

News Release



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Contact:

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Public Review of Environmental Assessment for Proposed Habitat Restoration

Detroit Lakes Wetland Management District is proposing to use Genetically Modified-Glyphosate Tolerant (GMGT) corn and soybeans for the purpose of habitat restoration on U.S. Fish and Wildlife Service lands within the District. In accordance with the National Environmental Protection Act, this proposed use requires the development of an Environmental Assessment. The EA evaluates the impact of the proposed action, as well as, other alternatives to select the best course of action. This EA will be available for public comment for 30 days for the public to respond to the proposed action.

The EA is available for public review and comment in the district headquarters office, as well as on the district website http://www.fws.gov/refuge/detroit_lakes_wmd/ from November 16, 2015 through December 15, 2015. You may submit comments in person, via email or surface mail. Comments received and agency responses will be included in the final version of this Environmental Assessment.

Please submit electronic comments to: detroitlakes@fws.gov

Written comments can be sent to:

Detroit Lakes Wetland Management District
Attn: GMGT Comments
26624 North Tower Road
Detroit Lakes, MN 56501

For more information on the Midwest Region of the U.S. Fish and Wildlife Service visit <http://midwest.fws.gov>.

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. We are both a leader and trusted partner in fish and wildlife conservation, known for our scientific excellence, stewardship of lands and natural resources, dedicated professionals, and

commitment to public service. For more information on our work and the people who make it happen, visit www.fws.gov.

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Environmental Assessment

The Use of Genetically-Modified, Glyphosate-Tolerant Corn and Soybeans On Lands Within Detroit Lakes Wetland Management District

Lead Agency: US Fish and Wildlife Service
Detroit Lakes Wetland Management District

November 2015

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U.S. Fish and Wildlife Service

National Wildlife Refuge System

Midwest Region

Detroit Lakes Wetland Management District

Environmental Assessment

Use of Row Crop Farming and Genetically modified, Glyphosate tolerant Corn and Soybeans on the Detroit Lakes Wetland Management District

Contents

Summary	1
Chapter 1: Purpose and Need	2
1.1 Purpose	2
1.2 Need for Action	2
1.3 Decision Framework	2
1.4 Background	4
1.5 Authority, Legal Compliance, and Compatibility	5
1.6 Issues Beyond the Scope of This EA	6
Chapter 2: Description of the Alternatives	7
2.1 Formulation of Alternatives	7
2.2 Alternatives Considered But Not Developed	7
2.3 Elements Common to All Alternatives	8
2.4 Alternatives Considered	13
Chapter 3: Physical and Social Environment	15
3.1 Introduction	15
3.2 Habitat	15
3.3 Existing Management of District Lands	19
3.4 Wildlife	19
3.5 Threatened and Endangered Species	19
3.6 Invasive Species	20
3.7 Socioeconomic	20
3.8 Cultural Resources	21

Chapter 4: Environmental Consequences..... 22

- 4.1 Effects Common to All Alternatives 22
- 4.2 Effects of Management Alternatives 24
- 4.3 Environmental Justice 26
- 4.4 Cumulative Impacts Analysis..... 26

Literature Cited 31

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Summary

Managed by the U.S. Fish and Wildlife Service (Service), the National Wildlife Refuge System includes more than 150 million acres of public lands and waters dedicated to habitat and wildlife conservation. The Refuge System includes 560 national wildlife refuges and 38 wetland management districts throughout the United States. This mission of the National Wildlife Refuge System is:

...To administer a national network of land and waters for the conservation, management and where appropriate restoration of the fish, wildlife and plant resources and their habitats for the benefit of present and future generations of Americans.

The Midwest Region of the Fish and Wildlife Service includes: Illinois, Iowa, Indiana, Michigan, Minnesota, Missouri, Ohio and Wisconsin. There are 54 national wildlife refuges and 12 wetland management districts in the Midwest Region.

The Detroit Lakes Wetland Management District (District) is responsible for the management of both fee title and easement Waterfowl Production Areas within Becker, Clay, Mahnomen, Norman and Polk Counties in Northwest Minnesota. There are 171 Waterfowl Production Areas (WPAs), 372 wetland easements, 17 Farmers Home Administration (FmHA) easements and 25 habitat easements within the District.

Although Service policy is to use the most natural means available to meet Refuge or District purposes and wildlife objectives, policy allows the use of cropland management in situations where objectives cannot be met through maintenance of more natural ecosystems (USFWS 1985). Service policy stipulates that only the minimum acreage required to meet objectives should be devoted to croplands. Currently, within the District, row crops on WPAs and habitat easements cover 455 acres, or less than 1% of District lands (acreages as of April 1, 2015).

In March of 2015, following an order from the United States District Court for the District of Columbia, the District halted the use of GMGT crops until an Environmental Assessment is completed. This EA will consider the environmental impacts of using GMGT crops on District lands.

Chapter 1: Purpose and Need

1.1 Purpose

The U.S Fish and Wildlife Service is the primary federal agency responsible for the conservation of habitat and wildlife. The Midwest Region of the U.S. Fish and Wildlife Service includes Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin. The Detroit Lakes Wetland Management District is comprised of Becker, Clay, Mahnomen, Norman and Polk Counties in Northwest Minnesota. The District is part of the National Wildlife Refuge System, which is the largest system of lands managed primarily for wildlife conservation in the world. The Refuge System mission is:

“...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, an plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The purpose of this Environmental Assessment (EA) is to review and evaluate current and alternative actions that use farming as a habitat management tool to support establishing purposes of Refuge System lands or the Refuge System’s mission, including the use of genetically modified, glyphosate tolerant (GMGT) corn and soybeans on National Wildlife Refuge System lands in the Detroit Lakes Wetland Management District (Figure 1), and to then select an alternative. Each alternative is evaluated based on the environmental consequences, including biological and socioeconomic impacts, in accordance with the National Environmental Policy Act (NEPA). Alternatives are also evaluated based on how effectively they support the purposes for which Refuge System lands were established and the mission of the Refuge System.

1.2 Need for Action

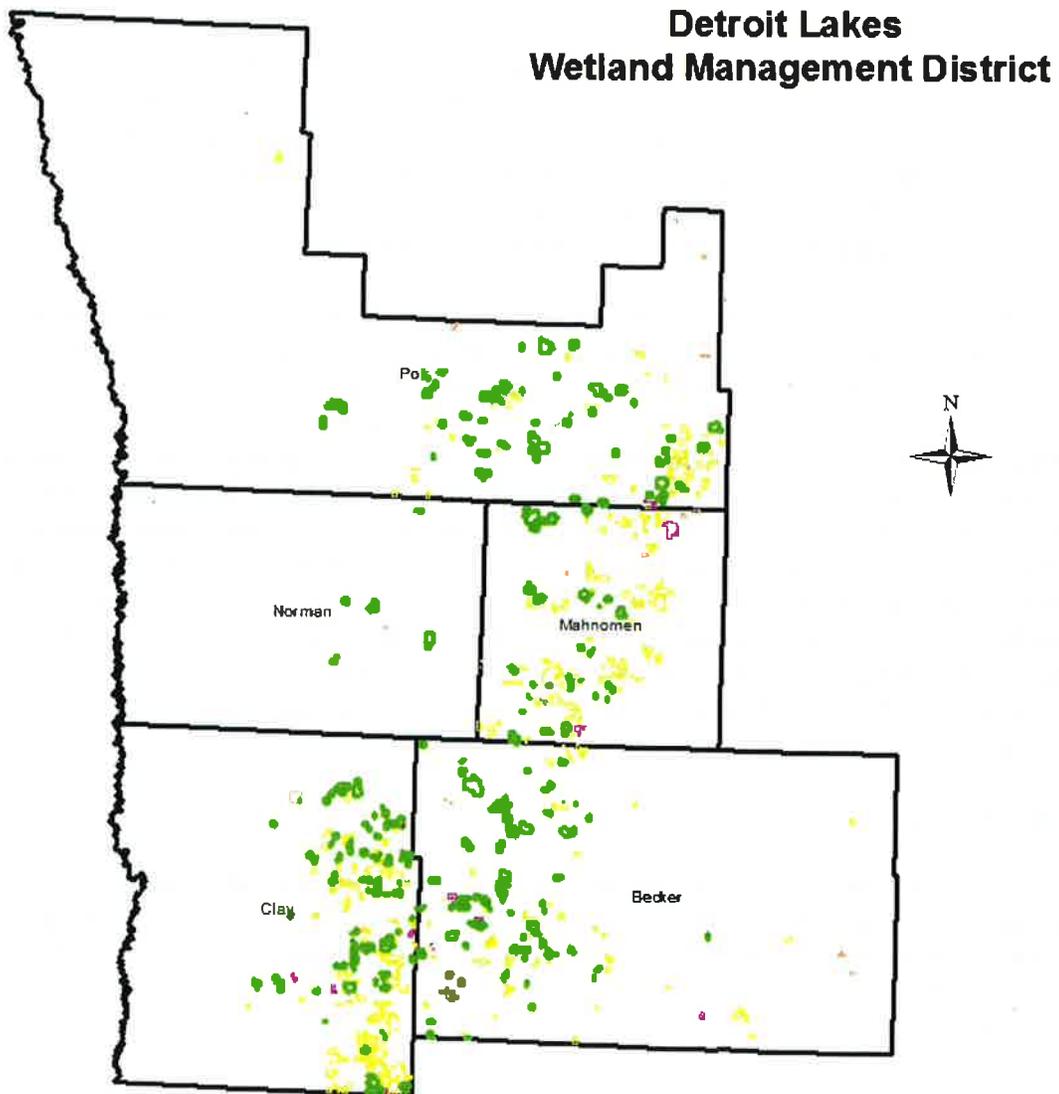
The increased use of GMGT corn and soybeans crops and revised Service and Regional policies regarding farming and genetically modified organisms warrant a reevaluation of farming as a tool for wildlife and habitat management and the use of GMGT corn and soybeans on Refuge System lands in the District.

