Monitoring and Evaluation Report

Fiscal Year 2009

Midewin National Tallgrass Prairie

USDA Forest Service

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Bill Glass

Fiscal Year 2009
MONITORING and EVALUATION REPORT

MIDEWIN NATIONAL TALLGRASS PRAIRIE

Executive Summary

This report documents Land and Resource Management Plan (Prairie Plan) monitoring completed in Fiscal Year 2009: October 1, 2008 through September 30, 2009. It provides a comprehensive account of our activities based on the Prairie Plan. We have evaluated the monitoring data to determine if management and program direction at the Midewin National Tallgrass Prairie has been effective.

The report also identifies the need for "course corrections" in program management and direction. We are pleased to report that we are "on course" and the activities, projects, and tools that we have been applying are working as intended. Additionally, specific recommendations to further Prairie Plan implementation are included at the end of certain sections to aid in identifying potential future projects.

The Prairie Plan, implemented since February 2002, requires detailed planning at the "site-specific" level in compliance with the National Environmental Policy Act (NEPA). During plan implementation, analysis of environmental effects is conducted for site-specific projects. Once a decision is made to begin site-specific activities such as building a new recreation trail or starting a new restoration, we monitor changes to relevant resources to see if we are doing what we said we would. In FY2009, the Prairie Supervisor made four decisions to approve proposals for special uses (gas pipelines), restoration, and demolition of old Army infrastructure.

Activities undertaken in Fiscal Year (FY) 2009 (October 1, 2008 - September 30, 2009) towards fulfillment of Midewin's Prairie Plan goals and objectives include:

1. Restoration of tallgrass prairie ecosystems and investment in long-term prairie ecology on over 6,000 acres, made possible with support from key partners.
2. Preparation of NEPA analyses and making site-specific decisions for planned restoration projects; four NEPA analyses were completed in 2009.
3. Production of native prairie plant seeds to increase Midewin's capacity to meet restoration goals.
4. Maintenance of existing infrastructure and prairie conditions for future use, including grazing, mowing grasses and noxious weeds, and road maintenance on 6,592 acres.
5. Construction of new recreational facilites, including new trails, bridges, and a scenic overlook.
6. Maintaining and improving access for public recreation in FY2009 on 7,200 acres of Midewin based on the U.S. Army's cleanup schedule.

7. Offering a variety of environmental education programs such as Mighty Acorns, the El Valor partnership, South Point Academy, tours, and a lecture series, to reach out to over 1,800 people of all ages.

Continued monitoring with generous contributions from many hard-working volunteers and partners has allowed us to observe and record the effects of actions taken to implement the Prairie Plan. Our team has evaluated the data collected in FY 2009 and from previous years and we have made the following conclusions:

- We are meeting the Prairie Plan goals and objectives.
- The Prairie Plan management prescriptions are being applied appropriately.
- The results of land management are responsive to the key issues, concerns, and opportunities.
- New issues, concerns, and opportunities have been adequately addressed.

In summary, we have determined that the desired outcomes in the Prairie Plan are being met, and that the assumptions made during the initial planning stages are still valid today.

Thank you to each person, group, and organization, and to all of Midewin's partners who have made, and continue to make, lasting contributions at Midewin. Volunteers bring a wonderful diversity of skills and knowledge that enhance native seed production, trail construction and maintenance, environmental education, heritage projects, and many other activities. Your combined efforts have greatly furthered restoration efforts and development of recreation facilities at Midewin.

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Introduction

This report documents monitoring and evaluation results for Fiscal Year 2009. The Midewin National Tallgrass Prairie (Midewin) continues to be a "prairie under construction," as restoration of tallgrass prairie ecosystems alters the former Joliet Army Ammunition Plant landscape into one that more closely resembles conditions that existed before European settlement of the region. The potential for Midewin is that of a vast beautiful prairie, rich with natural and cultural resources that visitors will experience to a greater degree in future years.

Why we monitor

The Prairie Plan lists specific monitoring questions and this report responds to those questions for FY2009 and determines:

1. Whether the goals and objectives outlined in the Prairie Plan are being met;
2. Whether management prescriptions are being applied appropriately;
3. Whether the results of land management are responsive to the key issues, concerns, and opportunities;
4. Whether new issues, concerns, and opportunities are arising;
5. Whether environmental effects are occurring as predicted; and
6. Whether costs of implementing the Prairie Plan are as predicted.

Monitoring responses to these questions and the resulting evaluation are the tools used to help determine the success or shortcomings of Prairie Plan implementation, and if the desired outcomes are being realized, and if the assumptions in the initial planning stages are still valid. Through this monitoring and evaluation process, we assess the quality of Prairie Plan implementation and determine if there is a need for change in the Plan direction. Monitoring addresses the physical, biological, social, and cultural elements along with any emerging issues. Evaluation addresses the results of monitoring, and makes recommendations for amendments, revisions, or changes in management direction to the Prairie Plan.

The Midewin Land and Resource Management Plan (Prairie Plan) was approved in February 2002 and amended in 2008. This report covers activities occurring during fiscal year 2009, providing answers to monitoring and evaluation program questions outlined in Chapter 6 of the Prairie Plan.

Monitoring and Evaluation Results

The monitoring results that follow reflect the specific monitoring questions in the Midewin Prairie Plan *Monitoring and Evaluation Plan* (Chapter 6). Questions listed in the Prairie Plan pertain to specific monitoring items. The narratives for each monitoring question include evaluation of the monitoring results. Trends that can be discerned from the monitoring results are also addressed.

Program Accomplishments

Determine how well objectives have been met by quantitative comparison of outputs and services with those projected by the Plan.

Table 1. Proposed & actual management activities & actual accomplishments: FY 2007-2009.

National Forest Fund Code	Project Description	FY 2007	FY 2008	FY 2009
CMFC Facilities Capital Improvements and Maintenance	Implement annual maintenance of Administrative Site. Design and build a visitor center.	No new facilities constructed in FY 2007	No new facilities constructed in FY 2008	No new facilities constructed in FY 2009
CMRD Roads Capital Improvements & Maintenance	Eliminate backlog of deferred maintenance for administrative roads (approx. 5 miles/year). Decommission unneeded roads in sensitive habitat, near tracts of native vegetation, & those that fragment grassland habitat or traverse wetlands or streams (approx. 10 miles/year, as funds allow).	3 miles of roads decommissioned	1.3 miles of roads decommissioned	1.9 miles of roads decommissioned
CMTL Trail Capital Improvements & Maintenance	Designate & maintain interim trails. Design & build permanent trails.	19 miles on interim trail maintained by mowing. Construction for West Side permanent trail continued.	19 miles of interim trail maintained by mowing Construction of the West Side trail continued. Construction of the Prairie Creek Loop Trail began.	19 miles of interim trail maintained by mowing Construction of the West Side trail continued.

National Forest Fund Code	Project Description	FY 2007	FY 2008	FY 2009
CWFS – Other Cooperative Funds	Deposit cooperator funds and donations; spend on authorized projects.	CenterPoint collected funds used for Middle Grant Creek and Drummond Floodplain restorations. The Wetlands Initiative partner funds used for Blodgett Road Dolomite Prairie and Drummond Floodplain restorations.	CenterPoint collected funds used for Middle Grant Creek and Drummond Floodplain restorations. ExxonMobil collected funds used for Dolomite Prairie restoration.	ExxonMobil collected funds used for Dolomite Prairie restoration.
DMDM Backlog Maintenance	Demolish former Army facilities and infrastructure as funds allow. Started with 22 transite warehouses and 16 railroad trestles.	Demolished 12 buildings: 10 Bunkers and 2 warehouses	13 Buildings Demolished	No sites were demolished in FY2009.
FDFD Recreation Fee Demo Program	Improve visitor facilities & services.	Maintained parking lots; provided portable toilets; provided interpretive programs	Maintained parking lots; provided portable toilets; provided interpretive programs	Maintained parking lots; provided portable toilets; provided interpretive programs
HWHW Hazardous Waste	Continue environmental coordination & support. Continue wetlands & drainage confirmatory sampling for arsenic in fence lines, railroad ballast, and Kemery and Doyle Lake sediment.		No Hazardous waste removed	No Hazardous waste removed
LALW Land and Water Conservation Fund	Emphasize acquisitions that further Plan objectives and improve access for restoration and recreation.	No new lands acquired using this fund	No new lands acquired using this fund	No new lands acquired using this fund
NFIM Inventory Monitoring	Conduct above project level integrated resource inventories, inventory planning design, documentation, field data collection, data management and stewardship, and prepare reports. Maintain resource information systems; produce annual monitoring and evaluation report.	TES Monitoring: 10,668 acres Heritage Inventory: 617 acres	TES Monitoring: 10, 484 acres Heritage inventory: 1,303 acres	TES Monitoring: 9,166 acres Heritage inventory: 413 acres
NFLE Law Enforcement	Support Forest Service LE activities.	LE activities supported	LE activities supported	LE activities supported

National Forest Fund Code	Project Description	FY 2007	FY 2008	FY 2009
NFLM Land Ownership Management	Administer & monitor special use permits. Continue boundary & title management.	8 special use permits for agricultural use; 4,670 acres	5 special use permits for agricultural use; 4,574 acres	9 special use permits administered; (4 for utility or road easements, 5 for agriculture use on 4,672 acres)
NFN3 Native Plant Materials	Expand production of appropriate native plants for habitat restoration and other needs. Initiate/expand native plant/pollinator gardens for public education and habitat.	$73,000, used to purchase 3,500 plants and grow >30,000 native plant plugs; install plants and plugs to enhance restored prairie and wetlands for pollinators.	$3,000, used to purchase >2,400 plants to install in native plant and pollinator gardens.	$25,000, used to purchase 2,500 native plugs for installation in pollinator gardens, and to hire STEP seasonal to install native plants in seed production beds.
NFPN Forest Planning	Maintenance of existing Plan; prepare amendments as needed.	Amendment will be completed in FY2008	Amendment signed June 26, 2008	No Amendment needed.
NFRG Grazing Management	Administer & monitor grazing permits for enhancement of grassland bird habitat (approx. 800-4,000 acres/year).	4,525 acres, 12 grazing permits, 11allotments managed.	4,525 acres 11 grazing permits, 11 allotments managed. 1 permit was cancelled.	4,525 acres 10 grazing permits, 10 allotments managed.
NFRW Recreation/ Heritage/ Wilderness	Outdoor recreation & management. Heritage resource protection, preservation, & interpretation. Environmental education (EE) programming. Interpretive tours & activities.	Recreation: Opened 808 additional acres to total 7,200 acres open for public use. Continued construction of west-side trail. Completed Bailey Bridge. Opened 2 new permanent trailheads. Began construction on a new wayside exhibit. Heritage: 9 site surveys; 9 new sites identified, 3 sites requiring further NRHP investigation EE: 10 lectures, 900 Mighty Acorn students, EL Valor camp and Urban Academy.	Recreation: 7,200 acres open for public use -- no new areas opened in FY08. Continued construction of the west side trail. Completed the construction of 2 bridges for the multiple use portion of the West side trail. Completed the conversion of a trestle to a multi-use bridge. 1.5 miles of trail constructed in Prairie Crk Woods. EE: 10 lectures with approx 327 participants, 900 Mighty Acorn students. Reached approx 2,800 student contacts through Conservation Ed.	Recreation: 7,200 acres open for public use -- no new areas opened in FY09. Construction continued on West Side Trail. Scenic overlook completed. Completed conversion of a trestle to a multi-use bridge and constructed a fiberglass bridge. 2.2 miles of trail constructed. EE: 10 lectures with approx 327 participants, 900 Mighty Acorn students. Reached approx 1,000 student contacts through Conservation Ed.

National Forest Fund Code	Project Description	FY 2007	FY 2008	FY 2009
NFSD – SCSEP Senior Community Service Employment Project	Hire and train 2-3 senior employees each year.	NA	NA	NA
NFVW Vegetation and Watershed Management	Begin implementation of South Patrol Rd and Mola-Hoff Rd wetland restoration projects (approx. 250-500 acres/yr). Continue native seed production. Develop wetland seedbed. Assess and maintain watershed conditions at Prairie, Jackson, and Grant Creeks. Monitor air quality. Control noxious weeds (approx. 200-500 acres yearly). Continue removal of woody vegetation in fence & hedge rows to connect fragmented areas. Implement NEPA decision on IPM herbicide use.	Restoration continued at South Patrol Road, Rt 66 Prairie, Middle Grant Creek Woods. Additional species & area added to seed bed production 2,034 acres treated for noxious and invasive plants.	Restoration continued at South Patrol Road, Route 66 Prairie, Middle Grant Creek Woods 3,696 acres treated for noxious and invasive plants by mowing.	Restoration (including invasive plant control) continued at South Patrol Road, Rt 66, Middle Grant Creek, Prairie Creek Woods, Lower Drummond areas, totaling approx. 1,425 acres. Restoration also initiated at Grant Creek Annex (74 ac.). Additional forb, grass, & sedge species added to seed bed production; first harvest off new native grass fields. 3,341 acres treated for noxious and invasive plants. Of this total, 480 acres controlled through partners or other agreements.
NFWF Wildlife Fisheries Habitat Management	Conserve and recover TES species and ecosystems (leafy prairie clover, white fringed prairie orchid, and other sensitive species). Continue restoration of Blodgett Road Wetlands; continue grassland bird habitat management through conversion of former cultivated land to either grassland or native vegetation by approximately 150 acres yearly. Manage up to 4,000 acres per year of grassland bird habitat, including invasive shrub and tree removal by hand or mechanical tools.	Managed 20 acres of dolomite prairie to protect TES. Restoration continues at Middle Grant Creek (502 acres) and Drummond Floodplain (470 acres). 160 acres converted to grassland. 14, 346 acres under active management Tree and shrub removal within the Drummond Floodplain and Middle Grant Creek Restoration acres to improve grassland bird habitat- 217 acres	Managed 20 acres of dolomite prairie to protect TES Restoration continues at Middle Grant Creek and Drummond Floodplain for a total of 6,481 acres in restoration 115 acres converted to grassland 13, 412 acres under active management	Managed 20 acres of dolomite prairie to protect TES Restoration continues at Middle Grant Creek and Drummond Floodplain for a total of 6,117 acres in restoration 98 acres converted to grassland 10,987 acres under active management

National Forest Fund Code	Project Description	FY 2007	FY 2008	FY 2009
PIPI Midewin Rental Fees	Collect fees for authorized agricultural use & implement grassland habitat management projects, including needed equipment, fencing, mowing, and seeding of grasses.	Brush control treatment 595 acres-heavy mowing. Herbicide treatment on restoration areas totaling 657 acres. Purchase of large bat-wing mower to mow invasive species. Continued railroad tie removal to allow prescribed burning. Construction of cattle fence to allow enlargement of grassland wildlife management areas. Pasture seed for planting grassland wildlife management area	Brush control treatment 595 acres-heavy mowing. Herbicide treatment on restoration areas totaling 657 acres. Continued railroad tie removal. Pasture seed for planting grassland wildlife management area	Brush control treatment 4,779 acres-heavy mowing. Purchased seeds and plant plugs for prairie and wetland restorations. Pasture seed for planting grassland wildlife management area Construction of cattle fence to allow enlargement of grassland wildlife management areas.
PRPR Midewin Restoration Fund	Collect authorized fees from salvage projects and implement priority projects.	No fees were collected	No fees were collected	No fees were collected
WFHF Hazardous Fuels Reduction	Plan, treat, and manage vegetation by mechanical treatment, prescribed fire, and other strategies. Monitor and document treatment. Continue to implement 2001 Prescribed Fire EA decision. Treat approximately 200 – 1,000 acres/year.	Fuels Treatment 1,038 acres prescribed burned. 555 acres mowed.	Fuels Treatment 1,700 acres prescribed burned.	Fuels Treatment 1,080 acres prescribed burned and nearly 6,592 acres of (integrated) hazardous fuels treatments in FY2009.
WFPR Wildfire Preparedness	Meet minimum firefighting production capability at Most Efficient Level.	Capacity=9 chains built/hour	Capacity=9 Chains built/hour	Capacity=9 Chains built/hour

Budget: How fiscal year 2009 program funding was utilized

The Prairie Plan is the basis for developing multi-year program budget proposals and the annual program of work. Actual funding levels appropriated by Congress have determined the rate of implementation of the Prairie Plan. The federal budget is appropriated on an annual basis by the United Stated Congress for fiscal years (from October 1 through September 30). Midewin leverages the allocated appropriated funds through cooperative partnerships and volunteer contributions.

