Draft Mitigation Management and Monitoring Plan

For

Illinois Department of Transportation

Arsenal Road/Interstate 55 Interchange

Compensatory Mitigation Project Area

Grant Creek North

USDA Forest Service

Midewin National Tallgrass Prairie

June 28, 2010

Revised July 9, 2010

Revised July 30, 2010

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Mitigation Goals and Objectives

Introduction and Background

The USDA Forest Service (FS) is proposing to restore or to re-establish former wetlands on approximately 155 acres at Midewin National Tallgrass Prairie in Will County. (For clarification the word "restore" will be used throughout this document and specifically means, "re-establishment that results in rebuilding a former aquatic resource and results in a gain of aquatic resource area and functions").

The North Grant Creek Project area is located along the western boundary of Midewin National Tallgrass Prairie, adjacent to Illinois Department of Natural Resources (IDNR) land. The project area is located primarily in the northern ¼ of section 3, T33N, R9E, (see Figure 1). The area is partially bounded by two former county roads; Blodgett Road to the north and West Patrol Road to the east. The southern boundary is Grant Creek and the western boundary is the ½ section line.

Determination of Credits

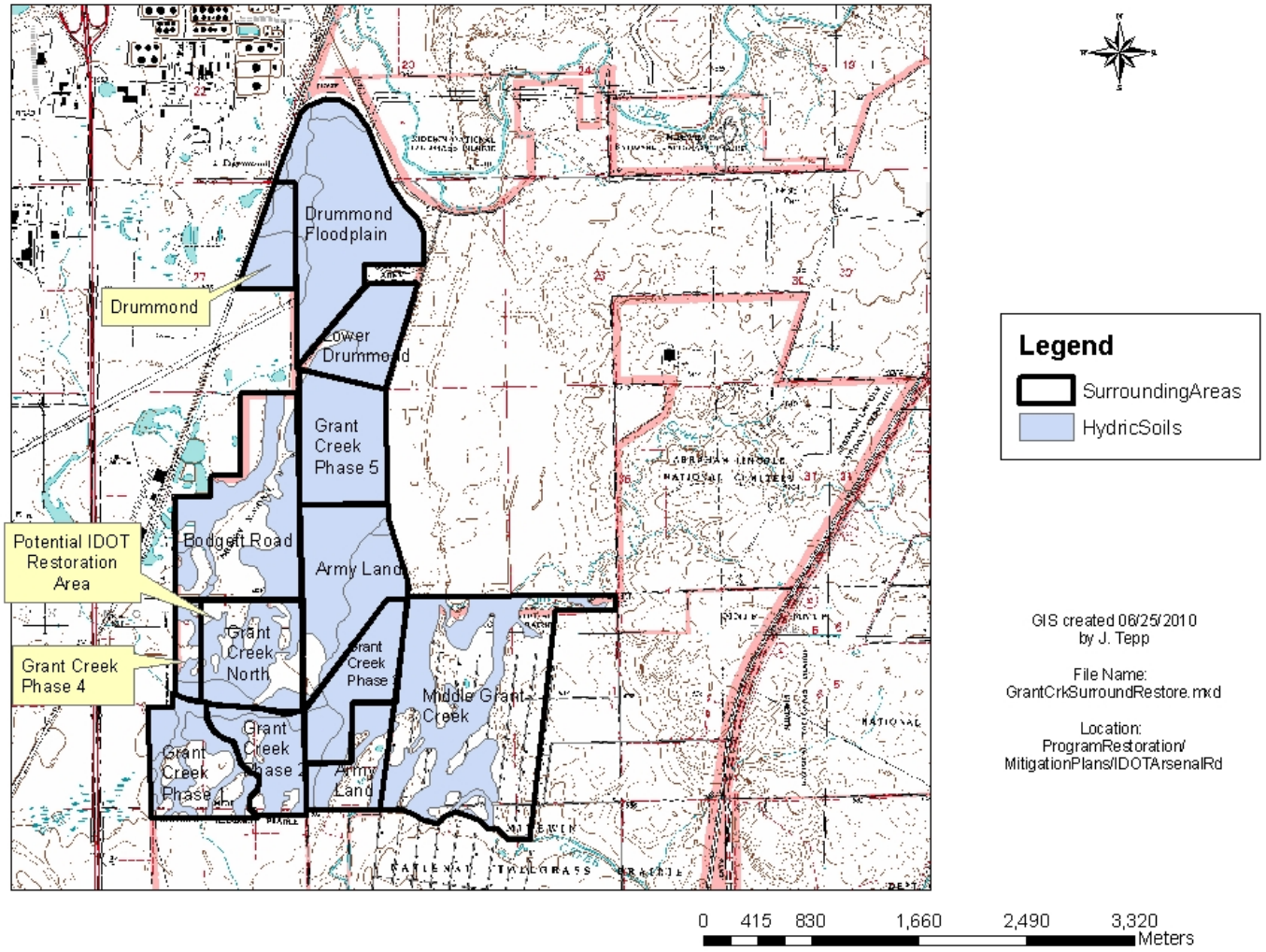
This type of wetland restoration will meet the Illinois Department of Transportation (IDOT) wetland mitigation requirements for the new I-55 interchange at Arsenal Road in Will County. IDOT is required to restore 14.75 acres of wetlands for this road project.

Midewin will restore sedge meadow and wet prairie in the project area by restoring the hydrology and planting native species. Mitigation credits for this project are:

Planned Restoration Goal	Acres	Credit Ratio	Mitigation Credit Acres
Restored Sedge Meadow	7	1:1	7
Restored Wet Prairie	8	1:1	8

In addition to these acres of mitigation credit acres, Midewin anticipates restoring an additional 4 acres of sedge meadow and 16 acres of wet prairie, while enhancing the 10.5 acres of existing wetlands and restoring 111.5 acres of native upland prairie within the project site.

Figure 1. IDOT Mitigation Area (Grant Creek North)
in relation to surrounding existing and potential restoration areas.



Goals and Objectives

The geographic area of interest is the 20,000 acre Midewin National Tallgrass Prairie. A primary goal for Midewin in the Prairie Land and Resource Management Plan is to restore the land to a more natural state for both vegetation and aquatic resources. This project area was identified in the Prairie Plan for restoration to native vegetation, primarily wetlands and prairie. This tract is also identified to become unfragmented grassland bird habitat. Completion of this wetland mitigation to restore or re-establish former wetlands and enhance existing wetlands will help with the overall restoration goal for Midewin.

Specific project goals and objectives

- Restore (re-establish) the former hydrology of the project area to the extent possible, by disabling approximately 12,697 feet of field drain tiles.
- A minimum of 15 acres of wetlands will be restored (re-established) within the project area to meet IDOT's mitigation requirements.
- Additional wetland restoration is expected from the planned management activities which may result in another 18 acres.
- Wetland enhancement of thirteen (13) existing wetlands totaling 10.5 acres through planned management activities.
- Restore 111.5 acres of upland to native prairie vegetation to provide a buffer to the wetlands.
- Restore native plants to appropriate locations and create a high diversity natural landscape.
- Link the project area to adjacent prairie and wetland restorations on Midewin National Tallgrass Prairie.
- Provide a native habitat structure that may provide future habitat for the federally threatened Eastern prairie fringed orchid (*Plantanthera leucophaea*).
- Provide habitat for state-listed and Regional Forester Sensitive Species.
- Provide habitat for wetland and grassland birds, along with other wildlife.
- Control the native and non-native invasive species within the project area.

