midkota (2 classes), and Memorial Middle School (Minot AFB). We banded 3,372 ducks during eight mornings. Mallards and pintails dominated the catch. In addition, we had Chris Franson from USGS National Wildlife Health Center collect blood samples from 400 ducks for a West Nile Virus Disease Study.

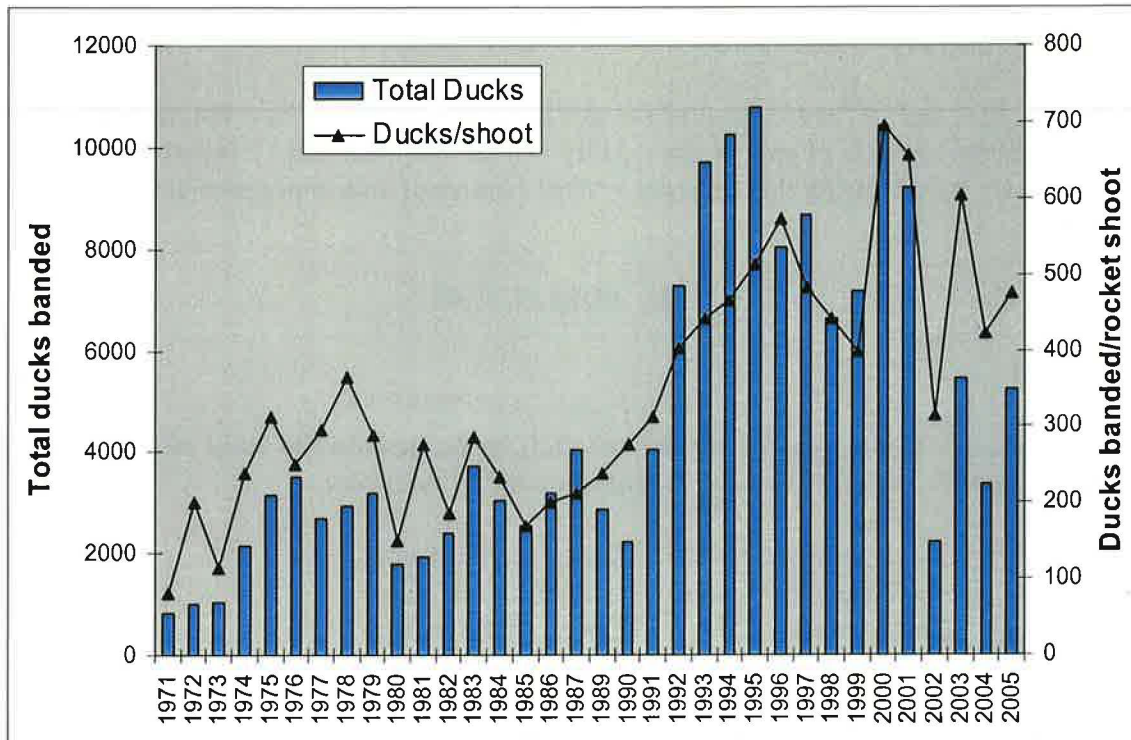


Figure 2. Change in total ducks banded since 1971. Also shown is a better measure of efficiency in ducks banded per rocket shoot.



Banding provides a unique opportunity for young people to get hand-on experience with wildlife (TAG)

17. Disease Prevention and Control

Pools 320, 326, and 332 were checked several times for avian botulism but no outbreaks occurred, likely because of good water quality and the cool summer. Several dozen dead pelicans were found during these checks – West Nile virus was implicated in these mortalities.

H. PUBLIC USE

1. General

Monthly articles were prepared by various staff to be included in local newspapers as the “Refuge Corner”. Article titles and contributors are listed below.

January	Gary Eslinger	Christmas Bird Count
February	Joe Guariglia	Backyard Birdfeeders
March	Lee Albright	History of the Refuge
April	Gary Erickson	Sharp-tailed grouse Dancing
May	Chase Marshall	Art of Prescribed Burning
September	Jerry Bahn	Wildlife Viewing
October	Todd Grant	Waterfowl Banding
November	Dom Marsden	Changing Migration
December	Dan Dushscherer	PFW Program

We reviewed several drafts of the Canoe Trail brochure in July and it looks like a final product will be out soon. Gutzke and Erickson edited the latest version of the refuge general brochure in September. It was sent back to the RO for finalization, while we search for appropriate photos for inclusion.

Erickson participated in the MSU- Bottineau Freshman Orientation session on August 22nd. About 100 students got information about the Refuge and the FWS.

Gutzke and Erickson participated in the Upham Centennial parade on July 2nd. Our fire truck pulled the airboat with “Honker” (volunteer Ella Gutzke) aboard waving and throwing candy. We all had a good time. Well, maybe Ella didn’t because it was a hot day and even hotter in that costume.

Erickson attended the Barton Wildlife Club meeting in Rugby on December 15th and led a general Q&A about refuge hunting and management.



*The refuge entry in the Upham Centennial with
"Honker" leading the way! (TWG)*

7. Other Interpretive Programs

Erickson gave a presentation on bluebirds to 15 members and 12 parents in the Willow City 4-H group in February. The group built bluebird boxes to be installed later this spring.

Fourteen 2nd grade students and their teachers from TGU-Towner were here on May 18th for a tour. Guariglia presented a program about fire and Fire Wise to four groups of 3rd, 4th, and 5th grade students from TGU Towner and TGU Granville at the Denbigh Experimental Forest in September.

8. Hunting

Waterfowl season was fairly slow. Few snow geese were in the area and lots of ducks moved on after the first couple weeks of season. Some guides are telling us they don't even try to hunt snow geese, concentrating instead on ducks and Canada geese. Times have changed.

Deer season brought lots visitors wearing orange. Hunting pressure was maybe a bit less than average. The change in regulations allowing antlerless tag holders on the refuge without a special refuge permit did not appear to increase the number of hunters significantly.

Four Special Use Permits for physically challenged deer hunters were issued, all for deer hunting. We suspect the privilege is abused by at least one of the individuals but when they have a doctor's concurrence and a permit from the State, our options are limited. This

individual was later cited for a violation off the refuge by a State warden, consequently his refuge permit was revoked.

Erickson, Albright, and Duchscherer taught Hunters Education Class in May. Eight graduated.

9. Fishing

There was nothing noteworthy to report about fishing on the refuge this year. Fishing is generally hot and cold, mostly cold. When fishing is good, the number of vehicles and the amount of litter increases. Most of the time, few if any folks try their luck. Ice fishing tends to pick up late in the year but sometimes this has as much to do with "Cabin Fever" as it does with actually catching fish.

Fishing was good at the Sheflo Bridge area in December. The river flow was enough to keep the water open and area residents took advantage, mainly catching northern pike.

11. Wildlife Observation

Metigoshe Ministries held their annual birding tour on the May 6th. Twenty-five folks found 68 species of birds, including a burrowing owl south of the headquarters in a new native grass seeding and at least 50 white-faced ibis.

MSU-Bottineau sponsored a birding tour May 20-22. Nine birders stopped at the Refuge twice during the three day event.

17. Law Enforcement

Hunting seasons were uneventful, especially for waterfowl. There were not many birds around as the early October snowstorm pushed many south and the snow goose migration was late again. The number of hunters has decreased over the past few years so there is not a lot of action out there.

Eslinger and Albright attended the second In-service session in Marana, AZ in February. Erickson attended the third session in March.