1.3 Decision Framework

The Regional Director for the Midwest Region will make two decisions based on this EA:

- Select an alternative regarding farming on Refuge System lands within the District.
- Determine if the selected alternative is a major federal action significantly affecting the quality of the human environment, thus requiring preparation of an Environmental Impact Statement.

Figure 1: National Wildlife Refuge System Lands, Detroit Lakes Wetland Management District



Legend

- Waterfowl Production Area
- FmHA Easement
- Habitat Easement
- Tallgrass Easement
- Wetland Easement
- County Boundary



1.4 Background

Currently, five out of 171 total WPAs within the District and one out of 25 total habitat easements within the District use farming as a method of habitat restoration. In 2015, 455 acres of District lands will be farmed, which is 0.9% of the District's total of 50,507 acres of WPAs and habitat easements. District farmland accounts for 0.04% percent of the total 1,214,800 planted acreage of corn and soybeans in the five-county District (USDA 2014). The majority of District land was farmland when it was acquired by the Service or had a farming history. It is expected that this trend will continue into the future as some of the best potential prairie habitat is also some of the most productive agricultural land within the District. The farming of District lands is utilized only as part of the process of native habitat restoration. The practice on all Service lands within the District has been to convert farmland to native prairie vegetation because natural habitats have greater value for wildlife (Tilman et al. 2001).

The use of genetically-engineered organisms in American agriculture has increased substantially over the past decade. Genetically –modified, herbicide-tolerant crops were planted on 92 percent of the United States soybean acres and 80 percent of the corn acres in 2008 (Brookes 2010). In Minnesota Glyphosate was used on 97 percent of the soybean acres and 90 percent of the corn acres in 2011 (MDA 2014).

Agriculture will continue to play a major role in the restoration of District lands into the future. Existing plans call for all cropland on District lands to be restored to native prairie vegetation. The 455 acres of cropland on District lands in 2015 will be reduced to 222 acres (51.2% reduction) in 2016, 133 acres (40.1% reduction) in 2017 and 72 acres (45.9% reduction) in 2018. All cropland on currently owned District lands will be restored back to native prairie habitats by the spring of 2019. However, as the Service continues to acquire land it is likely that much of it will be cropland and these numbers will vary from year to year. Current budget levels make it unlikely the Service could address all District lands that require restoration. Using agriculture to prepare sites for restoration and manage invasive or unwanted plant species is a cost effective method to restore these lands.

The purpose of farming on District lands is to prepare the seedbed for planting native prairie species to restore habitat for migratory birds. Farming may be used on newly acquired parcels with current agricultural fields and on existing lands where poor quality, non-native, previously farmed areas are broken and prepared to be planted to native species. This conversion of poor quality habitat to higher quality habitat results in more resilient cover. Farming on Service owned land within the District will not be used for food plots, provide food for wildlife or any other purpose than habitat restoration.

Farming within the District is conducted by working with a neighboring farmer, referred to as a "cooperator", by charging them a rental rate for farming. Under this system the farmer pays the Service an agreed upon amount and in exchange plants and harvests the entire field in accordance with the Special Use Permit and associated documents. Currently, the District requires the cooperator to plant GMGT soybeans the final two years of farming in order to control unwanted plant species and provide a firm, smooth seedbed for planting native species.

The District utilizes a diverse mix of local ecotype native species in its restoration efforts. This seed is obtained by either harvesting from native prairies within the District or by purchasing seed from local vendors. Local ecotype seed is better adapted to the local climate and site conditions. Having a diverse mix also allows the restoration to provide structural diversity for a variety of wildlife as well as making the restoration more resilient in the face of changing environmental factors.

Restoration of native vegetation is usually accomplished by dividing larger fields into smaller parcels for seeding, typically 40-60 acres. This means that a 160 acre field may take 3 years to seed completely to native vegetation. This approach has several advantages including reducing the risk of a large scale seed failure, decreasing local public concerns regarding invasive species and potentially increasing the diversity across seedings by utilizing different harvest years in order to complete the seedings.

Decreasing the public's concerns regarding invasive species, typically plumeless thistle is a large part of the restoration effort. In an ongoing study, there was no difference in the amount of plumeless thistle in mowed versus unmowed sites. In addition, during the first three years of restoration the abundance and richness of native forb species was greater in the unmowed sites (Esser, USFWS, unpublished data). The District makes every attempt to not clip or otherwise disturb the seeding after it is planted until a prescribed burn is completed three to five years after seeding.

1.5 Authority, Legal Compliance, and Compatibility

District lands are managed consistently with a number of federal statutes, regulations, policies and other guidance. The National Wildlife Refuge System Administration Act of 1966, as amended (NWRS Administration Act, 16 U.S.C. 668dd-668ee) is the core statute guiding management of the National Wildlife Refuge System. The National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57) made important amendments to the NWRS Administration Act, one of which was the mandate that a comprehensive conservation plan (CCP) be completed for every unit of the Refuge System. Among other things, comprehensive conservation planning has required field stations to assess their current farming program and establish objectives for the future.

The CCP for the District was completed in 2003. This CCP lays out the goals and objectives for the District for the following 15 years. In conjunction with the CCP a compatibility determination (CD) was signed allowing the use of limited (3 years or less) cooperative farming for habitat restoration. However, neither the CCP nor CD included specific language regarding GMGT crops. With the increase in use of GMGT corn and soybeans in the latter half of the decade it was necessary to update the CD to include these crops. In 2011 the Midwest Region completed an EA titled *"Use of Row Crop Farming and Genetically-modified, Glyphosate-tolerant Corn and Soybeans on National Wildlife Refuges and Wetland Management Districts."* This document identifies the specific conditions in which GMGT corn and soybeans can be used on District lands. Based on the 2011 Regional EA, a new CD was written and approved that allowed the use of farming to enhance and restore District grasslands. This CD specifically identified the use of GMGT crops as well as limiting farming agreements to five years.

Finally, an effort was undertaken in 2014 to update all of the CDs that were approved as part of the CCP in 2003. The farming CD was once again updated to include the phasing out of neonicotinoid treated seed by 2016. The District stopped the use of neonicotinoid treated seed in 2014.

In March of 2015, following an order from the United States District Court for the District of Columbia, the District halted the use of GMGT crops until an Environmental Assessment is completed. This EA will consider the environmental impacts of using GMGT crops on District lands.

