

Driftless Area

National Wildlife Refuge

Comprehensive Conservation Plan Approval

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Driftless Area

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Chapter 1: Introduction, Purpose and Need, Planning Background



Algific slope located on Driftless Area NWR. USFWS

Introduction

This document is a Comprehensive Conservation Plan (CCP) for the Driftless Area National Wildlife Refuge (Refuge). It follows the basic and accepted format for a CCP and stems from an Environmental Impact Statement (EIS) that was completed in 2006.

The Driftless Area NWR was established in 1989 under the authority of the Endangered Species Act of 1973 for the protection and recovery of the federally threatened Northern monkshood plant (*Aconitum noveboracense*) and endangered Iowa Pleistocene snail (*Discus macclintocki*). These species primarily occur on a rare and fragile habitat type termed algific

talus slopes (cold air slopes). The habitat harbors species that require a cold environment, some of which date from the ice age. The habitat is described in more detail in Chapter 3. These are areas where cold underground air seeps onto slopes to provide a constant cold microenvironment.

The Refuge consists of nine scattered tracts or 'units' totaling 781 acres. The Refuge contains upland hardwood forests, grassland, stream and riparian habitats.

Refuge Purpose and Management Background

The purpose of Driftless Area NWR is to conserve fish or wildlife that are listed as endangered or threatened species or plants (16 USC 1534 Endangered Species Act of 1973). The purpose and goals of the Refuge are directly tied to recovery plans which describe the conditions needed to recover the Northern monkshood and Iowa Pleistocene snail (U.S. Fish and Wildlife Service 1983, 1984).

The Refuge currently consists of nine units in Allamakee, Clayton, Dubuque, and Jackson Counties in northeast Iowa (Figure 1). The Refuge encompasses 781 acres, with individual units ranging from 6 to 209 acres (Table 1). The original authorized acquisition area for the Refuge was approximately 700 acres in eight counties in Iowa, Illinois, and Wisconsin (Figure 1) (U.S. Fish and Wildlife Service 1986). The most recent acquisitions were through land exchanges in 2001 and 2002. The Refuge has reached its approved acquisition acreage.

The purposes and goals of the Refuge are directly tied to original recovery plans which describe the steps needed to recover and conserve the Northern monkshood and Iowa Pleistocene snail (U.S. Fish and Wildlife Service 1983, 1984). Because of the fragile nature of their habitat and the low number of populations for each of these species, the primary recovery goal for both species is protecting and conserving the majority of remaining populations and their habitat. The primary threats to the habitat are grazing, logging, sinkhole filling, erosion, pesticides, invasive species, and development. Therefore, acquisition also includes land surrounding the endangered species habitat to provide a buffer area from some of these threats.

A management prospectus was completed by the Refuge in 1990 (U.S. Fish and Wildlife Service) to guide Refuge management. At that time, the Refuge consisted of the Howard Creek (208 acres) and Steeles Branch (15 acres) units. The prospectus outlined the need for strict protection of the algific slopes including fencing and signing, a low public use profile, and no development of public use facilities. Buffer areas to protect sinkholes, and cleaning of debris from sinkholes were also mentioned. Management of habitat surrounding algific slopes was to be through natural succession or planting, depending on the site. Most habitat management has occurred on the Howard Creek unit. Two former agricultural fields (51 acres) at the Howard Creek unit were planted with cool season grasses after cooperative farming ended around 1992. Over the years, box elder trees invaded these fields. Box elder trees and other invasive species were controlled with cooperative farming beginning in 1999 and 51 acres have been recently planted to native prairie grasses and forbs. Restoration and management of invasive species at this site are ongoing. Management on the other units has consisted of signing, fencing, law enforcement, and maintaining good relationships with the Refuge neighbors. The Howard Creek and Fern Ridge units were opened for public use in 1994. Northern monkshood population monitoring began in 1991 and Iowa Pleistocene snail population monitoring in 2001. Monitoring occurs on Refuge and sites owned by others.

Refuge Vision Statement

The vision for the Upper Mississippi River NWR Complex is:

The Complex is beautiful, healthy, and supports abundant and diverse native fish, wildlife, and plants for the enjoyment and thoughtful use of current and future generations. This can be stepped down to apply to Driftless Area NWR as follows: The Refuge is beautiful, healthy, and supports and conserves native and rare wildlife and plants for current and future generations.

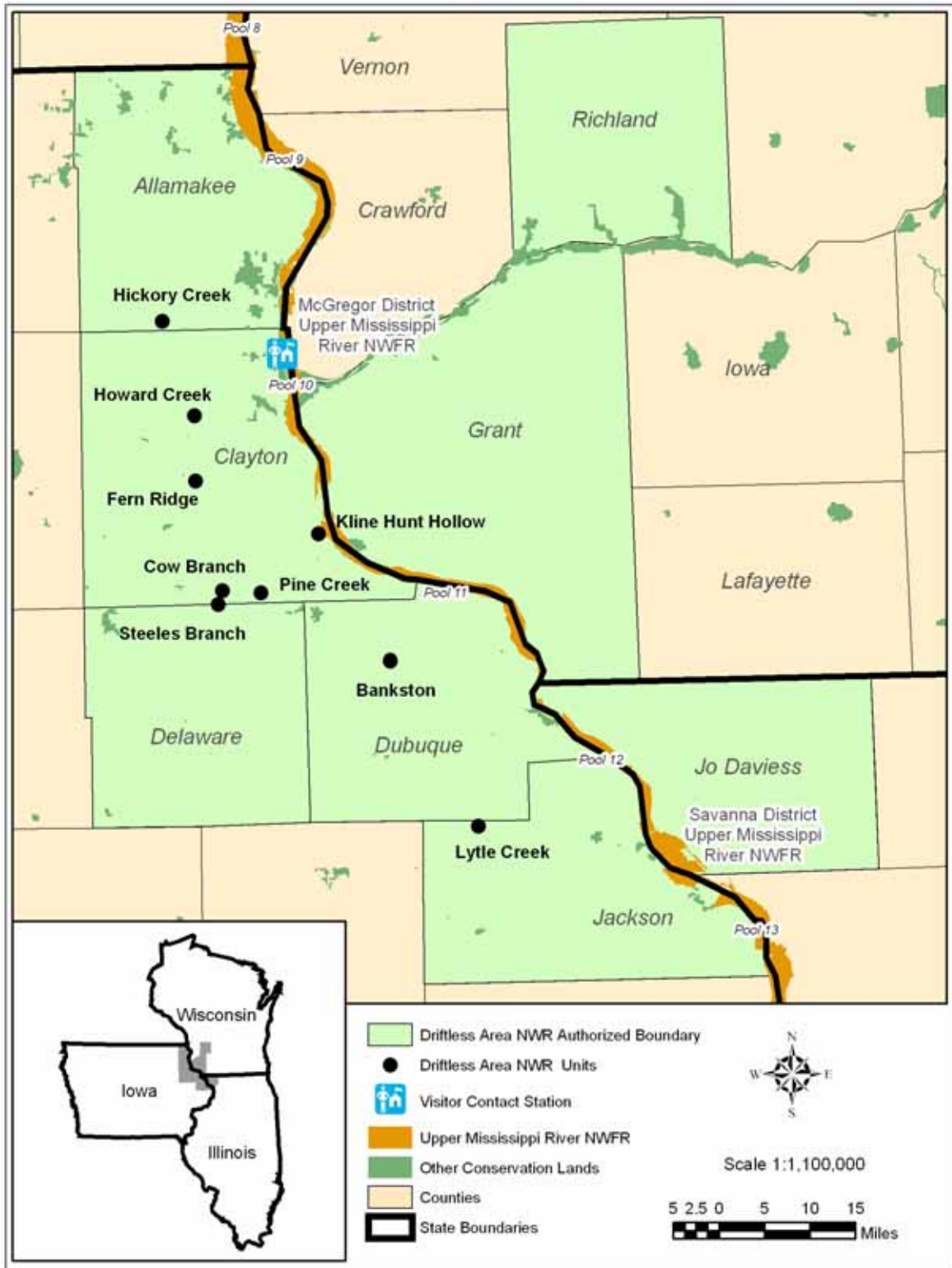
Purpose and Need for the Plan

Purpose

Comprehensive conservation plans are designed to guide the management and administration of national wildlife refuges for a 15 year period, help ensure that each refuge meets the purpose for which it was established, and contribute to the overall mission of the Refuge System. The CCP helps describe a desired future condition of the Refuge, and provides both long-term and day-to-day guidance for management actions and decisions. It provides both broad and specific policy on various issues, sets goals and measurable objectives, and outlines strategies for reaching those objectives. A CCP also helps communicate to other agencies, and the public, a management direction for a refuge to meet the needs of wildlife and people.

A long-term management direction did not exist for Driftless Area NWR. Management was guided by endangered species recovery plans, general policies, and shorter-term plans. The Refuge Improvement Act of 1997 mandates that the Secretary of the Interior, and thus the Service, prepare CCPs for all units of the National Wildlife Refuge System by October, 2012. In addition to this mandate, there are several reasons why preparation of a CCP was needed. There are new threats to

Figure 1: Location of Driftless Area NWR in Iowa



endangered species habitat, new laws and policies have been put in place, new scientific information is available, and levels of public use and interest have increased.

The National Environmental Policy Act of 1969 requires that federal agencies, and thus the Service, follow basic requirements for major actions significantly affecting the quality of the human environment. These requirements are: 1) consider every significant aspect of the environmental impact of a proposed action, 2) involve the public in its decision-making process when considering environmental concerns, 3) use a systematic, interdisciplinary approach to decision making, and 4) consider a reasonable range of alternatives. The EIS documents met those requirements and provided the necessary information and analysis to the decision-maker.

Finally, the planning process was an excellent way to inform and involve the general public, state and federal agencies, and non-government groups who have an interest, responsibility, or authority in the management or use of certain aspects of Driftless Area NWR.

Need

This CCP will help ensure that management and administration of the Refuge meets the mission of the Refuge System, the purpose for which the Refuge was established, and the goals for the Refuge. The mission, purpose, and goals are considered needs. These three needs are summarized in the following paragraphs. More detail on issues related to these needs can be found in the next chapter.



Golden saxifrage, Driftless Area NWR

Need 1: Contribute to the Refuge System Mission.

The mission of the National Wildlife Refuge System set forth in the Refuge Improvement Act of 1997 is:

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

Need 2: Help Fulfill the Refuge Purpose. The Refuge purpose is defined by the Endangered Species Act of 1973; that is: to conserve fish or wildlife which are listed as endangered or threatened species or plants (16 USC 1534 ESA). Achievement of the Refuge purpose will help reach endangered species recovery goals that will lead to delisting.

The Refuge has reached its existing approved acquisition acreage. Since Refuge establishment, additional information indicates the need to expand the Refuge geographic area and acreage, as well as to address ecological issues related to protection of endangered species.

Need 3: Help Achieve Refuge Goals.

Goal 1. Habitat: Conserve endangered species habitat and contribute to migratory bird and other wildlife habitats within a larger landscape. Related needs are to:

- # permanently conserve additional endangered species habitat to achieve delisting of the target species.
- # permanently conserve additional habitat for glacial relict species of concern to preclude listing
- # manage invasive species

- # restore grassland and forest habitats
- # assist others to manage off Refuge impacts to endangered species habitat

Goal 2. Species management: Manage and protect endangered species, other trust species, and species of management interest based on sound science through identification and understanding of algific slope communities and associated habitats. Related needs are to:

- # ensure all algific slopes and endangered species locations are known
- # inventory plants and animals associated with algific talus slopes
- # update the recovery plans for Iowa Pleistocene snail and Northern monkshood
- # determine the amount of buffer area needed to adequately protect algific slopes
- # assess deer impacts to the Refuge and endangered species

Goal 3. Visitor Services: Visitors understand and appreciate the role of the Refuge in protecting endangered species. Related needs are to:

- # provide wildlife-dependent recreation while protecting endangered species habitat
- # provide environmental education

National Wildlife Refuge System Mission, Goals, and Principles

The mission of the U.S. Fish and Wildlife Service is to work with others to conserve, protect, and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.

The U.S. Fish and Wildlife Service is the primary Federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. Specific responsibilities include enforcing Federal wildlife laws, managing migratory bird populations, restoring nationally important fisheries, administering the Endangered Species Act, and restoring wildlife habitat such as wetlands. The Service also manages the National Wildlife Refuge System.

Goals of the National Wildlife Refuge System

The Refuge System had its beginning in 1903 when President Theodore Roosevelt issued an Executive Order to set aside tiny Pelican Island in Florida as a refuge and breeding ground for birds. From that small beginning, the Refuge System has become the world's largest collection of lands specifically set aside for wildlife conservation. The administration, management, and growth of the Refuge System are guided by the following goals (Director's Order, January 18, 2001):

- # To fulfill our statutory duty to achieve refuge purposes and further the System mission.
- # To conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- # To perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.
- # To conserve a diversity of fish, wildlife, and plants.
- # To conserve and restore where appropriate representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- # To foster understanding and instill appreciation of native fish, wildlife, and plants, and conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

The National Wildlife Refuge System is a network of more than 540 refuges encompassing 95 million acres of lands and waters, 41 wetland management districts that are responsible for 2.4 million acres of Waterfowl Production areas, and 50 coordination areas covering 317,000 acres that are managed by State fish and wildlife agencies under cooperative agreements. Refuge System lands span the continent from Alaska's Arctic tundra to the tropical forests in Florida and from the secluded atolls of Hawaii to the bogs of Maine.



Northern Flicker: U.S. Fish & Wildlife Service

National wildlife refuges are established for different purposes. Most refuges have been established for the conservation of migratory birds, while some have been established to provide habitat for endangered species. Others have been formed to protect and propagate large mammals such as bison, elk, and desert bighorn sheep. Refuge habitats consist of a great diversity of plants and animals.

Refuges also provide unique opportunities for people. When it is compatible with wildlife and habitat needs, refuges can be used for wildlife-dependent activities such as hunting, fishing, wildlife observation, photography, environmental education and environmental interpretation. Many refuges have visitor centers, wildlife trails, automobile tours, and environmental education programs. Nationwide, an estimated 39.5 million people visited national wildlife refuges in 2003.

The National Wildlife Refuge System Improvement Act of 1997 established many mandates aimed at making the management of national wildlife refuges more consistent. The preparation of comprehensive conservation plans is one of those mandates. The legislation requires the Secretary of the Interior to ensure that the mission of the National Wildlife Refuge System and purposes of the individual refuges are carried out. It also requires the Secretary to maintain the biological integrity, diversity, and environmental health of the Refuge System.

Legal and Policy Framework

Driftless Area NWR is managed and administered as part of the National Wildlife Refuge System within a framework of organizational setting, laws, and policy. Key aspects of this framework are outlined below. A list of other laws and executive orders that have guided preparation of the CCP and EIS, and guide future implementation, are provided in Appendix E.

Driftless Area NWR is managed as part of the Upper Mississippi River National Wildlife and Fish Refuge Complex. The complex is completing a Comprehensive Conservation Plan for each unit, including Upper Mississippi River NWFR, Trempealeau NWR, and Driftless Area NWR. Because of the different purpose, land base, and management needs of Driftless Area NWR, this CCP is separate but following much the same time line and process as the other CCPs.

Compatibility Policy

No uses for which the Service has authority to regulate may be allowed on a unit of the Refuge System unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. Managers must complete a written compatibility determination for each use, or collection of like-uses, that is signed by the manager and the Regional Chief of Refuges in the respective Service region.

Biological Integrity, Diversity, and Environmental Health Policy

The Service is directed in the Refuge Improvement Act to “ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans...” The biological integrity policy helps define and clarify this directive by providing guidance on what conditions constitute biological integrity, diversity, and environmental health; guidelines for maintaining existing levels; guidelines for determining how and when it is appropriate to restore lost elements; and guidelines in dealing with external threats to biological integrity, diversity and health.

Wilderness Review

As part of the CCP process, we reviewed the lands within the boundaries of Driftless Area NWR for wilderness suitability. No lands were found suitable for designation as Wilderness as defined in the Wilderness Act of 1964. The Refuge does not contain 5,000 contiguous roadless acres, nor does the Refuge have any units of sufficient size to make their preservation practicable as Wilderness.

Chapter 2: The Planning Process

Introduction

Planning for Driftless Area NWR began with preparation of an Environmental Impact Statement. Public involvement efforts followed Service policy for comprehensive conservation planning, and also adhered to National Environmental Policy Act requirements for environmental documentation.

Originally, planning for Driftless Area NWR was included in planning for the Upper Mississippi River National Wildlife Refuge Complex, which in addition to Driftless Area NWR also includes Trempealeau NWR. It quickly became apparent that the Upper Mississippi River National Wildlife and Fish Refuge would be a significant planning project in its own right, and the two other refuges within the Complex would be better served by proceeding with comprehensive conservation planning and preparation of an EIS on their own. For that reason, the initial public scoping meeting held for Driftless Area NWR were held as part of the larger Upper Mississippi River NWR Complex planning project.



Prothonotary Warbler: USFWS

Meetings and Public Involvement

Four public scoping meetings were held in August and September 2002 to obtain input on issues. The meetings were held in Dubuque, Elkader, and Lansing, Iowa, and Prairie du Chien, Wisconsin, in combination with the Upper Mississippi River NWR scoping meetings. Eighty-four citizens attended and 21 comments were received. One additional written comment was received after the meetings. An evening “Manager for a Day” workshop was held in Elkader, Iowa in Spring 2003 to obtain potential solutions to the issues. There were 15 participants at the workshop. Four mailings of a CCP newsletter have been sent to a mailing list of 2,800 people including individuals, landowners, organizations, media, and congressional staff.

From public involvement activities, the Service learned about issues that concerned people about management of the Refuge. Refuge staff also identified issues. We organized the issues into four categories: Habitat Management, Visitor Services, Refuge Expansion, and Species Assessments. Alternatives were evaluated in the EIS on the basis of these issues.

Issues Identified in Scoping

Issue 1: Habitat Management

Because of the purpose of the Refuge, management of endangered species habitat is the top priority. Land acquired for the Refuge typically has been impacted by agricultural or logging activities. Habitats include hardwood forest, grassland and riparian areas. Refuge lands are small parcels, often fragmented from similar habitat in the area. Current management is to restore as much as practical to presettlement habitat types around algific slopes, although lack of funds and staff limit restoration efforts. Several external factors are influencing management efforts on the Refuge. Invasive species such as garlic mustard are impacting endangered species and other wildlife habitat. High local deer populations may also impact habitat. Erosion from farming adjacent to the Refuge can affect habitat on the Refuge.



Northern monkshood, Driftless Area NWR. Terry Tracy

Potential solutions identified by the public were to develop management strategies for forests, including consideration of deer impacts, expand management of habitats surrounding endangered species habitat, and work to control invasive species.

Issue 2: Visitor Services

Public use has not been emphasized on Driftless Area NWR because of concern for the fragile endangered species habitat, and the small size and lack of access to some units. Two of nine units are currently open to public use. Potential solutions suggested by the public were to maintain current hunting policies but increase awareness of regulations at the site, consider trail development in less sensitive areas, provide on-site information and education at select algific slopes while restricting direct access and negative impacts, provide guided walks, and encourage volunteers.

Issue 3: Refuge Expansion

The Refuge has reached its approved acquisition acreage. Refuge expansion will facilitate recovery goals and allow delisting of target species according to their recovery plans. Refuge land acquisition is aimed at protecting the entire algific slope system (endangered species habitat), including upland sinkholes and buffer area around the slope. Many of the currently protected algific slopes do not have adequate protection of sinkholes nor provide buffer from adjacent agricultural or other uses. Conservation of additional snail and monkshood populations is also needed to preserve genetic diversity over their range, protect large populations, and protect the majority of the populations as required by the recovery plans. Therefore expansion in Wisconsin is needed. Expansion in Minnesota would also allow protection of threatened Leedy's roseroot and species of concern. Protection of Service species of concern may preclude the need for future listing and would conserve a unique representative natural community and its biodiversity.

Potential approaches raised by the public were: to investigate other alternatives in addition to acquisition (e.g. conservation easements), increase funding for land protection, connect parcels of land where possible and expand boundaries to roads, railroads, or more recognizable features.

Issue 4: Species Assessments

Algific slopes were first described and mapped in the 1980s (Frest 1982, 1983, 1985, 1986, 1987). Additional information about algific talus slopes and the species that inhabit them is needed. For example, locations of sinkholes and specific information on distances and function of the cold air flow have not been studied. There are nearly 400 algific slopes/moderate cliffs in the Driftless Area, but not all are occupied by currently listed species. Few in-depth species surveys were done and many of

the known algific slope sites were only visited once. There may be rare, endemic, or unidentified species in this habitat. It is important to know what plants and animals depend on this habitat to prepare effective management strategies. Although original surveys to locate this habitat type were systematic and comprehensive, some sites likely remain undiscovered.

Review of the Draft EIS/CCP

The Draft EIS was released in May 2005 for a 60-day public review period. The review period extended from May 18 through July 22, 2005. During this review period, four public meetings were held in Decorah, Elkader, and Peosta, Iowa, and LaFarge, Wisconsin. Thirty-three people attended.

Approximately 156 copies of the DEIS summary and 87 copies of the Draft EIS were mailed based on the distribution list and upon request. A letter inviting comment was also sent along with the summary to 81 landowners who adjoin Refuge lands or who have species listed under the Endangered Species Act occurring on their land. Each Draft EIS summary contained information on how to obtain a copy of the DEIS.

Comments at the public meetings were recorded on a flip chart and a comment sheet was provided to encourage and facilitate additional written comments. Twelve comment letters or emails were received during the public review period and are included in the Final EIS. We adapted many of the revisions that were suggested regarding Refuge management. Several comments related to slight editorial corrections, and these comments were incorporated into the document.

Final EIS/CCP and Record of Decision

The Final EIS/CCP was distributed to local libraries and persons who requested the full document. The document was also posted on the Region's planning website. A project update was sent to elected officials and others who requested information about the project. The update described the highlights of the final document and how to request a copy. A Notice of Availability of the Final EIS/CCP was published in the Federal Register by the Environmental Protection Agency on February 17, 2006.

No comments were received in the 30 days after the publication of the Federal Register notice.

The Regional Director signed a Record of Decision on April 18, 2006.

Chapter 3: Refuge Environment and Management



Algific slope on a preserve of The Nature Conservancy.

Physical Environment

The namesake of the Refuge, the Driftless Area, is a region characterized by a near absence of glacial deposits, or glacial drift, causing it to be named the 'Driftless Area' by early geologists. Its rugged, dissected terrain resulted from weathering and stream erosion of Paleozoic age limestone bedrock (Prior 1991). The karst topography with caves, coldwater springs and streams, hardwood forests, and the Upper Mississippi River valley set northeast Iowa apart from the rest of the state. Karst is a type of topography that is formed on limestone and other soluble rocks, primarily by dissolution

from water. The Driftless Area also includes southeast Minnesota, southwest Wisconsin, and extreme northwest Illinois. Some portions of the Wisconsin Driftless Area are truly unglaciated. This area is one of the ecotypes identified in the U.S. Fish and Wildlife Service's Upper Mississippi River/Tallgrass Prairie ecosystem. Streams cutting into bedrock have created many cliffs and algal talus slopes which constitute habitat for a large number of plant species that are either unique to this area or well out of their normal ranges.

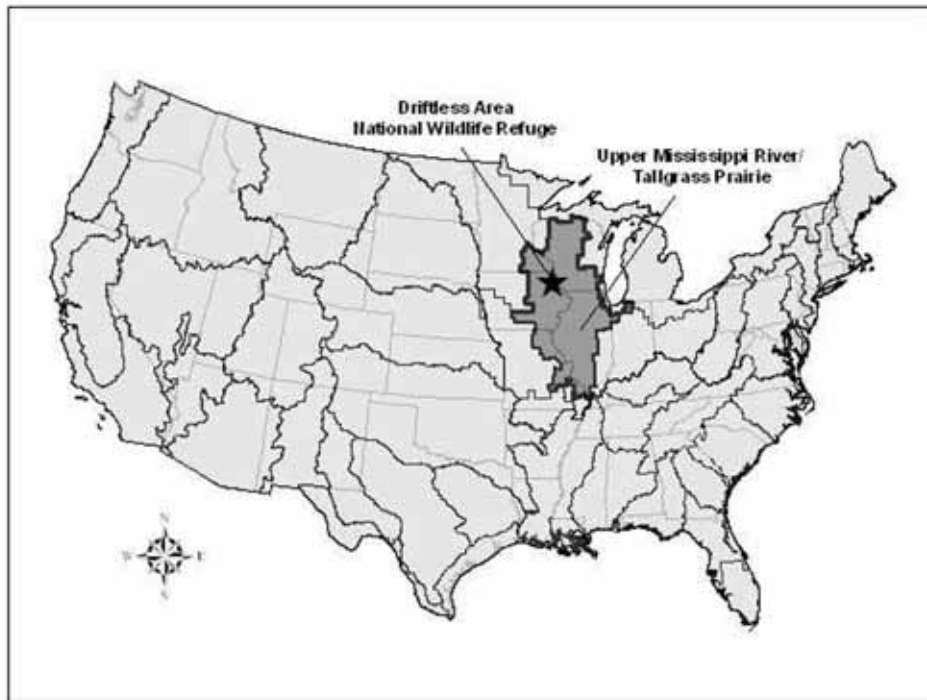
The Refuge currently includes nine scattered tracts that amount to 781 acres (Table 1). Habitat types found on the Refuge include hardwood forests, grassland, streams, and riparian habitats. The Driftless Area is within the eastern broadleaf forest (continental) province identified by Bailey (1995). The Refuge lies within the Mississippi flyway.

Upper Mississippi River/Tallgrass Prairie Ecosystem

The U.S. Fish and Wildlife Service has implemented an ecosystem approach to fish and wildlife conservation. Under this approach the Service's goal is to contribute to the effective conservation of natural biological diversity through perpetuation of dynamic, healthy ecosystems by using an interdisciplinary, coordinated strategy to integrate the expertise and resources of all stakeholders.

Driftless Area NWR lies within the Upper Mississippi River/Tallgrass Prairie Ecosystem (Figure 2). The Upper Mississippi River/Tallgrass Prairie Ecosystem is one of eight ecosystems that comprise the Great Lakes-Big Rivers Region (Region 3) of the U.S. Fish and Wildlife Service. The Upper Mississippi River/Tallgrass Prairie Ecosystem is a large and ecologically diverse area that encompasses land in the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The

Figure 2: Upper Mississippi River/Tallgrass Prairie Ecosystem



Mississippi River bisects the Ecosystem east and west. Major rivers in the Ecosystem include the Minnesota, Chippewa, Black, Wisconsin, Iowa, Rock, Skunk, Des Moines, Illinois, and Kaskaskia (Figure 3).

Migratory Bird Conservation Initiatives

U.S. Fish and Wildlife Service and other conservation plan priorities for migratory birds, such as Partners in Flight, are used to develop management guidelines for birds. The Refuge is within the Upper Great Lakes Plain physiographic area 16 as identified by the Partners in Flight Bird Conservation Plan (Knutson et al. 2001) and Bird Conservation Region 23 (Prairie Hardwoods Transition) identified by the North American Bird Conservation Initiative (Figure 4).

Iowa, Minnesota, Wisconsin, and Illinois are currently writing state wildlife conservation plans. Wisconsin has a Bird Conservation Plan, and Minnesota is working towards one. The Refuge will incorporate elements of these plans into management when possible.

