United States Department of Agriculture

Forest Service

Midewin National Tallgrass Prairie
(815) 423-6370

30071 South State Route 53
Wilmington, IL 60481

File Code: 1950

Date: January 25, 2001

Dear Friends of Midewin,

The Midewin Agriculture Environmental Assessment is now available for public review and comment over the next 30 days. The environmental asssessment will be available on Midewin's website www.fs.fed.us/mntp.

On October 1, 2000 Midewin National Tallgrass Prairie initiated a public comment period to scope for issues regarding the proposed agricultural land use. The scoping period ended on November 13, 2000. Public comments received were used to identify significant issues, mitigation measures, and to craft the alternatives. As the Prairie Supervisor, I am the Forest Service deciding official for this project.

The 30 day public comment period for this environmental assessment closes on Monday, February 26, 2001. Responses to all public comments on the draft Environmental Assessment will be a part of the final Environmental Assessment. A final Environmental Assessment, a Finding of No Significant Impact, and a Decision Notice will be published after considering all public comments received.

Comments may be sent via the Internet to rthakali@fs.fed.us or mailed to Renee Thakali at the address above.

Please be sure to include the following information when providing written comments:

- Your name, address, organization represented, and title;
- Title of the document you are commenting on;
- Specific facts and supporting reasons regarding your comments.

Copies of the Decision Notice will be mailed to those submitting comments and those requesting copies. For further information regarding this environmental assessment or project, please contact Renee Thakali at (815) 423-6370.

Thank you for providing your comments on this environmental assessment.

Sincerely,

/s/ FRANK KOENIG
Prairie Supervisor

Environmental Assessment
for
Continued Agricultural Land Use from 2001 through 2005.

MIDEWIN NATIONAL TALLGRASS PRAIRIE
Will County, Illinois

January 25, 2001

Table of Contents

1. Project Scope 1
Introduction 1
Project Area 1
Modified Proposed Action 3
Relationship to Management Plans 5
Purpose and Need for Action 5
Project Objectives 5
Decision to be Made 5
Public Involvement Summary 6
Key Issues 6
2. Alternatives 8
Alternative Development 8
Actions Common to All Action Alternatives 8
Alternative 1-Modified Proposed Action 8
Alternative 2-Conventional Soybean/Corn Cropping Followed by Small Grains 11
Alternative 3-Continuous Small Grain Cropping 12
Alternative 4-No Action 12
Alternative 5-Restoration Management Activities 13
Alternatives and Actions Dropped from Further Analysis 13
Alternative Mitigation Measures 14
3. Affected Environment and Environmental Consequences of the Alternatives 15
Aquatic Ecology and Water Quality 15
Affected Environment 15
Environmental Consequences 20
Air Quality 23
Affected Environment 23
Environmental Consequences 23
Soils 25
Affected Environment 25
Environmental Consequences 25
Heritage Resources 28
Affected Environment 28
Environmental Consequences 29
Recreation and Visual Quality 29
Affected Environment 29
Environmental Consequences 30
Sensitive Plant and Animal Populations 30
Affected Environment 30
Environmental Consequences 32
Invasive Plant Species 36
Affected Environment 36
Environmental Consequences 37
Land Use 38
Affected Environment 38
Environmental Consequences 39
Socioeconomics 39
Affected Environment 39
Environmental Consequences 40
Genetically-Modified Crops 42
Affected Environment 42
Environmental Consequences 42
4. Monitoring 43
5. Summary of Effects of Alternatives 43
Aquatic Ecology and Water Quality 43

Air Quality 44
Soils 44
Heritage Resources 45
Recreation and Visual Resources 45
Sensitive Plant and Animal Populations 45
Invasive Plant Species 45
Land Use 46
Socioeconomics 46
Genetically-Modified Crops 47
6. Cumulative Effects 47
Aquatic Ecology and Water Quality 49
Alternatives 1 or 2 49
Alternative 3 49
Alternative 4 or 5 49
Air Quality 49
Alternatives 1, 2, 3, 4, or 5 49
Soils 50
Alternatives 1, 2, or 3 50
Alternatives 4 or 5 50
Heritage Resources 50
Alternatives 1, 2, 3, 4, or 5 50
Recreation and Visual Quality 50
Alternatives 1 or 2 50
Alternative 3 50
Alternative 4 50
Alternative 5 51
Sensitive Plant and Animal Populations 51
Alternatives 1, 2, or 3 52
Alternatives 4 or 5 52
Invasive Plant Species 53
Alternatives 1 or 2 53
Alternative 3 53
Alternatives 4 or 5 53
Land Use 53
Alternatives 1, 2, 3, 4, or 5 53
Socioeconomics 53
Alternatives 1, 2, or 3 53
Alternatives 4 or 5 53
Genetically Modified Crops 53
Alternatives 1, 2, 3, 4, or 5 53
7. List of Preparers 55
8. References 55

Figures

Figure 1. Location Map
Figure 2. Project Map

Tables

Table 1. Modified Proposed Action (Alternative 1) Land Use Allocations.
Table 2. Streams of the Midewin Watershed Potentially Affected by the Project Alternatives.
Table 3 Summary of Estimated 1997 Land Uses of the Midewin Watershed.
Table 4 Results of Fish Surveys and IBI Ratings for Prairie Creek.
Table 5. Fish Species Recorded for Prairie, Jackson, and Grant Creeks.
Table 6. Water Quality Data for Prairie Creek and Grant Creek.
Table 7. Cropping Management Factor for Alternative Crops.
Table 8. Summary of Effects by Alternative.

1. **Project Scope**

Introduction

This site-specific environmental assessment (EA) documents the potential environmental effects of continued agricultural land uses at the USDA, Forest Service (USFS) managed Midewin National Tallgrass Prairie (MNTP) from 2001 through 2005. The MNTP occupies much of the US Army's former Joliet Arsenal. This EA was prepared in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts and any irreversible or irretrievable commitment of resources that would result from the proposed action and alternatives. Based on this EA, the USFS's Prairie Supervisor will decide whether or not to continue agricultural land uses at MNTP for the next five years.

An Interdisciplinary Team of resource specialists (identified in Section 7) used a systematic approach for analyzing the proposed project and alternatives to it, estimating the environmental effects, and preparing this EA. The planning process complies with NEPA and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508). An EA is "a concise public document … that serves to briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of "no significant impact" (40 CFR 1508.9).

Project Area

The project area occupies about 8,500 acres of the of the approximately 15,189-acre MNTP, 15 miles south of Joliet and 4 miles north of Wilmington, Illinois (see Figure 1). Adjacent to the project area are the Joliet Army Training Area and the yet to be completed Deer Run Industrial Park, Lincoln National Veterans Cemetery, Will County landfill, and Island City Industrial Park.

Past activities on private and government lands that affected the MNTP have included the following:

- Conversion of natural prairie grasslands to agricultural uses: row crop fields, pastures, and hayfields.
- Drainage and agricultural conversion of wetlands.
- Alteration of wetlands, streams, and riparian forest by agricultural runoff, stream channelization, and siltation.
- Hunting, to extinction, of large ungulates (bison and elk) and predators (mountain lion and wolf).
- Conversion of large, perennial agricultural grasslands (pastures and hayfields) to row croplands.
- Fragmentation of extensive natural habitats.
- Suppression of the natural fire regime.

- Introduction of non-native wildlife, invertebrates, and plants, which then competed with the native species.
- Development of a commercial infrastructure of roads, energy transportation, and communications.
- Conversion of all types of open lands (including agricultural, ruderal, and natural systems) to industrial, commercial, and residential uses.
- Quarrying and mining of bedrock, coal, gravel, and sand.

All of these activities except coal mining have occurred on land now held by the USFS at MNTP. The major impact, of course, was the construction and operation of the Joliet Army Arsenal.

Lands within the project area were in row crops/small grains or they were managed as grasslands (pastures or hayfields). Row crop/small grain fields were previously managed as row crop fields under both the U.S. Army and USFS. Up to (and including) year 1999, these fields were planted with either corn or soybeans. Weeds were controlled with conventional herbicides and tillage. In year 2000, most of these fields (90 percent) were planted with glyphosate-resistant, no-till soybeans. Glyphosate was the only herbicide used to control weeds. Fields that were still under existing Army leases (5 percent) were planted in corn. The remaining acreage was planted in oats or allowed to go fallow. The fallow fields (3 percent) were dominated by coarse, weedy forbs and annual grasses. Common species found in the fallow fields included horseweed (*Conyza canadensis*), prickly lettuce (*Lactuca serriola*), Canada thistle (*Cirsium arvense*), ragweeds (*Ambrosia* spp.), sweet-clovers (*Melilotus* spp.), and foxtails (*Setaria* spp.). Stands of noxious weeds (primarily Canada thistle) and certain invasive species were mowed to prevent flowering and seed production.

Most (70 percent) of the managed grasslands (pastures and hayfields) were fields previously managed as pastures or hayfields under both the Army and USFS. These fields are planted with Eurasian cool-season grasses, primarily Hungarian brome (*Bromus inermis*), fescue (*Festuca arundinacea*), redtop (*Agrostis alba*), Kentucky bluegrass (*Poa pratensis*), and clovers (*Trifolium pratense* and *T. repens*). The fields are managed to produce appropriate structure for specific suites of grassland birds, using grazing or hay cutting. These lands were selected for continued grazing, based on their use by grassland bird species, pasture conditions, condition of fences, availability of water sources, and protection of sensitive features. Some additional mowing has been done to control encroaching woody plants and noxious weeds. The remaining 30 percent of these fields were taken out of row crop production during 1997-2000 and planted with cool-season grasses and clovers. Since planting, they have been managed (primarily by mowing and hay cutting) to produce grass stands suitable for management with livestock. These grass plantings require three or four years to develop before they can be managed with livestock. Since 1997, livestock have been excluded from certain areas that were available for grazing under Army ownership, including rare plant communities, sensitive wetlands, and riparian corridors. Initially this was accomplished by removing livestock from the entire tract; however, since 1999, these sensitive habitats have been fenced off within tracts proposed for grazing management.

The MNTP is part of the Prairie Parkland, an area of approximately 40,000 acres that includes the Illinois Department of Conservation's Des Plaines Conservation Area, Goose Lake Prairie State Park, Heidecke Lake Fish and Wildlife Area and portions of corporate lands owned by Commonwealth Edison, General Electric, Mobil Corporation, Amoco Corporation, Stepan, Dow Chemical, and other large tracts. In all there are 22 proximal areas in the Prairie Parkland owned by State, County, and local governments, corporations, and interested private landowners located within 12 miles of Midewin.

Modified Proposed Action

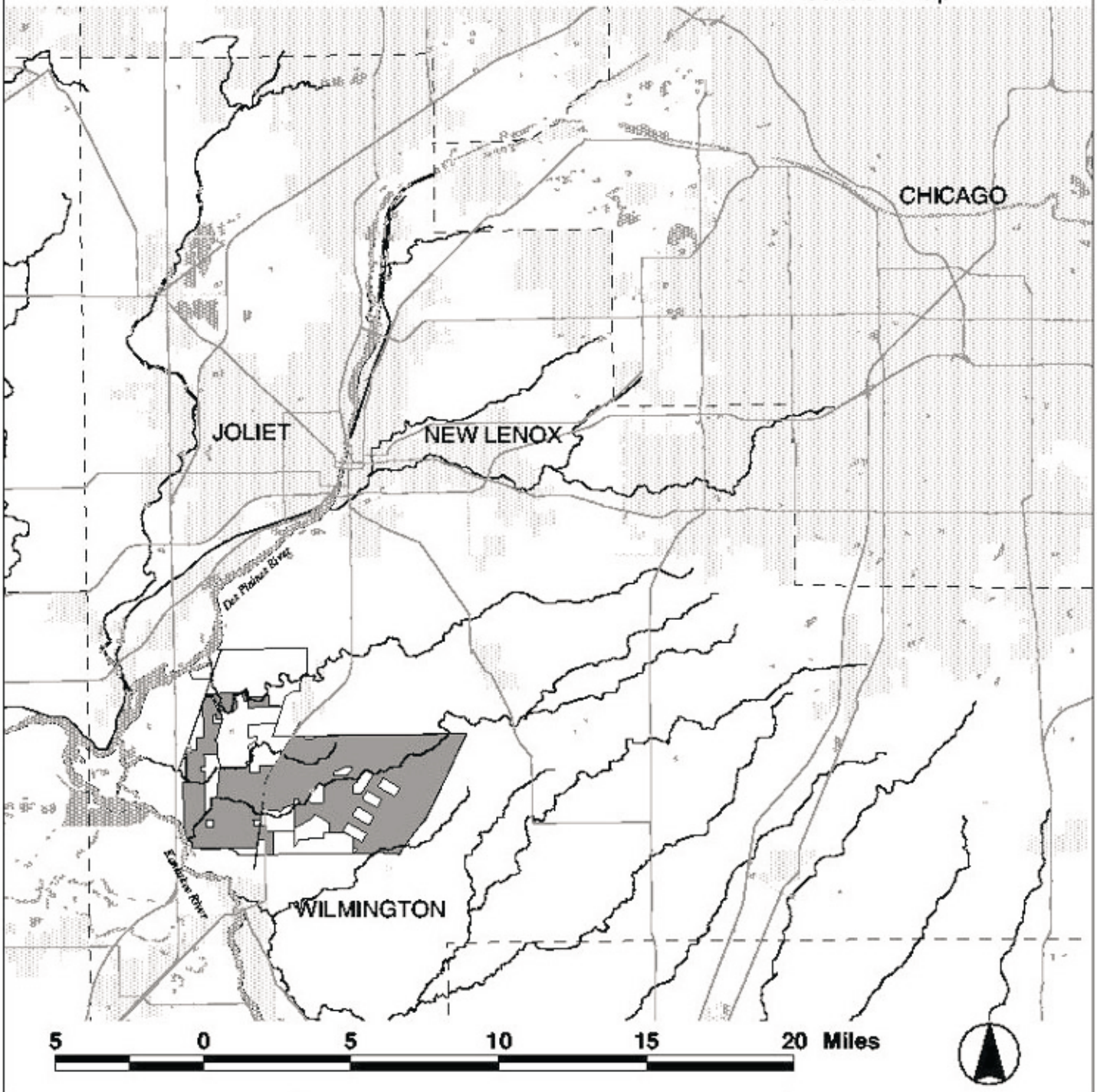
The USDA Forest Service (USFS), MNTP, is proposing to conduct agricultural special use on approximately 8,500 acres at MNTP from March 2001 until December 2005. The proposed agricultural special uses include producing row crops and small grains on 4,140 acres in 37 tracts, and allowing grazing or hay production on 4,310 acres within 25 tracts of land in 2001 (see Figure 2). The amount of row crops/small grains is expected to decrease from 2001 to 2005, as crop fields are converted to managed grasslands and restored prairie. Grasslands would be managed by livestock grazing or haying.

