

File Code: 1950

Date: June 27, 2001

Dear Friends of Midewin,

The Environmental Assessment for Managing Vegetation with Prescribed Fire at Midewin National Tallgrass Prairie is now available for public review and comment over the next 30 days.

This project proposes to use prescribed fire as a vegetation restoration management tool at ten sites on Midewin in order to control invasive plant species and reach desired habitat objectives. Fire exclusion has been identified as a major threat to many ecosystems, and the use of fire in prairie restoration activities is now well established as a key to promoting ecosystem stability and preserving biological integrity.

On January 10, 2000 Midewin initiated a public comment period to scope for issues regarding prescribed fire projects at Midewin. The scoping period ended on February 11, 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, July 30, 2001. All public comments on the EA will be addressed in my final decision. A Decision Notice will be published after considering all public comments.

Comments may be sent via the Internet to jmartina@fs.fed.us or mailed to Jeff Martina 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 concerning this project, please contact Jeff Martina at (815) 423-6370.

Thank you for providing your comments on this environmental assessment.

Sincerely,

FRANK KOENIG
Prairie Supervisor

ENVIRONMENTAL ASSESSMENT

for

Managing Vegetation with Prescribed Fire

**MIDWIN NATIONAL TALLGRASS PRAIRIE
Will County, Illinois**

June 27, 2001

Responsible Agency: USDA Forest Service, Midwin National Tallgrass Prairie

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1. PROJECT SCOPE

Introduction

This site-specific environmental assessment (EA) documents the potential environmental effects of using prescribed fire as a restoration management tool at ten sites on Midewin National Tallgrass Prairie. 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 reasonable alternatives. Based on this EA, the Prairie Supervisor will decide whether or not to use prescribed fire for prairie restoration for 10 sites at Midewin.

An Interdisciplinary Team of specialists (identified in Chapter 8) used a systematic approach to analyze the proposed project and the alternatives to it; and to estimate the environmental effects, and prepare this EA. The site specific project 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 Areas

The project areas consist of ten sites proposed for management with prescribed fire located on approximately 1,745 acres of the approximately 15,189-acre Midewin National Tallgrass Prairie (MNTP), 15 miles south of Joliet and 4 miles north of Wilmington, Illinois. (See Table 1 and Location Maps.)

Table 1. Sites proposed for management with prescribed fire.

Site Name	Size (Acres)	Location
Drummond Dolomite Prairie	183	Section 26, T34N, R9E
Blodgett Road Marsh	11	Section 34, T34N, R9E
Grant Creek Prairie Annex	213	Section 3, T33N, R9E
Prairie Creek Woods	210	Sections 10,15, T33N, R9E
Foxglove Prairie	36	Section 13, T33N, R9E
ENW Bunkerfield	412	Sections 31, 32, 33, T34N, R10E Sections 6, 5, 4, T33N, R10E
Hoff Road Prairie	5.5	Section 35, T34N, R10E
ESE Bunkerfield	485	Section 36, T34N, R10E Sections 2, 1, T33N, R10E
Doyle Lake Fields	113	Section 15, T33N, R10E
Native Seed Gardens	77	Sections 15,14,13 T33N, R9E

Proposed Action

The January 10, 2000 Scoping Letter proposed to use prescribed burning as a vegetation restoration management tool on 10 sites of Midewin National Tallgrass Prairie. Prior to ignition burn plans for each site would be prepared and approved in accordance with Forest Service requirements for prescribed fire. These burn plans will provide specific guidance on burning conditions and restrictions, and the type of fire crew and management need to safely conduct prescribed burns considering the specific characteristics and conditions for each site. Firelines or firebreaks (a path of vegetation mowed or mechanically thinned or removed) to control the spread of the fire would need to be completed prior to the start of the prescribed burn. Existing roads and abandoned railroad beds would be used as fire control lines whenever possible. The proposed burn season would be from October 1st through April 30th.

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

Purpose and Need for Action

The primary purposes of the Midewin National Tallgrass Prairie as outlined in the Illinois Land Conservation Act 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 agriculture uses over the next 20 years.
- 4) To provide a variety of recreation opportunities that are not inconsistent with the preceding purposes.

Consistent with the first primary purpose stated above, the purpose and need for this proposed project is to:

- Control encroachment of woody vegetation into existing native prairie habitat,
- Slow the spread of exotic and weedy plant species, and
- Stimulate the restoration and growth of native prairie and non-native (desired cool-season grasses) vegetation at Midewin.

Fire exclusion has been identified as a major threat to many ecosystems (*Leenhouts 1998*). The use of fire in restoring upland prairie sites is well established (*Thompson 1992; White 1986*). Of all grassland ecosystems in North America, the tallgrass prairies seem to benefit most from fire (*Northern Prairie Wildlife Research Center 2000b*). Restoration of ecological processes is the key to promoting ecosystem stability and preserving biological integrity (*Samson and Knopf 1993*). Populations of native and desired non-native species require periodic maintenance to sustain the diversity and productivity of prairie ecosystems. Prescribed fire is a useful management tool for controlling invasive plant species and reaching desired habitat objectives.

The ten sites proposed for management by prescribed burning were considered the highest in priority of sites needing restoration with prescribed fire based on the following criteria:

- Whether or not the site was a native vegetation remnant (typic prairie, dolomite prairie, sedge meadow, oak savanna, or marsh). Certain remnants ranked higher in priority, because of management needs (including exotic species control, reduction of fragmentation, restoring vegetation structure, and stimulating native herbaceous vegetation), species diversity, and configuration. Not all native vegetation remnants present on Midewin ranked equally high.
- Absence of fire in vegetation communities dependent on periodic fire. Long absence of fire puts these communities at higher risk of losing native prairie plant species that have evolved with periodic fires across the landscape.
- Access to site and presence of well established fire breaks (roads, abandoned rail beds etc.) Sites with nearby roads and firebreaks rated higher.
- Least potential to negatively affect other species or resources. Sites with less potential to damage special-status species sensitive to prescribed fire or impact other activities and resources were given higher priority.
- Potential to provide improved habitat for sensitive grassland birds. Existing grassland sites that have been planted with cool season grasses (Kentucky blue grass, redtop and clover) rated higher.

Restoring native prairie habitat will be a long-term project at a site as large as Midewin. Active management is needed to prevent all existing native vegetation remnants from degrading further. Sites 1, 2, 3, 4, 5 and 7 all contain remnants for native vegetation dependent on periodic fire. Most of these vegetation types were once common across Illinois, but are now reduced to less than 1/10 of 1% of their original area in the state. Sites 1, 2, 3, 4, and 5 are also habitat for native prairie species that are now on either the federal list of Threatened and Endangered Species or are on the Regional Forester's list of Sensitive Species for Midewin National Tallgrass Prairie.

Sites 6, 8, and 9 are agricultural fields formerly cultivated with crops. Since 1997, these fields were planted with cool-season grasses to be managed as grassland bird habitat. Commonly used management tools include mowing, grazing, haying, and prescribed burning. This EA analyzes the environmental effects of using prescribed burning as a land management tool for grassland bird habitat.

Site 10 is the native seed production garden at River Road where numerous native prairie species are cultivated to produce seed for restoration projects. These native prairie plant species require periodic maintenance with prescribed fire to control invasive weeds. Prescribed fire will also serve to stimulate growth, flowering, and seed production in the beds and fields.

Project Objectives

The interdisciplinary team identified the following objectives for restoration by prescribed fire:

1. Conserve/enhance native vegetation and wildlife as directed in Midewin's enabling legislation.
2. Improve or provide potential habitat for Regional Forester sensitive species and state listed species.
3. Control exotic and invasive plant species by removing brush.
4. Provide Midewin visitors with learning opportunities about prescribed fire as a restoration management tool.
5. Prevent rapid runoff or sediment to streams or wetlands following a prescribed fire.
6. Minimize damage to soil resources.
7. Prevent seeding by undesirable species in adjoining areas by carefully locating and timing prescribed burns in riparian areas.

Desired Conditions

For all 10 sites the desired conditions including the following:

- Return fire as a natural disturbance to prairie ecosystems that developed under periodic fires.
- Sustain the diversity and productivity of prairie ecosystems.
- Enhance habitat for populations of native and desired non-native plant and animal species.

Specific desired conditions for each site are listed below:

Site 1: Drummond Dolomite Prairie, 183 acres.

This site includes only a portion of the Drummond Dolomite Prairie area. Within the area proposed for fire management, remnants of dolomite prairie vegetation are concentrated along the west boundary; these areas are primarily wet and wet-mesic dolomite prairie. This site also includes extensive stands of exotic cool-season grasses, primarily smooth brome (*Bromus inermis*) and reed canary-grass (*Phalaris arundinacea*). There are scattered stands of shrubs, mostly concentrated along an abandoned railroad berm. This site was pasture for livestock until 1997.

Site 2: Blodgett Marsh Prairie, 11 acres.

This site is a mesic prairie remnant dominated by warm-season grasses, mostly big bluestem (*Andropogon gerardii*) with other native warm-season and exotic cool-season grasses. Portions of this grassland are being encroached upon by shrubs and trees.

Site 3: Grant Creek Annex, 213 acres.

The western third of this site consists of degraded prairie vegetation that is contiguous with higher quality prairie communities present on adjacent Illinois Department of Natural Resource land (Grant Creek Prairie Nature Preserve). The prairie vegetation on Midewin is being invaded by trees and shrubs; most of this site was heavily grazed by livestock until 1996. The eastern third is dominated by planted stands of Eurasian cool-season grasses. There are also several small wetlands in the eastern two-thirds of Site 3; these are dominated by sedges and rushes.

Site 4: Prairie Creek Woods, 210 acres.

Approximately 20% of this site includes remnant stands of open-grown oaks, hickories, and walnuts; these woodlands were grazed until the mid-1980's, and the understory is now dominated by dense thickets of exotic and native shrubs. The remainder is dominated by younger stands of cottonwoods, hackberries, various ash tree species, osage-orange, mulberries, hawthorns, and maples, also with a dense understory of exotic and native shrubs.

Site 5: Foxglove Prairie, 36 acres

This site consists of a prairie remnant surrounded by a wetland. The prairie remnant is dominated by a mix of native and exotic grasses and there has been encroachment by shrubs and trees. The surrounding wetlands are dominated by dense stands of silver maples, cottonwoods, and green ash. The prairie remnant extends to the south onto Illinois Department of Natural Resources (IDNR) land.

Site 6: Group 63 (ENW) Bunker Field, 412 acres

This site consists of former cultivated fields that have been planted with Eurasian cool-season grasses. Between these fields are long-established strips of cool-season grasses; these grasses also grow on the bunkers. There are scattered stands of shrubs and trees in this bunker field, primarily along an intermittent, channelized stream and side ditches. A few prairie forbs and grasses persist in the roadside along the north side of this bunker field.

Site 7: Hoff Road Prairie, 5.5 Acres

A portion of this site consists of a small mesic prairie remnant (perhaps only 0.2 acres); the surrounding area consists of grasslands dominated by Eurasian cool-season grasses. These grasslands also contain scattered stands of native forbs and grasses.

Site 8: Group 66 (ENE) Bunker Field, 485 acres

This site consists of former cultivated fields that have been planted with Eurasian cool-season grasses. Between these fields are long-established strips of cool-season grasses; these grasses also grow on the bunkers. The remnants of an Osage-orange fencerow are present. There are scattered stands of shrubs and trees in this bunker field, primarily along an intermittent stream drainage. A few prairie forbs and grasses persist in roadsides and railroad cuts in this bunker field.

Site 9: Doyle Lake Burn, 113 acres

This site consists of former cultivated fields that have been planted with Eurasian cool-season grasses. Between these fields are long-established strips of cool-season grasses and scattered shrubs. The eastern boundary of this site is a wetland (Doyle Lake) that includes dense stands of willows and wetland grasses, but also some areas of open water.

Site 10: Grass Seed Fields and Seed Production Beds, 77 acres

This site includes a portion of the River Road Seed Gardens. Included in the proposed prescribed burn project area are five fields (each field covering of 10-14 acres), each planted with a monotypic stand of one native grass species. The fields are divided by fencerows of trees.

Two wetlands are present in this area; both are dominated by cattails, sedges, and bulrushes, with some scattered shrubs and young trees. The seed beds consist of narrow strips (up to 7 feet wide and up to 500 feet long) planted with prairie forbs and/or grasses.

Immediate effects to be monitored after each treatment:

1. Reduction of litter and duff (all 10 sites).
2. Reduction of standing dead vegetation for grassland habitat enhancement (on Sites 6, 8 and 9).
3. New growth and tillering of existing cool season grasses (Sites 6, 8 and 9).
4. Increased new growth, flowering, and seed production of native plants in forb beds, grass seed fields, and wetlands (Site 10).
5. Increased recruitment of certain species from the seedbank; including Threatened, Endangered, and Regional Forester Sensitive Species (Sites 1, 2, 3, 4, 5, 7).
6. Stimulate growth and flowering in existing native vegetation (Sites 1, 2, 3, 4, 5, 7)
7. Top killing of woody plants to temporarily reduce shading and competition until the next fire (all sites).

The immediate effects can be monitored by inventorying the sites for presence or absence of certain plant species, developing a species list, measuring litter depth (before and after burns), and measuring shrub density/top kill with before and after photos. For the seed beds, effects will be monitored by recording seed production and purity.

Desired future conditions to be monitored periodically:

1. Reduction of cover by woody plants and exotic plant species (all sites).
2. Expansion of existing native vegetation remnants, with eventual coalescence into contiguous native vegetation (Sites 1, 2, 3, 4, 5, 7).
3. Habitat improvement/expansion for Federally Threatened and Endangered (TE) and Regional Forester Sensitive Species (RFSS), (Sites 1, 2, 3, 4, 5, 6, 7, 8, 9).
4. Reduction of grassland habitat fragmentation (Sites 1, 3, 6, 8, 9).
5. A productive source of native seed, free of contamination by noxious weeds or invasive exotics (Site 10).
6. Restore habitat structure (closed woodland and successional thickets to savanna) (Site 4).

Decision To Be Made

The Prairie Supervisor will decide whether or not to proceed with prescribed fire management on the ten proposed sites at Midewin National Tallgrass Prairie. If the prescribed burning is approved, project implementation would begin during the fall of 2001 and continue as needed (indicated by periodic monitoring of site conditions) or until there is a major change in conditions that require further analysis.

Public Involvement Summary

Public involvement with this proposed action was initiated in January 2000. The Prairie Supervisor sent a letter to approximately 400 interested individuals and organizations on January 10, 2000 requesting written comments on the proposed prescribed fire restoration projects by February 11, 2000. Twelve written comments were received and have been considered in this environmental assessment.

Key Issues

Key issues and other concerns related to the proposed action were identified by reviewing appropriate source materials used to develop the Land and Resource Management Plan, and by meeting with Midewin staff to identify site-specific issues and concerns. Comments received in response to the initial scoping letter were reviewed to help determine significant issues related to the proposed action (in compliance with 40 CFR 1501.7). The issues were then used to formulate alternatives, prescribe mitigation measures, and serve as a basis for analyzing effects.

Public scoping is an early and open process used to determine the range of issues as well as significant issues related to the effects of the proposed action. Many potential issues raised by the public can be resolved by implementing mitigation measures, altering design criteria, adhering to applicable laws and regulations, or can be dismissed if the issues are outside the scope of the analysis. Below is a list of issues identified during the scoping period and our proposed resolution to each issue.

- **ISSUE: Can prescribed burns be conducted safely with some contaminants and hazardous materials still remaining on portions of the former Joliet Army Ammunition Plant?**

Midewin National Tallgrass Prairie was created of lands that were a portion of the Joliet Army Ammunition Plant. Hazardous materials, including industrial by-products, waste, and substances used for maintenance, are present at several locations on both Midewin and on lands retained by the Army. Potential contaminants that are hazardous still remain on Army land in some areas. Additional concerns were raised over the possibility of fire escaping into unexploded ordnance areas, sellite ditches, and ash pile areas still owned by the Army.

Issue Resolution: Mitigation measures will prescribe safe distances from known contaminated sites and use roads and other cleared areas as fire breaks.

- **ISSUE: Prescribed burns conducted during the breeding season may destroy nests and young of sensitive bird species.**

There is concern for direct, negative impacts from prescribed burning on nesting birds, especially sensitive bird species and other bird species of concern or interest. Special concern was expressed about direct mortality or loss of nests resulting from prescribed burns conducted during the breeding season.

Issue Resolution:

The project will be designed with mitigation measures clearly prohibiting prescribed burning during the nesting season.

- **ISSUE: Will prescribed burning affect ongoing research projects at Midewin?**
There is some concern that prescribed burning will interfere with ongoing research projects.