Region 3 Fish and Wildlife Resource Conservation Priorities

The Government Performance and Results Act (GPRA) required the U.S. Fish and Wildlife Service to identify its most important functions and to direct its limited fiscal resources toward those functions. From 1997 to 1999 within Region 3, a group looked at how best to identify the most important functions of the Service within the region. The group recognized that the Service has a complex array of responsibilities specified by treaties, laws, executive orders, and judicial opinions that dwarf the agency's budget. The group recognized that at least two approaches are possible in identifying conservation priorities – habitats and species. The group chose to focus on species because 1) species represent biological and genetic resources that cannot be replaced; 2) a focus on species conservation requires a concurrent focus on habitat; and 3) by focusing on species

Figure 3: Watersheds Surrounding Driftless Area NWR

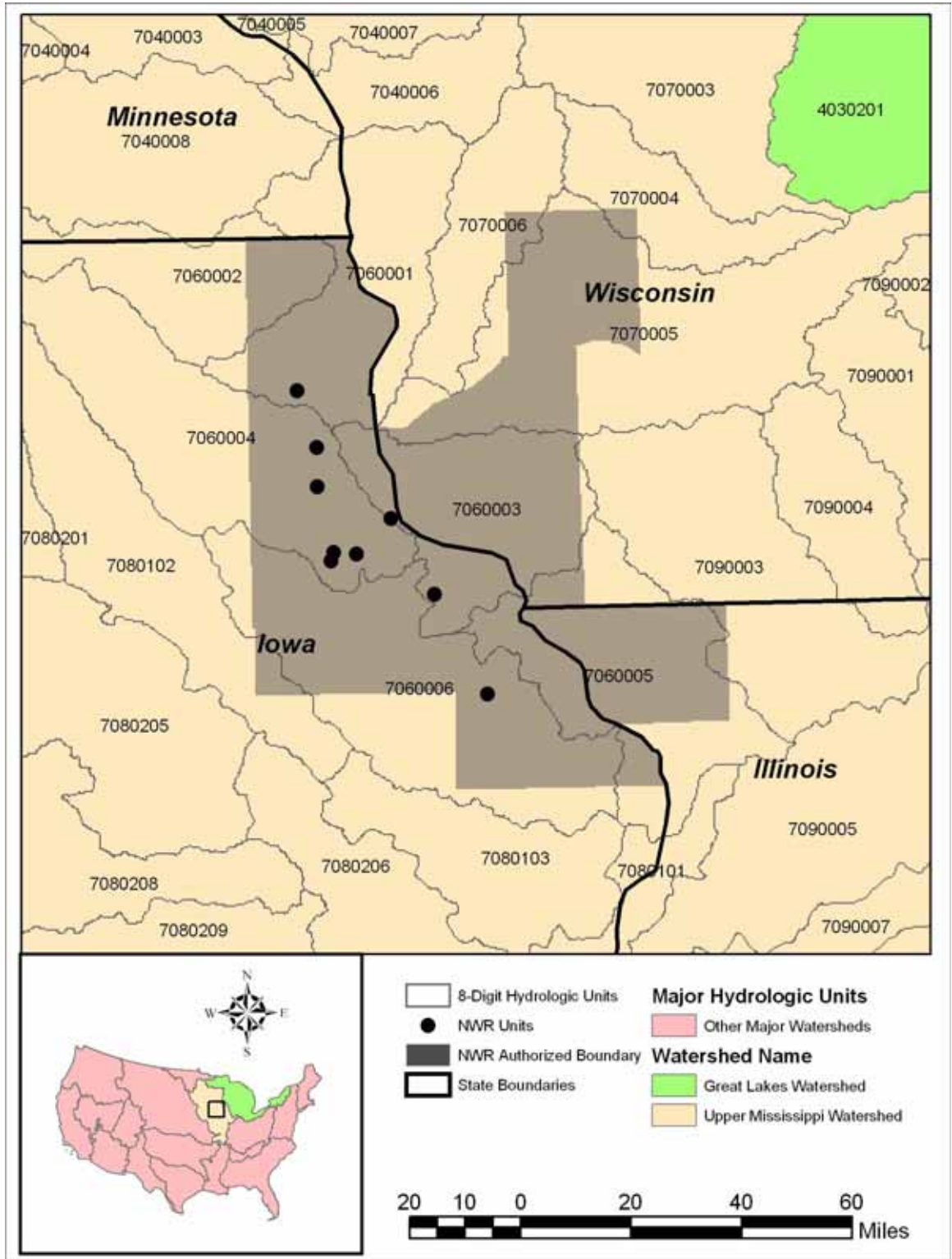
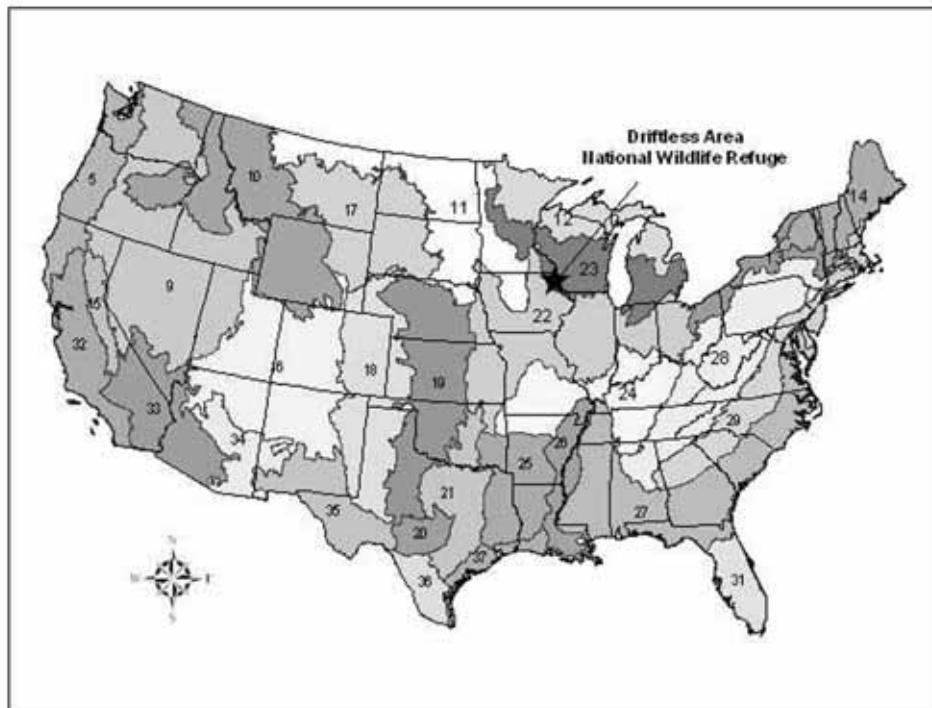


Figure 4: Bird Conservation Regions, Region 3 of the USFWS



assemblages and identifying areas where ecological needs come together the Service can select the few key places where limited efforts will have the greatest impact. Representatives of the migratory bird, endangered species, and fisheries programs in Region 3 identified the species that require the utmost attention given our current level of knowledge. Representatives prioritized the species based on biological status (endangered or threatened, for example), rare or declining levels, recreational or economic value, or “nuisance” level. The group pointed out that species not on the prioritized list are important too. But, when faced with the needs of several species, the Service should emphasize the species on the priority list. The Iowa Pleistocene snail, Northern monkshood, Leedy’s roseroot, and glacial relict snails are among the Regional Resource Conservation Priorities.

Climate

Climate conditions across the driftless region can vary greatly. Rainfall amounts are 32 to 34 inches annually with a growing season ranging from 135 to 155 days. In LaCrosse, Wisconsin, near the middle of the driftless area, the annual average temperature is 46.3 degrees Fahrenheit. The average minimum temperature is 36.6 degrees Fahrenheit and the average maximum temperature is 56.2 degrees Fahrenheit. Temperatures can range from well below zero in winter to 100 degrees in summer. The average relative humidity is 76 percent.

Soil and Water

Soils vary because Refuge units are scattered over a large area. Most of the soils are forest derived. Some savanna and prairie soils occur, mainly on the Howard Creek unit. All of the units contain some rock outcroppings or cliffs, and rocky soils. Soils are generally erodible. Water sources are from springs and streams on, or adjacent to, the Refuge units. The primary contaminant sources are from nonpoint source runoff from adjacent agricultural fields that could contain excess nutrients and

pesticides. Runoff may contaminate sinkholes and groundwater in addition to surface water. Water quality on the Refuge has not been tested. A contaminant assessment of the Refuge has been completed by the Service's Division of Ecological Services.

Fire

Wildfires in northeast Iowa are primarily from human caused road ditch fires that escape. Prescribed fire is used regularly on the Refuge as a habitat management tool. Periodic burning of grasslands reduces encroaching woody vegetation such as box elder. Fire also encourages the growth of desirable species such as native, warm-season grasses and forbs. Prescribed fires on the Refuge have only occurred on the Howard Creek unit and range from 10 to 60 acres depending on the goal of the burn. Burning does not occur every year. Prescribed fire may be used on other units in the future.

Socioeconomic Environment

The economy of communities near the Refuge lands are primarily based on farming with some industry and tourism jobs. Crops are mainly corn and soybean with beef and dairy cattle operations occurring in the area. Some timber harvest also occurs. Most communities in the area are under 10,000 people. The largest community is Dubuque, Iowa with a population of about 70,000.

Refuge Resources

Habitat/Vegetation



Cold air vent on an algalic talus slope with the rare plant golden saxifrage growing near it. USFWS

The Refuge contains upland hardwood forests, grassland, stream and riparian habitat (Figures 6-14). The Refuge provides wildlife habitat similar to that in the remainder of the region where lands are not farmed. The driftless region is a transition zone between eastern hardwood forests and midwestern tall grass prairies. Vegetation classifications for northeast Iowa vary (Cahayla-Wynn and Glenn-Lewin 1978). Glenn-Lewin et al. (1984) describe it as a dynamic area where vegetation probably never has been in a climax state. Historic habitats range from tallgrass prairie and savanna to maple/basswood and oak/hickory forest and riparian areas (Kemperman 1983, Glenn-Lewin et al. 1984). The presettlement forest was primarily oak (Glenn-Lewin et al. 1984). Fire was a natural part of the Driftless Area ecosystem, maintaining prairie and savanna. Because of the karst geology, wetland habitats are not predominant except along streams and rivers. _

Currently, despite the terrain, row crop and livestock agriculture is common. Prairie and savanna areas were converted to row crop or pasture and few unaltered native vegetation remnants exist. Patches of forest were cleared for agriculture, but the more rugged areas still support hardwood forest. Logging, grazing, development, and fire

Figure 5: Algific Talus Slope Diagram¹



1. Courtesy of The Nature Conservancy

suppression have impacted the remaining fragmented forests (Hemesath and Norris 1998). All forests on Refuge units were selectively logged at some time in the past; most within the last 30 years. Most Refuge forests were also subject to grazing. Invasive species occurring on the Refuge include garlic mustard, multiflora rose, leafy spurge, wild parsnip, Canada thistle, European buckthorn, and honeysuckle.

Algific Talus Slopes

The habitat of the Iowa Pleistocene snail and Northern monkshood and other rare species is the algific talus slope. This habitat, usually north facing, occurs where air circulation over underground ice produces a constant stream of moist cool air through vents onto the adjacent hillsides (Figure 5). These cold air vents are typically covered with a loose talus layer and a thin plant and litter cover. Some of these species, like Leedy's roseroot, occur on moderate cliffs. This is a similar habitat, where the overlying talus layer does not exist, generally because of removal by past erosive forces. Only the (now exposed) rock formation remains. Cool subsurface air flows out from the cliff face. Algific talus slopes and moderate cliffs vary in size from a few yards to one-half-mile in length. Sinkholes above the slope are important to the function of the habitat as a source of air and water flow and are included in Refuge protection when possible. Several sinkholes are usually associated with algific talus slopes and can be up to one-half mile away. Air flowing from surface vents ranges from 30 degrees F to 55 degrees F spring to fall (U.S. Fish and Wildlife Service 1984).

The vegetative community on algific talus slopes is different than the surrounding forest and typically contains ferns, mosses, liverworts, evergreen species such as Canada yew and balsam fir, birch, basswood, and sugar maple, and boreal disjunct herbs and ferns (Glenn-Lewin et al. 1984). The algific talus slopes also harbor state threatened and endangered plants and animals (Appendix

C) and in general support an entire community of rare or disjunct species. Algific talus slopes are ranked by NatureServe as a G2 community meaning that they are imperiled globally because of rarity. Service species of concern that occur on algific slopes include eight species of glacial relict snails: *Vertigo meramecensis*, *V. brierensis*, *V. iowensis*, *V. hubrichti*, *V. occulta*, *Catinella gelida*, *Novisuccinea Sp A* and *Sp B*. Some or all of these species are also listed by state law as threatened or endangered in Iowa, Illinois, Wisconsin, and Minnesota (Appendix C). Golden saxifrage (*Chrysosplenium iowense*) is a plant associated with algific slopes that is listed as threatened by Iowa and Minnesota and is included in the Service's draft species of concern list.

Most of the original inventories of algific talus slopes were done by Frest (1982, 1983, 1985, 1986, 1987). There are nearly 400 known algific slopes/moderate cliffs in the Driftless Area (Figure 6). Not every site contains the above species. Some sites have never been thoroughly surveyed for these species, particularly for snails. Although original surveys to locate this habitat type were systematic and comprehensive, some sites likely remain undiscovered.

Wildlife

U.S. Fish and Wildlife Service Region 3 migratory non-game birds of management concern that may occur on the Refuge are:

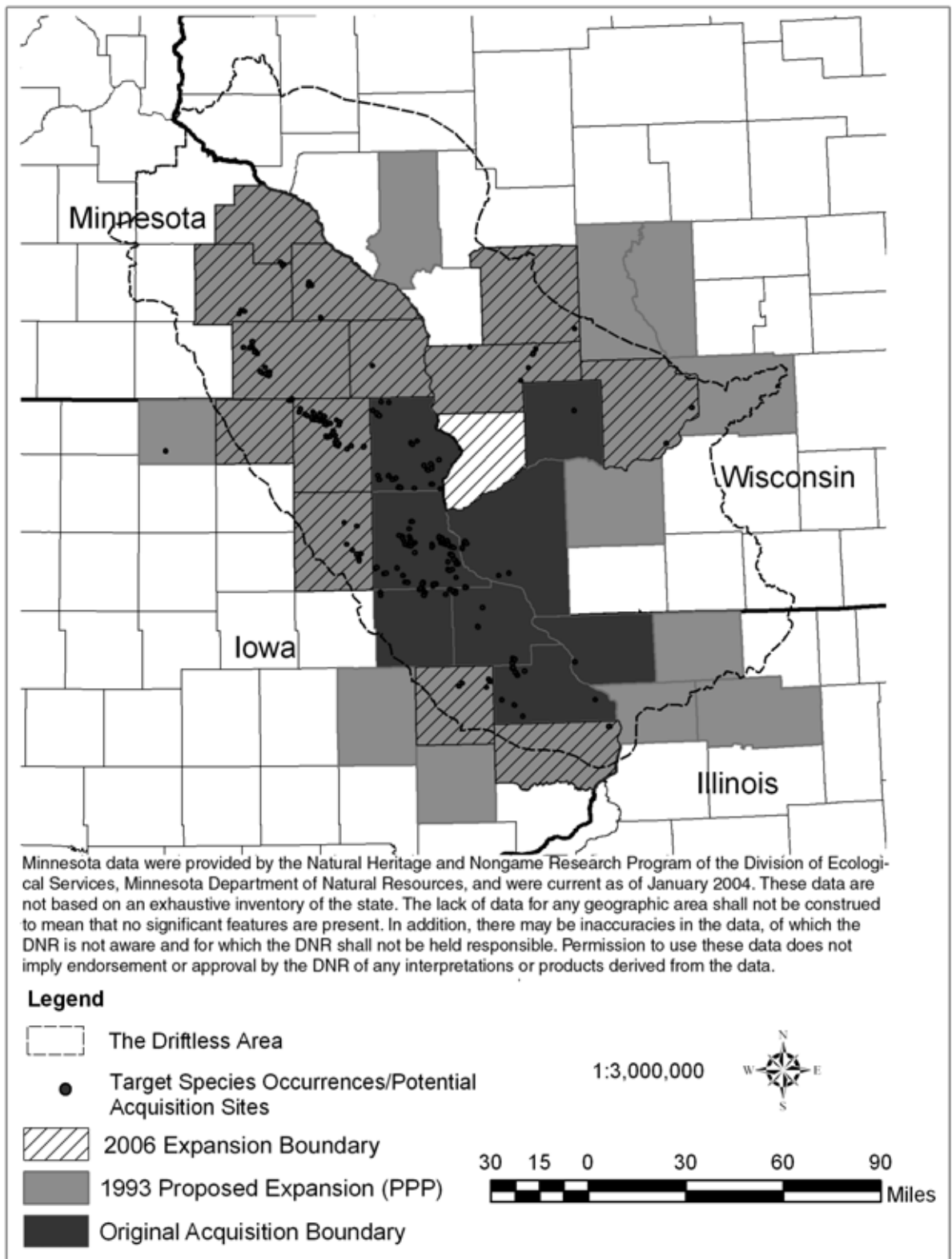
- # Northern harrier
- # Red-shouldered Hawk
- # Yellow-billed Cuckoo
- # Red-headed Woodpecker
- # Northern Flicker
- # Sedge Wren
- # Veery
- # Wood Thrush
- # Loggerhead Shrike
- # Blue-winged Warbler
- # Golden-winged Warbler
- # Chestnut-sided Warbler
- # Cerulean Warbler
- # Dickcissel
- # Field Sparrow
- # Grasshopper Sparrow
- # Bobolink
- # Eastern Meadowlark.

In addition to most of the above, Region 3 resource conservation priority bird species¹ that occur in northeast Iowa, and likely on the Refuge, are:

- # Wood Duck
- # Mallard
- # Blue-winged Teal
- # American Woodcock
- # Black-billed Cuckoo
- # Whip-poor-will
- # Louisiana Waterthrush
- # Kentucky Warbler

1. U.S. Fish and Wildlife Service 2002

Figure 6: Algific Talus Slopes and Target Species Occurrences in the Driftless Area

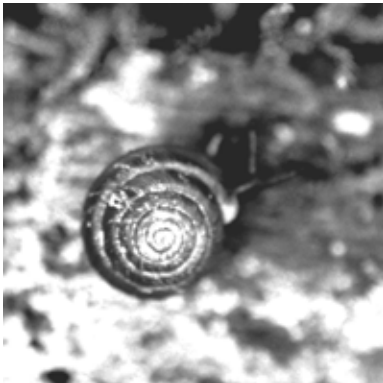


Many other migratory birds occur on the Refuge, including:

- # Mourning Dove
- # American Robin
- # Eastern Bluebird
- # Red-bellied Woodpecker
- # Pileated Woodpecker
- # Song Sparrow
- # Common Yellowthroat
- # Red-eyed Vireo
- # Brown Thrasher
- # Yellow Warbler
- # Common Grackle
- # Red-tailed Hawk

The Partners in Flight Bird Conservation Plan for the Upper Great Lakes Plain (Knutson et al. 2001) identifies priority bird populations and habitats. Some of the following priority species do occur, or likely occur, on the Refuge²:

- # Dickcissel
- # Bobolink
- # Red-headed Woodpecker
- # Blue-winged Warbler
- # Field Sparrow
- # Black-billed Cuckoo
- # Cerulean Warbler
- # Acadian Flycatcher
- # Kentucky Warbler
- # Prothonotary Warbler



Iowa Pleistocene snail. Bob Clearwater

Notable resident wildlife include white-tailed deer, Wild Turkeys, Ruffed Grouse, Ring-necked Pheasant, coyotes, numerous small mammals, and timber rattlesnakes. Predators may be important in the context of impacting breeding birds on the Refuge. Trout species occurrence on the Refuge is currently limited. Declines in timber rattlesnakes are of concern to some state agencies and they are listed as threatened by the State of Minnesota and are a Resource Conservation Priority species for the Service. Although they have not been seen on the Refuge, they likely occur and may occur on lands acquired in the future.

Threatened and Endangered Species

Fossil records show that the Iowa Pleistocene snail existed 400,000 years ago and was widespread in the Midwestern United States. It was thought to be extinct until discovered in Iowa in 1928. It was listed as federally endangered in 1977. It is also listed by state law as endangered in Iowa and Illinois. The Iowa Pleistocene snail is a relict species that has survived on these small areas of suitable habitat and is currently known to exist at 36 locations in Iowa and one in Illinois. The snail has narrow temperature, moisture and food requirements found only on algific talus slopes (Frest 1984). Adult shell diameter is 5-7 mm. Populations on each of the known sites vary from 500 to 10,000

2. *Hemesath and Norris 1998*

individuals. Each snail colony is a separate population as migration between algific slopes is unlikely, though could occur with flood events or transport by other animals (Ross 1999). Other glacial relict snails also appear to be restricted to algific talus slope or moderate cliff habitat and presumably cannot withstand even moderate changes in their environment (Frest 1991).

Northern monkshood was listed as federally threatened in 1973. It is also state listed as threatened in Iowa, Wisconsin, and New York, and endangered in Ohio. It does not occur in any other states, and the majority of the known populations occur in Iowa. There are 83 known sites in Iowa, 18 in Wisconsin, two in New York, and one in Ohio. Population sizes range from a few individuals to 10,000 plants. Most sites have a few hundred to 1,000 plants. Northern monkshood is a member of the buttercup family (Ranunculaceae) and grows on cool moist habitat including algific talus slopes and sandstone cliffs. Currently all monkshood sites on the Refuge are algific talus slopes. The plant requires specific temperature and moisture regimes (U.S. Fish and Wildlife Service 1983). Its hood shaped flower is adapted for bumblebee pollination and is typically purple in color, but can vary from white to blue and purple.

Leedy's roseroot does not currently occur on the Refuge, but future additions to the Refuge may be for the purpose of protecting this species. Leedy's roseroot was listed as threatened in 1992 and is a member of the stonecrop family (Crassulaceae). It grows on cool cliff habitats only in southeast Minnesota and New York. The four Minnesota populations each contain a few hundred plants. It has waxy, succulent leaves with small dark red to yellow flowers arranged in dense heads at the end of the stem. Male and female flowers occur on separate plants.

The only federally threatened or endangered bird occurring on the Refuge is the Bald Eagle, recently proposed for delisting. There are no known eagle nests on the Refuge.

Threats to Resources

Algific slopes and the plant and wildlife species that depend on them are fragile. Once damaged, or destroyed, this kind of habitat cannot be restored. Currently, threats to these sites are cattle grazing, logging, quarrying, building or development, invasive species, sinkhole filling, erosion, human traffic, pesticides, and natural landslides. Without some form of protection, populations of these species could be lost in a single event. The Refuge is focusing land acquisition efforts on protecting a specific type of endangered species habitat, but these efforts will also include forest, grassland, cropland, and streams surrounding the endangered species to protect sinkholes and provide buffer areas. The surrounding vegetation can influence temperature on the algific slopes, a required component of the habitat for these species.

Administrative Facilities

Driftless Area NWR shares Headquarter space with the McGregor District of Upper Mississippi River National Wildlife and Fish Refuge in McGregor, Iowa. In addition, the Refuge receives administrative support, law enforcement support and maintenance support from the McGregor District. Volunteers assist with some Refuge activities.

Cultural Resources

The uplands, floodplains, and tributaries of the driftless area offered a variety of resources to prehistoric populations. The area has a cultural history of 11,500 years with the Paleo-Indian peoples. Archeologists hypothesize that small family-groups of hunters-gatherers roamed widely in search of mega-fauna and other resources. The presence of these people is usually recognized through surface finds of their fluted spear points; none of these points have been identified within the Refuge.

People of the 6,000-year long Archaic tradition adapted their subsistence practices to changing environmental, habitat, and resources based changes including the 2,000-year very warm and dry altithermal that ended about 5,000 years ago. Extensive trade routes brought in exotic materials. People buried their dead in natural knolls. Archaic tradition cultural practices gradually evolved into the subsequent Woodland tradition.

Commencing around 3,000 years ago was the Woodland tradition. Archeological sites usually include pottery, arrowheads, and artificial mounds used for human burials and for other purposes. People exploited a wide range of habitats in an environment similar to that found in the early historic period. The people lived in larger, semi-permanent villages, practiced horticulture, and at some period participated in long distance trade. In some respects, Europeans coming into the Upper Mississippi River valley encountered people of the Woodland culture, some of whom may have been the ancestors of the Eastern Dakota Indians.

The Mississippian period started in the Saint Louis area about 1,000 years ago and moved up the Mississippi River. A related cultural group known as the Oneota, which may have developed from the Late Woodland culture, is more evident in the archeological record. Late Oneota people probably were the ancestors of the Ioway, Oto, Missouriia, and Winnebago Indian tribes.

Twenty-seven previously identified archaeological sites are located within one mile of the 17 units studied by Commonwealth Cultural Resources Group in 2002. These study units included current Refuge lands and areas of potential Refuge acquisitions. Twenty-two of these sites are prehistoric and one is a multi-component prehistoric and protohistoric site, one includes both prehistoric and historic components, and three are historic sites. The majority of prehistoric sites cannot be assigned to a specific period.

The following listed Indian tribes have been recognized by the federal government or self-identified by the tribe as having a potential concern for traditional cultural resources, sacred sites, and cultural hunting and gathering areas in the counties in which the Refuge is located.

- # Delaware Nation of Oklahoma
- # Flandreau Santee Sioux
- # Forest County Potawatomi Community
- # Hannahville Indian Community of Michigan (Potawatomi)
- # Ho-Chunk Nation of Wisconsin
- # Iowa Tribe of Kansas and Nebraska
- # Iowa Tribe of Oklahoma
- # Osage Nation of Oklahoma
- # Otoe-Missouria Tribe
- # Peoria Indian Tribe of Oklahoma
- # Sac & Fox Tribe of the Mississippi in Iowa
- # Sisseton-Wahpeton (Sioux) Oyate
- # Devils Lake Sioux Tribal Council
- # Upper Sioux Community of Minnesota
- # Winnebago Tribe of Nebraska
- # Wyandotte Tribe of Oklahoma

Although Indian tribes are generally understood to have concerns about traditional cultural properties, other organizations such as church congregations, civic groups, and county historical societies could have similar concerns.

A cultural resources overview and management study was prepared in 2002 as part of the Comprehensive Conservation Plan for the Refuge (Commonwealth Cultural Resources Group 2003). The document is available at the Refuge office, McGregor, Iowa. The report presents a cultural

history beginning 11,500 years ago through prehistoric and historic periods, ending in the 20th century. Current Refuge lands as well as potential acquisition areas were evaluated for the presence of archeological sites. Two historic sites were located on the Refuge units. The location of reported prehistorical and historic archeological sites within one mile of the Refuge units, and analysis of geomorphological data indicates high potential for unrecorded sites on most Refuge units. The document has a chapter about consultation processes identified in the National Historic Preservation Act of 1966 as amended, and a chapter that summarizes the responses to a letter sent to over 100 tribal communities, historical societies, and research groups who have potential interest in resources on the Refuge. The report concludes that a variety of cultural resources must be considered during any field projects associated with the Refuge. A comprehensive bibliography of cultural resources reports produced for studies performed within the vicinity of the Refuge is also included. Finally, a chapter on management of cultural resources under Section 106 of the National Historic Preservation Act is provided for use in Refuge management.

Cultural resources are an important part of the nation's heritage. The U.S. Fish and Wildlife Service is committed to protecting valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the U.S. Fish and Wildlife Service's mandate to protect fish, wildlife, and plant resources.

Public Use

Public use is currently minimal since most units are closed to protect endangered species or because access is limited. On two Refuge units that are open, most visitation is during the hunting season. Most users are bow hunting for deer. There were 2,741 visitors in FY 2003. This figure includes visitors to the McGregor District Visitor Contact Station.

Current Refuge Management Activities

Landcover for each of the Refuge's nine units is displayed in Table 1 on page 32 and the following figures:

- # Bankston Unit (Figure 7)
- # Cow Branch Unit (Figure 8)
- # Fern Ridge Unit (Figure 9)
- # Hickory Creek Unit (Figure 10)
- # Howard Creek Unit (Figure 11)
- # Kline Hunt Hollow Unit (Figure 12)
- # Lytle Creek Unit (Figure 13)
- # Pine Creek Unit (Figure 14)
- # Steeles Branch Unit (Figure 15)

The current management practice is to protect endangered species habitat, restore other habitats to presettlement vegetation when possible, control invasive species, and permit limited public use that is compatible with the purposes of the Refuge. Presentations and tours are given as requested and staff time allows. The Refuge office is co-located with the McGregor District of Upper Mississippi River NWR. An equipment storage warehouse and information kiosk were constructed in 2004 on the Howard Creek unit of the Refuge. Boundary fences and dirt surfaced roads are the only other constructed developments on the Refuge. One full-time Refuge Operations Specialist is assigned to the Refuge and supervised by the District Manager, McGregor District, Upper Mississippi River NWR.