Table 2 shows annual appropriated funds for Midewin.

Table 2. Fiscal Year 2009 Budget

FUND CODE	TITLE OF FUND CODE	FY2005 FINAL	FY2006 FINAL	FY2007 FINAL	FY2008 FINAL	FY2009 FINAL
CMFC	Facilities Capital Improvement/Maintenance	$569,000	$97,207	$100,000	$100,000	$88,000
CMII & CP09	Deferred Maintenance	$175,000	$638,736	$244,000	$0	$257,000
CMLG	Legacy Roads	$0	$0	$0	$0	$144,000
CMRD	Roads Capital Improve./Maint.	$306,000	$40,305	$209,000	$235,000	$244,000
CMTL	Trails Capital Improve./Maint.	$167,000	$616,943	$135,000	$148,000	$122,000
FDCL	Recreation Enhancement	$0	$0	$0	$0	$10,000
FDDS	Recreation Enhancement	$0	$0	$0	$0	$41,000
GBFB	Gifts and Banquets	$0	$0	$0	$0	$10,000
HTAE	Federal Highways	$0	$0	$0	$0	$1,000
HTAP	Federal Highway Aquatic Passage	$0	$0	$0	$0	$10,000
HTRP	Public Lands Transportation Plan	$0	$0	$0	$0	$5,000
LALW	Land Acquisition	$25,000	$11,000	$15,000	$15,000	$5,000
MSEQ	Administrative Visitor Maps	$0	$0	$0	$0	$1,000
NFIM	Inventory / Monitoring	$375,000	$193,000	$180,000	$251,000	$231,000
NFLM	Land Ownership Mgt.	$99,000	$57,000	$63,000	$71,000	$84,000
NFMG	Minerals / Geology Management	$0	$50,000	$53,000	$53,000	$53,000
NFN3	Native Plant Materials	$0	$0	$0	$0	$25,000
NFPN	Planning	$58,000	$49,000	$168,000	$102,000	$90,000
NFRG	Grazing Management	$29,000	$16,010	$17,000	$20,000	$21,000
NFRW	Rec./ Heritage / Wilderness	$843,000	$663,192	$574,000	$593,000	$611,000
NFVW	Vegetation / Watershed Mgt.	$542,000	$427,786	$376,000	$424,000	$453,000
NFWF	Wildlife / Fisheries	$542,000	$399,515	$376,000	$424,000	$422,000
PIPI	Midewin Rental Fees	$1,295,000	$1,083,556	$1,083,556	$800,000	$800,000
QMQM	Quarter's Maintenance	$0	$0	$0	$0	$6,000
TRTR	10% Roads and Trails	$51,000	$1,000	$53,000	$0	$0
URMN & URCP	Restoration Trust Funds	$0	$0	$0	$0	$2,000
WFHF	Hazardous Fuels Reduction	$57,000	$77,157	$98,000	$82,000	$87,000
WFPR	Fire Preparedness	$914,000	$679,662	$455,000	$662,000	$512,000
WFW3	Rehab and Restoration	$0	$46,300	$0	$0	$250,000
TOTAL		**$5,954,000**	**$5,147,369**	**$4,199,556**	**$4,262,000**	**$4,585,000**

Volunteer Program

How have volunteers and partners contributed to the Midewin?

The volunteer program is critical to three of the four primary objectives of Midewin's mission: restoration, education, and recreation. The volunteer spirits and accomplishments provide a strong momentum that Midewin relies on to stay true to its mission.

The 1,188 **restoration volunteers** in FY2009, including youth program students, helped complete many projects and seasonal tasks. Volunteers helped harvest and clean over 500 pounds of native seed from over 150 different species collected from Midewin's production seedbeds and wild sites. Volunteers also seed many plug trays in order to replenish the native plant stock as it is planted each year in restoration sites. The Mighty Acorns also contributed 570 hours harvesting seed in the fall, planting plug trays in the winter and removing garlic mustard in the spring.

Year round, horticulturist Eric Ulaszek teaches several **botany classes** to about 20 volunteers desiring to refine their plant identification skills. To aid as an identification resource, the size of Midewin's herbarium is consistently increasing with the help of two volunteers mounting and labeling dried specimen.

It is essential that we monitor wildlife in the natural areas and restored areas in order to determine which management practices yield the best results. Each year the numbers of skilled volunteers has been increasing. Volunteers gain skills through training workshops organized by the Volunteer Coordinators and through experience. Midewin has 109 trained monitors who track diversity and distribution of frogs and toads, birds, butterflies, stream macroinvertebrates, and rare plants. This data is shared with partners such as Illinois Natural History Survey, Illinois Butterfly Monitoring Network, The Nature Conservancy, Illinois RiverWatch and Chicago Botanical Garden (CBG) Plants of Concern. The data collected is used to reflect progress at Midewin and contributes to the larger monitoring effort regionally or state-wide.

Volunteer recreation staff built the Grant Creek Bridge in preparation for new trail development.

In FY2009, 149 **recreation volunteers** including youth program students, completed several projects that have improved recreation experiences at trailheads and on trails. Volunteer projects included assembling the Twin Oaks trail bridge, mowing

trails, constructing a fence at the Prairie Creek Woods trail, construction of the Grant Creek Bridge, including laying and seeding erosion control blankets, and installing trail markers on the new Grass Frog trail. El Valor students planted more native plants in the pollinator garden at the Iron Bridge Trailhead. The Wilderness Volunteer group traveled from all over the United States to camp in Midewin's interim campground while they built a wooden overlook at Buttonbush Pond. Midewin continues to work with a developmentally challenged group at Trinity Services who help landscape the Midewin headquarters.

The 41 **heritage volunteers** in FY2009 were dedicated to protecting and restoring Midewin's historical sites and stories. This group maintains and mends headstones in Midewin's pioneer cemeteries. The group also cleared invasive brush from the Moses-Morgan and Rogers historic farmsteads. The oral history program was revived by interviewing additional individuals that are former arsenal employees or descendants of farmers. An Eagle Scout, with his crew, designed and installed a bench and sign that interprets the history of the Bailey bridge built by Midewin volunteers. The Heritage Association volunteers spend many hours researching the history of Midewin and communicating the importance of protecting and interpreting our heritage. This group keeps the public informed with the *Prairie Wind* newsletter and by leading heritage tours.

The 63 **education volunteers** in FY2009 continued to educate the public with various interpretive, sightseeing tours, the youth programs, and at the Welcome Center. The most popular tours are still the heritage tours that take visitors to the old infrastructure of the ammunition factory, the pioneer cemeteries, and the historic farmsteads. Volunteer instructors lead nature activities and stewardship for 800-900 students three times a year in the Mighty Acorns program. These same instructors are called upon to lead activities for the El Valor summer camp and additional youth groups throughout the year. Midewin's volunteers also continue educating themselves by attending a series of lectures presented each winter at Midewin by professors, staff, and researchers.

Annual events at Midewin attract large volunteer groups. On National Public Lands Day 2009, Midewin Forest Service staff joined forces with 120 volunteers and spent 320 hours in six different projects. Volunteers harvested large amounts of native seed at the River Road seedbeds. They installed and seeded erosion control blankets at the new Grant Creek Bridge. Trail markers were installed along the new Grass Frog trail. Many cottonwoods and ash sapling thickets were removed from the South Patrol Road wetland restoration. Headstones were cleaned at the Starr's Grove cemetery. This day was also used as a training workshop for a new stream monitoring program.

The Earth Day celebration event is an important tradition to pull invasive garlic mustard. This year, volunteers spent over 80 hours at Bluebell woods giving wildflowers a chance to thrive by removing well over 100 pounds (hydrated weight) of garlic mustard.

Clubb Shedd helps remove hundreds of invasive garlic mustard plants in Bluebell Woods.

In November each year, Midewin hosts a Volunteer Recognition Banquet to present year end accomplishments and deliver awards to star volunteers. This event is a way to celebrate, reminisce, and express our admiration for the volunteers.

The **Midewin Alliance** is a 501(c)3 partnering coalition with over 100 members. The strength of the Alliance is in the dozen volunteer board members who play an integral role in finding funding for events and programs such as National Public Lands Day, the Volunteer Recognition Banquet, and Mighty Acorns youth program. They organize other annual events including the Jewel Shop & Share fundraiser and the Native Plant Sale. The Alliance is responsible for the production and distribution of the bimonthly Prairie Telegraph. A few Alliance members are involved with the research and design for a new souvenir guide to sell in the Welcome Center gift shop. An organization of the Alliance called the Midewin Interpretive Association (MidIA) operates the gift shop in the Midewin Welcome Center.

Highlights and new programs of FY2009

In FY09, Midewin received the 2008 US Forest Service Volunteer Award, a national award, for Midewin's volunteer program. In addition, the US Forest Service National Grasslands Council presented a Research & Technology Award to Midewin's Restoration Team and Volunteers for its success in starting the conversion of the former Joliet Arsenal to native wildlife habitats.

Three new volunteer programs were implemented in FY2009. After three years of training, thirteen volunteer botany students, mentioned above, contributed 343 hours to monitoring vegetation at the South Patrol Road and Route 66 restorations. This monitoring was formerly completed by the Illinois Natural History Survey staff that was also responsible for training the volunteers.

An additional breeding bird volunteer monitoring program was implemented and nine volunteers were trained for the pilot year.

Table 3. Volunteer Hours in by Resource Category.

Resource Category*	Hours
Recreation	997.5
Heritage	312.25
Wildlife, Fish & Rare Plants	1,638.5
Range Management	0
Forest Management	2,910
Watershed & Air Management	0
Protection	0
Research	0
Business & Finance	723
Facilities Construction (Off-Center)	0
Facilities Construction (On-Center)	0
Other Facilities	89.5
Other (Defined in Remarks)	1964
Total Hours	8634.75
Appraised Dollar Value	*$180,034.54*

***** The categories reflect 'Resource Category' as defined in the USDA Forest Service 'Senior, Youth & Volunteer Programs Accomplishment Report,' FSM1800-16.

One volunteer site steward was recruited for a pilot program in which volunteers lend support on designated areas or trail sections on Midewin.

Table 4 shows that the volunteer base has increased. Midewin's volunteers express that they continue coming back because of a passion for the outdoors for and the history surrounding this area. In addition, volunteers feel we are all on the same staff working towards a common mission. Volunteers enjoy identifying their interests and in turn, gaining experience and independence. The Volunteer Coordinator and Assistant Volunteer Coordinator work hard to recruit, train, protect, and recognize the amazing Midewin volunteers.

Table 4. Comparison of Volunteer/Youth Numbers, Hours, and Percent Change between FY08 and FY09

	FY06	FY07	FY08	FY09	Δ FY08-FY09	% Δ FY08-FY09
Number of Volunteers	413	375	384	586	+202	+53%
Volunteer Hours	11,005	6,687	6,758	7,749	+991	+15%
Number of Conservation Education Students	NA	1,269	921	863	-58	-6%
Conservation Education Stewardship Hours	NA	2,289	1,474	886	-588	-40%

Agriculture Use

Are continued agriculture permits used for resource management purposes?

Agricultural special use permits or leases continue to be used for resource management purposes at Midewin. Specifically, agricultural permits are used to control invasive plant species until areas can be converted to native vegetation or grassland wildlife habitat. These areas, if left idle, would be a major source of invasive plant invasion throughout Midewin. Agricultural crops are also used at Midewin to prepare sites for planting prairie and wetland vegetation and grassland bird habitat. The agricultural production controls invasive species prior to planting and provides an excellent seedbed to plant native prairie seed.

The trend has been to remove agricultural fields from production to provide habitat. As of the end of FY09, approximately 3,860 acres have been successfully removed from crop production and converted to native habitat, grassland wildlife habitat, or seed production (see Table 5). This trend may level off in the future because of the increasing need to control invasive plant species in lands already converted. The first few years of conversions require the most invasive plant species control. Additional large conversion areas would increase this workload to the point that the quality control could drop, threatening major investments already made.

Planting Pasture Grasses

The current crop rotation is between Roundup-ready soybeans and winter wheat. Corn has been excluded from this rotation because of the chemicals (pesticides and fertilizer) necessary for production. The Asian soybean rust arrived in the continental US in 2004 and is devastating to soybean production. Currently the rust is more prevalent in the southern states, but is expected to travel north. The fungus could have an impact on the use of soybeans for future management and may need to be treated with a fungicide.

Hay permits are utilized in grassland wildlife management areas to control grass height and woody plant invasion. All hay is cut after August 15th to protect ground-nesting wildlife.

Both soybeans and wheat have been used at Midewin prior to the planting of native vegetation or for site preparation. Site preparation with a crop of soybeans has resulted in fewer invasive plant species. Invasive plant species appear to survive in the wheat field or may colonize after the harvest of wheat in the summer.

Table 5. Agricultural Permits

FISCAL YEAR	Acres Removed from Crop Production Per Year	TOTAL acres authorized for agriculture includes new acquisitions or additions for seed bed preparation
1997 to 2002	1,894	
2003	343	3,998
2004	695	3,664
2005	238	3,112
2006	317	3,937*
2007	160	4,670*
2008	115	4,574*
2009	98	4,672
TOTAL acres removed from production and converted to grassland or prairie.	3,860	

* In 2006, additional land was transferred from the Army, which included cropland. In some years, hay fields were added to the agricultural permits program. Often non-agriculture lands have been put into row crops as a preparation to planting native vegetation or pasture. These factors account for the temporary increases in acres authorized for agriculture use from previous years.

Recommendations:

1. Continue agricultural practices to assist in the restoration process and control invasive species.
2. Maintain current levels of agriculture until levels of invasive plant infestations in currently converted areas are under better control, and only then convert more fields to native prairie or cool season pastures.
3. Keep recently transferred acres in agriculture and return agricultural practices to idle fields to control invasive plants species.
4. Two years prior to prairie and wetland restoration, cultivate Roundup-ready soybeans to control invasive plants.
5. Monitor soybean rust developments and prepare NEPA for the possible use of fungicides for control of the rust.

How many acres are under grazing or special use permits?

Grazing is used as a management tool to control grass height and provide habitat for grassland wildlife. At the end of FY09, there were ten grazing allotments--one west of Route 53 and the remaining nine allotments east of Route 53. The acres grazed should continue to increase over the next several years, and then will probably level off. It takes several years after conversion to cool season pasture grasses before a tract is ready for grazing, which accounts for the lag period between conversion and actual grazing expansion. Once invasive control in the existing pastures is in the less costly maintenance phase, additional conversion from crop production to

grazing can take place. As of the end of FY2009, 738 acres removed from crop production and converted to pasture were being prepared for grazing. Further seeding, invasive control, water sources, and fences are being planned and developed.

Table 6. 2002-2009 Grazing

YEAR	Grazing Program* (Acres)
2002	1,996
2003	2,461
2004	2,822
2005	3,467
2006	4,525
2007	4,525
2008	4,525
2009	4,525

**Each year some pastures are taken out of grazing for a brief period for rest and grassland renovation. For example in 2008 and 2009, 3,882 acres were actually grazed and 683 acres were rested and began grassland renovation. However, a total of 4,525 acres remain under the grazing program.*

Environmental analysis to develop new watering sources (wells) and stock watering ponds that can be used by other wildlife is currently underway. This would improve management of grassland bird habitat for better distribution of cattle within the allotments and would allow additional allotments to be grazed.