Issue Resolution:

Coordinating the timing and location of prescribed burns with on-going research projects will minimize effects on research projects or incorporate effects of fire on projects where possible.

- **ISSUE: Will prescribed fire affect adjacent landowners?**
Prescribed fire is a widely recognized management tool utilized by Illinois Department of Natural Resources (IDNR), county Forest Preserve Districts, and other member organizations of Chicago Wilderness. However, the use of prescribed fire on Midewin is a new activity and adjacent landowners (public, private, and corporate) need to be informed.

Issue Resolution:

We will coordinate with and notify adjacent landowners about the ignition dates, times, and locations, and possible short-term effects of prescribed burns.

- **ISSUE: Will prescribed fire destroy or impact significant cultural resources at Midewin?**
Issue Resolution

Heritage resource surveys will be completed prior to project implementation, and any potential effects will be mitigated by avoiding and protecting heritage sites.

- **ISSUE: Will the proposed prescribe burn project comply with other applicable laws and plans?**
The proposed action must comply with the four criteria for interim projects prior to completion of a Land and Resource Management Plan as listed in the *Notice of Intent for the Midewin Land and Resource Management Plan*. The proposed activity must comply with all applicable federal laws, regulations and Forest Service direction.

Issue Resolution:

Through this environmental assessment, and the Prairie Supervisor will determine whether the project complies with the interim project criteria. Compliance with all applicable laws and regulations will be met.

- **ISSUE: Will the sites be useful for interpretation following prescribed fire activities?**

Issue Resolution:

After prescribed burning, these sites will be available for interpretation. Because of increased native vegetation (including wildflowers), increased wildlife use, and reduced exotic and invasive plant species, such sites may be attractive to prairie visitors. Preparation of interpretive information and protective measures for vegetation and wildlife will be needed to interpret the sites.

- **ISSUE: Certain plant species will benefit more depending on the season of the prescribed burn.**

Midewin should conduct burns at varying times of the year to benefit the widest diversity of native plant species, including during the growing season (May-September). Certain prairie plants (including certain sensitive species) may benefit if some prescribed burns are conducted during the growing season. If burns are conducted only during the early spring, a relatively few plant species (primarily tall, warm-season grasses) will benefit.

Issue Resolution:

Mitigation measures do limit the use of prescribed fire during the growing and nesting seasons; however, Midewin staff anticipate burning during the growing and nesting seasons when adverse impacts on sensitive species can be mitigated.

- **ISSUE: Prescribed burns may impact conservative or sensitive insect species that over-winter in the litter-duff layer.**

There is some concern about the effects of the proposed action on long-term persistence and viability of some sensitive insect populations.

Issue Resolution:

Mitigation measures will restrict prescribed burns to only part of the habitat each year, thereby addressing viability issues. Additionally, not all native vegetation remnants are included within this proposed action.

- **ISSUE: Can the same management objectives be accomplished with other management tools?**

This issue concerns the use of fire as opposed to other management tools such as mowing to maintain native and desired non-native prairie ecosystems at Midewin.

Issue Resolution:

We will consider using other techniques (alternatives to prescribed fire) such as mowing to accomplish the same management objectives.

2. ALTERNATIVES CONSIDERED BUT DROPPED FROM FURTHER ANALYSIS

Mowing and brush cutting were considered as an alternative to prescribed burning to control exotic and invasive plants and improve habitat conditions, but were dropped from further analysis. Mowing and brush cutting would not fully meet project objectives of restoring fire as a natural disturbance process in the ecosystem, nor would mowing and brush cutting stimulate growth and flowering of native plants. Mowing or brush cutting would also not effectively remove standing dead vegetation.

3. DESCRIPTION OF ALTERNATIVES

This section describes implementation measures under the proposed action and no action alternatives.

Alternative 1- Proposed Action- Vegetation Management by Prescribed Burning

This alternative includes prescribed burning on ten units totaling approximately 1,745 acres within the Midewin National Tallgrass Prairie. It is proposed to burn all ten sites in one burning season, then conduct maintenance prescribed burns on a cycle of every year to every five years following the initial burn, depending on need. The prescribed burns would be implemented when weather and prescription conditions permit in order to meet management objectives. Burns would be planned and implemented during the most optimal periods between October 1st and April 30th, (although seasonal conditions may permit some burning in the summer months, when it meets management objectives). Firebreaks (areas cleared of vegetation by mowing or other mechanical means) will be prepared before burning. The perimeter of the burns will be blacklined and ignited by hand, with mop-up crews working directly behind the lighting crews.

Alternative 2 - No Action Alternative

The No Action Alternative is required for consideration under the Council on Environmental Quality regulations and also responds to certain concerns and issues raised during scoping for this project. Alternative 2 forms the baseline for comparison of the other alternatives. Under this alternative the Forest Service would not implement any prescribed fire in these project areas.

4. MITIGATION MEASURES

To minimize impacts to resources, the following mitigation measures will be implemented:

- 1) Implement prescribed burns at Drummond Dolomite Prairie (Site 1) so that no more than 25% of the total area occupied by the leafy prairie-clover receives fire treatment in one burning season.
- 2) Conduct all prescribed burns on Sites 1, 2, 3, 4, 5, and 7 before April 30th or after October 1st in order to minimize adverse effects on nesting sensitive bird species, Blanding's turtles, and certain sensitive prairie plants, unless the burns are conducted in a manner that minimizes or mitigates adverse impacts to these species.
- 3) Sites 1, 2, 3, 4, 5 or 7 should be surveyed prior to burns for nests or populations of any species of concern. If any new sites are found to be present, then burn plans should be redesigned to minimize or eliminate any potential adverse effects on these species.
- 4) If Sites 1, 2, 3, 6, 8, 9, and 10 are scheduled to be burned during the March 1- April 15 period, then these areas should be surveyed for nesting northern harriers and short-eared owls before

burn actions commence. If active nests of either species are present, there are two possible mitigation measures. The prescribed burn can be postponed until after August 15, or the nest location can be protected with firebreaks and an unburned buffer (approximately 300 feet around nest).

- 5) Burn no more than 1/3 of any site with native vegetation at one time, to avoid or reduce long-term impacts on populations of remnant-dependent insects (including three RFSS species). If any patches within a prescribed burn do not burn well, they should be left unburned to serve as refugia for remnant-dependent insects.
- 6) If over 25% of potential cover of any marsh habitat is burned at Sites 2 or 9 in the spring, then delay further burning in adjacent marsh habitat until after the following August.
- 7) Do not burn over one-third of total Henslow's sparrow habitat (including potential habitat) on Midewin during the August 15th –April 15th time period of any given year.
- 8) When mowing firebreaks in sensitive plant habitat, native vegetation remnants, or wetlands, either time mowing so as not to cause damage to plants or soils (ground frozen or dry) or use light-weight equipment to create firebreaks, such as leaf-blowers, hand-held brush-cutters, or two-wheel brush-mowers.
- 9) Implement prescribed burns only under an approved burn plan. Close monitoring of weather, fuel moisture, and regional fire danger conditions will begin 1-2 months prior to proposed burn dates and continue until after the burning is completed. Monitoring will provide input to support a go or no-go decision as to whether the prescribed burns are in prescription to address fire effects (smoke impacts and safety concerns) and to meet the overall objectives of this proposal.
- 10) All preparation work will be completed by Midewin Forest Service (FS) and Illinois Department of Natural Resources (IDNR) personnel and trained volunteers. A prescribed fire burn boss specialist will be appointed by Midewin FS staff. The burn boss will be responsible for safety, timing, execution, and declaring the burn extinguished.
- 11) According to the risk analysis conducted in the burn plans (located in the project file), these prescribed burns rated between a low to moderate degree of complexity. Proper firing techniques, numerous natural fire breaks within the landscape, and close proximity to additional firefighting resources (Volunteer Fire Departments) will help to minimize risks associated with the use of prescribed fire. Rapid response by firing and holding crews will extinguish any slop-over fires resulting from firing operations. In the event that holding resources are inadequate for control, an emergency wildfire situation will be declared. Escaped fire and contingency plans are detailed in the prescribed burn plans.
- 12) Heritage surveys will be completed in compliance with Section 106 of the National Historic Preservation Act, as amended, and heritage resources located within or adjacent to areas planned for prescribed burns will be protected by means of a firebreak or other buffer found acceptable by the Forest Service Archaeologist. These resources will be monitored during burning activities

to ensure their protection.

- 13) Use riparian buffers, firebreaks, runoff detention, or other erosion control measures to protect water resources depending on site conditions before and after each burn.
- 14) Identify and control sites where heavy fuel loading by woody vegetation may adversely affect soils by overheating.

5. 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 significant 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 analytical basis for the comparison of alternatives. The affected environment of the physical, biological and socio-economic resources are described first, followed by the environmental consequences (direct and indirect effects) of the alternatives.

Cumulative effects are discussed for each major issue or concern. Cumulative effects result from incremental impacts of proposed activities when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. The area of consideration for cumulative effects covers the Prairie Parklands in Will County, Illinois. Midewin is part of the Prairie Parklands, an area of approximately 40,000 acres of habitat 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 Parklands owned by State, County, and local governments, corporations, and interested private landowners located within 12 miles of Midewin.

Will County lies on 543,043 acres of land. It is estimated that this region is about 46 percent cropland, 9.9 percent urban, 30.4 percent pasture and other grasslands, 2.7 percent open water, 3.1 percent wetland, and 7.7 percent forest. The county includes the watersheds of the Kankakee, Des Plaines, and Calumet rivers; the Kankakee and the Des Plaines rivers are the only two major rivers in the county. The landscape of Will County is primarily open farmland with a large concentration of urban land along the northern borders, and smaller urban concentrations along the Des Plaines River corridor and major transportation routes. Will County has one of the largest concentrations of open grassland in the state of Illinois. However much of the crop fields and grasslands in the northern portion of the county are rapidly being converted to urban land uses (residential subdivisions and commercial complexes).

At present, the USDA Forest Service administers approximately 17,000 acres within the Midewin National Tallgrass Prairie and is expected to receive up to 4,000 additional acres

through transfer from the Army. Nearly 3,000 acres of Midewin are currently in row crop or hay production. The remaining land is pasture, abandoned fields, fencerows, abandoned home sites, structures built for Joliet Army Ammunition Plant (JOAAP), and remnants of native vegetation (forest, prairie, and wetlands).

Past activities that occurred on all JOAAP land prior to 1940 include timber cutting, wetland drainage, and conversion of natural vegetation to row crop fields, pasture, and hayfields. Most of these activities continued under the Army, but industrial areas were also constructed on several tracts. The Army also improved existing roads and added infrastructure such as railroads, roads, power lines, security fences, buildings, drainage ditches, reservoirs, wells, water towers, and water lines to support the ordnance plant.

Present and potential future activities at Midewin include prescribed burning, exotic species control, hydrologic restoration, natural community restoration, grassland bird habitat management (including grazing by livestock), continued row crop production, stream rehabilitation, building demolition, hazardous materials cleanup, scientific research, environmental education, trails and recreation facilities construction, and road removal. Present and future activities on the former Joliet Arsenal that may impact restoration activities at Midewin include development of two industrial parks, management of lands at the Lincoln National Cemetery, and construction and operation of a county landfill.

The Joliet Army Training Area, Lincoln National Veterans Cemetery, Deer Run Industrial Park, Will County landfill, and Island City Industrial Park are all part of the former Joliet Army Ammunition Plant and lie adjacent to Midewin National Tallgrass Prairie.

Soils

Affected Environment

Generally, the soils in the burn sites are silt or clay loams with level slopes and high moisture retention capacities. Fine sandy loams occur in some areas. Slopes are generally less than 2 percent, and are not known to exceed 4 percent in the proposed sites. Past uses and soil disturbances have changed the soil over the years through agriculture, excavations, fills, compaction, drainage, and road construction. Fire, grazing, and poor drainage were components of the natural landscape and soil formation processes.

Environmental Consequences

Alternative 1 –

Wildland fires and prescribed fires can lead to soil erosion if vegetative cover is eliminated over large, connected areas. Also, fires with heavy fuel loads can or reduce soil quality by “baking” under intense, prolonged heat. Hot, prolonged fires remove moisture and organic matter from soils and cause fusion of soil clays into hard, water-resistant particles. Such “baked” areas lose their fertility, repel water, and easily erode. However prescribed grassland fires generally raise the temperature of the soil only in a shallow upper layer (e.g. the upper ¼ inch), and the temperature is increased for only a brief period as the fire passes (*Ortmann et al. 1998*).

Also, grassland fires tend to produce a mosaic of exposed soils surfaces interspersed with burned clumps of grass, unburned vegetation debris, unburned duff, and other soil cover. The ground cover and rooted vegetation that remains after a grassland fire protects soils from erosion and controls runoff.

The prescribed fires will reduce soil cover and temporarily heat the soils. However, there is generally a low potential for detrimental effects on soils to occur. Grassland fires caused those same effects to a similar degree under natural conditions of soil formation at the proposed burn sites. Most soils in these sites are characterized by high soil moisture levels during the spring and fall burn seasons, which reduces heating rates of the soils as fire passes. Also, these sites are generally level to slightly sloping, with low potential for surface runoff and erosion. Fuel loads in some areas, e.g. where fallen wood has accumulated, may be higher now than would have occurred under historic conditions, and those sites can be identified and managed to avoid overheating of soils.

Alternative 2 –

(No Action). With no scheduled vegetation treatment there will generally be no greater loss of soil from erosion in this alternative and minimal risk of other potential effects on soils. Higher rates of soil erosion might occur in some areas where successional woodlands develop dense canopies and sparse understory communities that provide little soil cover.

Cumulative Effects

Relevant recent and future actions in the watersheds that drain Midewin include continued crop production and expanding urbanization. Agricultural uses employ soil conservation techniques, but soil loss rates commonly exceed natural rates of soil formation. Soil losses in the watersheds are also increasing as a result of urbanization. Prescribed burning activities at Midewin at these 10 sites will increase the potential for minor increases in soil erosion immediately after the burns. Continued management of the sites under native vegetation through prescribed fire and other means will result in soil erosion rates that are within the natural range of variability.

Water Quality

Affected Environment

Midewin is drained by four streams, with Jackson Creek and Prairie Creek designated with special regulatory status. Jackson Creek has been designated a “highly valued aquatic resource” by the Illinois Environmental Protection Agency (IEPA), and Prairie Creek was identified by the State of Illinois as a water body that failed to meet water quality standards for ammonia, metals, and non-priority organic pollutants. Stream water quality has been monitored with macro-invertebrate and fish surveys that show the aquatic communities are fairly diverse and stable. Long-term records and data are incomplete, although Prairie Creek has been monitored on a five-year schedule by the Illinois Department of Natural Resources and IEPA.

Environmental Consequences

Alternative 1

Short term adverse effects may occur from prescribed fire if heavy rainstorms follow prescribed burns in areas before new vegetation covers the ground, resulting in flushes of sediments into surface waters. In general, the sites have low potential to generate detrimental surface runoff following the prescribed burns. The low slopes at the sites will generally produce slow, shallow runoff. At some sites, mitigation measures can be employed to prevent delivery of greater sediment loads or other water quality constituents into receiving waters, e.g. providing buffers around drainage ditches. Monitoring of the burns and the sites will allow opportunities to recognize areas where the burn has increased the potential for surface runoff.

Alternative 2 –

(No Action) – This alternative would have no direct or indirect or adverse effects to water quality.

Cumulative Effects

Other activities on Midewin that may affect water quality include grazing, crop production, other restoration activities, and construction of roads and trails. These activities may have short term effects to water quality, but it is expected that restoration overall will result in minor benefits or improvements to water quality of the streams that drain Midewin. Outside of Midewin boundaries activities that affect water quality include construction of industrial parks, agriculture production, and Army clean-up operations. When added to the potential for all activities in the watersheds, it is likely that prescribed burning of these 10 sites at Midewin will result in minimal or no effects on the water quality of Jackson, Grant, Prairie or Jordan Creeks, or the Kankakee and Des Plaines Rivers.

Air Quality

Affected Environment

National Ambient Air Quality Standards (NAAQS) exist for certain criteria pollutants in the Clean Air Act as amended November 15, 1990, including ozone, volatile organic compounds (VOCs), particulate matter, and nitrogen oxides (NOx). Will County is within a Class II airshed and in a non-attainment zone for 1-hour Ozone. Ground-level ozone pollution zone results from a combination of plentiful sunshine and various pollutants, principally those from automobile exhaust. Ozone concentrations that exceed air quality standards for one-hour concentrations occur during summer afternoons. Under the general conformity provisions of the Clean Air Act, federal agencies are prohibited from taking any action within a non-attainment area that causes or contributes to a new violation of the standards, or increases severity of a standard. Federal agencies are required to ensure their actions conform to applicable State Implementation Plans. Grassland burns produce volatile organic compounds (VOCs), particulate matter, and nitrogen oxides (NOx), which can contribute to the formation of ground-level ozone.