Figure 7: Bankston Unit Landcover, Driftless Area NWR

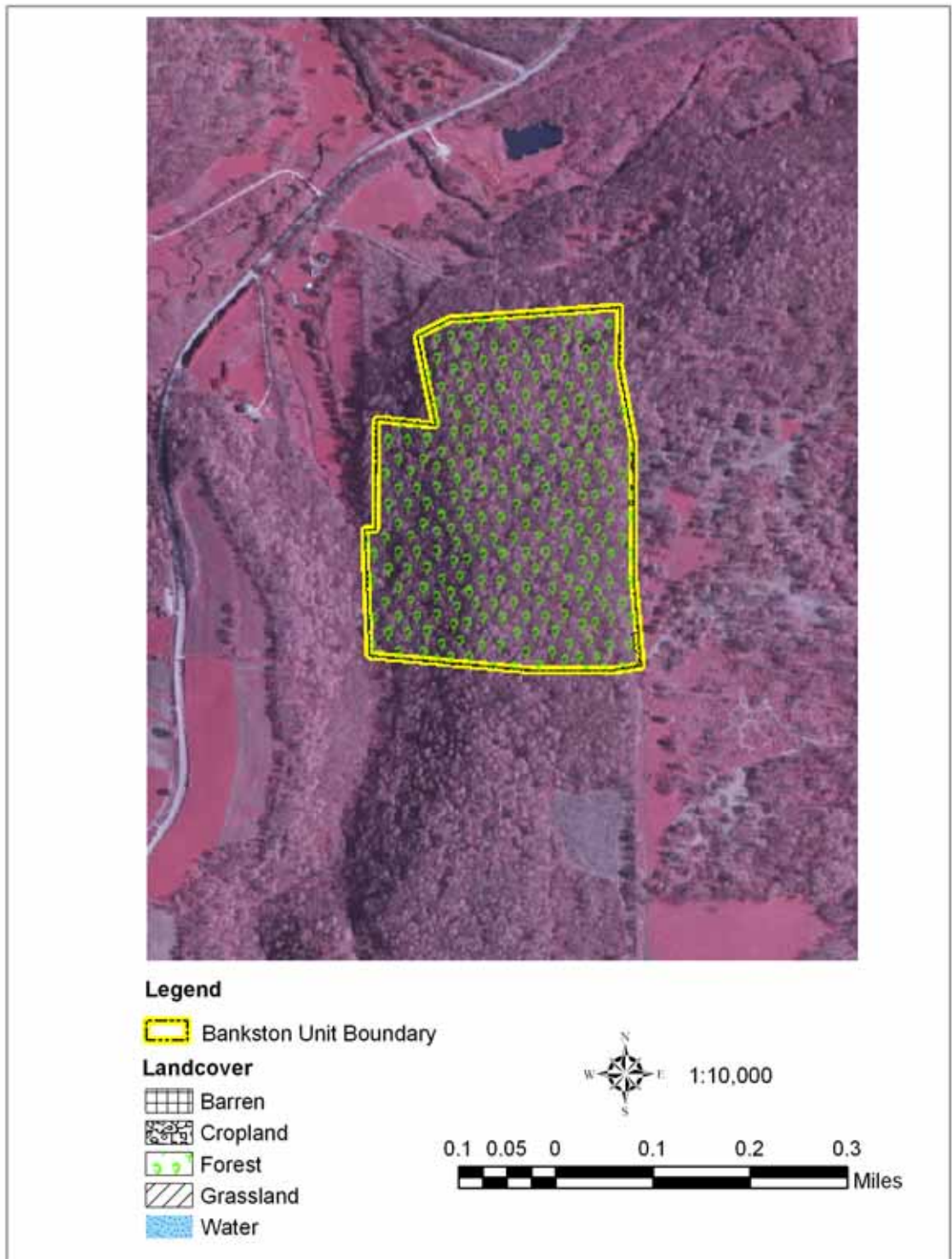


Figure 8: Cow Branch Unit Landcover, Driftless Area NWR

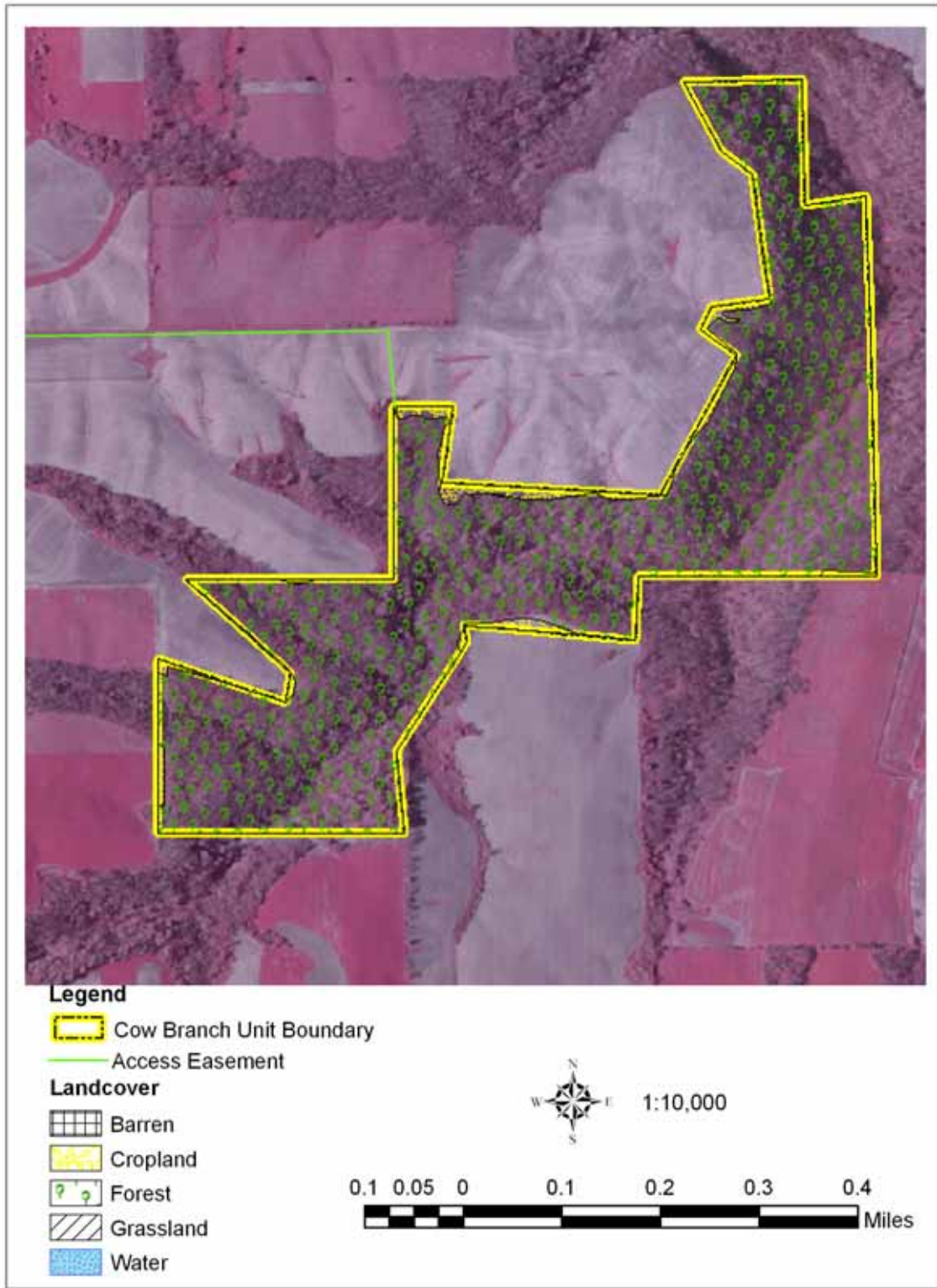


Figure 9: Fern Ridge Unit Landcover, Driftless Area NWR

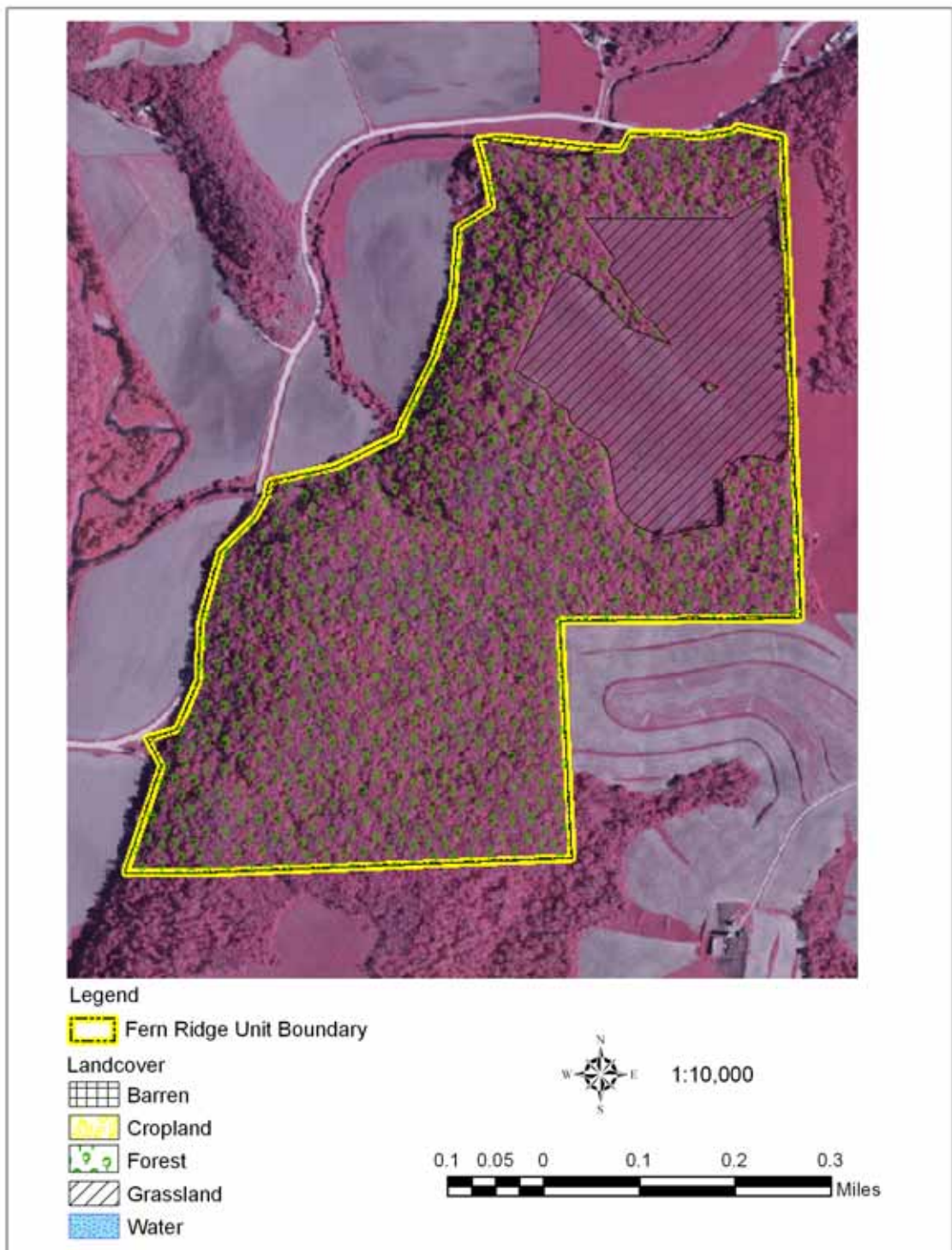


Figure 10: Hickory Creek Unit Landcover, Driftless Area NWR



Figure 11: Howard Creek Unit Landcover, Driftless Area NWR

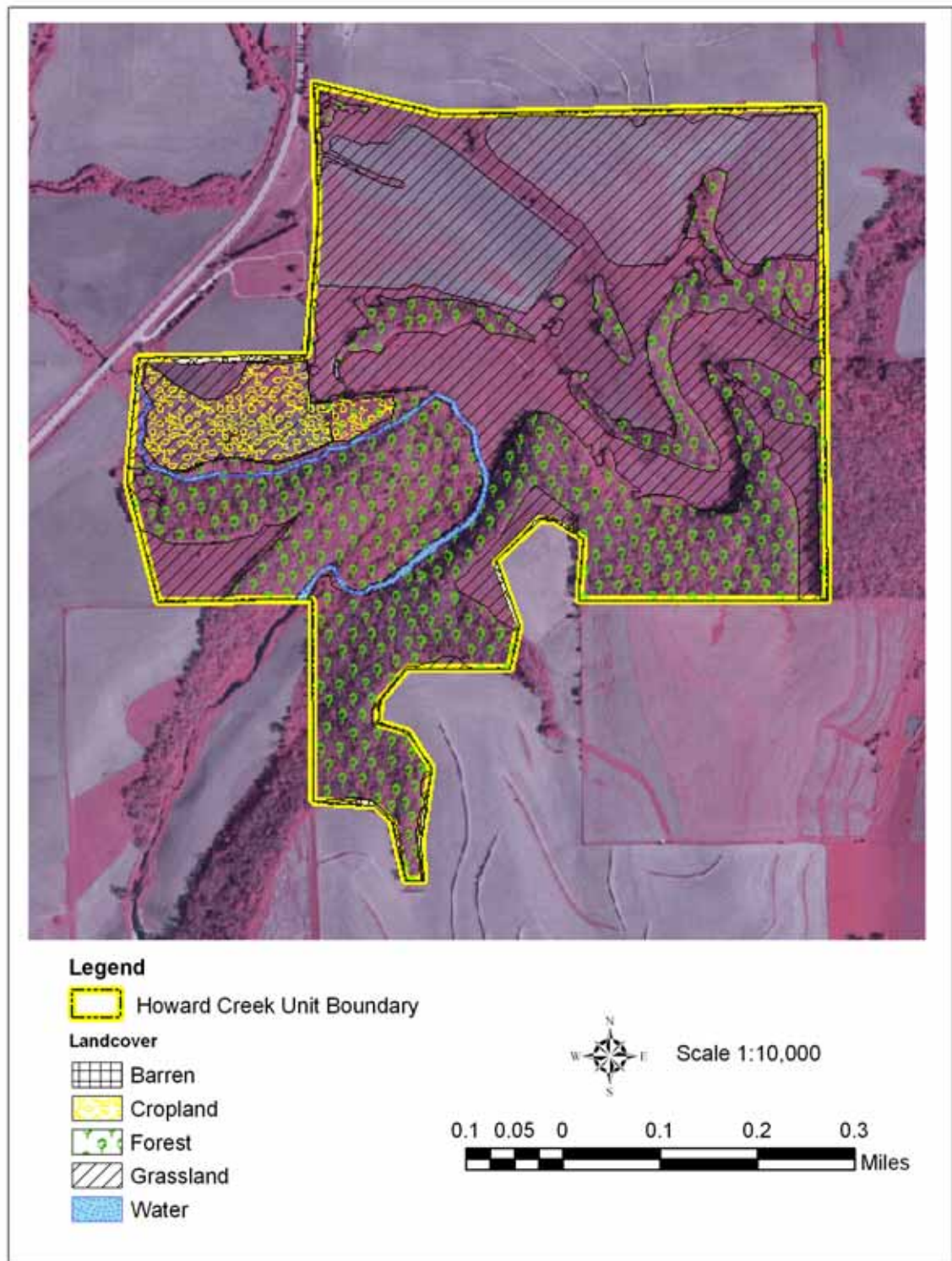


Figure 12: Kline Hunt Hollow Unit Landcover, Driftless Area NWR



Figure 13: Lytle Creek Unit Landcover, Driftless Area NWR

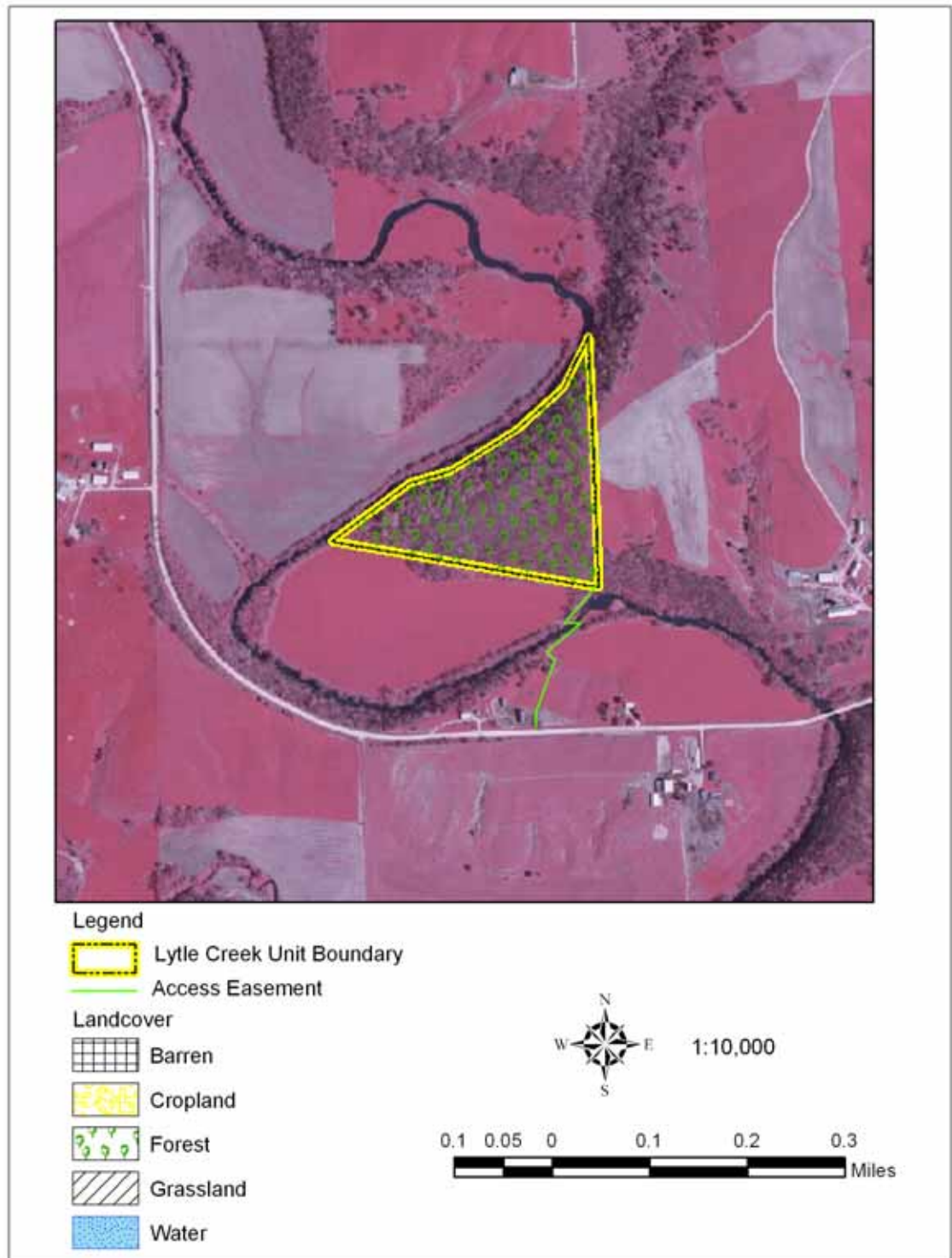


Figure 14: Pine Creek Unit Landcover, Driftless Area NWR

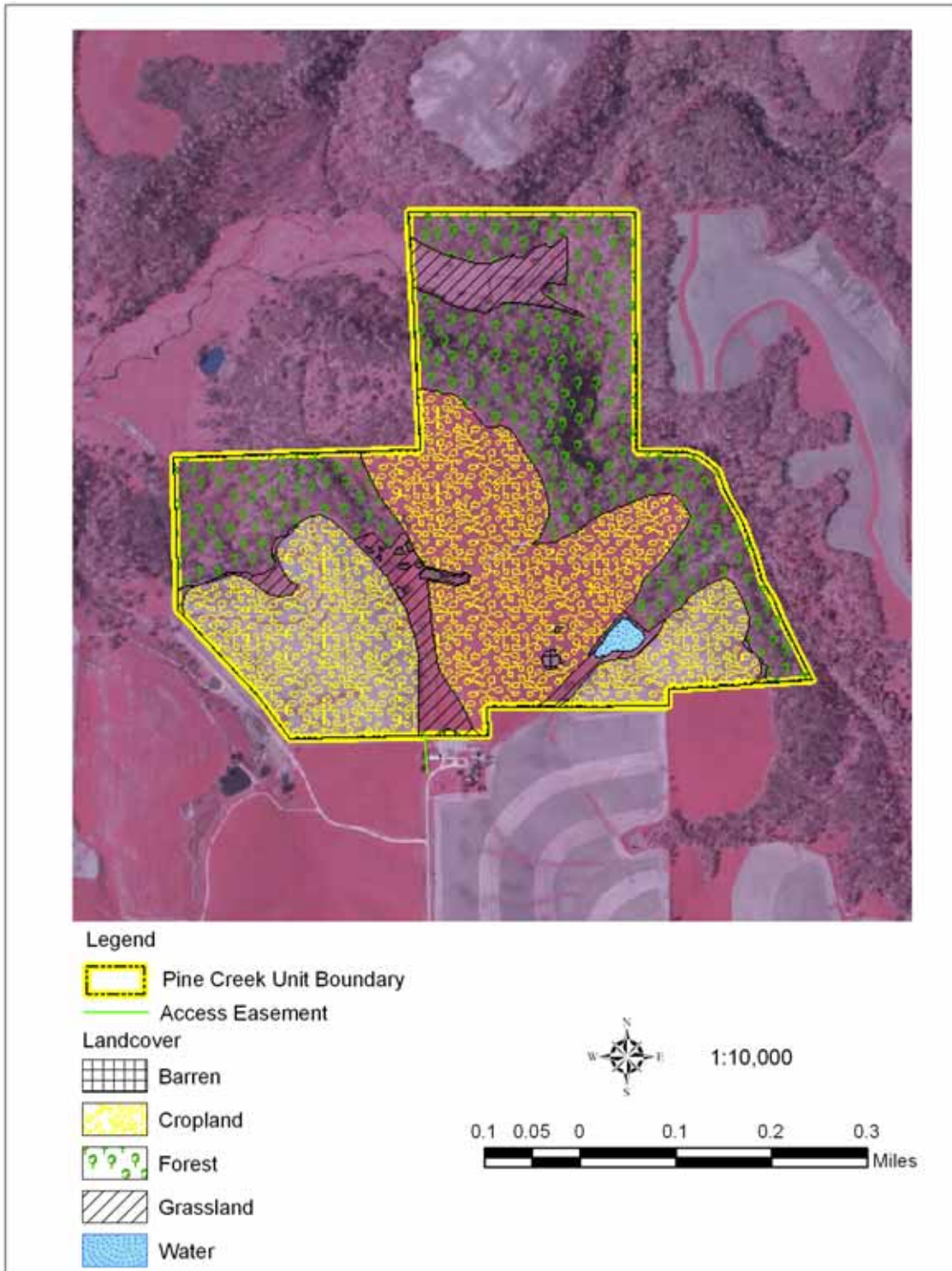


Figure 15: Steeles Branch Unit Landcover, Driftless Area NWR

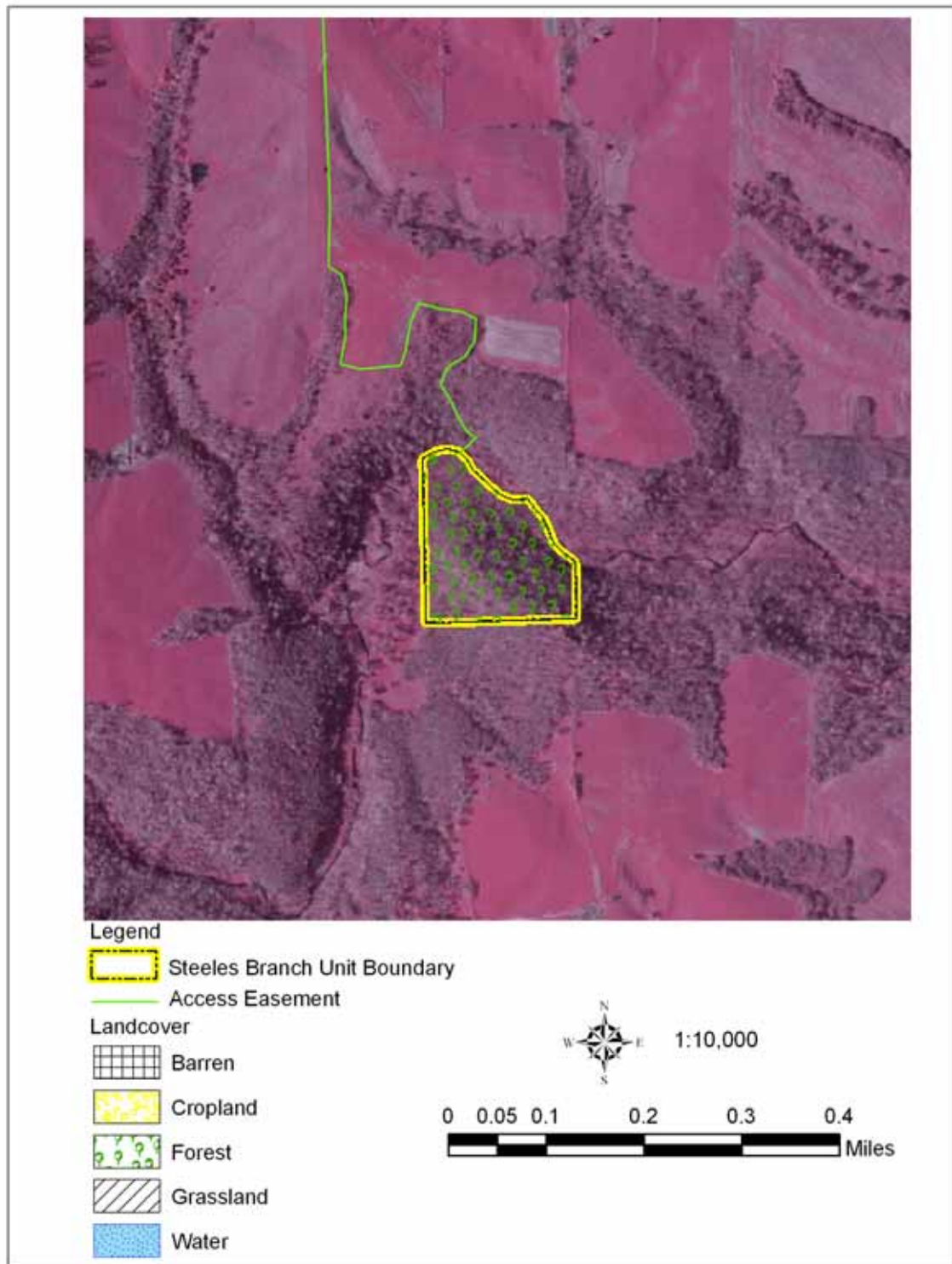


Table 1: Driftless Area NWR Units in Iowa (2004)

Unit Name	Acres	County	Year Acquired	Species present
Bankston	57	Dubuque	1991	Iowa Pleistocene snail
Cow Branch	110	Clayton	1996	Iowa Pleistocene snail Northern monkshood
Fern Ridge	207	Clayton	1991	Iowa Pleistocene snail
Hickory Creek	17	Allamakee	2001	Northern monkshood
Howard Creek	209	Clayton	1989/1990	Iowa Pleistocene snail Northern monkshood
Kline Hunt Hollow	6	Clayton	1991	Northern monkshood
Lytle Creek	20	Jackson	1991	Northern monkshood
Pine Creek	140	Clayton	2002	Northern monkshood
Steeles Branch	15	Clayton	1990	Northern monkshood

Grassland Habitat

There are 175.6 acres of grassland on the Refuge. The majority of grassland habitat exists on the Howard Creek unit (109.93 acres) and the Fern Ridge Unit (42.22 acres) (Figure 11 and Figure 9). Remnant native prairie exists on the Howard Creek unit (approximately 6 acres). The remainder of the grassland on Howard Creek unit is either cool season grasses or has been recently planted to native prairie species. The grassland on the Fern Ridge unit was cleared of trees by the previous owner for agriculture and is currently vegetated by cool season exotic grasses.

Prescribed burning has been used since 1996 to restore prairie remnants and control woody vegetation on the Howard Creek unit. Forty-eight acres of native prairie have been planted in former agricultural fields on the Howard Creek Unit. Cooperative farming has been used to prepare fields for planting. Currently, there are 81 acres in the cooperative farming program, primarily at the Pine Creek Unit. Invasive species control has taken place as staff time allows through the use of biological, mechanical and chemical control, mainly at the Howard Creek unit.

Forest Habitat

There are 535.32 acres of forest habitat on the Refuge. The majority of Refuge forests have been impacted by past grazing and logging. No restoration of forest habitats has been completed; however, tree seeds were collected in 2003 and sent to a nursery to grow trees for planting on the Refuge. Forest inventory and management plans are needed.

Streams

Cow Branch, Fern Ridge, Howard Creek, Pine Creek, and Steeles Branch units contain coldwater or warmwater streams with associated riparian areas. Lytle Creek, Hickory Creek, and Kline Hunt Hollow units have streams adjacent to the boundary. Spring fed streams on Pine Creek and Cow Branch units flow into designated trout streams off of the Refuge. Hickory Creek is a designated trout stream stocked with brown and brook trout by the Iowa DNR. Dry Mill Creek on the Fern Ridge unit is a put and grow trout stream that flows into the Turkey River. Steeles Branch creek was formerly stocked by the Iowa DNR but is no longer. Springs on the Refuge feed most of these streams. The Pine Creek unit also has a small manmade pond about one acre in size. Bankston unit does not contain any streams.

Endangered Species

The primary goal of Refuge management for endangered species is preventing disturbance to their habitat. Endangered species habitat is closed to all public entry because the species and their habitat are fragile. Algific slopes are typically steep, with a loose talus rock layer on the surface. Seven of the nine Refuge units are closed to all public entry because there is inadequate buffer around the algific talus slopes to allow human activity and there is not sufficient public access. Entry to several units is via an easement granted across private land. The two largest units, Howard Creek and Fern Ridge, are open to hunting, fishing, and wildlife observation. These units lie adjacent to public roads from which there is public access. The algific talus slopes are posted as closed to public entry on these open units. All units are periodically inspected by Refuge staff and law enforcement officers.

Most of the Refuge units are fenced to keep cattle from entering Refuge lands and to delineate boundaries. Refuge personnel maintain regular contact with neighboring landowners.

The invasive species, garlic mustard (*Alliaria petiolata*) has invaded some algific slopes. There is concern about its competition with Northern monkshood and other rare plants as well as possible effects on snail food sources. Garlic mustard is abundant on two slopes and has been hand removed from them during the last three years to begin control. Removal will likely be a continual effort until the seed bank is depleted. The forest surrounding these algific slopes also has abundant garlic mustard.

The recovery plans for both species require population monitoring to determine population status. A monitoring plan for Northern monkshood was developed cooperatively with the Iowa Department of Natural Resources and TNC in 1991. This monitoring has been conducted on Refuge sites as well as Iowa Department of Natural Resources preserves, The Nature Conservancy preserves, and private lands since 1991. A protocol for Iowa Pleistocene snail monitoring was developed in 2001 (Henry et al. 2003) and has been carried out each year since. Monitoring for both species occurs on a subset of the total number of known sites.

Refuge staff maintain contact with private landowners who have endangered species on their land in order to educate them about the fragile area on their land and inquire about possible acquisition or other forms of permanent protection. Some sites have been fenced through the Service's Endangered Species Landowner Incentive Program to prevent damage from cattle. The Nature Conservancy, Iowa DNR, and the Iowa Natural Heritage Foundation have been partners in landowner contact and land acquisition. The Refuge recently acquired Hickory Creek and Pine Creek units through land trades involving Upper Mississippi River NWFR lands. But, acquisition is currently limited by available funds and the need for additional Service authorization for Refuge expansion.

Recreation

Currently, the Howard Creek and Fern Ridge units of the Refuge are open for deer and upland game hunting. Special regulations regarding hunting dates and weapons are in place. Specifically, deer hunting is allowed only with archery and muzzleloader. Hunting dates are restricted to November 1 to January 15. Upland game hunting is allowed with approved non toxic shot. Spring turkey hunting is prohibited. These two units are also open for wildlife observation and photography. Fern Ridge and Steeles Branch units are open for fishing. All algific slopes are posted closed areas with no public entry. There are no public use trails. Educational programs and tours are occasionally given as requested by local groups or photographers.

Volunteers have assisted with habitat restoration at the Howard Creek unit. The Nature Conservancy has provided a summer intern for several years to work at the Refuge. Interns have assisted with endangered species monitoring, landowner contacts, invasive species removal, and other Refuge and TNC activities.

Cultural Resources

Reviews for threats to cultural resources on Refuge units are currently completed and submitted to the Regional Historic Preservation Officer as management activities arise. Recent examples of management activities include stabilizing a stream bank, building a warehouse, and burying debris from tree clearing.

Refuge Staff and Budget

The annual Refuge operations budget for fiscal year 2004 was \$92,285 which includes salary for one Refuge Operations Specialist (GS 9). The Refuge receives administrative, law enforcement, and maintenance support from the McGregor District of Upper Mississippi River National Wildlife and Fish Refuge. Volunteers also assist with Refuge activities.