Recommendations:

1. Continue grazing permits to provide habitat for grassland wildlife.
2. Maintain current acres grazed on Forest Service lands until levels of invasive plant infestations are under better control.
3. High priority should be given to controlling invasive trees and shrubs and repairing fencing in pastures recently transferred from the Army.
4. Start shifting cattle grazing from the west side of Midewin to the east side pastures as specified in the Prairie Plan.

How many acres of former agriculture land use are being restored?

For the period between 2002 and 2009, approximately 3,056 acres were taken out of crop production and planted to cool season pasture grasses. The 2006 planting was replanted to row crops for the short term as site preparation, due to the failure of the pasture planting, and will be replanted to pasture in the near future. Approximately 628 acres of former crop fields have been converted to native vegetation during the last decade. No additional seed production fields have been added since 2004.

Conversion of agricultural land use to cool season grass pasture and natural vegetation should slow down over the next few years, for reasons noted above under agriculture and grazing. Conversion to prairie and wetland communities has slowed down due to supplemental work needed on areas already converted.

Table 7. Agricultural Land Restoration

Fiscal Year	Cool Season Grass Pasture and Hay Field Conversion	Prairie and Wetland Conversion	Seed Production
1997 - 2002	1,749	-	145
2003	293	50	-
2004	176	488	31
2005	235	3	-
2006	317	-	-
2007	160	-	-
2008	115	-	-
2009	11	87	-
TOTAL	3,056	628	176

Recommendations:

1. Slow conversion until invasive plants are under better control in tracts previously converted.
2. Slow conversion to natural communities until supplemental restoration activities has decreased on tracts already converted.
3. If additional staffing, funding, or partnership help becomes available increase conversion of agricultural lands to cool season pasture or restored prairie.
4. Develop environmental assessments for new native vegetation restoration areas. Partners have expressed interest in continuing restoration partnerships with Midewin into new areas.

Air Quality

Is Midewin causing significant deterioration of air quality (contributing to air quality problems)?

During FY2009, activities at Midewin did not result in significant sources of air pollution or contribute to the deterioration of air quality. Midewin obtained the necessary permits from the Illinois Environmental Protection Agency (IEPA) prior to conducting 1,080 acres of prescribed burns. Midewin prescribed burns did not occur during ozone action days. Midewin participated in the development of the Illinois Smoke Management Plan during FY2008 that was finalized in FY2009.

Recommendations:

1. Pursue a Memorandum of Agreement with IEPA concerning the Illinois Smoke Management Plan.

Capital Infrastructure

Have adequate facilities been provided?

No new facilities were constructed in FY2009. The facilities master plan identified the following structures that may be needed in the future: warehouse, bunkhouse, Iron Bridge Outdoor Learning Center, River Road Seed Bed Learning Center, and additional greenhouses.

Former Army Facilities Removal

Are former contaminated areas being restored?

Midewin has not acquired any of the areas deemed as former contaminated areas. In FY2009, Army administered contracts to "clean up" the contaminated areas prior to a future land transfer to Midewin.

Ecosystem Restoration and Management

Are unfragmented blocks of grassland bird habitat being created or maintained?

Fragmented grassland wildlife habitat is primarily grassland that is divided by tree lines, hedgerows, scattered large trees, numerous shrubby woody plants, and/or old Army infrastructure, which results in smaller less desirable habitat compartments. Many types of grassland wildlife, especially grassland birds, are sensitive to nearby woody vegetation and require large open spaces for optimum breeding and rearing of their young in the grasslands.

To unfragment grassland habitat requires the removal of trees, shrubs, and/or manmade infrastructure to create large contiguous open spaces. The Prairie Plan calls for five large unfragmented areas that range in size from 501 acres to over 3,000 acres. Prairie and wetland restoration work also creates unfragmented habitat. Once an area is unfragmented, then continuous management is needed to keep it in that state, otherwise woody shrubs will soon grow right back. This management can be prescribed burning, grazing, or mowing.

To date, none of the large unfragmented areas identified in the Prairie Plan have been created. However, approximately 1,668 acres within those areas identified as large unfragmented tracts have been opened up. Another 685 acres, (not identified as dedicated unfragmented habitat), have been created by prairie and wetland restoration. In FY2009, approximately 4,779 acres were under mowing management to keep them from becoming further fragmented into smaller habitat parcels.

Existing habitat should be managed as unfragmented in the future to meet the requirements of the Prairie Plan. Until environmental analysis is completed for tree

removal, no additional habitat can be “unfragmented”. Maintenance of existing grassland wildlife areas through mowing and prescribed burning will continue to control re-invasions of trees and shrubs.

Due to the size of Midewin and limited staffing and funding, woody vegetation encroachment continues and in many areas becomes worse every year. Present management includes sites managed for grazing, hay production or natural community restoration areas. Other areas have encroaching trees and shrubs along the many roadside ditches, medians and along linear old railroad beds. Areas that still belong to the Army, but are scheduled to be transferred to Midewin in the near future, are heavily infested with shrubs and will continue to be a source of shrub invasion until they are brought into a management regime.

Funding through the Reinvestment Act (RA) will have a significant positive impact on small trees and shrubs. In FY2009, a five-member hazardous fuels crew was hired through RA funding. Their job was removal of small woody trees and shrubs. Approximately 100 acres heavily infested with autumn olive and bush honeysuckle was cleared. Most of this work continued into 2010. Additionally, RA funded a $1,700,000 project for contractual removal of small trees and shrubs. This work will be completed in 2010 and in 2011. There is the potential for over 5,000 acres to be treated. Other RA projects, such as railroad bed removal may also have some positive impacts since woody invasive plants along the railroad corridors will be removed with the railroad bed. All of this work will help unfragment some of the landscape. However, large trees greater than six inches diameter at breast height (dbh) will remain and possibly removed in the future.

Mowing Brush - Opening Up Wildlife Habitat

Recommendations:

1. Complete environmental analysis for restoring large areas of habitat that are currently fragmented.
2. Continue to unfragment grassland habitat for grassland wildlife; this should occur on a yearly basis.
3. Highest priority for unfragmenting habitat should be given to existing grassland habitat areas, grazing tracts, hay fields, prairie/wetland restorations, remnants, and the areas identified as unfragmented in the Prairie Plan.
4. Continue mowing to control small encroaching trees and shrubs in existing management areas and open up others not presently being managed.
5. Use of herbicide treatment is necessary in many tracts to better control invasive trees and shrubs.

6. Increase the use of prescribed fire in grassland wildlife areas to help control invasive trees and shrubs.
7. Maintain roadsides, medians, and railroad beds with periodic mowing, prescribed burning, and herbicide.

Are habitats being restored?

Restoration includes conversion of croplands to cool season grasses, planting native species, and management activities to improve existing cool season pastures and natural community areas. The initial conversion of croplands to grass fields and native vegetation is only one step in the restoration process. Another important step is the continued management of these converted tracts and any tracts of existing native vegetation. Management includes prescribed fire, invasive plant species control, and the planting of native seeds and plant plugs.

Each year new sites are chosen to begin the restoration process and the acres added vary from year to year. In FY2009, 6,117 acres (Table 8) were under restoration, down from 2008. Not every acre needs treatment each year, hence the

Restoration of Grant Creek includes re-creating wetlands and re-establishing native vegetation.

lower amount in FY2009. The number of acres restored annually is expected to remain level for the near future, because of limited resources and the need to manage the current restoration areas to control for invasive plant species. Rather

than adding additional acres that cannot be managed properly, resources should be spent on maintaining the existing restoration areas.

South Patrol Road

Table 8. Acres Being Restored Annually

Fiscal Year	Acres Receiving Restoration Treatments
2002	2,389
2003	4,107
2004	5,583
2005	5,443
2006	6,333
2007	6,472
2008	6,481
2009	6,117

Some agricultural fields have been converted to grazing tracts. These fields along the eastern boundary of Midewin are in areas designated as grassland habitat in the Prairie Plan. Restoration work for native vegetation has been concentrated on lands west of Illinois State Route 53 following the desired outcomes in the Prairie Plan. Crop fields, old pastures, and abandoned fields have been converted or restored to native plant communities.

Midewin NTP has several key partners to thank for making major contributions towards restoration of native habitat. Without these generous contributions, the progress we have made in restoration during the last decade would not have been possible. Table 9 summarizes the major partner contributions for each project.

Table 9. Partner Contributions to Restoration Projects

Restoration Project	Year Of Partner Assistance	Acres	Primary Partners	Partner Investment
South Patrol Road	2002 - 2004	459	The Wetlands Initiative, CorLands, USACE, IDNR*	$919,000
Route 66 Prairie	2003 -2004	65	CorLands, USACE, Ducks Unlimited	$156,000
Prairie Creek Woods	2002 - 2005	56	CorLands, USACE	$200,000
Middle Grant Creek	2003 -2008	502	CenterPoint Properties	$1,500,000+
Blodgett Road Dolomite Prairie	2002 - 2009	151	The Wetlands Initiative	$600,000+

Restoration Project	Year Of Partner Assistance	Acres	Primary Partners	Partner Investment
Drummond Floodplain	2003 - 2008	510	CenterPoint Properties & ExxonMobil	$100,000+
Lower Drummond	2008 - 2009	206	The Wetlands Initiative	$165,000
ExxonMobil Prairie Donation	2008 – 2009	40	ExxonMobil	$126,000
Grant Creek Prairie Annex	2009 – future	100	The Wetlands Initiative	$20,000
GRAND TOTAL				**$3,786,000**

* USACE -- United States Army Corps of Engineers, IDNR -- Illinois Department of Natural Resources

In FY2009, the Lower Drummond, the ExxonMobil Prairie Donation, and the Grant Creek Annex restoration projects all benefited from cooperative partnerships. The Wetlands Initiative and their donors partnered with the Forest Service to restore hydrology, plant native seeds and plants and to control invasive species in the Lower Drummond restoration project area. ExxonMobil contributed to controlling invasive species in the tract that was donated to the Forest Service.

The Wetlands Initiative started fundraising for restoration work to be done over the next few years at the Grant Creek Annex project area. The Wetlands Initiative is also fundraising for additional acres of restoration in the Grant Creek Annex area. Midewin started an environmental assessment in FY2009 for this project area.

Students from University of Saint Francis began monitoring and restoration work in the Upper Doyle Lake area. Activities during FY2009 included invasive species control, heron rookery monitoring, and photo point establishment.

Recommendations:

1. Continue new restoration partnerships.
2. Complete environmental assessment and resource planning for an expanded restoration area on the west side.
3. Add new restoration projects when funding, staffing, and/or partnership assistance becomes available.
4. Prioritize new restorations to link up with existing and planned restorations.
5. Complete environmental assessment and resource planning for a restoration area within the Kankakee River watershed on the east side of Midewin.
6. Explore new partnerships to expand restoration potential in the future.

How many acres are under management?

For this purpose, resource management activities are defined as mowing, planting (native vegetation and pasture vegetation), herbicide treatment for invasive species, agricultural production, and grazing to manage for grassland bird habitat. The acres

under management will increase over time, but is limited by staffing and budget levels. Table 10 below shows the total acreage in some phase of resource management. Number of acres under management (as defined above) varies from year to year, depending upon specific yearly needs.

Table 10. Acres of Resource Management

Fiscal Year	Area Under Resource Management (Acres)
2002	7,675
2003	9,662
2004	10,900
2005	10,908
2006	13,602
2007	14,346
2008	13,412
2009	10,987

Recommendations:

1. Continue management of existing acreage already under resource management to meet desired objectives.
2. Add resource management to new areas when additional Forest Service funding, staffing, and/or partnership assistance becomes available.

To what extent are vegetation composition objectives being met?

The first year that native vegetation was planted for restoration on Midewin was 2004. For many native prairie and wetland species, it takes several years before they are established and can be accurately identified in the field. In 2006, The Nature Conservancy helped Midewin staff establish a protocol (Plotwise Floristic Quality Assessment) to gather data from restoration sites. That data will be used to measure restoration success and to see if plant composition objectives are being met. Data from major restoration areas will be collected on an annual basis and compared to data from nearby high quality prairie and wetland remnants. It will be several years before there is sufficient data to determine a trend in species composition, but so far, the results are positive.

Table 11 shows the results for several restoration areas compared to Grant Creek Prairie Nature Preserve, which is a high quality prairie remnant that Midewin uses as a target. Although there are only a few years of data, the South Patrol Road and Route 66 prairie restorations are moving towards the Grant Creek Nature Preserve value. Blodgett Road restoration was not monitored in FY2009.

Table 11. Plotwise Floristic Quality Assessment*

Site	2006 FQI**	2007 FQI	2009 FQI
Grant Creek Nature Preserve (a high quality remnant prairie)	17.53	-	-
Blodgett Road Restored Area	10.65	7.24	-
South Patrol Road Restored Area	8.36	9.89	12.70
Route 66 Restored Area	4.66	6.28	9.19

*No data was collected in 2008.
** FQI is the floristic quality index, a comparative measure of plant species diversity.

Another method to evaluate species composition is to determine if the species being introduced are actually established and can be identified in plant surveys. Species lists were developed for the South Patrol Road and Route 66 areas. However, these lists are incomplete as some species are present in small numbers and are not noticed during surveys. Other species, in particular graminoid species, are difficult to find and identify in their early years. The most complete species list exists for the South Patrol Road restoration project where 181 species were seeded or planted, and 119 of these species have been found, representing 65% of the species planted. The actual percentage is probably higher. Considering the relative short period since initial planting and difficulty of locating and identifying young plants, 65% is quite adequate at this time. This number is relatively high in comparison to other local new prairie restorations in Northeastern Illinois. The number of different species established is expected to increase over time.

An additional method of determining if vegetation composition goals are being met is to look at invasive plant species. Invasive plant species can be native or non-native. Early in the restoration process, invasive species can be quite prevalent. With succession and management, the goal is to have fewer overall types of invasive species and smaller frequencies or less area for each invasive species. The Nature Conservancy is assisting Midewin staff to develop a plotwise floristic quality assessment to monitor invasive plant species. This protocol is under development and should be available for future reporting periods.

As the restorations age over the next five to ten years and additional data points are established, the evaluation of composition goals will be more comprehensive.

Recommendations:

1. Continue to monitor South Patrol Road, Route 66, and Blodgett Road restorations using the Plotwise Floristic Quality Assessment. Try to monitor yearly.
2. Expand Plotwise Floristic Quality Assessment to other current and future restoration efforts as staffing and funding is available.
3. Work with The Nature Conservancy to complete development of an invasive Plotwise Floristic Quality Assessment.

4. Explore other methods to monitor vegetation composition goals.


Grassland Wildlife Habitat Managers

To what extent is habitat management reaching desired habitat structure for RFSS birds and reaching Management Indicator goals?

Regional Forester Sensitive Species (RFSS) list of birds at Midewin fall into three categories: wetland birds, grassland birds, and open woodland birds. Wetland birds require wetlands (marsh, sedge meadow, and wet prairie). Restoration activities have restored former wetlands that had been drained by field tiles and drainage ditches. The South Patrol Road and Blodgett Road restoration projects have restored approximately 100 acres of wetlands. Beaver dams can also provide wetland habitat. Where beaver dams on Midewin do not threaten neighboring property or infrastructure, the dams have been left in place. Approximately 70 acres of wetland are being maintained through beaver activity. Wetland birds have been seen using these areas sporadically. Wetlands are starting to form in the Middle Grant Creek restoration project. As this and other wetlands are created, wetland bird use should increase.