Erickson submitted information in March for a follow-up background investigation after receiving last minute notification from the RO. This lack of tracking due dates by the WO nearly cost the Service a lot of money because a new background investigation is much more costly and would have been required if the deadline had been missed. An OPM investigator interviewed Albright and Erickson in June as part of their background investigations.

Gutzke, Albright, Eslinger and Erickson attended the Dakota Working Group meeting in Aberdeen, SD in June to review the revised easement manual.

Erickson helped the NDG&F Dept. warden investigate a deer poaching incident on a neighbor's land southeast of Upham in November. Three deer were shot from the road and left in the field.

I. EQUIPMENT AND FACILITIES

1. New Construction

Gutzke worked with RO Engineering to develop plans for our new shop facility, which is scheduled for construction next spring.

2. Rehabilitation

The old office furnace, which was located on the roof, was replaced prior to heating season with a high efficiency propane furnace situated within the building. It worked great this winter and is a far cry from the old version which tended to shut down during those -40 degree nights!

The culvert by Thompson Well was replaced. The beaver now have three to choose from and often have chosen all three to plug.

A culvert insert was installed in the west 320 low flow structure in October. No dirt was moved by using an insert.

The Johnson Bridge located along the Scenic Trail crosses the Souris River and over time gets clogged with trees and debris flowing down the river. With 1262 rental dollars we hired Dig It Up Backhoe Service to remove the accumulated litter and return the normal flow to the river.



Johnson Bridge with log jams...



...and after the cleanout. (MW)

3. Major Maintenance

Engineering Equipment Operator Bohl completed an overhaul of John Deere front-loader motor during the winter.

The water control structure that flows from the West Benson Unit to Pool 326 sustained damage due to flooding. The six foot culvert under the Upham/Willow City road collapsed. We will be working with McHenry County to fix the problem next year.



A portion of the water control structure under the Upham/Willow City road that sustained damage during the flood. (GEE).

The railroad bridge which crossed the northern end of the Refuge across Pool 357 was removed this winter through a contract paid by Burlington Northern Railroad. The bridge became useless when the tracks between the towns of Souris and Westhope were abandoned and the railroads easement was terminated.



***Removal of the Burlington Northern Railroad bridge
from Pool 357. (TWG).***

4. Equipment Utilization and Replacement

We were able to purchase a Ford Escape hybrid vehicle to replace an outdated and over used S-10 pickup. Project Leader Gutzke grabbed the new addition so he could drive in the electric mode and sneak up on unsuspecting staff!

We were able to acquire attachments for the Bobcat loadsteer including a tree shear, mower, and an auger.

We purchased a new MIG welder and plasma cutter for the shop.

7. Energy Conservation

Table 13 compares the last five years of energy consumption. Propane is used to heat the office and shop with a backup electric system. Problems with the old propane furnace at the office, which usually occurs when it is very cold, necessitated the use of the backup electric in past years. The new furnace system also utilizes a backup electric, but is much more efficient and should continue to reduce our propane usage in the future.

Table 13. Energy consumed, J. Clark Salyer NWR Complex, FY2001-2005.

	Diesel (Gal)	Gasoline (Gal)	Aviation Fuel (Gal)	Heating Oil (Gal)	Propane (Gal)	Electricity (KWH)
2005	6,342	8,190	31	-	6,780	75,235
2004	9,736	10,951	60	480	9,695	116,510
2003	8,754	9,958	121	-	9,420	66,109
2002	7,088	10,935	-	-	7,330	117,938
2001	5,127	10,020	160	-	8,636	99,094

J. OTHER ITEMS

2. Other Economic Uses

Ward Williston Oil Co. asked for permission this time through BLM to install an underground oil line from an off-refuge well to an on-refuge oil storage tank. The request was sent by BLM to the Project Leader for review, who denied it again this year. After some complaining by the oil company, they finally constructed a new tank battery off the Refuge.

Royalty income from Refuge oil wells has fluctuated over the years due to changing prices and volume output (Table 14). The rise of fuel at your local gas station is reflected in the jump in royalty income for the past three years.

Table 14. Oil well royalty income, J. Clark Salyer NWR FY2001-2005.

Year	Royalty Income
2005	256,336.00
2004	124,733.31
2003	141,984.89
2002	52,966.23
2001	99,795.59

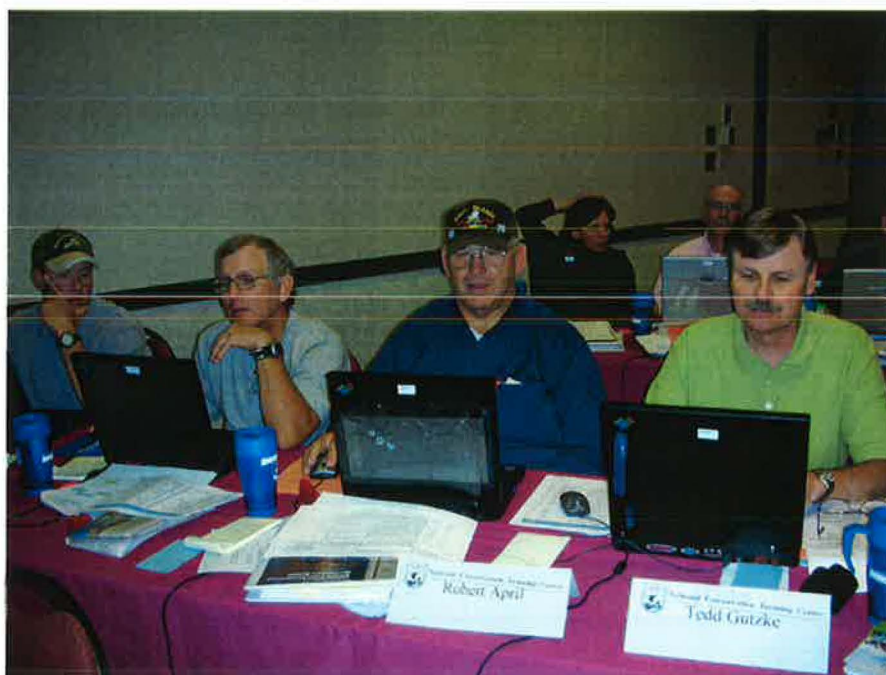
3. Items of Interest

Mike Hickey (OMB) visited the Complex in April along with Refuge Supervisor Krey and WHO Coordinator Lloyd Jones. Gutzke gave them a power point presentation highlighting the Refuge Complex and a summary of activities. Later, Gutzke and Erickson provided a tour of the Refuge.

Gutzke participated in several meetings of the Tri-County Flood Task Force during the year and worked on a sub-committee to try and determine where all the flood waters came from and what can be done to prevent a similar flood event.

Cliff Issendorf of the Bottineau Water Resource District spoke with Gutzke several times about a cleanout of the Gessner Drain, a ditch that was constructed in 1906 and crosses a portion of the Refuge emptying into Pool 332. Tract document research by Betty Adler (RO Realty) and refuge staff determined a 50' right-of-way existed for the drain. Mr. Issendorf requested that the ditch be expanded to 75' and the right-of-way expanded to 200'. Gutzke explained the Compatibility Determination process, and when Mr. Issendorf realized that Gutzke would be making the determination, he dropped his inquiry. This example is typical of the thinking up here as it relates to water management. When there is a lot of water involved, the goal is to move it along as fast as possible with no concern about downstream interests and no thought on how to reduce the amount of runoff that occurs.