Prescribed fires can also produce temporary air quality problems due to smoke dispersal in the vicinity of the burn. Smoke from prescribed fires can reduce visibility or cause distraction on roads and highways. Smoke can cause unpleasant odors, carry ash, or cause respiratory stress in some individuals, particularly the very young, the elderly, or others with respiratory ailments. The proposed burn sites lie near Interstate 55, State Route 53, local roads, neighboring industries, rural homes, the Abraham Lincoln National Veterans Cemetery, and the cities of Wilmington, Elwood, Symerton, and Manhattan.

Environmental Consequences

Alternative 1

Estimated emission rates for prescribed burns at Midewin are .0301 tons/acre for Volatile Organic Compounds (VOC) Methane and Non-Methane, .00675 tons/acre of Nitrogen Oxide Compounds (NOx) and .0301 tons/acre for particulate matter (*National Interagency Fire Center 1994*). These emissions can contribute to ozone formation. However, the prescribed burns will occur during spring and fall months, when ozone levels generally do not exceed air quality standards. As part of the planning process for the prescribed burns, Midewin will coordinate with the Illinois EPA to track ozone and air pollutant conditions so that the burns do not occur during periods when ozone concentrations may exceed air quality standards.

Regional weather patterns include winds from the southwest, west, or northwest when the most favorable burning conditions occur. Prescribed burns under these conditions may result in smoke being dispersed over Midewin National Tallgrass Prairie, Highway 53, the Lincoln National Memorial Cemetery, local private properties, homes, and industries, including Deer Run Industrial Park, Exxon Mobil, and the villages of Elwood, Symerton, Wilmington and/or Manhattan. It is unlikely that Interstate 55 to the west of Midewin would be affected, as easterly winds are usually accompanied with unfavorable burning conditions.

Burning late in the spring season when vegetation is green will produce more smoke. Burning in areas with poison ivy, can cause a rash on sensitive people because smoke particles carry the irritating oil from dead leaves and stems of poison ivy, and if inhaled may cause serious complications.

Alternative 2-

The No Action alternative would have no direct, indirect, short-term or adverse effect to air quality.

Cumulative Effects

It is estimated that during a year of high fire activity (over 1,000 acres) at Midewin, emissions from prescribed burning would only be a minor source of pollutants in the ozone non-attainment area in Illinois. When the mitigation measures are implemented (no burning on hot summer afternoons) there would not be any increase in emissions of the pollutants that are the ingredients for ozone pollution during the summer months (*USDA Forest Service 2001*).

Hazardous Materials

Affected Environment

The sites identified for prescribed burning are not known to be contaminated with hazardous materials. A security fence erected by the Army borders sites 1, 3, 6, 7, and 8. An arsenic based herbicide was used by the Army to control vegetation along the fenceline in the 1950's and 1960's. Recent sampling has found arsenic in the top layer of soil adjacent to the fencelines at levels that are higher than normal for the soils of MNTP. The elevated concentrations of arsenic are found in an irregular pattern of areas along the fences, in the upper inches of the soil, and generally within five feet of the fences. Sampling indicated that residual arsenic did not migrate in the soil, nor was arsenic present in detectable amounts in vegetation now growing at or near the fencelines (*TN & Associates, Inc. 2000*).

Environmental Consequences

The alternatives would have no direct, indirect, short-term or adverse effects on existing hazardous materials conditions. Based on sampling at Midewin for arsenic contamination, it does not appear that exposure to arsenic from prescribed burning of vegetation in arsenic-contaminated areas will pose a significant hazard because the arsenic is not taken up by vegetation, arsenic is not volatile, and the burns will not cause the arsenic to become more mobile. The amount of arsenic present in the soil at localized areas of elevated concentrations along the fences is insignificant compared to the amount of arsenic that occurs generally across the burn areas as a natural element in the soils. (*TN & Associates, Inc. 2000*).

Cumulative Effects

The United States Army will be decontaminating buildings, equipment, and soil from the former Joliet Army Ammunition Plant over the next decade. This project will not affect the Army's clean up operations and is not likely to affect the condition of any contaminated sites at Midewin.

Vegetation and Natural Communities

Affected Environment

There are ten (10) sites proposed for prescribed fire management. The vegetation of these tracts is described below. Nomenclature follows *Swink and Wilhelm (1994)* with a few exceptions; non-native plant species are indicated with an asterisk (*).

Site 1: Drummond Dolomite Prairie, 183 acres.

This site includes portions of the Drummond Dolomite Prairie area; not all of this site consists of dolomite prairie vegetation. All of the area east of West Patrol Road and south of Drummond Road was pastured until 1997; areas north of Drummond Road and west of West Patrol Road (and outside of the cyclone fence) have not been pastured recently (grazing ended between 1939

and 1980, depending on the tract). Fires were suppressed under Army administration (1940-1997), and there is no evidence of recent fire. In addition to grazing, some of these grasslands have been cut for hay both under and prior to Army administration.

To the east, most of the upland grasslands are dominated by Eurasian cool-season grasses, especially Hungarian brome (*Bromus inermis**), Kentucky bluegrass (*Poa pratensis**), redtop (*Agrostis alba**), and quackgrass (*Agropyron repens**). Frequent forbs include teasel (*Dipsacus sylvestris**), tall goldenrod (*Solidago canadensis*), and tall boneset (*Eupatorium altissimum*). There are scattered stands of shrubs and trees, especially along an abandoned railroad berm; the most prevalent woody species include eastern hackberry (*Celtis occidentalis*), white mulberry (*Morus alba**), green ash (*Fraxinus pensylvanicus*), Osage-orange (*Maclura pomifera**), red haw (*Crataegus mollis*), Amur honeysuckle (*Lonicera maackii**), and blue dogwood (*Cornus obliqua*). Autumn-olive (*Elaeagnus umbellata**), an invasive shrub, appears to be increasing within these grasslands.

To the west, the dolomitic bedrock rises to within 3-12 inches of the soil surface (the bedrock is at the surface west of FS land). This area consists of a mosaic of dolomite prairie, wetlands, and disturbed areas. The wetlands (including wet dolomite prairie) are dominated by extensive stands of native graminoids, including tufted hair grass (*Deschampsia cespitosa*), sedges (*Carex pellita*, *C. trichocarpa*, *C. vulpinoidea*, *C. granularis*), spikerushes (*Eleocharis erythropoda*, *E. compressa*), Torrey rush (*Juncus torreyi*), red bulrush (*Scirpus pendula*), and prairie cordgrass (*Spartina pectinata*). Frequent forbs include prairie ironweed (*Vernonia fasciculata*), prairie milkweed (*Asclepias sullivantii*), saw-toothed sunflower (*Helianthus grosseserratus*), Riddell's goldenrod (*Solidago riddellii*), giant goldenrod (*Solidago gigantea*), swamp milkweed (*Asclepias incarnata*), wild garlic (*Allium canadense*), blue vervain (*Verbena hastata*), late boneset (*Eupatorium serotinum*), water horehounds (*Lycopus americanus*, *L. uniflorus*), and smartweeds (*Polygonum* spp.). There are scattered stands of two invasive plant species, common reed (*Phragmites australis*), and cattails (*Typha* spp.); the exotic grasses redtop and quackgrass are also present in these wetlands. At the north end of this tract, there are large stands of reed canary-grass (*Phalaris arundinacea**); these stands appear to be spreading southward. Seasonally wet depressions within this area support ephemeral perennial and annual herbs, including water-plantains (*Alisma* spp.), water-purslane (*Ludwigia* spp.), squirrel-tail barley (*Hordeum jubatum**), and spikerushes (*Eleocharis acicularis*).

The dolomite prairie vegetation in this area is degraded, and is locally dominated by exotic grasses and forbs, including Canada bluegrass (*Poa compressa**), Hungarian brome, Kentucky bluegrass, wild carrot (*Daucus carota**), and common St. John's-wort (*Hypericum perforatum**). Native grasses are locally common and even dominant, including prairie dropseed (*Sporobolus heterolepis*), big bluestem (*Andropogon gerardii*), tufted hair grass, side-oats grama (*Bouteloua curtipendula*), switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), rough dropseed (*Sporobolus asper*), and wiry witch grass (*Panicum flexile*). Common forbs include nodding wild-onion (*Allium cernuum*), false-boneset (*Brickellia eupatorioides*), stiff vervain (*Verbena simplex*), hairy penstemon (*Penstemon hirsutus*), aromatic aster (*Aster oblongifolius*), and low calamint (*Satureja arkansana*).

Disturbed areas within this site include abandoned roads and railroad berms, roadsides, and areas

where soil and bedrock were removed or dumped. Common plants on these sites include Asiatic shrub honeysuckles (*Lonicera* spp.*), multiflora rose (*Rosa multiflora**), European buckthorn (*Rhamnus cathartica**), box elder (*Acer negundo*), wild parsnip (*Pastinaca sativa**), late boneset, wild carrot*, Hungarian brome*, Canada bluegrass*, common teasel*, evening primrose (*Oenothera biennis*), and yellow sweet-clover (*Melilotus officinalis**).

Site 2: Blodgett Marsh Prairie, 11 acres.

This site is a mesic prairie remnant that was degraded by past use as a pasture. Fires have been suppressed under Army administration (1940-1997), but there is limited evidence of recent fire (perhaps in the past 10 years). Overall species diversity is low, and the grassland is dominated by extensive stands of big bluestem, switchgrass, and Hungarian brome*, with lesser amounts of Canada wild-rye, Indiangrass (*Sorghastrum nutans*), rough dropseed, Kentucky bluegrass*, and little bluestem (*Andropogon scoparius*). The most abundant forb is tall goldenrod, but other common forbs include wild carrot*, saw-toothed sunflower, wild bergamot (*Monarda fistulosa*), prairie ironweed, tall boneset, grass-leaved goldenrod (*Euthamia graminifolia*), white sweet-clover (*Melilotus alba**), nodding wild-onion, tall spiderwort (*Tradescantia ohiensis*), partridge-pea (*Chamaecrista fasciculata*), round-headed bush-clover (*Lespedeza capitata*), heath aster (*Aster ericoides*), and old-field thistle (*Cirsium discolor*). In moister areas, dominant graminoids include prairie cordgrass, reedtop*, and sedges (*Carex subrecta*, *C. granularis*, *C. pellita*); associated forbs include prairie milkweed, New England aster (*Aster novae-angliae*), prairie sundrops (*Oenothera pilosella*), and water horehound (*Lycopus americanus*). Invading woody plants include autumn-olive* and green ash, with smaller amounts of multiflora rose*, black cherry (*Prunus serotina*), red haw, and Amur honeysuckle*.

To the east is a stand of black walnut (*Juglans nigra*), eastern hackberry, and green ash, with an open understory of exotic shrubs and grasses. Marsh vegetation is present along the north and east boundary of this site, primarily cattails (*Typha* spp.), river bulrush (*Scirpus fluviatilis*), common bur-reed (*Sparganium eurycarpum*), and common reed (*Phragmites australis*).

Site 3: Grant Creek Annex, 213 acres.

This site consists of grasslands that grade from native prairie remnants (at the western end) to planted stands of Eurasian pasture grasses (at the east end). Portions of this area have been managed previously with prescribed fire, brush cutting, mowing, hay-cutting, and livestock grazing.

The western third of this site consists of degraded prairie vegetation that is contiguous with higher quality prairie communities present on adjacent IDNR land (Grant Creek Prairie Nature Preserve). The westernmost portion, west of an abandoned railroad berm, has been managed in the past; the Army allowed prescribed burning and control of woody plant species in cooperation with the IDNR. The moister areas are dominated by stands of prairie cordgrass, bluejoint grass (*Calamagrostis canadensis*), and tussock sedge (*Carex stricta*, *C. haydenii*). Predominant forbs include saw-toothed sunflower, blue flag (*Iris shrevei*), spotted Joe-pye weed (*Eupatorium maculatum*), prairie ironweed, swamp milkweed, cowbane (*Oxypholis rigidior*), blue vervain, sweet coneflower (*Rudbeckia subtomentosa*), and field mint (*Mentha arvensis villosa*). The better-drained sites have been disturbed by a pipeline right-of-way and shrub invasion. Dominant graminoids include big bluestem, switchgrass, Canada bluegrass*, Hungarian brome*,

and redtop*; common forbs include wild carrot*, nodding wild onion, tall goldenrod, heal-all (*Prunella vulgaris*), tall coreopsis (*Coreopsis tripteris*), purple prairie-clover (*Dalea purpurea*), yarrow (*Achillea millefolium**), low calamint, flattened spikerush, sedges (*Carex tetanica*, *C. suberecta*, *C. granularis*), mountain-mint (*Pycnanthemum virginianum*), rattlesnake-master (*Eryngium yuccifolium*), Sullivant's coneflower (*Rudbeckia fulgida sullivanii*), dense blazing-star (*Liatris spicata*), and whorled milkweed (*Asclepias verticillata*). Invading woody plants include autumn-olive*, Amur honeysuckle*, Osage-orange*, eastern cottonwood, red haw, and sandbar willow (*Salix interior*).

The prairie remnants east of the abandoned railroad berm are being invaded by trees and shrubs; most of this site was heavily grazed with livestock until 1997. The vegetation is similar to areas west of the railroad berm, but there are dense stands of invading woody plants, primarily green ash, red haw, Amur honeysuckle*, prairie crabapple (*Malus ioensis*), multiflora rose*, and eastern cottonwood.

The eastern half of this site is dominated by planted stands of Eurasian cool-season grasses, primarily tall fescue (*Festuca arundinacea**), Kentucky bluegrass, Hungarian brome, and redtop. This area has been managed by brush cutting, hay-cutting, mowing, and livestock grazing; grazing was halted in 1997 until fences could be repaired and replaced. There are also several small wetlands in these grasslands; they are dominated by sedges (*Carex vulpinoidea*, *C. granularis*, *C. graviora*, *C. cristatella*), spikerushes (*Eleocharis erythropoda*), and rushes (*Juncus torreyi*, *J. dudleyi*).

Site 4: Prairie Creek Woods, 210 acres.

This site consists of a mix of native savanna and old-field vegetation along Prairie Creek. The entire site was grazed until the 1980's, and portions of oak savanna had been cleared and perhaps cultivated prior to 1940. Fires have been suppressed under Army administration (1940-1997), and there is no evidence of recent fire.

Approximately 20% of this site includes remnant stands of open-grown oaks, hickories, and walnuts; common canopy species are bur oak (*Quercus macrocarpa*), northern red oak (*Quercus rubra*), shagbark hickory (*Carya ovata*), and black walnut. Other tree species include bitternut hickory (*Carya cordiformis*), black oak (*Quercus velutina*), baswood (*Tilia americana*), common hackberry, and white oak (*Quercus alba*). The understory is dominated by dense stands of shrubs and young trees, including Missouri gooseberry (*Ribes missouriensis*), Amur honeysuckle*, white mulberry*, black cherry, red haw, and choke cherry (*Prunus virginiana*). Common species in the herbaceous layer include garlic mustard (*Alliaria petiolata**), white avens (*Geum canadense*), clinging bedstraw (*Galium aparine*), black snakeroot (*Sanicula odorata*), blue violet (*Viola soraria*), and sedges (*Carex blanda*). At some localities there are fairly rich assemblages of spring ephemerals, including Virginia bluebells (*Mertensia virginica*), spring-beauty (*Claytonia virginica*), toothwort (*Dentaria laciniata*), waterleaf (*Hydrophyllum virginicum*), red trillium (*Trillium recurvatum*), wild ginger (*Asarum canadense reflexum*), downy yellow violet (*Viola eriocarpa*), and mayapple (*Podophyllum peltatum*). Some savanna flora persists in a few localities along a pipeline right-of-way and in roadsides and pasture edges: big bluestem, cow parsnip (*Heracleum lanatum*), Sullivant's coneflower, blue-eyed grass (*Sisyrinchium angustifolium*), beard-tongue (*Penstemon calycosus*), wild bergamot, and

mullein-foxglove (*Dasistoma macrophylla*).

The old-fields are dominated by relatively young stands of green ash, honey-locust (*Gleditsia triacanthos*), red haw, American elm (*Ulmus americana*), Osage-orange*, eastern cottonwood, eastern hackberry, white mulberry*, black cherry, and box elder. There is often a dense understory of exotic and native shrubs, with Missouri gooseberry and Amur honeysuckle* being most abundant. Garlic mustard* is a common herb.