Call-back wetland bird surveys in FY2009 located a king rail in South Patrol Road and a yellow rail was seen during the breeding bird survey. King rails have nested on Midewin before and probably did this year. Yellow rails are new to Midewin, only being seen previously during migration. The bird was only seen once, so we do not know the nesting status.

Grassland birds can be placed into three suites: those that prefer short-stature grasses, those that prefer medium-stature grasses, and those preferring tall-stature grasses. Species do overlap the three general suites, but each seems to do best in one of the suites. The most critical grass height habitat at Midewin is the short-stature grasslands. Midewin uses cattle grazing to provide the short-stature grass habitat. Hay mowing and idle pastures provide the mid-stature grass habitat, while the prairie reconstructions and other non-grazed areas provide tall-stature grass habitat. Litter depth can also be important for some grassland bird species.

Grass height and litter depth are monitored during late spring and early summer to determine if the proper habitat structure is being maintained. Ideally, grass height should range from 15 to 80 cm and litter range from 2 to 4 cm in depth to provide habitat for each of the three suites of grassland birds.

Tables Table 12, Table 13, and Table 14 display grass height data collected for the past seven years. No data was collected in 2005, but grass heights would probably

have been similar to 2003 and 2004 since the grazing and management was identical. In 2002 and 2007 -2009, no tall-stature grassland tracts were monitored.

Table 12. Grass structure in pastures (short-stature grass habitat)

Year	Short Grass Acres	Short Grass Height Range	Short Grass Height Mean	Litter Depth Range	Mean Litter Depth
2002	1,335	17-47 cm	30 cm	0.6-2.7 cm	1.7 cm
2003	2,133	10-47 cm	23 cm	0.3-5.2 cm	1.9 cm
2004	2,169	10-53 cm	25 cm	0.3-3.1 cm	1.7 cm
2005	NA	NA	NA	NA	NA
2006	4,071	14-54 cm	31 cm	0.3-3.5 cm	1.6 cm
2007	2,436	14-35 cm	21 cm	0.65-1.96 cm	1.2 cm
2008	3,717	13-32 cm	21 cm	0.4-3.6 cm	1.5 cm
2009	2,083	26-44 cm	34 cm	0.7-2.9 cm	1.5 cm

Table 13. Grass height in idle pastures and hay fields (medium-stature grass habitat)

Year	Mid Grass Acres	Mid Grass Height Range	Mid Grass Height Mean	Litter Depth Range	Mean Litter Depth
2002	195	58 cm	58 cm	2.1 cm	2.1 cm
2003	305	34 cm	34 cm	1.2 cm	1.2 cm
2004	195	46 cm	46 cm	1.7 cm	1.7 cm
2005	NA	NA	NA	NA	NA
2006	396	25-47 cm	36 cm	1.2-2 cm	1.6 cm
2007	1035	26-29 cm	27 cm	0.9-2.63 cm	1.6 cm
2008	177	39 cm	39 cm	1.3 cm	1.3 cm
2009	543	37-40 cm	39 cm	1.1-2.5 cm	1.8 cm

Table 14. Grass height in idle grasslands and restorations (tall-stature grass habitat)

Year	Tall Grass Acres	Tall Grass Height Range	Tall Grass Height Mean	Range Litter Depth	Litter Depth Mean
2002	NA	NA	NA	NA	NA
2003	1,028	34-49 cm	43 cm	0.7-4.9 cm	3.0 cm
2004	592	32-53 cm	42 cm	2.8-2.9 cm	2.8 cm
2005	NA	NA	NA	NA	NA
2006	1,187	31-47 cm	41 cm	0.3-4.1 cm	2.2 cm
2007	NA	NA	NA	NA	NA
2008	NA	NA	NA	NA	NA
2009	NA	NA	NA	NA	NA

Tall-stature grasslands do not differ much from year to year and are given a much lower priority for monitoring. The tall stature grasslands are also much easier to evaluate visually. Grazing tracts are measured more than non-grazing tracts to help determine the proper number of cattle needed to achieve the desired results. The Robel pole method is used to determine grass height.

Analysis of grass height shows that desired grass height ranges are available for the grassland birds, although in FY2009 the short stature grass height was probably too tall overall. FY2009 was a very wet year and the pasture grasses responded by growing more rapidly. The data indicates that the current management is appropriate for grassland wildlife and that no change to the management regime is needed at this time. If increased precipitation levels continue into the future, additional cattle may have to be put out in the grazed areas.

Another structure component is the amount and location of shrubs and trees within the grasslands. Most grassland birds require wide-open areas with little to no shrubs and these areas are often referred to as "unfragmented areas" (see pages 17-18). The loggerhead shrike prefers the short-stature grassland with some shrubs for nesting. As areas are unfragmented by removal of woody brush and small trees, small grouping of shrubby trees are left for loggerhead shrikes along the perimeters. This action has been successful to maintain loggerhead shrike populations. Approximately half of the loggerhead shrike nests found each year are in small areas of shrubby trees on the edges of unfragmented tracts.

Large amounts of shrub habitat covers the Army property that will be transferred to the Forest Service. Unfortunately, most of the shrub species on the Army property are non-native invasive species, and these will continue to be sources of invasive plants until management plans are developed and followed.

The red-headed woodpecker is a bird of open woodlands and savannas. Although red-headed woodpeckers have been known at Midewin for years and are assumed to nest, their current status is unknown. It is believed the population is small. In FY2009 volunteer bird monitoring confirmed at least one pair in Prairie Creek Woods. Further woodland and savanna restoration in Prairie Creek Woods should provide for additional habitat.

In summary, current management plans for restoration and grazing are adequate to maintain the current populations of RFSS birds. To increase RFSS bird population numbers, additional restoration needs to take place. As additional lands are restored, the population numbers should increase. Fine-tuning the grazing regime would be useful, but does not appear to be critical at this point in time.

Recommendations:

1. Continue grass height sampling using the Robel pole method.
2. Analyze numbers of cows with grass heights and any differences between yearling and mother/calf operations.
3. Correlate the population of grassland birds with grass height and type of cattle operation.
4. Continue to provide isolated shrubby habitat along edges of open grasslands for loggerhead shrikes and other shrubland birds.

5. Develop a periodic monitoring protocol to monitor the status of the red-headed woodpecker.
6. Continue woodland and savanna restoration in Prairie Creek Woods to increase the amount of appropriate habitat.
7. Identify areas for shrubland wildlife and develop plans to restore these areas to appropriate habitat.

Environmental Education/Interpretation

Are tours, interpretation, and environmental education programs meeting objectives?

The goal of interpretation and environmental education at Midewin is to enhance the public's awareness and appreciation of prairies in Illinois and motivate participants to become advocates for prairie conservation and restoration. This year the program faced additional challenges, as two positions (interpretive specialist and environmental education specialist) were vacant for over six months. In the interim, the program was run by seasonal employees and volunteer coordinators with extra support from our veteran volunteers. In January 2010, a new environmental education specialist was hired. Midewin's interpretive and environmental education programs continue to focus on the following program activities:

Midewin Welcome Center

The Welcome Center was open to the public for the entire year. Visitation for FY2009 was 4,836 people. The interpretive sales outlet provided by the Midewin Interpretive Association (MidIA) also operated for the entire year.

Midewin Explorations

Midewin offered a full range of on-site interpretive programs during FY2009. The number of tour participants in FY2009 was 669. This represents a large increase from the previous year (312). This success is likely due to fees being dropped and greater press release coverage in Saturday papers. The environmental education specialist is currently working to improve the tour program and increase local awareness.

Midewin Lecture Series

FY2009 was the seventh year for the Midewin Lecture Series. This series of ten biweekly evening lectures during the winter months is designed to introduce participants to the natural and cultural history of Midewin and northeastern Illinois. Two hundred forty-three community members attended.

Youth Conservation Corps (YCC)

Midewin hosted the YCC crew for eight weeks during the summer of FY2009, providing employment and environmental education for six local high school students. These students helped develop and maintain the trail system, assisted with bird predation research and RiverWatch monitoring. The students took educational field trips every Friday.

Mighty Acorns Youth Stewardship Program

During FY2009, five schools representing three public school districts and one private school participated in the Mighty Acorns program at Midewin. Total student participation in the Mighty Acorns program at Midewin remained around 900 for the 2008-2009 school year. Our ability to maintain our existing Mighty Acorns program and to provide some expansion is dependent on our ability to provide transportation. We must also recruit additional volunteer instructors and provide more in-depth training.

Led by volunteer instructors, Mighty Acorns program learns to harvest native plant seed.

El Valor Summer Camp Partnership

During FY2009 Midewin supported the 9th year of the Forest Service El Valor Science and Technology day camp. Two four-week sessions operated out of the center in the Pilsen neighborhood and one five-week session operated out of the South Chicago center. Ninety-one students participated in the camp, including a trip to Midewin and environmental education activities provided by volunteers.

Through the programs listed above, Midewin provided interpretive activities for over 5,800 participants in FY2009. Conservation education programs at Midewin resulted in 1,000 student contacts; some students came to Midewin two or three different times.

Recommendations:

1. Continue to focus the interpretive program on the Land and Resource Plan management goals.
2. Through use of non-personal interpretive media such as signs and brochures, explore ways to provide the same benefits of interpretation to a new audience of dispersed recreation visitors.
3. Work with the Volunteer Coordinator to expand the volunteer instructors for the Mighty Acorns and summer interpretive program.

4. Continue to work with El Valor to refine the curriculum and logistics of the Science and Technology Summer Camp.
5. In addition to the staffed interpretive activities, work to develop additional self guided interpretive products that enhance the visitor experience and are consistent with the Prairie Plan and Interpretive Master Plan.
6. Through grant funding opportunities such as the Forest Service “More Kids in the Woods” program and others, pursue alternative funding sources to maintain current program levels and allow for modest program expansion.

Fire

Has a fire/smoke management plans for Midewin been developed and followed?

The Illinois Smoke Management Plan was finalized in FY2009. Midewin is following state direction for smoke management under the Clean Air Act.

Fire plays an important role in the prairie ecosystem. The Midewin Hotshot crew is igniting a prescribed fire to stimulate native grasses and prevent encroachment of woody vegetation and invasive plants.

Have fire burn plan been developed and followed?

Seven burn plans were prepared in FY2009 and 1,080 acres of prescribed burning was accomplished in the spring of FY2009 on four of the units (Grant Creek Annex, Middle Grant Creek, South Patrol Road, and the Seed Beds and Admin site). Fall of 2008 (FY2009 started October 1, 2008) was too wet for any prescribed burns to be completed.

Hazardous Materials

To what extend have hazardous substances sites have been mitigated?

No action needed in FY2009.

Integrated Pest Management

To what extent are noxious weeds and invasive species expanding or being reduced?

Controlling invasive plants at Midewin focuses on three specific situations:

1. Reducing or excluding invasive plant infestations where they pose immediate threats to natural resources, including habitat of Threatened, Endangered, or Sensitive species – these areas include native habitat remnants, restored natural habitats, and grassland wildlife habitat;
2. Conducting eradication efforts or preventing seed production in large infestations acting as seed sources for invasive plants; and
3. Eradicating infestations of invasive plant species that are new to Midewin.

In FY2009, 1,414 acres were treated with herbicides to control invasive species. The majority of herbicide applications used were glyphosate and triclopyr, with lesser amounts of clopyralid. These herbicides were directly applied as foliar treatments to kill infestations of both herbaceous and woody invasive plants or as cut stump treatments to kill resprouts from cut stumps of invasive trees and shrubs.

Manual methods including hand pulling and seed head removal (114 acres) were primarily used in habitats where vegetation or rare plant species were present. Herbicides were only used in these situations when a highly selective herbicide was available or a non-selective herbicide could be applied in a manner that minimized exposure to non-target plants. For certain species (cut-leaved and common teasels), manual methods were used to prevent seed set, followed by application of a specific herbicide to kill vegetative plants.

Mowing (1,813 acres) is widely used to prevent seed production in many invasive plants, especially thistles (Canada thistle, bull thistle, musk thistle), sweet-clover, and invasive shrubs (autumn-olive, Amur honeysuckle, Osage-orange, buckthorn). By preventing seed production, mowing reduces the rates of population growth and spread in these invasive plants. At some point in the future, these infestations will be controlled by combinations of prescribed fire, herbicide application, and/or competition from native plants.

Table 15 summarizes changes in the expansion of noxious weeds and invasive species at Midewin between FY2002 and FY2009.


Volunteers cut teasel seed-heads to control spread of this invasive plant.

Habitat restoration combined with partial funding through partnerships has been essential in expanding integrated pest management for more species on more acres. Staff training has expanded to include pesticide applicator license for seasonal positions since 2004, which allowed increased treatment of isolated infestations both within and outside large habitat restoration projects. In FY2009, nineteen staff members and five volunteers were licensed herbicide applicators or operators. Additional habitat restoration, new partnerships, and staff training are needed for these trends to continue.

Projected Monitoring Needs for IPM/Invasive Species:

1. Train additional field-going personnel and volunteers to recognize key invasive species, conduct field surveys for these species, map/collect data on infestation, and enter into appropriate databases.
2. Work with partners to rank invasive threats around TES populations and in rare habitats.
3. Improve methods for determining effectiveness of treatments, whether chemical, mechanical, or manual.
4. Improve methods for collecting and entering information on treatments.
5. Continue to participate in technologies assisting in identification and mapping of invasive plant infestations using remote sensing data.

Table 15. Expansion of Noxious Weeds and Invasive Species

Measure	FY2002	FY2009
Number of NNIS (non-native invasive plant species) present on Midewin	68 species	69 species (four additional species detected since 2002, but at least one eradicated and two previously reported species have been prevented from establishing a permanent presence.
Noxious weeds/Invasive plants – acres infested	As prior to Plan, entire site (15,200 acres) infested, but to varying degrees with different combinations and intensities of species	18,225 acres infested, but this reflects additional land transferred from the Army to the USFS at Midewin, and not an expansion in infestations. However, there is a reduced frequency of some invasive plants in treated areas.
Noxious weeds/Invasive plants - locations	Some species widespread, others very localized; at least 10 species restricted to less than five infestations (per species) not exceeding one acre. Two infestations (purple loosestrife and blue globe thistle) eliminated)	Since 2002, little change for some widespread species (Canada thistle, Amur Honeysuckle, Autumn-olive), but documented declines at some sites for Amur honeysuckle, poison hemlock, common teasel, reed canary grass, common reed, and garlic mustard. Since 2002, eradication of infestations for purple loosestrife (5); garlic mustard (1) cut-leaved teasel (2), sericea lespedeza (1), blue globe thistle (1), and crownvetch (4). Of concern are increasing numbers of new infestations for reed canary grass, crownvetch, and cut-leaved teasel, especially and in dolomite prairie areas.
Acres treated for NNIS Plants – Herbicide	Less than 0.1 acre (not including row crop fields)	1,414 acres (primarily in ongoing native habitat restorations)
Acres treated for NNIS Plants – Mowing	2,070 (both spot mowing and entire tract mowing)	1,813 acres (spot mowing for thistles and sweet-clover); does not include entire tract mowing for control of encroaching shrubs and trees in grassland habitat.
Acres treated for NNIS Plants – Manual Removal	12	114 acres (hand control of spot infestations in woodlands, dolomite prairie, and along roadsides)

Measure	FY2002	FY2009
Number of Invasive Plant Species treated:	11 species: garlic mustard cut-leaved teasel common teasel yellow sweet clover white sweet clover Canada thistle musk thistle purple loosestrife Autumn-olive Osage-orange multiflora rose	29 species were treated in FY09: garlic mustard cut-leaved teasel common teasel yellow sweet clover white sweet clover wild parsnip poison hemlock Canada thistle musk thistle bull thistle blue globe thistle purple loosestrife crownvetch bird's-foot trefoil reed canary grass common reed invasive cattails Autumn-olive Osage-orange multiflora rose Amur honeysuckle white mulberry black locust European buckthorn red clover white clover quack-grass smooth brome grass field garlic
Invasive Insects Monitored through partnerships	**1 species:** gypsy moth	**1 species monitored in 2009:** gypsy moth (9 captured at 4 trapping stations)

Cooperative Weed Management Area (CWMA)

In FY2009, the USDA Forest Service at Midewin National Tallgrass Prairie worked with other land management agencies in northeastern Illinois to begin development of a CWMA for Chicago Wilderness region (Lake, McHenry, Kane, DuPage, Cook, Kendall, and Will counties). This CWMA will work to share information, develop joint strategies, and educate the public concerning invasive plants in northeastern Illinois.