1.6 Issues Beyond the Scope of This EA

This EA is focused on the use of row crop farming as a management tool, and the use of GMGT corn and soybeans on Waterfowl Production Areas and Habitat Easements within the Detroit Lakes Wetland Management District for habitat restoration purposes only. It does not evaluate other issues, including:

- Farming on wetland easements
- Genetically modified organisms other than GMGT corn and soybeans

Chapter 2: Description of the Alternatives

2.1 Formulation of Alternatives

Alternatives were developed based on a review of authorities, policies and regulations as well as management needs of the District. This chapter describes two alternatives:

1. Alternative A: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Allowed
2. Alternative B: Farming for Habitat Restoration Purposes Only, No GMGT Corn and Soybeans

Development of the alternatives considered:

- The National Wildlife Refuge System Improvement Act of 1997
- The Midwest Region's 2011 Environmental Assessment *Use of Row Crop Farming and Genetically-modified, Glyphosate-tolerant Corn and Soybeans on National Wildlife Refuge and Wetland Management Districts*
- The Midwest Region's 2014 Farm Program Guidance
- Establishing purpose of the District
- Reasons for farming on District lands
- The availability and effectiveness of alternative management tools
- Benefits and impacts to wildlife
- Current goals and objectives identified in the completed Comprehensive Conservation Plan
- Current goals and objectives identified in the DRAFT Habitat Management Plan

2.2 Alternatives Considered But Not Developed

2.2.1 Unmanaged Succession

Unmanaged succession occurs when land is allowed to grow back with no human land management. This approach to restoration takes more time when compared to active management methods and typically results in a stand of vegetation dominated by undesirable, invasive and non-native plants. This is particularly true for lands that have been farmed for many years; the longer a tract is farmed, the less likely it is for native plant species to remain. This strategy for restoration is less efficient and effective than active restoration because native plant species are competing with invasive plants. Not only can unmanaged succession be unpopular with local weed boards, it can result in violations of local and state laws pertaining to control of noxious weeds.

Unmanaged succession was not carried forward for evaluation because its results are not acceptable or adequate to fulfill the establishing purposes of the District.

2.2.2 No Farming

No farming or fallowing means that once a parcel is acquired, farming would cease by the end of the calendar year. Depending on the size of the tract, native grassland restoration could be completed during that first complete year of ownership or over several years. The majority of land the USFWS acquires within the Detroit Lakes WMD is cropland. A significant concern is the unknown history of herbicide use on newly acquired tracts. Many herbicides have significant carryover and would likely have a detrimental impact on the establishment of native habitats.

Fallowing will not reduce the use of glyphosate by the District. If the field is left idle for one growing season, two applications of glyphosate would be applied to prevent unwanted plants from becoming established. The alternative to herbicide application would be hiring a contractor to disc a field to reduce weed competition. Discing a field one or two times per year would likely increase soil erosion on the site. Both of these options are not as efficient or cost effective as utilizing GMGT crops for seedbed preparation. In 2015, the cost to disc the 455 acres of cropland on District lands twice throughout the growing season is estimated at \$13,331.50 (IA State University Extension 2015). The District spends approximately \$20,000.00 to acquire local ecotype native seed. Spending any additional amount on seedbed preparation would decrease the amount available to acquire seed thereby reducing the number of acres the District restores by at least 50 percent annually.

The combination of unknown herbicide history and/or carryover, potential increased use of glyphosate or mechanical fallowing and an increase in restoration cost/time results in fewer acres of high quality habitat annually. Therefore, not farming does not meet the District's habitat restoration goals and was not carried forward for further consideration.

2.3 Elements Common to All Alternatives

Several elements are common to all five alternatives evaluated in this EA. These elements are listed here and are discussed in more detail in the following paragraphs.

- Issues Receiving Extensive Analysis During Comprehensive Assessments by the U.S. Department of Agriculture
- Adherence to the National Wildlife Refuge System Administration Act, as Amended by the National Wildlife Refuge System Improvement Act of 1997
- Adherence to FWS appropriate Use and Compatibility Policies
- Agricultural Lands Will Decrease on District Lands
- Procedures and Limits on Herbicide Use
- Adherence to FWS Integrated Pest Management and pesticide use policies and guidance
- Adherence to Midwest Region Farming Policy and Guidance

2.3.1 Issues Receiving Extensive Analysis During Comprehensive Assessments by the U.S. Department of Agriculture

Since 1986 the U.S. Department of Agriculture (USDA), the Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) have been the federal agencies responsible for assessing the safety of products of modern biotechnology. Assessments are based on the biological characteristics of each new organism. The USDA's Animal and Plant Health Inspection Service (APHIS) has completed

comprehensive assessments of GMGT corn and soybeans through NEPA review. This review did not find significant impacts regarding:

- Weediness

Corn and soybeans have been grown throughout the world without any report that they are serious weeds. They are not generally persistent in undisturbed environments without human intervention. In the year following cultivation, they may grow as a volunteer only under specific conditions and can be easily controlled by herbicides or mechanical means. They do not compete effectively with cultivated plants or primary colonizers.

- Human health and safety

The engineered proteins in GMGT corn and soybeans are not known to have any toxic properties and have minimal potential to be food allergens.

- Non-target species

The engineered proteins in GMGT corn and soybeans are not known to have any toxic properties and have minimal potential to be food allergens.

- Inadvertent crop-to-weed gene flow

There are no known species of weeds that are sexually compatible with corn or soybeans.

There are many EAs written by APHIS that assess GMGT corn and soybeans. Two of them may be found at the following web addresses:

http://www.aphis.usda.gov/brs/aphisdocs2/06_17801p_com.pdf

http://www.aphis.usda.gov/brs/aphisdocs2/00_01101p_com.pdf

2.3.2 Adherence to the National Wildlife Refuge System Administration Act, as amended by the National Wildlife Refuge System Improvement Act of 1997

The National Wildlife Refuge System Improvement Act of 1997 amended the National Wildlife Refuge System Act of 1966 and created comprehensive legislation spelling out how the Refuge System would be managed and how it could be used by the public. All of the alternatives evaluated in this EA are consistent with the main points of the Improvement Act:

- Wildlife conservation comes first on National Wildlife Refuges.
- The Service will adhere to biological integrity, diversity and environmental health of the Refuge System.
- Compatibility determinations will guide uses of Refuge System lands.
- Six wildlife-dependent recreational uses are priority public uses of the Refuge System: hunting, fishing, wildlife observation and photography, environmental education and interpretation.

- A comprehensive conservation plan will be prepared for every refuge and wetland management district.

2.3.3 Adherence to FWS Appropriate Use and Compatibility Policies

All of the alternatives evaluated in this environmental assessment would adhere to two policies guiding decisions on activities allowed on lands managed by the National Wildlife Refuge System: Appropriate Use and Compatibility.

The Appropriate Refuge Uses policy describes the initial decision process a refuge or district manager follows when first considering whether or not to allow a proposed use on a National Wildlife Refuge or Wetland Management District. The manager must first find a use appropriate before undertaking a compatibility review of the use. An appropriate use, as defined by the Appropriate Use Policy (603 FW1), is a proposed or existing use on a refuge that meets at least one of the following four conditions:

- The use is a wildlife-dependent recreational use as identified in the Improvement Act.
- The use contributes to the fulfilling of the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law.
- The use involves the take of fish and wildlife under State regulations.
- The use has been found to be appropriate as specified in section 1.11 (603 FW 1 of the Service Manual).

Waterfowl Production Areas (WPAs) that make up Wetland Management Districts are considered open to hunting unless posted as "closed". Other public uses on WPAs are prohibited unless specifically and legally opened. The Improvement Act states "...the Secretary shall not initiate or permit a new use of a Refuge or expand, renew, or extend an existing use of a Refuge, unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety." The Improvement Act also states that "...compatible wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, or environmental education and interpretation) are the priority general public uses of the System and shall receive priority consideration in Refuge planning and management."

In accordance with the Improvement Act, the Service has adopted a Compatibility Policy (603 FW 2) that includes guidelines for determining if a use proposed on a National Wildlife Refuge or Wetland Management District is compatible with the purposes for which the refuge or district was established. A compatible use is defined in the policy as *a proposed or existing wildlife-dependent recreational use or any other use of National Wildlife Refuge System lands that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the NWRS mission or the purposes of the Refuge* (603 FW2 of the Service Manual). The policy also includes procedures for documentation and periodic review of existing refuge uses.