Mitigation Site Baseline Information

Information on the compensatory mitigation site on National Forest System land at Grant Creek North is provided here. IDOT's application for the 404 permit has a description of the baseline information of the impact site near Arsenal Road and I-55 located approximately 2 miles north of the mitigation site.

At the beginning of World War II this tract was in crops, probably divided into three different fields as evidenced by the old fence lines and glacial erratic boulders present in the old fence lines. Remnants of an old farmstead are located on the northern boundary. Field drain tiles had been laid in the soil to drain the land for farming. The Army used the project area for as buffer land between the active ammunition plant area and private land and this tract was leased for cattle grazing. The Forest Service also managed this tract for grassland bird habitat with cattle grazing for the past decade.

Watershed

The 155-acre project location is part of the Grant Creek watershed (NHD 12-digit code 071200040904). This 10,734 acre watershed is currently a mixed land use of federal, state, private industrial, and agriculture. The majority of the watershed has been drained for farming in the past and has been altered by human activity. This project will restore the area to a more natural state and will link to other areas currently undergoing restoration at Midewin.

Grant Creek was listed as a 303(d) impaired water for aquatic use due to unknown cause(s) by Illinois EPA in 2008. The stream was channelized in the past and currently has nearly vertical banks four to five feet in height with no floodplain, except in extreme precipitation events. The restoration of Grant Creek's streambank or floodplain is not included in this mitigation plan.

Wetlands

The wetland delineation conducted by FluidClarity, Ltd in 2010 indicates there are sixteen (16) wetlands in and around the Grant Creek North project area (see Figure 2). Table 1 is a summary of the wetland delineation findings. Yellow highlighted wetlands in the table are either completely or partially out of the proposed Grant Creek North project area for IDOT mitigation. There are 13 existing wetlands totaling 10.5 acres within the Grant Creek North project area. Most of the existing wetlands are small, isolated pockets.

Table 1. Wetland delineation summary for Grant Creek North and Grant Creek Phase 4 project areas. Source: FluidClarity, Ltd. 2010. Grant Creek North & South Drummond Wetland Assessment Report. Oak Park, IL. 19 pp + appendices.

WETLAND	POSSIBLE JURISDICTIONAL STATUS*	SIZE (AC) ONSITE	FQI	NATIVE MEAN C	COMMENTS	DOMINANT VEGETATION	WETLAND TYPE
A	ISOLATED	0.004	3.8	1.4		redtop (*Agrostis alba*), quack grass (*Agropyron repens*), curly dock (*Rumex crispus*), Kentucky blue grass (*Poa pratensis*) and riverbank grape (*Vitis riparia*)	EMERGENT
B	ISOLATED	0.009	7.8	2.4		brown fox sedge (*Carex vulpinoidea*), common water plantain (*Alisma subcordatum*), broad-leaved cattail (*Typha latifolia*) and riverbank grape (*Vitis riparia*)	EMERGENT
C	ISOLATED	0.050	8.7	1.9		red ash (*Fraxinus pennsylvanica*) and hackberry (*Celtis occidentalis*) in the tree stratum; and barnyard grass (*Echinochloa crusgalli*), pinkweed (*Polygonum pensylvanicum*), brown fox sedge (*Carex vulpinoidea*) and water pepper (*Polygonum hydropiper*) in the herbaceous stratum	FORESTED
D	ISOLATED	0.017	7.9	2.5		brown fox sedge (*Carex vulpinoidea*), common fox sedge (*Carex stipata*), wood gray sedge (*Carex grisea*), and redtop (*Agrostis alba*) in the herbaceous stratum and a few cottonwood (*Populus deltoides*) tress nearby	SEDGE MEADOW
E	ISOLATED	0.096	11.3	3.3		brown fox sedge (*Carex vulpinoidea*), Kentucky blue grass (*Poa pratensis*), red bulrush (*Scirpus pendulous*), and crested oval sedge (*Carex cristatella*)	SEDGE MEADOW
F	ISOLATED	0.139	9.5	3.0		marsh spike rush (*Eleocharis smallii*), brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), crested oval sedge (*Carex cristatella*), fog fruit (*Lippia lanceolata*), curly dock (*Rumex crispus*), and hedge bindweed (*Convolvulus sepium*)	SEDGE MEADOW

G	ISOLATED	0.079	10.4	3.3		brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), crested oval sedge (*Carex cristatella*), hedge bindweed (*Convolvulus sepium*), bird's foot trefoil (*Lotus corniculatus*), and tall fescue (*Festuca elatior*)	SEDGE MEADOW
H	JURISDICTIONAL	7.873	19.0	2.9	Likely connected to Grant Creek at south via field tile	marsh spike rush (*Eleocharis smallii*), brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), soft stemmed bulrush (*Scirpus validus creber*), Dudley's rush (*Juncus dudleyi*), crested oval sedge (*Carex cristatella*), common ragweed (*Ambrosia artemisiifolia elatior*), curly dock (*Rumex crispus*), squirrel-tail grass (*Hordeum jubatum*), horse nettle (*Solanum carolinense*) and quack grass (*Agropyron repens*)	SEDGE MEADOW/ EMERGENT
I	ISOLATED	0.949	13.6	3.3		brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), spreading oval sedge (*Carex normalis*), squirrel-tail grass (*Hordeum jubatum*), and curly dock (*Rumex crispus*)	SEDGE MEADOW
J	ISOLATED	1.215	16.2	2.9		brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), spreading oval sedge (*Carex normalis*), broad-leaved woolly sedge (*Carex pellita*), tall fescue (*Festuca elatior*) and common water horehound (*Lycopus americanus*)	SEDGE MEADOW
K	ISOLATED	0.157	8.2	3.3		brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), crested oval sedge (*Carex cristatella*), red-rooted spike rush (*Eleocharis erythropoda*) and curly dock (*Rumex crispus*)	SEDGE MEADOW
L	ISOLATED	0.393	6.4	2.4		brown fox sedge (*Carex vulpinoidea*), water pepper (*Polygonum hydropiper*), common ragweed (*Ambrosia artemisiifolia elatior*) and curly dock (*Rumex crispus*)	EMERGENT
M	ISOLATED	0.478	8.0	2.7		marsh spike rush (*Eleocharis smallii*), brown fox sedge (*Carex vulpinoidea*), crested oval sedge (*Carex cristatella*),	SEDGE MEADOW

						common ragweed (*Ambrosia artemisiifolia elatior*), curly dock (*Rumex crispus*), and blue vervain (*Verbena hastata*)	
N	ISOLATED	1.547	14.2	3.3		marsh spike rush (*Eleocharis smallii*), brown fox sedge (*Carex vulpinoidea*), red bulrush (*Scirpus pendulous*), and blue vervain (*Verbena hastata*)	SEDGE MEADOW
O	ISOLATED	0.041	11.7	3.7	High Quality	brown fox sedge (*Carex vulpinoidea*), marsh spike rush (*Eleocharis smallii*), wool grass (*Scirpus cyperinus*), and blue vervain (*Verbena hastata*)	SEDGE MEADOW
P	JURISDICTIONAL	creek	16.0	3.1	Grant Creek	cottonwood (*Populus deltoides*) and box elder (*Acer negundo*) in the tree stratum; and reed canary grass (*Phalaris arundinacea*), clearweed (*Pilea pumila*), wild golden glow (*Rudbeckia laciniata*), poison ivy (*Rhus radicans*), wood nettle (*Laportea canadensis*) and wingstem (*Actinomeris alternifolia*) in the herbaceous stratum	GRANT CREEK/FORESTED