Native Plant Materials

In FY2009, NFN3 funding was used to purchase over 2,500 plugs of native forbs, grasses, sedges, and shrubs for planting in native plant and pollinator demonstration gardens on Midewin, primarily in public access areas. This activity was accomplished primarily with volunteers and participants in environmental education/stewardship programs.

The funding was also used to hire two additional STEP seasonal employees to assist in planting 25 species in seed production beds; this added another ten species to seed production, and increase production of fifteen species already established.

Restoration crew planting natives for seed production.

These seasonal employees also collected seed from twenty species of native plants to produce plugs that will be used to expand seed production for future years.

Land Ownership

To what extent land boundaries have been adjusted?

Midewin acquired 2,640 acres in the last month of FY2005 with the third land transfer (T3) from the Department of Defense (Army). The total acreage of land administered by Midewin at the end of FY2005 was 18,094. Midewin acquired the Vulcan Tract (92 acres) in FY2007 and an additional 39 acres in FY2008 through a donation from ExxonMobil. The total acreage of land administered by Midewin remained at 18,225 at the end of FY2009.

Table 16. Land Purchase, Donation, or Exchange in Acres from FY 2005 to 2009

Year	Land Acquired (Acres)	Source	Total Land Managed by Midewin (Acres)
2005	2,640	Army (T3)	18,094
2006	0	NA	18,094
2007	92	Vulcan	18,186
2008	39	ExxonMobil	18,225
2009	0	NA	18,225

Recreation

Constructed by the Wilderness Volunteers organization in summer 2009, the Buttonbush Pond Overlook provides a tranquil resting spot along the Prairie Creek Woods Trail.

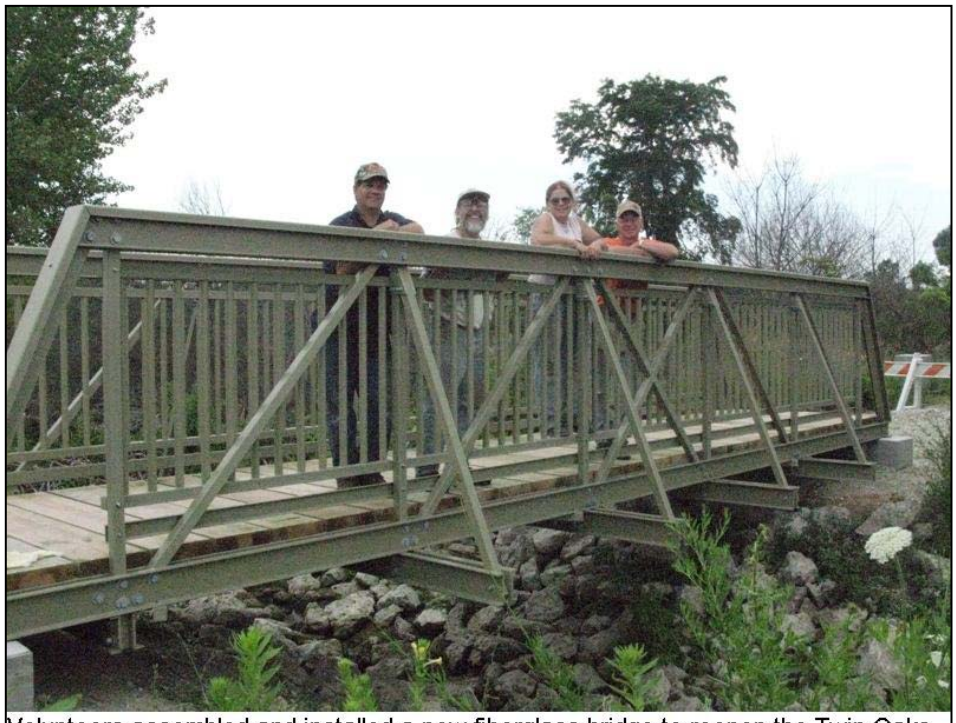
Are trails constructed to standards for planned use?

Construction of the West Side Trail continued in FY2009 and ½ mile of trail was completed. The grass frog trail (1.7 miles) was completed for temporary use until the multiple use West Side Trail can be completed.

Midewin volunteers completed construction of a fiberglass bridge on the Twin Oaks Interim Trail Loop. South Point Academy completed the conversion of a second former railroad trestle to multiple use trail bridge.

Wilderness Volunteers completed construction of a scenic overlook at Buttonbush Pond.

Is the Prairie being managed in accordance with prescribed recreation opportunity spectrum (ROS) guidelines?



Volunteers assembled and installed a new fiberglass bridge to reopen the Twin Oaks Interim Trail Loop on Midewin's east side. (July 2009)

No new permanent recreation developments occurred in FY2009. Existing recreation developments, including Midewin's Welcome Center, are being managed in accordance with Prairie Plan-prescribed Recreation Opportunity Spectrum (ROS) standards. Trails and additional facilities are

being developed in accordance with ROS guidelines.

Are visitors well informed of recreation resources? Have resources been adequately interpreted?

Part of Midewin was opened to the public for recreational use for the first time in June 2004. An extensive communication effort was conducted to scope public concerns and then to produce brochures, flyers, and web pages. The programs started in 2004 continued throughout 2005. The Midewin Welcome Center was open six days a week during the peak-use season. Brochure boxes were added at public access points. A public contact trailer was circulated around major access points and trail patrols were used to insure that positive personal interaction was made with many visitors. The escorted tour program continued to offer interpreted tours to lands that remain closed to the public.

Research

Are key information needs being pursued as research projects? What is the contribution of these projects to Midewin and general knowledge?

Research is an integral component of the mission of the Forest Service at Midewin, and is emphasized by the Illinois Land Conservation Act of 1995, Midewin's founding legislation. Research helps fill information gaps regarding restoration activities at Midewin. Information needs at Midewin fall into two primary categories:

1. Effectiveness of resource management for purposes of adaptive management.

2. Status of biological resources, especially species of conservation concern, including RFSS, and federal and state threatened and endangered species.

As in past years, research and monitoring projects completed and ongoing within FY2009 contributed to each of these information needs.

Midewin has a number of annual projects centered on grassland (and other) bird species inhabiting the site. These include the annual Upland Sandpiper Survey, the annual Shrubland Bird Bioblitz, and volunteer monitoring of breeding birds. Related projects included the monitoring of vegetation height-density relationships to evaluate habitat structure and quality for grassland birds with respect to cattle grazing or its absence.

Other research projects examined a variety of topics for example, specific species of conservation concern, relationship of soil nutrient status to plant performance, effects of fire management on prairie organisms, and invasive species.

Several proposed projects acquired external funding.

Projects with external funding

Conservation 2000, Prairie seed banks at Midewin National Tallgrass Prairie: a key to its restoration, Brenda Molano-Flores and Christopher J. Whelan, Illinois Natural History Survey, $34,694. This project, which began in 2007, continues with additional soil and above-ground vegetation sampling. The project supports Jason Zylka, INHS and the Department of Natural Resource and Environmental Sciences, University of Illinois at Urbana-Champaign, who is using it for his Master's research.

National Fish and Wildlife Foundation, Carbon sequestration via prairie restoration at Midewin, Christopher J. Whelan and Brenda Molano-Flores, Illinois Natural History Survey, Miquel Gonzalez-Meler, University of Illinois at Chicago, $74,380. This project entailed soil sampling in conjunction with the C2000 seed bank project and will determine soil nutrient stocks in relation to past land use history. Using a space for time substitution, potential for below-ground carbon sequestration resulting from prairie restoration will be estimated by using agricultural crop fields and existing remnant prairies as endpoints of a continuum from no restoration to full restoration of prairie habitat. They found that conversion of row-crop lands to both pasture and prairie led to increased pools of both carbon and nitrogen. Remnant prairie soils contained about 3 to 4 times the carbon stocks as row crop soils.

Other ongoing research projects by subject

- Demography, migration and conservation of the Loggerhead Shrike in Eastern North America, Amy Chabot, Queen's University, Ontario, Canada
- Impact of Prescribed Burning on Prairie Spiders, Frank Pascoe, St. Francis University
- Reproductive ecology of prairie plants, Brenda Molano-Flores, Illinois Natural History Survey
- Evaluating restoration success within disparate landscapes; assessing restoration authenticity and conservation value using insects, plants and vertebrates of conservation concern, Ron Panzer, Northeastern Illinois University
- Sex ratio variation in gynodioecious Lobelia siphilitica: effects of population size and geographic location, Christine Caruso, University of Guelph, and Andrea L. Case, Kent State University
- Field Guide to Fishes and Crayfishes, Francis M. Veraldi, Army Corps of Engineers, and Philip, W. Willink, The Field Museum of Natural History

Threatened, Endangered Species and Regional Forester's Sensitive Species (RFSS)

To what extent are NFS lands and their management contributing to the recovery, conservation, and viability of threatened, endangered, or proposed species and to what extent are actions prescribed in recovery plans being implemented? To what extent are National Forest System Lands and their management contributing to the viability of Regional Forester' Sensitive Species (RFSS) and other species of concern?

The staff at Midewin has been attempting to increase the monitoring done on listed species and RFSS. Current staffing levels limit how much can be monitored, but partners and volunteers are helping to increase our capacity.

In FY2009, population counts were completed for leafy prairie clover, ear-leaf false foxglove, ginseng, small white ladies' slipper, limestone hedge-hyssop, and glade quillwort. Subplot counts and population estimates were made for false mallow, pitcher's stitchwort, and goldenseal. Acres were surveyed for grassland birds (approximately 5,000 acres), wetland birds (305 acres), ear-leaf foxglove (15 acres), false mallow (20 acres), glade quillwort (20 acres), pitcher's stitchwort (20 acres), leafy prairie clover (20 acres), limestone hedge-hyssop (20 acres), small white ladies slipper (14 acres), ginseng (34 acres), and eastern prairie fringed orchid (15 acres) for a total of 5,483 acres.

Plants, grassland birds, and wetland birds are adequately monitored at this time. Additional shrubland bird habitat could be monitored, once all the land from the Army is transferred to Forest Service management. Much of the current Army land provides habitat for shrubland birds. As more wetlands are re-created at Midewin, monitoring of wetland birds and amphibians will need to be increased. Protocols and monitoring of the RFSS insects needs to be initiated, especially as the prescribed fire program increases and burning takes place in higher quality natural communities. Many of these insects are difficult to capture in large enough numbers to allow for the determination of population trends.

Table 17. Population Counts and Surveys (Plants).

Fiscal Year	Number of Population Counts	Area Surveyed (Acres)
2002	Population Counts = 2	4,592
2003	Population Counts/Estimates = 5	5,948
2004	Population Counts/Estimates = 7	6,620
2005	Population Counts/Estimates = 7	6,717
2006	Population Counts/Estimates = 10	10,416
2007	Population Counts/Estimates = 11	10,668
2008	Population Counts/Estimates = 10	10,568
2009	Population Counts/Estimates = 9	9,166

In compliance with Prairie Plan direction (p. 6-13), monitoring of RFSS and other sensitive species will be conducted on a rotational basis so that in any given year, a subset of species is monitored. Each subset is to be monitored only every five years. Midewin is a new unit and monitoring of many species has just started in the last five years. For many target species, the small number of sampling years makes definitive results difficult to determine, but the trends are discernable.

Through the help of volunteers and partners, monitoring of some species has taken place at more frequent intervals; on a yearly basis for some species. Much of the plant monitoring is accomplished through a partnership with the Chicago Botanic Garden (CBG) and volunteers with the Chicago Wilderness "Plants of Concern" (POC) monitoring program. Where necessary to meet the needs of intensive monitoring, additional monitoring techniques are added to the POC protocol. Protocols for some problematic plant species are still being developed and/or refined.

Leafy Prairie Clover *Dalea foliosa* (Federally Endangered)
Leafy prairie clover is a short-lived perennial plant that grows in dolomite prairie. Population monitoring of the entire population started in 2002. Climatic conditions are one major factor on seedling germination and survival, so the number of seedlings can fluctuate wildly from year to year. Another factor that contributes to plant survival is browsing by deer, rodents, and insects. Overall, the population trend for this plant appears to be increasing, mainly through seedling recruitment.

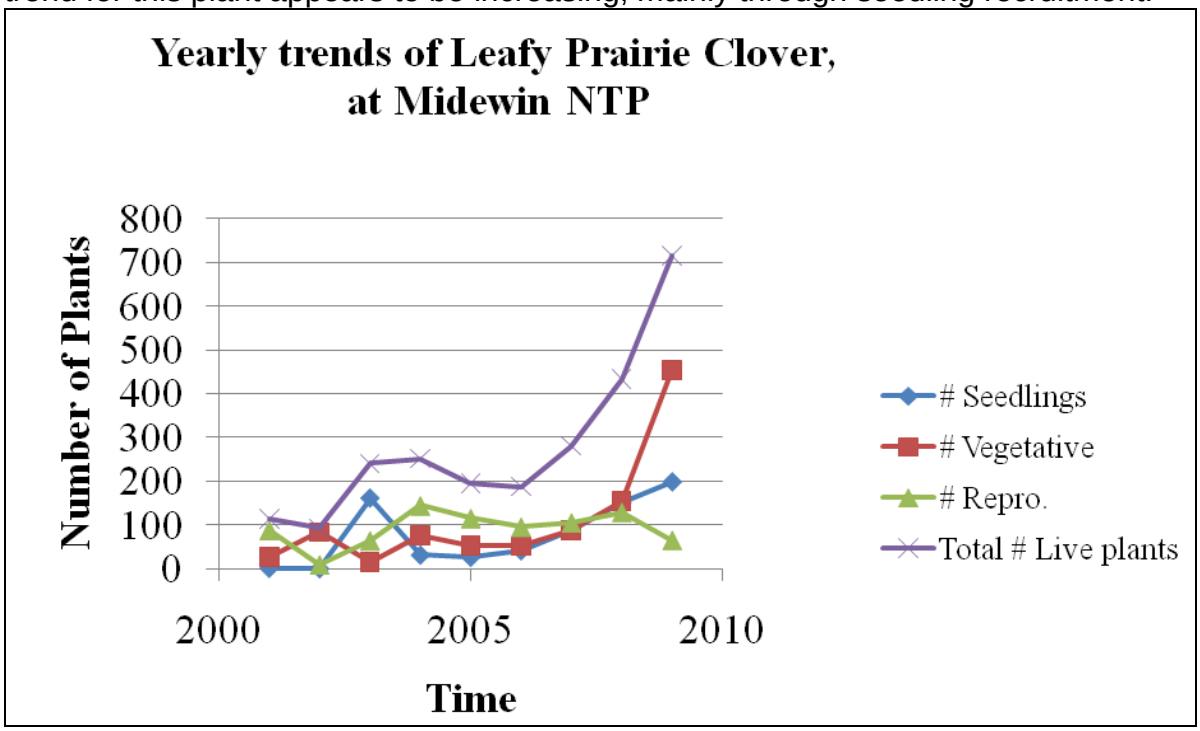


Figure 1. Annual Population Trends of Leafy Prairie Clover.