Continued agricultural land use at MNTP over the next five years would manage grassland bird habitat and maintain existing crop fields in a weed-free condition, until seed resources are available for prairie restoration and a final land and resource management plan is implemented. Under this proposed action, farmers would bid on the row crop/small grain and grazing special use permits. Agriculture and grazing would continue, while some of the land is converted from agricultural row crops to grassland wildlife habitat or restored prairie. The grassland areas would be maintained by livestock grazing and haying to provide habitat for suites of grassland birds dependent on large open grasslands with relatively moderate and short grass length.

Specific details on the Modified Proposed Action and alternatives are contained in Section 2 of this EA.

Midewin Agricultural Land Use Environmental Assessment

Location Map



LEGEND

- Major Road
- County Boundary
- Open Water
- Major Stream
- Midewin NTP
- Municipality

Location Information

Midewin is located approximately 45 miles SW of downtown Chicago and15 miles South of Joliet. It is located the Channahon, Jackson, Manhattan, Wilmington, Florence and Wilton Townships of southwest Will County, Illinois

Projection: UTM Meters
Zone 16, NAD83
Data Source: Midewin GIS
Created 01/01, jbm
Midewin National Talllgrass Prairie
USDA Forest Service
30071 South State Hwy 53
Wilmington, Illinois 60481
(815)-423-6370
www.fs.fed.us/mntp

Figure 1

Relationship to Management Plans

The Land and Resource Management Plan (LRMP) for Midewin is currently under development by the USFS. Under the enabling legislation (PL-104-106 Illinois Land Conservation Act of 1995, signed into law on February 10, 1996) the Forest Service may conduct management activities at MNTP prior to completion of a LRMP. Agriculture and grazing are identified as appropriate interim projects in the *"Notice of Intent to Prepare and Environmental Impact Statement for the Land and Resource Management Plan, 1998"*.

Purpose and Need for Action

Consistent with the Illinois Land Conservation Act of 1995, the Forest Service has begun the conversion of row crops to small grain crops, pasture, grassland bird habitat, and tallgrass prairie. Continuation of agricultural land uses are needed at MNTP for the next five years, at a minimum, to manage grassland bird habitat and maintain weed-free fields, until seed resources are available for restoration and a LRMP is implemented.

Project Objectives

The Interdisciplinary Team identified the following objectives for the continuation of agricultural land uses at MNTP:

1. The main objectives are to employ agricultural land use practices (cropping and grazing) to comply with MNTP enabling legislation, to maintain lands in a weed-free state until restoration can be undertaken, and to protect/enhance habitat for sensitive plant and animal species.

2. A secondary objective is to accomplish these land management objectives in a cost-effective manner.

Decision to be Made

The USFS Prairie Supervisor will decide whether or not to continue agricultural land uses at MNTP for the next five years. If a decision is made to continue agricultural land uses, the specific types of agricultural will be determined. The acreage of each permitted land use type(s) will be defined. Monitoring of agriculture use and herbicide use to determine proper implementation and mitigation measures would be part of the decision. This EA will provide the basis for the Prairie Supervisor to determine whether an EIS will be required, should significant impacts result from the chosen alternative.

Public Involvement Summary

The public was invited to participate in this analysis in October 2000. The Interdisciplinary Team contacted approximately 600 interested parties on October 10, 2000, requesting comments by November 13, 2000. A scoping package was distributed that included a project description, site maps, and a request that interested parties consider the following specific questions:

1. Is there any information about the project area (MNTP) that you believe is important in context of the proposed activities that the Forest Service might have overlooked?

2. For the group you represent, what are the potential effects of this proposal that you are particularly concerned about?

3. Are there reasonable alternative ways to meet the Purpose and Need (the rationale for conducting activities) for which you would like the Forest Service to develop and analyze the environmental effects?

4. Are there environmental effects in addition to the ones listed (in the scoping document), which you feel are important and would like to have displayed in the EA? If so, please include your rationale for why they should be analyzed.

Fourteen written comments were received in response to the scoping letter.

Key Issues

Key issues and other concerns related to the proposed action were identified by reviewing appropriate source materials being used to develop the LRMP and by internal scoping to identify site-specific issues and concerns. Comments received in response to the scoping letter were reviewed to help define the key issues to be examined. These issues were used to formulate alternatives and to prescribe mitigation measures. In addition, they served as a basis for analyzing effects. The following issues were identified as important for this proposal:

<u>Sensitive Plant and Animal Populations</u>: The MNTP provides habitat for populations of several federal and state listed Threatened and Endangered, and Regional Forester Sensitive plant and animal species (RFSS). Certain agricultural uses provide cost-effective methods to manage habitats for RFSS species, especially grassland birds. Conversely, some aspects of the Modified Proposed Action and other project alternatives may have adverse effects on these species of concern.

<u>Invasive Exotic Plant Species</u>: Native vegetation or habitat restoration efforts are frequently hampered by the invasion of exotic plant species. Implementation of the Modified Proposed Action or other project alternatives would result in varying degrees of exotic plant species invasion and/or control. The degree of infestation will determine the

amount of eradication/control measures required as prairie and other native vegetation is restored on MNTP.

Land Use Allocations: The Modified Proposed Action or other project alternatives would result in particular land use allocations and public access opportunities. These allocations must be consistent with the intent of the enabling legislation (PL-104-106, Illinois Land Conservation Act of 1995).

Socioeconomics: In this context, socioeconomics refers to the intersecting interests of farmers who seek both economic gain and land tenure and the public that seeks the protection of natural resources, the preservation of public health, and a contribution to public revenues. The Forest Service, in addition to pursuing its own goals, is in a position to mediate the social and economic interests of all affected parties. The Modified Proposed Action or other project alternatives should be socioeconomically acceptable to the Forest Service, the agricultural special use or grazing permittees, and the general public.

Row Crops and Small Grains: This issue is related to the use of appropriate crop types. For the purpose of this EA, row crops will refer to soybeans or corn; small grain crops will refer to wheat or oats. Within the framework of each alternative, these crops should be cultivated for appropriate lengths of time and in appropriate locations.

Herbicide and Other Agricultural Chemical Use: The Modified Proposed Action or other project alternatives would require varying types and amounts of herbicide and other agricultural chemicals. The effects associated with the use of these chemicals will be described for each alternative.

Genetically-Modified Crops: Some members of the public expressed concern about the use of glyphosate-resistant soybeans, which are a component of the Modified Proposed Action. The biological effects of planting glyphosate-resistant soybeans will be described and compared to the requirements of alternative crops.

Grassland Management: The Modified Proposed Action or other project alternatives would result in various types/intensities of animal grazing and non-grazing methods to accomplish similar goals. The biological and social effects associated with these grazing and non-grazing methods require analysis.

In addition to the key issues described above, the EA examines the effects of the project alternatives on the issues of water, air, soil, recreation, visual resources, and heritage resources.

2. Alternatives

Alternative Development

Based upon written comments received in response to the October 10, 2000, scoping letter, along with the associated key issues, the Interdisciplinary Team formulated five project alternatives. Each alternative seeks to strike a balance between the public and private interests by presenting a range of options that would permit a negotiated land management solution consistent with the goals identified by these parties. These alternatives are:

Alternative 1 Modified Proposed Action
Alternative 2 Conventional Soybean/Corn Cropping Followed by Small Grains
Alternative 3 Continuous Small Grain Cropping
Alternative 4 No Action
Alternative 5 Restoration Management Activities

Actions Common to All Action Alternatives

Two objectives are included in each action alternative (Alternatives 1, 2, 3, and 5):

To the maximum extent possible, each action alternative would employ land management activities to maintain lands in a weed-free state until prairie restoration can be undertaken.

Each action alternative would also restore portions of the existing crop fields to prairie and/or other native vegetation.

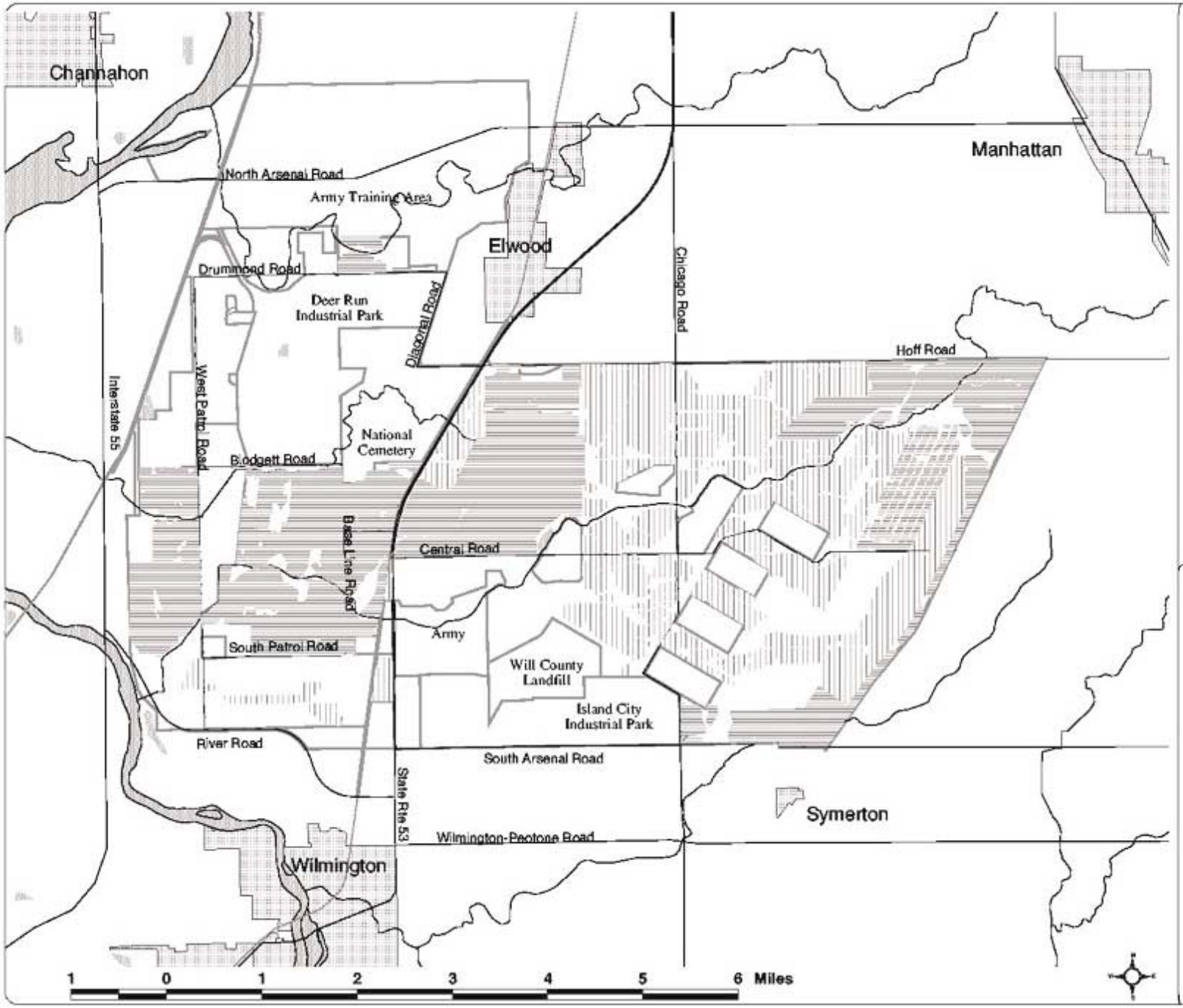
Alternative 1-Modified Proposed Action

This alternative is titled the "Modified" Proposed Action, because the land use allocation acreage figures have been changed slightly from those presented in the scoping package. These changes are the result of funding projections that have been made since the issuance of the scoping package. The Modified Proposed Action would continue agricultural land use at MNTP for the next five years. Under this Proposed Action (Figure 2), the USFS would continue to plant no-till row crops (genetically-modified, glyphosate-resistant soybeans) that minimize soil erosion. These would be rotated with small grains (non-modified wheat and oats) in certain fields that previously have been used for row crop agriculture. Glyphosate would continue to be applied to the soybeans, but not the small grain crops. Fields in the small grain portion of the rotation would be mowed in late summer (after harvest) to control certain noxious weeds, if needed. For the purposes of this analysis it is assumed that any area identified as "row crop/small grain" in Figure 2 could be in glyphosate-resistant soybeans, wheat, or oats in any given year. The maximum amount of acreage in row crops/small grains would be 4,140 acres in 2001. The acreage in row crops/small grains would be expected to decline by up to

2,300 acres at the end of the 2005 growing season. Areas removed from row crops/small grains would be converted to grassland habitat or restored to native vegetation.