Several staff took SAMM's training this year – another administrative burden we are required to manage instead of the wildlife resource.



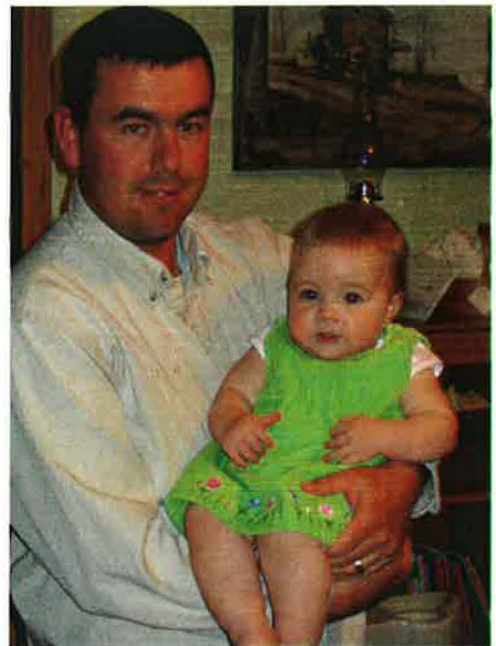
Marsden, Erickson, April and Gutzke happily learning the complexities of SAMMS.

We had a baby boom this spring! Three of our fire staff were blessed with new babies in a matter of a few months. All were girls – I don't know, maybe it is something in the water!



*First to arrive was Madeline Ellen Guariglia
on April 25th.*

*...then came Kenady Elizabeth Marshall
on May 13th.*



*...and finally Drew Olivia Marsden
on July 19th*



We gladly welcome them into our Refuge Family.

4. Credits

The report was written and photographs taken by Eslinger, Grant, Guariglia, Gutzke, Marshall and Welstad. It was compiled by Opdahl and edited by Gutzke.

J. Clark Salyer Wetland Management District

Upham, North Dakota

Annual Narrative Report

Calendar Year 2005

U.S. Department of the Interior
Fish and Wildlife Service
National Wildlife Refuge System

INTRODUCTION

J. Clark Salyer Wetland Management WMD (WMD) is located in north-central North Dakota. The WMD includes Renville, Bottineau, Rolette, McHenry and Pierce Counties covering over 6,400 square miles. Within the five counties, there are 2,288 wetland easement contracts protecting 131,635 wetland acres, 36 grassland easement contracts protecting 18,310 acres of native prairie, 127 fee title waterfowl production areas (WPAs) totaling 27,332 acres, 45 FmHA easement tracts protecting 6,966 recorded acres and 7 easement refuges totaling 7,910 acres.

The majority of the WMD is made up of glacial drift prairie with the Souris Glacial Lake Plain occupying central Bottineau County and north-central McHenry County. A portion of eastern Pierce County, in and around Hurricane Lake, lies within glacial Lake Cando. Only a small portion of southwestern McHenry County lies within the Missouri River Coteau. A twelve township area in southwestern Rolette and north-central Pierce Counties has numerous small prairie lakes and potholes comparable to the Missouri River Coteau. Many WPAs are located in this geological formation. The Turtle Mountains lie in the northeastern part of the WMD. They are not really mountains but a wooded moraine rising about 500 feet above the surrounding prairie. Many shallow lakes and small potholes make up this geological formation. Uncleared uplands in the Turtle Mountains are made up of green ash, burr oak, aspen and various shrubs. This area is home to the highest density of ruffed grouse in North Dakota.

The Glacial Souris Lake Plain contains the largest relatively unfragmented tract (about 1 million acres) of Northern Mixed-grass Prairie in North Dakota. This area contains some of the highest quality waterfowl habitat in the prairie pothole region (e.g., 180 duck pairs/mi²) and a high concentration of Bird Conservation areas. One hundred forty-eight migratory bird species breed within the area. The North Dakota Natural Heritage Inventory has identified 19 rare animal and 35 rare plant species within the Souris Lake Plain.

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C. LAND ACQUISITION

1. Fee Title

There was no fee title tracts purchased in 2005.

Table I. Waterfowl Production Area acreage by county
in the J. Clark Salyer WMD, 2005

County	Acres
Bottineau	2,589
McHenry	5,882
Pierce	12,750
Renville	311
Rolette	5,800
Total	27,332

2. Easements

Easement acquisition worksheets were submitted for 46 landowners during FY 2005. Eighteen wet easement contracts were purchased covering 9,601 wet acres. Seven grassland easement contracts covering 3,008 grassland acres were purchased in McHenry County.

Table 2. Summary of wetland easement acres by county, J. Clark Salyer WMD, 2005.

County	Wetland Acres Acquired FY 2005	Total Contracts	Total Wetland Acres	Goal Acres
Bottineau	810	459	29,476	33,614
McHenry	5,286	462	30,936	32,372
Pierce	907	650	36,425	38,215
Renville	2,598	323	15,690	17,096
Rolette	0	412	20,149	23,455
Total	9,601	2,306	132,676	144,752

Table 3. Summary of grassland easement acreage by county, J. Clark Salyer WMD, 2005.

County	Acres Acquired		Total Grassland Acres
	FY 2005	Total Contracts	
Pierce	0	5	1,469
McHenry	3,008	38	19,849
Total	3,008	43	18,310

D. PLANNING

5. Research and Investigations

During the past 14 years, a significant amount of applied research has been conducted within the J. Clark Salyer NWR Complex. Much of the research utilized study sites on J. Clark Salyer NWR and other large refuges within the north-central and northwestern portion of North Dakota, but is directly applicable to trust resources on the J. Clark Salyer and other Wetland Management Districts. An extensive list and review of these projects can be found in the Annual Narrative for J. Clark Salyer NWR and will not be repeated here.

Floristic Inventory of J. Clark Salyer WPAs

During 2004-2005, an extensive inventory of the composition of all upland habitats on Waterfowl Production Areas within the WMD Complex was completed. All upland habitats were stratified as tracts on native sod or tracts with a probable cropping history. A random set of 25m transects was generated for each tract. A density of one transect per five acres in native sod and one transect per 10 acres in seeded grasslands was used. All native prairie tracts greater than 10 acres were sampled, but data was collected on only a subset of old cropland tracts that were seeded to either DNC or native grasses. A belt transect method was used to describe existing plant communities for each tract. The belt transect method can be quickly, efficiently, and extensively applied, is robust to varied observer skill levels, and supports the development of wildlife-habitat models.

We were extremely fortunate to have three seasonal technicians (T. Snyder, M. Wolf, and J. Thury[2004]) with extensive plant experience to implement the project. D. Fowler-Caron help collect data in 2004. C. Guariglia was instrumental in designing and implementing GPS and GIS protocol and managing databases. Field crews sampled about 820 transects in native sod and 120 transects in seeded grasslands. Data have been compiled and are summarized below. Tract summarized will be completed in 2006. This data will be used 1) as a baseline inventory of extant grassland composition (that could be repeated in the future to assess changes), and 2) to set habitat objects for selected tracts, and 3) to select appropriate directed strategies to deal with specific vegetation management issues for each tract.