Monitoring protocols that include assessing population status and impacts of management are currently meeting the goals outlined in the Prairie Plan. The

current monitoring techniques are adequate. Restoring prescribed burning to the population is critical for habitat improvement. With the land transfer from Exxon Mobil in 2008 to the Forest Service where this population is located, more extensive land management is now possible. With greater management, the population size is expected to continue to increase over time.

Table 18. Population Demographics of *Dalea foliosa* at Midewin

Fiscal Year	Number of Seedlings	Number of Vegetative Plants	Number of Flowering Plants	Total Number of Plants
2002	0	83	9	92
2003	161	15	64	240
2004	31	76	144	251
2005	26	53	115	194
2006	41	51	95	187
2007	87	88	105	280
2008	151	154	129	434
2009	198	453	65	716

Midewin is assisting the US Fish and Wildlife Service (USFWS) in recovery actions for this plant in northeastern Illinois. In July of 2009, 100 Leafy Prairie Clover plugs, grown at Midewin from the Drummond population, were planted on a former railroad berm of the Drummond dolomite prairie. These plants will continue to be monitored along with nearby subpopulations through protocols developed by USFWS. Midewin is also raising plants and distributing seed to be put into appropriate habitat in the historic range within northeastern Illinois. Plants were distributed to the Illinois Department of Natural Resources, Will County Forest Preserve District, DuPage County Forest Preserve District, and Joliet Junior College for outplanting in FY2009. With additional restoration planned in the Drummond area, opportunities may develop for restoration of leafy prairie clover in currently degraded areas. With the expansion of dolomite prairie restoration, the viability of the Midewin population will increase.

Glade Quillwort *Isoetes bulteri* (RFSS, Illinois Endangered Plant)

The glade quillwort is a plant found in dolomite prairie. Population size monitoring and demographic monitoring has been established for this plant and more than five years of data has been collected. Since 2003, the plant population tends to fluctuate, but appears to be stable overall based on the data. Population numbers were highest in FY2009, most likely due to the cool, wet spring and more than 6.5 inches of rain. Additional years of monitoring will be necessary to determine long-term trends of the population. Monitoring the leaf number and longest leaf length was started in 2003 as a possible means of measuring fitness of the plants. So far, there is little difference in their measurement from year to year, but because of the short monitoring period, trends are difficult to determine.

Collecting of demographic data may prove problematic; it is difficult relocating tagged plants. The tags apparently get uplifted out of the thin soil from the winter

freezing and thawing action. Flooding in the Drummond area over the past few years may have had an adverse impact on glade quillwort demonstrated by decreased survival. The source of the flooding on the Burlington Northern Santa Fe railroad has been resolved and the waters have receded.

In 2004, 156 plants of glade quillwort were salvaged from a degraded dolomite prairie and transplanted onto Midewin, but survivorship has been low (<5% of the transplants have survived). Originally, a large portion of the natural population of glade quillwort was on the ExxonMobil property. Management of the entire population will be much easier and effective with transfer of the property to the Forest Service.

Table 19. Glade Quillwort Population Sampling

Fiscal Year	Population Size
2003	163
2004	408
2005	277
2006	398
2007	230
2008	373
2009	639

The monitoring goal is to monitor population changes in relation to management activities and to assess the status of the population. Threats to the population such as invasive species are also being monitored. These techniques to determine population size and threats are adequate and should continue on a yearly basis, along with demographic monitoring if suitable techniques can be developed. Monitoring should help determine the effects of future management on this area and RFSS plant populations. Monitoring is being conducted by Chicago Botanic Garden with volunteers and Midewin staff.

Sullivant's Coneflower *Rudbeckia fulgida var. sullivantii* (RFSS)

Sullivant's coneflower is a locally common perennial plant at Midewin. Monitoring was initiated in 2003 to determine the impacts of management activities (grazing, prescribed burning, mowing, general restoration techniques, and a control) on the plant. Five macroplots have been monitored in the past with different management regimes. Each plot has population size, area covered, and invasive species threats identified. In 2004, photopoints were established. Additional years of data will ultimately determine the effects of each management regime. Monitoring was not conducted in FY2009 and will be conducted on a rotational basis in the future.

Planned dolomite prairie restoration in the Drummond Floodplain area will provide additional habitat in the future. More intensive management of the transferred ExxonMobil property should benefit the population.

Monitoring is conducted by Chicago Botanical Gardens (CBG) with volunteers and Midewin staff. Monitoring goals are to determine the impact of different management practices on population numbers, plant cover, density, frequency, and reproductive output. This species is regularly incorporated into seed and planting mixes used in prairie restoration on Midewin, but only on ecologically appropriate sites.

Ear-leaf False Foxglove *Tomanthera auriculata* (RFSS, Illinois Threatened Plant)

Ear-leaf foxglove is an annual plant associated with a variety of prairie habitats, but most often on fine-textured soils. Due to its annual life history, there are often fluctuations in population numbers; the plant is abundant in some years and essentially disappearing in other years only to reappear again in subsequent years. On Midewin, ear-leaf false foxglove occurs in six sub-populations. Two of the six subpopulations were discovered during the 2007 monitoring season. Annual population size monitoring has taken place since 2001. Overall, the population appears to be doing well, although subpopulations may decrease in some years. The current management of prescribed fire and invasive species control may have benefited the population over the last three years.

The subpopulations at Midewin have shown characteristic fluctuations. The two largest subpopulations have tended to increase, probably in response to prescribed burning and control of woody encroachment during 2007 and 2008. The smaller populations continue to fluctuate, sometimes down to less than ten individuals. Overall the population is increasing, but there does appear to be significant deer and vole browse occurring which is reducing potential reproduction.

Table 20. Ear-leaf False Foxglove Population Sampling

Fiscal Year	Population Size/ Number of Stems
2001	1,873
2002	1,134
2003	236
2004	1,100
2005	1,775
2006	3,224
2007	9,400*
2008	22,130*
2009	3,386*

*Two subpopulations were so large that population numbers were estimated based on sample transects.

Current management practices of periodic prescribed burning and invasive species control appear to be adequate at this time. Restoration of prairie habitat will benefit the ear-leaf false foxglove. Seeds have been planted in some of the restorations, but plants have not been located yet. Deer browse may be a threat, as they browse the tops of the plants before seed can be produced.

Monitoring goals include trends in population size over time, impacts of management and threats to the populations. The current monitoring strategy is adequate to meet the goals of the Prairie Plan. Monitoring is being conducted by CBG with volunteers and Midewin staff.

False Mallow *Malvastrum hispidum* (RFSS, Illinois Endangered Plant)
The false mallow is an annual plant found in dolomite prairies with population numbers in the thousands that may fluctuate yearly. The entire population is sub-sampled. Monitoring started in 2003 and three subpopulations are being monitored. Besides the number of plants, an estimated percent cover is determined. Photopoints have also been established at each subpopulation. The populations in the plots have a tendency to fluctuate from year to year, but are generally stable. Competition from invasive grasses is one threat to this species. However, it is hoped that increased land management using prescribed fire and more extensive invasive control the population should increase.

Table 21 indicates the number of plants within each 6-meter-by-6-meter monitoring plot within each of the three subpopulations.

In FY2009, the estimated population of subpopulation 2 based on the sampling plot 2 was 10,690 individuals, while subpopulation 3 was estimated to have 7,910 individuals. There were no plants found within the plot in subpopulation 1, however management and data collection will continue. In general, the population area appears stable throughout the habitat.

Table 21. False Mallow Subpopulation Sampling.

Fiscal Year	Plot 1	Plot 2	Plot 3*	Total of 3 Plots
2003	459	164	NA*	623
2004	111	34	317	462
2005	215	14	210	439
2006	81	73	496	650
2007	169	7	87	263
2008	194	12	5	211
2009	0	21	179	200

* Plot 3 was not established until 2004.

The monitoring goals are to reflect population changes in relation to management activities and to track threats to the population. Presently these goals are being met and photoplots should continue. Monitoring will become more important as more active management occurs and should be able to determine its effectiveness.

Pitcher's Stitchwort *Minuartia pitcheri* (RFSS, Illinois Threatened Plant)
Pitcher's stitchwort is another annual dolomite prairie plant that can have large fluctuations in population size from year to year. Discrete populations may not fluctuate synchronously, because of differences between sites. This plant is difficult to monitor because of its annual transitory nature. With large population sizes and difficulties in population monitoring, the protocols are still in the formative stages.

Seven permanent plots have been established and monitored since 2004. Within the plots, subplots are used to determine population size and the data averaged and merged for the entire plot. Use of the larger plots accommodates the fluctuation in population size and migration of the annual plant locations. Data will continue to be collected to establish trends. Photoplots were established in 2004 to visually demonstrate population change from year to year.

Table 22. Pitcher's Stitchwort Subpopulation Sampling

Fiscal Year	Plot 1	Plot 2	Plot 3	Plot 3A	Plot 4	Plot 4B	Plot 6
2004	5	7	375	NA	63	NA	NA
2005	63	NA	129	NA	15	NA	198
2006	0	NA	101	600*	1	147	55
2007	0	NA	77	1,525	1	181	281
2008	0	0	239	3,524	1	240	249
2009	0	0	248	3,782	3	779	711

*An estimate because of the large and dense population in 2006 at this location.

The goals of the monitoring are to reflect population changes in relation to management activities and to track threats to the population. In the past, limited management has taken place because of split ownership. More effective management can now take place since land is now managed by the Forest Service after transfer from Exxon Mobil and hopefully population increases will be detected. Data gathering will continue to make evaluations on management practices and photoplots will help determine gross population changes over time. Pitcher's Stitchwort has a very transient nature that makes monitoring a challenge. The CBG, with assistance from volunteers and Midewin staff, monitors this rare plant.

Crawe's Sedge *Carex crawei* (RFSS)

Crawe's sedge is a small perennial sedge that can be found in dolomite prairies and other calcareous habitats. Subpopulation monitoring began in 2004. Different monitoring techniques are being tried and evaluated. There are currently four subpopulations and it will take several years to determine any trends. Random quadrats are censused within the subpopulations to determine densities. The densities are used to estimate population sizes for the subpopulations. This plant was not monitored in FY2009 and will be monitored every other year in the future.

In 2005 and subsequent years, total subpopulation sizes were estimated based on quadrat and transect sub-sampling. Monitoring did not occur in Subpopulation 2 in FY2009 due to localized flooding.

Table 23. Crawe's Sedge subpopulations

Year	Subpop1	Subpop2	Subpop 2A	Subpop3	Subpop4	Subpop5
2004	101-200	101-200	NA	124*	165*	NA
2005	401-800	NA	NA	1094*	2,663*	NA
2005 est	NA	NA	NA	17,769	76,468	NA
2006	7,562	NA	NA	4102	18,118	NA
2007	16,108	NA	NA	8,936	68,221	NA

Year	Subpop1	Subpop2	Subpop 2A	Subpop3	Subpop4	Subpop5
2008	15,004	NA	214*	196	5,714	101-200*

*estimated counts

Monitoring goals are to reflect population changes in number and extent of area occupied in relation to management activities and threats to the population. The CBG is helping develop monitoring techniques and conducting the monitoring with trained volunteers.

Salvaged plants of this species, taken from unprotected sites around Midewin, have been used to propagate this species for establishment in restored habitats.

Limestone Hedge-Hyssop *Gratiola quartermaniae* (RFSS)

This small newly described semi-aquatic annual plant species was only discovered at Midewin in 2003. It grows in small vernal ponds within the dolomite prairie. Monitoring was initiated in 2006 (see Table 24).

Table 24. Limestone Hedge-Hyssop Population

Fiscal Year	Plant Count
2006	1,300
2007	NA
2008	14,420
2009	5,689

There is not enough data at this time to indicate how the population is doing. However, like other annual plants, populations of this species appear to fluctuate with climatic conditions. For example, in 2007, the habitat was much drier than normal and no plants confirmed as *Gratiola quartermaniae* were found. A considerable seedbank must exist however, given the population size recorded in the following year.

The monitoring goals are to determine the population size and area of the population. The techniques used will help determine increases or decreases of the population. With the assistance of volunteers, the CBG is monitoring the population.

Glade Mallow *Napaea dioica* (RFSS)

Glade mallow is a perennial plant usually found in alluvial soils along streams and rivers. Two small subpopulations are known and were monitored for presence in 1997, 1998, and in 2002, but not seen in other years. In 2006 and 2007, concentrated efforts were made to relocate these populations. No plants were found. However, several plants were found adjacent to Forest Service land, along a railroad right-of-way. The goal is to relocate the live plants on Midewin, and cage them to prevent deer browse. Deer browse may be an important factor in this species decline and possible disappearance from Forest Service land. Future searches will be conducted, but it may be necessary to re-establish this plant species. This species is successfully being grown in the Midewin seed production

area; some of the plants producing seed are descended from the population once present on Midewin.

White Lady's Slipper *Cypridieum candidum* (RFSS, Illinois Threatened Plant)

White lady's slipper is a long-lived perennial orchid that occurs in calcareous prairies. Six subpopulations are located on Midewin with two additional ones on adjacent Illinois Department of Natural Resources property. Each subpopulation located on Midewin is only represented by a few plants. One subpopulation on adjacent land is represented by several hundred plants. Midewin subpopulations appear stable and a few are increasing in number, however because of the small size, they are still vulnerable.

White Lady's Slipper

The monitoring goal is to determine potential population changes in relation to management activities. Monitoring is being conducted by Midewin staff and volunteers with protocols developed by the CBG.

Table 25. White Lady's Slipper subpopulation

Fiscal Year	Subpop 2	Subpop 3	Subpop 4	Subpop 5	Subpop 6	Subpop 7	Subpop 8
2002	1	NA	NA	NA	NA	NA	NA
2003	2	1	2	NA	NA	NA	NA
2004	2	1	2	NA	NA	NA	NA
2006	2	2	3	1	9	NA	NA
2007	2	5	3	1	10	2	1
2008	2	5	4	3	24	3	1
2009	2	12	4	3	29	3	1

NA means subpopulations were not yet located in that year.

Common Valerian *Valeriana edulis var. ciliate* (RFSS)

Common valerian is a gynodioecious (has both female and hermaphroditic individuals) perennial plant species that is found in prairies and wetlands. Common valerian currently is not found at Midewin, although it is found on adjoining state land within a few feet of Midewin's boundary. If plants appear on Midewin land, population monitoring will begin. This plant is being reintroduced into Midewin restorations and was planted in seed production beds in FY2009. When common valerian is successfully introduced in restorations, restored populations will be monitored.

American Ginseng *Panax quinquefolius* (RFSS)

Ginseng is a long-lived herbaceous perennial plant with a thick taproot that is harvested for medicinal purposes. Overharvesting is a threat to this species.

Ginseng is very rare on Midewin and is only found in a few scattered locations. Periodic monitoring of ginseng (see Table 26) by Midewin staff has occurred since 2001.

Table 26. Ginseng Population Size

Fiscal Year	Ginseng Population Size
2001	20
2002	NA
2003	9
2004	NA
2005	NA
2006	12
2007	12
2008	NA
2009	10

Some marked plants disappeared after 2001 with deer browse thought to be the cause. Plants were caged in 2006 and fruiting and foliage persistence improved. The population is still vulnerable to threat; caging helps protect from deer browse but also calls attention to the plants and illegal harvesting may occur. During monitoring in FY2009, several new plants were located near existing plants but there were also plants missing from intact cages. In the past, deer moved cages attempting to reach the plants.

Demographic monitoring (number of leaves, height to base of petioles, number of flowers, and number of fruits) started in 2007 for a better evaluation of the plants and their health. The demographic monitoring should be adequate to determine the health of the population over time. Establishment of additional plants and increased protection of existing plants is necessary to maintain the viability of this plant.