Livestock grazing, and hay cutting would be used to maintain existing and newly established grassland habitat (approximately 4,310 acres). Some additional mowing may be required to control invading shrubs or noxious weeds. Mowing and hay cutting would be conducted outside the nesting season for grassland birds. If any mowing is required to control small infestations of weeds during the grassland bird nesting season, the infestation will be inspected on foot to locate and avoid any active nests. Duration and intensity of grazing would vary with management requirements. The Modified Proposed Action also includes developing several wells, maintaining or relocating existing fences, and constructing new fences for effective use of livestock as a management tool.

Up to 2,300 acres of row crop/small grain fields would be converted to grassland wildlife habitat or restored prairie during these five years, depending on funding. The location and amount of prairie and grassland habitat restoration would depend on the funding and allocations in the upcoming Midewin LRMP. These areas would be managed with prescribed burning, mowing, grazing, or hay cutting, depending on the habitat management objectives (for example, restored prairie might be managed differently than upland prairie).



Midewin Agricultural Land Use Environmental Assessment Project Map

LEGEND

- Row Crop/Small Grain
- Proposed Grazing/Haying
- Major Road
- Railroad
- Stream
- Open Water
- Boundary
- Municipality

Unlabeled land is primarily agricultural in use
Scale: 1:63360 or 1 inch = 1 mile
Source: Midewin GIS, 01/01, jbm

Location of Midewin within the State of Illinois

Figure 2

Land use allocations for the Modified Proposed Action are described in Table 1.

Table 1. Modified Proposed Action (Alternative 1) Land Use Allocations (in acres).

Land Use	2000	2001	2002	2003	2004	2005
Row Crop/Small Grain	4,413	4,155	4,140-3,574*	3,890-2,613*	3,640-2,613*	3,390-2,613*
Alfalfa[1]	120	0	0	0	0	0
Grassland Habitat Management (Grazing, Grass Hay, Mowing)[2]	4,253	4,310	4,310-4688*	4310-5,269*	4,310-6,796*	4,310-8,073*
Lands Removed from Row Crops/Small Grains available for Conversion to Grassland Habitat or Prairie Restoration[3]	157	150-378*	15-581*	250-1,527*	250-1,277*	250-1,037*

* These ranges are subject to funding available for conversion from row crops to grassland habitat and small grains.

[1] Alfalfa is not suitable as grassland bird habitat (because of management requirements) and is converted to row crops (to kill the alfalfa) before final conversion to grassland habitat or restored prairie.

[2] The amount of land converted to grassland habitat will be determined by the Midewin LRMP, and will probably always be less that the projected upper range shown, because some land converted from row crops in 2001-2005 will be restored to prairie.

[3] Acreages reflect the amount of land taken out of row crops/small grains on an annual basis, and assumes grassland management (usually mowing or haying) and use by some grassland birds begins the following year. Grazing is usually not used as a management tool until at least 2-4 growing seasons after initial planting of grasses.

Alternative 2-Conventional Soybean/Corn Cropping Followed by Small Grains

Alternative 2 would also continue agricultural land use at MNTP for the next five years. Land use allocations would be the same as those described for the Alternative 1 (Table 1); however, Alternative 2 differs from Alternative 1 in the following ways. Under Alternative 2, “row crops” refer to the rotation of conventional (genetically unmodified) soybeans and corn. In any given year row crop fields would be in conventional soybeans or corn. No-till methods would be employed to minimize soil erosion. Glyphosate would not be used. Instead, atrazine would be used on corn and sethoxydim used on soybeans for early pre-plant, burn-down, pre-emergence and/or post-emergence treatment and control of weeds. Pesticides (chlorpyrifos for rootworm and permethrin for cutworm/corn borer) could also be required under this alternative. Corn could require the application of 125-150 pounds of nitrogen fertilizer per acre in the spring. Wheat and oats would be planted as an intermediate stage between row crops and the establishment

of grassland bird habitat or restored prairie. Management of existing and new grassland habitat would be the same as proposed under Alternative 1 (grazing and haying). Alternative 2 also would develop several wells, maintain or relocate existing fences, and construct new fences for effective use of livestock as a management tool.

Some public comments expressed concern over the use of genetically-modified crops (glyphosate-resistant soybeans) and the use of the herbicide glyphosate. This alternative is intended to be responsive to those interests by substituting non-genetically-modified crops and agricultural chemicals required to produce these crops.

Alternative 3-Continuous Small Grain Cropping

Like Alternatives 1 and 2, Alternative 3 would continue agricultural land use at MNTP. Land use allocations would be the same as those described for Alternatives 1 and 2, with some tracts removed from crops and converted to grassland habitat or restored wetland/prairie. Under this alternative, however, all cropland would be continuously planted with no-till small grains (wheat and oats) that minimize soil erosion. These fields could require mowing in late summer (after grain harvest) to control certain noxious weed species. Grassland management practices would be identical to those in Alternatives 1 and 2. Alternative 2 also would develop several wells, maintain or relocate existing fences, and construct new fences for effective use of livestock as a management tool.

This alternative more fully addresses the public concern regarding herbicide use, by only planting crops that are traditionally grown without herbicide applications. Some application of nitrogen may be needed, however, to maintain good harvests of grains without rotation with row crops. Small grain crops are less marketable in Illinois than are corn or soybeans. As a result, it may be difficult to find interested permittees to grow small grain crops (R. Ziegenhorn, pers. com., January 16, 2001).

Alternative 4-No Action

This alternative would terminate all ongoing agricultural land use (row crops, small grains, livestock grazing, and hay cutting) activities at MNTP. These lands would remain unmanaged until such time that they were restored in accordance with the Midewin LRMP. Prior to restoration, areas formerly in agriculture would be dominated by herbaceous weeds, shrubs, and young trees.

This alternative addresses public comments calling for the cessation of all agricultural activity. Justification included the perceived contamination of soils by herbicides and continuing soil erosion from tillage operations. It was also suggested that the prairie would regenerate itself from such benign neglect. This alternative does not allow for the continuation of agricultural practices, as described in the MNTP enabling legislation (PL-104-106), nor does it manage habitats for suites of bird species dependent on short and medium stature grasslands.

Alternative 5-Restoration Management Activities

Like Alternative 4, this alternative would terminate all ongoing agricultural land use (row crops, small grains, livestock grazing, and hay cutting) activities at MNTP. As opposed to leaving these lands unmanaged until such time that they were restored in accordance with the Midewin LRMP, the Forest Service would actively engage in prescribed mowing, other mechanical vegetation management techniques, and prescribed burning. Mowing would be undertaken twice yearly (late June and mid-August).

This alternative addresses the same set of public comments as in Alternative 4. Instead of an absence of management, the growth of weeds and brush would be controlled. Such an alternative is a compromise between those seeking to preclude all agricultural activity and goal of the USFS to maintain an environment conducive to future restoration efforts. This alternative does not allow for the continuation of agricultural practices, as described in the MNTP enabling legislation (PL-104-106), nor does it manage habitats for suites of bird species dependent on short and medium stature grasslands.

Alternatives and Actions Dropped from Further Analysis

The "Status Quo" Alternative (i.e., performing the same activities over the next five years as were performed in year 2000) was considered, but dropped from further analysis. It did not fully meet the objective of environmental protection and does not fulfill the purposes of the enabling legislation by removing lands from cultivation over the next five years. Such an action would not provide increased habitat for viable populations of sensitive species. The methods employed in such an alternative (i.e., glyphosate-resistant soybeans and livestock grazing) would be the same as those in Alternative 1, the Modified Proposed Action.

One comment was made that bison should be used on MNTP instead of livestock. This comment was not included in the analysis, because the grazing tracts do not have proper containment fencing for bison at this time. The feasibility of grazing bison at MNTP awaits a decision on allotments for bison in the Midewin LRMP.

The Interdisciplinary Team concluded that the production of row crops without herbicides represents a high-risk strategy that few, if any, farmers would be willing to take. Organic farming on approximately 4,150 acres would require several large operators with significant labor forces. Such operators currently are not present in the area. Alternatively, numerous small operators would be required, but similarly, they are not present in the area. Given the temporary status of the cropland, the time required to learn the required organic farming skills, and the three-year waiting period before crops can be certified and sold as "organic", the required operators would not likely bid for these permits (E. Nafzinger, pers. com., University of Illinois Cooperative Extension Service, January 15, 2001).

Alternative Mitigation Measures

As described in Section 3 below, the proposed alternatives could adversely affect the resources of the MNTP. In order to minimize these adverse effects mitigation measures have been incorporated into each of the alternatives, as described below.

Similar to the Forest Service agricultural special use permits that expired on December 31, 2000, Alternatives 1, 2, or 3 would require permittees to implement soil and water conservation practices that prevent erosion and preserve soil fertility. Tillage of the soil would not generally be allowed. Exceptions to this would include tillage to remove tire tracks or small ditches resulting from the previous year's crop. Other conditions where tillage would be necessary would be negotiated between the Prairie Supervisor and the permittee in consultation with the local Natural Resource Conservation Service or Cooperative Extension personnel.

All agricultural special use permit holders that would use fertilizers to maintain or improve soil fertility (Alternatives 1, 2, or 3) must base application decisions on soil testing and soil fertility mapping information in an attempt to minimize effects on water quality.

Alternatives 1, 2, or 3 would relocate/construct fences and wells for livestock. To eliminate potential effects on heritage resources, an inventory would be conducted of all areas of proposed earth disturbance. All recorded sites that are found to be eligible for inclusion on the National Register of Historic Places would be avoided during project implementation.

Livestock grazing is an integral component of Alternatives 1, 2, and 3. To minimize affects on Sullivant's Coneflower (*Rudbeckia fulgida*, var *sullivanti*) the entire population of this plant would not be exposed to livestock grazing.

Alternative 5 would include large scale prescribed mowing, other mechanical vegetation management techniques, and prescribed burning. Alternatives 1, 2, and 3 could include small scale mowing. All Forest Service, contracted personnel, or special use permit holders engaging in these activities would be properly trained.

MNTP would continue to restore and expand breeding habitat for sensitive grassland bird species not benefited by grazing or haying, such as Henslow's Sparrow (*Ammodramus henslowi*), Northern Harrier (*Circus cyaneus*), and Short-Eared Owl (*Asio flammeus*).

MNTP would protect wetlands in pastures or hayfields in order to provide nesting habitat for the Northern Harrier, Short-Eared Owl, and other bird species under Alternatives 1, 2, and 3.

Interim recreational trails likely would be developed in grasslands and components of a permanent trail system developed prior to 2005 if Alternatives 1, 2, or 3 were implemented. Grazing areas would require special gates/turnstiles to allow access yet

keep livestock contained. Proper design of these gates/turnstiles would ensure access to the trails for the disabled.

3. Affected Environment and Environmental Consequences of the Alternatives

This chapter briefly describes the present condition of the environment and changes that may be expected by implementing one of the action alternatives or by taking no action at this time. The key issues generated through the scoping process, plus the requirements of the National Environmental Policy Act (NEPA), define the general scope of environmental concern for this project. This chapter also forms the scientific and analytic basis for the comparison of alternatives.

Cumulative effects are discussed in Chapter 6 for each key issue identified below. Cumulative effects result from incremental impacts of proposed activities when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

Aquatic Ecology and Water Quality

Affected Environment

Surface water in the project area drains through four perennial streams that generally flow in a west-southwesterly direction: Jackson, Prairie, Grant, and Jordan creeks. Together, these creeks drain nearly 110 square miles of urban, agricultural, and undeveloped land to the Des Plaines or Kankakee rivers (Table 2).

Table 2. Streams of the Midewin Watershed Potentially Affected by the Project Alternatives (Source: Openlands, Date Unknown).

Stream	Perennial Stream Miles	Drainage Area (mi^2)	Watershed Land Uses
Jackson Creek (DesPlaines River Sub - Basin)	25	37	Agricultural Rural residential Suburban residential Army training area Prairie parkland Transportation Commercial
Grant Creek (DesPlaines River Sub-Basin)	4.5	11	Agricultural Village of Elwood Industrial Prairie parkland Transportation
Prairie Creek (Kankakee River Sub-Basin)	21	47	Agricultural Rural residential Prairie parkland Tank farms Industrial Transportation
Jordan Creek (Kankakee River Sub-Basin)	8	14	Agricultural Prairie parkland Industrial Transportation Rural residential
TOTAL	33.5	109	

As shown in Table 3, lands within the Midewin watershed are overwhelmingly (86 percent) rural. Croplands make up 58 percent of the area. Pasture (7 percent), suburban residential (6 percent), open space/protected (6 percent), and parks/recreation/cemetery (5 percent) also occupy large portions of the watershed. These land uses affect water quality by determining the character of wet weather runoff.