Partnerships

Partners have been important players in Refuge activities over the years. The Nature Conservancy helped establish the Refuge and has worked extensively with the Refuge since then. TNC owns several preserves on which algific talus slopes occur and works to preserve the biodiversity of the Driftless Area. They have conducted algific slope inventory and research, contacted landowners, provided summer interns, and worked on acquisitions in a cooperative effort to protect the unique resources of the area. The Iowa Natural Heritage Foundation has also been a valuable partner in landowner contacts and land acquisition. Other agencies and individuals have assisted with prairie restoration at the Howard Creek unit. The Iowa DNR also owns preserves that protect algific talus slopes and federally listed species and has been an important partner in land protection and management.

Chapter 4: Management Direction

Summary of Future Management Direction



Cold air vent on Driftless Area NWR. USFWS

Permanent protection of habitat is the primary recovery goal for the Iowa Pleistocene snail and Northern monkshood as the habitat cannot be restored once lost and the species are difficult to reintroduce. As well as meeting recovery goals, protection of additional algific slopes or moderate cliffs would meet the Service's goals of conserving biological integrity, diversity and environmental health. Refuge land protection will meet key recovery goals for these species and may prevent future listing of other land snail and plant species.

Permanent conservation of algific talus slopes goes beyond protection of the slope itself from physical disturbance. New information and

threats since the recovery plans were written increase the need for active management to meet multiple recovery goals for delisting. Some slopes are, or may be, impacted by invasive species (garlic mustard), high local deer populations, erosion runoff into sinkholes, and vegetative succession on adjacent habitat. This alternative takes a long-term ecological approach to endangered species conservation and meets multiple recovery goals that can lead to delisting of the Iowa Pleistocene snail during the life of the CCP. The Service also has the responsibility to manage Refuge lands in an ecologically sound manner for other wildlife species. The objectives in this CCP are aimed at taking care of existing Refuge habitats as well as adding lands for endangered species protection.

The total approved acquisition area for the Refuge is 6,000 acres in 22 counties (four states) according to a revised Land Protection Plan (Appendix I). The LPP is the total Refuge acreage desired to complete the Refuge project and is a longer term plan than the CCP. Expansion into additional counties will allow potential acquisition and protection of large populations, populations across the species' ranges, and protection of the majority of populations. The 2,275 acres listed in the objectives is the acreage we believe we can protect within the 15-year life of the CCP given anticipated levels of willing sellers, funding, and the need to accomplish other Refuge objectives. The acreage includes that needed to permanently protect algific slopes including sinkholes and buffer areas to protect from adjacent land uses. Protection may also be achieved in cooperation with other agencies.

Habitat

Inspection of Refuge units will increase to 8 hours/week and a law enforcement officer shared with the McGregor District of Upper Mississippi River NWR. Invasive species control, particularly for garlic mustard, will increase. Iowa Pleistocene snail and Northern monkshood monitoring will continue. More study of algific slopes, such as determining the impacts of shade to aid with

restoration decisions on adjacent habitat, will be completed. A biologist has been added to the staff. Conservation site plans for potential acquisition areas will be completed. Approximately 2,200 acres of endangered species habitat above the 2004 level will be conserved through acquisition or other means to meet delisting criteria of the Iowa Pleistocene snail and contribute to recovery goals for Northern monkshood and Leedy's roseroot. Seventy-five acres above the 2004 level will be conserved to help preclude listing of glacial relict snail species of concern. Of course, acquisition levels are dependent on funding and willing sellers.

Forty acres of grassland will be restored at the Howard Creek Unit. Forty-one acres of forest will be reestablished at the Fern Ridge unit (Figure 16), 7 acres at the Howard Creek unit (Figure 17), and 68 acres at the Pine Creek unit (Figure 18). A management plan will be developed for all other forest lands to describe how forests would provide habitat for migratory birds and other wildlife. Habitat management plans will be prepared for newly acquired lands.

Species Management

Surveys for new algalic talus slopes and associated species will be done. Species inventories of selected algalic talus slopes would aid in understanding of these unique communities. Recovery plans for the Iowa Pleistocene snail and Northern monkshood will be updated. Study of the location and function of sinkholes will be initiated. An evaluation of deer populations and their impacts on the Refuge will be completed.

Visitor Services

A wildlife observation trail will be added to the Howard Creek Unit. Office and Visitor Center space will continue to be shared with the McGregor District, although space is limited. A new professionally developed interpretive display, as well as increased environmental education will be completed. An interpretive park ranger will be shared with McGregor District. Threshold visitor use levels will be determined. A Visitor Services Plan will be completed.

Cultural Resources

Cultural resources on federal lands receive protection and consideration that would not normally apply to private or local and state government lands. This protection is through several federal cultural resources laws, executive orders, and regulations, as well as policies and procedures established by the Department of the Interior and the Service. The presence of cultural resources including historic properties cannot stop a federal undertaking since the several laws require only that adverse impacts on historic properties be considered before irrevocable damage occurs. However, the Refuge will seek to protect cultural resources whenever possible.

During early planning of any projects, the Refuge will provide the Regional Historic Preservation Officer (RHPO) a description and location of all projects and activities that affect ground and structures, including project requests from third parties. Information will also include any alternatives being considered. The RHPO will analyze these undertakings for potential to affect historic properties and enter into consultation with the State Historic Preservation Officer and other parties as appropriate. The Refuge will also notify the public and local government officials to identify any cultural resource impact concerns. This notification is generally done in conjunction with the review required by the National Environmental Policy Act or Service regulations on compatibility of uses.

Figure 16: Future Desired Conditions, Fern Ridge Unit, Driftless Area NWR

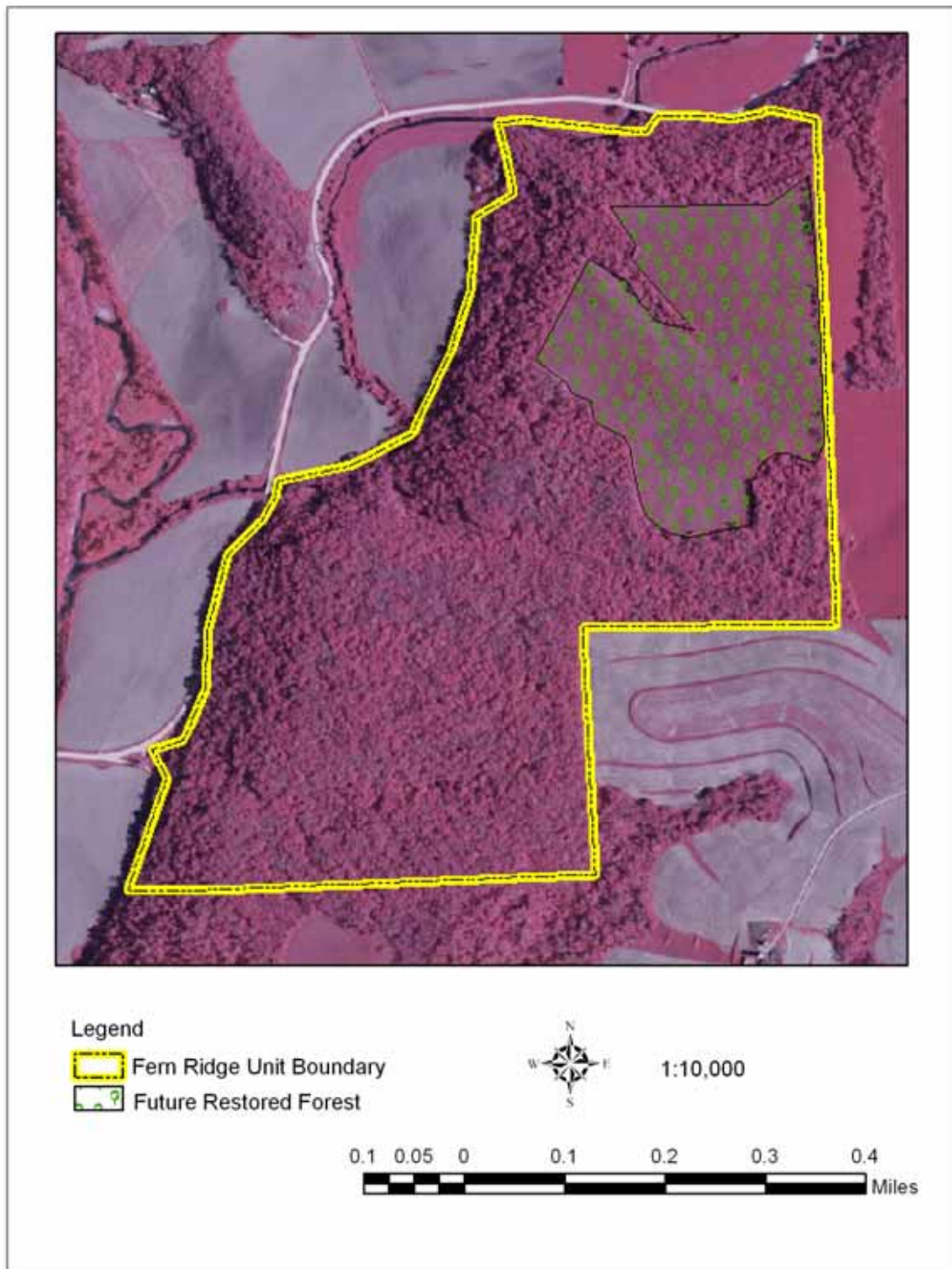


Figure 17: Future Desired Condition, Howard Creek Unit, Driftless Area NWR

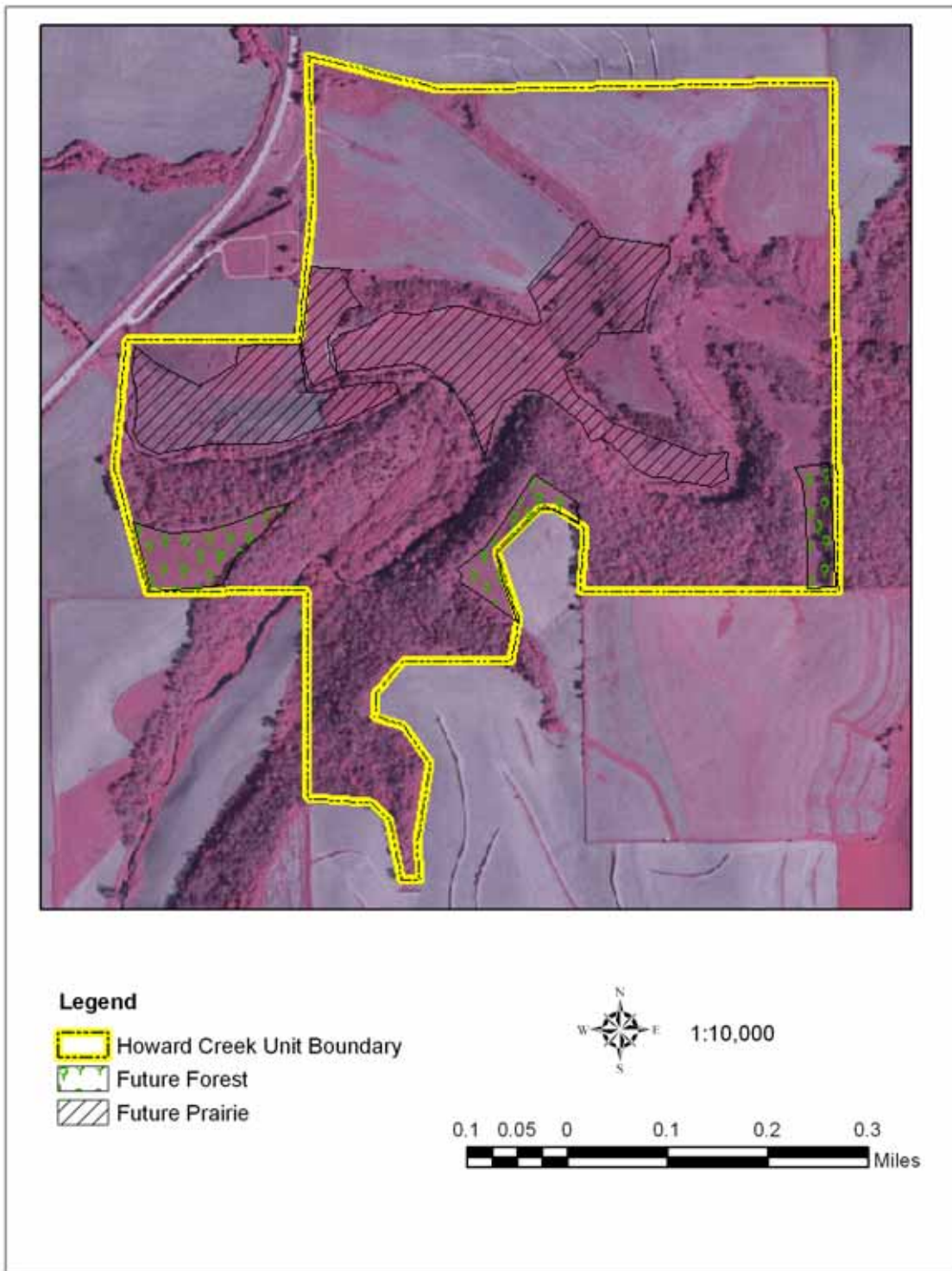
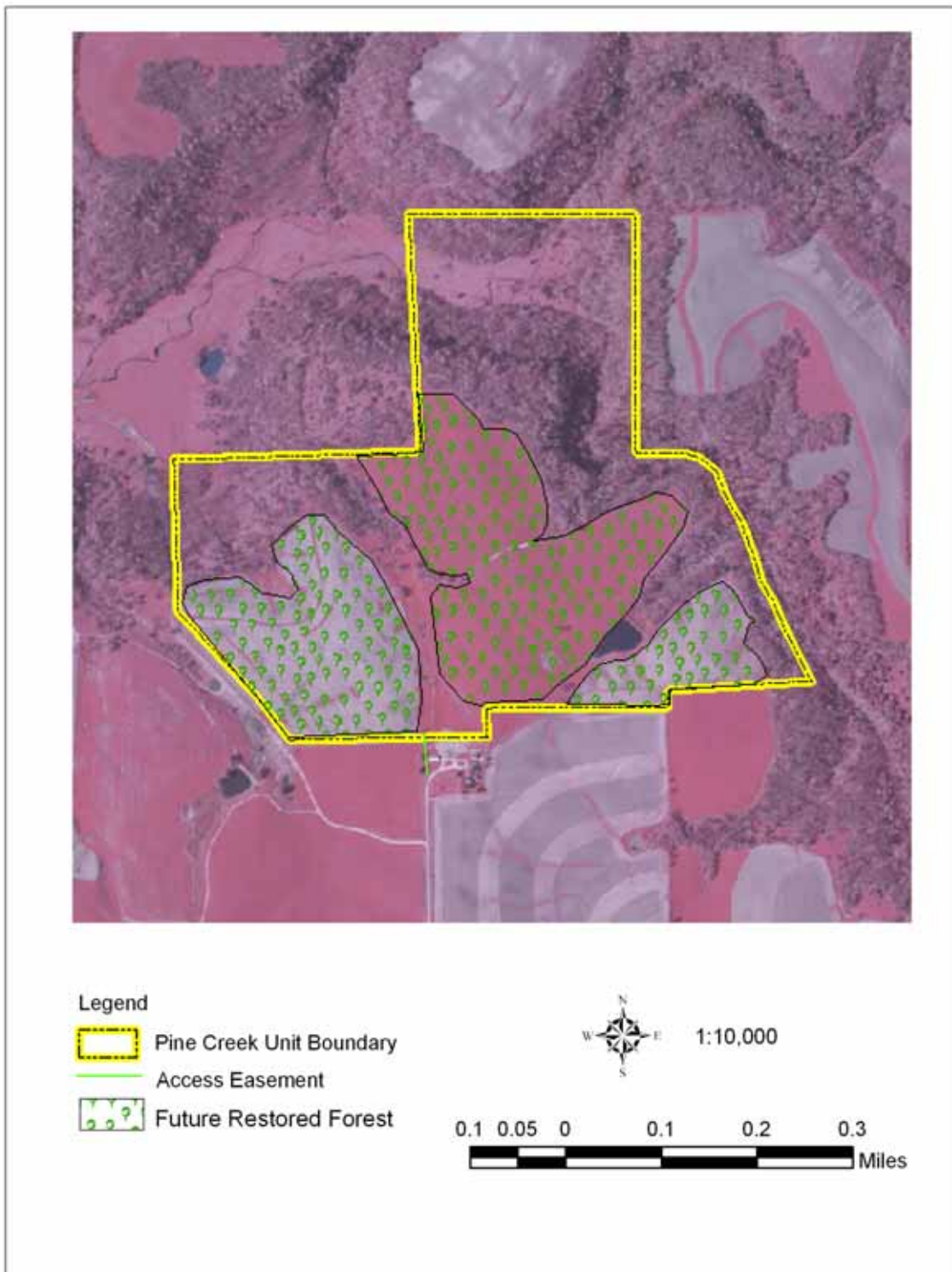


Figure 18: Future Desired Condition, Pine Creek Unit, Driftless Area NWR



Goals, Objectives and Strategies

Habitat Goal

Goal: Conserve endangered species habitat and contribute migratory bird and other wildlife habitats within a larger landscape.

Objective 1: Increase management of physical and biological impacts to algific slopes by eliminating invasive species (on slopes), maintaining zero impacts from public use, and reducing off Refuge impacts on two units by 2015.

Rationale: The Refuge purpose is to conserve endangered and threatened species. This objective is tied to the purpose of the Refuge and Iowa Pleistocene snail and Northern monkshood recovery plan goals for permanent protection of habitat. Algific talus slopes are fragile because of the steep slopes with a loose surface rock layer. All algific slopes would remain closed to all public entry. However, some management activity on algific slopes is needed to maintain their biological integrity. Invasive garlic mustard is competing with Northern monkshood. It has unknown effects on the Iowa Pleistocene snail, but we speculate garlic mustard could affect its specific food requirements. Removal of garlic mustard can be completed by carefully hand pulling it on some sites, but may take several years to control using this method because of the seed bank present. Vegetation adjacent to algific talus slopes can affect temperatures and other microclimate characteristics important to the species that inhabit them. Study of the impact of shade on algific talus slopes would help in determining what the best restoration options are adjacent to the slopes. Population monitoring of both species would continue at 2004 levels on selected sites on and off Refuge. These management activities would be done under specific guidelines such as restricting the number of people, number of sites, avoiding more sensitive sites, using wildlife trails, and other restrictions to prevent damage to the habitat.

Strategies:

1. Maintain existing closed areas.
2. Ensure boundary signing and fencing on all units are adequate
3. Increase inspection of units, on average 8 hours per week, particularly during hunting seasons.
4. Share a law enforcement officer with the McGregor District of UMRNWFR.
5. Increase contact with landowners adjacent to the Refuge to prevent impacts from grazing, logging, invasive species, erosion, and sinkhole filling. Specifically, use USDA programs, Partners for Fish and Wildlife program or endangered species funding to reduce erosion impacts to the Fern Ridge and Cow Branch units.
6. Remove all garlic mustard from algific slopes on the Howard Creek and Lytle Creek units in ways that minimize disturbance. Expand garlic mustard control efforts in surrounding habitats on all units.
7. Monitor Iowa Pleistocene snail and Northern monkshood populations (on Refuge and other public and private lands) at 2004 level of effort to measure population trends for recovery and as an indicator of habitat condition.

8. Monitor soil/vent temperatures on algific talus slopes with data loggers that collect daily temperature.
9. Fund research to determine impacts of shade on algific talus slopes, particularly in regard to Northern monkshood. Complete study by 2010. This would aid in determining the best restoration alternative adjacent to algific slopes.
10. Add a wildlife biologist to the staff to help accomplish additional work.

Objective 2: Restore existing 40 acres of grassland on the Howard Creek Unit to a mixture of at least 25 species of local genotype grasses and forbs by 2009.

Rationale: Other wildlife habitats are present on the Refuge and should be managed for Service trust resources when possible. Native climax vegetation would likely do best on the land and require the least long term maintenance once established. The Howard Creek Unit contains remnant native prairies and much of the area was once prairie or savanna. Some planting of native prairie species has already taken place on this unit and this objective is aimed at completing grassland restoration for the Howard Creek Unit.

Strategies:

1. Use fire and other techniques to control invading woody vegetation on remnant and restored prairies.
2. Use biological, chemical, and mechanical controls to control invasive species on other habitats.
3. Develop partnerships with local groups to restore prairie and possibly create demonstration areas.
4. Plant a mixture of native grasses and forbs (local genotype).

Objective 3: Establish oak-hickory forests on all lands that were historically hardwood forest under pre-European settlement conditions by 2012.

Rationale: The majority of Driftless Area Refuge habitat is or was hardwood forest that has been impacted by past agricultural or logging uses. Some forests are degraded and some were completely cleared for farming. Habitat immediately adjacent to algific talus slopes may affect such factors as microclimate (i.e. shade helps maintain cool conditions) and encroachment of invasive species. Restoration of forests is important to maintaining endangered species habitat.

Although Refuge units are relatively small, they do provide habitat for Region 3 Resource Conservation Priority species and migratory non-game birds of management concern. These species will be encouraged through habitat restoration planning. Fragmentation of habitats both within and around Refuge lands is a concern for migratory bird management because of the effects of predators and parasitic cowbirds. Restoration of native vegetation on the Refuge would reduce, but not eliminate, fragmentation within units and would provide closer connection to forest in the surrounding landscapes. Active restoration by planting trees would speed restoration and provide the species desired for wildlife habitat.

Strategies:

1. Plant 116 acres of native forest on the Pine Creek (68 ac), Fern Ridge (41 ac), and Howard Creek units (7 ac) (Figure 16, Figure 17 and Figure 18).

2. Develop partnerships with local groups to restore forests and evaluate feasibility of establishing reforestation demonstration areas.
3. Inventory exotic invasive species and develop plans for control on each unit.
4. Coordinate with states and partners to develop Habitat Management Plans for each Refuge unit and implement forest management plans for existing forests on the Fern Ridge and Bankston units during the life of the plan.

Objective 4: Permanently conserve 2,200 additional acres of endangered species habitat above the 2004 level to achieve this recovery goal for the Iowa Pleistocene snail and contribute to recovery goals for the Northern monkshood and Leedy’s roseroot by 2020.

Rationale: This objective is tied to the purpose of the Refuge and species’ recovery plan goals for permanent protection of habitat. More habitat protection is needed to reach these recovery goals. Refuge land protection can lead to delisting of these species and may prevent future listing of other land snail and plant species. Refuge land protection will also conserve biological integrity, diversity, and environmental health according to Service policy.

Overall Refuge expansion is proposed at 6,000 acres in 22 counties (four states) under a revised Land Protection Plan (Appendix I). The LPP is the total Refuge acreage desired to complete the Refuge project and is a longer term plan than the CCP. Expansion into additional counties will allow potential acquisition of large populations, populations across the species’ ranges, and of the majority of their populations. Acquisition would not necessarily occur in every location, but where willing sellers exist for known species locations in any of these



Cold air vent and mosses on algal slope. USFWS

counties. Acquisition acreage includes algal slopes, associated sinkholes, and buffer areas needed to permanently protect them from adjacent land uses. The acreage listed in this alternative is what we believe is possible to protect in the next 15 years given willing sellers, funding, and Refuge resources. Habitat protection may also be in cooperation with other agencies.

Strategies:

1. Maintain contact with landowners to maintain integrity of sites and identify willing sellers. Use the Service’s Partners for Fish and Wildlife program and assistance from partners such as TNC.
2. Acquire additional land adjacent to Refuge sites where the algal slopes or sinkholes are not under permanent protection.
3. Protect an additional 20 snail and monkshood sites.

4. Coordinate with the USFWS Twin Cities Ecological Services office and Minnesota DNR to identify and acquire any Leedy's roseroot site that becomes available.
5. Seek consistent annual Land and Water Conservation Fund appropriations to meet the objective.
6. Work with partners to protect sites through a variety of means such as funding provisions of the Endangered Species Act (Section 6), land trust conservation easements, U.S. Department of Agriculture programs, fund raising, and congressional appropriations.
7. Prioritize sites for protection and prepare site preservation plans in Geographic Information Systems format with state and partner input.
8. Protect sites through conservation easements and fee title acquisition.

Objective 5: Permanently conserve 75 additional acres of habitat above the 2004 level to help preclude listing of glacial relict species of concern by 2020.

Rationale: Some algific slopes are occupied by Service species of concern, but not by threatened and endangered species. This objective would begin to protect sites for these species to help preclude future listing as threatened or endangered.

Strategies:

1. Protect three sites for other species of concern.
2. Maintain contact with landowners to maintain integrity of sites and identify willing sellers. Use assistance from partners such as TNC.
3. Protect sites through conservation easements and fee title acquisition.

Species Management

Goal: Manage and protect endangered species, other trust species, and species of management interest based on sound science through identification and understanding of algific slope communities and associated habitats.

Objective 1: Identify and evaluate new algific slopes in the Driftless Area for the presence of threatened and endangered species and species of concern within 3 years of plan approval.

Rationale: Initial surveys to locate algific talus slopes and associated species were done in the 1980s. Several new algific slopes were found in the last few years just by casual observation, indicating that more may be present than is currently known. A renewed comprehensive survey should be done to ensure that as many algific slopes as possible are known. This information may shed new light on species abundance or threats to endangered and rare species. Survey of potential habitat is a recovery goal.

Strategies:

1. Review existing algific slope records to identify potential new survey locations. Actively search areas that may have been underrepresented in original surveys. Survey any new locations for Iowa Pleistocene snail and Northern monkshood.
2. Seek assistance from Partners to provide funding or people to accomplish objective.

Objective 2: Establish the size of upland buffers needed to provide permanent protection of algific talus slopes by 2009.

Rationale: Sinkholes are crucial to cold air flow on algific talus slopes. Their function, locations, and distance from slopes is not completely known. In addition, more information is needed on sinkhole locations and distance from algific talus slopes. This objective is also a recovery task for the Iowa Pleistocene snail and is essential to determining land protection areas and strategies.

1. Conduct winter surveys to locate sinkholes associated with algific slopes to aid in protection efforts.
2. Initiate studies to determine the function and association of sinkholes and other features to cold air flow and hydrology.
3. Explore ways to study the potential impacts of climate change on algific talus slopes.

Objective 3: Gain a better understanding of plants and animals associated with algific talus slopes and similar habitats in the Driftless Area.

Rationale: Comprehensive surveys for plants and insects have never been done for algific talus slopes. There may be additional rare, endemic or new species. Inventory of wildlife on other Refuge habitats has not been completed. An inventory of Refuge plant and animal communities is needed to prepare effective management strategies. The Refuge Improvement Act also requires inventory and monitoring of fish, wildlife, and plants on all Refuges. Refuge partners are also interested in inventory of algific slopes.

Strategies:

1. Work with experts to inventory snail, plant and insect species on six or more algific talus slopes within 8 years of plan approval.
2. Inventory birds on Refuge units to document habitat use and develop plans for management of conservation priority species on the Refuge.

Objective 4: By 2008, determine the appropriate deer density and population structure for Refuge units that will safeguard habitat.

Rationale: Deer populations in northeast Iowa have been high for several years. There is concern that high deer densities, particularly on units where hunting is not allowed, could impact algific talus slopes as well as other habitats. The population level that causes negative impacts needs to be determined.

Strategies:

1. Use research or literature searches to determine the current and desired deer density on the Refuge.
2. Working with states, manage deer populations at a level and population structure that does not negatively impact algific slopes or associated habitats.
3. Use special permit hunts when damage to algific slopes or other habitats from deer is observed.

Objective 5: Update the recovery plans for Iowa Pleistocene snail and Northern Monkshood within 5 years of CCP approval.

Rationale: The current recovery plans for these species are outdated and do not include all locations, specific recovery objectives, threats, or specific monitoring guidelines. Updated plans would provide for better planning and species protection and increase the likelihood of recovery.

Strategies:

1. Work with Ecological Services and applicable states to update and rewrite draft recovery plans.

Visitor Services Goal

Goal: Visitors have an understanding and appreciation of the role of the Refuge in conserving endangered species.

Objective 1: Increase environmental education programs by 50 percent within 8 years of CCP approval and establish an upper level limit for visitation within 5 years of CCP approval.

Rationale: Promotion of the Refuge and wildlife-dependent recreation has historically been limited because of the sensitive nature of endangered species habitat and limited staff to manage public use. However, the public is now more aware of land owned by the Service and has expressed interest in increasing outreach and wildlife-dependent recreation opportunities. With targeted programs, visitors' understanding of the Refuge's purpose can be enhanced. Education about endangered species and the special resources of the Driftless Area may promote stewardship among landowners and therefore further protection of rare and endangered species. Education about snails and their habitat is a recovery task.

Only units with public access routes and sufficient acreage surrounding endangered species habitat would be open to the public. However, there is a level of use that could cause unacceptable changes in habitat and wildlife. To better achieve the endangered species purpose of the Refuge, the level below which impacts are negligible needs to be determined. The primary increased use would be off-site environmental education.

Strategies:

1. Maintain the Howard Creek and Fern Ridge units open to upland game and white-tailed deer hunting. Open the Pine Creek Unit to hunting under the same special regulations as the Howard Creek and Fern Ridge units.
2. Maintain the Steeles Branch and Fern Ridge units open to fishing. Open the Pine Creek Unit to fishing.
3. Maintain the Howard Creek and Fern Ridge units open to wildlife observation and photography. Open the Pine Creek Unit to wildlife observation and photography.
4. Maintain McGregor District Visitor Contact Station as a place of primary public contact.
5. Develop an information kiosk at the Fern Ridge Unit by 2007.
6. Develop a wildlife observation trail at the Howard Creek Unit by 2008.