Goldenseal *Hydrastis Canadensis* (RFSS)

Goldenseal is another long-lived perennial herbaceous plant with a rhizome that is frequently harvested for supposed medical uses like ginseng. Overharvesting also is a threat to this species. Goldenseal is rare at Midewin, however, it is found in a few scattered locations.

This plant has been periodically monitoring since 2001 by Midewin staff. The plants were monitored in 2001, 2003, 2006, and FY2009. Ten subpopulations were located in the early years, but only five in 2006, although the search in 2006 was not as complete. In 2007 demographic monitoring (number of stems with different numbers of leaves, percent herbivory and number of fruits) was initiated on six populations that were located. In FY2009, ten subpopulations were again located. There is not enough data to determine trends at this time although there does seem to be a reduction in stem density which may be attributed to deer browse. Although the population may be at risk from deer herbivory, caging may call attention to the plants and increase the possibility of illegal harvesting.

Establishment of additional plants and increased protection of existing plants is necessary to maintain the viability of this plant. The demographic monitoring should be sufficient once enough years of data are collected.

American Burnet *Sanguisorba Canadensis* (State Endangered)
American Burnet is a perennial plant historically known to several moist prairies within Will County, IL. Because it has been historically found in nearby locations with similar soils and vegetation, this plant was reintroduced to the wet prairie restoration at Blodgett Road in FY2009. Several plots of twenty-five plant plugs each were planted on grids within the restoration and initially monitored with regard to number of stems. To assess the status of this reintroduction, Midewin staff will annually monitor two of these plots. There are plans in FY2010 to distribute seed to appropriate habitat at this restoration from plants growing in seed production areas.

Eastern Prairie Fringed Orchid *Platanthera leucophaea* (Federally Threatened)
The eastern prairie fringed orchid has not been found at Midewin, even though it is located on adjacent land owned by the IDNR. The population is within a few hundred feet of Midewin in similar habitat. As habitat improvement occurs on Midewin, it is hoped that the existing population may expand onto Midewin. This orchid spends early stages of its life cycle underground or as hard-to-find vegetative plants. There is a possibility that there are vegetative plants on appropriate habitat adjacent to the state land. In FY2009, several surveys were conducted on appropriate potential habitat to search for this orchid. In the future, these surveys will be continued and may be expanded as habitat improves.


Eastern Prairie Fringed Orchid

Seeds have been introduced onto Midewin from adjacent lands, but no plants have been found. Seed reintroduction will probably continue in the future. Monitoring will be initiated when plants start to appear from reintroduction efforts or show up naturally. Several partners have expressed an interest in expanding the reintroduction program at Midewin and locating appropriate habitat. Surveys for the soil fungus needed by the orchid are being conducted at this time.

Regional Forester Sensitive Species- Grassland Birds

Grassland birds are being monitored using several different methods. One monitoring method was designed to accurately reflect the upland sandpiper *Bartramia longicauda* populations and nesting loggerhead shrikes *Lanius ludovicianus migrans* (both species are RFSS). Incidental to this specific data collection, data is also collected on other grassland bird species including the RFSS Henslow's sparrow *Ammodramus henslowii* and Bobolinks *Dolichonyx oryzivorus.* This survey is done in early May at the beginning of the breeding season. Population estimates of other grassland birds may be low due to the early survey. In FY2009, a grassland breeding bird survey was done in June to more accurately reflect the true population size. In the future both surveys will continue.


Henslow's sparrow (Photo by R. Hickson)

Of the RFSS grassland bird species, Henslow's sparrows prefer taller grass heights and are usually found in idle grasslands or prairie restorations. Bobolinks tend to prefer the medium height grasses, lightly grazed areas, hay fields, or idle grasslands. Loggerhead shrikes and upland sandpipers prefer short grass heights, usually grazed tracts. Loggerhead shrike habitat needs to include scattered small trees and shrubs to nest in, while upland sandpipers prefer open relatively treeless expanses. Although there is some fluctuation in the population numbers from year to year, each seems to be doing adequately at this time based on this year's survey.

Table 27. RFSS Grassland Bird Population Numbers

Fiscal Year	Bobolink	Henslow's Sparrow	Upland Sandpiper	Loggerhead Shrike (nests)
2001	278	41	15	9
2002	281	15	11	7
2003	234	16	20	9
2004	325	12	21	8
2005	321	20	20	8
2006	260	10	22	13
2007	268	19	25	11
2008	337	22	20	6
2009	396	49	18	7
Estimated viable population size (pairs)	680	65	123	48

Bobolinks, Henslow's sparrows, and upland sandpiper numbers are total birds found, the actual population numbers are probably higher since for some species as the females are more secretive. None of these four species are at the population numbers estimated to be needed for viable populations over a 50-year period. As more restoration takes place, the population numbers should increase and hopefully approach the numbers needed for viable populations.

Table 28 below shows the population trends for obligate grassland birds, including the RFSS species mentioned above, from FY2003 through FY2009. Prior to 2009, monitoring took place early in the breeding season and some birds were under-counted. For example, the dickcissel arrives on the breeding ground late. Even with the early survey dates, the data looks fairly accurate when compared with the 2009 data. The data suggests that the populations of the more common grassland birds are quite robust. The rarer species are uncommon because they are at the edge of their range and/or dependent upon cyclic prey and habitat conditions. The later point count survey (June survey) will continue into the future and will become the major census technique for grassland birds.

Table 28. Yearly Comparisons of Grassland Bird Populations

Grassland Birds	2003	2004	2005	2006	2007	2008	2009
Upland Sandpiper	20	21	20	22	25	20	18
Bobolink	234	325	321	260	268	337	396
Dickcissel	16	100	72	18	9	2	718
Grasshopper Sparrow	166	255	230	353	325	391	394
Eastern Meadowlark	356	495	452	601	640	660	661
Western Meadowlark	0	1	1	2	0	0	1
Henslow's Sparrow	16	12	20	10	19	22	49
Savannah Sparrow	32	27	42	159	84	54	62
Vesper Sparrow	0	0	1	1	0	0	1
Northern Harrier	0	0	1	0	5	1	3
Loggerhead Shrike (nests)	9	8	8	13	11	6	7

Monitoring is being done by Forest Service staff with assistance from The Nature Conservancy, Illinois Natural History Survey, Illinois Department of Natural Resources, and volunteers. The monitoring seems adequate, but more precise monitoring is being developed in partnership with The Nature Conservancy.

Other Federally listed and RFSS Species

The other RFSS bird species tend to have a spotty presence at Midewin each year. Data is inadequate to determine trends or viability of these species at this time. As restoration and management activities expand, additional habitat for these species will become more common, there may be an increase in habitat usage at Midewin and better monitoring may be possible.

Short-eared owl *Asio flammeus* and northern harrier *Circus cyaneus* are raptors that may have nested infrequently at Midewin in the past, but there is little evidence of current nesting. Both of these species are common winter residents, especially when their prey items (voles) are common. In FY2009, two pairs of birds were repeatedly seen on the each side of Midewin during the breeding season. The assumption is that there may have been two nests, but we were never able to confirm the nests.

Wetland birds, discussed earlier, have populations that fluctuate widely.

The federally listed bald eagle *Haliaeetus leucocephalis* and Whopping crane *Grus Americana* have used Midewin infrequently during migration. There is no evidence they are nesting on Midewin.

One or two calling male Cerulean warblers *Dendroica cerulean* were reported on the former Joliet Army Ammunition Plant in the mid-1990s. There is no evidence that these birds were breeding and there have been no confirmed sightings since the initial ones.

The red-headed woodpecker *Melanerpes erythrocephalus* nests at Midewin, but nothing is known about the population size of this woodpecker. The population size is thought to be small. Monitoring protocols have not been developed since this species has only recently been added to Midewin's sensitive species list. Volunteer monitors in FY2009 repeatedly saw several red-headed woodpeckers in Prairie Creek Woods and may have even found a nest tree.

Plains leopard frog *Rana blairi* is an uncommon frog at Midewin and has not been seen recently. Several frog and toad monitors thought they heard this frog in FY2009, both on the west and east sides of Midewin. Additional monitoring in the future may turn up the breeding areas and then additional monitoring can be done to possibly ascertain the population.

Blanding's turtle *Emydoidea blandingii* is a very uncommon turtle at Midewin. Several sightings were recorded in the mid-1990s. No Blanding's turtle has been seen since the original sightings. A graduate student trapped turtles for one summer at locations they were previously seen and never caught any. It is not known if there still is a population of this rare turtle. It seems likely that even if there is, it may not be a viable population. There is the possibility of reintroducing Blanding's turtle in the future as a part of captive breeding programs in the Chicago area. Turtles seen in appropriate ponds will continue to be identified in order to verify Blanding's turtles on Midewin.

The Indiana bat *Myotis sodalis* is listed as a federally endangered mammal. Although Midewin is near the edge of its northern range, the US Fish and Wildlife Service feels that Indiana bats may possibly be in Northeastern Illinois. Bat surveys in the past have failed to turn up Indiana bats. In 2007 Midewin started a

comprehensive bat survey to determine specifically if Indiana bats use Midewin and to determine what other species use the site. Bat surveys took place in 2008 and were finished in FY2009. Indiana bats were not found at Midewin.

Franklin's ground squirrel *Spermophilus franklinii* is a secretive rare prairie mammal. Franklin's ground squirrel prefers tall, thick grasses and forbs. They appear to be quite rare at Midewin; no live animals were found, but a carcass was found on the far east side of Midewin near an abandoned railroad that the Will County Forest Preserve District developed into a trail. In FY2009, during a pipeline installation, one was caught on Forest Preserve property and released adjacent to Midewin. Surveys are needed to determine if Franklin's ground squirrels are on Midewin and to assess the population size.

The ellipse *Venustaconcha ellipsiformis* is a mussel that is known to occur in Jackson Creek. Monitoring portions of Jackson Creek have been done biennially from 2001 by a consultant monitoring the water quality in Jackson Creek for the Deer Run Industrial Park. Ten sampling sites are monitored; half of the sites are on Midewin property, the other half on the Joliet Army Training Area.

The population seems small, but stable. FY2009 was the last year that the consultant for Deer Run Industrial Park will do these surveys. Midewin staff should continue the monitoring although specialized training may be necessary.

Table 29. Number of observations of ellipse mussel at sampling sites

Mussel Bed Site Number	**Number Observed**				
	2001	**2003**	**2005**	**2007**	**2009**
5	2	1	3	1	3
6	1	3	0	0	1
7	1	3	7	15	5
8	2	0	4	1	0
11	0	1	0	0	0
Total Number of Observations	**6**	**8**	**14**	**17**	**9**

Thirteen RFSS insects are known from Midewin. Monitoring populations of these insects is difficult. Midewin staff has been depending upon researchers familiar with these species to determine their presence in the past. Food plants for these species are being reintroduced into Midewin prairie and wetland restorations. Monitoring may consist of monitoring the increase of food plants and periodic presence monitoring of the particular insects. The current status of these species is unknown, but thought to be stable or expanding since habitat for them is expanding and management techniques are used to minimize disturbance to these species.

Table 30. Midewin RFSS Insects

Scientific Name	Common Name
Aflexia rubranura	Red-veined Prairie Leafhopper
Papaipema beeriana	Blazing Star Stem Borer
Papaipema eryngii	Rattlesnake-master Borer
Papaipema tennii	New Species
Danella lita	Crawling Mayfly
Dichagyris reliqua	A Noctuid Moth
Macrosteles potoria	A Leafhopper
Onconcnemis saundersiana	A Noctuid Moth
Plusia vernusta	White-streaked Looper Moth
Sparatiniphaga includens	A Noctuid Moth
Schinia jaguarina	A Owlet Moth
Sphinx eremtius	Hermit Sphinx Moth
Sphinx luscitiosa	Clemen's Sphinx Moth

Recommendations:

1. Continue monitoring Federally-listed and RFSS species.
2. Increase monitoring of each species to a yearly basis if increased staffing, funding and/or partnership assistance becomes available.
3. Increase restoration and management of habitat for loggerhead shrikes and upland sandpipers.
4. Encourage research to determine why loggerhead shrikes and upland sandpipers have not responded to increased habitat.
5. Work with researchers to develop methods to monitor RFSS insects.
6. Increase monitoring of wetland species as wetland restoration increases and develop more formalized methods.

Transportation & Utilities

To what extent are road closures effective in preventing off-road vehicle travel?

Off-road vehicle travel is prohibited at Midewin. The posting of signs and enforcement of rules have served as effective deterrents to prohibit off-road vehicle travel. Areas that were previously disturbed by illegal travel continue to show signs of natural recovery, indicating that the signing and enforcement actions are having the desired effect. In FY2009, Midewin continued to issue enforcement actions (including violation notices with monetary fines, written notices similar to a warning ticket, and verbal warnings) causing a continued decline in the number of illegal incursions.

Water Quality

What is the condition of the ground water on Midewin?

Ground Water Quantity Monitoring

Instruments for measuring groundwater at nine well locations around Midewin were deteriorating and many were replaced during the FY2009 season. The new instruments should provide continuous data for water level and water temperature without data loss.

The United States Geological Survey has agreed to post data from selected Midewin groundwater wells on their website. The address for the well at Boathouse Road is http://groundwaterwatch.usgs.gov/AWLSites.asp?S=412053088101801. A graph of well data from Boathouse Road including storm event precipitation from the Midewin weather station is shown below in Figure 2.

Recommendations:

1. Continue monitoring of groundwater levels in wells that currently have instruments. Replace instruments as needed.
2. Work with USGS to explore ways for correcting water levels for precipitation to see if levels are higher in restoration areas compared to before restoration occurred.
3. Continue providing data to USGS for posting on Internet as requested.
4. Assist with USGS goals of improving groundwater monitoring in the region.

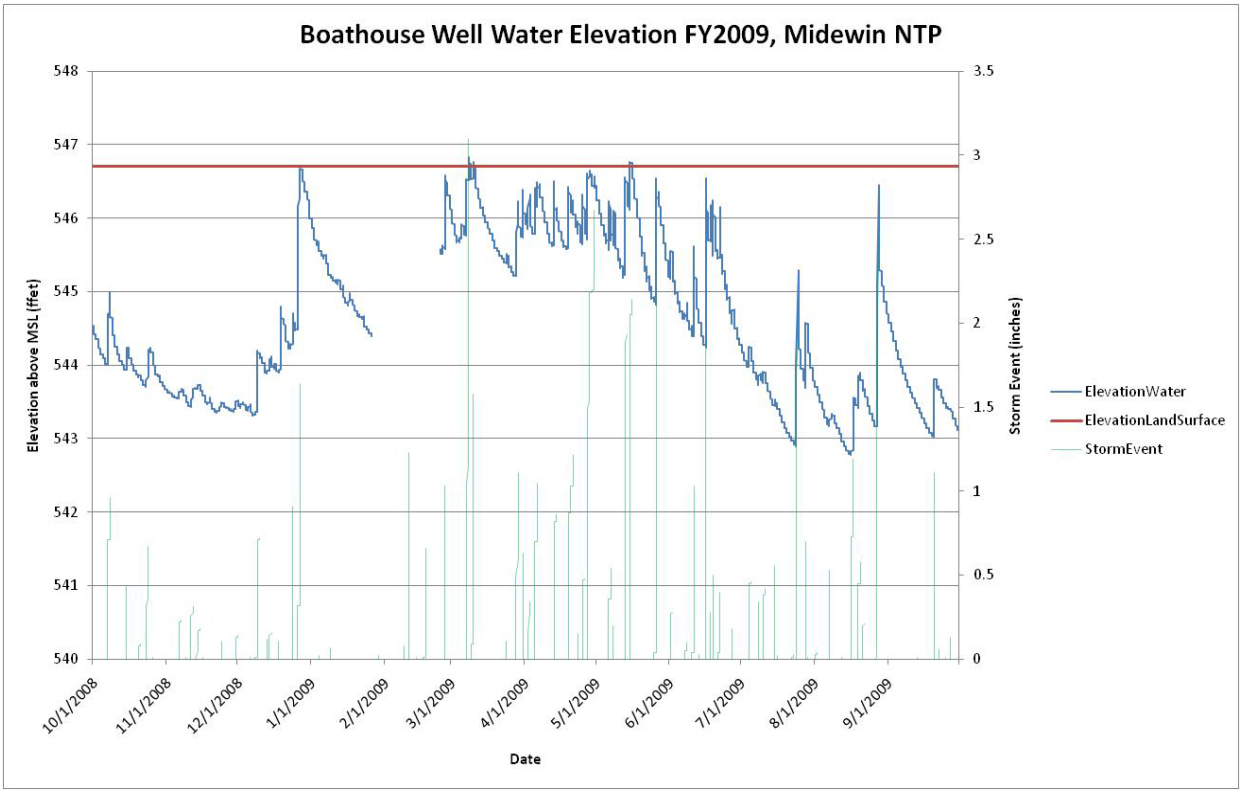


Figure 2. Boathouse Road Well Data.