Site 5: Foxglove Prairie, 36 acres

This site consists of a prairie remnant surrounded by wetlands. The remnant was probably grazed until the 1970's or 1980's; drainage ditches and woody invasion have reduced the period of inundation in the surrounding wetlands. Fires have been suppressed under Army administration (1940-1997), and there is no evidence of recent fire.

The prairie remnant is dominated by extensive stands of big bluestem, switchgrass, and Kentucky bluegrass*, with lesser amounts of Hungarian brome*, Canada wild-rye, rough dropseed, Canada bluegrass*, and sedges (*Carex gravida*, *C. meadii*). The most abundant forb is tall goldenrod, but other common forbs include prairie dock (*Silphium terrebrinthaceum*), wild carrot*, saw-toothed sunflower, obedient plant (*Physostegia virginiana arenaria*), prairie ironweed, tall boneset, grass-leaved goldenrod (*Euthamia graminifolia*), bottle gentian (*Gentiana andrewsii*), white sweet-clover (*Melilotus alba**), nodding wild-onion, dense blazing-star, marbleseed (*Onosmodium hispidissimum*), heath aster (*Aster ericoides*), and old-field thistle (*Cirsium discolor*). Invading woody plants include autumn-olive*, blue dogwood, green ash, American elm, common apple (*Malus domestica**), Amur honeysuckle*, and silver maple (*Acer saccharinum*). The prairie remnant extends to the south onto adjacent IDNR land.

The wetter soils around the remnant formerly supported native wetland species, and shade-suppressed clumps of prairie cordgrass, blue flag, bluejoint grass, and sedges (*Carex pellita*, *C. stricta*) are present under the woody canopy. These wetlands are now dominated by monotypic stands of eastern cottonwood, silver maple, or green ash.

Site 6: Group 63 (ENW) Bunker Field, 412 acres

This site consists of former cultivated fields that have been planted with Eurasian cool-season grasses and clovers; species planted include Kentucky bluegrass*, redtop*, white clover (*Trifolium repens**), and red clover (*Trifolium pratense**). Some oats (*Avena sativa**) persist in these fields. Between fields are long-established strips of cool-season grasses; these grasses also grow on the bunkers. The predominant grasses in these strips and on the bunkers include Hungarian brome*, Kentucky bluegrass*, and tall fescue*. Common forbs in these grasslands include wild carrot*, tall goldenrod, bull thistle (*Cirsium vulgare**), chicory (*Cichorium intybus**), hairy aster (*Aster pilosus*), tall boneset, common teasel*, fleabanes (*Erigeron annuus*, *E. strigosus*), and whorled milkweed. A few native prairie species survive along the roads, including stiff goldenrod (*Solidago rigida*), compass-plant (*Silphium laciniatum*), and switchgrass.

There are scattered stands of shrubs and trees in the bunker field, primarily at abandoned house-sites, along an intermittent, channelized stream, and along side ditches. Common woody species

in this bunker field are autumn-olive*, box elder, eastern cottonwood, Osage-orange*, black cherry, white mulberry*, and Amur honeysuckle*.

Site 7: Hoff Road Prairie, 5.5 Acres

This site includes of a small mesic prairie remnant (perhaps only 0.2 acres). This remnant was maintained by hay-mowing under the Army and not discovered until mowing ceased in 1998. This site has probably not been burned in at least 60 years. The dominant grasses are big bluestem, Indiangrass, and little bluestem. Kentucky bluegrass*, redtop*, timothy (*Phleum pratense**), and Hungarian brome* are also present. Common forbs include rattlesnake-master (*Eryngium yuccifolium*), tall spiderwort, yellow coneflower (*Ratibida pinnata*), rosinweed (*Silphium integrifolium*), stiff sunflower (*Helianthus rigidus*), Canada thistle (*Cirsium arvense**), yarrow*, and wild carrot*. A few woody species are invading this site, mostly poison-ivy (*Toxicodendron radicans*). The surrounding area consists of grasslands dominated by Eurasian cool-season grasses (Hungarian brome* and Kentucky bluegrass*), but these grasslands do contain scattered stands of native forbs and grasses.

Site 8: Group 66 (ENE) Bunker Field, 485 acres

This site is nearly identical to Site 6 in vegetation and land use patterns. However, there are remnants of an Osage-orange fencerow; in addition, the invading woody species include both red cedar (*Juniperus virginiana*) and Norway maple (*Acer platanoides**) that are spreading from an abandoned house site. Stands of wetland plants occur in the deeper drainage ditches, including bulrushes (*Scirpus atrovirens*, *S. pendulus*), sedges (*Carex vulpinoidea*), and rushes (*Juncus torreyi*).

Site 9: Doyle Lake Burn, 113 acres

This site consists of former cultivated fields that have been planted with Eurasian cool-season grasses. The predominant grasses are redtop* and Kentucky bluegrass*; common weedy forbs in these fields include horseweed (*Conyza canadensis*), fleabane (*Erigeron annuus*), bull thistle*, tall goldenrod, prickly lettuce (*Lactuca scariola**), and wild carrot*. Between these fields are narrow strips of cool-season grasses and scattered shrubs, including autumn-olive*, Amur honeysuckle*, and elderberry (*Sambucus canadensis*).

The eastern boundary of this site is a wetland (Doyle Lake) that includes dense stands of willows (*Salix nigra*, *S. interior*, *S. alba**), cattails, and wetland grasses (reed canary grass*, common reed), but also some areas of open water.

Site 10: Grass Seed Fields and Seed Production Beds, 77 acres

This site includes portion of the River Road Seed Gardens. Included in the proposed prescribed burn are five fields (each field covering of 10-14 acres), each planted with a monotypic stand of one native grass species. The grass species include big bluestem, Indiangrass, Canada wild-rye, side-oats grama, and little bluestem. A few species of noxious weeds and other non-desirable plants are present in these fields, mostly as isolated patches. These species include Canada thistle*, musk thistle*, white sweet-clover*, horseweed, late boneset, tall goldenrod, foxtails*, and cool-season grasses. The fields are divided by fencerows of spontaneous trees, mostly green ash, eastern cottonwood, eastern hackberry, box elder, red haw, white mulberry*, and black cherry.

Two wetlands are present in this area; both are dominated by cattails (*Typha* spp.), sedges (*Carex vulpinoidea*, *C. pellita*, *C. cristatella*), rushes (*Juncus torreyi*, *J. interior*), bulrushes (*Scirpus fluviatilis*, *S. validus*, *S. atrovirens*, *S. cyperinus*), and spikerushes (*Eleocharis erythropoda*). Native forbs present in these wetlands include swamp milkweed, blue vervain, New England aster, and panicled aster (*Aster simplex*). There are stands of invasive grasses present, both common reed and reed canary grass*. Some scattered shrubs and young trees are present, mostly eastern cottonwood and green ash.

The seed beds consist of narrow strips (up to 7 feet wide and 500 feet long) planted with prairie forbs and/or grasses. Current (but localized) weed problems in the beds include Canada thistle*, bull thistle*, sweet-clover*, wild carrot*, tall goldenrod, hairy aster, horseweed, foxtails*, and certain cool-season grasses.

Environmental Consequences

Alternative 1 –

The tallgrass prairie is a recent phenomenon (post-glacial) in northeastern Illinois (less than 10,000 years old), and this prairie was historically exposed to a fire regime of dormant-season burns that were set mostly in the fall by Native Americans. Growing-season burns (summer) may enhance the diversity of tallgrass prairie grasses and forbs and assist in controlling the invasion of woody species. Nevertheless, there is insufficient scientific documentation and historic evidence to support widespread use of growing-season burns as a management procedure in midwestern tallgrass prairies. Dormant-season burns favor native C4 plants (warm-season plants) by increasing the rate of soil warming in the spring and the availability of inorganic nutrients and soil moisture. (*Anderson 1990, 1997*).

The existing native vegetation remnants at these 10 sites will remain within a mosaic of restored natural communities. Populations of native plant species will be less vulnerable to encroachment by non-native and invasive native plants. The vulnerability of these populations will also be reduced because they will no longer exist as small populations in isolated remnants. The proposed action of prescribed burning will reduce height and total cover of shrubs and other small woody vegetation. The smaller woody plants will be burned back to the ground; some resprouting will occur, but the reduced shade will allow greater competition from grasses and other herbaceous plants.

Prescribed fire will remove duff, release nutrients, increase bare ground and soil temperatures, creating a good seed bed and resulting in increased vigor, competitiveness, flowering, seed set, recruitment, and seed germination. Increased seed production will occur in grass seed fields and forb beds. However, timing of these burns is important; for example, burning during late fall, winter, and early spring causes increased vigor in native tallgrasses and may favor these species over forbs. Tallgrass prairie vegetation will respond dramatically if prescribed burns are conducted at the proper time of year. Tallgrass prairie burning reduces mulch cover and increases the number of reproductive grass shoots and it also results in a more rapid phenological development of young plants and an increase in flower production (*Anderson 1990, 1997*; *Collins and Gibson 1990*; *Glenn-Lewin et al 1990*; *Northern Prairie Wildlife Research Center*

2000a, 2000b.)

Fire increases the vigor of prairie species, and the year of a burn is likely to be associated with taller plants, especially the grasses, along with greater abundance of flowers. The stimulation is due to removal of insulating litter of grass stems and leaves by the fire, which allows the soil to warm up earlier in the spring and thus increases the length of the growing season (Pauly 1997).

Fire and increased competition of native prairie plants will gradually eliminate some invasive exotic herbaceous plants. However fire may enhance germination of certain exotics (teasel and sweet-clover), but timed burning can also be used to control these species (Packard, 1997; Solecki 1997).

Prescribed burning stimulates prairie plants to form a vigorous sod, thus hindering establishment of woody seedlings, and kills the above-ground parts of certain invading shrubs and trees. Most deciduous trees and shrubs resprout from the roots, and repeated fires are needed to keep resprouting brush under control. Prescribed fire may top-kill most seedlings up to 3 inches tall. Even if woody plants resprout, seed production of most species will be prevented, reducing rates of spread and recruitment. Repeated burning may result in the death of some woody species, including certain exotic shrubs (Nyboer 2000). Some savanna trees at Prairie Creek woods may be adversely affected by repeated prescribed burning (Northern Prairie Wildlife Research Center 2000a; Solecki, 1997).

Alternative 2 –

(No Action) - For Sites 1, 2, 3, 4, 5, and 7, there will be no immediate change in the amounts of native vegetation. However, the size, quality, and species richness of these sites may decline as a consequence of continued encroachment by non-native and invasive native plant species, in part caused by a lack of management and also resulting from the relative isolation and small size of these native vegetation remnants (Packard and Ross 1997).

The former crop fields of Sites 6, 8, and 9 will gradually be colonized by a mixture of non-native and invasive native plant species. Early colonists will likely be ragweeds (*Ambrosia* spp.), tall goldenrod (*Solidago canadensis*), quackgrass (*Agropyron repens*), hairy aster (*Aster pilosus*), wild carrot (*Daucus carota*), sweet-clover (*Melilotus* spp.), Canada thistle (*Cirsium arvense*), and other herbaceous species. Eventually, woody species will spread out from the fencerows and other stands of trees and shrubs; likely woody invaders include autumn-olive (*Elaeagnus umbellata*), Amur honeysuckle, wild blackberry (*Rubus* spp.), black cherry, green ash, hackberry, Eastern cottonwood, and red haw.

For Site 10 woody plants will invade the grass fields with no treatment. Forb production beds will be more difficult to manage and require more mechanical treatments (mowing, hand-weeding).

General Wildlife

Affected Environment

Edge wildlife species such as raccoons, opossum, white-tailed deer, fox squirrel, cardinal, indigo bunting, American robin, and catbird are much more common in Will County and the general area than wetland and grassland species. These edge species are fairly common at Midewin National Tallgrass Prairie, in Will County, and in the surrounding area. Wetland species such as waterfowl, muskrats, frogs, toads, and turtles are not widespread at Midewin and the surrounding area due to the extensive wetland loss from development and agriculture. Grassland wildlife species such as eastern meadowlark, savannah sparrow, grasshopper sparrow, dickcissel, prairie vole, and smooth green snake are not common in the surrounding area due to conversion of prairie to agricultural land, but some grassland species are still somewhat common at Midewin because of extensive agricultural grasslands. Midewin provides some of the only remaining habitat for these grassland species and some of the only land that can be converted to grassland in Will County and the surrounding area.

Environmental Consequences

Alternative 1 –

This alternative will impact some wildlife positively, others negatively. Burning can benefit many wildlife species by increasing habitat diversity, quality and yield of nutritious browse, seeds, and forage. A common misconception is that many animals are killed by prescribed fire. Animals usually escape by running or flying away, going below ground, or moving to unburned islands of vegetation. The primary effect of prescribed fire on wildlife is habitat alteration, not mortality. Fire conducted in early April will avoid nest destruction. Habitat sites can be divided so that only a half or a third are burned in a given year. This will provide refuge for animals excluded from the burned area, and increase habitat diversity as different canopy structures, litter accumulations, and different plants species are created or established (*Ortmann et al. 1998*). Wildlife that will be negatively impacted includes primarily edge species. However, wildlife using wetland and grassland habitat will benefit.

Alternative 2 –

In the no action alternative, time and succession will result in a decrease in available habitat for the wetland and grassland species currently known from the project areas, with potential for significant declines of the populations at Midewin National Tallgrass Prairie and the surrounding area. Habitat for most other wildlife species will not change over the short term. Some grassland birds may benefit, but only those without restrictive habitat requirements. Over time, the grassland habitat will degrade as non-native plants take over the sites without further habitat management. Woody encroachment will increase habitat for edge species over time but decrease the habitat for grassland and wetland wildlife species.

Cumulative Effects

Present or reasonably foreseeable future activities at Midewin which may impact wildlife include: restoration of native vegetation, restoration of natural hydrology, removal of invasive, non-native plant species, grazing of livestock, and construction of trails. Nearby corporate

lands, Army land at the Joliet Army Training Area, and state land at nearby state parks and conservation areas provide extensive habitat for edge species. These species tend to be ubiquitous and declines at Midewin National Tallgrass Prairie will not drastically impact their populations. There is little chance that prairie or grassland restoration will occur on a large scale in Will County other than at Midewin National Tallgrass Prairie. Some, perhaps most of the wildlife species present on private land in Will County, are likely to decrease, largely because of habitat destruction. However, it is likely that some habitat for these species will become state, county, and municipal conservation lands. Near Midewin large segments of land are owned by corporations and used as buffer for industrial parks. This land is essentially left alone and provides early successional and edge species habitat.

Management Indicator (MIS) and Special Status Species

The Forest Service is required to address Management Indicator Species (MIS) under current planning regulations (36 CFR 219) to gauge the effects of management activities implemented under land management plans. These are species whose well-being is considered an indication of the general health of the ecosystem. Midewin National Tallgrass Prairie is a new Forest Service unit and MIS are identified in the proposed Land and Resource Management Plan, May 2001. The MIS may be Federal-listed species, a Regional Forester Sensitive Species (RFSS), or other species that serve as a suite of species which can be used to assess ecosystem integrity, encompass habitat needs for other species, and represent the range of environments in the planning unit (see Appendix A for a complete list of Federal-listed species and RFSS for Midewin).

Pre-existing surveys and records, and recent surveys specifically conducted for this project, have determined that two Federal-listed plant species, 24 sensitive plant and animal species (RFSS), and three state-listed species (one plant and two birds) are present or likely to be present within the ten sites proposed for prescribed burning (see Appendix A). Aspects of these species' conservation status and biology that are relevant to the proposal are summarized below. Further information on these species and the effects of prescribed fire are in the biological evaluation prepared for this project (*Ulaszek 2001*) and draft conservation assessments prepared for Midewin National Tallgrass Prairie (*USDA-FS 2000*).

All these species have survived and presumably thrived for centuries in a landscape in which fire was a conspicuous and often dominant force in shaping native vegetation. Evidence suggests that natural and man-caused fires occurred throughout the year and in other habitats besides prairie, such as woodlands (*Anderson 1990, 1997; McClain and Elzinga 1994*). These species all survived despite this potentially devastating force. However, in today's fragmented landscape, where there is limited habitat and populations of sensitive species are isolated, the potential adverse effects can be magnified (*Panzer 1988*).

The Affected Environment for each species is described, followed by the Environmental Consequences of Alternative 1. Environmental Consequences for the No Action Alternative are summarized for all species, unless otherwise noted.

Leafy prairie-clover (*Dalea foliosa*) Federal Endangered; State Endangered; Proposed Management Indicator Species for Midewin.