Table 3. Summary of Estimated 1997 Land Uses of the Midewin Watershed (Source: Openlands, Date Unknown).

Land Uses		Area (acres)	Percent of Total
Urban	Suburban Residential	4,500	6
	Commercial	500	1
	Light Industrial/Office	2,500	3
	Heavy Industrial	2,000	2
	Municipal/Institutional	100	<1
	Highway	500	1
	Construction	100	<1
	Utility	1,000	1
	SUBTOTAL	11,200	14
Rural	Open Space/Protected	5,000	6
	Parks/Cemetery/Recreation	4,000	5
	Army Training Facility	3,000	4
	Rural Residential/Estates	2,000	2
	Rural Community	1,500	2
	Surface Water/Wetlands	200	<1
	Cropland	47,100	58
	Pasture	6,000	7
	Hay	1,000	1
	SUBTOTAL	69,800	86
TOTAL		**81,000**	**100**

On September 16, 1996, Prairie Creek was sampled for fish at stream miles 5.3 and 9.7. The results were compared to similar data collected by R.W. Larimore *et al.* in 1960-1964 and are shown in Table 5. The 1996 fish survey revealed that Prairie Creek was "fully supportive of aquatic life". The Index of Biotic Integrity (IBI) uses fish sampling data to indicate the overall health and integrity of a stream. The IBI assesses the health of fish communities using twelve different factors. These twelve factors fall into three categories: species composition, trophic composition, and fish abundance and condition. The data yield an overall site score ranging from 12, for exceptionally poor quality, to 60, for sites of exceptionally high quality. The IBI integrates information from individual, population, community, and ecosystem levels into a single ecologically based index of water resource quality.

Table 4. Results of Fish Surveys and IBI Ratings for Prairie Creek (Source: Ragusa 1996, documented in Openlands Project and Illinois State Museum, 1999).

Measure	Station: Mile 5.3		Station: Mile 9.7		Stations Combined	
	1960-64	1996	1960-64	1996	1960-64	1996
Total Species	22	19	12	20	28	22
IBI Ratings	-	50	-	44	-	47

IBI = Index of Biotic Integrity (>41 is considered to be fully supportive of aquatic life, 21-40 is partially supportive, and <21 is considered non-supportive, according to Illinois 305(b) water quality assessment methodology in Illinois EPA 2000).
- = No Data available.

Glass (1994), as cited by the Openlands Project and the Illinois State Museum (1999), contends that Prairie Creek is potential habitat for three Illinois endangered or watch list fish species, because of their occurrence downstream in the Kankakee River: Pallid Shiner (*Notropis amnis*), Greater Redhorse (*Moxostoma valenciennesi*), and River Redhorse (*Moxostoma carinatum*). Smith (1979) acknowledges that little is known about the preferred habitat of Pallid Shiner, but suggests it is clear vegetated pools with little or no current. Greater Redhorse prefers shallow, clear waters of medium to large-sized river reservoirs and lakes, similar to the river Redhorse (Pflieger 1975). These habitat preferences do not make Prairie Creek an attractive candidate for restoration of these rare fish populations. None of these three fish have been found in Prairie Creek in past surveys (Table 5), although 35 other species that are not sensitive have been documented.

Jackson Creek has been described by Glass (1994) as one of the "least disturbed streams in Northeast Illinois". In his fish surveys, he found 22 fish species Jackson Creek, including the exotic Common Carp (*Cyprinus carpio*). In a survey (documented in Openlands, Date Unknown) of mussel fauna, the (Regional Forester's Sensitive Species) Ellipse Mussel (*Venustaconcha ellipsiformis*) was recorded in Jackson Creek as well.

In Grant Creek, Ragusa found 19 species of fishes, including the Common Carp.

No fisheries data are available to describe Jordan Creek.

Table 5. Fish Species Recorded for Prairie, Jackson, and Grant Creeks* (Source: Ragusa, 1996, as documented in Openlands, Date Unknown).

	Creek		
Species	**Prairie**	**Jackson**	**Grant**
Rock Bass	X	X	
Common Stoneroller	X	X	X
White Sucker	X	X	X
Red Shiner	X		X
Spotfin Shiner		X	X
Carp		X	X
Silverjaw Minnow	X		
Creek Chubsucker		X	
Fantail Darter	X	X	
Johnny Darter	X	X	X
Orangethroat Darter	X	X	
Grass Pickerel	X		X
Hornyhead Chub	X		X
Northern Hog Sucker	X	X	
Black Bullhead	X	X	
Yellow Bullhead	X		X
Green Sunfish	X	X	X
Pumpkinseed	X		
Orangespotted Sunfish	X	X	
Longear Sunfish		X	
Striped Shiner	X	X	X
Redfin Shiner	X	X	
Smallmouth Bass	X		
Largemouth Bass	X		
Hornyhead Chub	X	X	X
Golden Shiner	X		
Common Northern Shiner	X		
Bigmouth Shiner			X
Rosyface Shiner	X		X
Sand Shiner			
Stonecat	X		X
Slender Madtom	X		
Southern Redbelly Dace		X	
Bluntnose Minnow	X		X
Creek Chub	X	X	X
Ribbon Shiner	X		X
Emerald Shiner	X		
Suckermouth minnow	X	X	
Black Redhorse	X		
Golden Redhorse	X		
Blackstripe Topminnow	X	X	
Blackside Darter		X	
Rainbow Darter	X		
TOTAL	35	22	19

*This list includes the results of several studies and may not represent current conditions. There is no known fish sampling data for Jordan Creek at Midewin.

Limited water quality data has been collected at the site. A search of the US Environmental Protection Agency's (USEPA, 2000) STORET (STOrage and RETrieval) water quality database found that the Illinois Environmental Protection Agency sampled two streams on the property. While these data (Table 6) are insufficient to demonstrate trends, they do indicate that these streams are moderately nutrient rich. Suspended solids are somewhat high, but may reflect wet weather conditions or high phytoplankton concentrations in summer.

The Forest Service has removed rolling terrain with relatively high rates of soil erosion from cropping and planted them to pasture over the last several years. The last of these areas will be planted to pasture in the spring of 2001. Additionally, the Forest Service has excluded livestock from stream corridors. As a result, current water quality should be improved relative to the data shown in Table 6.

Table 6. Water Quality Data for Prairie Creek and Grant Creek (Source: USEPA, 2000).

Site	Time Period	Total P (mg/L)	Total Ammonia (mg N/L)	Total Suspended Solids (mg/L)
Prairie Creek at River Road	1990-1994	Mean = 0.07 N = 2	Mean = 0.07 N = 2	Mean = 27.5 N = 2
Prairie Creek at River Road	1995-1997	Mean = 0.02 N = 2	Mean = 0.06 N = 2	Mean = 8.5 N = 2
Grant Creek at I-55	1980-1984	Mean = 0.13 N = 3		Mean = 12.7 N = 3

Environmental Consequences

Alternative 1

Alternative 1 gradually converts up to 2,300 acres in numerous tracts from crop/small grain production to grassland. It would eliminate the need for fertilizers and pesticides, aside from glyphosate, which has been classified a "General Use Pesticide". Glyphosate (N-[phosphonomethyl] glycine), which has a low potential for runoff, would be used on glyphosate-resistant soybeans grown at MNTP. Glyphosate is a broad-spectrum, nonselective, systemic herbicide used for control of annual and perennial plants, including grasses, sedges, broad-leaved weeds, and woody plants (Oregon State University, 1996a). Glyphosphate is generally applied to foliage in a water-soluble concentrate or powder.

Glyphosate is no more than slightly toxic to fish, and practically non-toxic to aquatic invertebrate animals at concentrations likely to occur at MNTP. Glyphosate does not build up (bioaccumulate) in fish tissue (USDA, Forest Service, 1996).

No-till cropping would minimize the amount of sediment and other runoff (containing any glyphosate) from reaching the streams of the MNTP. The Forest Service has placed

conservation buffer strips between the streams and the row crop fields, further minimizing sedimentation.

As tracts are taken out of glyphosate-resistant soybean production and put into grazing or native prairie, less glyphosate would be applied and, therefore, less would enter streams of the MNTP watershed relative to the existing conditions. The conversion of crops to grassland and/or prairie would also reduce the sedimentation of MNTP waterways relative to current levels. Alternative 1 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie on current agriculture fields.

Alternative 2

Like Alternative 1, this alternative would gradually convert up to 2,300 acres in numerous tracts from row crops/small grain production to grassland. The respective acreage of row crops/small grains in Alternative 2 would be similar to Alternative 1. No genetically modified crops would be included in Alternative 2. No glyphosate would be used on the conventional corn/soybeans that are rotated with small grain crops. Instead, a variety of herbicides may be employed. Among these are atrazine (for corn) and sethoxydim (for soybeans).

Atrazine has been classified as a "Restricted Use Pesticide", due to its high potential for groundwater contamination. It is commonly found at low levels in private and community wells in rural areas of Illinois. Atrazine is a selective herbicide used to control broadleaf and grassy weeds. It is available as dry, flowable liquid, water dispersible granular, and wettable powder formulations. Atrazine is slightly toxic to fish. Because of its high solubility in water, atrazine does not tend to accumulate in fish tissue (Oregon State University, 1996a).

Sethoxydim, which is a "General Use Pesticide" is a selective, post-emergence herbicide used to control annual and perennial grass weeds. Its potential to contaminate groundwater appears limited. It is available in emulsifiable concentrate formulations. Sethoxydim is slightly to moderately toxic to aquatic species (Oregon State University, 1996c).

Chlorpyrifos (a "General Use Pesticide") and permethrin (a "Restricted Use Pesticide") could also be required on corn to treat rootworms, cutworms, and/or corn borer. As the likelihood of using these pesticides is small, they are not examined in detail in this EA.

No-till cropping would minimize the amount of sediment and other runoff (containing any atrazine and sethoxydim) from reaching the streams of the MNTP. The Forest Service has placed conservation buffer strips between the streams and the crop fields, further minimizing sedimentation.

As tracts are taken out of crop production and put into grazing or native prairie, less herbicide would be applied and, therefore, less would enter streams of the MNTP

watershed relative to the existing conditions. The conversion of crops to grassland and/or prairie would also reduce the sedimentation of MNTP waterways relative to current levels. Alternative 2 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 3

Alternative 3 would replace row crops with small grain crops (wheat and oats) and convert the same portion of these to grazing lands and native prairie over the next five years, as would Alternatives 1 and 2. The small grain crops would use no herbicides. Nutrient management planning would determine if nitrogen fertilizers are used.

No-till cropping would minimize the amount of sediment reaching the streams of the MNTP. The Forest Service has placed conservation buffer strips between the streams and the row crop fields, further minimizing sedimentation.

As tracts are taken out of small grain production and put into grazing or native prairie, less sediment would enter streams of the MNTP. Alternative 3 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 4

This alternative would terminate all ongoing agricultural land use (row cropping, small grain cropping, and livestock grazing) activities at MNTP. These lands would remain unmanaged until such time that they were restored in accordance with the final Midewin LRMP. No herbicides would be applied.

Fields dominated by coarse, annual forbs would be subject to heavy sheet erosion in the first one or two years after the cessation of cropping. This would be especially true after frost has killed the foliage, leaving bare soil exposed between the plant stems. In years three to five, little sediment would enter the creeks of the MNTP as a result of this alternative. Alternative 4 would likely require tillage, herbicide application, and possibly bulldozing in order to address severe weed infestations and restore prairie. These methods would negatively affect water quality and aquatic organisms.

Alternative 5

Like Alternative 4, this alternative would terminate all ongoing agricultural land use activities at MNTP. As opposed to leaving these lands unmanaged until such time that they were restored in accordance with the Midewin LRMP, the Forest Service would actively engage in prescribed mowing, other mechanical vegetation management techniques, and prescribed burning. No herbicides would be used.

As in Alternative 4, the coarse, annual forbs occurring in the previously cropped fields would result in heavy sheet erosion during the first one or two years after the cessation of

cropping. This would be especially true after frost has killed the foliage, leaving bare soil exposed between the plant stems. Prescribed mowing and burning could also expose a small amount of substrate to erosion. In years three to five, little sediment would enter Grant, Jordan, or Prairie creeks as the result of Alternative 5. Alternative 5 would require tillage and herbicide application in order to address weed infestation and restore prairie.

Alternative 5 likely presents fewer risks to water quality and aquatic organisms than would Alternative 4, but more than Alternatives 1, 2, or 3.

Air Quality

Affected Environment

The Illinois EPA (1999) described air quality in the Will County/Joliet Pollution Summaries Index Sector during 1999 as "good" more than 80 percent of the time. The remainder of the time, air quality was described as "moderate". At no time during 1999 did the area exhibit "unhealthful", "very unhealthful", or "hazardous" air quality.

Petroleum refineries and other industrial uses occur on lands surrounding the MNTP. These industries emit various pollutants into the atmosphere, including volatile organic materials, particulate matter, carbon monoxide, sulphur dioxide, and nitrogen oxide.