Ground Water Quality Monitoring

MKM Engineers, Inc. is contracted to monitor wells that were installed for the Army, as required by the Army's Record of Decision. Most of the wells are situated on Army property that have not yet been transferred to Midewin. Several chemicals are monitored depending on well location, which was based on the chemicals used on the site and their breakdown products.

The Final Annual Report for the Groundwater Operable Unit Long Term Monitoring, Fall 2007, states that the Remediation Goals have been attained for groundwater at Site M5 and recommends an initiation of request for closure of Site M5. Site M5 is located in the southern portion of CenterPoint Intermodal immediately north of Grant Creek and Forest Service land.

Recommendations:

1. Continue to review reports provided by the Army on groundwater cleanup progress. Explore ways to aggregate data from these reports into a digital format so the Midewin can efficiently analyze and summarize the information.
2. Explore possibility of combining water level data from Army and Forest Service to produce new groundwater level maps.

What is the condition of water bodies on Midewin?

Surface Water Quantity Monitoring

A stream gauge was installed on Grant Creek in 2004 that collects and records the height of the water every half hour.

The graph in Figure 3 shows water levels in Grant Creek in FY2009 and also shows the rainfall recorded at the rain gauge at the Midewin Supervisor's Office.

Recommendations:

1. Continue monitoring with current stream gauge at Grant Creek and West Patrol Road.
2. Explore ways to analyze data to assess impacts to stream flow from CenterPoint construction activities over time.
3. Look for opportunities to install new, permanent stream gauge on Prairie Creek.

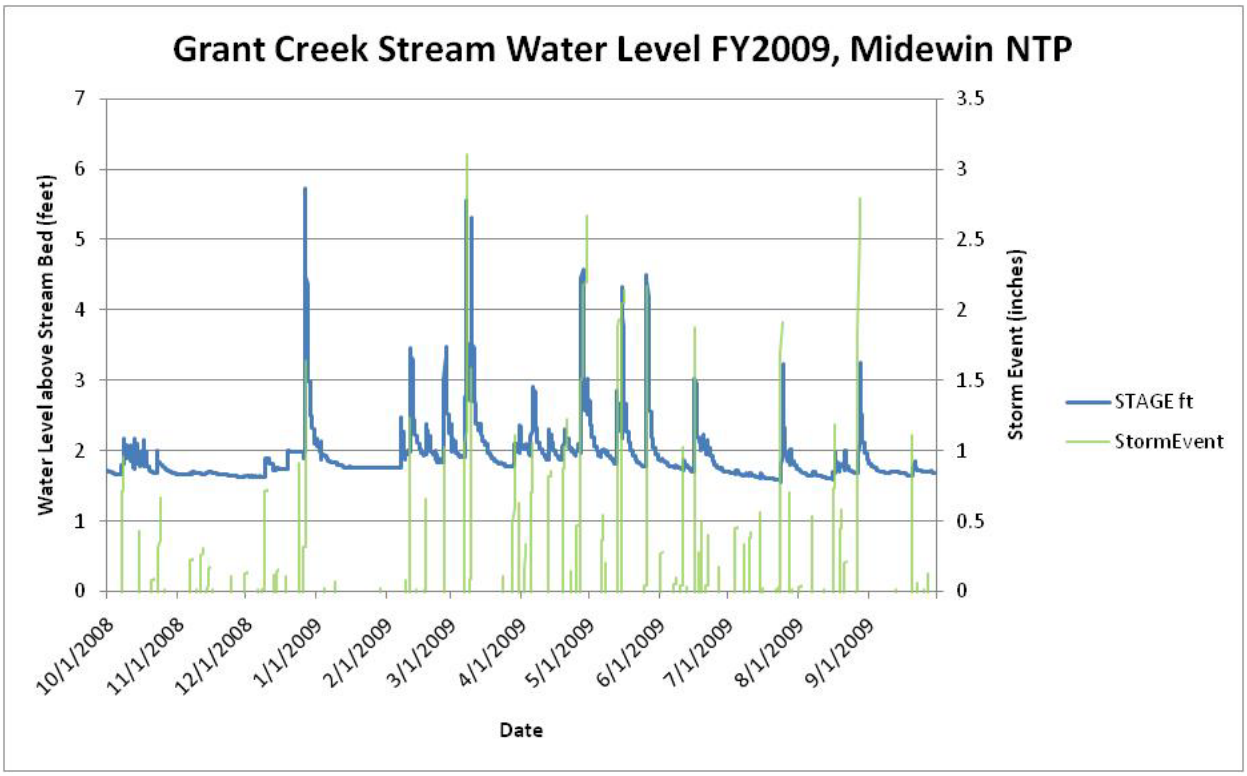


Figure 3. Grant Creek Stream Data

Surface Water Quality Monitoring

In September 2010, Midewin started a water quality monitoring program with volunteers to acquire in-stream measurements of velocity and water chemistry parameters at four sites on Prairie Creek and one site on Grant Creek. The first full year of monitoring will be in FY2010, and includes velocity, pH, temperature, dissolved oxygen, nitrate, conductivity, and phosphate. All parameters except phosphate are measured using electronic devices in the flowing water. Monitoring will be approximately biweekly from March through November.

Recommendation:

1. Continue to implement this monitoring program and compile data gathered.

Macro invertebrate Monitoring

Macro invertebrate surveys were conducted by volunteers in the Illinois RiverWatch monitoring program, which is part of the Illinois EcoWatch program. Macro invertebrate data exist for Grant Creek, Prairie Creek, Jackson Creek and Jordan Creek on the Midewin National Tallgrass Prairie. FY2009 was the first year all streams were represented in the RiverWatch program, and the three major streams now have at least two monitoring locations.

Table 31. FY2007-2009 RiverWatch monitoring macro invertebrate data and quality rating*.

Location	Taxa Richness (TXR)			EPT Taxa Richess (EPT)			Macro invert. Biotic Index (MBI)		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Grant Creek West Patrol Rd	15 (E)	15 (E)	17 (E)	7 (E)	7 (E)	7 (E)	4.35 (E)	4.98 (G)	4.38 (G)
Grant Creek A Line Rd	--	7 (P)	8 (P)	--	2 (P)	4 (G)	--	4.93 (G)	5.71 (P)
Jackson Creek Drummond	--	--	17 (E)	--	--	7 (E)	--	--	5.70 (F)
Jackson Creek Baseline Rd	13 (G)	15 (E)	21 (E)	5 (E)	5 (E)	8 (E)	4.75 (G)	5.03 (F)	5.53 (F)
Prairie Creek River Rd	15 (E)	15 (E)	17 (E)	6 (E)	4 (G)	6 (E)	5.14 (F)	4.82 (G)	5.35 (F)
Prairie Creek A Line Rd	18 (E)	16 (E)	15 (E)	7 (E)	7 (E)	6 (E)	4.57 (G)	4.93 (G)	5.43 (F)
Prairie Creek Road1N	12(G)	11 (F)	13 (G)	7 (E)	6 (E)	5 (E)	5.28 (F)	5.57 (F)	5.80 (P)
Prairie Creek Cherry Hill	10 (F)	13 (G)	10 (F)	5 (E)	5 (E)	4 (G)	5.06 (F)	5.42 (F)	5.16 (F)
Jordan Creek S Arsenal Rd	--	--	8 (P)	--	--	3 (F)	--	--	5.88 (P)

*Quality rating where E = excellent, G = good, F = fair, P = poor, VP = very poor. Quality rating is based on tentative revised 2004 rating table on RiverWatch macro invertebrate identification sheet.

Three indexes of stream quality (see table above) are determined at each sampling point within a stream: taxa richness (TXR), Ephemeroptera + Plecoptera + Trichoptera taxa richness (EPT), and macro invertebrate biotic index (MBI). MBI scores provide a general overview of stream health. Taxa richness is an indicator of the diversity of aquatic life. EPT taxa richness is an indicator of the diversity of highly sensitive aquatic organisms.

After declining values for macroinvertebrates during the 2002-2005, the streams of Midewin now indicate excellent diversity of taxa. Earlier declines may have been due to removal of bridges, construction activities associated with CenterPoint, and low rainfall. MBI values continue to fluctuate, and in some cases, a high abundance of particular taxa significantly weights the final MBI value toward that particular group. The relatively low values thus far for Grant Creek upstream (A Line Road) compared to good to excellent numbers downstream at West Patrol Road appears unusual. The A Line Road site would appear to have good stream habitat but has much less flowing water than downstream at West Patrol Road.

Recommendation:

1. Continue RiverWatch at current locations. When Army cleanup is completed, restart RiverWatch site at Prairie Creek and Road 2W.

Mussel Monitoring

Openlands conducted mussel surveys on Midewin streams in FY2009. Results were generally low, with the exception of Kemery Lake. In FY2009, the final mussel survey of Grant Creek and Jackson Creek required from CenterPoint construction (see page 53, Table 29) was conducted. Results indicate generally stable populations in Jackson Creek but additional data is needed for a Grant Creek determination.

Recommendations:

1. Support efforts to investigate ways to increase mussel reproduction in Midewin streams.
2. Continue mussel surveys at least every two years on Jackson Creek to monitor for ellipse through partnership or contract.
3. Consider implementing rotational monitoring of Grant, Jackson, and Prairie Creeks through partnership or contract to obtain consistent data on mussel populations in these streams.

Wildlife

What effects are management activities having on Management Indicators?

Management Indicators for Midewin include native habitat, suites of wildlife, and specific species. The native habitat indicators at Midewin include dolomite prairie, upland typic prairie, wet typic prairie, sedge meadow, marsh, seep, savanna, and forest/woodland. Each native habitat management indicator has associated plant species.

Management of the native vegetation remnants is occurring where NEPA compliance is completed and decisions have authorized restoration work. Currently native vegetation remnants are improving (with authorized management), at a status quo condition, or in some cases degrading. A prairie-wide habitat maintenance environmental assessment, completed in FY08, has allowed for managing all the native vegetation remnants. Improvement in the quality of native vegetation remnants is expected with management authorized under this environmental assessment.

Table 32. Representative Plant species of Native Habitat Management Indicators

Native Habitat Management Indicators	Representative Plant Species (not always restricted to one habitat)
Dolomite Prairie	Tufted Hair Grass, Flatstem Spikerush, Low Calamint, Hairy Beardtongue, Nodding Wild Onion, Prairie Dropseed
Upland Prairie	Big Bluestem, Little Bluestem, Prairie Dropseed, Obedient Plant, Purple Prairie-clover, Rattlesnake-master, Leadplant, Compass-plant, Prairie Coreopsis, Prairie Phlox, Hoary Puccoon, Rough Blazing-star, Round-headed Bush-clover, Prairie Oval-sedge
Wet Prairie	Prairie Cordgrass, Michigan Lily, Common Mountain-mint, Prairie Sundrops, Bull Sedge, Prairie Ironweed, Big Bluestem, Golden Alexander, Bottle Gentian, Marsh Bedstraw, Riddell's Goldenrod
Sedge Meadow	Tussock Sedge, Broom Oval-sedge, Bluejoint Grass, Swamp Milkweed, Autumn Sneezeweed, Blue Monkey-flower, Wild Blue Iris, Dudley's Rush, Marsh Running Sedge, Marsh Fox Sedge
Marsh	Great Bulrush, Common Arrowhead, Common Bur-reed, River Bulrush, Mad-dog Skullcaps, Lake Sedge, Duckweed, Mild Water-pepper, White Water-crowfoot, Broad-leaved Cattail
Seep	Great Blue Lobelia, Spotted Joe-Pye-Weed, Orange Jewelweed, Fowl Manna Grass, White Turtlehead, Porcupine Sedge
Savanna	Burr Oak, Hazelnut, Shagbark Hickory, Wild Hyacinth, Sweet Joe-Pye Weed, Bottlebrush Grass, Spring Beauty, Little Bluestem, Penn Sedge, Prairie Crabapple, Mullein False-foxglove
Woodland/Forest	White Oak, Red Oak, Bitternut Hickory, Hop-hornbeam, Elm-leaved Goldenrod, Woodland Blue Phlox, Wild Geranium, Gray's Sedge, Blackhaw Viburnum, Mayapple, James' Sedge, American Elm, Late Figwort, Yellow Crownbeard, Virginia Bluebells

Grassland habitat indicators are used for monitoring grassland habitat, both acreage and management treatments. Many species of grassland wildlife are highly sensitive to habitat structure (grass height, litter density), management (prescribed burning, haying, mowing), or area effects (fragmentation). Grassland habitat indicators are represented by three habitats: short-stature grassland, medium-stature grassland, and tall-stature grassland. Each habitat is represented by specific wildlife. The grassland birds have been discussed above and are doing well, indicating these management indicators are in good shape. Little is known of the other representative wildlife that tends to be harder to census, but since the habitat is in good condition, it is likely these species may also be doing well.

Benthic Macro-invertebrates are aquatic insects (especially insect larvae), crustaceans, snails, worms, leeches, and other invertebrates present in and on the substrate of permanent streams ("benthic" means "bottom"). Benthic macro-invertebrates have been monitored since 1996 at Prairie, Jackson, and Grant Creeks.

Table 33. Representative Wildlife Species of Grassland Habitat Indicators

Grassland Habitat Indicator	**Representative Wildlife Species** (Not always restricted to one habitat)
Short-stature Grassland	upland sandpiper, grasshopper sparrow, and thirteen-lined ground squirrel
Medium-stature Grassland	bobolink, eastern meadowlark, smooth green snake, and deer mouse
Tall-stature Grassland	Henslow's sparrow, sedge wren, and meadow vole

Leafy prairie-clover and Henslow's sparrows, discussed under the TES species section, appear to have stable populations and are expected to increase with additional restoration.

The monitoring of white-tailed deer has only begun and the data set is too small at this time for any analysis. The population of white-tailed deer is thought to be either increasing or stable at this time. The Nature Conservancy is monitoring the deer population in partnership with the Forest Service. Table 34 shows the number of deer counted.

Table 34. White-Tailed Deer Observations

Season (Winter)	**Number of Deer**
2005-2006	389
2006-2007	415
2007-2008	342
2008-2009	357

Special Areas

Has there been any non-compliance for Management Area 3 Lands? If so, describe actions taken to remedy the non-compliance and explain the reasons for the non-compliance.

Resource activities on lands designated as Management Area 3 have all complied with the standards set for these special areas. Therefore, no actions were needed to remedy for non-compliance activities.

List of Preparers

The Midewin Prairie Monitoring Team prepared this Annual Monitoring and Evaluation Report. While many individuals were involved in monitoring activities, the following staff directly contributed the details and expertise necessary for this report.

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