Additionally, we completed a systematic inventory of infrastructure for each WPA using Refuge Lands Geographic Information System (RLGIS) protocol. C. Erickson, J. Henson, and J. Thury (2004) completed the field work. Each WPA in the J. Clark Salyer WMD was visited and the inventory data was collected and stored on handheld Trimble units, using ArcPad and the RLGIS extension. Data was transferred to a computer at the office on a daily basis and C. Guariglia checked, corrected, and merged the data with existing ArcView themes. At the end of the field season, all of the data collected was available for the staff to use.

One of the first projects implemented was the replacement of missing or damaged boundary signs. Using ArcView, we were able to query the existing data to determine how many signs needed to be replaced and where they were located. In the future, as new signs, fences, etc. are added, we will update this database and keep the inventory current.

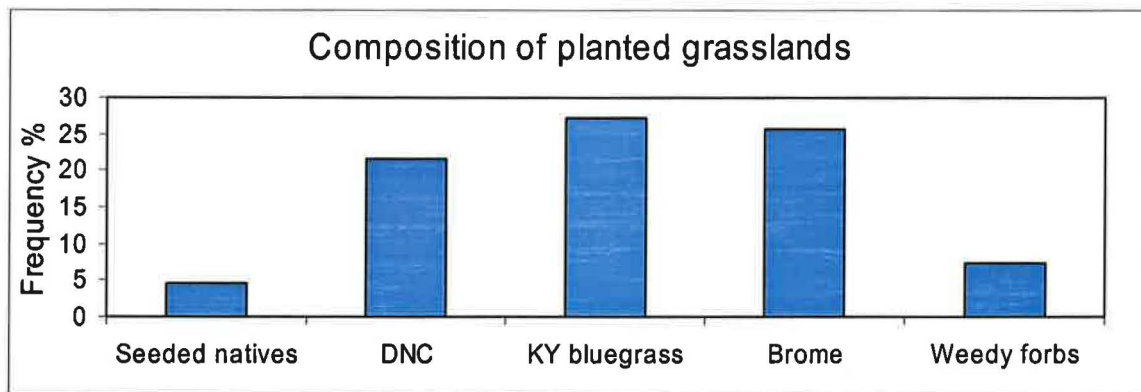


Figure 1. Floristic composition of old cropland areas seeded to dense nesting cover (DNC) and/or native grasses and forbs. Seeded grasslands are degraded by Kentucky bluegrass and smooth brome. Weedy forbs are dominated by leafy spurge and, to a lesser extent, Canada thistle.

Preliminary results of the vegetation inventory indicate that seeded grasslands and native prairie tracts are significantly invaded by cool-season introduced plants, especially Kentucky bluegrass, smooth brome, leafy spurge, and to a lesser extent, yellow sweet clover and Canada thistle (Figures 1 and 2). Low shrubs, dominated by western snowberry occupy about 10% of native prairie tracts. Less than 5% of native prairie tracts have intact native grassforb communities, but almost 15% of tracts are dominated by native grasses and forbs.

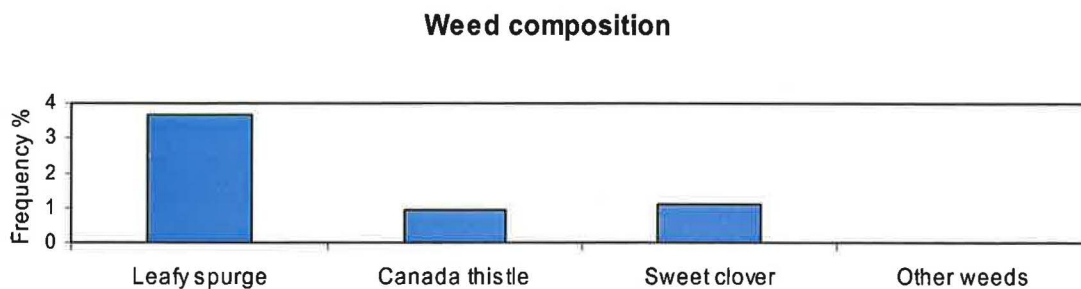
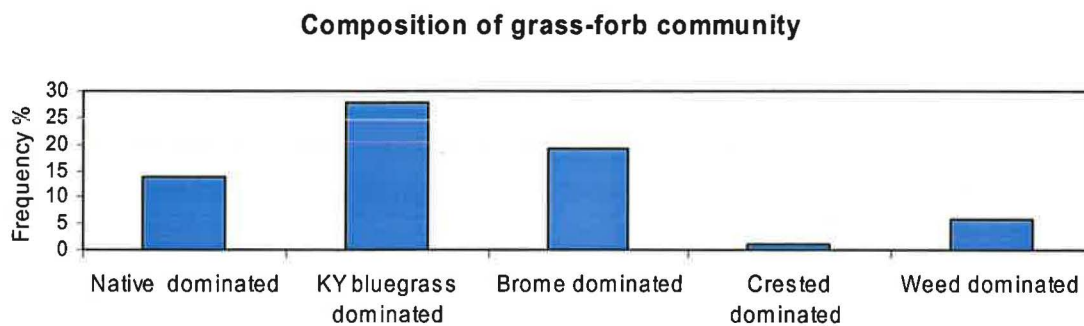
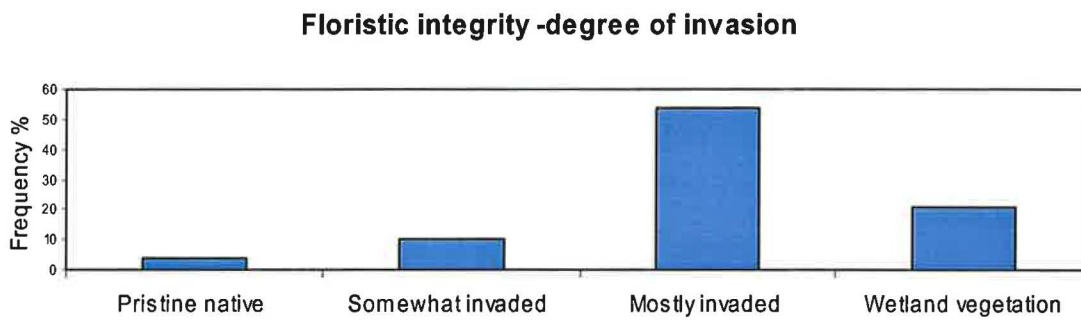
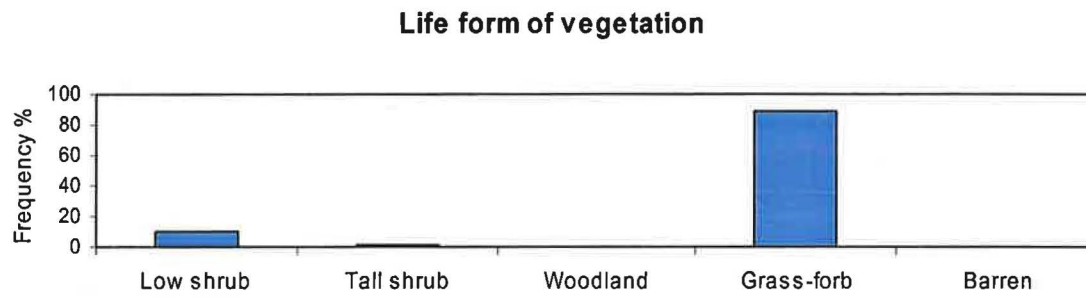


Figure 2. Floristic composition of native prairie tracts on WPAs. The sample includes 820 transects for all native prairies >10 acres.