***** The jurisdictional status indicated in this Table is the opinion of FCL and must be confirmed by the USACE.

Vegetation

Currently the project area is dominated by native and non-native invasive plant species. The north and south boundaries along with the old fence lines consist of a mix of native invasive trees species such as green ash *Fraxinus pennsylvanica*, cottonwood *Populus deltoides* and hawthorn *Crataegus sp.* and non-native trees such as osage orange *Maclura pomifera* and non-native shrubs such as bush honeysuckle *Lonicera sp.* and Autumn olive *Elaeagnus umbellata*. The open areas are dominated by such Eurasian plant species, smooth brome *Bromus inermis*, Kentucky blue grass *Poa pratensis*, orchard grass *Dactylis glomerata*, Clover species *Trifolium sp*., bird's foot trefoil *Lotus corniculatus, and sweet clover Melilotus sp.*

Soils

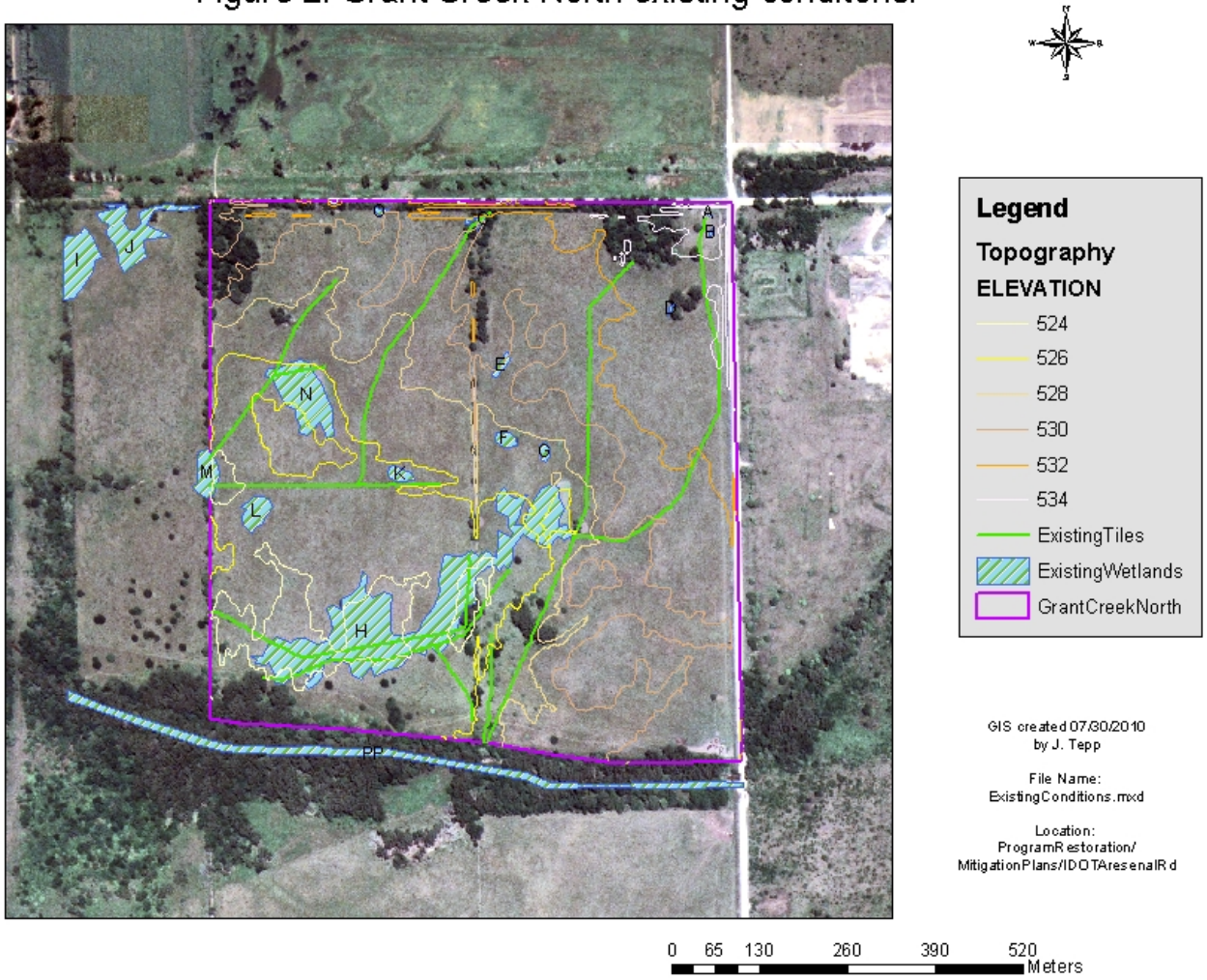
NRCS Web Soil Survey accessed 6/22/2010 indicates the project area is composed of the following soil types in Table 2 (acreage difference due to manual input of Area of Interest):

Table 2. Soil types in Grant Creek North project area.

Map Unit Symbol	Map Unit Name	Approx. Acres	Hydric/Non-Hydric
314A	Joliet Silt Loam, 0-2 percent slopes	77	Hydric
315A	Channahon Silt Loam, 0-2 percent slopes	33	Non-Hydric
315B	Channahon Silt Loam, 2-4 percent slopes	24	Non-Hydric
317A	Millsdale Silty Clay Loam, 0-2 percent slopes	23	Hydric

Approximately two-thirds of the project area has potential to support existing and restored wetlands. The wetland delineation report show a few small wetland areas are present in soil units classified as not hydric by NRCS mapping, indicating local pockets of hydric soil conditions within the larger soil unit.

Figure 2. Grant Creek North existing conditons.