Aerial application of herbicides/pesticides is not permitted at MNTP. As described earlier, glyphosate is currently used on glyphosate-resistant soybeans grown at MNTP. It does not evaporate easily and is not considered an air quality concern.

Current row cropping and small grain cropping at MNTP is done using no-till practices. As a result, little dust is generated.

Farm machinery used to plant, maintain, and harvest row crops and small grain crops currently add an insignificant amount of pollution to the air in comparison to surrounding industries.

Environmental Consequences

Alternative 1

This alternative would continue the use of commercial glyphosate in areas planted with glyphosate-resistant soybeans. As some tracts are taken out of soybean production and put into grassland or restored prairie, less glyphosate will be applied. Glyphosate does not evaporate easily and would not be an air quality concern.

No-till practices would generate little dust.

Farm machinery would generate an insignificant amount of air pollution.

Alternative 1 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 2

This alternative would rotate the farming of conventional corn and soybeans. Careful application of atrazine and sethoxydim would result in no air quality concerns.

No-till practices would generate little dust.

Farm machinery would generate an insignificant amount of air pollution.

Alternative 2 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 3

Areas of continuously cropped small grains could require mowing in late summer to control noxious weeds. Such mowing would generate an insignificant amount of dust and vehicle emissions.

No-till practices would generate little dust.

Farm machinery would generate an insignificant amount of air pollution.

Alternative 3 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 4

This alternative would terminate all ongoing agricultural land use activities at MNTP. A large increase in ragweeds, chenopods, pigweed, and other allergen (pollen) producers would result.

Alternative 4 would likely require tillage, herbicide application, and possibly bulldozing in order to address severe weed infestations and create grassland/restore prairie. These methods would negatively affect air quality, but probably not enough to have significant effects.

Alternative 5

Like Alternative 4, this alternative would terminate all ongoing agricultural land use (row cropping, small grain cropping, and livestock grazing) activities at MNTP. As opposed to leaving these lands unmanaged, the Forest Service would actively engage in prescribed mowing and other mechanical vegetation management techniques. Mowing would generate dust and vehicle emissions. Increases in allergens would occur.

Prescribed burning would produce smoke that could limit visibility. The effects on air quality would depend on the season, frequency, duration, and scale of burning.

Tillage, herbicide application, and possibly bulldozing would be required in order to address weed infestations and create grassland/restore prairie. These methods would negatively affect air quality, but probably not enough to have significant effects.

Soils

Affected Environment

The soils at MNTP are developed from glacial till, outwash sand, proglacial lake sediments, and dolomitic bedrock. Prairie soils (mollisols) are widespread. These prairie soils have a thick (at least 10 inches), dark colored, and organically rich surface horizon. Many of the Midewin soils are poorly drained and supported wet prairie and marshes prior to being tilled and drained (Openlands Project and Illinois State Museum, 1999).

The east side of the MNTP consists largely of poorly drained silty clay loam developed in glacial till. The southwest portion of the site is dominated by thin, poorly drained, silty loam, formed in glacial till over bedrock (Openlands Project and Illinois State Museum, 1999).

There are 25 soil types at MNTP. The principal types are Ashkum, Drummer, and Elliot. USDA soil maps rank most of these soils as “uneroded”, some as “somewhat eroded”, and none as “severely eroded”. Most slopes are between 2 and 4 percent, with the remainder being between 4 and 7 percent. These steeper slopes have been removed from cropping and are now grazed by livestock. Only a few MNTP soils are considered “well drained”. Most soils are “somewhat poorly drained” and “poorly drained”. Natural vegetative cover types, which include savanna and forest, are dominated by prairie and wetland.

Environmental Consequences

All factors being equal, soil loss among alternatives can be compared by examining the cropping management factor (C) in the Universal Soil Loss Equation (Table 7). The cropping management factor, sometimes called the vegetative cover factor, estimates the effect of ground cover conditions and general management practices on soil erosion rates. “C” is assumed to be unity (1.0) for continuously fallow ground. Smaller values account for vegetative canopy protection of soil, reduction of rainfall energy, and protection of soil by crop residues, roots, and mulches.

Soybeans and corn, even under no-till practices, offer little vegetative cover to protect the soil. Small grains (wheat or oats) offer increased protection. Pasture and restored prairie would offer the greatest protection of soil resources.

Table 7. Cropping Management Factor (C) For Alternative Crops (Adapted from Novotny and Chesters 1981).

Crop	Cropping Management Factor (C)
Continuous fallow tilled	1.0
Shortly after seeding or harvesting[a]	0.3 – 0.8
Soybeans[b]	0.2 – 0.3
Corn	0.1 – 0.3
Wheat or oats[b]	0.05 – 0.15
Permanent pasture	0.003 – 0.01
Prairie	<0.003

[a] Depending on root and residue density

[b] During the main part of the growing season

Alternative 1

Alternative 1 would continue the use of glyphosate-resistant soybeans rotated with small grains. Under the no-till management practices that would continue if this alternative were implemented, the soil will be somewhat protected at the "C" level of 0.05-0.3. Erosion would be relatively low under Alternative 1.

Commercial glyphosate would be used to control grasses, herbaceous plants, and brush within areas of glyphosate-resistant soybeans. This would keep the weed seedbank in cropland soils low. Glyphosate would not adversely affect future prairie plantings. Under the anticipated nutrient management planning, fertilizer additions are expected to be minimal. Some soil compaction and a plow pan would result from the use of no-till methods. Livestock grazing would also result in some soil compaction. These factors are not likely to interfere with post cropping grassland or prairie plantings.

As shown in Table 7, "C" values decrease under grass/prairie conditions and soil erosion would decrease as areas are so planted.

Alternative 2

This alternative, conventional (genetically unmodified) soybeans and corn, would also be managed under no-till conditions. In any given year, row crop fields could be in conventional soybeans or corn. Prior to grassland creation or prairie restoration, small grains would be planted. The soil will be protected at the "C" level of 0.05-0.3, erosion would be somewhat worse under Alternative 2 than it would be under Alternatives 1 or 3.

Some soil compaction and a plow pan would result from the use of no-till methods. Livestock grazing would also result in some soil compaction.

Atrazine and sethoxydim would be used to control grasses, herbaceous plants, and brush within areas of corn and soybeans. This would keep the weed seedbank in cropland soils

low, but would likely have residual effects on the growth of wheat and oats, which are the intermediate step between crops and grassland/prairie.

Soil erosion would decrease as areas are planted in small grains and would decrease again as areas are planted to grassland/prairie.

Alternative 3

The small grain crops employed in Alternative 3 would provide slightly better soil protection (C=0.05-0.15) and result in slightly less erosion than would the crops used under Alternatives 1 or 2.

No-till methods used to install the small grains would result in some compaction of the soils and development of a plow pan. Livestock grazing would also result in some soil compaction.

No herbicides would be used under this alternative. While the small grains would generally keep weeds out, they would not do so as effectively as Alternatives 1 or 2.

Alternative 4

This alternative would terminate all ongoing agricultural land use activities at MNTP. Fields dominated by coarse, annual forbs could be heavily eroded in the first year or two after the cessation of cropping, particularly after frost has killed the foliage and the soil surface is exposed between the stems. In subsequent years, soil erosion would decrease and the perennial weeds, shrubs, and trees would preserve soil structure.

No herbicides would be used in managing lands prior to prairie restoration. As described in a subsequent section of this document ("Exotic Plants"), the soils would be contaminated with a weed seedbank under Alternative 4. Tillage, herbicides, and possible bulldozing would be required to remove herbaceous and woody weed species during creation of grasslands or restoration of prairie.

Alternative 5

Like Alternative 4, this alternative would stop all ongoing agricultural land use activities at MNTP. The Forest Service would then actively engage in prescribed mowing, other mechanical vegetation management techniques, and prescribed burning. Fields dominated by coarse, annual forbs could be heavily eroded in the first year or two after the cessation of cropping, particularly after frost has killed the foliage and the soil surface is exposed between the stems. In subsequent years, soil erosion would decrease and perennial weeds would help preserve soil structure.

Mowing, which would keep areas relatively free of trees/shrubs, could result in some compaction of the soils.

No herbicides would be used in managing lands prior to prairie restoration. Prescribed burning could remove enough surface vegetation to generate soil erosion.
Soils would be contaminated with a weed seedbank if Alternative 5 were implemented. This contamination would be less than in Alternative 4, since mowing would be conducted to minimize flowering and seed production of noxious weeds and invasive species. Tillage, herbicides, and possible bulldozing would be required to remove herbaceous and woody weed species during creation of grasslands or restoration of prairie.

Heritage Resources

Affected Environment

Heritage resource sites likely to be present within the project area include Euro-American farmsteads and related features such as roads, fence lines, discard areas, churches, schools and cemeteries dating from the mid-nineteenth to the mid-twentieth centuries, as well as a prehistoric Native American mortuary, village and limited activity camps sites. Native American sites potentially date as early as 12,000 to 10,000 B.C., and as late as the 1830s. There is also the possibility of sites or features associated with the World War II-era Kankakee Ordinance Works, or the later Joliet Arsenal, that are located in the study areas.

These sites were present before the agricultural special use permits were issued and are a reflection of the area's agrarian heritage. Many of the pre-arsenal farmsteads and related features are located adjacent to cultivated fields (under agricultural special use) just as they were prior to the construction of the arsenal facilities. The farm fields themselves are a related feature of the agricultural heritage of the region. Continuing agricultural activities on these agricultural leases only serves to perpetuate the visual manifestation of the farming heritage of this area.

The Native American sites present within the study area have been subjected to cultivation in the past.

Will County has traditionally been agriculturally oriented. In 1880, 98 percent of the land in the county was farmed. Between 1860 and 1949, the acres of Will County under farmland cultivation grew from 243,086 acres to 375,049 acres. With the exception of the land occupied by the Elwood Ordinance Plant and the Kankakee Ordinance Works (i.e., the Joliet Arsenal), the farmland included in MNTP has been under continuous cultivation since at least 1880.

Environmental Consequences

Alternatives 1, 2, and 3

Allowing the existing agricultural special uses to continue over the next five years in areas that have been under cultivation since 1880 would not adversely affect the heritage resources present within the study area.

Constructing new fences could have an adverse effect on heritage resources through the excavation of individual fence posts. Similarly, well excavation could impact heritage resources. Conducting an inventory of individual project areas, such as well development sites, would mitigate any potential impacts to heritage resources. All recorded sites that are found to be potentially eligible for inclusion on the National Register of Historic Places (NRHP) would be avoided during all project-related activities. Therefore, these alternatives would have no additional effects on heritage resources.

Alternatives 4 and 5

These alternatives would not affect heritage resources.

Recreation and Visual Quality

Affected Environment

The *"Analysis of the Management Situation"*, July 1999, outlined specific planning and decision criteria that are being used to develop and evaluate alternatives to the Midewin LRMP. These include providing for environmental education/interpretation opportunities and providing for recreation activities and facilities that foster knowledge, appreciation, and understanding of prairie ecosystems.

Because of ongoing salvage and cleanup operations, much of the MNTP is closed to the general public. At the present time there is no public recreational access to the project area portion of the MNTP east of Illinois Route 53. Deer hunting (administered by the IDNR) is available by permit in the southwest portion of the project area. This hunting area occurs along River Road and in portions of the bunker field located south of Prairie Creek from October through January.

Midewin, as part of the Recreation Fee Demonstration Program, has the authority to charge fees for recreation activities and programs. At least 80 percent of fees collected at MNTP, including those currently collected for deer hunting, will be reinvested on-site.

Three accessible hunting blinds are available by reservation for people with disabilities. Two of these sites are located in the River Road Hunting Area and are available all season. The site located in the Bunker Hunting Area is available for shotgun, muzzleloader, and late season archery hunting.

Escorted tours of the MNTP are currently available upon request from April through October. These tours introduce visitors to the natural and cultural history of the MNTP. Topics covered in the tours include the evolution of the tallgrass prairie, the history of human use and occupation of the site, creation of the MNTP, and management challenges facing the Forest Service and IDNR in undertaking restoration of an area this large. Tours are limited to 25 individuals or 10 vehicles.

Environmental Consequences

Alternatives 1, 2, and 3

With the exception of converting some croplands to grassland, these alternatives would result in no visual or recreation changes to the existing MNTP lands used for deer hunting. These areas would continue to be managed for a mixture of livestock grazing and agriculture.

Alternatives 4 and 5

Existing MNTP deer hunting lands would undergo change from relatively open grazing and cropland to old field and shrubland. The wide-open vistas typically enjoyed by prairie visitors would become obscured by shrubs and small trees. Increased browse and cover would increase the suitability of the existing land for hunting, but the ability of hunters to view deer would decrease. This would result in decreased deer hunting success. Alternative 4, which would do nothing to control shrub and tree growth, would result in lower deer hunting success than would Alternative 5 which would use mowing and burning to control tree and shrub growth.

Sensitive Plant and Animal Populations

Affected Environment

The tracts proposed for agricultural special use contain habitat for eight species on the Regional Forester's Sensitive Species list for MNTP: one plant, one amphibian, and six birds. The management of these species is discussed below.