E. ADMINISTRATION

1. Personnel

J. Clark Salyer WMD and NWR are administered as a complex from the same office but are considered separate stations. Operational funding and personnel are incorporated with the J. Clark Salyer NWR budget.

A full-time WMD Manager and Biological Technician work primarily on the WMD. The Administrative Officer spends about one-third of her time on WMD work. A PFT Private Lands Biologist is responsible for the Partners for Wildlife Program for the WMD.

5. Funding

See the J. Clark Salyer NWR Annual Narrative for detail.

F. HABITAT MANAGEMENT

1. General

With little moisture from the snowmelt grasslands had only subsoil moisture to begin the growing season. The dry weather pattern continued well into the month of May and it appeared that our grasslands were going to suffer from lack of moisture. But the month of June brought record rainfall and grasslands responded accordingly. However due to the heavy rain access to fields was made difficult or impossible until later in July and August. This delayed tillage and applications of herbicides. The weeds and grasses had a definite advantage due to the heavy rains. Warm and dry weather during most of the fall made for a good harvest.

2. Wetlands

Good water levels remained on the deeper marshes and lakes going into the winter of 2004-05. However, most of the temporary wetlands were dry. With little runoff from the snow melt the outlook for the temporary wetlands was rather poor. With dry weather continuing well into May it appeared the small wetlands would remain dry for the season. However record rain amounts in June filled to overflowing many temporary wetlands as well as the larger wetlands and lakes. Widespread flooding occurred in northern and central parts of the WMD where rainfall in excess of 20 inches was recorded during the month of June. During July the weather returned to a more normal pattern and stayed with us for the rest of the year.



Heavy rains during June filled all the small wetlands in this portion of Bottineau County. Notice the yellow borders which shows the dying vegetation. 6/16/05- GAE

In December Gutzke and Erickson along with Bill Bicknell (ES) met with Wes Wiedenmeyer and Bruce Miller (NRCS) and Gene Siercks and Terry McDonald from the Boundary Creek Water Resource District concerning flood problems associated with the Holsten Slough WPA. According to surveys the sheet pile structure that was mutually installed by all three entities in the 1980's to allow natural water flow into the WPA has moved due to frost heave and may be causing problems to an adjacent landowner, Mark Bernstein. It was agreed that we will try to remedy the problem and get the structure back to the original elevation. Later an attorney for Mr. Bernstein contacted all parties for FOIA documents on the WPA and its history of management. The NRCS Engineer and Wold Engineering agree the weir has very little effect on the water level in the drain and the flooding was caused by the large amounts of rain during the month of June.



Water was just going over the sheet piling at Holsten WPA when this photo was taken. Notice how some of the piling has risen due to frost. If the elevation of the piling where the water is flowing over has not moved, then the matter of the structure causing flooding problems to an adjacent landowner would not be true since the structure would still permit the water to flow at the original elevation. 5/23/05 – GAE



Within 10 days heavy rains brought the water up to an elevation that made the structure at Holsten Slough WPA irrelevant. 6/2/05 - GAE

3. Forests

Nine WPA's in the Turtle Mountains have native stands of burr oak, green ash and aspen. Most of the remaining woodlands in the WMD are shelter belts on old farmstead plantings. There are 1,482 acres of woodland on the 127 WPA's.

4. Croplands

Three WPA's were farmed this year with primary emphasis on preparing seedbeds prior to seeding grass.

Table 4. Farming program J. Clark Salyer WMD, 2005.

Unit	Acres	Purpose
Foster	36	DNC Farming
Round Lake	225	DNC Farming
Horseshoe Lake	140	DNC Farming
Totals	401	

The 36-acre field on Foster WPA will be seeded to grass in 2006. Our share from the crop was used to purchase the grass seed needed for the field. At Round Lake a 135-acre field will be farmed by the cooperator for several years before it is ready for grass seeding. Another 90-acre field at Round Lake was summer fallowed and will be chemically fallowed with Roundup for another year or two before being seeded to grass. At Horseshoe Lake a 140-acre field was summer fallowed in early June just before the heavy rains arrived. It was August before we were able to apply Roundup to the weeds and grasses due to the excessively wet soils. This field will also be chemically fallowed with Roundup for another year or two before being seeded to grass.

5. Grasslands

The 116-acre field at LaFromboise WPA in Rolette County that was seeded to native grasses in 2002 and hayed last year appears to have been a failure. An attempt to have the field hayed again this year by a cooperator due to thistles and wormwood appearing in the growth failed as did attempts to have it mowed by force account. The 113-acre field on Christenson Lake WPA in Pierce County that was disked and dragged last summer was to have been sprayed with Roundup in early July before the creeping jenny and thistles were gone to seed. Due to a failure in completing the force account spraying on time we had our cooperator hay as much of the regrowth as possible before spraying since the weeds were a bit too tall for our spraying equipment. He was not able to hay 30 acres of the field as the heavy stand of creeping jenny in the lower areas had caused his hay equipment to continually plug. Later in August we were able to spray the regrowth on the hayed portion of the field. However a lot of noxious weed seed had already been put on the ground. The 40-acre field at Regstad WPA in McHenry County that was seeded in 2002 and hayed by our cooperator last year to

control the spread of absinth wormwood was hayed again this year. Haying appears to be having an effect on the wormwood on the southern portion of the field. The 220-acre field that was seeded to native grasses on the Welford WPA in Pierce County last fall has a serious wormwood infestation starting on the west side next to the old farm site. In 2006 we will have an opportunity to try to get the upper hand on these areas.

Snyder and Wolfe completed 32 vegetative monitoring transects on 11 WPA's later during the month of September.

7. Grazing

With the above normal precipitation, grasslands were in very good condition even into late fall. A total of 22 WPA's were grazed during the year.

Nearly half the units have noxious weed control as part of the agreement. This has proved to be of great benefit to our operation, both in time saved for us and the quality and timing of the work done.

Table 5. Summary of the grazing program on J. Clark Salyer WMD, 2005.

WPA	No. Of Units	Acres	AUM's Used	Objective
Boreson	2	76	53	IG, RL&CSI
Guthrie	2	30	27	IG, RL&CSI
Heer	2	100	55	IG, RL&CSI
Keller	3	214	125	IG, RL&CSI
Kuntz	4	150	114	IG, RL&CSI
Mikes Peak	6	418	337	IG, RL&CSI
Reider	1	70	59	IG, RL&CSI
Avocet	2	28	27	IG, RL&CSI
Bullrush	1	124	59	IG, RL&CSI
Christenson	4	185	176	IG, RL&CSI
Herd Lake	3	222	177	IG, RL&CSI
Juniata	1	45	49	IG, RL&CSI
Kittilson	1	23	16	IG, RL&CSI
Long Lake	3	194	184	IG, RL&CSI
Saline Slew	2	157	38	IG, RL&CSI
Seil	1	32	42	IG, RL&CSI
Wolford	3	153	120	IG, RL&CSI
Armstrong	4	184	143	IG, RL&CSI
Beaver	1	35	28	IG, RL&CSI
Ghost Valley	3	497	269	IG, RL&CSI, NWC
LaFromboise	2	130	130	IG, RL&CSI,
OxCreek	2	41	41	IG, OW, RL&CSI
Totals		3108	2269	

IG - Invigorate Grasslands, OW - Open Wetland, RL&CSI - Reduce Litter and Cool Season Invasion, NWC - Noxious Weed Control

8. Haying

A total of 26 permits were issued for haying during the year through a regular permit or as a condition of a farming permit.