Mitigation Site Selection and Justification

Site Selection

In the spring of 2009, the US Fish and Wildlife and other agencies considered locating wetland mitigation for IDOT's I-55 Arsenal Road project near the actual IDOT project area, and asked the Forest Service if there was potential for the mitigation on Midewin. The North Grant Creek project area was proposed as a possible site. After joint discussions the agencies agreed that this site on National Forest System lands on Midewin National Tallgrass Prairie can provide the necessary wetland mitigation requirements for the IDOT I-55 Arsenal Road project. IDOT will provide the funding that will be administered by Openlands. The area has been drained and altered from its native state, and restoration of this area will coincide with other ongoing restoration activities on surrounding lands.

Land Ownership

The USDA Forest Service owns and manages the property on Midewin National Tallgrass Prairie that is proposed for this IDOT mitigation.

Context with Surrounding Land

The project area is a part of Midewin National Tallgrass Prairie (MNTP), a large-scale native vegetation restoration. Ultimately Midewin will be approximately 20,000 acres of native vegetation; prairie, wetlands and scattered savanna and woodland. Current restoration activities are primarily taking place on the west side of MNTP (west of Illinois Route 53). Approximately 2,000 acres are currently being restored to native vegetation.

The Grant Creek North project links up to numerous restoration projects ongoing or planned in the Grant Creek/Prairie Creek watersheds, (see Figure 1). Lower Drummond, Blodgett Road, Grant Creek Phase 1, and Middle Grant Creek are in various stages of restoration. The Forest Service is partnering with The Wetlands Initiative to restore Grant Creek Phases 1 and 2. Restoration on Grant Creek Phases 3 and 4 is expected in the next few years. Restoration for the Drummond Floodplain is funded and expected to start soon. The Army land will be transferred to the Forest Service in the near future. Centerpoint Properties (CenterPoint North) has agreed to restore grasslands on this Army tract as mitigation for road impacts on grassland birds. Grant Creek North is an important piece in this large restoration area of 2,286 acres.

Grant Creek Phase 1 restoration is adjacent to the Illinois Department of Natural Resource's Grant Creek Prairie Nature Preserve and Grant Creek Prairie Land and Water Reserve. Grant Creek Prairie Nature Preserve is a high quality prairie with the federally listed Eastern prairie fringed orchid and several Illinois listed plants and animals. Linkage of these areas may allow colonization of these species into the mitigation project area and into other restoration areas at MNTP.

The National Forest Foundation has agreed to assist with funding for restoration of the 2,084 acre South Prairie Creek Outwash Plain restoration area. Approximately 500 acres of this site has already been restored working with partners including The Wetlands Initiative, US Army Corps of Engineers, and

Openlands. An additional 150 acres is planned for restoration work to begin late this summer or early next fall.

SHPO Culture Resource Clearance Letter

Consultation letter has been sent to SHPO and we expect their concurrence by mid August. Existing cultural resources will be avoided during drain tile disablement. The Midewin Archeologist has determined there will be no effect to cultural resources in the project area.

Mitigation Work Plan

Table 3 shows the anticipated work schedule. Some activities may be delayed due to inclement weather or wet soil conditions.

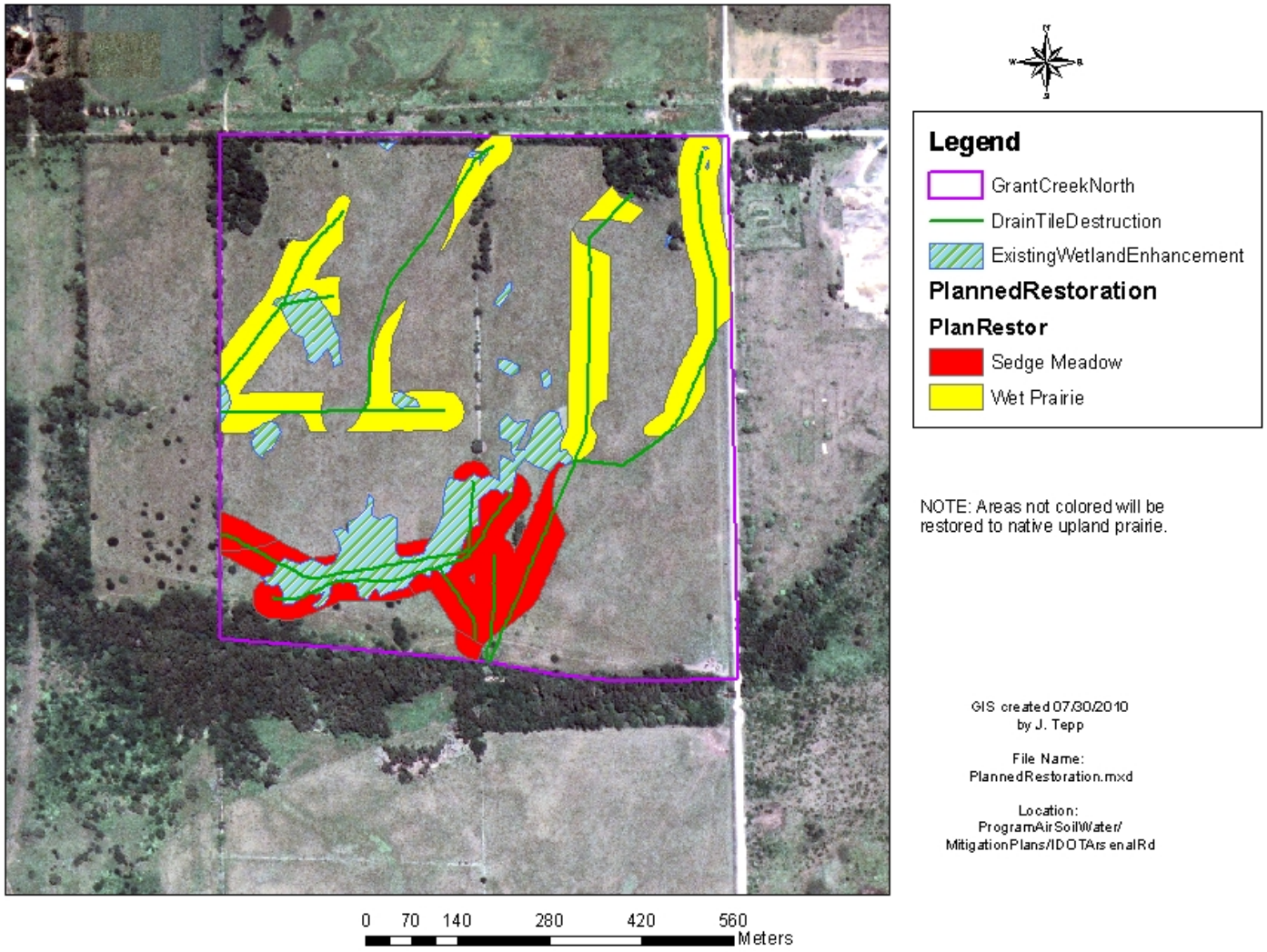
Table 3. Mitigation Work Timeline

Initial Activity	**Completion Date**
NEPA completed for the project	Fall 2010
Tree and shrub removal	Fall 2010
Invasive herbaceous plant control	Fall 2010
Field tile disabling	Fall 2010
Prescribed burn	Fall 2010
Initial Seeding	Winter 2010
Planting	Spring 2011
Spot treatment of invasive species	Spring – Fall 2011
Mowing of weedy herbaceous plant species if needed	Summer 2011
Subsequent Activity (yearly as needed)	**Completion Date**
Prescribed burn	Spring or Fall
Supplemental Seeding (Overseeding)	Winter
Supplemental Planting	Spring
Spot treatment of invasive species	Spring – Fall

Grading Plan

No substantial modifications to the existing topography are planned for this project.