The Detroit Lakes Wetland Management District completed a compatibility determination for "Farming for Cover Enhancement" in conjunction with its Comprehensive Conservation Plan in April, 2003. A new appropriate use and compatibility determination were completed for "Cooperative farming as a habitat management tool to enhance and restore refuge grasslands" in May, 2011. This new CD specifically identified GMO crops (specifically Glyphosate-tolerant corn and soybeans) as being authorized on District lands when used for habitat restoration. The compatibility determination was updated again in

May, 2015 as part of a general re-writing of expiring non-priority use CDs. This most recent CD lays out the specific circumstances under which farming and the use of GMGT corn and soybeans may be used. In addition, it described the phasing out of neonicotinoid treated seeds from the farming program by 2016. No neonicotinoid treated seeds have been used on District lands since 2013.

2.3.4 Agricultural Lands Will Decrease within the Detroit Lakes Wetland Management District

Under all alternatives evaluated, the amount of District Lands that are planted in row crops will diminish as land is restored to native habitat. How quickly the farming program decreases varies with each alternative.

The Service's Biological Integrity, Diversity and Environmental Health policy (601 FW3) provides direction on the use of farming (including row crops) and directs land managers to restore land to native habitats. Farming on the Detroit Lakes Wetland Management District has been reviewed under its Comprehensive Conservation Plan (CCP) completed in 2003. The District's CCP prairie restoration objective states "Restore an average of 800 acres of uplands on WPAs to native seeded grassland species each year. Begin the process on all new acquisitions within 3 years of purchase...." In addition, the DRAFT District Habitat Management Plan (HMP) goal for habitat restoration states "Restore biologically diverse grasslands using local ecotype seed to mimic native plant communities and manage them using natural processes to provide quality habitat for upland-nesting waterfowl and other grassland-dependent wildlife." Currently (2015) 0.9 percent of District lands are farmed. Under the current seeding plan, all cropland on currently owned District lands will be restored back to native prairie habitats by the spring of 2019. However, as the Service continues to acquire land it is likely that much of it will be cropland and these numbers will vary from year to year.

2.3.5 Procedures and Limits on Herbicide Use

Under all of the alternatives evaluated, protective measures will be followed to ensure the proper use of herbicides on District lands. Service policy requires that managers complete a Pesticide Use Proposal, or PUP, each year before applying pest control chemicals (herbicides, insecticides, fungicides, etc.) on District lands. Each PUP is completed by District staff and approved at either field, regional or national levels, depending on the pesticide being proposed. Requiring PUPs helps ensure that product label instructions are followed, that pesticides are used effectively and safely, that the lowest risk products are selected, and that buffers are maintained.

Typically, Roundup Original Max (glyphosate) is the preferred herbicide to use in restoration efforts because there is no residual carryover that might impact reseeding of native vegetation the following winter/spring. A brief description of Roundup Original Max follows:

- Roundup Original Max (Monsanto) – Roundup Original Max is a postemergence, non-selective herbicide with no residual soil activity. The active ingredient in Glyphosate, N(phosphonomethyl)glycine. There is no residual soil activity after application. This herbicide cannot be applied directly to water.

In 2015, the District applied and received approval for the use of three additional herbicides on WPAs planted to conventional soybeans and corn. This was necessitated because the District was prohibited from using GMGT crops until an environmental review was conducted. A brief description of each herbicide follows:

- Fusilade DX (Syngenta) – Fusilade DX is a postemergence herbicide for control of perennial and annual grass weeds in soybeans. The active ingredient is fluzifop-P-butyl. This chemical is known to leach and move into surface and ground water. It is also toxic to fish and aquatic invertebrates. It is also recommended to wait 60 days after application to plant forage grasses. Best management practices required during the use of Fusilade DX include maintaining vegetative buffers adjacent to all water features, not applying on poorly drained soils or areas with a shallow water table and not applying within 48 hours of forecasted rain events.
- Basagran (Micro Flo Products) – Basagran is a postemergent herbicide for control of broadleaf weeds in soybeans. The active ingredient is bentazon. This herbicide is known to leach through the soil into ground water where soils are permeable and the water table is shallow. The best management practice is to avoid these areas completely.
- Resource (Valent) – Resource is a postemergent herbicide for control of susceptible broadleaf weeds in soybeans. The active ingredient is flumiclorac. This pesticide is known to kill shrimp, so it will be applied no closer than 70 feet from wetlands, streams, lakes and rivers as fresh water shrimp may also be impacted. Drift is also a concern so it will be applied in winds between 2-10 mph and will not be applied during inversion events. A 40 foot setback is required from non-target plants.

2.3.6 Integrated Pest Management

While the District does not have a specific Integrated Pest Management (IPM) plan, all alternatives considered would adhere to the Service’s IPM policy (569 FW 1, 2010).

IPM is “a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health and environmental risks” (7 USC 136r-1). IPM coordinates the use of pest biology environmental information and available technology to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people, property, resources and the environment.

More information on IPM is available in Service policy issued on preparing and implementing integrated pest management.

2.3.7 Adherence to Midwest Region Refuge System Farming Policy

All of the alternatives developed in this EA would adhere to national and regional policy related to farming on National Wildlife Refuge System lands.

Nationally, the Fish and Wildlife Service policy on Biological Integrity, Diversity and Environmental Health (601 FW 3, 2001; Amendment 1, 2006) states:

“We do not allow Refuge System uses or management practices that result in the maintenance of non-native plant communities unless we determine there is no feasible alternative for accomplishing refuge purpose(s). For example, where we do not require farming to accomplish refuge purpose(s), we cease farming and strive to restore natural habitat. Where feasible and consistent with refuge purpose(s), we restore degraded or modified habitats in the pursuit of biological integrity, diversity and environmental

health. We use native seed sources in ecological restoration. We do not use genetically modified organisms in refuge management unless we determine their use is essential to accomplishing refuge purpose(s) and the Regional Chief, National Wildlife Refuge System, approves the use.”

The Midwest Region incorporated national policy into the Region’s policy on farming in 2010:

“Where feasible and consistent with Refuge purpose(s), Region 3 staff (we) restore and manage degraded or modified habitats in the pursuit of biological integrity, diversity and environmental health. We do not allow Refuge uses or management practices that result in the maintenance of non-native plant communities unless we determine there is no feasible alternative for accomplishing the Refuge purpose(s). Where farming is not required for Refuge purpose(s) we cease farming and strive to restore natural habitats. We do not use genetically modified organisms in Refuge management unless we determine their use is essential to accomplish Refuge purpose(s) and the Chief of Refuges for Region 3 approves the use. The use of genetically modified organisms is limited to herbicide-resistant crops only (September 24, 2010, Notice from Midwest Regional Chief). More specifically the use of GMGT corn and soybeans can only be used for habitat restoration purposes.” (USFWS 2011)

2.4 Alternatives Considered

2.4.1 Alternative A: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Allowed (Preferred Alternative)

Under Alternative A, the use of GMGT corn and soybeans on District lands would continue but only as a habitat restoration tool. Currently, as part of restoration planning the amount of cropland on WPAs will decrease an average of 45.7 percent per year through 2018. All currently existing agricultural lands would be reseeded to native prairie vegetation by the spring of 2019. However, row crop farming is likely to continue, but only on newly acquired tracts where habitat restoration has not occurred.

This alternative retains the option to use GMGT corn and soybeans to prepare former agricultural fields for habitat restoration. The District completed the GMGT eligibility questionnaire and received approval from the Regional Refuge Chief, to use GMGT corn and soybeans for habitat restoration purposes in 2011. The questionnaire identified why the use of GMGT crops was essential in meeting the District’s habitat restoration objectives.

The District works with local cooperators to plant corn and soybeans through a Special Use Permit (SUP). The SUP establishes the terms and conditions the cooperator must follow such as, how long tracts may be farmed, the herbicides that may be used and any other special conditions they must follow. Typical farming practices used throughout the District include mechanically tilling the ground with disks and harrows, using drills and planters to seed the crop and using a combine to harvest. In addition, two pesticide treatments are applied to control invasive species during the growing season.

Conditions outlined in the Service’s Special Use Permit would be followed. Many of these conditions relate to the Environmental Protection Agency’s CORE 4 conservation practices:

- Conservation tillage
- Crop nutrient management
- Pest management

- Conservation buffers

2.4.2 Alternative B: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Not Allowed.

Under Alternative B, the use of GMGT corn and soybeans on District lands would no longer be allowed. As in Alternative A, farming would be allowed for habitat restoration purposes only. Cooperator selection, farming practices and special conditions would all be the same as Alternative A, with the exception of GMGT crops being prohibited.