DNC rejuvenation generally involves haying an old field in efforts to improve the stand or haying a new field in order to keep the growth vigorous. Fields that will not respond to haying are broken and summer fallowed after the hay is removed and then cropped generally for two years before seeding back to grass.

Wetland haying is generally done in conjunction with upland haying with the emphasis being to remove the heavy accumulation of dead litter, open up the wetlands and invigorate the growth on these areas.

Regular upland haying involves treatment of lowland native prairie, native seedings and some tame and native grass mixtures for the purpose of removing litter and invigorating the growth.

Weed control haying is generally done on newly seeded DNC or native fields where the grasses and legumes have not yet become established. Under normal conditions this would be the first year or two of the seeding but in other cases it may be two to three years after the original seeding.

The grand total for acres hayed is 1,017 acres. This includes the 419 acres hayed for weed control. All of the weed control acres are for DNC fields infested with either absinth wormwood or Canada thistle. Reductions in the wormwood stands were observed in all the fields. This was accompanied with increased vigor and density of the alfalfa.

The 48-acre DNC field at Grenier WPA continued to be mostly wormwood free. This particular field was seeded in 1996 and hayed to control wormwood in 1997, 1998 and 2000. This was the fifth year in a row that haying was not necessary to control wormwood.

Table 6. Summary of haying management on J. Clark Salyer WMD, 2005.

WPA	Acres DNC Rejuvenate	Acres Wetland Haying	Acres Regular Haying	Acres Weed Control
Beatty			28	
Weinrebe	16			
Zurcher			34	
Eidem				127
Eidmann			17	
Freelanders		30	15	
Keller	10			
Knutson			17	
Martin		30	80	10
Regstad				40
Spichke				16
Aylmer Lake				202
Black-Bryn	20			
Christenson	80			
Cruden			23	
Long Lake	35			
Round Lake	90		38	
Twin Lake			35	24
Totals	251	60	287	419

9. Fire Management

One burn was completed on the Wetland Management District for 100 acres, while one wildfire occurred on the Volk WPA for five acres.

Table 7. Prescribed Fires Completed, J Clark Salyer WMD, 2000-2005.

Year	2000	2001	2002	2003	2004	2005
No. of Burns	4	0	3	2	0	1
Acres Burned	158	0	265	560	0	100

10. Pest Control

A total of 641 acres was sprayed with low volatile, 2,4-D Ester for control of leafy spurge in grasslands. In an effort to improve on the timing and accuracy of our spraying efforts much of the acreage was done by cooperators.

Table 8. Weed control by cooperators on J. Clark Salyer WMD, 2005.

County	Acres Treated	Number of Tracts	Number of Cooperators	Primary Target
Bottineau	23	2	2	L. Spurge
McHenry	49	5	5	L. Spurge
Pierce	206	9	8	L. Spurge
Rolette	243	4	5	L. Spurge
Totals	521	20	20	

In July leafy spurge flea beetles were collected from Beatty WPA in Bottineau County and released on selected sites in the WMD.

13. Easement Monitoring

Ground checks were finished during the month of May for the easement aerial easement surveys that were completed during the fall of 2004. Three drain violation cases and two fill violation cases were confirmed. A total of 12 wetland basins had been drained and four separate wetlands had been filled. All violations were restored before the end of the year.

In addition one FmHA tract was discovered with a ditch. This will be restored in cooperation with the local NRCS Office.

Also restoration was finally completed on Bottineau 22X,1 involving four wetlands that were drained with a bulldozer in the fall of 2001.

In the fall Welstad and Eslinger completed easement flights on 3 ½ counties before snow cover stopped the surveys on December 1st. A total of 20 burns, five ditches and three fills were listed as potential violations.

A total of 25 burning permits were issued during FY 2005. In addition one permit was issued for a dugout on a wetland easement, one for a stock pond and one for tree removal.

Oil well activity decreased from five projects last year to two this year.

G. WILDLIFE

2. Endangered and/or Threatened Species

A plan to manage the Dakota Skipper is in development. A major thrust of the plan is to develop reasonable land management guidelines for dealing with Skippers. Within the refuge complex, we have inventoried existing vegetation characteristics associated with Skippers, and should soon have a reasonable idea of tracts where Skippers could expect to be found.

The first bald eagle of 2005 was observed near Mikes Peak WPA in McHenry County on March 15. Four bald eagles were observed near Westhope on March 24.

In the fall, two bald eagles were observed along the Souris River in McHenry County on September 14. One bald eagle was observed at Freeland WPA in McHenry County on October 18 and another one at Wolford WPA in Pierce County on October 20.

3. Waterfowl

The spring migration began on March 28 when a major movement of geese and ducks was noted in the WMD. Due to a lack of water from the snowmelt the migration came and went quickly. After the first week of April most of the migratory waterfowl were gone.

Due to the poor runoff from the snowmelt, most small wetlands were in fair to poor condition until the heavy rains began in late May. Deeper wetlands and lakes, however, continued to hold good water levels. Most of the smaller wetlands improved to good or better as the summer progressed due to the heavy rains.

The second count of the 4-square mile breeding pair survey, conducted in May, found 64 percent of the sample ponds holding water compared to 75 percent last year. The estimated number of pairs decreased by 45 percent from last year and was the lowest since 1992.

Table 9. Four square mile survey breeding population estimates for the J. Clark WMD, 1987 - 2005

WMD Data				Pair Data													
Year	Area (sq. miles)	Area Wet (sq. miles)	Wet Ponds	Mallard	Gadwall	Blue-Winged Teal	Northern Shoveler	Northern Pintail	American Wigeon	Green-Winged Teal	Wood Duck	Redhead	Canvasback	Lesser Scaup	Ring-Necked Duck	Ruddy Duck	Total
1987	6552.3	259.31	110398	48991	21456	52245	6231	5622	3212	2409	0	12015	25084	13032	5228	8497	204022
1988	6552.3	118.81	68570	28268	16096	40500	5579	2087	2087	1565	0	5925	15382	5734	1966	3547	128737
1989	6552.3	153.83	69196	49504	38918	39419	10078	4613	5032	839	1599	8871	4943	1863	0	7008	172688
1990	6552.3	51.46	23364	14357	14282	20340	3924	4282	2409	2409	0	2901	523	1322	0	387	67136
1991	6552.3	102.59	49008	26424	12916	50859	3288	1843	1843	369	0	10600	607	718	0	3937	113402
1992	6552.3	127.7	70704	42337	42379	87239	19241	8246	2604	2604	0	23388	7628	2914	0	13585	252166
1993	6552.3	136.55	98725	108341	50773	70054	23003	6707	5962	8198	725	10799	7425	465	1056	2450	295958
1994	6552.3	230.29	141594	58855	20604	127502	18595	10685	5698	3562	0	64284	26853	5068	0	26496	368201
1995	6552.3	486.52	192700	135069	41230	240794	38077	26032	4881	5694	785	65970	18646	13317	1062	38687	630243
1996	6552.3	438.22	227366	95372	52794	305307	36759	28924	7231	8838	764	55354	14830	8666	5440	28011	648291
1997	6552.3	560.89	205353	113908	91005	295191	32197	24582	3642	9104	3482	53775	14005	8375	1098	35826	686189
1998	6552.3	395.79	157252	137282	93095	397875	40710	27252	8857	13626	5253	55069	7780	4995	3546	35461	830800
1999	6552.3	715.9	282253	232084	132608	426558	77401	78767	14321	21482	989	46516	10466	17933	2061	105026	1166212
2000	6552.3	396.02	128011	180139	156165	436964	112671	59758	8715	12450	599	53062	9732	5968	404	26027	1062653
2001	6552.3	554.64	254781	254847	153709	362965	74767	65400	14533	2725	0	61619	12220	13680	5291	55800	1077557
2002	6552.3	354.02	116429	208774	136814	211939	53893	73163	19162	37743	4478	31824	7528	9404	1533	8616	804871
2003	6552.3	354.63	156178	148147	129149	255393	43414	28231	3939	7878	1258	81592	13939	14663	2847	36523	766973
2004	6552.3	325.73	170306	124243	77105	209589	65265	64206	8874	9918	506	31435	13708	5405	1445	18568	630266
2005	6552.3	277.35	144051	72205	36757	107411	16560	12408	2327	1939	377	7871	4746	7585	1101	13022	284307