Affected Environment

There are five populations of this species in northeastern Illinois; one population is located on Midewin (and adjacent private land), and is present at the western boundary of one site. All other extant populations of this endangered species occur in central Tennessee and north-central Alabama. This species is a relatively short-lived perennial forb of dolomite prairies.

Environmental Consequences

Alternative 1 –Prescribed burning is not likely to adversely affect leafy prairie clover, and may have indirect positive effects on leafy prairie clover, primarily through habitat improvement (control of encroaching woody plants and exotic plant species). Prescribed burns may also increase germination and recruitment of leafy prairie-clover from the seed bank. Increase in potential habitat following prescribed fire, may increase the population size of this species at Midewin.

Alternative 2 - The no-action alternative will not provide for improvement of existing leafy prairie-clover habitat on Midewin, probably resulting in reduced recruitment and gradual decline in the population on Midewin.

Eastern prairie white-fringed Orchid (*Platanthera leucophaea*) Federal Threatened; State Endangered.

Affected Environment

A population of this species occurs outside of the Midewin boundary, near one of the ten sites proposed for prescribed burning. Suitable habitat for this species is also available on Midewin. Eastern prairie white-fringed orchid is present at other localities in northern Illinois and the upper Midwest. This orchid occurs in mesic and wet-mesic prairies.

Environmental Consequences

Alternative 1 –Fire may have some positive effects on Eastern prairie white-fringed , such as increasing recruitment and flowering, but these effects are more closely correlated during years of higher than average precipitation. Increase and improvement of potential habitat following prescribed fire may result in the appearance of this orchid on Midewin, which would lead to an overall increase in numbers and extant of the population now present on adjacent land. Prescribed fires would also have some indirect positive effects, by killing or damaging encroaching woody plants and exotic plant species.

Alternative 2 - The no-action alternative will not provide for improvement of existing habitat on Midewin, making it unlikely that the adjacent population of eastern prairie white-fringed orchid will expand onto Midewin.

Crawe's Sedge (*Carex crawei*) RFSS

Affected Environment

This perennial sedge occurs scattered throughout northern North America, but is fairly uncommon and local in distribution, especially in the southern and western portions of this wide range. There are probably no more than thirty extant populations of Crawe's sedge in northeastern Illinois and adjacent Indiana. Two of the larger populations of this species is present on two of the ten sites proposed for prescribed burning. Two other Sites (2 and 5) contain suitable habitat, but this species has not been located anywhere else on Midewin. There is a planted bed of this species at Site 10.

Environmental Consequences

Alternative 1-The precise response of Crawe's Sedge to prescribed fire is unknown, but its growth habitat (rhizomatous perennial), general observations, and the response of similar graminoids suggest that prescribed burning will result in improved habitat without any direct, long-term damage to individual plants or populations. Burns conducted in late spring (late April to early June) could prevent flowering and fruiting for one growing season, but a late burn would also reduce competition from exotic cool-season grasses in dolomite prairie. Fire will also reduce shading and other competition from encroaching woody plants (both native and exotic). Because of reduced litter and shading plus released nutrients, prescribed burning would be expected to increase vigor, flowering, seed set, and perhaps recruitment in this species. However, these factors will also result in similar responses from native tall grasses, which may increase competition from these species.

Alternative 2 - The no-action alternative will not provide for improvement of existing habitat. However, it is likely that the populations of Crawe's sedge will persist vegetatively, until outcompeted by encroaching shrubs and exotic cool-season grasses.

Hill's Thistle (*Cirsium hillii*) RFSS; State Threatened.

Affected Environment

This native thistle occurs in the upper Midwest, primarily in well-drained prairies. Less than 25 populations are present in Illinois. A population of this species occurs near the Midewin boundary, near one of the ten sites. Suitable habitat for this species is available on Midewin. Although this thistle occurs in native prairies, it still requires some disturbance to create micro-habitats for seed germination and recruitment of new individuals.

Environmental Consequences

Alternative 1- Hill's thistle may benefit through prescribed fire. Prescribed burning could increase the population size existing adjacent to Midewin National Tallgrass Prairie by creating conditions more suitable for recruitment of seedlings onto Midewin. Grazing and mowing are management tools that can create suitable sites and may be used in conjunction with prescribed fire to maintain the habitat of Hill's thistle by reducing the encroachment of woody plants.

Alternative 2 - The no-action alternative would not provide for improvement of existing habitat on Midewin, making it unlikely that the adjacent population of Hill's thistle would expand onto NF land.

Small White Lady's-slipper (*Cyripedium candidum*) State Endangered

Affected Environment

This spring-flowering orchid is restricted to moist, calcareous prairies and fens. This species occurs at less than twenty other sites in northern Illinois. There is one, small population present on Midewin; however, it is contiguous with a larger population on adjacent state land.

Environmental Consequences

Alternative 1-Prescribed burning is likely to have beneficial affects, such as increased flowering and recruitment, because fire may remove cover from duff and invasive plants. However, late spring burns (late April-May) are likely to prevent seed production in this early flowering species. Small white lady's-slipper may benefit through prescribed fire. Increases and improvement of existing habitat could increase the population size at Midewin National Tallgrass Prairie.

Alternative 2 – Without prescribed burning, reproductive effort (flowering and seed production) and recruitment on Midewin are likely to decline. The no-action alternatives will result in lowered habitat quality as woody plants and exotic grasses encroach on the small population.

Butler's Quillwort (*Isoetes butlerii*) RFSS; State Endangered

Affected Environment

This perennial herb occurs in limestone glades and calcareous barrens in the lower midwestern and central southern USA; populations in northeastern Illinois are widely disjunct from the bulk of this species' range. Butler's quillwort is extant at five localities in Will and adjacent DuPage counties, Illinois; all sites are dolomite prairie. One of these sites is on Midewin (and adjacent private land) at Site 1. This species is actively growing from April to July, when it is vulnerable to damage from prescribed burns. However, low fuel levels in preferred microhabitats (shallow depressions in dolomite prairie) and saturation/inundation of habitat will probably restrict the use of fire to the dormant season when there will be no danger to the plants.

Environmental Consequences

Alternative 1-Prescribed fire will be useful in controlling encroaching woody species or exotic plants in dolomite prairie. Prescribed burning should improve habitat for this species if the action is not conducted when it is actively growing from April to early July, or if the specific microhabitat is not burned.

Alternative 2 - No action will probably not have immediate, adverse effects on this species. However, the gradual spread of encroaching woody plants and exotic cool-season grasses may eventually cause changes in this species' microhabitats, resulting in loss of the population.

False Mallow (*Malvastrum hispidum*) RFSS; State Endangered

Affected Environment

This summer annual herb occurs in dry prairies, calcareous barrens, and limestone glades in the lower midwestern and upper southern states of the USA. The northern Illinois populations are

disjunct from the majority of the range, and here the false mallow is restricted to at least six localities in Will, Grundy, and nearby LaSalle Counties, Illinois. Most sites are dolomite prairie, but this species does occur in other dry prairie habitats. There is one large population present on Midewin (and adjacent private land); this site is dolomite prairie (Site 1). This species is actively growing from June to September, when it could be vulnerable to damage from prescribed burns.

Environmental Consequences

Alternative 1-Low fuel levels in preferred micro-habitats (shallow soils and bedrock exposures in dolomite prairie) will minimize the number of plants damaged by growing season burning; there will likely be no adverse effects from burning at other times of the year. Prescribed burning is a useful management tool for controlling encroaching woody species or exotic plants in dolomite prairie. Burning will also expose substrate, creating sites for seed germination and recruitment of new mallow plants.

Alternative 2 – The no action alternative will probably not have immediate, adverse effects on false mallow. However, the gradual spread of shrubs and exotic cool-season grasses may eventually cause changes in this species' microhabitats, eventually restricting it to the most extreme habitats able to resist shrub and cool-season grass encroachment.

Pitcher's Stitchwort (*Minuartia patula*) RFSS; State Threatened

Affected Environment

Although widespread in the eastern USA, Pitcher's stitchwort is extremely local in distribution, usually restricted to glades, barrens, rock outcrops, alvars, dolomite prairies, and other calcareous, shallow-soil communities. This species is a winter annual herb of calcareous, rocky, seasonally dry habitats, including limestone glades, rock outcrops, and dolomite prairies, usually flowering in May and June. There are at least twenty extant populations in northern Illinois; one of these populations is at Midewin (and adjacent private land) at Site 1. This species is actively growing from March to July, when it is vulnerable to damage from prescribed burns.

Environmental Consequences

Alternative 1- Low fuel levels in preferred micro-habitats (shallow soils and bedrock exposures in dolomite prairie) will minimize the number of plants damaged by late spring burning; there will likely be no adverse effects from burning at other times of the year. Prescribed burning is a useful management tool for controlling encroaching woody species or exotic plants in dolomite prairie. Burning will also expose substrate, creating sites for seed germination and recruitment of new stitchwort plants.

Alternative 2 - No action will probably not have immediate, adverse effects on Pitcher's stitchwort. However, the gradual spread of woody plants and exotic cool-season grasses in the dolomite prairie may eventually cause changes in this species' microhabitats, eventually restricting it to the most extreme habitats able to resist shrub and cool-season grass encroachment.

Glade Mallow (*Napaea dioica*) RFSS

Affected Environment

This species is a rhizomatous perennial herb of moist meadows and floodplain terraces. It remains fairly widespread in Illinois and at other localities in the Midwest, but most extant populations are in degraded or disturbed habitats. A small population of glade mallow is present on Midewin, within site 1.

Environmental Consequences

Alternative 1-There is no precise documentation available on the effects of prescribed burning or mowing on this species. Like many native perennials, however, it is unlikely this species will be harmed by dormant-season burning. By removing litter and duff, top-killing woody vegetation, and exposing the soil surface, fire will probably increase the vigor and recruitment in populations of glade mallow. Growing season burning could result in damage to the stems above, but the plant would be expected to resprout and resume flowering during the next growing season.

Alternative 2 - The no-action alternative will probably not result in an immediate decline of this species, but the population will also be unable to expand because of shading and competition from encroaching woody plants.

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

Affected Environment

This perennial herb is widespread around the Great Lakes and Midwest; however, it is very localized and common at only a few sites. Habitats include mesic forests, seeps, open woodlands, roadsides, dolomite prairies, typic prairie, and pastured grasslands. Sullivant's coneflower is fairly widespread on the western third of Midewin, in outwash plain soils; this composite is present at Sites 1, 3, 4, 5, and planted in forb beds at Site 10.

Environmental Consequences

Alternative 1-There is no precise documentation available on the effects of prescribed burning on Sullivant's coneflower. Like many native perennials, however, this species will probably not be harmed by dormant-season burning; this species is present (and locally common) in burned areas on adjacent state lands. By removing litter and duff, top-killing woody vegetation, and exposing the soil surface, fire will probably increase the vigor and recruitment in populations of Sullivant's coneflower. Growing season burning could result in damage to the stems above ground, but the plant is expected to resprout and resume flowering during the next growing season. Sullivant's coneflower may benefit through prescribed fire. Increases in potential habitat could increase the population size at Midewin National Tallgrass Prairie.

Alternative 2 – Under the no-action alternative, this species will gradually decline at these sites because of increased competition from rank grasses, shrubs, and the build up of duff. Some populations will persist where other management tools (grazing) can be used, as in the eastern two-thirds of Site 3 (*USDA Forest Service 2001b*).

Earleaf False-Foxglove (*Tomanthera auriculata*) RFSS; State Threatened

Affected Environment

This annual herb occurs in prairies and similar habitats. This species is a hemiparasite (partially-dependent root parasite) on other flowering plants. Although widespread in the Midwest, the number of populations is low; less than thirty populations are known in Illinois. At Midewin, this species is present at two localities, both proposed for prescribed burning (Sites 1 and 5).

Environmental Consequences

Alternative 1-This species is actively growing from June to September, when it could be vulnerable to damage from prescribed burns. However, this species responds positively to prescribed burns conducted during other seasons, probably because of increased sites for germination and recruitment along with increased vigor of host plants.

Alternative 2 - The no-action alternative will result in continued degradation of habitat, especially increased shrub encroachment. Both populations of earleaf false-foxglove will be expected to decline, because of reduction in seedling recruitment sites and loss of vigor in host species.

Hairy Valerian (*Valeriana edulis* var. *ciliata*) RFSS

Affected Environment

This spring-flowering herb is restricted to moist, calcareous prairies and fens. The valerian occurs at over thirty other sites in northern Illinois. There is one, small population present on Midewin at Site 3; however, it is contiguous with a larger population on adjacent state land.

Environmental Consequences

Alternative 1-Prescribed burning is likely to have beneficial affects, such as increased flowering and recruitment, because fire may remove cover from duff and invasive plants. However, late spring burns (late April-May) are likely to prevent seed production in this early flowering species. Hairy valerian may benefit through prescribed fire. Increases in potential habitat could increase the population size at Midewin National Tallgrass Prairie.

Alternative 2 – Without prescribed burning, reproductive effort (flowering and seed production) and recruitment on Midewin are likely to decline. The no-action alternatives will result in lowered habitat quality, as woody plants and exotic grasses encroach on the small population.

Red-veined Prairie Leafhopper (*Aflexia rubranura*) RFSS; State Threatened

Affected Environment

This insect is a remnant-restricted species (*Panzer et al. 1997; Panzer et al. 1995*) of prairies; less than 15-20 populations exist. This species is dependent upon its food plant, prairie dropseed (*Sporobolus heterolepis*). Both this species and its food plant are present at site 1. Small populations of prairie dropseed (<10 plants) are present at Sites 3 and 5, but the leafhopper has not been discovered at either site. There may be insufficient habitat for the leafhopper at the latter two sites. There are newly planted individuals of prairie dropseed at Site 10, but it is unlikely that this flightless insect has spread to this locality.

Environmental Consequences

Alternative 1- The red veined leafhopper is dependant upon its host plants. Prairie restoration will provide habitat for their host plants and subsequently benefit the insects. Burning only a portion of occupied and potential habitat at Sites 1, 3, and 5 during any given season will provide refuge areas from which this species can recolonize burned areas.

Alternative 2 – Under the the no-action alternative, there will be no potential lost of red-veined leafhoppers to prescribed fire. However, in the long-term, habitat will continue to degrade as these remnants are invaded by shrubs and exotic plants.

Henslow’s Sparrow (*Ammodramus henslowii*) RFSS; State Endangered

Affected Environment

This species is a area-sensitive grassland bird that breeds in the Northeast and Midwest USA; they migrate south in winter to the southeastern USA. Preferred habitat is open grassland with taller grasses and some accumulated litter and duff. This species has been nesting regularly at Midewin since 1998; two sites used by this species (Sites 1 and 3) are proposed for prescribed burning. Henslow’s sparrows are common on nearby prairie lands (Goose Lake Prairie) and Midewin also has a sizable population.

Environmental Consequences

Alternative 1- The proposed prescribed burns will affect less than 25% of Henslow’s sparrow breeding habitat at Midewin. Henslow’s sparrow are highly sensitive to fire and may not use recently burned breeding habitat for two or three growing seasons following a prescribed fire. However, in the long-term, prescribed burning is an effective way to maintain Henslow’s sparrow habitat, while providing nearby areas of breeding habitat.

Alternative 2 – This species will not temporarily lose portions of its breeding habitat under the no-action alternative. However, habitat quality will degrade as time passes and shrubs invade. Some sites currently used for nesting by Henslow’s sparrow (Sites 1 and 3) will eventually become unsuitable for this grassland bird.

Short-eared Owl (*Asio flammeus*) RFSS, State Endangered

Affected Environment

This owl is widespread in the northern hemisphere, nesting in tundra, grasslands, marshes, and other open habitats; wintering habitat is similar, but the owl may also forage over crop stubble and pastures. At present, this species occurs on Midewin as a winter visitor; it is usually seen foraging over grasslands, pasture, and crop stubble. Although this species has not been discovered nesting on Midewin, it has nested recently on nearby state land and other tracts in northern and central Illinois. Sites 1, 3, 6, 8, and 9 contain suitable foraging habitat (and perhaps nesting habitat) for short-eared owls.

Environmental Consequences

Alternative 1- The short-eared owl is only known as a migrant and winter resident. Restoration to prairie and grassland will improve foraging habitat and may provide more potential breeding

habitat in the long term. Prescribed burning at Sites 1, 2, 3, 6, 8, and 9 will temporarily reduce potential breeding and foraging habitat for short-eared owls until after one growing season following a burn. Late spring burns (during or after March) could cause nest mortality, but this species is not known to be nesting at any of the sites proposed for prescribed burning.

Alternative 2 - The no-action alternative will also provide habitat for this species, and all habitat will remain suitable because of duff retention. There will also be no adverse impacts on active nests from spring burns. However, these areas will eventually become unsuitable for short-eared owls because of shrub encroachment, unless they are managed by other means, such as grazing or hay-cutting on Sites 3 (eastern two-thirds), 6, 8, and 9 (*USDA Forest Service 2001b*).