7. Develop an interpretive display at McGregor District Visitor Contact Station by 2007.
8. Present local school groups at least 10 environmental education programs per year, with an emphasis on endangered species.
9. Share an interpretive park ranger with the McGregor District.
10. Develop a Visitor Services Plan within 2 years of CCP approval. The Plan will describe basic visitor and resource protection, appropriate signing, informational brochures, Visitor Center displays, and other information needed for visitors to have an educational and enjoyable experience.
11. Permit compatible wildlife-dependent recreation on newly acquired lands.
12. Establish a reliable system for documenting and monitoring public use within 2 years of CCP approval.
13. Establish the relationship between level of use and impacts to resources within 5 years of plan approval and modify the Visitor Services Plan accordingly.
14. Develop a volunteer program and continue to work with the Friends of the Upper Mississippi River Refuges.

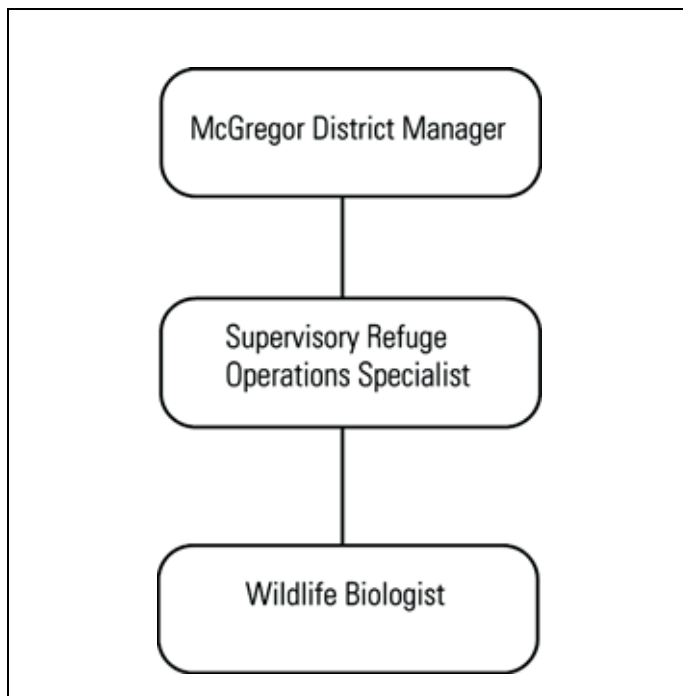
Chapter 5: Plan Implementation

Personnel and Office Needs

One Refuge Operations Specialist is currently assigned to the Refuge and supervised by the McGregor District Manager. A wildlife biologist will be added to implement the many goals and objectives identified in this CCP. The Nature Conservancy of Iowa has funded a summer intern to work at the Refuge for the last 3 years and plans to continue this position as funds permit, to assist with endangered species monitoring and other tasks of interest to both the Service and TNC. McGregor District staff occasionally assists with maintenance, prescribed burning and habitat improvements on the Refuge.

Refuge staff currently use a mobile home (obtained as excess property from the Federal Emergency Management Agency) located adjacent to the McGregor District office. It is not clear to visitors that the Driftless Area Refuge office is here and there is only a small display made by Refuge staff in the McGregor District Visitor Contact Station. The Refuge shares limited equipment storage space with McGregor District. A new office located with McGregor District or at a different location is needed to meet basic operational needs.

Figure 19: Future Staffing Needs, Driftless Area NWR



Funding Needs

Land values in northeast Iowa have increased in recent years, at least partly due to an interest in recreational land. The 2003 Iowa State Land Value Survey gives average values of farmland at \$1,645 per acre in Allamakee County, \$2,111 per acre in Clayton County, \$1,904 per acre in Winneshiek County, and \$2,722 per acre in Dubuque County. The Vernon County Land and Water Conservation Department in Wisconsin reports farmland values at about \$2,000 per acre. Land values in Olmsted County, Minnesota, in 2004 averaged \$3,236 per acre and in Fillmore County \$1,868 per acre as estimated by county assessors. These values do not distinguish between forested land and cropland. Forested land is often being sold for the same value as cropland because of the recreational interest. Therefore, an average value for northeast Iowa counties, where the majority of land acquisition would occur, would be \$2,095 per acre.

Acquiring 2,275 acres over the course of the CCP would cost approximately \$4,766,125.

Step-down Management Plans

This CCP provides broad guidance for future management and land acquisition for Driftless Area National Wildlife Refuge. Before projects are implemented, additional detailed plans will need to be prepared. Several step-down management plans must be completed to better describe the planned work and to meet Service policy. The following plans will be completed during the life of the CCP:

- # Habitat Management Plan
- # Unit Management Plans
- # Forest Management Plans
- # Endangered Species Site Preservation Plans
- # Visitor Services Plan
- # Funding



Coyote, U.S. Fish & Wildlife Service

Funding will come from a variety of internal and external sources. Refuge maintenance funds are currently used primarily for fencing needs and replacement of tools and equipment. Habitat restoration funds have come from challenge cost share grants or internal funds. All of these funding sources are in short supply. The full implementation of this plan will be dependent on increased traditional funding or new sources of funding as a result of partnerships or grants. In particular, partnerships for land acquisition and habitat restoration may be needed. The Nature Conservancy, Iowa Natural Heritage Foundation, States, and universities are potential partners that have expressed interest in various actions identified in the plan. Volunteers will also be important in assisting Refuge staff with fulfilling the future vision of the Refuge.

Partnership Opportunities

Potential partnerships exist with The Nature Conservancy, Iowa Natural Heritage Foundation, States, universities, and other private conservation groups to accomplish the objectives outlined in the CCP. Partners have specifically expressed interest in assisting with habitat protection, landowner contacts, site preservation plans, habitat restoration, inventory, and study.

Volunteer Program

We will work with volunteers in carrying out the activities of this plan. Likely activities where volunteers can help us include tours, environmental education, habitat restoration, monitoring, and invasive species removal.

Monitoring and Evaluation

Monitoring is critical to the successful implementation of the plan. Every five years this plan will be revisited to document progress, reassess direction and determine if any modifications are necessary to meet changing conditions. Public involvement in evaluating progress and plan implementation will be encouraged. Increased public visitation and new facilities will be evaluated for compatibility with Refuge purposes.

Plan Amendment and Revision

The CCP is meant to provide guidance to the Refuge Manager and staff over the next 15 years. However, the CCP is also a dynamic and flexible document and several of the strategies contained in this plan are subject to natural, uncontrollable events such as floods, drought and tornados. Likewise, many of the strategies are dependent upon Service funding for staff and projects. Because of all these factors, the recommendations in the CCP will be reviewed periodically and, if necessary, revised to meet new circumstances. If any revisions are major, the review and revision will include the public.

Appendix A: Record of Decision

Record of Decision

for

Comprehensive Conservation Plan

Driftless Area

National Wildlife Refuge



U.S. Fish and Wildlife Service

Division of Conservation Planning
Bishop Henry Whipple Federal Building
Room 530
1 Federal Drive
Ft. Snelling, Minnesota 55105

Introduction

This Record of Decision (ROD) has been developed by the U.S. Fish and Wildlife Service (Service) in compliance with agency decision-making requirements of the National Environmental Policy Act of 1969, as amended. It documents the decision of the Service, based on the information contained in the Final Environmental Impact Statement (FEIS) for the Comprehensive Conservation Plan (CCP) and the entire administrative record. The Service has selected the preferred alternative (Alternative C) as described in the FEIS as the best alternative for the Comprehensive Conservation Plan for the Driftless Area National Wildlife Refuge (NWR). A notice of this decision will be published in the *Federal Register* and a news release will be sent to the media.

Purpose of Action

The purpose of this action is to specify and adopt a long-term management direction for the Driftless Area NWR that will achieve the Refuge purpose and the mission of the National Wildlife Refuge System.

Need for Action

A long-term management direction does not currently exist for Driftless Area NWR. Management is currently guided by endangered species recovery plans, general policies, and shorter-term plans. Since the Refuge was established, there are new threats to endangered species habitat, new laws and policies have been put in place, new scientific information is available, and levels of public use and interest have increased. In addition, the Refuge Improvement Act of 1997 mandates that the Secretary of the Interior, and thus the Service, prepare CCPs for all units of the National Wildlife Refuge System by October, 2012.

Key Issues

Through public scoping and with input from various agencies and publics, key issues and possible solutions were identified. The issues were 1) habitat management, 2) visitor services, 3) refuge expansion, and 4) species assessment. These issues were thoroughly examined in the Draft and Final EIS.

Alternatives Considered

Three alternatives and their consequences were described in detail in the Draft and Final Environmental Impact Statement. Under all alternatives recovery plans for the Iowa Pleistocene snail and the Northern monkshood would be updated, cultural resources would be protected, and the Refuge's Fire Management Plan would guide prescribed fire and wildfire suppression.

Alternative A. No Action

Present management practices would continue under this Alternative. The No Action alternative is a status quo alternative where current conditions and trends continue. The alternative served as the baseline to compare and contrast with the other alternatives. Acquisition efforts would not occur under this alternative because there would be no approved expanded acquisition boundary.

Alternative B. Habitat Protection Emphasis

Under this alternative the primary focus of Refuge activities would be on the permanent protection of endangered species habitat through land acquisition and minimal physical disturbance of endangered species habitat. The expanded acquisition area for the Refuge would include a total of 6,000 acres in 22 counties in four states as described in a Land Protection Plan (Appendix J of the FEIS). The 3,400 acres specified in this alternative is the acreage that would be protected within the 15-year life of the CCP given anticipated levels of willing sellers, funding, and Refuge personnel.

Alternative C. Habitat Protection, Increased Management, and Integrated Wildlife-dependent Recreation (Preferred Alternative)

Under this alternative the focus would be on the permanent protection of endangered species habitat and additional algific slopes through land acquisition and active management of endangered species habitat. New information and threats increase the need for active management. Fewer acres acquired in this alternative would allow limited Refuge resources to address all impacts to the habitat. The total expanded acquisition area for the Refuge would include 6,000 acres in 22 counties in four states as described in a Land Protection Plan (Appendix J of the FEIS). The 2,275 acres specified in this alternative is a realistic acreage that would be protected within the 15-year life of the CCP given

anticipated levels of willing sellers, funding, and the need to accomplish other Refuge objectives in this alternative.

Environmentally Preferable Alternative

Alternatives B and C are environmentally preferable to Alternative A (No Action) because the primary recovery goal of permanent protection of the listed species would occur in both alternatives. Alternative C represents the most environmentally preferable alternative because it would lead to meeting multiple recovery goals and the likely delisting of the Iowa Pleistocene snail.

Basis for the Decision

The Service selected Alternative C, as described in the FEIS, as the best alternative for the Comprehensive Conservation Plan to guide refuge management for the next 15 years. Alternative C is the most environmentally preferable alternative. Alternative C is likely to lead to the delisting of the Iowa Pleistocene snail and significant progress towards recovery for Northern monkshood and Leedy's roseroot, as well as beneficial effects for other trust species. Algific talus slopes are more likely to benefit under the management proposed in Alternative C than the other alternatives. Alternative C is also expected to lead to more public support and more public opportunities than the other alternatives. Alternative A was not selected because it would not lead to reaching recovery goals or delisting of species. Alternative B was not selected because minimal management would likely lead to negative effects on algific talus slopes and delisting of species might not occur.

The rationale for choosing the selected alternative as the best alternative for the Comprehensive Conservation Plan is based on the impact of this alternative on the issues and concerns that surfaced during the planning process. The environmental impacts of the three alternatives were analyzed as to

how they would impact: 1) habitat management, 2) visitor services, 3) refuge expansion, and 4) species assessments. Chapter 7 of the FEIS reproduced all written comments sent to the Service regarding the Draft EIS and gave the Service's response to each comment. Oral comments received at the public meetings were summarized and the Service's response given.

Public Comments to FEIS

The Service filed the FEIS for the Comprehensive Conservation Plan for Driftless Area National Wildlife Refuge with the Environmental Protection Agency (EPA) on February 3, 2006. In compliance with agency decision-making requirements of the National Environmental Policy Act of 1969, as amended, the Service is required to circulate the FEIS for 30 days after filing with the EPA before issuing a Record of Decision on the Comprehensive Conservation Plan.

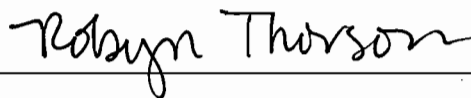
During the 30-day circulation period, which ended March 6, 2006, the Service received no comments.

Mitigation

Because all practicable means to avoid or minimize environmental harm have been incorporated into the preferred alternative, no mitigation measures have been identified.

Conclusion

Based on a thorough review of the Administrative Record for this project, and careful consideration of the full range of impacts from the Comprehensive Conservation Plan on all aspects of the human environment, including the social, economic, cultural, and natural resources of the area, I have decided to implement the Comprehensive Conservation Plan for the Driftless Area National Wildlife Refuge as described in Alternative C in the FEIS (February 2006).



APR 18 2006

Robyn Thorson
Regional Director
U.S. Fish and Wildlife Service

Date

Appendix B: Glossary

Appendix B: Glossary

Algific Talus Slope:	Cold producing rocky slope in which air circulation and groundwater infiltration produce more or less permanent underground ice whose incomplete melting produces a constant stream of moist cool air which filters through a thin plant and litter cover over an extensive rock talus.
Aquatic Species:	Includes all freshwater, anadromous and estuarine fishes, freshwater mollusks, freshwater crustaceans and freshwater amphibians.
Archaeological and Cultural Values:	Any material remains of past human life or activity greater than 100 years old which are of archaeological interest as defined by Section 4(a) of the Archaeological Resources Protection Act and 43 CFR Part 7.3.
Biodiversity:	The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
Biologic Integrity	Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities.
Candidate Species:	Those species for which the Service has on file sufficient information on biological vulnerability and threats to propose them for listing.
Compatible Use:	A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director or designee, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge (PL 105-57).
Comprehensive Conservation Plan:	A document, completed with public involvement, that describes the desired future condition and provides long-term (15 year planning horizon) guidance to accomplish the purposes of the refuge system and the individual refuge units.
Conservation:	The management of natural resources to prevent loss or waste. Management actions may include preservation, restoration and enhancement.
Conservation Agreements:	Written agreements reached among two or more parties for the purpose of ensuring the survival and welfare of unlisted species of fish and wildlife and/or their habitats, or to achieve other specified

conservation goals. Participants voluntarily commit to implementing specific actions that will remove or reduce the threats to these species.

Conservation (Species):	The use of all methods and procedures which are necessary to bring any species to the point at which the measures provided are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation. Conservation is the act of managing a resource to ensure its survival and availability.
Cross-program:	Communication and cooperation between multiple programs. The Service is organized into programs such as Refuges, Migratory Birds, Law Enforcement, Fisheries, International Affairs, Endangered Species, and Environmental Contaminants.
Cultural Resources:	Cultural Resources: “those parts of the physical environment - natural and built - that have cultural value to some kind of sociocultural group... [and] those non-material human social institutions....” (King, p.9). Cultural resources include historic sites, archeological sites and associated artifacts, sacred sites, traditional cultural properties, cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony) (McManamon, Francis P. DCA-NPS; letter 12-23-97 to Walla Walla District, COE), and buildings and structures.
Delisting:	A process for removing a listed species from the lists of threatened and endangered species due to recovery. Delisting requires a formal rulemaking procedure, including publication in The Federal Register.
Direct Take:	Under the authorities of the Migratory Bird Treaty Act, direct take is to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shot, wound, kill, trap, capture, or collect.
Downlisting:	Process for changing a species' status from endangered to threatened due to a reduction in threats and improved status of the species. Downlisting requires a formal rulemaking procedure, including publication in The Federal Register.
Ecosystem:	Dynamic and interrelating complex of plant and animal (including humans) communities and their associated non-living environment.
Ecosystem Approach:	1) Protecting or restoring the natural function, structure, and species composition of an ecosystem, recognizing that all components are interrelated. 2) Management of natural resources using system-wide concepts to ensure that all plants and animals in ecosystems are maintained at viable levels in native habitats and

that basic ecosystem processes are perpetuated indefinitely (Clark and Zaunbrecher 1987).

Ecosystem Management Plans:

Plans developed that identify natural resource needs, set resource goals and objectives, identify needed actions, determine budget needs and outline a process to monitor and evaluate the success of the actions.

Endangered Species:

A listed species in danger of extinction throughout all or a significant portion of its range.

Endangered Species Consultations:

Process whereby federal agencies consult with the Service on any prospective agency action when the agency has reason to believe that an endangered or threatened species may be effected by an action the agency is funding, permitting, or conducting.

Endangered Species Listing:

The process of adding a species to the Endangered Species list, which includes publication in The Federal Register of a proposed rule to list the species, a public comment period allowing for one or more public hearings, and a final determination either to list the species or withdraw the proposal.

Enhance (habitats):

Improves habitat through alteration, treatment, or other land management of existing habitat to increase habitat value for one or more species without bringing the habitat to a fully restored or naturally occurring condition.

Environmental Health:

Composition, structure, and functioning of soil, water, air and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

Forest Fragmentation:

Fragmentation may occur when a forested landscape is subdivided into patches. Fragmentation may also occur when numerous openings for such things as fields, roads, and powerlines interrupt a continuous forest canopy. The resulting landscape pattern alters habitat connectivity and edge characteristics, influencing a variety of species.

Geographic Information System:

GIS aids in the collection, analysis, output and distribution of spatial data and information.

Glacial Relict Species:

A plant or animal known from fossil records to have existed during glacial events, or the Ice Age, that still exists today.

Invasive Species:

An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

Karst:

A type of topography that is formed on limestone, gypsum, and other soluble rocks, primarily by dissolution. Karst landscapes are

characterized by sinkholes, caves, and underground drainage.
(American Geological Institute)

Moderate Cliff:	An algalic talus slope that has lost the talus layer from erosion to form a cliff face. The small cracks that feed cold air are then exposed on the surface of the cliff creating a cold moist habitat.
Migratory Nongame Birds of Management Concern:	Those species of nongame birds that (a) are believed to have undergone significant population declines; (b) have small or restricted populations; or (c) are dependent upon restricted or vulnerable habitats.
Migratory Species:	Species that move substantial distances to satisfy one or more biological needs, most often to reproduce or escape intolerable cyclic environmental conditions.
Multi-species Recovery Plan:	A recovery plan developed for more than one listed species. Multi-species recovery plans are usually developed for groups of listed species that share similar habitat and/or face similar threats.
National Wildlife Refuge System:	All lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction.
National Outreach Strategy:	Outreach is a two-way communication between the Service and the public to access understanding and impact of the Service's education programs. It establishes mutual understanding and promotes involvement with the goal of improving joint stewardship of America's fish and wildlife resources.
Partnership Agreements:	See Conservation Agreements.
Population Monitoring:	Assessments of the characteristics of populations to ascertain their status and establish trends related to their abundance, condition, distribution or other characteristics.
Prescribed Fire:	Controlled fires set under specific conditions (prescription) to meet specific habitat objectives.
Protect (habitat):	Maintain current quality or prevent degradation to habitat. The act of ensuring that habitat quantity and quality do not change, most often as a result of human activities but sometimes in response to unwelcome natural processes or phenomena.
Recovery Plans (species):	Documents developed by the Service that outline tasks necessary to stabilize and recover listed species. Recovery plans include goals for measuring species progress towards recovery, estimated costs and time frames for the recovery process, and an identification of

public and private partners that can contribute to implementation of the recovery plan.

Reintroduction (of species):	Listed species reintroduced into their former range when such an action is necessary for species recovery and is called for in an approved recovery plan. Species may be reintroduced with the full protection of their listed status or as an experimental population that allows for greater flexibility in how the reintroduced individuals are managed.
Restore (habitat):	Returns the quantity and quality of habitat to some previous naturally occurring condition, most often some baseline considered suitable and sufficient to support self-sustaining populations of fish and wildlife.
Riparian Habitats:	Those lands adjacent to streams or rivers that form a transition zone between aquatic and upland systems and are typically dominated by woody vegetation that is of a noticeably different growth form than adjacent vegetation. Riparian areas may or may not meet the definition of wetlands used by Cowardin et al (1979).
Sinkhole:	A funnel-shaped depression in a karst area, commonly with a circular or oval pattern. Sinkhole drainage is subterranean and sinkhole size is usually measured in meters or tens of meters. Common sinkhole types include those formed by dissolution, where the land is dissolved downward into the funnel shape, and by collapse where the land falls into an underlying cave (American Geological Institute)
Species of Concern:	A species not on the federal list of threatened or endangered species, but a species for which the Service or one of its partners has concerns.
Stakeholders:	State, tribal, and local government agencies, academic institutions, the scientific community, non-governmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.
Threatened Species:	A listed species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Undertaking:	A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval..." (36 CFR 800.16(y); 12-12-2000), i.e., all Federal actions.
Uplands:	All lands not meeting the definition of wetlands, deepwater, or riverine.
Visitors:	The total number of visitors to the Refuge System and Fish Hatchery System as estimated by refuge managers in the annual

Public Education and Recreation module of the Refuge Management Information System and by hatchery managers in.

Watershed: The area drained by a river or stream and its tributaries.

Wetlands: Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (Cowardin et. al., 1979. In layman's terms, this habitat category includes marshes, swamps and bogs.

Wildlife-dependent recreational use: A use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.

Appendix C: Species List

Species List

Common and scientific names of plants and animals referenced in the text or found on the Refuge. State or federal threatened and endangered status is given. A complete species list for the Refuge has not been completed. Not all of the bird species in this list have been confirmed on Refuge lands, but do occur in the area. Some alpine talus slope species do not have common names.

Bird List for Driftless Area NWR

Common name	Scientific name	Status*	Resource Conservation Priority (RCP) Species
Acadian Flycatcher	<i>Empidonax vireescens</i>	W T	✓
American Robin	<i>Turdus migratorius</i>		
American Woodcock	<i>Scolopax minor</i>		✓
Bald Eagle	<i>Haliaeetus leucocephalus</i>	F T, I E, IL T	✓
Black-and-White Warbler	<i>Mniotilta vana</i>		
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>		✓
Blue-winged Teal	<i>Anas discors</i>		✓
Blue-winged Warbler	<i>Vermivora pinus</i>		✓
Bobolink	<i>Dolichonyx oryzivorus</i>		✓
Brown Thrasher	<i>Toxostoma rufum</i>		
Brown-headed Cowbird	<i>Molothrus ater</i>		✓
Cerulean Warbler	<i>Dendroica cerulea</i>	W T	
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>		
Common Grackle	<i>Quiscalus quiscula</i>		
Common Yellowthroat	<i>Geothlypis trichas</i>		
Dickeissel	<i>Spiza americana</i>		✓
Eastern Bluebird	<i>Sialia sialis</i>		
Eastern Meadowlark	<i>Sturnella magna</i>		✓
Field Sparrow	<i>Spizella pusilla</i>		✓
Golden-winged Warbler	<i>Vermivora chrysoptera</i>		✓

Bird List for Driftless Area NWR (Continued)

Common name	Scientific name	Status*	Resource Conservation Priority (RCP) Species
Grasshopper Sparrow	<i>Ammodramus savannarum</i>		✓
Henslow's Sparrow	<i>Ammodramms henslowii</i>		✓
Kentucky Warbler	<i>Oporornis formosus</i>	W T	✓
Long-eared Owl	<i>Asio otus</i>		✓
Loggerhead Shrike	<i>Lanius ludovicianus</i>	M T, IL T	✓
Louisiana Waterthrush	<i>Seiurus motacilla</i>		✓
Mallard	<i>Anas platyrhynchos</i>		✓
Mourning Dove	<i>Zenaida macroura</i>		
Northern Flicker	<i>Colaptes auratus</i>		✓
Northern Harrier	<i>Circus cyaneus</i>	I E, IL E	✓
Northern Shrike	<i>Lanius excubitor</i>		
Orchard Oriole	<i>Icterus spurius</i>		✓
Pileated Woodpecker	<i>Dryocopus pileatus</i>		
Prothonotary Warbler	<i>Protonotaria citrea</i>		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>		
Red-eyed Vireo	<i>Vireo olivaceus</i>		
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>		✓
Red-shouldered Hawk	<i>Buteo lineatus</i>		✓
Red-tailed Hawk	<i>Buteo jamaicensis</i>		
Ring-necked Pheasant	<i>Phasianus colchicus</i>		
Ruffed Grouse	<i>Bonasa umbellus</i>		
Sedge Wren	<i>Cistothorus platensis</i>		✓
Short-eared Owl	<i>Asio flammeus</i>		✓
Song Sparrow	<i>Melospiza melodia</i>		
Upland Sandpiper	<i>Bartramia longicauda</i>		✓
Veery	<i>Catharus fuscescens</i>		
Western Meadowlark	<i>Sturnella neglecta</i>		✓

Bird List for Driftless Area NWR (Continued)

Common name	Scientific name	Status*	Resource Conservation Priority (RCP) Species
Whip-poor-will	<i>Caprimulgus vociferus</i>		✓
Wood Duck	<i>Aix sponsa</i>		✓
Wood Thrush	<i>Hylocichla mustelina</i>		✓
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>		
Yellow-throated Vireo	<i>Vireo flavifrons</i>		

* Threatened and endangered status: F=Federal, I=Iowa, IL=Illinois, M=Minnesota, O=Ohio, NY=New York, W=Wisconsin. T=threatened, E=endangered

Plant List for Driftless Area NWR

Common name	Scientific name	Status*
	<i>Carex peckii</i>	
Adoxa	<i>Adoxa moschatellina</i>	W T, IL E
Alder buckthorn	<i>Rhamnus alnifolia</i>	IL E
Balsam fir	<i>Abies balsamea</i>	
Basswood	<i>Tilia americana</i>	
Big bluestem	<i>Andropogon gerardi</i>	
Bitternut hickory	<i>Carya cordiformis</i>	
Black cherry	<i>Prunus serotina</i>	
Black walnut	<i>Juglans nigra</i>	
Black-eyed susan	<i>Rudbeckia hirta</i>	
Box elder	<i>Acer negundo</i>	
Canada anemone	<i>Anemone canadensis</i>	
Canada thistle	<i>Cirsium arvense</i>	
Canada yew	<i>Taxus canadensis</i>	
Compass plant	<i>Silphium laciniatum</i>	
Fragile fern	<i>Cystopteris fragilis</i>	
Daisy fleabane	<i>Erigeron strigosus</i>	
Dwarf enchanter's nightshade	<i>Circaea alpina</i>	IL E
Dwarf scouring rush	<i>Equisetum scirpoides</i>	IL E
Dwarf goldenrod	<i>Solidago sciaphila</i>	
Dwarf raspberry	<i>Rubus pubescens</i>	
Equisetum pratense	<i>Equisetum pratense</i>	IL T
European buckthorn	<i>Rhamnus cathartica</i>	
False gromwell	<i>Onosmodium occidentale</i>	
False medic grass	<i>Schizachne purpurescens</i>	
Flowering spurge	<i>Euphorbia corollata</i>	
Forbes' saxifrage	<i>Saxifraga forbesii</i>	
Frigid ambersnail	<i>Catinella gelida</i>	
Garlic mustard	<i>Alliaria petiolata</i>	
Golden saxifrage	<i>Chrysoplenium iowense</i>	I T, M E
Hackberry	<i>Celtis occidentalis</i>	

Plant List for Driftless Area NWR (Continued)

Common name	Scientific name	Status*
Hairy puccoon	<i>Lithospermum croceum</i>	
Harebell	<i>Campanula rotundifolia</i>	
Hoary vervain	<i>Verbena stricata</i>	
Indian grass	<i>Sorghastrum nutans</i>	
Ironwood	<i>Ostrya virginiana</i>	
Kidney leaved violet	<i>Viola renifolia</i>	
Leadplant	<i>Amorpha canescens</i>	
Leaf-cup	<i>Polymnia canadensis</i>	
Leafy spurge	<i>Euphorbia esula</i>	
Leatherwood	<i>Dirca palustris</i>	
Leedy's roseroot	<i>Sedum integrifolium</i>	F T, M E
Little bluestem	<i>Schizachyrium scoparium</i>	
Limestone oak fern	<i>Gymnocarpium robertianum</i>	IL E
Louisiana waterthrush	<i>Seiurus motacilla</i>	
Mountain maple	<i>Acer spicatum</i>	
Mountain mint	<i>Pycnanthemum virginianum</i>	
Mouse-ear chickweed	<i>Cerastium arvense</i>	
Multiflora rose	<i>Rosa multiflora</i>	
Musclewood	<i>Carpinus caroliniana</i>	
Needle grass	<i>Stipa spartea</i>	
Northern lungwort	<i>Mertensia paniculata</i>	I E
Northern monkshood	<i>Aconitum noveboracense</i>	F T, I T, W T, O E, NY T
Occult vertigo	<i>Vertigo occulta</i>	I T
Pale lobelia	<i>Lobelia spicata</i>	
Paper birch	<i>Betula papyrifera</i>	
Prairie dropseed	<i>Sporobolus heterolepis</i>	
Prairie rose	<i>Rosa carolina</i>	
Prairie thimbleweed	<i>Anemone cylindrica</i>	
Prairie violet	<i>Viola pedatifida</i>	
Prickly ash	<i>Xanthoxylum americanum</i>	
Prickly rose	<i>Rosa acicularis</i>	I E, IL E

Plant List for Driftless Area NWR (Continued)

Common name	Scientific name	Status*
Purple prairie clover	<i>Petalostemum purpureum</i>	
Quaking aspen	<i>Populus tremuloides</i>	
Red oak	<i>Quercus rubra</i>	
Red-berried elder	<i>Sambucus racemosa</i>	
Rigid goldenrod	<i>Solidago rigida</i>	
Rose twisted stalk	<i>Streptopus rosius</i>	
Shagbark hickory	<i>Carya ovata</i>	
Showy lady's slipper	<i>Cypripedium reginae</i>	I T, IL E
Side-oats grama	<i>Bouteloua curtipendula</i>	
Slippery elm	<i>Ulmus rubra</i>	
Stinging nettle	<i>Urtica dioica</i>	
Sugar maple	<i>Acer saccharum</i>	
Sullivantia	<i>Sullivantia sullivantii</i>	M T, IL T
Sumac	<i>Rhus typhina</i> or <i>R. glabra</i>	
Touch-me-not	<i>Impatiens pallida</i>	
Twinflower	<i>Linnaea borealis</i>	I T
Twinleaf	<i>Jeffersonia diphylla</i>	I T
Western yarrow	<i>Achillea millefolium</i>	
White prairie clover	<i>Petalostemum candidum</i>	
Wood Nettle	<i>Laportea canadensis</i>	
Woodrush	<i>Luzula acuminata</i>	

* Threatened and endangered status: F=Federal, I=Iowa, IL=Illinois, M=Minnesota, O=Ohio, NY=New York, W=Wisconsin. T=threatened, E=endangered

Snails, Mammals, Reptiles, and Turtles of Driftless Area NWR

Common name	Scientific name	Status*
Bluff vertigo snail	<i>Vertigo meramecensis</i>	S E, M T
Briarton pleistocene vertigo snail	<i>Vertigo brierensis</i>	S E
Minnesota pleistocene ambersnail	<i>Novisuccinea Sp A</i>	I E, M T
Iowa Pleistocene ambersnail	<i>Novisuccinea Sp B</i>	I E, M E
Iowa Pleistocene snail	<i>Discus macclintocki</i>	F E, I E, IL E
Iowa Pleistocene vertigo snail	<i>Vertigo iowensis</i>	I E
White-tail deer	<i>Odocoileus virginianus</i>	
Coyote	<i>Canis latrans</i>	
Snapping turtle	<i>Chelydra serpentina</i>	
Timber rattlesnake	<i>Crotalus horridus</i>	M T, IL T

Appendix D: Compatibility Determinations

The following compatibility determinations have had public review. Copies of the signed documents are available for viewing at the Driftless Area NWR Headquarters:

- # Cooperative farming for habitat restoration
- # Interpretation and environmental education
- # Recreational fishing
- # Hunting of resident game
- # Wildlife observation and photography (including the means of access such as hiking, snowshoeing, cross-country skiing, and canoeing)
- # Research, monitoring, inventory by third parties
- # Firewood and commercial tree cutting for habitat management purposes
- # Pre-acquisition compatibility of wildlife-dependent uses

Appendix E: Compliance Requirements

Appendix E / Compliance Requirements

Rivers and Harbor Act (1899) (33 U.S.C. 403): Section 10 of this Act requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States.