Canada goose production remains very good in the WMD. The early September season doesn't seem to be reducing numbers but rather inspiring the birds to produce more.

Water conditions remained generally good on the deeper wetlands and lakes during the fall. However, as the case has been for the last eight years, many areas showed a general absence of waterfowl until late in the season.

4. Marsh and Water Birds

The cormorant, pelican and ring-billed gull colonies on the island at Willow Lake easement refuge were active again this year.

8. Game Mammals

Populations of white-tailed deer remain high district-wide. The moose population in the Turtle Mountains remains good with a population density of nearly one animal per square mile. Moderate sign has been observed at Willow and Rabb Lake NWR's.

10. Other Resident Wildlife

a. Upland Game Birds

According to surveys completed by the North Dakota Game and Fish Department, Hungarian Partridge numbers declined by 22 percent during the spring survey.

The spring dancing ground surveys showed the statewide breeding population of sharp-tailed grouse to be down by six percent compared to last year. Another wet June did not help the production.

A string of mild winters has been very beneficial to the ring-necked pheasant population. Although we had heavy rains during the peak of the hatch in June, production appears to have been good.

The spring count of the ruffed grouse population in the Turtle Mountains showed a 37 percent increase from last year. However, the overall population is still low following the apparent cyclic low in 2002. The last population peak was in 1999. Hunter success was also down.

b. Furbearers

Fox and coyote still continue to suffer somewhat from a prolonged sarcoptic mange outbreak. In 2005 the percentage of coyotes with mange dropped compared to 2004. However mange in the fox population increased slightly. According to North Dakota Game and Fish surveys, coyote populations are increasing in the Missouri Coteau and the Drift

Prairie regions. The population of water-dependent furbearers such as muskrat and mink remained good during the year. The beaver population is increasing in many parts of the WMD. More interest in trapping would help to keep populations in balance.

H. PUBLIC USE

2. Outdoor Classrooms – Students

On September 13, Colette Guariglia presented five programs to 110 seventh graders during the Bottineau County Conservation Tour held at Carbury Dam. On September 14, Gary Eslinger presented five programs to 60 seventh graders during the Pierce County Soil Conservation District's Eco Ed Conservation Camp held at Rugby.

7. Other Interpretive Programs

Erickson, Albright and Duchscherer taught a Hunter Education Class during May at refuge headquarters. Eight students graduated from the course.

8. Hunting

a. Waterfowl

Water conditions were again good for hunting in most areas of the WMD. Since most of the birds again decided to stay in Canada hunter success was quite poor except for the large marshes and lakes in eastern and southern portions of the WMD which were hunted mainly by non-residents. Success on some of these areas was good the first weekend or two. After that it was hard to find birds until late October when the birds from Canada finally moved down. Mild weather kept good numbers of geese in many areas of the WMD until mid-November. However, most hunters had quit for the season in October. Therefore there was not much hunting pressure on these late season birds.

b. Upland Game

Upland game birds showed decreases in their populations again during the summer. As a result overall hunter success was also down.

c. Deer

The deer population continues to remain high throughout the WMD. North Dakota Game and Fish Department surveys indicated another good harvest in the WMD.

10. Trapping

With the mild weather lasting to the end of the year trapping conditions were good. Due to the continued good water conditions on the deeper marshes there was good potential for harvesting water-dependent furbearers such as muskrat and mink. However, low fur prices kept the harvest low.

J. OTHER ITEMS

1. Cooperative Programs

In 1987 the U.S. Fish and Wildlife Service initiated the N.D. Wildlife Extension Program, now called the Partners for Fish and Wildlife Program (PFFW). The program provides financial incentives and technical assistance for landowners to restore, enhance, and conserve wildlife habitat on private land.

The PFFW project types include:

Hydrological restoration of drained wetlands. Wetlands are restored by the PFFW through the installation of ditch plugs or by filling shallow, excavated ditches leading out of drained wetlands. Natural revegetation occurs within the first year following restoration of hydrology, primarily due to the rich seed source from surrounding wetlands and the revival of viable yet dormant seed bank in the wetland soils. Approximately 30% of all wetlands restored by the PFFW are perpetually protected with a Fish and Wildlife Service Wetland Easement.

Restoration of native prairie and tame grass vegetation on cropland. The PFFW provides seed and technical assistance while the landowner provides the inkind services to replant native grasses and forbs on the same land. These projects provide excellent nesting habitat for several wildlife species.

Establishment of rotational grazing systems on degraded native prairie. This type of project is done to maintain adequate patch size required by a variety of grassland birds, and to restore, through timely management of grazing, the native prairie flora that otherwise would be further reduced by the pre-existing grazing method. Restoration grazing systems on native rangeland allow up to a full year's rest for rotating cells.

Establishment of new wetlands. The nature of the North Dakota landscape, include numerous watersheds, with abundant grass. This provides the PFFW with exceptional opportunities for establishment of headwater wetlands that enhance breeding and migrational habitat for numerous wildlife species.

Funding for the PFFW program comes from a variety of private, state and Federal sources. It's through this approach that the Service and private landowners can become partners in

wildlife and wetland conservation. To date the J. Clark Salyer Partners For Fish and Wildlife Program has completed 209 projects that have restored, enhanced, and created over 1,850-acres of wildlife habitat.

Eleven Wildlife Extension Agreements (WEA) were initiated in 2005 of which six were completed.

2005 Projects Completed

The Robert McIlory WEA: Initiated in 2005, this project is located in McHenry County. Mr. McIlory installed five nesting structures for mallard hens on 8.4 acres of wetlands. The PFFW provided the materials, and Mr. McIlory provided the construction, installation, and maintenance of the structures for a period of ten years.

The Bill Mahle WEA: Initiated in 2005, this project is located in Pierce County. Mr. Mahle seeded 29.9 acres of cropland to tame grass to enhance 26.2 acres of wetlands. The PFFW provided 90% of the grass seed cost, while Mr. Mahle provided the seedbed preparation, the seeding operation and the remaining 10% of the grass seed cost.

The Max Feight WEA: Initiated in 2005, this project is located in Bottineau County. Mr. Feight seeded 57.1-acres of crop land to native grass that enhanced 4.2 acres of wetlands. The PFFW program paid for 70% of the grass seed cost, while Mr. Feight provided the seedbed preparation, the seeding operation, and 30% of the grass seed cost.