Figure 3. Grant Creek North restoration plan.



Planned Restoration

A field tile inventory was conducted in 2009 to locate existing field tiles within the project area (see Figure 3). The tiles identified in the inventory will be dug up and smashed in place where feasible or disabled in existing wetlands to restore hydrology to the area. The trench will be backfilled with the soil removed in the same sequence, sub-surface soil on the bottom and top soil on the top. Laterals found will also be disabled. Hydrology restoration will take place prior to planting.

Disabling drain tiles will restore hydrology to the area and provide habitat for a mix of wetland and upland native prairie restoration. Controlling invasive species, restoring hydrology, planting, and seeding will restore wetlands including sedge meadow (11 acres), and wet prairie (22 acres), and enhancement of existing wetlands (10.5 acres). The remaining area will be restored to native upland prairie (111.5 acres). See Figure 3 for the location of restoration and enhancement work.

Invasive species control will be achieved with an integrated approach using mechanical means as well as herbicide application. Invasive species control will take place prior to and after seeding/planting.

Prior to seeding, invasive species control will be used to remove the existing Eurasian herbaceous ground cover and to prepare the seedbed for the native plants and seeds. One or more broadcast spraying of glyphosate herbicide will be used. The number of treatments needed will depend on the success and persistence of the invasive species. A large seed bank of the invasive species may require several applications.

The native and non-native woody shrubs and trees will be removed before planting native prairie forbs. Larger trees will be cut down and the stumps ground down to 6 inches below the ground to prevent re-sprouting. Smaller woody vegetation will be cut off near ground level and the cut surface treated with an herbicide such as glyphosate to prevent re-sprouting. The cut woody material will be chipped and removed off from the site.

The timing and number of treatments is critical for effective control of invasive species. Each plant species targeted for herbicide treatment will receive a minimum of two treatments a year. Application will be at the most effective time period for the particular species. It is critical that the application be prior to seed set, to decrease the available invasive species seed bank. Likewise, mowing will be during flowering, but well in advance of seed set. Mowing will also be used if necessary to alleviate the shading of young prairie plants by weedy herbaceous plants. Trees and shrubs will be treated between August 15th and April 1st to avoid impacts to nesting birds. Work will only be done when the ground is dry or frozen to prevent rutting and damage to the soil.

Ideally seeding will be done during the winter months. Seeds will be broadcast on the bare soil and allowed to be buried (planted) to the appropriate depth by the freeze-thaw action. This will also allow for the stratification of those seeds that require a cold treatment. If timing doesn't allow for a winter seeding, the seeds will be planted with a seed drill during the spring months. Native plant plugs will be installed during the spring and early summer months and will be watered as needed. Plugs planted in hydrated wetlands may not need supplemental watering.

Vegetation Restoration

Native vegetation will be restored in appropriate locations based upon existing soil types and anticipated hydrologic conditions. Predicting exact future conditions is difficult, but the plant mixes provide overlap between community types which allows the plants to sort out themselves on a hydrologic continuum. The proposed plant communities to be restored with proposed plant species are listed below.

Sedge Meadow

Sedge meadow vegetation will be established in areas that are expected to be inundated in the spring and where the soil moisture levels are expected to remain high during the entire growing season during normal years. Eleven (11) acres of sedge meadow will be planted. Table 4 lists the species to be planted and the quantities of sedge meadow vegetation proposed. The plant plugs will be supplemented with a seed mix. The proposed plant and seed mix will be supplemented with additional species supplied by the Forest Service during the project period, depending on annual production.

Table 4. Sedge Meadow Wetland Plant Mixes (11 ac.)

Scientific Name	Common Name	Planting Rate (plants/acre)	Seeding Rate (lbs/acre)
Alisma subcordatum	Water Plantain		0.25
Asclepias incarnata	Swamp Milkweed		0.25
Aster novae-angliae	New England Aster		0.125
Aster puniceus	Shining Aster		0.125
Aster simplex	Panicled Aster		0.125
Bidens cernuua	Nodding Bur Marigold		0.125
Cacalia plantaginea	Prairie Indiana Plantain	25	
Calamagrostis canadensis	Bluejoint Grass	100	
Carex buxbaumii			0.063
Carex cristatella		100	
Carex haydenni			0.063
Carex hystericina	Porcupine Sedge	400	
Carex lacustris	Lake Sedge	200	
Carex pellita	Broad-leaved Woolly Sedge	300	0.125
Carex scoparia		100	0.063
Carex stipata		100	
Carex stricta	Tussock Sedge	400	
Carex vulpinoidea	Fox Sedge		0.25
Cicuta maculata	Water Hemlock	100	
Eleocharis erythropoda	Redroot Spikerush		0.063
Eleocharis obtusa	Blunt Spikerush		0.125
Elymus virginicus	Virginia wild Rye		2.0
Eupatorium maculatum	Spotted Joe Pye Weed	200	0.25
Eupatorium perfoliatum	Marsh Boneset	100	
Glyceria striata	Fowl Manna Grass	400	0.25

Helenium autumnale	Marsh Sneezeweed	100	.063
Impatiens capensis	Jewelweed		0.063
Iris virginica	Blue Flag	300	0.5
Juncus dudleyi	Dudley's Rush		0.063
Juncus torreyi	Torrey's Rush		0.063
Leeersia oryzoides	Rice Cut Grass		0.25
Lobelia cardinalis	Cardinal Flower	50	0.063
Lobelia siphilitica	Great Blue Lobelia	200	0.063
Lycopus americanus	Common Water Horehound		0.063
Lythrum alatum	Winged Loosestrife	100	0.063
Mimulus ringens	Monkey Flower		0.063
Penthorum sedoides	Ditch Stonecrop		0.001
Phlox glaberrima	Marsh Phlox	50	
Polygonum amphibium	Water Smartweed		0.063
Polygonum hydropiperiodes	Mild Water Pepper		0.063
Scripus atrovirens	Dark Green Bulrush	200	0.5
Scirpus cyperinus	Woolgrass	100	0.125
Scirpus pendulus		100	0.125
Scirpus pungens	Chairmaker's Rush		0.125
Solidago gigantea	Giant Goldenrod	100	0.063
Teuncrium canadense	American Germander		
Verbena hastata	Blue Vervain	100	
Vernonia fasciculate	Common Ironweed		.125
TOTAL		**3925**	**7.326**

Wet Prairie

Wet prairie vegetation will be established in areas that are expected to be temporarily inundated in the spring and after heavy rainfall, and can remain saturated into early summer during normal years. Twenty-two (22) acres of wet prairie will be planted. Table 5 indicates the proposed species and the quantities of wet prairie vegetation proposed. The plant plugs will be supplemented with a seed mix. The proposed plant and seed mix will be supplemented with additional species supplied by the Forest Service during the project period, depending on annual production.