Upland Sandpiper (*Bartramia longicauda*) RFSS; State Endangered

Affected Environment

This species is an area-sensitive grassland bird that breeds in the northern USA and Canada; they migrate south in winter to southern South America. Preferred habitat is open grassland with relatively short grasses (a heterogenous cover of areas between 4 to 12 inches in grass height is best for breeding) and with little accumulated duff. The largest concentration of nesting upland sandpipers in Illinois is at Midewin; sandpipers have nested at Sites 1 and 3. Additionally, Sites 6, 8, and 9 have potential, but are marginal breeding habitat for upland sandpipers at present.

Environmental Consequences

Alternative 1 –Prescribed burning at Sites 1, 3, 6, 8, and 9 will improve habitat structure for upland sandpipers, especially if conducted before the breeding season (late March to early April). Any prescribed burns conducted from late April to late July could cause nest or chick mortality. An early spring fire will remove litter and result in shorter grasses preferred by upland sandpipers for foraging.

Alternative 2 - The no-action alternative will also provide some habitat for this species. However, these areas will eventually become unsuitable for upland sandpipers because of duff accumulation and shrub encroachment, unless they are managed by other means, such as grazing on Sites 3 (eastern two-thirds), 6, 8, and 9 (*USDA Forest Service 2001b*).

Northern Harrier (*Circus cyaneus*) RFSS, State Endangered

Affected Environment

This raptor is widespread in the northern hemisphere, nesting in tundra, grasslands, marshes, prairies, and other open habitats; wintering habitat is similar, but the harrier also forages over crop stubble and pastures. At present, this species usually occurs on Midewin as a winter visitor; it is usually seen foraging over grasslands, pasture, and crop stubble. There is one confirmed nesting record in the past five years, but this species may have nested at other times undetected, as northern harriers are observed occasionally on Midewin during the breeding season. Northern harriers have nested recently on nearby state land and other tracts in northern and central Illinois. Sites 1, 2, 3, 6, 8, 9, and 10 contain suitable foraging habitat (and potential breeding habitat) for northern harriers.

Environmental Consequences

Alternative 1 – Prescribed burning at the sites listed above will temporarily reduce potential breeding and foraging habitat for northern harriers, but improve habitat in the long term by top killing encroaching woody species and improving grass cover. Less than 15% of the potential habitat at Midewin will be affected. Late spring burns (during or after April) could cause nest mortality, but no northern harrier nests have been found on the sites.

Alternative 2 - The no-action alternative will also provide habitat for this species, and all would remain suitable because of duff retention. There will also be no adverse impacts on active nests from spring burns. However, these areas will eventually become unsuitable for northern harriers because of shrub encroachment, unless they are managed by other means, such as grazing or hay-cutting on Sites 3 (eastern two-thirds), 6, 8, and 9 (*USDA Forest Service 2001b*).

Bobolink (*Dolichonyx oryzivora*) RFSS; State Watch List

Affected Environment

This species is an area-sensitive grassland bird that breeds in the northern USA and southern Canada; they migrate south in winter to southern South America. Preferred habitat is open grassland with moderately tall grasses (a relatively homogenous cover of 20-50 cm is best for breeding), few shrubs, and with small amounts of accumulated duff. Midewin may support the largest concentration of breeding bobolinks in Illinois; they have nested at Sites 1 and 3. Additionally, Sites 6, 8, and 9 are potential, but marginal breeding habitat for bobolinks at present.

Environmental Consequences

Alternative 1-Prescribed burning may improve habitat for bobolinks at Sites 1 and 3 by removing dead vegetation, duff, and topkilling shrubs. Late spring burning (April) may temporarily delay or reduce nesting owing to reduced grass heights. Burning after early May and before August could cause nest mortality in bobolinks nesting at Sites 1 and 3. Burning in Sites 6, 8 and 9 may improve conditions by creating a more heterogenous stand of grasses.

Alternative 2 - The no-action alternative will also provide some habitat for this species. However, these areas will eventually become unsuitable for bobolinks because of duff accumulation and shrub encroachment, unless they are managed by other means, such as grazing or hay-cutting on Sites 3 (eastern two-thirds), 6, 8, and 9 (*USDA Forest Service 2001b*).

Blanding's Turtle (*Emydoidea blandingii*) RFSS, State Threatened

Affected Environment

This reptile has a fairly restricted range in the eastern Great Plains, upper Midwest, and northeastern USA. This turtle is usually associated with open marshes and natural ponds, but does occur in adjacent upland habitats. There are scattered populations in northern and central Illinois, including at Midewin and adjacent and nearby public and private lands. At Midewin, this species is known to occur at Sites 1 and 2; populations are believed to be small. Potential wetland habitat for Blanding's turtle occurs adjacent to Site 9; marginal habitat is present within

Sites 3, 4, and 10. Blanding's turtle has not been observed at any of these sites during herpetological surveys.

Environmental Consequences

Alternative 1 - The response of Blanding's turtles to fire is not well documented; however, fire is a suitable management tool for maintaining portions of this reptile's habitat in Illinois. Prescribed burning is not expected to result in the loss of any Blanding's turtles, because the seasonal activity of this species makes it unlikely to be present in any habitat with suitable fuels. Prescribed burning at Sites 1 and 2 will improve habitat by removing duff and stimulating growth of native plants.

Alternative 2 – There will be no potential for loss of Blanding's turtles as a result of fire under the no-action alternative; however, habitat will continue to degrade through the encroachment of woody plants.

Least Bittern (*Ixobrychus exilis*) status is RFSS; State Threatened.

Affected Environment

Least bitterns occur throughout much of temperate USA and tropical America; nesting in Illinois is very localized. This species prefers marshes dominated by tall grasses, including cattail, bur-reed, bulrushes, and common reed. This small heron was first discovered breeding on Midewin in 1999 at Site 2; there is also suitable breeding habitat present at or adjacent to Sites 9 and 10.

Environmental Consequences

Alternative 1- The response of least bitterns to fire is not well documented; however, it is expected that complete removal of vegetative cover from nest sites or potential nesting habitat will have a temporary, but detrimental impact. Least bitterns have been recorded as re-nesting after other forms of disturbance.

Alternative 2 - There will be no potential for loss of least bittern nests or nesting habitat under the no-action alternative; however, habitat will continue to degrade through the encroachment of woody plants.

Migrant Loggerhead Shrike (*Lanius ludovicianus migrans*) status is RFSS; State Threatened.

Affected Environment

This subspecies is the breeding form found in the Midwest USA, Northeast USA, and southern Ontario; the entire range of this species includes most of the USA and northern Mexico. Northern populations (including those at Midewin) winter in the southern USA. The shrike prefers grasslands with grass heights less than 4 to 12 inches for foraging; the presence of dense, thorny shrubs is required for nesting and prey impalement. The largest concentration of nesting loggerhead shrikes in northern Illinois is at Midewin; shrikes have nested at or adjacent to sites 1, 4, and 6. Additionally, Sites 8 and 9 are potential breeding and foraging habitat for loggerhead shrikes.

Environmental Consequences

Alternative 1- Prescribed burning at Sites 1, 3, 6, 8, and 9 will improve habitat structure for loggerhead shrikes, if conducted shortly before the breeding season (late March-early April). An early spring fire will remove litter and result in shorter grasses preferred by loggerhead shrikes for foraging. However, a prescribed burn may also top-kill some shrubs used as nesting sites. Shrubs suitable for nesting will most likely resprout with 2 to 5 years of a prescribed burn.

Alternative 2 - The no-action alternative will also provide some habitat for this species. However, these areas will eventually become unsuitable for loggerhead shrikes because of duff accumulation unless they are managed by other means, such as grazing or hay-cutting on Sites 3 (eastern two-thirds), 6, 8, and 9 (*USDA Forest Service 2001b*). Also, without some type of management, suitable nesting shrubs and young trees will continue to grow and will eventually become unsuitable as nest sites.

Blazing-star Stem-borer (moth) (*Papaipema beeriana*) status is RFSS.

Affected Environment

This moth is a remnant-dependent species (*Panzer et al. 1997; Panzer et al. 1995*) of prairies; probably less than 25 populations exist. This species is dependent upon its food plant, marsh blazing-star (*Liatris spicata*). Both this species and its food plant are present at Site 3. Moderate-sized populations of marsh blazing-star (food plant for the moth) are present at Sites 1, 2 and 5, but the Blazing-star stem borer moth has not been discovered at these sites. There may be insufficient habitat for this moth at the latter two sites. There are plantings of the marsh blazing-star at Site 10, but it is unlikely that this remnant-dependent insect has spread to this locality.

Environmental Consequences

Alternative 1- The insect species are dependant upon food plants. Prairie restoration will provide habitat for their host plants and subsequently the insects. While all life stages of the individual moths are highly vulnerable to fire, prescribed burning is essential for maintaining both the habitat and food plant for this insect. By only burning a portion of occupied and potential habitat in any one year, refuge areas will be provided for survivors to recolonize burned areas.

Alternative 2 - Under the the no-action alternative, there will be no potential lost of blazing-star stem-borers to prescribed fire. However, in the long-term, habitat will continue to degrade and the blazing-star populations decline as these remnants become invaded by shrubs and exotic plants.

Rattlesnake-master Stem-borer (moth) (*Papaipema eryngii*) RFSS, State Endangered

Affected Environment

This moth is a remnant-dependent species (*Panzer et al. 1997; Panzer et al. 1995*) of prairies; fewer than 15 populations exist. This species is dependent upon its food plant, rattlesnake-master (*Eryngium yuccifolium*). The food plant and evidence of this species is known from site 3, which is adjacent to larger, known populations of both this moth and rattlesnake-master (these

are on state land). Small populations of rattlesnake-master (<100 plants) are present at Sites 2 and 7, but this insect has not been discovered at either site. There may be insufficient habitat for this moth at the latter two sites. There are plantings of rattlesnake-master at Site 10, but it is unlikely that this remnant-dependent insect has spread to this locality.

Environmental Consequences

Alternative 1- This moth is dependant upon its host plants. Prairie restoration will provide habitat for host plants and subsequently the insects. While all life stages of the individual moths are highly vulnerable to fire, prescribed burning is essential for maintaining both the habitat and food plant for this insect. By only burning a portion of occupied and potential habitat in any one year, refuge areas will be provided for survivors to recolonize burned areas.

Alternative 2 - Under the the no-action alternative, there will be no potential loss of rattlesnake-master stem-borers to prescribed fire. However, in the long-term, habitat will continue to degrade and the rattlesnake-master populations will decline as these remnants become invaded by shrubs and exotic plants.

King Rail (*Rallus elegans*) RFSS; State Threatened

Affected Environment

King rails occur throughout the eastern USA, into Mexico; nesting in Illinois is very localized. This species uses sedge meadows, wet prairies, and marshes dominated by grasses, including sedges, cattails, bur-reeds, bulrushes, wetland grasses, and common reed. King rails have been recorded nesting at Site 1, and birds have been seen or heard in appropriate habitat at Sites 3 and 9. Sites 2 and 10 also contain potential breeding habitat for the king rail.

Environmental Consequences

Alternative 1- The response of king rails to fire is not well documented; however, it is expected that complete removal of vegetative cover from nest sites or potential nesting habitat would remove nesting cover. Fall or early spring fires may prevent or delay nesting. King rails continue to breed on nearby state lands managed with prescribed fire. Properly timed fire is a suitable management tool for maintaining this species' habitat in Illinois.

Alternative 2 – Under the no-action alternative, existing habitat will continue to be present. However, in the long-term, habitat might degrade and disappear through the encroachment of woody plants.

Plains Leopard Frog (*Rana blairi*) RFSS

Affected Environment

This amphibian has a relatively restricted range in the Great Plains and Midwest regions of the USA and adjacent Mexico. The breeding habitats for this frog are usually open marshes and natural ponds that lack populations of predatory fishes. Outside the breeding season, the plains leopard frog often forages in grasslands, prairies, and pastures. This species is widely distributed in central and southern Illinois; Midewin is at the northern margin of the species' range. Despite intensive surveys, this species has only been found at one locality on Midewin along Prairie

Creek; this locality is not within any of the proposed prescribed burns. However, potential breeding habitat for this frog species is present at or adjacent to Sites 2 and 9 and upland foraging habitat is present at all ten sites.

Environmental Consequences

Alternative 1- The plains leopard frog is known to breed on Midewin National Tallgrass Prairie in shallow wetlands. Prescribed fire implemented in the action alternatives may provide additional breeding sites, positively influencing the population. The response of the plains leopard frog to fire is not well documented; however, fire is a suitable management tool for maintaining this amphibian's habitat in Illinois. Prescribed burning is unlikely to result in the loss of any plains leopard frogs because the seasonal activity of this species makes it unlikely to be present in any habitat with suitable fuels.

Alternative 2 – Under the no-action alternative, habitat for the plains leopard frog will continue to exist on Midewin. However, there will be a gradual decline as open foraging habitat becomes invaded by woody plants.

Common Moorhen (*Gallinula chloropus*) State Threatened

Affected Environment

Common moorhen occur throughout much of temperate and tropical North America, and also in Eurasia, Africa, and South America. This species prefers large marshes, with areas of open water; it nests among emergent vegetation or in shrub thickets. This species occurs throughout Illinois in low numbers; most recent breeding records are from Northeast Illinois. At Midewin, the moorhen nests periodically in wetlands in and adjacent to Sites 2 and 9; the other eight sites proposed for prescribed burning do not contain suitable habitat.

Environmental Consequences

Alternative 1- The response of common moorhen to fire is not well documented; however, it is expected that complete removal of vegetative cover from nest sites or potential nesting habitat will temporarily remove nest cover and either prevent or delay nesting of the common moorhen.

Alternative 2 - There will be no potential for loss of common moorhen nests or nesting habitat under the no-action alternative; however, habitat will continue to degrade through the encroachment of woody plants.

Pied-billed Grebe (*Podiceps podilymbus*) State Threatened

Affected Environment

Pied-billed grebes occur throughout most of temperate USA and tropical America; nesting in Illinois is very localized. This species prefers ponds, open marshes with areas of open water, and emergent vegetation; grebes nest among dense emergent or floating vegetation. At Midewin, pied-billed grebes nest periodically in wetlands in and adjacent to Sites 2 and 9; the other eight sites proposed for prescribed burning do not contain suitable habitat.

Environmental Consequences

Alternative 1- The response of pied-billed grebes to fire is not well documented; however, it is expected that complete removal of vegetative cover from nest sites or potential nesting habitat will have a temporary but detrimental effect by removing nesting cover and either preventing or delaying nesting. However, removal or top-killing of woody vegetation will improve habitat for grebes.

Alternative 2 - There will be no potential for loss of pied-billed grebe nests or nesting habitat under the no-action alternative; however, habitat will continue to degrade through the encroachment of woody plants.

Cumulative Effects

Past activities in Will County which have probably affected federal endangered species, RFSS, and state-listed species include: conversion of natural vegetation to cropland and pasture, grazing, mowing of grassland for hay, fire suppression, erosion and sedimentation from agricultural activities, timber cutting, drainage of wetlands, extirpation of large ungulates (elk, bison) and large predators (gray wolf, puma, and black bear), introduction of non-native animal and plant species, and development of a urban area and rural communities with transportation and energy transmission infrastructure. Not all of these activities have adversely affected these species. For example, upland sandpiper habitat on pastures was maintained by livestock grazing. Some, perhaps most of the species of concern present on private land in Will County are likely to decrease, largely because of habitat destruction. However, it is likely that some habitat for these species will become state, county, and municipal conservation lands in Will County. In addition, habitat for some species has been or is being restored on nearby state and county lands, most notably at Goose Lake Prairie State Park in Grundy County.

Present or reasonably foreseeable future activities on Midewin which may affect federal endangered species, Regional Forester's sensitive species, and state-listed species include: restoration of native vegetation, restoration of natural hydrology, removal of invasive, non-native plant species, grazing of livestock, and construction and use of trails.

Federal Listed Species

Leafy prairie-clover has never been an especially widespread species; however, it has undergone drastic declines in northeastern Illinois because of habitat loss to quarries and industrial development. Habitat degradation, fire suppression, severe over-grazing by livestock, and excessive collecting by people have also contributed to this species' decline. Only five natural populations are now extant in Illinois, with one remaining on Midewin. Although these populations are now the focus of intensive restoration management, three populations are relatively small and thus vulnerable to stochastic events (including the population on Midewin).