Chapter 3: Physical and Social Environment

3.1 Introduction

The Detroit Lakes Wetland Management District includes 171 Waterfowl Production Areas and 25 Habitat Easements in five Northwest Minnesota counties. These counties are:

- Becker
- Clay
- Mahnomen
- Norman
- Polk

The District lies in the transition zone of western Minnesota, where the prairies meet the forest. The western portion is in the historic Glacial Lake Agassiz lake bottom which is known today as the Red River Valley. Topography of that area is flat and the landscape heavily agricultural. When moving east from the Red River Valley, the first important landscape feature is the Glacial Lake Agassiz Beachridge. This small transition from historical lake bottom to a more rolling glacial topography begins with only a slight rise in elevation. In some locations, it is less than 10 feet. The beachridge is unique due to its soils and hydrology. The soils below the ridge tend to be heavy and clay-based, while the ridge itself contains a mix of soil types but typically sandy and rocky. Many laterally-formed wetland basins lay on top of the ridge and much lateral movement of water occurs both above and below the ground from east to west. This unique combination of soils and hydrology has left many portions of the beachridge unplowed. The grassland on the beachridge has been used for haying and grazing and has not been heavily farmed. In recent years, however, the demand for construction aggregate and oil fracking has increased the destruction of the beachridge in search of sand and gravel. The beachridge contains the greatest quantity of unbroken native prairie in the District, but it is under this new and direct threat right now.

Moving east from the beachridge is the Prairie Pothole Region (PPR) of northwestern Minnesota. The PPR extends from northern Iowa through Alberta, Canada and is characterized by a prairie landscape dotted with shallow depressional wetlands. These “potholes” formed when the last glaciers receded, around 10,000 years ago. The PPR is well known for its importance to breeding waterfowl; the region is responsible for producing over 50% of the continent’s waterfowl (Smith et al. 1964), earning it the nickname “the Duck Factory of North America.” Any remaining wetlands and grassland in this area of the District tend to be slightly topographic, with shallow prairie potholes and mesic prairie. The topography further increases up to the Alexandria Moraine in the eastern portion of our District. The Moraine was left by the last glaciation and contains undulating topography with deep lakes and wetlands. The soils tend to be sandy. Dry prairies and oak savannas occur most commonly in this area of the District in conjunction with this landscape feature. The eastern side of the moraine and the sandy outwash plains in the far eastern portion of the District are primarily deciduous and some mixed forest habitat.

3.2 Habitat

Regardless of where traveling in Minnesota during the pre-settlement era, one can only begin to imagine what the landscape looked like. The landscape of this District is likely one of the most diverse in

Minnesota. In a 10 mile stretch of land in Mahnommen County, one can progress from flat, open wet prairie, through oak openings and barrens and into deciduous and coniferous forests. Many of the pre-settlement vegetation/habitat types as documented and then mapped by Marschner (1974) and later adapted by Coffin (1988) can be found within the District (Figure 2).

The landscape within the DLWMD has changed dramatically since the pre-settlement era. As white settlers arrived in western Minnesota, they discovered a precious resource in the prairie—its soils. This discovery ultimately led to the conversion of prairie to cropland in the heart of the District between the Lake Agassiz Beachridge and the Alexandria Moraine (Figure 3). Massive conversion of wetlands and prairie to agricultural fields has dramatically altered the landscape, hydrology, and the region's carrying capacity for waterfowl and other prairie- and wetland-dependent plants and wildlife. In many locations in the district, the only areas with a native plant community are managed conservation lands. Minnesota has less than 1% of its original tallgrass prairie (Samson et al. 1998) and roughly 15% of pothole wetlands (Johnson et al. 2008) remain in Minnesota.

Figure 2: Pre-settlement Vegetation of the Detroit Lakes Wetland Management District

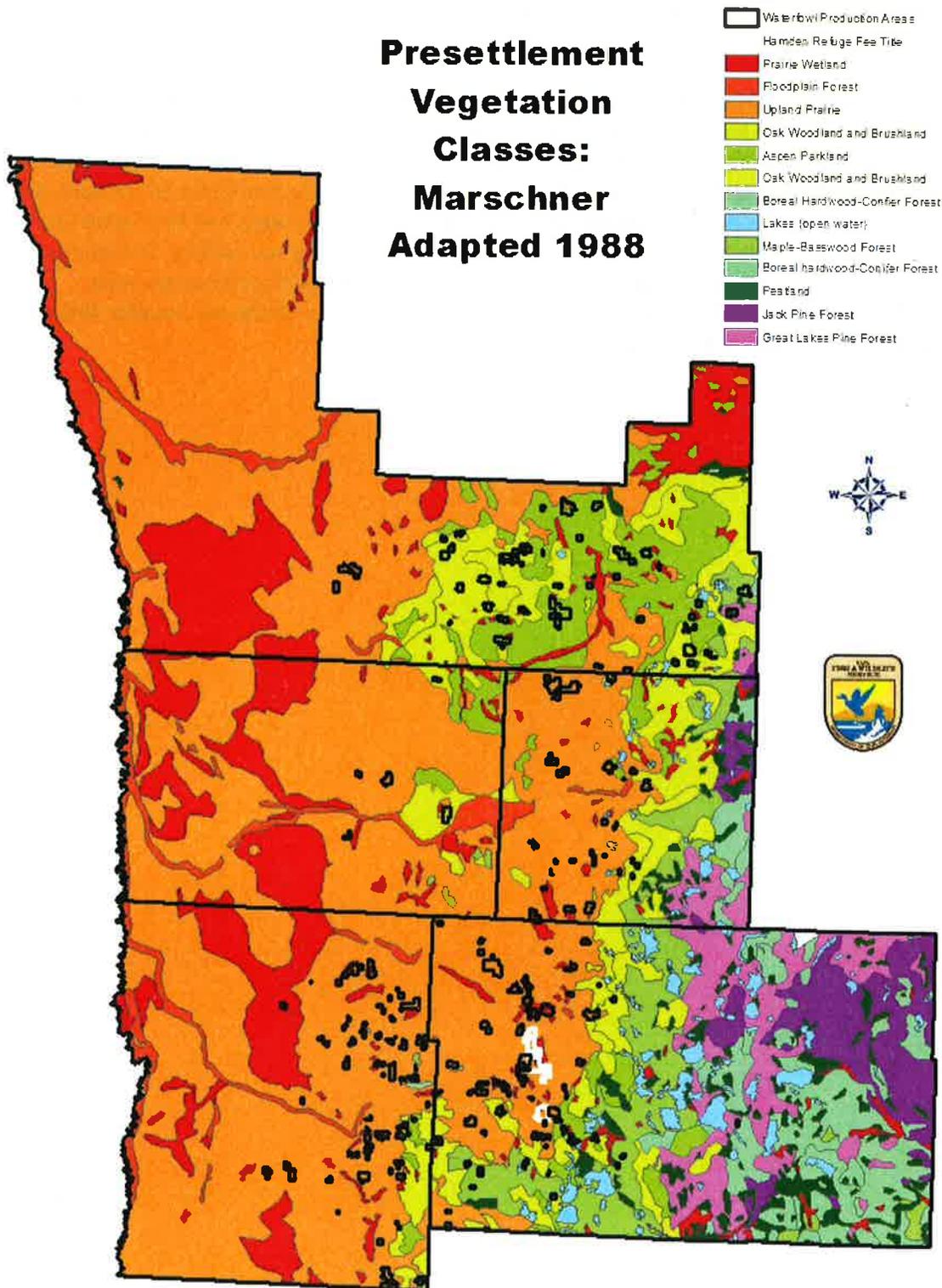
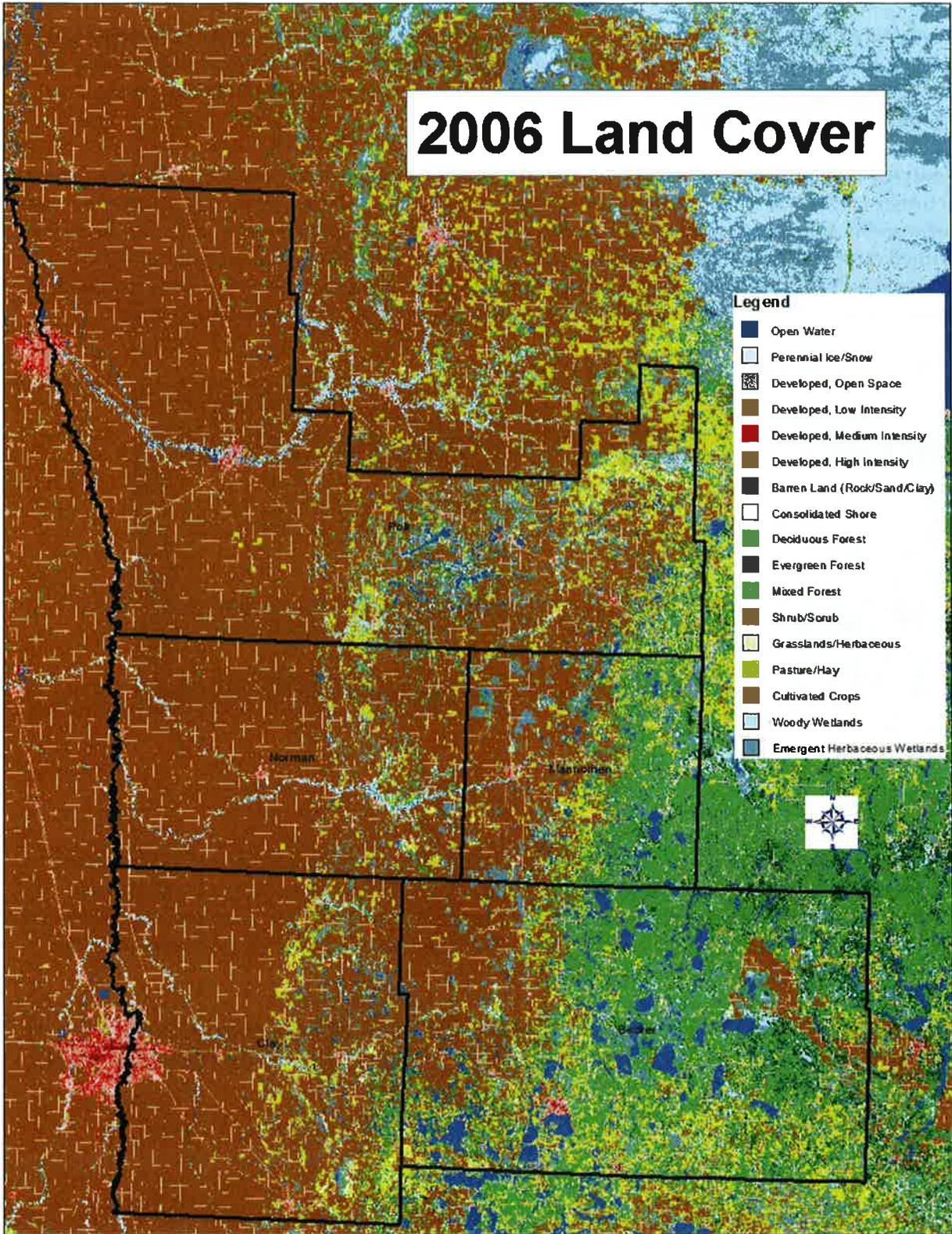