The Darrel Hamman WEA: Initiated in 2005, this project consisted of a 190 acre tame grass seeding along with a 815 acre grazing system, located in McHenry County. The PFFW program provided 55% of the grass seed cost, 90% of the fence materials and 50% of a water development. Mr. Hamman provided the seedbed preparation, the seeding operation, 10% of the grass seed, 10% of the fence material, 50% of the water development and 100% of the labor for the fence installation.

The Tim Swearson WEA: Initiated in 2004, this project is designed to enhance 4,290 feet of riparian area along the Mouse River in McHenry County. Mr. Swearson agreed to put up a cattle barrier along the river to reduce erosion and bank failure. The PFFW provided 100% of the fence material, while Mr. Swearson provided the fence installation along the river.

Projects Initiated

There were five projects initiated and not completed in 2005. A 2.5 acres wetland creation, three grazing systems for a total of 400 acres and one native grass seeding for 109 acres.

LORDS LAKE NWR

This 1915-acre easement refuge straddles the Bottineau-Rolette County line and is closed to hunting. The Refuge provides a resting area for snow geese and other waterfowl in the fall.

By fall the lake level had dropped only five inches below the spring level due to heavy rains in the watershed during the summer.

WILLOW LAKE NWR

This 2,621-acre easement refuge is in the Turtle Mountains of Rolette County. The Service purchased 228 acres as a WPA within the original boundary through the Small Wetlands Acquisition Program (SWAP). The Refuge is closed to hunting and the Service has the water rights on the 1,200-acre lake.

There is a two-acre tract with a cabin, garage and outhouse owned by the Service. This and the WPA tract have been used for environmental education projects by Minot State University - Bottineau in the past.

The lake level rose two feet during the summer as result of heavy rains in the watershed. At freeze up there was still an inch of water going over the top of the outlet structure.

The pelican and cormorant rookery on the island on the west side of the lake was flooded out this year due to the record high water levels from the heavy rains during the month of June.



***Record high water levels were recorded on Willow Lake
from the heavy June rains. 7/6/05 – GAE***



***By the end of July the water had dropped and left behind
a lot of dead vegetation. 7/27/05 – GAE***

RABB LAKE NWR

This 260-acre refuge is located along the Canadian border in northwestern Rolette County. The upland is dominated by aspen and green ash. The 102-acre lake and an adjacent North Dakota Game and Fish Department Wildlife Management Area provide excellent migratory habitat for diving ducks, mainly canvasbacks.

Rabb Lake is the most remote of our easement refuges and access is possible only during good weather. This isolation may explain the presence of uncommon birds such as red-necked grebes and broad-winged hawks.

The lake level was near normal operating level during the spring. The water level rose several inches during the summer as a result of the heavy rains during the month of June. The level remained several inches high going into freeze up.

SCHOOL SECTION LAKE NWR

This is a 297-acre easement refuge in northern Rolette County located three miles from the Canadian border. The 260-acre lake provides excellent diving duck habitat and has provided good fishing for northern pike. In 1996 the lake was stocked with 6,000 northern pike fingerlings in an effort to reestablish the fisheries in this lake. In 1997 a total of 18,000 pike were stocked, in 1998 a total of 16,000 northern pike and 400 adult walleye were stocked and in 1999 a total of 10,000 pike were stocked in the lake. Ruffed grouse and white-tailed deer are found in the upland habitat.

On June 12, 1996 a portion of the refuge upland in Section 16, Tract No. 2a, was revoked, totaling 382.70 acres. The North Dakota Game and Fish Department had requested the revocation since they are the property owners and we wanted to eliminate the dual management on the area. The lake portion of the easement amounting to 260.7 acres and a 36.6 acre upland area in Section 9 remained intact as these areas are not revocable.

The lake was near normal operating levels during the spring but rose nearly a foot during the summer as a result of the heavy rains in the month of June. By fall the lake level had dropped to about the same level as in the spring.

BUFFALO LAKE NWR

This is a 1,564-acre refuge in southern Pierce County in the southern overflow valley of glacial Lake Souris. It is part of the headwaters of the north fork of the Sheyenne River. The Service owns 24 acres in fee title.

On June 12, 1996, the upland portion of the refuge in Section 36 was revoked. This is Tract No. 2 with a total acreage of 530.1 acres. The Game and Fish Department had requested the revocation since they are the property owners and we wanted to eliminate the dual

management on the area. The lake portion of the easement remained intact as there are no other areas that are revocable.

In 1994 work began on exchanging a 2.54-acre tract of land that had been used a church camp as part of the original acquisition agreement. The exchange was completed during 1995. The new 10-acre exchange tract is less than a mile from the original refuge boundary.

When the Refuge was established, a spillway and rubble masonry culvert were installed in the county road creating the 660-acre lake. A relief spillway, diversion dike, and a diversion ditch were installed later providing extra water from another watershed. The local sportsmen's club repaired the spillway in the 1960's and raised the lake two feet.

The lake has been stocked with fish but fishing has usually been poor. Reproduction is poor and a good fishery has never developed. The lake suffered a complete winter kill in 1989. Game and Fish personnel stocked 10,000 northern pike and 1,500 adult perch during the summer of 1994 and another 25,000 northern pike during 1995 and 1996. In 1997 a total of 38,000 pike and 7,000 yellow perch were added and in 1999 a total of 10,000 pike and 8,229 yellow perch were added.

Moderate runoff during the year kept water going over the spillway all year. The water level at freeze up was only two inches below the spring reading.

COTTONWOOD LAKE NWR

This is a 1,013-acre National Wildlife Refuge in southern McHenry County. A diversion ditch, relief spillway and outlet spillway were constructed when the Refuge was established. A new outlet spillway was built by the Butte Sportsmen's Club in 1983.

The lake is a popular fishing area for local residents. Due to little runoff from the snowmelt the lake level in the spring was slightly below the fall level. With good runoff from summer rains the water level at freeze up was four inches above the level taken in the spring and near normal operating levels.

When it is full, Cottonwood Lake is from 12 to 15 feet deep. It was eradicated in 1992 when the lake was only four feet deep as a result of the drought. Heavy rains in 1993 brought the lake level up over three feet. Subsequently the Game and Fish Department stocked 9,100 fathead minnows as a forage source for northern pike. During 1994 some 5,000 yellow perch and 11,000 northern pike were stocked in the lake. In 1995 a total of 15,000 northern pike were added to the lake, in 1996 10,000 pike, in 1997 a total of 1,000 yellow perch, in 1998 a total of 5,000 pike, in 1999 a total of 16,000 pike, in 2003 a total of 20,000 pike and in 2004 a total of 20,000 pike were stocked in the lake.

WINTERING RIVER NWR

This is a 239-acre National Wildlife Refuge in southern McHenry County. The Service purchased 160 acres as a WPA. This is the only easement refuge that has mostly Type IV wetland habitat. A dike and diversion ditch create a 157-acre marsh.

In 1985, a new water control structure was installed to help maintain deeper water for cattail control. The marsh has a few openings but is still choked with cattails. Good runoff in the watershed during June kept a good flow going through the WPA for part of the year. The water was two inches below the spillway level during the spring but by late fall the water had dropped to six inches below spillway level.

The heavy stand of cattails provide excellent cover for resident game such as deer and pheasant.