Table 5. Wet Prairie Wetland Plant Mixes (22 ac.)

Scientific Name	Common Name	Planting Rate (plants/acre)	Seeding Rate (lbs/acre)
Allium canadense	Canada Wild Onion		0.125 (bulbs)
Allium cernuum	Nodding Wild Onion		0.125
Andropogon gerardii	Big Bluestem		.125
Anemone Canadensis	Meadow Anemone	25	
Asclepias incarnata	Swamp Milkweed		0.25
Asclepias sullivantii	Prairie Milkweed	25	.063
Aster novae-angliae	New England Aster		0.125

Aster puniceus	Shining Aster		0.063
Aster simplex	Panicled Aster		0.125
Bidens cernuua	Nodding Bur Marigold		0.063
Cacalia plantaginea	Prairie Indiana Plantain	25	
Calamagrostis canadensis	Bluejoint Grass	300	
Cammassia scilloides	Wild Hyacinth		0.063
Carex buxbaumii			0.063
Carex granularis			0.063
Carex pellita	Broad-leaved Woolly Sedge	300	0.125
Carex scoparia		200	0.063
Carex stipata		100	
Carex vulpinoidea	Fox Sedge		0.25
Cicuta maculata	Water Hemlock	100	
Coreopsis tripteris	Tall Coreposis		0.25
Elymus canadensis	Canada Wild Rye		2.0
Elymus virginicus	Virginia Wild Rye		2.0
Eryngium yuccifolium	Rattlesnake Master		0.5
Eupatorium maculatum	Spotted Joe Pye Weed	200	0.25
Eupatorium perfoliatum	Marsh Boneset	100	
Fragaria virginiana	Wild Strawberry	25	
Gentiana andrewsii	Bottle Gentian	25	
Helenium autumnale	Marsh Sneezeweed	100	.063
Juncus dudleyi	Dudley's Rush		0.063
Juncus torreyi	Torrey's Rush		0.063
Liatris spicata	Marsh Blazing-star	300	.1250
Lobelia siphilitica	Great Blue Lobelia	200	0.063
Lycopus americanus	Common Water Horehound		0.063
Lythrum alatum	Winged Loosestrife	100	0.063
Mimulus ringens	Monkey Flower		0.063
Penstemon digitalis	Foxglove Beard-tongue		0.25
Phlox glaberrima	Marsh Phlox	50	
Physostegia virginiana	Obedient Plant	50	0.125
Pycnanthemum virginianum	Mountain Mint	50	0.125
Ratibida pinnata	Yellow Coneflower		0.125
Rudbeckia hirta	Black-eyed Susan		0.5
Rudbeckia fulgida sullivantii	Sullivant's Coneflower		0.25
Rudbeckia subtomentosa	Sweet Coneflower	50	0.25
Scirpus atrovirens	Dark Green Rush	200	0.125
Scirpus pendulus	Red Bulrush	200	0.063
Silphium integrifolium	Rosinweed		0.125
Silphium laciniatum	Compass Plant		0.125
Silphium terebinthinaceum	Prairie Dock		0.25
Solidago gigantea	Giant Goldenrod	100	0.063
Solidag0 riddellii	Riddell's Goldenrod	50	0.25
Sorghastrum nutans	Indian Grass		0.063

Spartina pectinata	Prairie Cord Grass	300	
Sporobolus heterolepis	Prairie Drop Seed	300	0.5
Stachys palusris	Woundwort		0.063
Teuncrium canadense	American Germander		0.063
Thalictrum dasycarpum	Purple Meadow-rue		0.001
Tradescantia ohiensis	Ohio Spiderwort	50	0.125
Verbena hastata	Blue Vervain	100	
Vernonia fasciculata	Commone Ironweed		.125
Veronicastrum virginicum	Culver's Root	50	
Zizia aurea	Golden Alexanders	50	0.25
TOTAL		**4025**	**11.073**

Wetland Enhancement

Approximately 10.5 acres of wetlands dominated with low quality non-native species occur within the project area. Native species that grow within these wetlands tend to be invasive. The non-native species and invasive native species will be controlled within these areas and emergent native vegetation will be planted. Table 6 indicates the proposed species to be planted and the quantities of emergent vegetation proposed. The plant plugs will be supplemented with a seed mix. The proposed plant and seed mix will be supplemented with additional species supplied by the Forest Service during the project period, depending on annual production.

Table 6. Emergent Wetland (enhancement) Plant Mixes (10.5 ac.)

Scientific Name	Common Name	Planting Rate (plants/acre)	Seeding Rate (lbs/acre)
Alisma subcordatum	Water Plantain		2.0
Asclepias incarnata	Swamp Milkweed		0.25
Bidens cernuua	Nodding Bur Marigold		0.125
Carex comosa	Bristly Sedge	300	
Carex frankii		100	
Carex hystericina	Porcupine Sedge	400	
Carex lacustris	Lake Sedge	100	
Carex lupulina		200	
Carex stipata		100	
Carex stricta	Tussock Sedge	200	
Carex vulpinoidea	Fox Sedge		0.25
Cicuta maculata	Water Hemlock	100	
Eleocharis erythropoda	Redroot Spikerush		0.063
Eleocharis obtusa	Blunt Spikerush		0.125
Eupatorium perfoliatum	Marsh Boneset	100	
Iris virginica	Blue Flag	300	0.5
Juncus effuses	Common Rush?		0.125
Juncus torreyi	Torrey's Rush		0.063

Leeersia oryzoides	Rice Cut Grass		0.5
Lobelia siphilitica	Great Blue Lobelia	200	
Mimulus ringens	Monkey Flower		0.063
Penthorum sedoides	Ditch Stonecrop		0.001
Polygonum amphibium	Water Smartweed		0.063
Polygonum hydropiperiodes	Mild Water Pepper		0.063
Sagitaria latifolia	Common Arrowhead	200	2.0
Scirpus acutus	Hardstem Bulrush	200	
Scripus atrovirens	Dark Green Bulrush	200	0.5
Scirpus cyperinus	Woolgrass	100	0.25
Scirpus fluviatilis	River Bulrush	100	
Scirpus pungens	Chairmaker's Rush		0.125
Sium sauve	Water Parsnip	100	
Sparganium eurycarpum	Common Bur-reed	500	
Verbena hastata	Blue Vervain	100	
TOTAL		**3,600**	**7.066**

Upland Prairie

Upland prairie will be established in the areas that aren't expected to be restored or enhanced as wetlands, approximately 111.5 acres. Table 7 indicates the proposed species to be planted and the quantities of upland prairie vegetation proposed. The plant plugs will be supplemented with a seed mix. The proposed plant and seed mix will be supplemented with additional species provided by the Forest Service during the project period, depending on annual production.

Table 7. Upland Prairie Plant Mixes (111.5 ac.)