Under Alternative 1, this population will be managed with prescribed fire, which should result in increased recruitment from the seed bank. As this population increases, its likelihood of long-term persistence increases, and it will contribute to the continuation of viable populations of leafy prairie-clover in northeastern Illinois. Under Alternative 2 this population will not receive

the benefits of fire management, and may eventually decline and disappear. This alternative may have adverse impacts on the long-term survival of leafy prairie-clover in northeastern Illinois.

Eastern prairie white-fringed orchid was formerly common throughout the moist prairies of the upper Midwest. Although most populations were extirpated by conversion of prairies to agricultural land, other factors contributed to decline, including wetland drainage, collecting for the horticultural trade, fire suppression in the remaining prairies, and loss of pollinators. The population occurring adjacent to Midewin is managed with prescribed burning and there has been an overall trend toward increased numbers.

Under Alternative 1, management will improve existing habitat on Midewin. Previously undiscovered vegetative individuals may begin flowering, or this orchid may colonize onto Midewin after management. In either case, there will be an increase in the population and occupied habitat, which will improve the long-term prospects for this population. This population is one of two known populations of eastern prairie white-fringed orchid in the Prairie Parklands, and under Alternative 1, could expand to become one of the larger populations in Illinois. Under the no-action alternative, these benefits will not occur. The population on adjacent land will not undergo additional habitat expansion and will be more vulnerable to stochastic events.

Regional Forester Sensitive Species

In Illinois, **Butler's quillwort** is restricted to a few dolomite prairie sites within Will and DuPage Counties. Although recently discovered in Illinois (1991), evidence suggests that much habitat and probably several populations have been lost to habitat destruction. Not all known populations are protected, and it is likely that some will be lost to industrial development.

Under Alternative 1, habitat for these species at Midewin will be managed using prescribed fire. Existing habitat will improve in quality and there may an expansion of habitat as non-native species are reduced. This population will make a contribution toward the overall survival of this species in northeastern Illinois. Under Alternative 2 (no-action), Butler's quillwort will probably continue to persist at Midewin for decades. However, it is unlikely that the population will expand into improved habitats, and the significance of this population will decline as the habitat becomes increasingly encroached upon by non-native grasses and woody plants.

False mallow populations in northeastern Illinois are restricted to dolomite prairies. There are at least six populations, but not all receive protection. Much habitat (and probably several populations) has been destroyed by quarrying and industrial development. Many of the populations are large (100's to 1000's of individuals) but often fluctuate in size.

Alternative 1 will benefit the population on Midewin, and will contribute to the survival of this species in northeastern Illinois. This population will probably continue to survive in extreme habitats under the no-action alternative, but will not expand. The significance of this population of false mallow will decline as the habitat becomes increasingly encroached upon by non-native grasses and woody plants.

In northeastern Illinois, **Pitcher's stitchwort** occurs in dolomite prairies and on limestone ledges. Many populations are small and isolated, and are threatened by quarrying or invasion of habitat by exotic plant species. A few large populations are present on public land; some of these are protected.

Alternative 1 will benefit the population on Midewin by improving and increasing its habitat. As the Midewin population grows, it will become increasingly significant for northeastern Illinois. Under the no-action alternative, the Midewin population of Pitcher's stitchwort is likely to decline until it is restricted to the most extreme dolomite habitats because of competition from encroaching shrubs and non-native grasses.

At least thirty populations of **Crawe's sedge** survive in northeastern Illinois, but many more have been extirpated by habitat loss. Many surviving populations are small and isolated, but a few large, protected populations are present at localities other than Midewin.

Under Alternative 1, populations of Crawe's sedge on Midewin will be expected to increase under fire management. These populations are regionally significant, although perhaps not essential for the long-term survival of the species in northeastern Illinois. However, these populations will be unable to contribute to the persistence of Crawe's sedge in northeastern Illinois if they are lost to competition from encroaching shrubs and non-native grasses, which is expected under the no-action alternative.

Sullivant's coneflower is locally common in grasslands and prairie remnants on the western third of Midewin, with smaller populations scattered throughout the southern Prairie Parklands. Although this species is able to persist in roadsides and pastures, much habitat has been lost to conversion to cropland, industrial and residential development, and woody succession.

Under Alternative 1, Sullivant's coneflower is expected to increase at Sites 1, 3, 4, and 5; increasing the size of the overall population on Midewin, which may contain the largest concentration of this species. Under the no-action alternative, some of these populations will be eventually decline, although large populations will remain elsewhere on Midewin and in the Prairie Parklands.

Hill's thistle was formerly widespread throughout the upland prairies of the Midwest, although most populations were extirpated by conversion of prairies to agricultural land. Other factors contributed to decline, including fire suppression in the remaining prairies, herbicide spraying, and loss of pollinators. The population occurring adjacent to Midewin is managed with prescribed burning.

Under Alternative 1, management will improve existing habitat on Midewin. Previously undiscovered vegetative individuals may begin flowering, or the species may colonize onto Midewin after management. In either case, there will be an increase in the population and occupied habitat, which will improve the long-term prospects for this population. The population is one of two known populations of Hill's thistle in the Prairie Parklands, and under Alternative 1, could expand to become one of the larger populations in Illinois. Under the no-

action alternative, these benefits will not occur. The population on adjacent land will not have additional habitat expansion, and would be more vulnerable to stochastic events.

At least thirty populations of **earleaf false-foxglove** survive in Illinois, but many more have been extirpated by habitat loss. Many surviving populations are small and isolated, and vulnerable to loss from fire suppression, woody encroachment, loss of pollinators, and stochastic events compounded by this species' dependence on host plants (it is a root parasite dependant on certain other plant species). Protected populations are present at several localities other than Midewin, including elsewhere on the Prairie Parklands.

Under Alternative 1, both populations of earleaf false-foxglove on Midewin are expected to increase under fire management. These populations are regionally significant, although perhaps not essential for the long-term survival of the species in Illinois. However, these populations will not contribute to the persistence of earleaf false-foxglove in northeastern Illinois if they are lost to competition from encroaching shrubs and non-native grasses, which is expected under the no-action alternative.

Hairy valerian has declined throughout the upper Midwest as prairie habitat was converted to agricultural land. Many remaining populations are threatened by hydrological modification of remaining wet prairies, fire suppression, invasion of habitat by woody plants and exotic herbaceous plants, and conversion of remaining habitat to residential, industrial, or commercial uses. The few plants on Midewin are part of a larger population that occurs on adjacent land.

Under Alternative 1, management will improve existing habitat on Midewin. Previously undiscovered vegetative individuals may begin flowering, or additional individuals may colonize on Midewin after management. In either case, there will be an increase in the population and occupied habitat, which will improve the long-term prospects for this population. The population is one of more than thirty known from northern Illinois. Under the no-action alternative, these benefits will not occur. The population on adjacent land will not undergo additional habitat expansion, and would be more vulnerable to stochastic events.

Glade mallow is restricted to the upper Midwest, where it is widespread but restricted to degraded riparian habitats. The original habitat of this species is not known for certain. At Midewin, this species occurs in wetlands and wet meadows in a floodplain adjacent to dolomite prairie. The population is small and most reproduction is by vegetative means.

Alternative 1 is likely to have benefits for glade mallow through removal of competing woody and non-native vegetation by fire. Continual management of this population with fire may help restore its original habitat, stimulate sexual reproduction and recruitment from seeds, and Midewin could have one of the few glade mallow populations present in restored native habitat at Midewin. Under the no-action alternative, these benefits will not occur.

Red-veined prairie leafhoppers have declined because of the loss of its habitat (prairie) and food plant (prairie dropseed). The remaining populations are threatened by continued habitat loss and degradation, the latter a result of fire suppression, woody encroachment, and invading exotic plants. The small size of many remaining populations also makes them susceptible to

stochastic events, such as loss of genetic diversity or intensive fires. The Midewin population is one of several known to exist in northeastern Illinois.

With the mitigation measures, Alternative 1 is likely to benefit this insect by improving habitat and stimulating growth, flowering, and recruitment in its food plant, prairie dropseed. The expanding population may then become a suitable source from which to restore the red-veined prairie leafhopper to other prairie restorations both on Midewin and elsewhere in the Prairie Parklands. Under the no-action alternative, these benefits will not occur.

The **blazing-star Stem-borer** has declined greatly because of the loss of its habitat (prairie) and food plant (marsh blazing-star). The remaining populations are threatened by continued habitat loss and degradation, the latter a result of fire suppression, woody encroachment, and invading exotic plants. The small size of many remaining populations also makes them susceptible to stochastic events, such as loss of genetic diversity, parasitic wasps or intensive fires. The Midewin population is one of several known to exist in northeastern Illinois.

With mitigation measures, Alternative 1 is likely to benefit this moth by improving habitat and stimulating growth, flowering, and recruitment of its food plant, marsh blazing-star. This expanding population may then become a suitable source from which to restore the moth to other prairie restorations, both on Midewin and elsewhere in the Prairie Parklands. Under the no-action alternative, these benefits will not occur.

The **rattlesnake-master stem-borer** has declined greatly because of the loss of its habitat (prairie) and food plant (rattlesnake-master). The remaining populations are threatened by continued habitat loss and degradation, the latter a result of fire suppression, woody encroachment, and invading exotic plants. The small size of many remaining populations also makes them susceptible to stochastic events, such as loss of genetic diversity, parasitic wasps or intensive fires. The Midewin population is one of a few known to exist in northeastern Illinois.

With mitigation measures, Alternative 1 is likely to benefit this species by improving habitat and stimulating growth, flowering, and recruitment of its food plant, rattlesnake-master. This expanding population may then become a suitable source from which to restore the moth to other prairie restorations both on Midewin and elsewhere in the Prairie Parklands. Under the no-action alternative, these benefits will not occur.

Henslow's sparrow occurs widely as a breeding bird throughout the midwestern and northeastern USA, but has declined because of the loss of suitable grassland habitat, including tallgrass prairie. Within Illinois (and the Prairie Parklands), the largest concentration of breeding birds occurs at Goose Lake Prairie State Park, but the breeding population at Midewin is increasing, probably augmented by colonists from Goose Lake Prairie.

Under Alternative 1, prairie habitat for Henslow's sparrow at Midewin will continue to improve, but not all habitat will be suitable for this species in a given year because of burning rotations. However, when mitigation measures are followed, Midewin will continue to contribute to the population growth of this species within the Prairie Parklands, possibly serving as a source for

colonists as other restoration projects provide suitable habitat. Under the no-action alternative, these benefits will not occur.

Short-eared owls have been known to nest elsewhere in the Prairie Parklands and in Illinois, but on Midewin are known only as migrant and winter visitors. Declines in the Midwest are largely the result of habitat loss.

Under Alternative 1, some areas on Midewin will become temporarily unsuitable for nesting by the species, but the proposed action should provide for long-term habitat improvement. This improvement in habitat could lead to eventual nesting by short-eared owls on Midewin, which will contribute to local breeding populations. Mitigation measures should prevent loss of nests to prescribed burns conducted in spring. Under the no-action alternative, there will be no temporary loss of nesting habitat, nor any possibility of nest mortality from prescribed burning. However, other benefits (long-term habitat improvement) will not occur.

The **northern harrier** has been known to nest at Midewin sporadically and is a regular migrant and winter resident. Habitat loss has been the major cause of decline in nesting within the Midwest, although other factors, including persistent pesticides and nest disturbance (by humans and mammalian predators), may have also contributed to this decline.

Under Alternative 1, some areas on Midewin will become temporarily unsuitable for nesting by the species, but the proposed action should provide for long-term habitat improvement. Mitigation measures will prevent loss of harrier nests to prescribed burns conducted in spring. The addition of tracts with existing grassland areas at Midewin National Tallgrass Prairie will increase preferred habitat for northern harriers. These increases may make Midewin more favorable for northern harriers and nesting may become more regular. This could result in modest increases in breeding northern harriers in the Prairie Parklands. Under the no-action alternative, there will not be temporary losses in potential breeding habitat, nor will there be any risk of nest mortality from prescribed burns. However, without long-term habitat improvement, other benefits to local populations of northern harrier may not occur.

The **upland sandpiper** is known to nest sporadically at some locations in the Prairie Parklands, but only regularly at Midewin National Tallgrass Prairie. Midewin has the most stable and largest breeding population of upland sandpipers in Illinois. The decline of this species in Illinois (and the Midwest) is almost entirely the result of habitat loss and changing land management practices, which have resulted in the loss of extensive natural (upland prairie) and agricultural (pastures) grasslands.

The action alternative will create some marginal habitat for upland sandpipers through restoration of existing prairie remnants. Cool-season grasslands (Sites 6, 8, and 9) will also be enhanced by removal of duff and top-killing of woody plants. With nearby grazed short-grass areas (preferred habitat), these burned areas will become more important in maintaining a stable population of upland sandpiper at Midewin. Under the no-action alternative, these benefits will not occur, but other management activities at Sites 6, 8, and 9 will improve or create habitat for upland sandpipers (*USDA Forest Service 2001*).

Bobolinks are known to nest at Midewin National Tallgrass Prairie on a regular basis and Midewin probably has one of the largest populations in the state of Illinois. Their decline in Illinois and the Midwest is associated with changes in farming practices, resulting in the loss of extensive hayfields and pastures. These agricultural grasslands served as surrogates for this species' original prairie habitat.

The action alternative will improve habitat for bobolinks through restoration of existing prairie remnants and enhancement of cool-season grass plantings. These improvements will occur through removal of duff and top-killing of woody plants. These burned areas will become more important in maintaining a stable population of bobolinks at Midewin, and populations may serve as sources to recolonize other restored grasslands in the region. Under the no-action alternative, some of these benefits will not occur, but other management activities at Sites 6, 8, and 9 will improve or create some habitat for bobolinks (*USDA Forest Service 2001*).

Migrant loggerhead shrikes nest at Midewin on a regular basis and are known to use the project areas for foraging. Nesting has occurred within and adjacent to certain project areas (Sites 1, 2, 3, and 6). Midewin supports the largest breeding population of migrant loggerhead shrikes in northern Illinois (and possibly the upper Midwest); nesting is sporadic elsewhere in the Prairie Parklands.

Alternative 1 will create some foraging habitat for shrikes through restoration of existing prairie remnants and enhancement of cool-season grasslands, primarily through removal of duff. Considered with nearby grazed short-grass areas (preferred foraging habitat), burned areas will become more important in maintaining a stable population of migrant loggerhead shrike at Midewin and the Prairie Parklands. Prescribed burning may result in the loss of some nesting habitat through top-killing of thorny shrubs and trees. However, many of these top-killed woody plants will resprout, creating dense, thorny, multi-stemmed shrubs that are preferred nesting sites. The no-action alternative will not remove duff and improve foraging conditions for this species, but other management activities at Sites 6, 8, and 9 will provide some benefits for shrikes (*USDA Forest Service 2001*). The no-action alternative will also not result in any temporary loss of nesting sites for loggerhead shrikes.

A small number of **Blanding's turtles** are known to occur along the western boundary of Midewin. These animals probably belong to a larger population present on adjacent Army, state of Illinois, and private lands. This species has declined greatly because of habitat loss; increased predation, woody encroachment of remaining habitat, road mortality, and collecting for pets have also contributed to the decline of this reptile.

Under Alternative 1, there will be some habitat improvement for this species, through removal of duff, top-killing of shrubs, and exposure of potential nesting sites. However, mitigation measures must be followed to prevent turtle mortality from fires, although turtle mortality from prescribed fires is unlikely. Habitat improvement on Midewin may improve the prospects for this population. The no-action alternative will not provide these benefits, although there will be no risk to Blanding's turtle from prescribed fire.

The **least bittern** has been known to breed in marshes at Midewin, probably in small numbers. Populations in Will County and the surrounding area are probably small, but their secretiveness makes population estimates difficult.

Prescribed burning (Alternative 1) is expected to improve the quality of available habitat at Midewin, primarily by removing encroaching trees. As mitigation measures are followed, there should not be significant losses of nesting habitat for least bitterns. Under the no-action alternative, there should be no adverse effects on nesting habitat, but the woody encroachment of marshes will probably continue.

King rails have been known to breed in wet prairies, sedge meadows, and marshes at Midewin, but in small numbers. Populations in Will County and the surrounding area (especially Goose Lake Prairie State Park) are probably small, but their secretiveness makes population estimates difficult.

Prescribed burning (Alternative 1) is expected to improve the quality of available habitat at Midewin, primarily by removing encroaching woody plants. Under the no-action alternative, these benefits will not occur.

At Midewin, the **plains leopard frog** is near or at the northern margin of its range; throughout its range, the major causes of declines are habitat destruction and wetland modification. Climatic factors and competition from other amphibian species may contribute to this species' scarcity at Midewin.