Figure 3: Detroit Lakes Wetland Management District Land Cover (2006)



3.3 Existing Management of District Lands

The Service uses a variety of techniques to manage lands within the District, depending on the habitat, the presence of endangered species and other factors. Habitat management techniques include but are not limited to, prescribed burning, haying, mechanical treatment of invasive trees and chemical and biological control of invasive species.

Row crop farming has been used to accomplish habitat restoration objectives on District lands. Farming activities on WPAs are almost always a small part of the local farming economy. The District has slowly reduced the amount of cropland through the years and will continue to do so. In 2015, 455 acres were farmed compared to 590 acres in 2011. However, since 2011 the District has restored 1,094 acres of cropland on WPAs but due to continual acquisition of new parcels that are cropland the number of acres is only slightly reduced. See table 1 below for an overview of crop acres and restored acres.

Table 1: Crop Acres and Restoration Acres by Year

Detroit Lakes Wetland Management District					
	2015	2014	2013	2012	2011
GMO Corn Acres	0	0	36	85	0
GMO Soybean Acres	0	496	482	729	590
Non-GMO Corn Acres	0	0	0	0	0
Non-GMO Soybean Acres	455	0	0	0	0
Total Acres Farmed	455	496	518	814	590
Cropland Acres Restored	184	148	260	219	283

In March 2015, following an order from the US District Court, the District halted the use of GMGT crops until an Environmental Assessment is completed.

3.4 Wildlife

Migratory birds are the focus of district land acquisition and management, in particular waterfowl. Primary nesting waterfowl include Mallard and Blue-winged Teal. Shallow lakes and some larger wetlands also support over-water nesting species such as Lesser Scaup and Canvasback. In addition to waterfowl, other migratory birds common on district lands include grassland-dependent passerines, shorebirds and other wetland-dependent species.

Undesirable fish such as fathead minnows, bullheads and carp infest many of the wetlands within the District. In addition, a wide variety of mammals inhabit Service owned lands, from small rodents to White-tailed deer and Moose.

3.5 Threatened and Endangered Species

Six threatened, endangered and candidate species are known to occur within the District (See Table 2: Threatened and Endangered Species within the Detroit Lakes Wetland Management District). In general, the majority of these species will be found in more natural habitats rather than in the farmed lands.

Species such as wolves may occasionally use these fields to feed. More detailed information for each species can be found online at:

<http://www.fws.gov/endangered/>

Table 2: Threatened and Endangered Species Within the Detroit Lakes Wetland Management District

Detroit Lakes Wetland Management District						
County	RELISTED-Th Gray Wolf	Threatened WPF Orchid	Threatened* Northern Long-eared Bat	Threatened Dakota Skipper	Candidate Sprague's Pipit	Endangered Poweshiek Skipperling
Becker	X		X			
Clay		X	X	X	X	X
Mahnomen	X		X			X
Norman		X	X	X		X
Polk	X	X	X	X	X	X

3.6 Invasive Species

Invasive species are defined as “non-native species whose introduction does, or is likely to cause economic or environmental harm or harm to human health” (National Invasive Species Council, www.invasivespecies.gov/). Invasive species can be plants, animals and microbes but discussion of invasive species in this EA refers to plant species.

Invasive species are a growing issue on lands within the District. While there are numerous invasive species found throughout the district, five are considered a major concern because of their ability to invade both native and restored habitat, decreasing their value to wildlife. The five species are:

- Smooth brome
- Kentucky bluegrass
- Common tansy
- Crown vetch
- Wild parsnip

3.7 Socioeconomic

In 2014 the US Census Bureau estimated 135,368 people living in the five county Wetland Management District. According to the 2012 Census of Agriculture there were 4,153 farms within the District (USDA 2014). In 2014 these farms raised soybeans on 874,000 acres and corn on 340,800 acres (USDA 2014). Sales of corn and soybeans accounted for \$820,587,000 in revenue in these five counties in 2012 (USDA 2014). More information regarding agricultural statistics can be found at the following website:

http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Minnesota/

3.8 Cultural Resources

Both prehistoric and historical cultural resources are distributed throughout the five county district. All areas that are farmed have been farmed and disturbed in the past and have little likelihood of finding cultural resources.

Chapter 4: Environmental Consequences

This chapter discusses the potential effects of the actions proposed in the alternatives. Included in the discussion are the effects to the environment and human communities associated with the use of farming and GMGT corn and soybeans on Detroit Lakes Wetland Management District lands.