Antiquities Act (1906): Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Migratory Bird Treaty Act (1918): Designates the protection of migratory birds as a Federal responsibility. This Act enables the setting of seasons, and other regulations including the closing of areas, Federal or non Federal, to the hunting of migratory birds.

Migratory Bird Conservation Act (1929): Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Fish and Wildlife Coordination Act (1934), as amended: Requires that the Fish and Wildlife Service and State fish and wildlife agencies be consulted whenever water is to be impounded, diverted or modified under a Federal permit or license. The Service and State agency recommend measures to prevent the loss of biological resources, or to mitigate or compensate for the damage. The project proponent must take biological resource values into account and adopt justifiable protection measures to obtain maximum overall project benefits. A 1958 amendment added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs. It also authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds.

Migratory Bird Hunting and Conservation Stamp Act (1934): Authorized the opening of part of a refuge to waterfowl hunting.

Historic Sites, Buildings and Antiquities Act (1935), as amended: Declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. Provides procedures for designation, acquisition, administration, and protection of such sites.

Refuge Revenue Sharing Act (1935), as amended: Requires revenue sharing provisions to all fee-title ownerships that are administered solely or primarily by the Secretary through the Service.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act (1948): Provides that upon a determination by the Administrator of the General Services Administration, real property no longer needed by a Federal agency can be transferred without reimbursement to the Secretary of Interior if the land has particular value for migratory birds, or to a State agency for other wildlife conservation purposes.

Federal Records Act (1950): Directs the preservation of evidence of the government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Fish and Wildlife Act (1956): Established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

Refuge Recreation Act (1962): Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage the uses.

Wilderness Act (1964), as amended: Directed the Secretary of Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System, with final decisions made by Congress. The Secretary of Agriculture was directed to study and recommend suitable areas in the National Forest System.

Land and Water Conservation Fund Act (1965): Uses the receipts from the sale of surplus Federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

National Wildlife Refuge System Administration Act (1966), as amended by the National Wildlife Refuge System Improvement Act (1997) 16 U.S.C. 668dd668ee. (Refuge Administration Act): Defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, or environmental education and interpretation); establishes a formal process for determining compatibility; established the responsibilities of the Secretary of Interior for managing and protecting the System; and requires a Comprehensive Conservation Plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

National Historic Preservation Act (1966), as amended: Establishes as policy that the Federal Government is to provide leadership in the preservation of the nation's prehistoric and historic resources.

Architectural Barriers Act (1968): Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

National Environmental Policy Act (1969): Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended: Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

Endangered Species Act (1973): Requires all Federal agencies to carry out programs for the conservation of endangered and threatened species.

Rehabilitation Act (1973): Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal government to ensure that anybody can participate in any program.

Archaeological and Historic Preservation Act (1974): Directs the preservation of historic and archaeological data in Federal construction projects.

Clean Water Act (1977): Requires consultation with the Corps of Engineers (404 permits) for major wetland modifications.

Surface Mining Control and Reclamation Act (1977) as amended (Public Law 95-87) (SMCRA): Regulates surface mining activities and reclamation of coal-mined lands. Further regulates the coal industry by designating certain areas as unsuitable for coal mining operations.

Executive Order 11988 (1977): Each Federal agency shall provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 11990: Executive Order 11990 directs Federal agencies to (1) minimize destruction, loss, or degradation of wetlands and (2) preserve and enhance the natural and beneficial values of wetlands when a practical alternative exists.

Executive Order 12372 (Intergovernmental Review of Federal Programs): Directs the Service to send copies of the Environmental Assessment to State Planning Agencies for review.

American Indian Religious Freedom Act (1978): Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

Fish and Wildlife Improvement Act (1978): Improves the administration of fish and wildlife programs and amends several earlier laws including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out a volunteer program.

Archaeological Resources Protection Act (1979), as amended: Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

Federal Farmland Protection Policy Act (1981), as amended: Minimizes the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

Emergency Wetlands Resources Act (1986): Promotes the conservation of migratory waterfowl and offsets or prevents the serious loss of wetlands by the acquisition of wetlands and other essential habitats.

Federal Noxious Weed Act (1990): Requires the use of integrated management systems to control or contain undesirable plant species, and an interdisciplinary approach with the cooperation of other Federal and State agencies.

Native American Graves Protection and Repatriation Act (1990): Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

Americans With Disabilities Act (1992): Prohibits discrimination in public accommodations and services.

Executive Order 12898 (1994): Establishes environmental justice as a Federal government priority and directs all Federal agencies to make environmental justice part of their mission. Environmental justice calls for fair distribution of environmental hazards.

Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System (1996): Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the System.

Executive Order 13007 Indian Sacred Sites (1996): Directs Federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

National Wildlife Refuge System Improvement Act (1997): Considered the “Organic Act of the National Wildlife Refuge System. Defines the mission of the System, designates priority wildlife-dependent public uses, and calls for comprehensive refuge planning.

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act (1998): Amends the Fish and Wildlife Act of 1956 to promote volunteer programs and community partnerships for the benefit of national wildlife refuges, and for other purposes.

National Trails System Act: Assigns responsibility to the Secretary of Interior and thus the Service to protect the historic and recreational values of congressionally designated National Historic Trail sites.

Treasury and General Government Appropriations Act of 2001 (Public Law 106-554): In December 2002, Congress required federal agencies to publish their own guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information that they disseminate to the public (44 U.S.C. 3502). The amended language is included in Section 515(a). The Office of Budget and Management (OMB) directed agencies to develop their own guidelines to address the requirements of the law. The Department of the Interior instructed bureaus to prepare separate guidelines on how they would apply the Act. The U.S. Fish and Wildlife Service has developed “Information Quality Guidelines” to address the law.

Appendix F: Refuge Operations Needs (RONS) and Maintenance Management System (MMS)

Refuge Operations Needs (RONS) and Maintenance Management System (MMS)

Refuge Operations Needs (RONS)

RONS Project No.	Strategy No.	Project Description	First Year Need	Recurring Annual Need
01001	2.5.4.1, Obj. 1, Strategy 10. Also would assist with other objectives	endangered species monitoring (biologist)	128,000	128,000
Total			\$128,000	

Deferred Maintenance and Equipment Needs (MMS)

MMS	Refuge Rank	Strategy No.	Project Description	Fund Type	Year	Cost
04001	1	2.5.4.1 No. 2	Replace 60,000 linear feet of barbed wire fencing	DM	2004	34,000
04002	2	2.5.4.3 No.7	Revised Visitor Center display	DM	2004	52,000
04100	3	2.5.4.3 No. 6	Construct accessible hiking trails and wildlife interpretive facilities	SC	2004	313,000
01001	4	All	Replace chevy cargo truck	SE	2004	23,000
00468	1	All	Replace McGregor District office/shop facility Combined with McGregor District	LC	2004	2,297,000

Appendix G: List of Preparers

List of Preparers

Cathy Henry, Refuge Operations Specialist

Driftless Area National Wildlife Refuge, McGregor, Iowa

Ms. Henry served as the primary author and coordinated with agencies and the public. She has worked for the U.S. Fish and Wildlife Service for 12 years. She has a Bachelor of Science degree in Animal Ecology and a Master of Science degree in Wildlife and Fisheries Science.

John Lindell, District Manager

Driftless Area National Wildlife Refuge, McGregor, Iowa

Mr. Lindell assisted with writing and editing and coordination with agencies and the public. Mr. Lindell has 33 years of experience with the U.S. Fish and Wildlife Service. He has a Bachelor of Arts degree in zoology and a Master of Arts degree in Wildlife Biology.

Eric Nelson, Wildlife Biologist

Upper Mississippi River National Wildlife and Fish Refuge, Winona, Minnesota

Mr. Nelson provided overall coordination of the Upper Mississippi River NWFR Complex CCP process, arranged and coordinated public meetings, mailings, and assisted with editing.

Don Hultman, Refuge Complex Manager

Upper Mississippi River National Wildlife and Fish Refuge Complex, Winona, Minnesota

Mr. Hultman provided oversight on the CCP process and coordination with agencies and the public and assisted with editing

Gary Muehlenhardt, Wildlife Biologist/Refuge Planner

Regional Office, Region 3

Mr. Muehlenhardt assisted with formulation of alternatives and editing.

John Dobrovolny, Regional Historian

Regional Office, Region 3

Mr. Dobrovolny coordinated the Cultural Resources review for the Refuge.

John Schomaker, Refuge Planner

Regional Office, Region 3

Mr. Schomaker assisted with formulation of alternatives and editing.

Gabriel DeAllesio, Biologist/GIS Specialist

Regional Office, Region 3

Mr. DeAllesio prepared several maps for the comprehensive conservation plan.

Jane Hodgins, Technical Writer/Editor

Regional Office, Region 3

Ms. Hodgins served as primary editor.

Appendix H: Mailing List for the EIS

Mailing List for the Environmental Impact Statement

Elected Federal Officials

- # U.S. Senator Richard Durbin (Illinois)
- # U.S. Senator Peter Fitzgerald (Illinois)
- # U.S. Senator Charles Grassley (Iowa)
- # U.S. Senator Tom Harkin (Iowa)
- # U.S. Senator Norm Coleman (Minnesota)
- # U.S. Senator Mark Dayton (Minnesota)
- # U.S. Senator Russ Feingold (Wisconsin)
- # U.S. Senator Herb Kohl (Wisconsin)
- # U.S. Representative Philip Crane (Illinois)
- # U.S. Representative Lane Evans (Illinois)
- # U.S. Representative Dennis Hastert (Illinois)
- # U.S. Representative Donald Manzullo (Illinois)
- # U.S. Representative Tom Latham (Iowa)
- # U.S. Representative Jim Nussle (Iowa)
- # U.S. Representative Gil Gutknecht (Minnesota)
- # U.S. Representative Mark Kennedy (Minnesota)
- # U.S. Representative Ron Kind (Wisconsin)

Elected State Officials

- # State Senator Denny Jacobs (Illinois)
- # State Senator Todd Sieben (Illinois)
- # State Senator Mike Connolly (Iowa)
- # State Senator E.T. Gaskill (Iowa)
- # State Senator Kitty Rehberg (Iowa)
- # State Senator Julie Hosch (Iowa)
- # State Senator Bryan Sievers (Iowa)
- # State Senator Roger Stewart (Iowa)
- # State Senator Mark Ziemann (Iowa)
- # State Senator Bob Kierlin (Minnesota)
- # State Senator Steve Murphy (Minnesota)
- # State Senator Ron Brown (Wisconsin)
- # State Senator Mark Meyer (Wisconsin)
- # State Senator Dale Schultz (Wisconsin)
- # State Representative Mike Boland (Illinois)
- # State Representative Jim Sacia (Illinois)
- # State Representative Patrick Verschoore (Illinois)
- # State Representative Polly Bukta (Iowa)
- # State Representative Chuck Gipp (Iowa)
- # State Representative Pam Jochum (Iowa)

- # State Representative Steven Lukan (Iowa)
- # State Representative Pat Murphy (Iowa)
- # State Representative Steven Olson (Iowa)
- # State Representative Bob Osterhaus (Iowa)
- # State Representative Roger Thomas (Iowa)
- # State Representative Gregory Davids (Minnesota)
- # State Representative Jerry Dempsey (Minnesota)
- # State Representative Gene Pelowski (Minnesota)
- # State Representative Steve Sviggum (Minnesota)
- # State Representative Barbara Gronemus (Wisconsin)
- # State Representative Mike Huebsch (Wisconsin)
- # State Representative DuWayne Johnsrud (Wisconsin)
- # State Representative Gabe Loeffelholz (Wisconsin)
- # State Representative Jennifer Shilling (Wisconsin)

Federal Agencies

- # U.S. Army Corps of Engineers
- # U.S. Coast Guard
- # U.S. Department of Agriculture, Natural Resource Conservation Service
- # U.S. Department of Interior, U.S. Fish & Wildlife Service
- # U.S. Department of Interior, U.S. Geological Survey
- # U.S. Department of Transportation
- # U.S. Environmental Protection Agency
- # U.S. Forest Service

Native American Tribes

- # Bad River Band, Chippewa
- # Boise Forte Band, Chippewa
- # Fond du Lac Band, Chippewa
- # Grand Portage Band, Chippewa
- # Lac Courte Oreilles Band, Chippewa
- # Lac du Flambeau, Chippewa
- # Leech Lake Band, Chippewa
- # Mille Lacs Band, Chippewa"
- # Red Cliff Band, Chippewa
- # Red Lake Band, Chippewa
- # Sandy Lake Band, Chippewa
- # Sokaogon Chippewa
- # Devils Lake (Spirit Lake) Sioux
- # Flandreau Santee Sioux
- # Lower Brule Sioux
- # Lower Sioux Mdewakanton
- # Prairie Island Sioux
- # Santee Sioux
- # Shakopee Mdewakanton Sioux

- # Sisseton-Whapeton Sioux
- # Upper Sioux Community
- # Iowa Tribe of Kansas
- # Iowa tribe of Oklahoma
- # Menominee Indian Tribe
- # Miami Tribe
- # Stockbridge-Munsee
- # Peoria Indian Tribe
- # Citizen Potawatomi
- # Forest County Potawatomi
- # Hannahville Indian Community, Potawatomi
- # Prairie Band of Potawatomi
- # Sac & Fox Nation of Missouri
- # Sac & Fox Tribe of the Mississippi
- # Ho-Chunk Nation
- # Winnebago Tribe of Nebraska

State Agencies

- # Iowa Department of Natural Resources
- # Iowa Historical Society
- # Iowa Department of Cultural Affairs
- # Illinois Department of Natural Resources
- # Illinois Historic Preservation Division
- # Minnesota Department of Agriculture
- # Minnesota Department of Natural Resources
- # Minnesota Department of Transportation
- # Minnesota Historical Society
- # Minnesota Pollution Control Agency
- # Minnesota Water & Soil Resource Board
- # Wisconsin Department of Natural Resources
- # Wisconsin Division of Tourism
- # Wisconsin Department of Transportation
- # Wisconsin Department of Agriculture, Trade and Consumer Protection

Cities

- # Alma, Wisconsin
- # Brownsville, Minnesota
- # Cassville Village, Wisconsin
- # Dubuque, Iowa
- # Edgewood, Iowa
- # Elkader, Iowa
- # Fountain City, Wisconsin
- # Garnavillo, Iowa
- # Guttenberg, Iowa
- # Harper's Ferry, Iowa

- # Hokah, Minnesota
- # La Crescent, Minnesota
- # La Crosse, Wisconsin
- # Lansing, Iowa
- # McGregor, Iowa
- # Monona, Iowa
- # New Albin, Iowa
- # Onalaska, Wisconsin
- # Prairie du Chien, Wisconsin
- # Stoddard, Wisconsin
- # Trempealeau, Wisconsin
- # Waukon, Iowa
- # Winona, Minnesota

Counties

- # Carroll, Illinois
- # Jackson, Illinois
- # JoDaviess, Illinois
- # Rock Island, Illinois
- # Whiteside, Illinois
- # Allamakee, Iowa
- # Clayton, Iowa
- # Clinton, Iowa
- # Dubuque, Iowa
- # Houston, Minnesota
- # Wabasha, Minnesota
- # Winona County, Minnesota
- # Buffalo, Wisconsin
- # Crawford, Wisconsin
- # Grant, Wisconsin
- # La Crosse, Wisconsin
- # Trempealeau, Wisconsin
- # Vernon, Wisconsin

Organizations

- # American Rivers
- # Audubon Society
- # Boy Scouts of America
- # Izaak Walton League of America
- # Sierra Club
- # The Nature Conservancy
- # The Wilderness Society
- # Friends of the Upper Mississippi Refuges
- # Sportsmen's Clubs (96)
- # Businesses (45)

- # Schools/Univ. (26)
- # Libraries (34)
- Other Organizations (54)

- # River Associations and Committees (13)
- # Lower Mississippi River Conservation Committee
- # Midwest Area River Coalition 2000
- # Mississippi River Basin Alliance
- # Mississippi River Citizen Commission
- # Mississippi River Interstate Cooperative Research Association
- # Mississippi River Parkway Commission
- # Mississippi River Regional Planning Commission
- # Mississippi River Revival
- # River Resource Alliance
- # Upper Mississippi River Basin Association
- # Upper Mississippi River Congressional Task Force
- # Upper Mississippi River Conservation Committee
- # Upper Mississippi Waterway Association

Media

- # Newspaper (74)
- # Radio (20)
- # TV (16)

Citizens

- # Illinois (274)
- # Iowa (287)
- # Minnesota (574)
- # Wisconsin (928)
- # Citizens in Other States (35)

Appendix I: References

References

- Bailey, R.G. 1995. Description of the Ecoregions of the United States. USDA Forest Service
- Cahayla-Wynne, R. and D.C. Glenn-Lewin. 1978. The Forest Vegetation of the Driftless Area, Northeast Iowa. *Am. Midl. Natural.* 100(2):307-319.
- Commonwealth Cultural Resources Group, Inc. 2002. Comprehensive conservation plan archaeological and historic resources, Driftless Area National Wildlife Refuge in Allamakee, Clayton, Delaware, Dubuque, Fayette, and Jackson Counties, Iowa and Grant County, Wisconsin. WR-0110. Prepared for U.S. Fish and Wildlife Service, Fort Snelling, MN
- Frest, T.J. 1982. Project SE-1-4 Iowa Pleistocene snail final report. University of Iowa, Iowa City, IA 162pp.
- Frest, T.J. 1983. Final report northern driftless area survey. University of Iowa, Iowa City, IA. 17pp.
- Frest, T.J. 1985. Final report Iowa Pleistocene snail survey. University of Washington, Seattle, WA. 37pp.
- Frest, T.J. 1986. Final report Iowa Pleistocene snail survey. University of Washington, Seattle, WA. 26pp.
- Frest, T.J. 1987. Final report Iowa Pleistocene snail project. University of Washington, Seattle, WA. 39pp.
- Frest, T. J. 1991. Summary status reports on eight species of candidate land snails from the driftless area (paleozoic plateau), upper midwest. Seattle, WA
- Glenn-Lewin, D.C., R.H. Laushman, and P.D. Whitson. 1984. The Vegetation of the Paleozoic Plateau, Northeastern Iowa. *Proc. Iowa Acad. Sci.* 91(1):22-27.
- Hemesath, L.M. and W.R. Norris. 1998. Forest avifauna of northeast Iowa. *Iowa Bird Life* 68(2):29-41.
- Henry, C., W.R. Clark, M.J. Burns, C. Dettman. 2003. Population monitoring protocol for the Iowa Pleistocene snail (*Discus macclintocki*). U.S. Fish and Wildlife Service, McGregor, IA 31 pp+ app.
- Kemperman, J. 1983. Forests and Forestry pages 33-35 in *Iowa Conservationist*. Iowa Conservation Commission, Des Moines, IA
- Knutson, M.G., G. Butcher, J. Fitzgerald, and J. Shieldcastle. 2001. Partners in Flight Bird Conservation Plan for the Upper Great Lakes Plain (Physiographic Area 16). USGS Upper Midwest Environmental Sciences Center in cooperation with Partners in Flight. LaCrosse, WI.
- Ross, T.K. 1999. Phylogeography and conservation genetics of the Iowa Pleistocene snail. *Molec. Ecol.* 8:1363-1373.
- U.S. Fish and Wildlife Service. 1990. Driftless Area National Wildlife Refuge Management Prospectus. U.S. FWS, McGregor, IA 25pp.

U.S. Fish and Wildlife Service. 1983. National recovery plan for northern monkshood (*Aconitum noveboracense*). U.S. Fish and Wildlife Service, Twin Cities, MN. 81pp.

U.S. Fish and Wildlife Service. 1984. National recovery plan for Iowa Pleistocene snail (*Discus macclintocki* (Baker)). U.S. Fish and Wildlife Service, Twin Cities, MN. 23pp + app.

U.S. Fish and Wildlife Service. 1986. National driftless area land protection plan. U.S. Fish and Wildlife Service, Twin Cities, MN. 20pp.

U.S. Fish and Wildlife Service. 1998. *Sedum integrifolium* spp. Leedyi (Leedy's roseroot) Recovery Plan. Ft. Snelling, MN. 31pp.

U.S. Fish and Wildlife Service. 2002. Region 3 Fish and Wildlife Resource Conservation Priorities. Ft. Snelling, MN

U.S. Fish and Wildlife Service. 2002. Driftless Area National Wildlife Refuge Fire Management Plan. McGregor, IA 29 pp.

U.S. Fish and Wildlife Service. 2004. The economic impacts of the Driftless National Wildlife Refuge. 15pp.

Appendix J: Land Protection Plan

Driftless Area National Wildlife Refuge

Land Protection Plan 2005

I. Project Description

Driftless Area National Wildlife Refuge (NWR) was established in 1989 under the authority of the Endangered Species Act of 1973 with the purchase of 139.3 acres in Clayton County, Iowa. The purpose of Driftless Area NWR is to conserve fish or wildlife which are listed as endangered or threatened species (16 USC 1534 Endangered Species Act of 1973). The Refuge was specifically intended to protect lands for the federally listed endangered Iowa Pleistocene snail and threatened Northern monkshood. Recovery plans for these two species describe permanent protection of remaining colonies as the primary recovery goal (U.S. Fish and Wildlife Service 1983, 1984). Refuge land acquisition would offer the permanent protection specified in the recovery plan. Tracts were purchased throughout the 1990s and two land exchanges were completed in 2001 and 2002 to bring the current Refuge acreage to 781.

The namesake of the Refuge, the Driftless Area, encompasses portions of Minnesota, Wisconsin, Iowa, and Illinois (Figure 1). The high topographic relief of the area, the varying slope angles and aspects, the karst features resulting from dissolution of underlying carbonate rocks, and the close approach of the Wisconsin glaciers to the area have acted together to produce a variety of microclimates. These, in turn, support a number of rare species that are dependent upon unusual combinations of temperature and moisture.

Iowa Pleistocene snail

The Iowa Pleistocene snail (*Discus macclintocki*) was listed as endangered in 1977 because of the small number of populations, small total population, and its very restricted and fragile habitat type. It is also listed as endangered by the states of Iowa and Illinois. The U.S. Fish and Wildlife Service completed a recovery plan in 1984 written by Dr. Terry Frest. At that time the snail was known from 18 small sites in Clayton and Dubuque Counties, Iowa and Jo Daviess County, Illinois. Fossil records indicate that the snail was once widely distributed in the Midwest during the Pleistocene era (approximately 300,000-500,000 YBP). It is therefore considered a glacial relict species and its habitat is restricted to cold algific talus slopes (Figure 2). Threats to the species and its habitat listed in the recovery plan are human disturbance, logging, grazing, road building, quarrying, sinkhole filling, pesticides, residential construction, and natural factors such as rock slides and stream undercutting or weather related factors. In recent years invasive species and increased development pressure have also been identified as threats to the Pleistocene snail.

The main features of the recovery plan are to gain management control of algific talus slopes where the snail occurs and protect them from human disturbances. Restoration and monitoring are also stated as being important. The Iowa Pleistocene snail can be considered for reclassification from endangered to threatened if permanent protection of 16 of the existing colonies can be achieved and documentation of stable or increasing populations can be done. Delisting can be considered if stringent protection of at least 24 or more sufficiently dispersed viable breeding colonies is achieved. A viable population from a genetic standpoint would be a breeding population of 500; however, further study regarding this number is needed. Dr. Frest (U.S. Fish and Wildlife Service 1984) states that it is likely other sites remain to be found. Indeed, further surveys by Dr. Frest and others in the

Figure 2: Algific Talus Slopes Illustrated



1980s discovered a new total of 37 sites in Clayton, Clinton, Fayette, Delaware, Dubuque, Jackson counties in Iowa and JoDaviess County in Illinois.

The basic premise of the recovery plan is to protect all of the sites with viable breeding colonies. Even though the number of sites has since increased, it still is not large and nearly all populations should be protected to achieve delisting. The recovery plan needs updating to include all known sites, new monitoring information, and to refine downlisting and delisting criteria. Although 22 snail sites currently have some protection, 12 of these need additional protection of algific slopes and/or sinkholes to be considered fully protected for delisting purposes. Some of the largest populations are not protected and the species needs protection across its range to preserve genetic differences and to protect against catastrophic events in one area.

Northern monkshood

Northern monkshood (*Aconitum noveboracense*) was listed as threatened in 1978 because of its limited range and habitat preference. It is also listed as threatened by the states of Iowa, Wisconsin, and New York and as endangered by Ohio. A recovery plan was completed in 1983. It was one of the first plant species listed under the Endangered Species Act. Monkshood requires a cold soil environment associated with cliffs, talus slope, algific slope, or spring/headwater stream situations. Its habitat is typically in rugged areas and on fragile cliffs or slopes that cannot tolerate a great deal of disturbance. In 1983, there were 24 sites known in Iowa, Wisconsin, Ohio, and New York. The authors acknowledged that Iowa had the greatest potential for discovery of new sites. There are now 83 known sites in Iowa, 18 in Wisconsin, two in New York, and one in Ohio. Sites vary greatly in population size from just a few plants to thousands of plants. Threats are dams and reservoirs, road construction, power line maintenance, logging, quarrying, grazing, developments, scientific overcollecting, and natural events. On algific slope sites, disturbance or filling of the sinkholes is also

a threat. More recently, invasive species, and in particular garlic mustard, have become a threat as well. There is also a greater amount of development pressure in the region than in the 1980s.

The primary goal of the recovery plan is to provide a basis for delisting by providing security for all known northern monkshood locations against damage or destruction of the existing habitats. This security could be in various forms of acquisition, easement, fencing and landowner awareness. Additional goals included searches for new sites, much of which was completed in the 1980s, and propagation research.

This recovery plan also needs revision to include all of the known sites, more recent research, and more precise downlisting and delisting criteria. The viable population size for protection efforts needs to be determined. Currently there are 45 monkshood sites in some form of permanent protection. Some of these are small populations that may not be considered viable. Similar to snail sites, many of the protected sites need additional slope/cliff, sinkhole, or buffer area protection to be considered fully protected for delisting purposes. Monkshood also needs additional protection across its range to include sites in Iowa and Wisconsin.

Leedy's roseroot

Leedy's roseroot was listed as threatened in 1992 because of its low numbers, few and disjunct populations, and specialized cliffside habitat. It is also listed as threatened by the state of Minnesota. The recovery plan was approved in 1998. The plant is found in only specialized cliffside habitat. In Minnesota, it occurs on moderate cliffs, which are cooled by air exiting underground passages. There are only three populations in New York and four in Minnesota. One site in Minnesota is owned by the Department of Natural Resources. Besides its disjunct occurrences and low numbers, the major threats are on-site disturbances and groundwater contamination.

Leedy's roseroot may be considered for delisting when all three privately owned Minnesota populations are protected by conservation easements or fee title acquisition by a public agency or private conservation organization, the contamination threat is removed from the fourth Minnesota population, and specific protection measures are taken for New York populations. Protected populations must be geographically distinct, self-sustaining, and have been protected for five consecutive years by measures that will remain effective following delisting. Additional tasks needed include locating new populations, determining the hydrologic relationship of cliffs with upland areas, securing funding for site protection, securing landowner involvement, implementing monitoring, providing public education, and maintaining a genetic bank.