Sullivant's Coneflower

Sullivant's Coneflower (*Rudbeckia fulgida*, var *sullivanti*) is relatively common in prairie communities, old fields, pastures, and successional thickets, only west of Illinois Route 53. It is widespread in such habitat at MNTP. Within the areas proposed for agricultural special use, this species is present only in tracts proposed for grassland management. Its persistence and abundance in these tracts, where grazing has been practiced for more than 20 years, suggests that the species is not adversely affected by the presence of livestock (or that grazing, at least, does not exert a severe impact). The species is not found in or adjacent to any tract proposed for row crops or small grains under Alternatives 1, 2, or 3.

Plains Leopard Frog

The Plains Leopard Frog (*Rana blairi*) has been found only in a small area along Prairie Creek, but MNTP staff have been unable to locate the actual breeding sites, despite the presence of suitable habitat (E. Ulaszek, pers. com., USFS, December 22, 2000). This frog has not been found east of Illinois Route 53 at MNTP and may be restricted to a few tracts proposed for grazing use under Alternatives 1,2 or 3. It has been found in areas near or adjacent to Prairie Creek, where wetlands have been fenced to exclude livestock. It does not occur in or adjacent to any tract proposed for row crops or small grains.

Northern Harrier

Northern Harriers (*Circus cyaneus*) have been recorded nesting at the MNTP, but not every year. None have been recorded nesting on any of the tracts proposed for grazing under Alternatives 1, 2, or 3. Due to the short plant cover, these grazing tracts are marginal nesting habitat for this hawk. They do, however, provide suitable foraging habitat for both breeding and wintering harriers. Other factors being suitable (cover height and density, lack of disturbance, prey availability), ungrazed wetland exclusion areas in pastures would provide adequate nesting sites if their areas were several hundred square meters. In winter, harriers utilize a wide variety of foraging habitats, including fallow fields, croplands (row crops and small grains), and mown hayfields. The intensity of their hunting over these habitats may be determined by their success in obtaining prey, as well as by the hunting experience of the individual harrier.

Upland Sandpiper

The MNTP supports the largest aggregation of Upland Sandpipers (*Bartramia longicauda*) in Illinois, due to a large concentration of habitat managed by grazing. The density of the species at MNTP is greater than in other areas of the Prairie Parklands, because grazing is not used as a management tool in the other grasslands. Six tracts of the MNTP proposed for grazing special use permits under Alternatives 1, 2, or 3 contain known breeding Upland Sandpipers. Elsewhere in the Prairie Parklands, no Upland Sandpipers breed, since grazing is not used as a habitat management tool. A seventh tract (east of Illinois Route 53) has been used by these birds for post-breeding foraging since 1997, due to the conversion from row agriculture to cool-season grassland.

Short-eared Owl

The Short-eared Owl (*Asio flammeus*) is a common winter visitor to the MNTP, although it is not known to breed there. In winter, the Short-eared Owl uses all habitat that supports small rodents (principally voles, *Microtus*), including pasture, small-grain stubble, wetlands, and native grasslands. For breeding success large tracts of such habitat, along with a high population of small rodents, must be available.

Migrant Loggerhead Shrike

The project area supports a substantial and apparently stable breeding population of the Migrant Loggerhead Shrike (*Lanius ludovicianus migrans*), which is found in or near many of the tracts under special use permits for grazing. Grazing is a suitable management tool for maintaining the grass at a height required by shrikes for prey accessibility. Shrikes prefer to forage in native pastures and pastures of forage crops, avoiding cereal crops (Johnson, et al. 1998).

Bobolink

The Midewin Prairie supports the largest breeding concentration of Bobolinks (*Dolichonyx orizivora*) in Illinois, estimated at 850-900 birds. Bobolinks are tolerant of light grazing, which maintains proper grass height and litter depth, and suppresses excessive growth of forbs and shrubs. Bobolinks also use grass hayfields (but are deterred by alfalfa). Care must be taken that such fields are not mowed during the nesting season, that is, before mid-August (USDA, Forest Service, 2000).

Henslow's Sparrow

Before 1996, breeding by Henslow's Sparrow (*Ammodramus henslowi*) was recorded only occasionally at MNTP, but since then the number of known breeding pairs has increased to 10-15. They are found nesting in ungrazed grasslands. Among the tracts proposed for grazing under Alternatives 1, 2, or 3, this sparrow has been confirmed breeding in only one tract east of Illinois Route 53 and may possibly nest in two tracts west of Illinois Route 53. Portions of one additional tract west of Illinois Route 53 provide suitable foraging habitat for Henslow's Sparrows, but MNTP staff have yet to find them there (E. Ulaszek, pers. com., USFS, December 22, 2000).

<u>Environmental Consequences</u>

Sullivant's Coneflower

Alternatives 1, 2, and 3

Adverse effects on the total MNTP population of Sullivant's Coneflower would be minor. Many of the populations of Sullivant's Coneflower (greater than 50 percent) would remain outside of the agricultural special use areas. Only four tracts contain plants of this species. These individuals could be subject to some grazing, trampling or mowing, but most of their foliage is fairly low (less than 6 inches) and this species appears to benefit from having taller competitors removed by mowing or grazing.

Alternative 4

With no effort made to control ecological succession, the MNTP population of coneflower would be expected to decline under Alternative 4, as native and exotic shrubs invade and dominate the habitat, shading out the coneflower plants.

Alternative 5

Active weed control programs could allow some MNTP coneflower populations to survive under mowing and burning. However, the timing of mowing needed to control invasive species would prevent successful flowering and seed production. This would decrease the population of Sullivant's Coneflower.

Plains Leopard Frog

Alternatives 1,2, 3, 4, and 5

None of these alternatives would negatively affect this species. The fencing of wetlands would prevent the loss of temporary pools that may provide breeding conditions.

Northern Harrier

Alternatives 1, 2, and 3

These alternatives would increase the acreage of grassland and consolidate grassland habitat. Both of these actions would benefit the harrier.

Alternative 4

Allowing ecological succession of grasslands would lead to a decrease in foraging habitat and negatively affect the harrier.

Alternative 5

The abandonment of all cropping and grazing, combined with efforts to maintain grasslands, probably would benefit the harrier. However, the timing and frequency of mowing, especially if conducted near nesting areas, would discourage nesting. Less frequent mowing probably would allow the development of weedy crop fields that would provide marginal habitat for harrier foraging.

Upland Sandpiper

Alternatives 1, 2, and 3

These alternatives would increase the quantity of grazing land at MNTP, thereby benefiting the sandpiper.

Alternative 4

Alternative 4 would effectively eliminate the Upland Sandpiper from areas of the MNTP under management and may contribute to loss of regional viability, but would not cause a trend toward federal listing due to the extensive range of the species.

Alternative 5

This alternative would be slightly detrimental, as the resulting grassland probably would be higher on average than that preferred by the Upland Sandpiper. Mowing during the breeding and brood rearing season, which might be required to control invasive plants, would destroy nests and cause chick mortality.

Short-eared Owl

Alternatives 1, 2, and 3

These alternatives would benefit the owl by gradually increasing grassland habitat and managing existing habitat.

Alternative 4

This alternative would exert a slight adverse impact on wintering individuals of the species, but not enough to cause a trend toward federal listing or loss of viability, due to the wide distribution of the species and the position of MNTP at the periphery of its range.

Alternative 5

This alternative would provide benefits by optimizing the grassland for voles and creating grass heights that would facilitate hunting by the owl. If mowing were undertaken during the breeding season, any attempt by the owl to nest would be negatively affected.

Migrant Loggerhead Shrike

Alternatives 1, 2, and 3

These alternatives would increase the quantity of grazing land at MNTP gradually over the five-year period and manage existing habitat, thereby benefiting the shrike.

Alternatives 4 and 5

These alternatives would exert an adverse impact that would further the existing trend toward federal listing and might reduce the viability of the regional population.

Bobolink

Alternatives 1, 2, and 3

The increase in grazing and gradual increase in cool season grassland would exert a slightly beneficial impact on this species.

Alternative 4

This alternative would exert a detrimental impact, but not so severe that it would be likely to cause a trend toward federal listing of the Bobolink.

Alternative 5

The impacts on the Bobolink associated with Alternative 5 would depend on how the activities of grassland management are conducted, both in terms of frequency and timing.

Henslow's Sparrow

Alternatives 1, 2, and 3

These alternatives would be slightly beneficial to this species, through the gradual increase in cool season grasses that would tend to maintain grass heights preferred by the sparrow.

Alternative 4

By increasing areas of brushland, Alternative 4 would adversely affect the Henslow's Sparrow. The adverse effects would not impact populations with sufficient severity to cause a trend toward federal listing or a loss of population viability.

Alternative 5

This alternative would adversely impact the sparrow, but to a lesser extent than Alternative 4.

Invasive Plant Species

Affected Environment

The infestation levels of many invasive plants are regulated by farming and grazing (Carroll, C and J. White, 1997). MNTP staff (E. Ulaszek, pers. com, USFS, November 8, 2000) have stated that ongoing agricultural practices prevent the expansion of or control the abundance and coverage of the exotic and native invasive species that would hamper landscape restoration efforts.

Common exotic species that invade fallow crop fields at MNTP include: Musk Thistle (*Carduus nutans*), Bull Thistle (*Cirsium vulgare*), Chinese Cup-grass (*Eriochloa villosa*), Common St. John's-wort (*Hypericum perforatum*), Birds-foot Trefoil (*Lotus corniculatus*), Alfalfa (*Medicago sativa*), White Sweet Clover (*Melilotus alba*), Yellow Sweet Clover *(Melilotus officinalis*), Canada Bluegrass (*Poa compressa*), Johnson Grass (*Sorgham halapense*), and Giant Foxtail (*Setaria faberi*).

Common native species that invade fallow crop fields at MNTP include: Giant Ragweed (*Ambrosia trifida*), Dogwoods (*Cornus spp*.), Horseweed (*Conya canadensis*), Late Boneset (*Eupatorium serotinum*), Green Ash (*Fraxinus pennsylvanicus*), Eastern Cottonwood (*Populus deltoides*), Sandbar Willow (*Salix interior*), and Tall Goldenrod (*Solidago canadensis*).

MNTP areas where cropping activities recently (1998) ceased were observed to be dominated by the following weedy species: Bull Thistle, Canada Thistle (*Cirsium arvense*), Chinese Cup-grass, Wild Carrot (*Daucus carota*), Multiflora Rose (*Rosa multiflora*), Giant Ragweed, Giant Foxtail, and Burdock (*Arctium minus*).

When grassland areas at MNTP are removed from management, the following species increase and become dominant: Teasel (*Dipsacus laciniatus*), Autumn-Olive (*Elaeagnus umbellata*), Osage-Orange (*Maclura pomifera*), Canada Thistle, Amur Honeysuckle (*Lonicera maackii*), White Mulberry (*Morus alba*), and others.

Several of the species listed above are on the Illinois Noxious Weed List and control is required by the Illinois State Noxious Weed law. These include Canada Thistle, Musk Thistle, and Johnson Grass.

Environmental Consequences

Alternative 1

This alternative would continue cultivation, haying, and livestock grazing activities. These activities would maintain affected portions of the MNTP in a relatively weed-free state.

The use of glyphosate-resistant soybeans and glyphosate would provide better weed control than would the other alternatives (S. Banovetz, pers. com., Agroecol, January 16, 2001). Continued use of this cropping system would significantly minimize the amount of annual weed seed in the upper portion of the soil and reduce the amount of invasive plant control efforts required during subsequent grassland establishment or prairie restoration.

Alternative 2

This alternative would continue cultivation, haying, and livestock grazing activities. These activities would maintain affected portions of the MNTP in a relatively weed-free state.

The use of unmodified corn and soybeans, along with herbicides atrazine (for corn) and sethoxydim (for soybeans) would provide less effective weed control than Alternative 1. Alternative 2 weed control, however, would be more effective than that proposed for Alternatives 3, 4, or 5.

Alternative 3

Like Alternatives 1 and 2, this alternative would continue cultivation, haying, and livestock grazing activities. These activities would maintain affected portions of the MNTP in a relatively weed-free state.

No herbicides would be used under this alternative. The small grain crops would be less effective in controlling weeds than would Alternatives 1 or 2; however, they would be more effective than Alternatives 4 or 5.

Alternative 4

When cultivation, haying, or livestock grazing are phased out, some weed species would increase at least temporarily. For instance, removal of cattle from an existing pasture may stimulate an increase in white sweet clover. Over time, competition from other weed species would likely crowd out sweet clover. A large population of sweet clover would leave a considerable seed bank in the soil, creating management challenges during restoration.

Invasive woody plants, such as Autumn-Olive, Osage-Orange, Amur Honeysuckle, and White Mulberry would become established and produce fruit prolifically within the project area over the next five years. These fruits are highly attractive to birds, which would disperse the seeds and increase the scale of the infestation/weed seed bank.

Herbaceous perennial species, such as Teasel, are also quite prolific. One single plant may produce several thousand long-lasting seeds. Such species would rapidly reproduce and infest the project area.

Fields taken out of cultivation would become weed-filled, resembling those described in the Affected Environment. Soil seedbanks would rapidly be dominated by these weed species in the absence of management activities.

Alternative 5

Cessation of agricultural activities would result in weed infestation and seed bank contamination, as described under Alternative 4. These effects would be somewhat offset by regular burning and mowing, but invasive plant populations are likely to be much more problematic than those encountered in Alternatives 1, 2, or 3.