4.1 Effects Common to All Alternatives

4.1.1 Endangered and Threatened Species

The use of GMGT corn and soybeans on District lands will not affect any threatened or endangered species. None of the plants and few of the animals listed as threatened or endangered in the Detroit Lakes Wetland Management District spend any time in corn or soybean fields. The USDA's APHIS completed environmental assessments of the use of GMGT corn and soybeans (USDA 2000, USDA 2007) and concluded:

1. There are no significant differences between the chemical compositions of GMGT and non-GMGT corn and soybeans. Contact with, or ingestion of GMGT corn and soybeans are very unlikely to have any effect on any plant and animal.
2. Feeding experiments with chickens failed to detect any differences between GMGT and non-GMGT corn and soybeans regarding mortality rates, weight gain and reproductive rates.
3. There are no known species of weeds that are sexually compatible with corn or soybeans, so there is no likelihood there can be an unintended transfer of genes to a threatened or endangered species.
4. Corn and soybeans are very unlikely to escape into natural habitats because corn and soybeans can only persist with intensive human management, so there is no chance they will escape into native habitats occupied by threatened or endangered species.
5. Use of GMGT corn and soybeans will not significantly alter cultivation practices. Grain production on private lands within the Detroit Lakes Wetland Management District will be dominated by soybeans and corn that are treated with herbicides, neonicotinoids and synthetic fertilizers.

The USDA's APHIS routinely reviews potential impacts for proposals of the general release of genetically modified crops. In that agency's environmental assessment of GMGT corn and soybeans, APHIS included and evaluation on threatened and endangered species prior to general release. The final EAs and Findings of No Significant Impact (FONSI) for both crops concluded that no effect is expected on federally listed threatened and endangered species, species proposed for listing or their proposed or designated critical habitats from exposure to GMGT corn or soybeans or from exposure to label rates of glyphosate expected to be used in conjunction with GMGT soybeans and corn. In addition, the U.S. Environmental Protection Agency has not received any reported adverse effects on threatened or endangered species or their habitats from exposure to glyphosate or GMGT soybeans and corn. The use of conventional corn and soybeans on District lands will not affect any threatened or endangered species. None of the plants and few of the animals listed as threatened or endangered in the Detroit Lakes Wetland Management District spend any time in corn or soybean fields. Western

prairie fringed orchid (*Platanthera praeclara*) is a threatened plant found in a few locations in Clay, Norman and Polk counties within the District. Western prairie fringed orchid may be negatively affected if exposed to herbicides during the growing season. This potential affect would need to be considered prior to herbicide application if any plants are located within the vicinity. However, Western prairie fringed orchid is found almost exclusively on native prairie sites and none are located in close proximity to farm fields on District lands. Using herbicides will not impact Western prairie fringed orchid if:

1. Herbicides are applied following pesticide label instructions. These instructions include information regarding the use of a particular herbicide around water, near sensitive habitats and near threatened and endangered species.
2. Conditions outlined in the Service's cooperative farming agreement are followed. Many of these conditions relate to the best management practices designed to protect soil and water, and manage pest and nutrients.
3. Pesticide Use Proposals are completed, as required by Service policy. Pesticide Use Proposals are required before the application of pesticides on Service lands. Impacts to threatened or endangered species are considered during this annual review.

4.1.2 Wildlife Habitat

Both alternatives will result in high quality, native wildlife habitat. All land that is being farmed will be restored back to native habitats instead of remaining in row crops such as soybeans or corn. These restored native habitats are more valuable to wildlife, particularly ground nesting waterfowl and grassland nesting birds. In addition, restoring row crop fields to native habitat reduces the amount of fertilizers and herbicides used as they are typically more sustainable in the long term.

4.1.3 Cultural Resources

The consequences of the planned management on cultural resources are the same across all alternatives. Since most of the agricultural activities have resulted in ongoing ground disturbance, any additional effects to cultural or historic resources are likely to be minor or non-existent. Any management actions with the potential to affect cultural resources require District Manager review, as well as review by the Service's Regional Historic Preservation Officer in consultation with the State Historic Preservation Office as mandated by Section 106 of the National Historic Preservation Act. Areas considered in this review have been previously farmed or disturbed, reducing the likelihood that impacts to cultural resources will occur.

4.1.4 Organic Soybeans

Organic farming is managed in accordance with the Organic Foods Production Act of 1990 to respond to site-specific conditions by integrating cultural, biological and mechanical practices that foster cycling of resources promote ecological balance and conserve biodiversity. The USDA National Organic Program develops implements and administers national production, handling and labeling standards (<http://www.ams.usda.gov/AMSv1.0/nop>). The use of genetic engineering is prohibited in the production of organic crops.

A review of potential impacts of glyphosate-tolerant soybeans and corn to Certified Organic Farmers was completed by APHIS prior to general release (USDA 2000, USDA 2007). The conclusion made was that for soybeans, there should be no apparent potential for significant impact to organic farming through deregulation and general release. Soybeans are highly self-pollinated with large, heavy seeds that are not easily dispersed. Therefore minimal buffer zones are needed to prevent cross-pollination to other soybeans or contamination of adjacent agricultural land (USDA 2007).

No negative impacts to organic soybean farming are anticipated under either alternative evaluated.

4.2 Effects of Management Alternatives

This analysis of effects compares how each of the two alternatives adheres to Service policy and how they affect environmental issues related to *Wildlife Issues*, *Habitat Issues* and *Socioeconomic Issues*. Table 3 below summarizes the effects of both alternatives.

Table 3: Summary of Alternative Effects

Summary of Alternatives		
Issues	Alternative A (Preferred Alternative) GMGT Crops Allowed	Alternative B GMGT Crops Prohibited
Wildlife	Increase in nesting waterfowl	Increase in nesting waterfowl
	Increase in grassland nesting birds	Increase in grassland nesting birds
	No increase in toxicity to aquatic resources	Potential increase in toxicity to aquatic resources
Habitat	Increase in high diversity native habitat	Increase in high diversity native habitat
	No herbicide movement into adjacent surface water	Potential increase in herbicide movement into adjacent surface water
	No residual herbicide carryover impacting habitat restoration	Potential herbicide carryover negatively impacting habitat restoration
	No herbicide movement into ground water	Potential herbicide movement into ground water
Socioeconomic	Small reduction in overall acreage of cropland within the District	Small reduction in overall acreage of cropland within the District
	No impact to local cooperators by changing farming practices	Potential impact to local cooperators by changing farming practices using non-GMGT crops

4.2.1 Alternative A: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Allowed

Under Alternative A, the use of GMGT corn and soybeans for habitat restoration on District lands would be allowed. Currently 84 percent of the farmed acres on District lands will be restored by 2018. The remaining 72 acres would be farmed in 2018 and restored in 2019. Under Alternative A, the District would adhere to the present schedule for restoring farmland to native habitat. Newly acquired tracts could also be farmed until being restored to native habitat.

The amount of cropland being actively farmed when acquired by the District is expected to decrease. This is due to the donation of lands by partner organizations. Typically when these lands are donated to the Service they are already restored. However, there will be some tracts that the District acquires in which active farming is taking place. Once these lands are acquired they will be restored to native vegetation within three years.

Glyphosate-resistant (GR) weeds are a concern in GMGT cropping systems. Fourteen GR weed species have been identified in the United States (Heap 2015). Of the 14 GR species identified in the US, three species have been reported in Minnesota (Heap 2015). The continued use of glyphosate as the primary herbicide in GMGT systems is the primary contributor to glyphosate-resistance in weeds (Livingston et al., 2015). Twelve best management practices (BMPs) were recommended by the Weed Science Society of America (WSSA) to reduce herbicide resistance in weeds (Norsworthy et al., 2012). These BMPs ranged from gaining an understanding of weeds to preventing the spread of weeds. Two of the most important practices were utilizing a diverse approach to weed management and using multiple modes of action (MOAs) to tackle difficult weed problems.

The three species of weeds identified in MN as GR are all annuals. These annual weeds, while a concern for agricultural producers, have not been shown to negatively impact the District's native habitat restorations. In fact, 33% of plants found in the first year of a restoration were annuals. By year five, this percentage had been reduced to 2%. More importantly, common ragweed, the only GR annual found, represented 3% of plants recorded in year one and was not recorded in year five. (Esser, USFWS, Unpublished Data).

While there is controversy regarding glyphosate's effect on human health, the Environmental Protection Agency (EPA) has established Maximum Contaminant Levels (MCL) for this herbicide. Exposure to levels above the MCL could result in congestion of the lungs and increased breathing rate (EPA 2009). Long-term exposure to levels above the MCL could result in kidney damage and/or reproductive effects EPA (EPA 2009). According to the EPA (2009) insufficient evidence exists to determine if glyphosate has the potential to cause cancer. Glyphosate does not bioconcentrate in aquatic organisms.