Scientific Name	Common Name	Planting Rate (plants/acre)	Seeding Rate (lbs/acre)
Allium canadense	Canada Wild Onion		0.125 (bulbs)
Allium cernuum	Nodding Wild Onion		0.125
Andropogon gerardii	Big Bluestem		.125
Asclepias incarnata	Swamp Milkweed		0.25
Asclepias sullivantii	Prairie Milkweed	25	.063
Aster ericoides	Heath Aster		0.063
Aster novae-angliae	New England Aster		0.125
Aster laevis	Smooth Blue Aster		0.063
Baptisia alba	White Wild Indigo	25	0.125
Baptisia bracteata	Cream Wild Indigo	25	0.125
Cacalia plantaginea	Prairie Indiana Plantain	25	
Carex bicknelli	Bicknell's Sedge	50	.0.25
Carex meadii	Mead's Sedge	25	
Cassia fasciculate	Partridge Pea		0.250

Coreopsis palmate	Prairie Coreposis	25	
Coreopsis tripteris	Tall Coreposis		0.25
Desmodium canadense	Illinois Tick-trefoil	25	
Dodecatheon meadia	Shooting Star	50	0.063
Elymus canadensis	Canada Wild Rye		4.0
Euphorbia corollata	Flowering Spurge	10	
Eryngium yuccifolium	Rattlesnake Master		0.5
Fragaria virginiana	Wild Strawberry	25	
Heliopsis helianthoides	False Sunflower	100	
Gentiana andrewsii	Bottle Gentian	25	
Helenium autumnale	Marsh Sneezeweed	100	.063
Helianthus rigidus	Prairie Sunflower	10	
Heuchera richardsonii	Alumroot	25	0.063
Liatris aspera	Rough Blazing Star	300	.1250
Lespedeza capitata	Round-headed Bush Clover	25	0.60
Monarda fistulosa	Wild Bergamont		0.125
Panicum oligosanthes scribnerianum	Scibner's Panic Grass	10	
Parthenium integrifolium	Wild Quinine	50	0.125
Penstemon digitalis	Foxglove Beard-tongue		0.25
Petalostemum candidum	White Prairie Clover	50	0.125
Petalostemum purpureum	Purple Prairie Clover	50	0.125
Phlox pilosa	Prairie Phlox	50	
Physostegia virginiana	Obedient Plant	25	0.125
Pycnanthemum virginianum	Mountain Mint	50	0.125
Ratibida pinnata	Yellow Coneflower		0.125
Rosa Carolina	Pasture Rose		0.63
Rudbeckia hirta	Black-eyed Susan		0.5
Rudbeckia fulgida sullivantii	Sullivant's Coneflower		0.25
Silphium integrifolium	Rosinweed		0.125
Silphium laciniatum	Compass Plant		0.125
Silphium terebinthinaceum	Prairie Dock		0.25
Solidago juncea	Early Goldenrod	25	0.063
Solidago nemoralis	Grey Goldenrod	50	0.25
Solidago rigida	Stiff Goldenrod		0.063
Sorghastrum nutans	Indian Grass		0.250
Spartina pectinata	Prairie Cord Grass	300	
Sporobolus heterolepis	Prairie Drop Seed	300	0.5
Schizachium scoparius	Little Bluestem	50	2.0
Tradescantia ohiensis	Ohio Spiderwort	50	0.125
Veronicastrum virginicum	Culver's Root	50	
Zizia aurea	Golden Alexanders	50	0.25
TOTAL			

West Side Pedestrian Trail

This pedestrian trail is a mowed path running from the River Road Seed Bed trailhead on River Road north to the Blodgett Road Restoration Area and marsh. This trail passes through the project area. Presently the exact alignment of this trail has not been determined on the ground, but will avoid wetland areas. It can be relocated easily to avoid areas that become wet. The trail will not impact the compensatory wetland mitigation performance standards for this project. Other land uses include occasional deer and turkey hunting by pedestrian hunters during state hunting seasons.

Performance Standards

At the end of the 5-year mitigation and monitoring period, the following vegetation standards will be obtained:

Vegetation Performance Standards

A. A temporary cover crop shall be planted on all slopes immediately upon completion of any earthwork to prevent soil erosion. Soil erosion and sediment control measures shall be in place during all construction work. An erosion control blanket may also be required depending on site conditions and season of planting. Within three (3) months, at least 90% of this area, as measured by aerial coverage, will be vegetated. If the desired long-term slope vegetation is not planted with the temporary crop, it shall then be planted in the first available growing season appropriate for each plant community. All cover crop species shall be non-persistent or native and not allelopathic.

B. Species selected for the planting shall be native to the county where the mitigation site is located (ref. Swink and Wilhelm, Plants of the Chicago Region, 1994), and shall be appropriate for the hydrologic zone to be planted. A minimum number of native perennial species proposed for establishment shall be present within each plant community to meet certification standards, as follows:
    a. **Marsh**- minimum of 15 native perennial species
    b. **Sedge meadow/wet prairie**- minimum of 35 native perennial species
    c. **Wet-Mesic Prairie** (buffer) - minimum of 25 native perennial species

C. At least 50% of the required minimum number of species shall occur at a 10% frequency or greater, within each plant community zone or area. Multiple transects within a given plant community may be combined for this frequency analysis.

D. A native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 shall be achieved in each separate vegetated plant community (e.g. wet prairie, marsh, mesic prairie buffer), and as measured over the entire mitigation site area. Native plant species coefficients of conservatism are designated in Swink, Floyd and Gerould Wilhelm, Plants of the Chicago Region (Indianapolis: Indiana Academy of Science, 4th edition, 1994).

E. The native floristic quality index value (native FQI) shall be greater than or equal to 20 in each separate vegetated community zone and as measured over the entire mitigation site. The floristic quality assessment method is described in Swink and Wilhelm, Plants of the Chicago Region.

i. Steps D and E are evaluated based upon the overall plant community inventories as well as transect summaries. If a portion of the site has achieved compliance with the performance standards, the standard shall be maintained in that portion until the final compliance sign off for the mitigation site.

F. No area over the entire mitigation site greater than 1 square meter shall be devoid of vegetation, as measured by aerial coverage, unless specified on approved mitigation plans. This standard does not apply to emergent and aquatic communities.

G. None of the three most dominant plant species in any of the wetland community zones may be non-native species or weedy species, including but not limited to *Typha angustifolia*, *Typha X glauca*, *Phragmites australis*, *Lythrum salicaria*, *Salix interior,* or *Phalaris arundinacea*, unless otherwise indicated on the approved mitigation plan. These species shall not cumulatively comprise more than 5% of the total percent cover (not relative cover) for each community.

H. The native perennial species within each wetland plant community shall represent at least 80% of the total dominance measure. A lower percent native perennial species of the total dominance measure may be acceptable if it is demonstrated with transect data that the remaining dominance percentage is by native annual and biennial wetland plant species and the FQI and mean C standards are exceeded.