Land Use

Affected Environment

As previously described, the primary purposes of the MNTP, as outlined in the Illinois Land Conservation Act of 1995 (enabling legislation), are:

1. To manage the land and water resources to conserve and enhance the native populations of fish, wildlife, and plants.

2. To provide scientific, environmental, and land use education and research.

3. To allow continuation of agricultural uses over the next 20 years, and

4. To provide a variety of recreation opportunities that are not inconsistent with the preceding purposes.

The Midewin LRMP is currently under development. Under the enabling legislation, the Forest Service may conduct management activities at MNTP prior to completion of a LRMP. Agriculture and grazing are interim projects listed in the *"Notice of Intent to Prepare an Environmental Impact Statement for the land and Resource Management Plan, 1998"* as needing to be implemented pending compliance with the following criteria:

1. The Forest Service must determine that the environmental conditions of the site where the activity may occur meet the standards necessary for the activity.

2. The activity does not interfere with Army cleanup operations as directed in the legislation *(2913 [e][1])*.

3. The activity does not represent an irretrievable commitment of resources (i.e., a project can be "undone" with relative ease and minimal finances) unless it is necessary for safety or resource protection purposes.

4. The activity represents a valid, existing right as provided by the legislation (e.g., agriculture) *(Section 2915 [b])*.

Environmental Consequences

Alternatives 1, 2, and 3

These alternatives would comply with the MNTP enabling legislation by continuing agricultural practices over the next 5 years.

By maintaining project lands in a relatively weed-free state, these alternatives would allow for cost effective future prairie restoration.

Alternatives 4 and 5

These alternatives, which eliminate all agricultural land uses, would not comply with the MNTP enabling legislation.

Alternatives 4 or 5 also would result in weed infestations that make future prairie restoration very difficult and costly. Therefore, they would represent an irretrievable commitment of resources.

Socioeconomics

Affected Environment

Will County, in which the MNTP is located, is part of Illinois' 6-county Chicagoland (northeastern Illinois) area. Other counties in the Chicagoland area are: Cook, DuPage, Kane, Lake, and McHenry. Will County, the second largest of the 6-county area, consists of 24 townships and 35 municipalities. The latest (year 1999) Will County population estimate from the U.S. Census Bureau is 459,189, which ranks fourth of the six counties. In terms of population growth between 1990 and 1998, Will County is the fastest growing of the six counties with an increase of 101,876 people. In terms of percent population growth, Will County ranks third (behind McHenry and Kendall) with a population increase of 28.5 percent. Approximately one-half of the people coming to Will County between 1990 and 1998 came from Cook County, which includes the City of Chicago. The 1990 census revealed that 83.7 percent of the population was "urban" and 16.3 percent as "rural" (Will County, 2000).

The 1998 unemployment rate for Will County was 4.2 percent, slightly less than the 6-county average of 4.3 percent. Unemployment in the City of Joliet, the County's largest urban center, was 6.7 percent in 1998 (Northeastern Illinois Planning Commission [NIPC], 2000a).

In 1998, Will County had a per capita personal income (PCPI) of $26,114, which ranked 17th in the State of Illinois and was 87 percent of the state average. In 1988, Will County ranked 12th in the State in terms of PCPI (NIPC, 2000b).

The largest industries in Will County during 1998 were services, representing 25.1 percent of earnings; state and local government, 14.3 percent; and construction, 12.7 percent. Slow growth was seen in durable goods manufacturing in 1998 and fast growth in services.

Will County farmland decreased eight percent from 325,227 acres in 1992 to 293,526 acres in 1997. The average size of farms increased five percent from 308 acres in 1992 to 323 acres in 1997. Full-time farms decreased 15 percent from 596 farms in 1992 to 506 farms in 1997. The market value of agricultural products sold increased 17 percent between 1992 and 1997 to $107,129,000. Crop sales accounted for 92 percent of this market value, and livestock the remaining eight percent. The average market value of agricultural products sold per farm increased 36 percent from $86,574 in 1992 to $117,724 in 1997 (NIPC, 1999).

Agricultural activities at Midewin carry social and economic effects. Revenue from farming activities at MNTP finds its way into nearby communities, affecting their economies as well as their capacity to generate a robust community life. Rural sociological research (Hefferman and Lasley, 1978) has shown that both the economic and social life of small towns is dependent on the size and number of surrounding farms. Cropping and grazing plans chosen by USFS would affect the potential revenue to farmers and therefore the social and economic contributions those farmers make to their community. Further, cropping plans affect the bids farmers are likely to make for the use permits. Lower permit revenue to the Forest Service could affect the amount of funding available for prairie restoration activities. In addition, 25 percent of permit revenue currently supports local county roads and public schools.

Environmental Consequences

Alternative 1

This alternative would crop glyphosate-resistant soybeans (rotated with small grains) and generate a maximum revenue in year 2001 of about $300 per acre. A maximum of 2,300 acres of cropland would be converted to grassland over the next five years. In the third year after planting to grasses, a portion of the grassland acreage removed from cropping would be reopened to livestock grazing. Local farmers are well-acquainted with the required farming techniques and would likely bid for these special use permits. In the

process, revenue would be spent at local machinery dealers, supply stores, grain elevators, and small businesses.

Livestock grazing practices would be identical to Alternatives 2 and 3. As they would also be very similar to ongoing practices, minimal socioeconomic change would result.

The income generated by agricultural special use permits would decline slightly over the next five years, as lands are taken out of agricultural production and grazing. Fewer acres would translate into smaller lease payments. However, this alternative would retain much of the existing income.

Alternative 2

This alternative would also continue agricultural production at MNTP. Genetically unmodified corn and soybeans (which would generate a maximum revenue in year 2001 of about $350 per acre) would be replaced by small grains two years prior to converting tracts to grassland. As under Alternative 1, a maximum of 2,300 acres of cropland would be converted to grassland over the next five years, with a portion of the grassland reopened to grazing. Local farmers likely would bid for these special use permits and distribute revenues back to the local community.

Livestock grazing practices would be identical to Alternatives 1 and 3. As they would also be very similar to ongoing practices, minimal socioeconomic change would result.

The income generated by agricultural permits would decline slightly over the next five years, as lands are taken out of agricultural production and grazing. However, this alternative, which would allow permittees the highest return per acre, would retain the largest portion of the existing income and have less effect on permit holders, local communities, Forest Service revenues, county roads, and local schools than other action alternatives.

Alternative 3

Alternative 3 would reduce revenues substantially by shifting to small grain crops with lower market values (a maximum of about $125 per acre in year 2001). The dislocation of permit holders could be greater than that encountered under Alternatives 1 and 2, given the switch to low revenue crops. It may be difficult to fill all permits, requiring the Forest Service to take over management.

Livestock grazing practices would be identical to Alternatives 1 and 2. As they would also be very similar to ongoing practices, no socioeconomic effect would result.

The income generated by agricultural permits would decline slightly over the next five years, as lands are taken out of agricultural production and grazing.

Alternative 4

This alternative would cease all farming and grazing activities, eliminating revenues from permits over the next five years. The economic impact to permit holders would be great given the removal of the MNTP property from production.

The lack of management would allow weeds to flourish on the property. The spread of weeds would result in the Forest Service spending additional monies ($40-$100 per acre per application) on weed control during subsequent prairie restoration efforts.

Alternative 5

The effects of this alternative would be similar to Alternative 4. However, managing the lands would result in additional costs to the Forest Service. The costs of mowing would range from $20 to $40 per acre per application (J. Larson, pers. com., USFS, January 11, 2000). These costs would be offset by a decrease in restoration costs relative to Alternative 4.

Genetically-Modified Crops

Affected Environment

Approximately 60 percent of the soybeans grown on land in Will County that surrounds the MNTP are genetically-modified, that is, glyphosate-resistant (E. Nafzinger, pers. com, University of Illinois Cooperative Extension Service, December 16, 2000). These glyphosate-resistant soybeans do not hybridize with the local flora, nor are they known to harm the local fauna. The likelihood of this genetically-modified soybean crossing with conventional, genetically unmodified soybeans on adjacent land is very low (E. Nafzinger, pers. com, University of Illinois Cooperative Extension Service, December 16, 2000), as soybeans are highly self-pollinated.

Environmental Consequences

Alternative 1

This alternative includes the use of genetically-modified, glyphosate-resistant soybeans, rotated with genetically unmodified small grains (wheat and oats). As described above, these glyphosate-resistant soybeans do not hybridize with the local flora, nor are they known to harm the local fauna. The likelihood of this genetically-modified soybean crossing with conventional, genetically unmodified soybeans on adjacent land is very low.

Alternatives 2, 3, 4, and 5

These alternatives would use no genetically-modified crops and, therefore, generate no affects.

4. **Monitoring**

All alternatives would include the monitoring of populations of Sullivants's Coneflower under a variety of degrees of exposure to grazing and other management practices, including the protection of certain populations as controls. This would require estimates at regular intervals of the size and condition of each population.

All alternatives would continue to monitor conditions in the various grasslands of the MNTP to determine that management objectives are being met. Habitat Suitability Indices (HSI's) would be used to measure specific objectives, correlated with estimates of bird populations.

All alternatives would also monitor sensitive bird populations in existing hayfields, pastures, and other grasslands, using established census areas and establishing new study areas as crop fields are converted to grasslands. Each nest found (or determined with certainty to be present) should be recorded in the database.

In Alternatives 1, 2, or 3, agricultural practices and herbicides/pesticides used by the permittees would be monitored to determine proper implementation and compliance with the MNTP Spill Safety Plan.

All agricultural special use permit holders that would use fertilizers to maintain or improve soil fertility (Alternatives 1, 2, or 3) must base application decisions on soil testing and soil fertility mapping information.

5. **Summary of Effects of Alternatives**

Following is a summary of the effects generated by the alternatives. The discussion is organized by key issue and is depicted in Table 8.

Aquatic Ecology and Water Quality

Alternatives 1 or 2 would use herbicides to control weeds within areas of row crops. Alternative 1 would use glyphosate, a "General Use Pesticide" with low potential for runoff. Alternative 2 would use atrazine, sethoxydim, and possibly other herbicides. Atrazine has been classified as a "Restricted Use Pesticide" due to its potential for groundwater contamination. Sethoxydim is a "General Use Pesticide". No-till practices would limit the sedimentation generated by cropping in Alternatives 1 or 2. Alternatives 1 or 2 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternative 3 would use no herbicides in growing wheat and/or oats. No-till practices would limit sedimentation prior to grassland creation or prairie restoration. Alternative 3 would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to create grassland or restore prairie.

Alternatives 4 or 5 would employ no herbicides or tillage prior to grassland creation or prairie restoration. Heavy sheet erosion would occur in former crop fields in the first one or two years after the cessation of cropping. This sheet erosion would degrade the water quality and, therefore, the aquatic ecology of MNTP streams. Alternatives 4 or 5 would likely require tillage, herbicide application, or bulldozing in order to create grassland or restore prairie in areas infested with weeds, shrubs, and trees. These practices would degrade water quality and aquatic ecology. Mowing and burning of weeds in Alternative 5 would result in somewhat less tillage, herbicide, or bulldozing being required during grassland creation or prairie restoration than under Alternative 4.

Air Quality

Alternatives 1, 2, or 3 would generate few emissions prior to or during grassland creation or prairie restoration.

Alternative 4 would generate no emissions prior to restoration. During grassland creation or prairie restoration, however, Alternative 4 would likely require tillage, herbicide application, and possibly bulldozing in order to address severe weed infestations. These methods would negatively affect air quality, relative to Alternatives 1, 2, or 3, but probably not enough to have significant effects.

Alternative 5 would employ prescribed burning and mowing to manage lands prior to prairie restoration. The effects on air quality would depend on the season, frequency, duration, and scale of burning. During grassland creation or prairie restoration, tillage, herbicide application, and possibly bulldozing would be required in order to address weed infestations. These methods would negatively affect air quality, relative to Alternatives 1, 2, or 3, but probably not enough to have significant effects.

Soils

Cropfields under Alternative 1 would have a low erosion rate. Glyphosate applications would have little effect on future grassland or prairie plantings, but would keep the weed seedbank in the soil low.

Alternative 2 cropfields would have a moderate erosion rate. Atrazine and sethoxydim would likely affect the growth of small grains, which are an intermediate step to grassland or prairie. They would keep the weed seedbank in the soil low, but not as low as under Alternative 1.

Alternative 3 would have a low erosion rate. No herbicides would be used. While the small grains would generally prevent the formation of a weed seedbank, they would not do so as effectively as Alternatives 1 or 2.

Alternative 4 would result in high rates of erosion in former croplands during years 1 and 2. No herbicides would be used and a large weed seedbank would likely form in the soil.

Alternative 5 would result in high rates of erosion in former croplands during years 1 and 2. No herbicides would be used and a large weed seedbank would likely form in the soil. This weed seedbank may be slightly smaller than under Alternative 4, as mowing and burning would be used to manage weedy species.

Heritage Resources

No project alternatives would disturb MNTP heritage resources sites.

Recreation and Visual Resources

Alternatives 1, 2, or 3 would have no adverse affects on deer hunting success or visual enjoyment of the MNTP.

Alternatives 4 or 5 would likely decrease deer hunting success and visual enjoyment of the MNTP. Alternative 5 would likely have more a more negative affect than would Alternative 4.

Sensitive Plant and Animal Populations

Alternatives 1, 2, or 3 would have no adverse affects on sensitive plant and animal populations.