Glacial relict snails

Eight glacial relict snail species and one plant species, all of which are associated with algific talus slope or cliff habitats, are on the Service's draft species of concern list. A status assessment for taxa under consideration for listing is currently being completed for them by Region 3. These species are the snails *Vertigo brierensis*, *V. hubrichti hubrichti*, *V. hubrichti variabilis*, *V. iowaensis*, *V. meramecensis*, *Catinella gelida*, *Novisuccinea* n. sp. *minnesota a*, *Novisuccinea* n. sp. *minnesota b*, and the plant golden saxifrage (*Chrysosplenium iowense*). These species sometimes occur with the previously described threatened and endangered species, but also occur on sites without them. They occur in Iowa, Minnesota, and Wisconsin and some, or all, are listed as threatened or endangered by each of these states. Since they occur on the same fragile habitat with similar threats, permanent protection measures are also important to their continued existence.

Background

The original land protection plan (LPP, U.S. Fish and Wildlife Service 1986) outlined the purposes, objectives, protection alternatives, and proposed action for the Refuge. The LPP outlined protection of approximately 25 sites containing approximately 700 acres in eight counties (Figure 1). The project at that time was expected to bring approximately 70 percent of the known Northern monkshood population and 75 percent of the known Iowa Pleistocene snail population under direct

USFWS protection. This was to be accomplished by purchasing the 18 largest monkshood and nine largest snail sites. Appropriations in 1989 and 1996 have been used to purchase (fee title) 781 acres, which protects 11 monkshood sites and eight snail sites. Nine of these monkshood sites are among the largest 18 sites and only one snail site is among the nine largest sites. Eight of these other largest sites are at least partially protected by other agencies or organizations.

In 1993, a preliminary project proposal (PPP) was approved by the Director of the Fish and Wildlife Service to develop a detailed plan to acquire up to an additional 6,220 acres in 25 counties in Illinois, Iowa, Minnesota, and Wisconsin (Figure 1) to protect enough monkshood and Iowa Pleistocene snail sites for recovery goals and to protect other rare species associated with algal talus slopes and similar rare habitats. The PPP also added acquisition areas for the plant, Leedy's roseroot (*Sedum integrifolium ssp leedyi*), which was listed as threatened in 1992 and grows on similar habitat in southeast Minnesota. Its primary recovery goal is also permanent protection (U.S. Fish and Wildlife Service 1998). The PPP also targeted protection of the plants golden saxifrage (*Chrysozplenium iowense*) and sullivaniantia (*Sullivantia sullivantia*), and eight species of glacial relict land snails that are associated with algal talus slopes and similar habitats throughout the Driftless Area (Frest 1991). At that time these were all Category 2 candidate species for federal listing¹. Some of these species occur only in the Driftless Area, or the majority of their populations occur in the Driftless Area. Known locations were based on surveys done in the 1980s (Frest 1982-1987) (Figure 3).

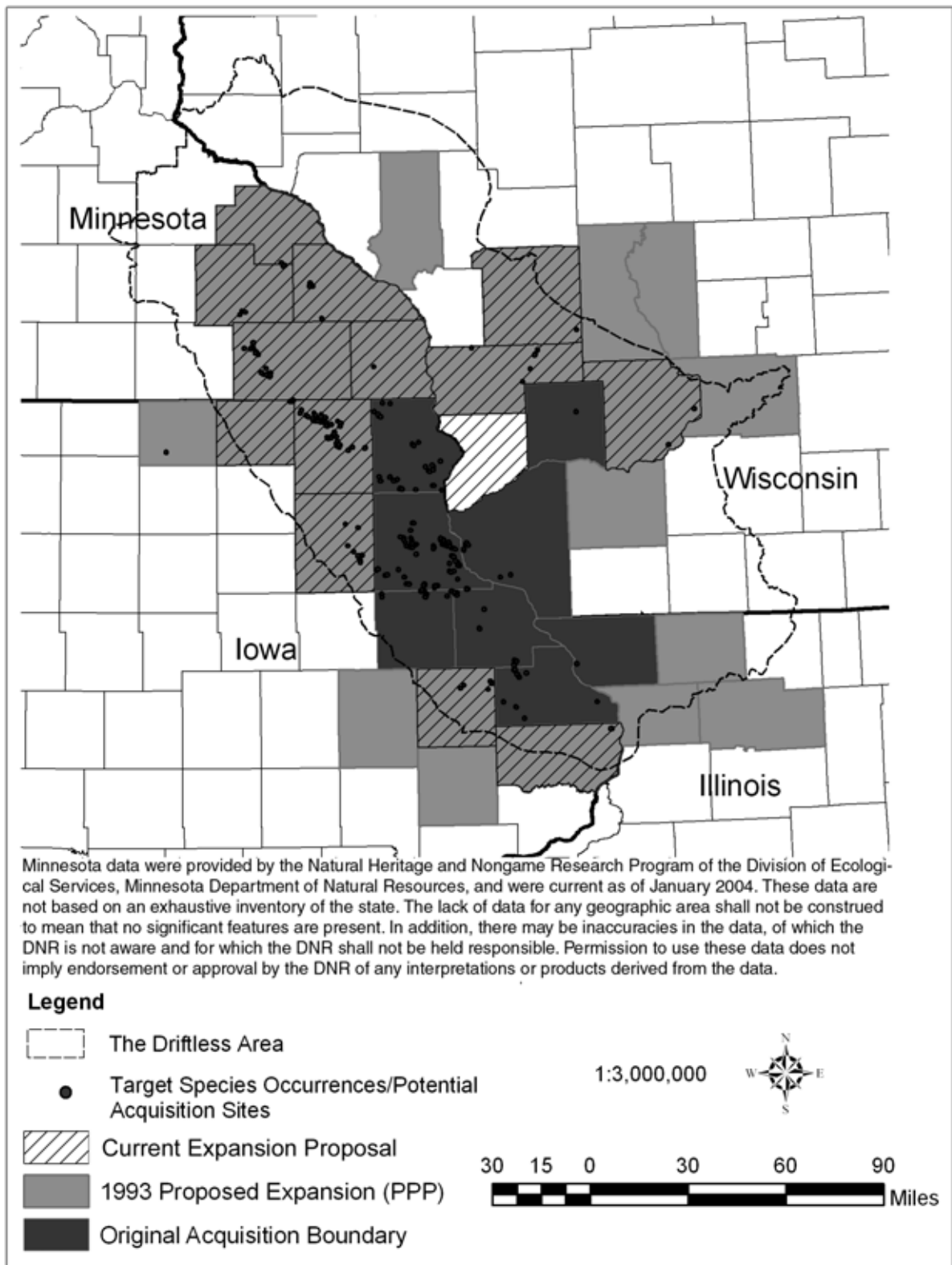
Since that time, sullivaniantia was found to occur more commonly on cliff habitats in Wisconsin and Iowa. It is now state-listed in Illinois and Minnesota and is not a U.S. Fish and Wildlife Service species of concern. Some of the counties proposed in the 1993 PPP were included only for protection of sullivaniantia and are not considered areas for potential acquisition in this expansion proposal (Figure 1). Mitchell County in Iowa contains only two sites, both of which are already protected in a county park. Therefore, this county was removed from the expansion proposal. Crawford County, Wisconsin was added to the expansion proposal because of its potential to contain habitat for endangered species and species of concern.

Thus, the number of counties where acquisition could occur is now 22. This includes the eight counties in the original acquisition area for the Refuge. The species previously described are included in a preliminary draft species of concern list for Region 3. None are candidate species at this time.

The Refuge did not pursue further study for the 1993 PPP until the Comprehensive Conservation Plan process began in 2002. The CCP planning effort was the logical time to examine all management and land protection issues related to the Refuge. The preferred alternative identified in the environmental impact statement that accompanies the CCP proposes the acquisition of approximately 6,000 acres to permanently protect and preserve a sufficient portion of the Northern monkshood and Iowa Pleistocene snail populations so that both species can be delisted. Since any acquisition would be on a willing seller basis and would be dependent upon funding availability, it is reasonable to expect that approximately 2,275 acres would be acquired over the next 15 years. The goal would be to acquire the entire 6,000 acres within at least 25 years. The expanded boundary allows the potential protection of any of these species' populations across their range. Protection across the geographic range of these species is important to preserve genetic diversity, sites with larger populations, potential reintroduction sites, and sites that may contain other rare species. Acquisition within this expanded boundary would not occur at every species location, but would allow protection of the majority of sites with viable populations to ultimately reach delisting goals and prevent listing of species of concern.

1. The Service discontinued the use of a list of "category 2 candidates" in 1996. None of these species are currently candidates for listing under the Endangered Species Act.

Figure 3: Target Species Occurrences, Driftless NWR



Refuge land acquisition is aimed at protecting the entire algific slope system at each site, including upland sinkholes and buffer area around the slope. Many of the currently protected algific slopes on the Refuge do not have adequate protection of sinkholes, nor do they provide buffer from adjacent agricultural or other uses.

Habitats on acquired lands will be restored to pre-European settlement vegetation when possible. Lands will be opened to compatible wildlife-dependent recreation only when there is sufficient buffer area around endangered species habitat, sufficient public access, and the ability to conduct law enforcement on a regular basis.

II. Threats to and Status of the Resource

Land acquisition is focused on protecting a specific type of endangered species habitat, but also includes forest, grassland, cropland, and streams surrounding the endangered species to protect sinkholes and provide buffer areas. The surrounding vegetation can influence temperature on the algific slopes, a required component of the habitat for these species. The algific talus slopes are fragile and cannot be restored once damaged or destroyed. The threats to these sites are cattle grazing, logging, quarrying, building or development, invasive species, sinkhole filling, erosion, human traffic, pesticides, and natural landslides. Without some form of protection, populations of these species could be lost in a single event.

III. Proposed Action and Objective

The primary purpose of this project is to permanently protect and preserve a sufficient portion of the Northern monkshood and Iowa Pleistocene snail populations so that both species can be delisted. With relatively little additional protection, recovery goals for permanent protection of habitat could be met for the Iowa Pleistocene snail to result in delisting.

A secondary purpose of this project is to permanently protect and preserve populations of other species of federal concern, specifically golden saxifrage and glacial relict snail species. Potential reintroduction sites for listed species would also be preserved. The project would also conserve biological integrity and diversity or a unique habitat type, a goal of the National Wildlife Refuge System.

The Service proposes to acquire approximately 6,000 acres that includes approximately 200 ownerships (Figures 4-9, pages 13-18, and Table 1 on page 123). While 6,000 acres would become the long-term acquisition goal for Driftless Area NWR, the Refuge's comprehensive conservation plan sets an acquisition target of approximately 2,275 acres to be achieved over the next 15 years. This 2,275-acre CCP target is based on estimates of potential available funds for land acquisition over the 15-year life of the CCP, and on a realistic estimate of the availability of willing sellers from the pool of identified priority tracts. Acreages of individual tracts have been determined for sites containing the three federally listed species. However, sites that contain only species of concern need further study to delineate tract boundaries (Figures 4-9). Acreage estimates are given for these study sites (Table 1), but exact boundaries have not yet been determined. We estimate that the cost of acquiring all land proposed would be from \$6 million to \$12 million. The primary funding for acquisition would be from money appropriated from the Land and Water Conservation Fund. Since acquisition would only be from willing sellers, it is likely that if this acquisition were to occur, it would be over a period of 10-25 years. Because CCPs detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes, the CCP and this Land Protection Plan do not constitute a commitment for funding for future land acquisition.

Any acquired lands would become part of the Refuge. Operations costs will ultimately depend upon the amount of land purchased in fee and easement and habitat restoration requirements.

IV. Protection Alternatives

This section outlines and evaluates two strategic alternatives for the conservation of approximately 6,000 acres of scattered tracts in the counties shown in Figure 1. The two protection alternatives discussed in this section are included in the alternatives considered in the Driftless Area NWR Comprehensive Conservation Plan and Environmental Impact Statement. Protection Alternative A is incorporated into Alternative A of the EIS. Protection Alternative B is incorporated into Alternatives B and C of the EIS.

Alternative A (No Action):

Under this alternative, the Service would not seek any additional realty interests in land and water. The Refuge would continue to contact landowners to assist them with conserving endangered species on their land. For example, the Refuge may help them fund fencing to exclude cattle through endangered species recovery funding, the Service's Partners for Wildlife Program, or through state programs. The Refuge would assist partners in securing funding and conserving sites through a variety of means such as Endangered Species Act Section 6 grants to states, conservation easements held by land trust groups like The Nature Conservancy or Iowa Natural Heritage Foundation, or U.S. Department of Agriculture programs.

Alternative B (Preferred):

The Service would facilitate the protection of approximately 150 acres per year from willing sellers using outreach and technical assistance, conservation easements and fee-title purchase of land (and/or donations from private parties) or a combination of all methods, depending on site, circumstances, and landowner interests. The estimate of 150 acres per year is based on historical funding levels in the Service's Region 3, which includes Iowa, Illinois, Wisconsin, and Minnesota. Any acquisition of lands would be from willing sellers only, regardless of the type of interest. The Service would acquire the land interests necessary to reach recovery and delisting goals for the Iowa Pleistocene snail, Northern monkshood, and Leedy's roseroot.

Areas acquired in fee-title through donation or purchase would be owned by the Service and managed as part of the Driftless Area NWR. Tracts in which an easement is negotiated would remain in private ownership. Administration, management, and monitoring of the fee title tracts and easements would be done by the staff at Driftless Area NWR. This alternative would be carried out on a tract-by-tract basis as land and funding become available.

If acquired, the lands would contribute to the recovery goals for the respective threatened and endangered species and to the goals of the CCP by providing permanent protection to the habitat and species colonies, and by restoring habitat surrounding endangered species.

V. Alternative Preservation Tools

Alternative preservation tools proposed for the boundary modification area are fee acquisition, conservation easements, wildlife management agreements, and private lands extension agreements. Wildlife management agreements and private land extension agreements could be used to preserve the land and endangered species until permanent protection can be gained. Permanent protection is needed to ensure the survival of the species and to reach recovery goals for delisting. Other acquisition methods that could be utilized by the Service include donations, partial donations, or transfers.

Wildlife Management Agreements

These agreements are negotiated between the Refuge Manager and a landowner that specify a particular management action the landowner will do, or not do, with his or her property. For example, an agreement may be for excluding cattle from endangered species habitat. More comprehensive agreements are possible for such things as upland restoration or public access. These agreements are strictly voluntary on the part of the landowner and are voided if the property is sold.

As long as a landowner abides by the terms of the agreement, this protection can be effective in meeting certain preservation objectives. Unfortunately, because these agreements are voluntary and temporary, there is no long-term assurance the terms will continue to be met.

Direct Service costs for this alternative are generally low, but can add up to near fee or easement costs if the agreement is for several years. Staff time and administrative costs are relatively high since agreements must be monitored yearly and renegotiated when land ownership changes.

Leases

Under a lease agreement, the Service would negotiate with a landowner to receive use of the land or for maintenance of the land in a given condition. Generally, the landowner would receive an annual lease payment. For example, the Service could lease 40 acres of grassland habitat to protect sinkholes, part of the algific slope system. The landowner would be paid to maintain the area as grassland and not use it for row crops.

The cost effectiveness of leases would vary depending on the length and payment terms of the lease. In many cases, the cost of a lease rapidly approaches the cost of outright purchase in a few years. Also, leases do not offer the long-term protection of habitat, and are more complex for the Service to administer than fee or easement because of the monitoring, coordination, and administration requirements.

Conservation Easements

With a conservation easement, the Service in effect purchases a specific interest from a private landowner. For example, the Service may purchase a wetland easement that protects a wetland from draining, filling, and burning. The landowner gives up the right to drain, fill, and burn, but no other land rights. The wetland may still be cropped, or hayed, as natural conditions allow.

Typically, in a conservation easement, a landowner would agree to refrain from commercial, industrial, or residential development or other major alteration of habitat. The landowner would continue to use the land as before the easement and retain rights such as hunting and control of trespass, for instance.

Easements are voluntary and purchased only from willing sellers. Payments for conservation easements are generally based on a percentage of the appraised value of the land and vary according to the use restrictions imposed. Easements are most often perpetual and compensation is a one-time, up-front payment.

Easements can be useful when existing land use of a tract is partially compatible with the refuge purposes, and when the landowner desires to use the land for some compatible purpose. Examples of land uses that are normally restricted under terms of a conservation easement include:

- # Development rights – agricultural, commercial and residential.
- # Alteration of natural topography.
- # Uses negatively affecting the maintenance of plant and wildlife communities.
- # Excessive public access and use; and
- # Alteration of natural water level.

Depending on the type of easement, this option may be cost effective in meeting certain Refuge management purposes. Some easements, however, may cost the Service more than 75 percent of fee value and cost efficiency is compromised. If the easement is not perpetual, long-term resource protection is not guaranteed.

Easements are more difficult to manage than fee title transactions because of the monitoring, coordination, and administrative requirements. If a landowner fails to honor the easement contract, the Service must take steps to re-establish the terms of the contract. Changes in land ownership on which an easement exists are frequently a source of difficulty and expense to the Service. In the short run, easements have more impact on the tax base of local municipalities than cooperative management agreements and leases, but less impact than fee-title acquisition. In the long run, Service acquisition of interest in lands may be beneficial to the tax base of local municipalities because of increased desirability of land and increased recreational opportunities.

Fee-Title Acquisition

Fee-title acquisition of land assures permanent protection of resources. All rights of ownership are transferred to the Service in fee title acquisition. Land is purchased only from willing sellers with offers based on fair market value appraisals. Some fee title acquisitions are accomplished through donation or exchange. Although initially the most costly for the Service, in the long run, lands acquired in fee-title are easier to manage and plan for because the Service has complete control. Staff time is saved by not having to renegotiate terms for less-than-fee title arrangements. In the short run, fee-title acquisition will have the greatest impact on the tax base of local municipalities of any alternative preservation tools. The impact from reduced tax revenues to local government is offset by revenue sharing payments from the Service. In the long-term, Service acquisition of interest in lands may be beneficial to the tax base of local municipalities because of increased desirability of land and increased recreational opportunities.

VI. Coordination

The Service has approved recovery plans for the three federally listed species discussed in this plan. These recovery plans were reviewed by cooperating and affected State and Federal agencies. These three recovery plans recommend habitat protection, including acquisition as priority recovery tasks or actions.

In addition to being federally listed, the Iowa Pleistocene snail is listed as endangered by the State of Iowa and the monkshood is listed as threatened by Iowa and Wisconsin. Leedy's roseroot is listed as threatened by Minnesota. Some protection and/or acquisition efforts are being carried out by all three states with Wisconsin owning part or all of three sites (harboring less than 500 monkshood plants), Iowa owning 14 of approximately 100 monkshood or snail sites within the state, and the Illinois Department of Conservation having a nonbinding conservation agreement on its only site. The Nature Conservancy (TNC) previously had an active acquisition program in Iowa and Wisconsin. TNC owns several preserves in Iowa for these species. The Refuge currently has close coordination with TNC and that is expected to continue. The Iowa Natural Heritage Foundation has also assisted the Refuge with protection of endangered species habitat and expects to continue when possible. All four states have expressed support for Refuge land acquisition during CCP coordination and expressed support for the original LPP.

Because of the fragile nature of algific slope sites, precise locations will not be publicly disclosed. Many landowners have been contacted recently by Refuge staff and were contacted in the past by TNC. All landowners with listed species on their land have been told about the species and have been informed of the Service's interest in buying the land. Not all adjacent landowners who own sinkholes or buffer areas have been contacted. The majority of landowners contacted are impressed with the importance of their sites and understand the need to protect them.

VII. Sociocultural Impacts

Restoration, preservation, and management of additional lands by the Service will have little negative effect on the current lifestyles of individuals and communities in and around the Refuge. Lands acquired will be small, scattered tracts from 10 to 200 acres. Landowners who choose to sell their land to the Service will be most affected. Where acquired lands contain home sites, owners who relocate will be reimbursed for moving expenses. Renters also receive certain relocation benefits, including assistance in finding suitable alternate housing that is affordable. In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Public Law 91-646), displaced persons are provided relocation payment assistance for the costs of relocation in addition to advisory services. Under certain conditions, some homeowners may be able to reserve a “life estate” on their homes, meaning they could remain in their homes for the rest of their lives after selling to the Service. This type of reservation does, however, reduce the amount paid for their homes. Other landowners who negotiate easements or other less-than-fee transactions may have to change certain land management practices to comply with conditions of the easement.

All land transactions will be purely voluntary in keeping with Service policy to purchase lands or rights only from willing sellers. The property rights of landowners who choose not to sell their land will not be directly affected by purchases around them since they will retain all right of land ownership. The Service will always take into account the interests of adjacent landowners when managing acquired land.

Lands in which the Service acquires a fee interest will be open to compatible Refuge public uses when sufficient buffer around the endangered species locations is present, and when there is sufficient public access. Endangered species habitat will always be closed to all public entry. Public use of the Refuge probably will not increase markedly over current levels. Tracts will be fenced when necessary to exclude neighboring livestock.

VIII. Summary of Proposed Action

The priority of acquisition of parcels will be determined by recovery goals, refuge purposes, goals and objectives in the CCP, the species present and the population size, the importance of the location in conserving genetic diversity, and proximity to existing Refuge tracts.

The following is a ranked list of priorities for protecting lands with these threatened and endangered species. This list will help assure that the limited resources available to the Service are used efficiently and effectively.

High Priority Land:

- # Lands adjacent to existing Refuge tracts that would add needed buffer, protect sinkholes or provide better access for management.
- # Iowa Pleistocene snail sites with large populations or outlying populations (i.e. Illinois) that may be important for genetic reasons.
- # Any of the three Leedy’s roseroot populations in Minnesota.
- # Monkshood sites with large populations.
- # Sites with more than one threatened and endangered species and species of concern.
- # Sites with an immediate threat.

Medium Priority Land:

- # Iowa Pleistocene snail sites with small populations
- # Northern monkshood sites with small populations
- # Sites that only contain species of concern, but large populations

Low Priority Land

- # Northern monkshood sites with fewer than 100 plants
- # Iowa Pleistocene snail sites where snails have not been located in the last 10 years.
- # Sites that only contain species of concern.
- # Sites that have been significantly disturbed or degraded.

Currently, Refuge staff talk to landowners at least on an annual basis and sometimes more frequently to ensure that sites are being protected. Refuge staff also inquire about landowners' interest in selling land. Future acquisition would be dependent on the availability of funds.

References

Frest, T.J. 1982. Project SE-1-4 Iowa Pleistocene snail final report. University of Iowa, Iowa City, IA 162pp.

Frest, T.J. 1983. Final report northern driftless area survey. University of Iowa, Iowa City, IA. 17pp.

Frest, T.J. 1985. Final report Iowa Pleistocene snail survey. University of Washington, Seattle, WA. 37pp.

Frest, T.J. 1986. Final report Iowa Pleistocene snail survey. University of Washington, Seattle, WA. 26pp.

Frest, T.J. 1987. Final report Iowa Pleistocene snail project. University of Washington, Seattle, WA. 39pp.

Frest, T. J. 1991. Summary status reports on eight species of candidate land snails from the driftless area (paleozoic plateau), upper Midwest. Seattle, WA

U.S. Fish and Wildlife Service. 1983. National recovery plan for northern monkshood (*Aconitum noveboracense*). U.S. Fish and Wildlife Service, Twin Cities, MN. 81pp.

U.S. Fish and Wildlife Service. 1984. National recovery plan for Iowa Pleistocene snail (*Discus macclintocki* (Baker)). U.S. Fish and Wildlife Service, Twin Cities, MN. 23pp + app.

U.S. Fish and Wildlife Service. 1986. National driftless area land protection plan. U.S. Fish and Wildlife Service, Twin Cities, MN. 20pp.

U.S. Fish and Wildlife Service. 1998. *Sedum integrifolium* spp. Leedyi (Leedy's roseroot) Recovery Plan. Ft. Snelling, MN. 31pp.