I. A vegetation map of the mitigation site based on as-built drawings developed at the completion of implementation shall be submitted. This information shall be descriptive and define the limits of all vegetation areas by community type, based on field observations. The permanent transects shall be shown on this map. Representative photographs of each vegetation area by general community zone shall be submitted to the Corps.

Hydrology Performance Standards

Consistent with the Corps of Engineers Wetlands Delineation Manual (1987) and/or any appropriate regional supplements, all areas to receive credit as wetland plant communities shall have soils saturated within 12 inches or less of the ground surface for at least 12.5% of the growing season as defined in this ICA. To meet this standard, the mitigation site shall demonstrate inundated or saturated soils for **23 consecutive days during the growing season**. In addition to this minimum, hydrology data should reflect a hydrologic regime that is appropriate to the native plant community proposed for establishment.

Site Protection and Maintenance

Long-term Legal Protection Instrument

On federal property such as Midewin, there is no specific site protection instrument. However, the Illinois Land Conservation Act P.L. 104-106, and the Prairie Land and Resource Management Plan both state a primary mission for Midewin is “to manage the land and water resources in a manner that will conserve and enhance the native populations of fish, wildlife, and plants”. The Prairie Land and Resource Management Plan for Midewin can be found at http://www.fs.fed.us/mntp/plan/index.htm. For the past decade, the Forest Service and the US Army Corps of Engineers have a common understanding documented in an interagency agreement (#06-IA-11091500-001), that any wetlands

restored on Midewin through programs of the Corps, will be managed and maintained as wetlands by the Forest Service.

Maintenance and Invasive Species Control Plan and Schedule

Invasive species control after seeding and planting will consist of spot treatment with an herbicide such as glyphosate or trichlopyr to control woody re-sprouts and herbaceous invasive species. For biennial herbaceous species (teasel and sweet clovers), the flowering stalks will be cut off and removed where appropriate. If necessary, the entire area will be mowed to control herbaceous invasive plants from taking over during the first couple of years. Species targeted for spot treated with an herbicide include: reed canary grass, common reed, teasel, cattails, thistles, bird's foot trefoil, clovers, and woody seedlings such as cottonwood, ash, autumn olive and bush honeysuckle.

Prescribed Fire

Prescribed fire is necessary to help control invasive plants and to stimulate growth of some prairie plants. Prescribed fire can also be useful in preparing a seed bed for winter seeding. Ideally the area will be burned yearly for the first few years, but prescribed fire is dependent upon weather conditions and fuel conditions. Unfavorable weather conditions and lack of fuel especially in the early years may not allow for yearly burns. Although this area is in a rural setting, many smoke sensitive areas are nearby including Interstate 55, ExxonMobil refinery, and Deer Run Industrial Park, and certain wind direction and conditions must be present for a "GO" decision. Prescribed burning will be yearly or as often as conditions allow for the first five years.

Maintenance Schedule (yearly as needed)	**Time Period**
Prescribed burn	Spring or Fall
Supplemental Seeding (Overseeding)	Winter
Supplemental Planting	Spring
Spot treatment of invasive species	Spring – Fall
Mowing	Spring –Fall Years 2-5

Long Term Management Plan

Once performance standards have been met and to ensure long-term success of the restored wetlands, the Forest Service at Midewin will continue funding of management activities including prescribed burns on a 3 to 5 year rotation and spot treatment of invasive species as needed.

Monitoring Plan

The Forest Service takes full responsibility for project monitoring for this wetland mitigation. Specific items to be monitored and the monitoring protocols are described below.

Vegetation Monitoring

Straight-line sampling transects will be randomly chosen and marked permanently within each of the plant communities zones for both the restoration and enhancement areas. Transects will be permanently marked in the field, recorded by GPS and entered into GIS software. One meter square sample quadrats will be placed along the transect lines and data collected to evaluate the vegetation. Inventories of all the vascular plants within each quadrat will be recorded.

A floristic inventory of all plant communities within the mitigation area will be taken. All species within the mitigation area will be inventoried and evaluated using the Floristic Quality Assessment (FQA) method. This data will be used to evaluate the Performance Standards given above.

Biannual sampling of the vegetation in the wetland restoration and enhancement areas will conducted beginning the first complete growing season after planting/seeding, and each subsequent year for 5 years. Sampling will be conducted in spring (May/June) and summer (August/September).

Permanent photo points will be established within each of the plant communities. Photos will be taken yearly during the growing season to show changes in vegetation over time.

Wildlife Monitoring

The project area has been monitored for grassland birds for over 10 years. This annual monitoring will continue with wetland bird monitoring as the wetlands develop. Grassland birds are monitored using a point count method, recording birds seen or heard in a 5-minute period within a 100 meter radius. Call back monitoring will done for wetland birds once the wetland vegetation has developed enough to provide habitat.

Hydrology Monitoring

Surface water will be monitored by installing staff gauges within existing wetlands and the surface water levels recorded no less than every two weeks from April 15 - October 20.

Data Reporting

An annual report will be submitted to the US Corps of Engineers by January 30 of the following year throughout the five-year monitoring period. The monitoring report will include data collected through the year for each of the data collection categories. The annual report will include restoration activities completed and the progress and success/failures of the restoration and management activities during the year and cumulatively from year one. The annual report will also propose any necessary remedial actions or changes in restoration strategies.

Specific information the annual report will include:

- A vegetation map showing the limits of all the vegetation areas by plant community type. Dominant vegetation within each plant community will be listed. Permanent transect, photo points and bird monitoring points will be located on the map.

- Photographs taken at the photo monitoring points along with other photographs showing the general site conditions.
- FQI analysis including the mean C and FQI values for the entire mitigation site.
- Calculate the relative frequency and relative cover for each plant species. Calculate the relative importance value of each native species.
- Bird monitoring data.
- Wetland delineation to document the jurisdictional limits of the wetland restoration area will be conducted during the fourth growing season.

Adaptive Management Plan

Unforeseen changes in site conditions may require a change in the planned restoration techniques or schedule. This adaptive management plan will guide decisions to revise this compensatory mitigation plan:

A. If additional field drain tiles are discovered, they will be disabled.
B. If extremely wet weather or poor wind conditions or other factors prevent prescribed burning, that activity will be postponed until another opportunity arises.
C. If sufficient quantities of native plants or seed material cannot be acquired either from sources at Midewin or the commercial market, seed bed preparation and planting will be postponed until adequate sources are available.
D. If a new invasive plant species or other plant disease that is determined to significantly impact the restored mitigation site is discovered, the Forest Service Ecologist and Horticulturists will determine assess the situation and determine what actions will be needed. The Forest Service will use the monitoring data along with site visits to determine if the restoration and enhancement is progressing as planned.
E. If necessary, the Forest Service will make changes to the restoration and enhancement plans in consultation with the US Army Corps of Engineers.

Financial Assurances

Finances to implement this project for the next five years will be provided by IDOT. After performance standards are met, future funding for long term management will depend on federal appropriated funds allocated by the Forest Service to Midewin. Funding to maintain restored areas will be top priority.