Alternative 4 would negatively affect the following seven sensitive species: Sullivant's Coneflower, Northern Harrier, Upland Sandpiper, Short-eared Owl, Migrant Loggerhead Shrike, Bobolink, and Henslow's Sparrow.

Alternative 5 would negatively affect the following four sensitive species: Sullivant's Coneflower, Upland Sandpiper, Migrant Loggerhead Shrike, and Henslow's Sparrow.

Invasive Plant Species

Alternatives 1 and 2 would use herbicides and grazing to effectively control invasive plant species. Minimal tillage, reduced herbicide application, and no bulldozing likely would be required to control invasive plants during grassland creation or prairie restoration.

Alternative 3, which includes small grains croplands (with some mowing, but no herbicides) and grazing, would provide a moderate level of weed control. Alternative 3

would likely require minimal tillage, reduced herbicide application, and no bulldozing in order to control invasive plants during grassland or restore prairie.

Alternative 4 would do nothing to control the spread of invasive plant species. Tillage, herbicide application, and/or bulldozing likely would be required to control invasive plants during grassland creation or prairie restoration.

Alternative 5 would attempt to control the spread of invasive plant species with prescribed mowing and burning. The ability of these methods to control the spread of weeds is low. As under Alternative 4, tillage, herbicide application, and/or bulldozing likely would be required to control invasive plants during grassland creation or prairie restoration.

Land Use

Alternatives 1, 2, or 3 would comply with the MNTP enabling legislation and USFS restoration goals by continuing agricultural practices over the next 5 years. By maintaining project lands in a relatively weed-free state, these alternatives would allow for cost-effective future prairie restoration.

Alternatives 4 and 5, which eliminate all agricultural land uses, would not comply with the MNTP enabling legislation or USFS restoration goals. Also, these alternatives would result in weed infestations that make future prairie restoration very difficult/costly and represent an irretrievable commitment of resources.

Socioeconomics

Alternative 1 would generate a maximum revenue in year 2001 of about $300 per acre. This is higher than other project alternatives, with the exception of Alternative 2. These funds would be spent in the local community and used to help fund local road, schools, and MNTP restoration.

Alternative 2 would generate the highest maximum revenue (about $350 per acre) of the project alternatives and have the most socioeconomic benefit.

Alternative 3 would generate a maximum revenue of about $125 per acre.

Alternative 4 would generate no revenue or socioeconomic benefit.

Alternative 5 would generate no economic benefit. In addition, the Forest Service would be required to spend funds for prescribed burning and mowing.

Genetically-Modified Crops

Alternative 1 would use a genetically-modified (glyphosate-resistant soybeans) crop, rotated with small grains, to maintain a portion of the MNTP in a weed-free condition. The biological affects of this crop are expected to be minimal.

Alternatives 2, 3, 4, or 5 would not include genetically-modified crops.

6**. Cumulative Effects**

Cumulative effects are a result of the incremental impacts upon a resource that result from the interaction of two or more individual actions. Cumulative effects can be either beneficial or have an adverse effect (or beneficial to one and adverse on another). The cumulative effects identified for each "key issue" over the next five years are discussed below.

Table 8. Summary of Effects by Alternative.

Key Issues	Indicator	Alternatives				
		1	2	3	4	5
Aquatic Ecology and Water Quality	Crop Herbicides[1]	GU	RU&GU	N	N	N
	Herbicides Required for Grassland Creation or Prairie Restoration*	L	L	L	H	H
	Sedimentation in Years 1-2*	L	L	L	H	H
	Sedimentation During Restoration*	L	L	L	H	H
Air Quality	Pre-Restoration Emissions*	L	L	L	L	V
	Restoration Emissions*	L	L	L	M	M
Soils	Erosion In Years 1-2*	L	M	L	H	H
	Herbicide Effects on Plants*	L	H	N	N	N
	Weed Seedbank Development*	L	L	M	H	H
Heritage Resources	No. of Heritage Resource Areas Disturbed	0	0	0	0	0
Recreation and Visual Quality	Adverse Effects on Deer Hunters*	N	N	N	M	H
Sensitive Plant and Animal Populations	No. of RFSS Species Negatively Affected	0	0	0	7	4
Invasive Plant Species	Degree of Infestation*	L	L	M	H	H
Land Use	Compliance with MNTP Enabling Legislation and Restoration Goals	Yes	Yes	Yes	No	No
Socioeconomics	Maximum Cropland Revenue Per Acre (in 2001 U.S. dollars)	300	350	125	0	0
Genetically-Modified Crops	Use of Glyphosate-Resistant Soybeans	Yes	No	No	No	No

[1] GU=General Use, RU=Restricted Use, N=None.
* H=High, M=Moderate, L=Low, V=Varies with Management, N=None.

Aquatic Ecology and Water Quality

Alternatives 1 or 2

While herbicides would be used on cropland under these alternatives, cumulative effects on aquatic ecology and water quality associated with this herbicide use would be minimal. As shown in Table 3, more than one-half (47,100 acres) of the land within the MNTP watershed is in crop production. The quantity of herbicides in area waters generated by the 4,413 cropland-acres at MNTP in 2001 would be minimal in comparison to that generated by other cropland in the watershed. Cumulative effects due to herbicide application at MNTP would continue to be minimal over time, as MNTP cropland acreage would diminish and cropland acreage in townships surrounding the MNTP would be continue at present levels (Will County Land Use Department, 1990).

Alternative 3

This alternative would have virtually no cumulative effects on aquatic ecology and water quality.

Alternative 4 or 5

These alternatives would allow invasive herbaceous and woody vegetation to cover MNTP lands. The herbicides, tillage, and possible bulldozing required during future restoration efforts would likely affect aquatic ecology and water quality. Alternative 5, which would use mowing and burning to control invasive vegetation prior to restoration, would have less effect on aquatic ecology than would Alternative 4. In Alternatives 4 or 5, sedimentation effects on aquatic ecology and water quality would be added to those occurring due to other cropland in the watershed.

Air Quality

Alternatives 1, 2, 3, 4, or 5

No project alternatives likely would have cumulative effects on Will County air quality, with the possible exception of Alternative 5 if extensive prescribed burning is conducted.

Soils

Alternatives 1, 2, or 3

These alternatives would use no-till cropping methods to minimize erosion. Minimal tillage or other earth disturbance would be required during future restoration. Therefore, the cumulative effect would be minimal.

Alternatives 4 or 5

Implementation of these alternatives would result in the development of weedy vegetation at MNTP. During future restoration efforts, tillage and other earth disturbance that results in soil erosion would be required. These activities would have a minor cumulative effect on soil erosion in the MNTP watershed.

Heritage Resources

Alternatives 1, 2, 3, 4, or 5

No project alternatives would have cumulative effects on heritage resources.

Recreation and Visual Quality

Alternatives 1 or 2

Interim recreational trails would likely be developed in grasslands and components of a permanent trail system developed prior to 2005 under Alternatives 1 or 2. These areas would require temporary closure during or immediately after herbicide/pesticide application. Grazing areas would require special gates/turnstiles to allow access yet keep livestock contained. Proper design of these gates/turnstiles would ensure access to the trails for the disabled. No cumulative effects on recreation and visual quality would result.

Alternative 3

Interim recreational trails would likely be developed in grasslands and components of a permanent trail system developed prior to 2005 if Alternative 3 were implemented. No cumulative effects on recreation and visual quality would result.

Alternative 4

Public access could be permitted under this alternative. Public access areas would likely be temporarily closed during prescribed mowing or burning. Despite the burning and mowing efforts, trees and shrubs would likely proliferate. This would reduce hunting

success and limit views. Due to the extensive lands available for public recreation in Will County, no cumulative effects would result.

Alternative 5

Public access could be permitted under this alternative. Trees and shrubs would undoubtedly proliferate, reducing hunting success and limiting views. Due to the extensive lands available for public recreation in Will County, no cumulative effects would result.

Sensitive Plant and Animal Populations

Past activities within the Prairie Parklands and at MNTP (see Introduction) have caused drastic declines in populations of most species of native wildlife and plants. Many prairie plants survived well into the 20th Century by being able to survive on roadsides, railroad rights-of-way, fencerows, native pastures, wetland hayfields, and pioneer cemeteries. Some grassland birds, small mammals, amphibians, and reptiles were also able to adapt to the agricultural landscape, utilizing large perennial pastures and hayfields as substitutes for native prairie. Following World War II, however, additional changes in agricultural technology caused further declines in prairie wildlife and plant species. Especially important were the removal of fencerows and the replacement of fire with herbicides as a vegetation management tool, which effectively eliminated the reservoir populations of many prairie plants and their dependent arthropods along rights-of-way and field margins. Grassland birds lost breeding habitat as permanent pastures and hayfields were converted to the more economical production of cash crops (primarily corn and soybeans). The remaining wetlands were drained for use in row crop production. Hayfields left in service were converted from grasses and clover to alfalfa, which required cutting at the peak of the grassland bird nesting season, thus diminishing the population replacement of many bird species.

By the early 1990's, the average pasture size in Illinois had declined to 20 acres, well below the minimum required by most area-sensitive birds. By this time there were few substantial concentrations of grassland and prairie wildlife in Illinois outside of a few large prairie reserves (e.g., Goose Lake State Park, Des Plaines State Fish and Wildlife Area) or a few areas managed with large permanent pastures (e.g., the Joliet Army Arsenal). Smaller remnants, often less than five acres, were protected as reserves in some localities, but usually support only certain prairie plants, prairie-specific soil organisms, and generalist species.

Some other activities outside of the boundaries of Midewin may have an impact on species that this program is trying to protect and encourage. These include expansion of residential, commercial or industrial development; continued chemical and physical alteration of streams, by agricultural runoff, stream channelization, and siltation; development of new sources of stone, gravel, and sand; air pollution and other atmospheric and climatic changes; fragmentation and destruction of remaining natural habitat; increased introductions of non-native species and the proliferation of those

already established; and the general expansion and intensification of the infrastructure for transportation, energy, and communication. Increases in the human population of the region will continue to place economic and social pressure on grasslands for recreation, agriculture, and other uses.

The actions proposed to be carried out during the next five years are merely the initiation of a longer and broader program that will be described in detail in the Land and Resource Management Plan, now in preparation by the Forest Service. Some of the actions now proposed are intended to maintain ecological conditions of grassland in areas eventually to become prairie. Others will actively begin the conversion of pasture or grassland to prairie, depending on seed availability. The cumulative effects of annual changes will be a reduction in the row-crop area and an increase of grassland by up to 2,300 acres. Secondary benefits of this conversion will be increases in the populations of some grassland birds determined to be area-sensitive.

Alternatives 1, 2, or 3

Generally, the cumulative effects associated with these alternatives would take the following forms:

A year-by-year decrease in row cropping, as these special use permits are removed from cropping and converted to cool-season grasses (maintained by grazing or haying).

A gradual increase in grassland habitat, primarily dominated by short grasses, which is expected to reach about 2,300 additional acres at the end of five years.

Increases in populations of the sensitive plants and animals that require this type of grassland: Sullivant's Coneflower, Plains Leopard Frog, Upland Sandpiper, Loggerhead Shrike, Northern Harrier, and Short-eared Owl.

Improved breeding success of some of these species, due to the exclusion of livestock from wetlands and improved foraging habitat.

Alternatives 4 or 5

Under Alternative 4, all areas now under special use permits would begin a gradual succession toward their climax vegetation; through most of the eastern part of MNTP this is mixed hardwood forest. Thus, the cumulative effects of this alternative after five years would be fields of tall forbs, grasses, shrubs, and young trees. None of the sensitive species would respond favorably to this shift.

Under Alternative 5, which would manage grassland by mowing and controlled burning, there would be essentially no cumulative development of habitat, except at field edges, and the resultant ecosystem would not attract any of the above sensitive species. This alternative might contribute to the loss of important breeding populations of Upland Sandpiper, Loggerhead Shrike, and possibly Bobolink. Depending on the timing of

mowing, Sullivant's Coneflower might survive under Alternative 5 and Henslow's Sparrow might find the grass height appropriate.

Invasive Plant Species

Alternatives 1 or 2

These alternatives would have few cumulative effects with respect to invasive plant species.

Alternative 3

Additional weeds would become established in row crop fields at MNTP. These weeds would become a source for infestations on surrounding lands.

Alternatives 4 or 5

These alternatives would result in MNTP lands being dominated by invasive plant species. MNTP would become a source for weed infestations on surrounding lands. Effects associated with Alternative 4 would be worse than those with Alternative 5.

Land Use

Alternatives 1, 2, 3, 4, or 5

There would be no cumulative effects on land use, as defined in this EA.

Socioeconomics

Alternatives 1, 2, or 3

These alternatives would have no cumulative effects on socioeconomics.

Alternatives 4 or 5

These alternatives would result in MNTP lands being dominated by invasive plant species. MNTP would become a source for weed infestations on surrounding lands. Control of these invasive plants on surrounding lands would be time and labor intensive, negatively affect socioeconomics.

Genetically Modified Crops

Alternatives 1, 2, 3, 4, or 5

No cumulative effects would result for any of the project alternatives. Alternative 1 would include the use of a genetically-modified crop (glyphosate-resistant soybeans), but

use of this crop is common in Will County. Genetically-modified crops are not included in Alternatives 2, 3, 4, or 5.

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