Under Alternative 1, there will be some habitat improvement for this frog species through top-killing of shrubs encroaching on its foraging and breeding habitat. Mitigation measures will prevent mortality from fires. Habitat improvement on Midewin may improve the prospects for this population. The no-action alternative will not provide these benefits.

State-listed species

Small white lady's-slipper has declined throughout the upper Midwest as prairie habitat has been converted to agricultural land; many remaining populations are threatened by hydrological modification of remaining wet prairies, fire suppression, invasion of habitat by woody plants and exotic herbaceous plants, loss of pollinators, collecting, and conversion of remaining habitat to residential, industrial, or commercial uses. The few plants on Midewin are part of a larger population that occurs on adjacent land.

Under Alternative 1, management will improve existing habitat on Midewin. Previously undiscovered vegetative individuals may begin flowering, or additional individuals may colonize onto Midewin after management. In either case, there will be an increase in the population and occupied habitat, which will improve the long-term prospects for this population, one of more than twenty known from northern Illinois. Under the no-action alternative, these benefits will not occur. The population on adjacent land would not have additional habitat expansion, and would remain more vulnerable to stochastic events.

The **common moorhen** nests at Midewin on a regular basis in small numbers. The Blodgett Road Marsh (Site 2) is regularly used for breeding, and nesting has been recorded from the Doyle Lake area (Site 9). This wetland bird breeds in small numbers elsewhere within Will County, but there are larger breeding populations scattered in northern Illinois.

Alternative 1 will not increase habitat for the common moorhen, but will maintain and perhaps improve existing habitat. There may be some temporary loss of nesting habitat because of prescribed fires, but this should not be significant with implementation of mitigation measures.

Pied-billed grebes nest at Midewin on a regular basis in small numbers. The Blodgett Road Marsh (Site 2) and Doyle Lake area (Site 9) are regularly used for breeding. This wetland bird breeds in small numbers elsewhere within Will County, but the species breeds in scattered localities throughout northeastern Illinois. Declines in grebe populations are largely the result of habitat destruction.

Alternative 1 will not increase habitat for pied-billed grebes, but will maintain and perhaps improve existing habitat. There may be some temporary loss of nesting habitat because of prescribed fires, but this should not be significant with implementation of the mitigation measures.

Summary

Under Alternative 1, prescribed fire will have a positive impact on all federal-endangered species, Regional Forester's sensitive species, and state-listed species occurring in or adjacent to the areas proposed for prescribed burning. There may be some temporary adverse effects that should not have long-term adverse consequences for these populations with implementation of the mitigation measures. The proposed action may enhance the viability of some species within the region by improving and expanding existing habitat. The no-action alternative could impact some of these species in a negative manner through habitat succession and degradation.

In summary, the cumulative effects of all past, present and reasonably foreseeable actions including prescribed fire as proposed here, will not cause significant adverse impacts to federally-listed Threatened or Endangered Species, Regional Forester Sensitive Species, or state-listed species. The US Fish and Wildlife Service concurred with these findings for Federally-listed species, (February 6, 2001, project file letter).

Recreation and Visual Quality

Affected Environment

At the present time there is no recreation access at any time throughout the year at Sites 1, 2, 7, 8, 9. Sites 3, 4, 5, and 10 have been open to deer hunting from October 1st through mid-January during the past three years. To date, no other recreation opportunities have been available in these areas. However, during the past two years, Sites 3, 4, 6, 9, and 10 have served as a portion of the route used for public planning tours and the areas have been visible to the public

participating in these tours. Midewin also has two interim hiking trails, but neither traverses or is adjacent to any of the areas proposed for management with prescribed fire.

Final Recreation Opportunity Spectrum (ROS) classifications will be designated through the Land and Resource Management Plan planning process. Proposed ROS for Sites 1, 2, 3, 4, 5, 6, 7, 9, and 10 is “*Roaded Natural*” (areas with moderate levels of development and a noticeably modified environment within a natural-appearing landscape), and for Site 8 the proposed ROS is “*Semi-Primitive*” (areas with predominantly natural appearing landscape with less development). Prescribed fire is considered by the Forest Service as a common natural resource management activity conducted at sites with these classifications. The Proposed Plan also designates Proposed Scenic Integrity for Midewin. Sites 1 and 5, are classified as Low Scenic Integrity areas; and Sites 2, 3, 4, 6, 7, 8, 9, and 10 as High. Proposed objectives in the Plan are to enhance the scenic integrity in these areas through ecosystem management. Prescribed fire will be an effective tool to meet the Proposed Plan objectives for Scenic Integrity.

Environmental Consequences

Alternative 1 – Alternative 1 will have no direct, indirect, short-term or adverse effects on existing or future recreation opportunities on Sites 1, 2, 7, and 8. No recreation opportunities currently exist and the action proposed will not preclude future recreation opportunities in the area. The restoration of this area through prescribed burning will provide long-term and beneficial effects by providing a unique interpretive opportunity. Additional long-term effects of the proposed action will improve visual quality by restoring the area to a more natural-appearing environment by reducing the amount of non-native species.

The direct, short-term and adverse effects of Alternative 1 on Sites 3, 4, 5, and 10 will be the displacement of some deer hunters who have hunted in this area over the past three years. The timing of the prescribed burns may temporarily prevent hunting in these areas. Periodic prescribed burning may also have a direct and indirect effect on the quality of the hunting experience, primarily by reducing the amount of woody vegetation. Deer hunting opportunities may be detrimentally affected in both the short and long-term as a result of loss of some cover for both deer and hunters.

Interim hiking trail opportunities are available outside of the perimeter fence on the west side of Midewin. Use of these trails is unlikely to be affected by Alternative 1. The activities proposed would not have any effect on or preclude any future recreation opportunities in this area.

Short-term effects of the proposed action will be adverse impacts on the visual quality of the area as a result of burning. However, the effect will be minimal as the area is not presently open to the public. Long-term effects of the proposed actions will enhance visual quality by restoring the area to a more natural-appearing environment by reducing the number of non-native plant species.

Alternative 2 - (No Action)

Alternative 2 will have no impact on any existing recreation as no recreation opportunities currently exist, and will not preclude any future recreation opportunities on Sites 1, 2, 6, 7, 8, and

9. Deer hunting will continue in Sites 3, 4, 5, and 10. The visual quality will not be improved to a more natural-appearing landscape.

Cumulative Effects

The cumulative effects of all past, present and reasonably foreseeable future actions related to prescribed fire will not significantly affect the provision of future recreation opportunities or the quality of the visual resources in these areas.

Heritage Resources

Affected Environment

The types of archaeological sites likely to be present within these project areas include Euro-American farmsteads and related features such as roads, fence lines, and discard areas dating from the mid-nineteenth to the mid-twentieth centuries, as well as prehistoric Native American sites dating from as early as 12,000 to 1000 BC to the 1830's. There is also the possibility of sites or features associated with the WW II-era Kankakee Ordnance Works, or the later Joliet Arsenal being located in the project areas. Will County has traditionally been oriented toward agriculture production. Continuous cultivation has occurred since 1880.

Environmental Consequences

Alternative 1 – Following surveys and identification of heritage resources within the project areas, all heritage sites related to prescribed burning will be avoided during prescribed burning activities. Monitoring and protection of heritage sites will result in no effect on these resources.

Alternative 2 - (No Action). There will be no effect on heritage resources.

Cumulative Effects

Past, present and reasonably foreseeable future actions related to prescribed burning at Midewin are not expected to have significant effects on heritage resources within or near the project areas.

Socio-Economics

Affected Environment

Will County is part of Illinois' six-county Chicago metropolitan area. Will County is the second largest of the six counties and the fastest growing. The 1990 census revealed that 83.7 percent of Will County's population is urban and 16.3 percent is rural. Twenty-five percent of revenues generated at Midewin are returned to the state and county for local roads and schools. Midewin is adjacent to Exxon Mobil, Deer Run Industrial Park, Abraham Lincoln National Cemetery, Des

Plaines Conservation Area, and private lands. Midewin is also a site for on-going research projects by 20 research scientists or graduate students.

Environmental Consequences

Alternative 1 – Implementation of the prescribed burns is not expected to have any effect on the socio-economic conditions of the communities or neighborhoods adjacent to Midewin or to greater Will County. It is not expected that prescribed burning will curtail or impact current research projects at Midewin. It is estimated that it will cost approximately \$20-\$40 per acre to conduct prescribed burns at these 10 sites.

Alternative 2 – The No Action Alternative would have no effect to the socio-economic conditions.

Environmental Justice

Executive Order 12898 (February 11, 1994) directs federal agencies to focus attention, identify and address as appropriate, disproportionately high and adverse human health human and environmental conditions in minority communities and low-income communities. The principle behind environmental justice is simple: people should not suffer disproportionately because of their ethnicity or income level.

The proposed action and the no action alternative will affect Forest Service lands on the Midewin National Tallgrass Prairie in Will County, Illinois. The area is fairly affluent: Will County ranks 10th in the Illinois in per capita income, with a poverty rate of 6%, where statewide the rate is 12%. Approximately 11% of the total population in Will County is minority, compared to 17.8% statewide. Since the early 1970's the economy of the area has steadily changed from a manufacturing base to a more service-oriented economy. There is no evidence that this proposal would disproportionately affect any minority or low-income communities.

Compliance with Applicable Laws and Plans

Illinois Land Conservation Act –

Section 2914 (b) (2) Initial Management Activities, authorizes management activities to further the four purposes of Midewin prior to completion of a Land and Resource Management Plan “in order to expedite the administration and public use of the MNTP”. The purpose of this project, “to control encroachment of woody vegetation into existing native prairie habitat, to slow the spread of exotic and weedy plant species, and to stimulate the restoration and growth of native and non-native (but desired) prairie vegetation at Midewin”, is aligned with purpose (1): “To manage the land and water resources... in a manner that will conserve and enhance the native

populations and habitats of fish, wildlife, and plants”, and with the intent of Midewin’s enabling legislation.

Midewin Land and Resource Management Plan (Plan) – While the final Plan is still being determined, the action alternative considered in this environmental assessment complies with the planning and decision criteria and proposed goals, objectives, and standards and guidelines of the Proposed Plan. The proposed prescribed fire project also complies with the four criteria for interim projects outlined in the 1998 Notice of Intent:

- “*The environmental conditions of the sites meet the standards necessary for the activity*”. None of the 10 sites proposed for prescribed burning are known to be contaminated, with the exception of arsenic in the soil along the fenceline at Sites 6 and 8, which is not expected to pose any threat or have any impact on project activities.
- “*The activity will not interfere with Army cleanup operations*”. (The prescribed burning is not expected to interfere with Army cleanup operations, and burning operations will be coordinated with the local Army office.
- “*The activity does not represent an irretrievable commitment of resources (i.e., it can be undone with relative ease and minimal finances unless it is necessary for safety or resource protection purposes)*”. While we cannot retrieve the financial and fuel resources used after a prescribed burn is complete, the prescribed burning activities are necessary for resource protection purposes, i.e., to control encroachment of woody vegetation and to slow the spread of exotic and weedy plant species.
- “*The activity represents a valid, existing right as provided by legislation, e.g. Agricultural leases*”. This criterion is not applicable to this project.

The National Historic Preservation Act of 1966, National Environmental Policy Act of 1969, the Archaeological Resources Protection Act of 1979, and E.O. 11593 of 1971 mandate federal agencies to take heritage resources into consideration when planning land management activities. See Heritage Resources discussion above.

Clean Air Act - Illinois EPA burning permit: A burning permit will be obtained from Illinois EPA prior to burning.

6. MONITORING

Monitoring will be conducted to evaluate the effectiveness of the prescribed fire projects by primarily using permanent photo points updated annually along with random sampling inventories of the vegetation (broad-scale observation of different plots and disturbed grounds).

Vegetation monitoring will be performed periodically following project implementation and will include:

1. Visual inspection of sites for surface flow and soil erosion.
2. Photo inspection and vegetation inventory.

7. LIST OF PREPARERS and CONSULTATION WITH OTHERS

Interdisciplinary Team

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Consultation with Others

Bill Glass, Heritage Biologist, Illinois Department of Natural Resources

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Appendix A:

Special Status Species on Midewin National Tallgrass Prairie, including Federal-listed, Regional Forester's Sensitive, and State-listed Plant and Animal Species

**Table 1. Proposed Prescribed Burning on 10 Sites
Summary Table for Special Status Species (1 of 2)**

Scientific Name	Common Name	Status ¹	Species Present?	Habitat Present?
Plants:				
<i>Carex crawei</i>	Crawe's Sedge	RFSS	Yes	Yes
<i>Cirsium hillii</i>	Hill's Thistle	RFSS, ST	No	Yes
<i>Cypripedium candidum</i>	Small White Lady's Slipper	SE	Yes	Yes
<i>Dalea foliosa</i> (= <i>Petalostamen foliosum</i>)	Leafy Prairie-Clover	FE, SE	Yes	Yes
<i>Hydrastis canadensis</i>	Goldenseal	RFSS	No	No
<i>Isoetes butlerii</i>	Butler's Quillwort	RFSS, SE	Yes	Yes
<i>Malvastrum hispidum</i> (= <i>Sphaeralcea angusta</i>)	False Mallow	RFSS, SE	Yes	Yes
<i>Minuartia patula</i> (= <i>Arenaria patula</i>)	Pitcher's Sandwort	RFSS, ST	Yes	Yes
<i>Napaea dioica</i>	Glade Mallow	RFSS	Yes	Yes
<i>Panax quinquefolius</i>	American Ginseng	RFSS	No	No
<i>Platanthera leucophaea</i> (= <i>Habenaria leucophaea</i>)	Eastern Prairie White-fringed Orchid	FT, SE	No	Yes
<i>Rudbeckia fulgida</i> var. <i>sullivantii</i>	Sullivant's Coneflower	RFSS	Yes	Yes
<i>Tomanthera auriculata</i> (= <i>Agalinis auriculata</i>)	Earleaf False-Foxglove	RFSS, ST	Yes	Yes
<i>Valeriana edulis</i> var. <i>ciliata</i>	Hairy Valerian	RFSS	Yes	Yes
Animals:				
<i>Aflexia rubranura</i>	Red-veined Prairie Leafhopper	RFSS, ST	Yes	Yes
<i>Ammodramus henslowii</i>	Henslow's Sparrow	RFSS, SE	Yes	Yes
<i>Asio flammeus</i>	Short-eared Owl	RFSS, SE	No	Yes
<i>Bartramia longicauda</i>	Upland Sandpiper	RFSS, SE	Yes	Yes
<i>Circus cyaneus</i>	Northern Harrier	RFSS, SE	Yes	Yes
<i>Dendroica cerulea</i>	Cerulean Warbler	RFSS, SW	No	No
<i>Dolichonyx oryzivora</i>	Bobolink	RFSS, SW	Yes	Yes
<i>Emydoidea blandingii</i>	Blanding's Turtle	RFSS, ST	Yes	Yes
<i>Gallinula chloropus</i>	Common Moorhen	ST	Yes	Yes
<i>Haliaeetus leucocephalus</i>	Bald Eagle	FT, ST	No	No
<i>Ixobrychus exilis</i>	Least Bittern	RFSS, ST	Yes	Yes
<i>Lanius ludovicianus migrans</i>	Migrant Loggerhead Shrike	RFSS, ST	Yes	Yes
<i>Papaipema beeriana</i>	Blazing-star Stem-borer (moth)	RFSS	Yes	Yes
<i>Papaipema eryngii</i>	Rattlesnake-master Stem-borer (moth)	RFSS, SE	Yes	Yes
<i>Podiceps podilymbus</i>	Pied-billed Grebe	ST	Yes	Yes
<i>Rallus elegans</i>	King Rail	RFSS, ST	Yes	Yes

¹ FE = Federal Endangered species; FT = Federal Threatened species; RFSS = Regional Forester's Sensitive species; SE = Endangered by Illinois Endangered Species Protection Board (1998); ST = Threatened by Illinois Endangered Species Protection Board (1998); SW = Watch List by Illinois Endangered Species Protection Board (1995)

**Table 1. Proposed Prescribed Burning on 10 Sites
Summary Table for Special Status Species (2 of 2)**

Scientific Name	Common Name	Status¹	Species Present?	Habitat Present?
Animals (continued):				
<i>Rana blairi</i>	Plains Leopard Frog	RFSS	No	Yes
<i>Venustaconcha ellipsiformis</i>	Ellipse (mussel)	RFSS, SW	No	No

¹ FE = Federal Endangered species; FT = Federal Threatened species; RFSS = Regional Forester's Sensitive species; SE = Endangered by Illinois Endangered Species Protection Board (1998); ST = Threatened by Illinois Endangered Species Protection Board (1998); SW = Watch List by Illinois Endangered Species Protection Board (1995)