Alternative A would not increase the threat of herbicide toxicity to wildlife compared to Alternative B. In fact, Alternative A is advantageous to wildlife because it encourages conservation tillage and it is an efficient, cost-effective method of preparing farm land for conversion to native habitats. Alternative A would have no effect on seed availability or the local farming economy. It would have no effect on cooperators operations for weed control in crop fields as approximately 90 percent and 96 percent of corn and soybeans, respectively, are currently sprayed with Glyphosate within the five-county District. Ultimately, local cooperators would be affected due to fewer acres being farmed. The District Manager must determine whether the use of farming and genetically modified crops is required to accomplish

the establishing purpose of the District. Use also requires specific concurrence by the Midwest Region Refuge Chief.

4.2.2 Alternative B: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Not Allowed

Under alternative B, the use of GMGT corn and soybeans would be prohibited. Only conventional (non-GMGT) corn and soybeans would be allowed. Currently 84 percent of the farmed acres on District lands will be restored by 2018. The remaining 72 acres would be farmed in 2018 and restored in 2019. Under Alternative B, the District would adhere to the present schedule for restoring farmland to native habitat. Newly acquired tracts could also be farmed until being restored to native habitat.

The amount of cropland being actively farmed when acquired by the District is expected to decrease. This is due to the donation of lands by partner organizations. Typically when these lands are donated to the Service they are already restored. However, there will be some tracts that the District acquires in which active farming is taking place. Once these lands are acquired they will be restored to native vegetation within three years.

Negative impacts of herbicides evaluated under Alternative B include: known toxicity to fish and aquatic invertebrates, potential toxicity to other wildlife through movement into adjacent waters, and herbicide carryover in the soil. Alternative B would have no effect on seed availability. However, this alternative may impact local cooperators because their equipment is not set up for non-glyphosate chemical application. Alternative B would likely not impact the overall local farm economy but may have a negative impact on individual cooperators. Cooperators would likely need to change their overall farming practices for relatively few acres, thereby reducing profitability.

4.3 Environmental Justice

Executive order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Clinton on February 11, 1994. Its purpose was to focus the attention of federal agencies on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income community’s access to public information and participation in matters relating to human health or the environment. The proposed actions will have no impact on minority or low income populations.

4.4 Cumulative Impacts Analysis

Cumulative impacts are effects on the environment that result from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions. Potential cumulative effects for the alternatives are described in this section. The discussion considers the interaction of

activities on District lands with other actions occurring over a larger spatial and temporal frame of reference.

Service policy states:

“We do not allow refuge uses or management practices that result in the maintenance of non-native plant communities unless we determine there is no feasible alternative for accomplishing refuge purpose(s).” (601 FW 3 Biological Integrity, Diversity, and Environmental Health).

This policy and trends in land management practices indicate that future actions will result in more restoration of crop land to natural habitats on District lands. This trend is unlikely to have any significant impacts on a regional (five-county) scale when District lands currently cover only 1.4% percent of total acres within the District.

4.4.1 Alternative A: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Allowed

4.4.1.1 Wildlife Issues

In general, the cumulative effect of the District’s farming program is there will be fewer farmed acres and more restored natural areas under Alternative A. On a five-county scale, this reduction in farmed acres will likely have a positive impact on most wildlife-related issues by providing more suitable habitat for nesting grassland birds, species diversity for pollinators, and winter cover for resident wildlife.

4.4.1.2 Habitat Issues

The loss of grassland and wetland habitats within the five-county area continues. It is estimated that over 85 percent of wetlands in Minnesota’s Prairie Pothole Region have been lost to drainage (Johnson et al., 2008) and roughly 99 percent of tallgrass prairie in Minnesota has been lost (Minnesota County Biological Survey, 2011). Under Alternative A utilizing farming as a short-term management tool to convert row-crop fields to native grassland and wetland habitats allows the District to provide valuable habitat for a diversity of wildlife.

4.4.1.3 Socio-economic Issues

Because row crops on District lands are such a small part (0.04 percent) of the row crop acreage in the five-county area, it’s unlikely they would impact the larger economy. Alternative A does have a short-term impact on cooperative farmers because agricultural land will be converted to native habitats. Cooperative farmers will lose farming opportunities as all current cropland will be restored to native habitats by 2019.

4.4.2 Alternative B: Farming for Habitat Restoration Purposes Only, GMGT Corn and Soybeans Not Allowed

4.4.2.1 Wildlife Issues

Alternative B, as in Alternative A will result in an increase of native habitat and likely have a positive impact on most wildlife-related issues. However, Alternative B would not allow the use of Glyphosate to

control weeds. This would require the use of alternative herbicides that may be more harmful to wildlife. Table 4 shows the most common herbicides used on private land within the five-county District as well as their environmental concerns and length of carryover. While the District received approval for three non-glyphosate herbicides in 2015, it is likely the District would be asked to consider some of these herbicides for use on conventional beans. Herbicides such as Harness® and Surveil™ V are toxic to fish and/or aquatic invertebrates.

4.4.2.2 Habitat Issues

Similar to Alternative A, Alternative B utilizes farming as a short term management tool to convert row-crop fields to native grasslands, allowing the District to provide a diversity of wildlife habitat. However, unlike Glyphosate, which has no carryover, non-Glyphosate herbicides have the potential for significant carryover which impacts the ability of the District to restore habitat. See Table 4 for a comparison of commonly used herbicides and length of carryover as well as water quality concerns.

4.4.2.3 Socio-economic Issues

Alternative B would likely have a minimal impact on the larger overall economy because of the small acreage of cropland. However, the use of herbicides other than Glyphosate currently comprises less than 12 percent of the corn and 4 percent of the soybean crops (MDA 2014). Because non-Glyphosate products are rarely used, this would require a change in cooperators operations to apply these alternative chemicals, potentially impacting their profitability.

Table 4: Common Herbicides Used on Corn and Soybeans on Private Land Within the Detroit Lakes Wetland Management District (MDA 2014)

Active Ingredient	Potential Alternative Used	Trade Name	Crop	Carryover	Environmental Impacts*
Glyphosate	Alternative A	Roundup® Ultra	Corn/ Soybeans	none	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark
Mesotrione	Alternative B	Callisto®	Corn	18 mo. For grasses** 10-18 mo. For broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark High potential for runoff several weeks after application
Acetochlor	Alternative B	Harness®	Corn	18 mo. For grasses** 9 mo. For broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Toxic to fish Potential ground water contamination Potential surface water contamination
Dicamba	Alternative B	Banvel®	Corn	120 days for grasses and broadleaves****	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark
Diflufenzopyr	Alternative B	Distinct®	Corn	120 days for grasses** Up to 120 days for broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Known to leach into groundwater
S-metolachlor	Alternative B	Dual II Magnum	Corn	12 months for grasses** 4-9 mo. For broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Known to leach into groundwater High potential for runoff into surface water for several months
Clopyralid	Alternative B	Stinger®	Corn	None for grasses** 10.5-18 mo. For broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Potential to leach into groundwater Potential to impact surface water

Flumetsulam	Alternative B	Python® WDG	Corn	9 months for grasses** 4-18 mo. For broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Potential to leach into groundwater
Clethodim	Alternative B	Clethodim 2E	Soybeans	30 days for grasses** 30 days for broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark
Thifensulfuron	Alternative B	Harmony® GT XP	Soybeans	45 days for grasses** 45 days for broadleaves***	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark
Flumioxazin	Alternative B	Surveil™ V	Soybeans	None for grasses**** 10-12 mo. For some broadleaves****	Do not apply: <ul style="list-style-type: none"> • Directly to water • To areas surface water is present • To intertidal areas below the high water mark Toxic to non-target plants Toxic to aquatic invertebrates

* Environmental impacts taken from specified herbicide labels. <http://www.cdms.net/Label-Database>

** Carryover information gathered from Herbicide Carryover Potential for Forage Grasses table. <http://ipm.missouri.edu/PCPM/2012/8/Consider-Herbicide-Carryover-Potential-before-Planting-Wheat-or-Forage-Grasses-this-Fall/>

*** Carryover information taken from specified herbicide labels. <http://www.cdms.net/Label-Database>

**** Carryover information taken from crop restrictions and potential to injure fall cover crops. <http://extension.psu.edu/plants/crops/soil-management/cover-crops/herbicide-persistence/herbicide-carryover-table>

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