Figure 4: Driftless Area NWR LPP Map Locator

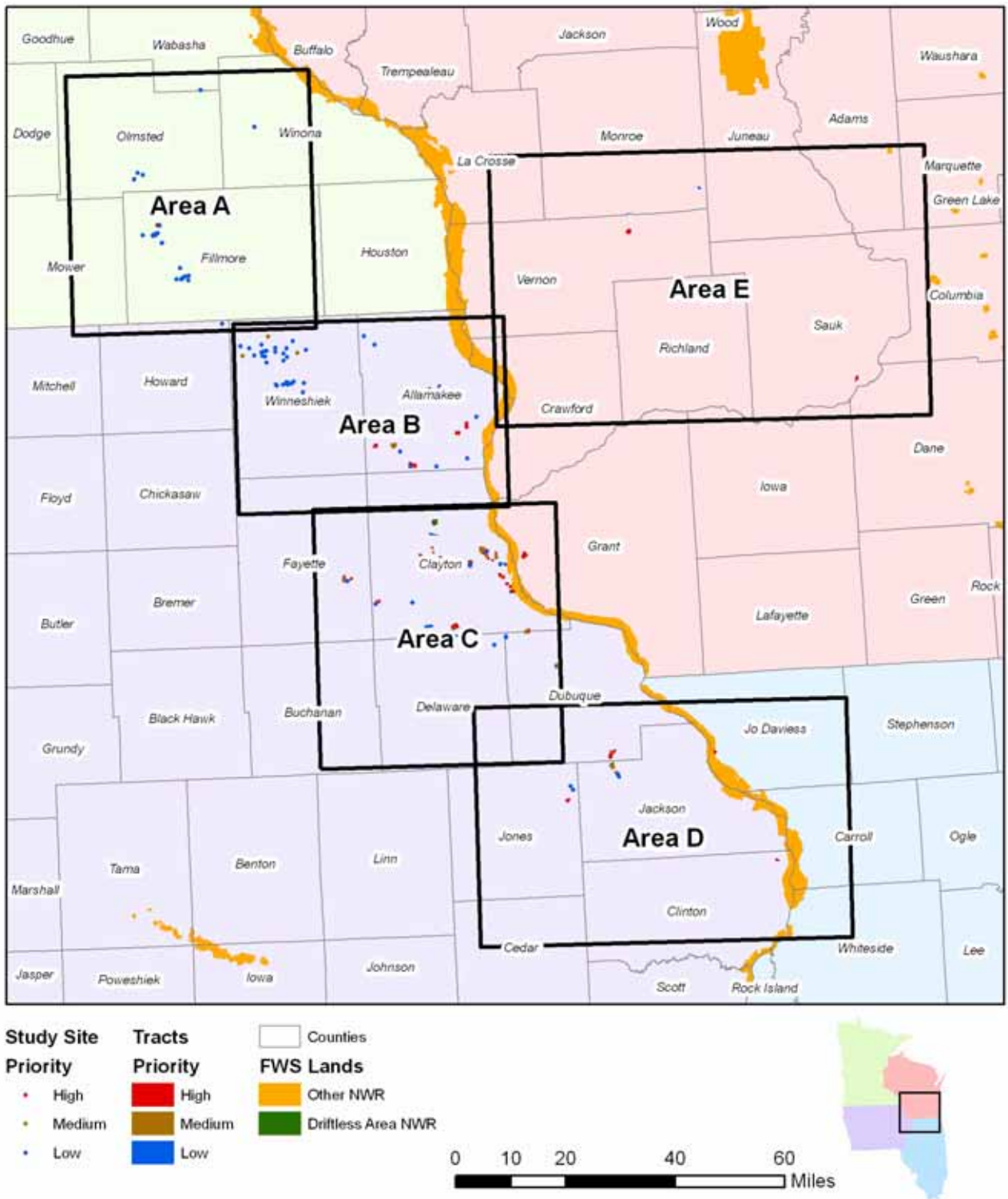


Figure 5: Area A, Driftless Area NWR Land Protection Plan

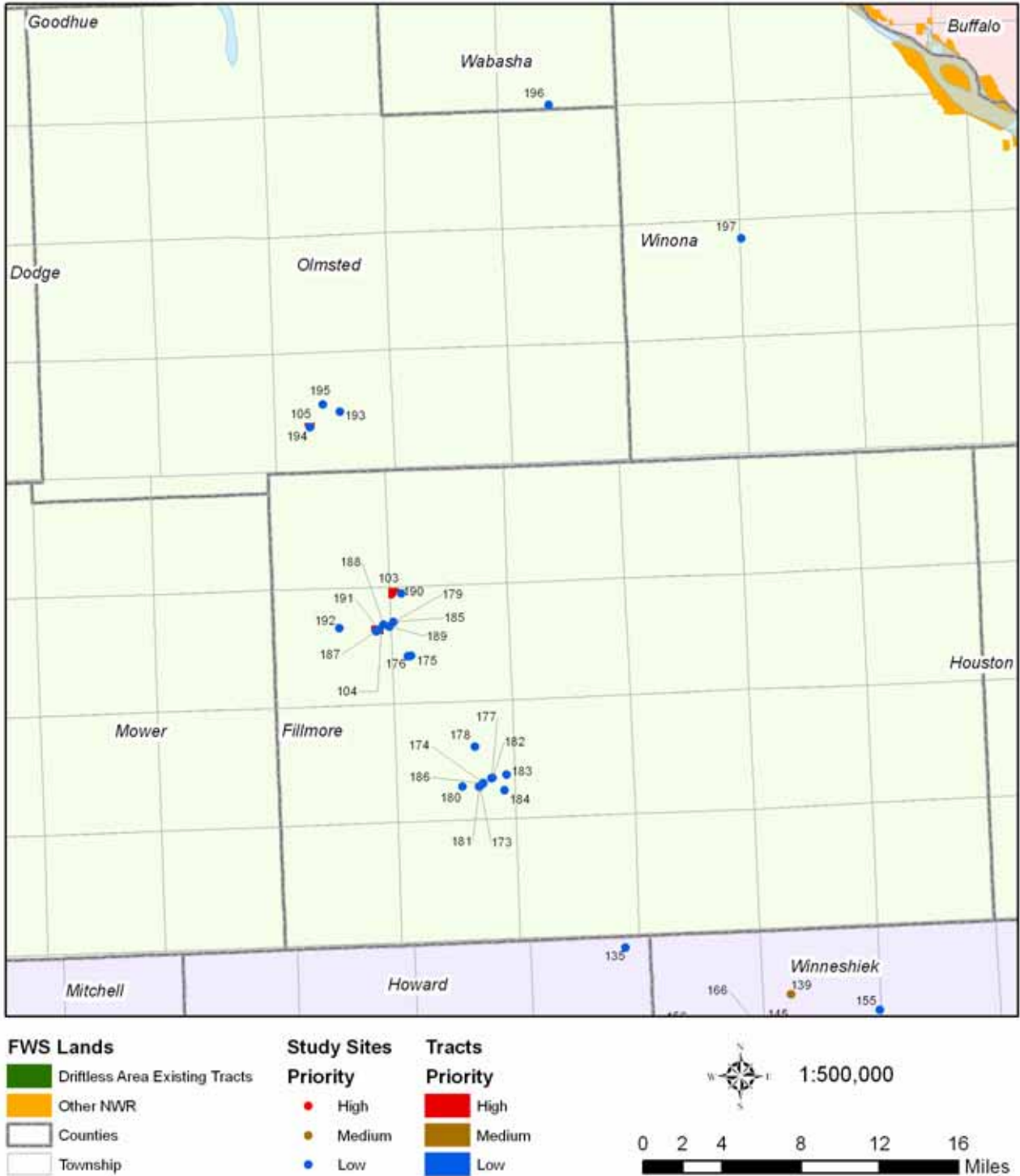


Figure 6: Area B, Driftless Area NWR Land Protection Plan

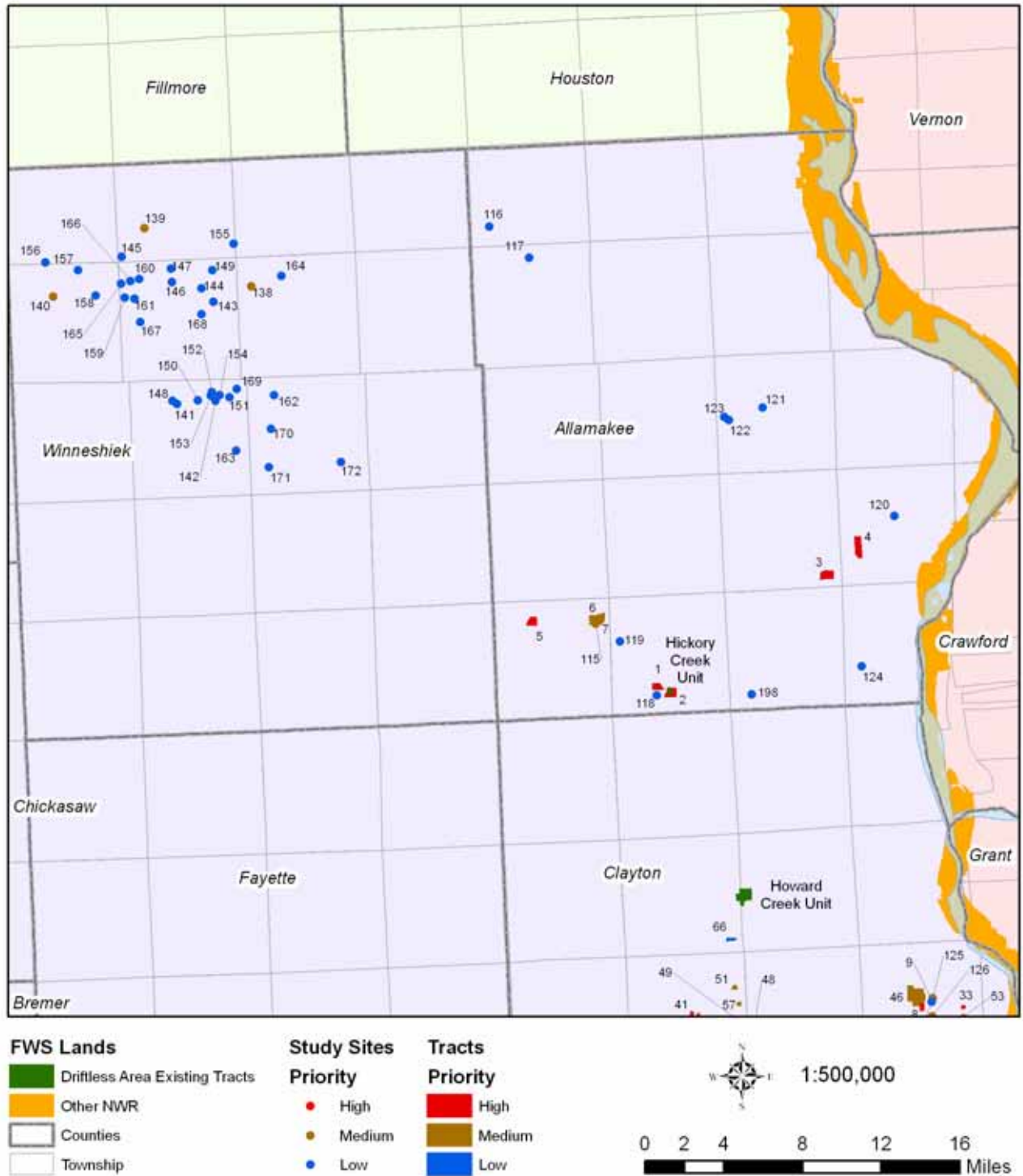


Figure 7: Area C, Driftless Area NWR Land Protection Plan

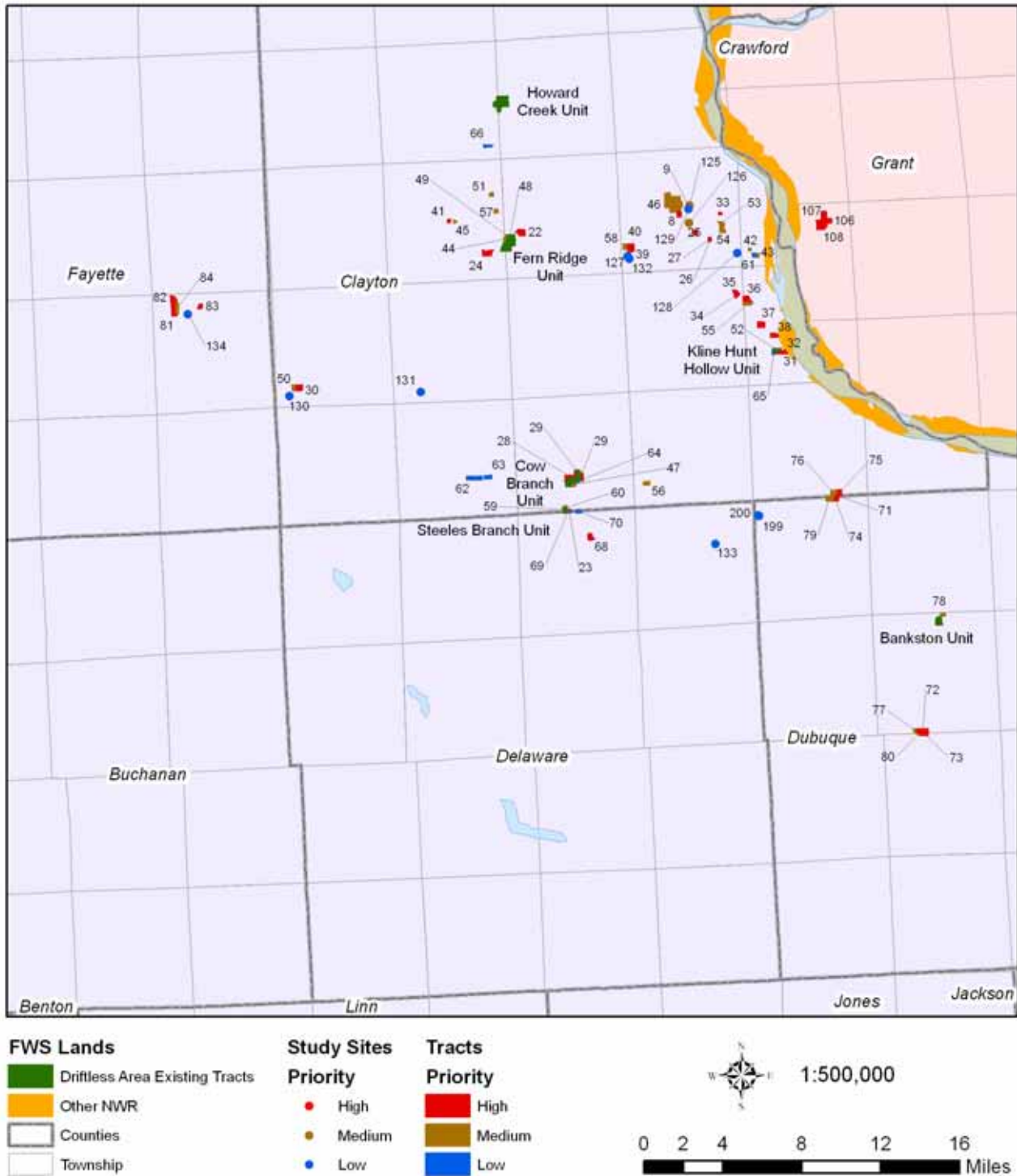


Figure 8: Area D, Driftless Area NWR Land Protection Plan

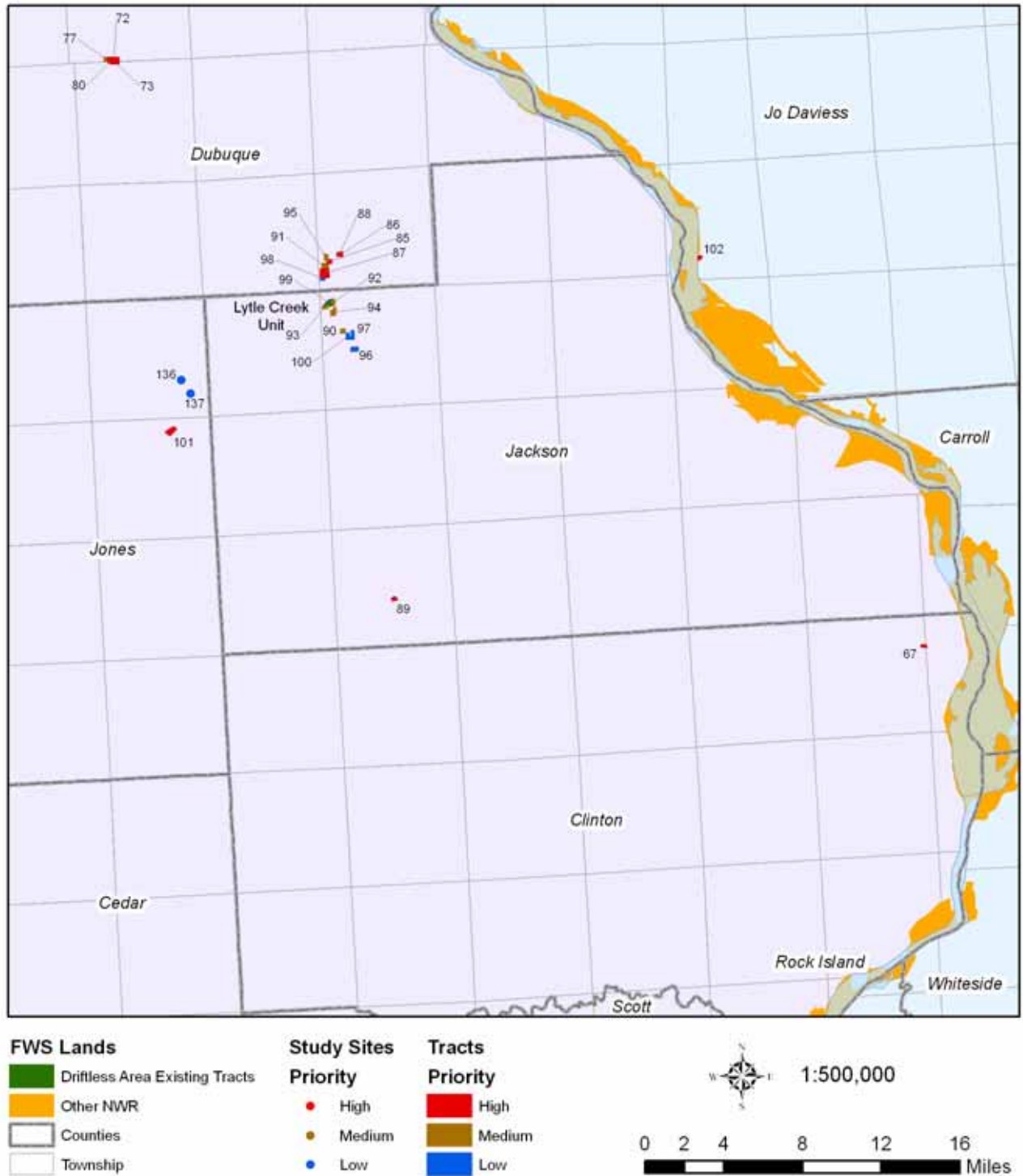


Figure 9: Area E, Driftless Area NWR Land Protection Plan

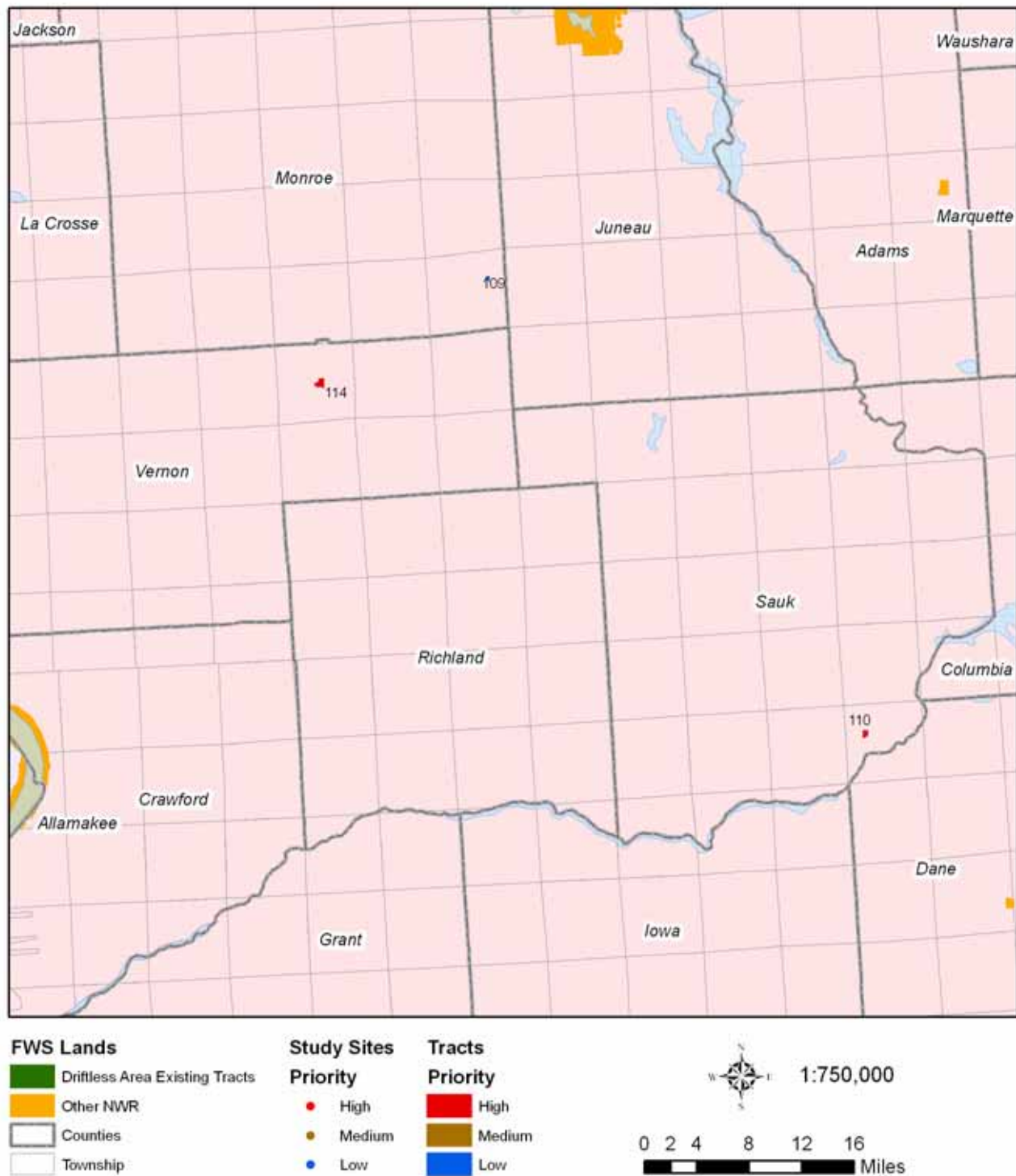


Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
1	Tract	Allamakee, IA	61.5	High	Monkshood, Glacial Relict Snail
2	Tract	Allamakee, IA	98.4	High	Monkshood, Glacial Relict Snail
3	Tract	Allamakee, IA	121.5	High	Monkshood, Golden Saxifrage
4	Tract	Allamakee, IA	146.0	High	Monkshood
5	Tract	Allamakee, IA	81.3	High	Monkshood
6	Tract	Allamakee, IA	99.5	Medium	Monkshood
7	Tract	Allamakee, IA	43.7	Medium	Monkshood
115	Site	Allamakee, IA	25	Medium	
116	Site	Allamakee, IA	20	Low	Glacial Relict Snail
117	Site	Allamakee, IA	20	Low	Glacial Relict Snail
118	Site	Allamakee, IA	20	Low	Glacial Relict Snail
119	Site	Allamakee, IA	10	Low	Glacial Relict Snail
120	Site	Allamakee, IA	15	Low	Glacial Relict Snail
121	Site	Allamakee, IA	20	Low	Glacial Relict Snail
122	Site	Allamakee, IA	20	Low	Glacial Relict Snail
123	Site	Allamakee, IA	25	Low	Glacial Relict Snail
124	Site	Allamakee, IA	25	Low	Glacial Relict Snail
198	Site	Allamakee, IA	20	Low	Golden Saxifrage
8	Tract	Clayton, IA	21.6	High	Iowa Pleistocene Snail
9	Tract	Clayton, IA	13.1	High	Iowa Pleistocene Snail, Glacial Relict Snail
22	Tract	Clayton, IA	52.6	High	Iowa Pleistocene Snail, Glacial Relict Snail
23	Tract	Clayton, IA	6.8	High	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
24	Tract	Clayton, IA	57.2	High	Monkshood
25	Tract	Clayton, IA	14.9	High	Monkshood

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
26	Tract	Clayton, IA	3.3	High	Monkshood, Glacial Relict Snail
27	Tract	Clayton, IA	5.0	High	Monkshood, Glacial Relict Snail
28	Tract	Clayton, IA	89.8	High	Monkshood
29	Tract	Clayton, IA	38.3	High	Monkshood, Golden Saxifrage
30	Tract	Clayton, IA	60.2	High	Iowa Pleistocene Snail, Glacial Relict Snail
31	Tract	Clayton, IA	42.6	High	Monkshood, Glacial Relict Snail, Golden Saxifrage
32	Tract	Clayton, IA	1.1	High	Monkshood, Glacial Relict Snail, Golden Saxifrage
33	Tract	Clayton, IA	4.8	High	Monkshood, Iowa Pleistocene Snail
34	Tract	Clayton, IA	22.5	High	Monkshood
35	Tract	Clayton, IA	14.4	High	Monkshood
36	Tract	Clayton, IA	59.5	High	Monkshood
37	Tract	Clayton, IA	47.0	High	Monkshood
38	Tract	Clayton, IA	31.4	High	Monkshood
39	Tract	Clayton, IA	15.9	High	Iowa Pleistocene Snail
40	Tract	Clayton, IA	39.7	High	Iowa Pleistocene Snail
41	Tract	Clayton, IA	8.0	High	Monkshood
42	Tract	Clayton, IA	5.8	Medium	Monkshood
43	Tract	Clayton, IA	16.5	Medium	Monkshood
44	Tract	Clayton, IA	31.5	Medium	Iowa Pleistocene Snail
45	Tract	Clayton, IA	3.5	Medium	Monkshood
46	Tract	Clayton, IA	366.9	Medium	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
47	Tract	Clayton, IA	28.7	Medium	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
48	Tract	Clayton, IA	1.3	Medium	Iowa Pleistocene Snail
49	Tract	Clayton, IA	1.5	Medium	Iowa Pleistocene Snail
50	Tract	Clayton, IA	19.9	Medium	Iowa Pleistocene Snail, Glacial Relict Snail
51	Tract	Clayton, IA	12.4	Medium	Monkshood
52	Tract	Clayton, IA	28.3	Medium	Monkshood, Glacial Relict Snail
53	Tract	Clayton, IA	7.8	Medium	Monkshood
54	Tract	Clayton, IA	56.3	Medium	Monkshood
55	Tract	Clayton, IA	26.7	Medium	Monkshood
56	Tract	Clayton, IA	25.4	Medium	Monkshood, Golden Saxifrage
57	Tract	Clayton, IA	11.0	Medium	Monkshood
58	Tract	Clayton, IA	36.5	Medium	Iowa Pleistocene Snail
59	Tract	Clayton, IA	7.1	Medium	Monkshood
60	Tract	Clayton, IA	10.5	Medium	Monkshood
125	Site	Clayton, IA	20	Medium	Glacial Relict Snail
126	Site	Clayton, IA	30	Medium	Glacial Relict Snail
61	Tract	Clayton, IA	13.1	Low	Monkshood
62	Tract	Clayton, IA	63.9	Low	Monkshood, Iowa Pleistocene Snail, Golden Saxifrage
63	Tract	Clayton, IA	25.7	Low	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
64	Tract	Clayton, IA	6.5	Low	Monkshood, Golden Saxifrage
65	Tract	Clayton, IA	6.9	Low	Monkshood, Glacial Relict Snail, Golden Saxifrage

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
66	Tract	Clayton, IA	14.2	Low	Monkshood
127	Site	Clayton, IA	20	Low	Glacial Relict Snail
128	Site	Clayton, IA	20	Low	Glacial Relict Snail
129	Site	Clayton, IA	30	Low	Glacial Relict Snail
130	Site	Clayton, IA	20	Low	Glacial Relict Snail
131	Site	Clayton, IA	15	Low	Glacial Relict Snail
132	Site	Clayton, IA	15	Low	Glacial Relict Snail
67	Tract	Clinton, IA	11.6	High	Iowa Pleistocene Snail
68	Tract	Delaware, IA	30.5	High	Monkshood
69	Tract	Delaware, IA	14.0	Low	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
70	Tract	Delaware, IA	14.2	Low	Monkshood, Golden Saxifrage
133	Site	Delaware, IA	20	Low	Glacial Relict Snail
71	Tract	Dubuque, IA	24.0	High	Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
72	Tract	Dubuque, IA	46.2	High	Iowa Pleistocene Snail
73	Tract	Dubuque, IA	37.5	High	Iowa Pleistocene Snail
74	Tract	Dubuque, IA	39.6	High	Monkshood, Iowa Pleistocene Snail,
75	Tract	Dubuque, IA	34.3	High	Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
76	Tract	Dubuque, IA	37.1	Medium	Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
77	Tract	Dubuque, IA	15.4	Medium	Iowa Pleistocene Snail
78	Tract	Dubuque, IA	13.7	Medium	Iowa Pleistocene Snail, Glacial Relict Snail

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
79	Tract	Dubuque, IA	35.5	Medium	Monkshood, Iowa Pleistocene Snail
80	Tract	Dubuque, IA	9.9	Medium	Iowa Pleistocene Snail
199	Site	Dubuque, IA	50	Low	Golden Saxifrage
200	Site	Dubuque, IA	30	Low	Glacial Relict Snail
81	Tract	Fayette, IA	15.2	High	Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
82	Tract	Fayette, IA	121.1	High	Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
83	Tract	Fayette, IA	17.7	High	Iowa Pleistocene Snail, Golden Saxifrage
84	Tract	Fayette, IA	26.8	Medium	Iowa Pleistocene Snail, Golden Saxifrage
134	Site	Fayette, IA	40	Low	Glacial Relict Snail, Golden Saxifrage
103	Tract	Fillmore, MN	88.7	High	Leedy Roseroot, Glacial Relict Snail
104	Tract	Fillmore, MN	114.8	High	Leedy Roseroot, Glacial Relict Snail
173	Site	Fillmore, MN	25	Low	Golden Saxifrage
174	Site	Fillmore, MN	15	Low	Glacial Relict Snail
175	Site	Fillmore, MN	20	Low	Glacial Relict Snail
176	Site	Fillmore, MN	10	Low	Golden Saxifrage
177	Site	Fillmore, MN	20	Low	Glacial Relict Snail
178	Site	Fillmore, MN	25	Low	Glacial Relict Snail
179	Site	Fillmore, MN	25	Low	Glacial Relict Snail
180	Site	Fillmore, MN	15	Low	Golden Saxifrage
181	Site	Fillmore, MN	20	Low	Glacial Relict Snail
182	Site	Fillmore, MN	20	Low	Golden Saxifrage
183	Site	Fillmore, MN	15	Low	Glacial Relict Snail

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
184	Site	Fillmore, MN	20	Low	Glacial Relict Snail
185	Site	Fillmore, MN	20	Low	Glacial Relict Snail
186	Site	Fillmore, MN	25	Low	Glacial Relict Snail
187	Site	Fillmore, MN	15	Low	Glacial Relict Snail
188	Site	Fillmore, MN	20	Low	Glacial Relict Snail
189	Site	Fillmore, MN	20	Low	Glacial Relict Snail
190	Site	Fillmore, MN	20	Low	Glacial Relict Snail
191	Site	Fillmore, MN	15	Low	Glacial Relict Snail
192	Site	Fillmore, MN	20	Low	Glacial Relict Snail
106	Tract	Grant, WI	27.4	High	Monkshood, Glacial Relict Snail
107	Tract	Grant, WI	157.4	High	Monkshood, Glacial Relict Snail
108	Tract	Grant, WI	22.2	High	Monkshood, Glacial Relict Snail
135	Site	Howard, IA	50	Low	Golden Saxifrage
85	Tract	Jackson, IA	19.8	High	Monkshood
86	Tract	Jackson, IA	16.2	High	Monkshood
87	Tract	Jackson, IA	94.0	High	Monkshood
88	Tract	Jackson, IA	10.6	High	Monkshood
89	Tract	Jackson, IA	15.1	High	Monkshood
90	Tract	Jackson, IA	18.2	Medium	Monkshood, Golden Saxifrage
91	Tract	Jackson, IA	50.3	Medium	Monkshood
92	Tract	Jackson, IA	31.2	Medium	Monkshood
93	Tract	Jackson, IA	12.4	Medium	Monkshood
94	Tract	Jackson, IA	35.4	Medium	Monkshood
95	Tract	Jackson, IA	19.2	Medium	Monkshood
96	Tract	Jackson, IA	34.7	Low	Monkshood
97	Tract	Jackson, IA	31.0	Low	Monkshood, Iowa Pleistocene Snail, Glacial Relict Snail, Golden Saxifrage
98	Tract	Jackson, IA	15.5	Low	Monkshood

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
99	Tract	Jackson, IA	8.2	Low	Monkshood
100	Tract	Jackson, IA	13.5	Low	Monkshood
102	Tract	Jo Daviess, IL	13.8	High	Iowa Pleistocene Snail
101	Tract	Jones, IA	58.5	High	Monkshood
136	Site	Jones, IA	10	Low	Glacial Relict Snail
137	Site	Jones, IA	10	Low	Glacial Relict Snail
109	Tract	Monroe, WI	13.7	Low	Monkshood
105	Tract	Olmsted, MN	52.1	High	Leedy Roseroot, Glacial Relict Snail
193	Site	Olmsted, MN	30	Low	Glacial Relict Snail
194	Site	Olmsted, MN	20	Low	Glacial Relict Snail
195	Site	Olmsted, MN	20	Low	Glacial Relict Snail
110	Tract	Sauk, WI	52.2	High	Monkshood
114	Tract	Vernon, WI	133.4	High	Monkshood
196	Site	Wabasha, MN	15	Low	Glacial Relict Snail
138	Site	Winneshiek, IA	30	Medium	Glacial Relict Snail
139	Site	Winneshiek, IA	25	Medium	Glacial Relict Snail
140	Site	Winneshiek, IA	40	Medium	Glacial Relict Snail, Golden Saxifrage
141	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
142	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
143	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
144	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
145	Site	Winneshiek, IA	10	Low	Glacial Relict Snail
146	Site	Winneshiek, IA	30	Low	Glacial Relict Snail
147	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
148	Site	Winneshiek, IA	35	Low	Glacial Relict Snail
149	Site	Winneshiek, IA	10	Low	Glacial Relict Snail
150	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
151	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
152	Site	Winneshiek, IA	20	Low	Glacial Relict Snail

Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.) (Continued)

Tract/Site Number	Site/Tract	County, State	Tract Acreage (Site Est. Acres)	Priority	Species of Concern
153	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
154	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
155	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
156	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
157	Site	Winneshiek, IA	25	Low	Golden Saxifrage
158	Site	Winneshiek, IA	35	Low	Glacial Relict Snail
159	Site	Winneshiek, IA	25	Low	Glacial Relict Snail, Golden Saxifrage
160	Site	Winneshiek, IA	25	Low	Golden Saxifrage
161	Site	Winneshiek, IA	20	Low	Golden Saxifrage
162	Site	Winneshiek, IA	25	Low	Golden Saxifrage
163	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
164	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
165	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
166	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
167	Site	Winneshiek, IA	35	Low	Glacial Relict Snail
168	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
169	Site	Winneshiek, IA	20	Low	Glacial Relict Snail
170	Site	Winneshiek, IA	25	Low	Glacial Relict Snail
171	Site	Winneshiek, IA	30	Low	Glacial Relict Snail
172	Site	Winneshiek, IA	15	Low	Glacial Relict Snail
197	Site	Winona, MN	10	Low	Glacial Relict Snail