

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 1: Driftless Area NWR Acquisition Boundaries

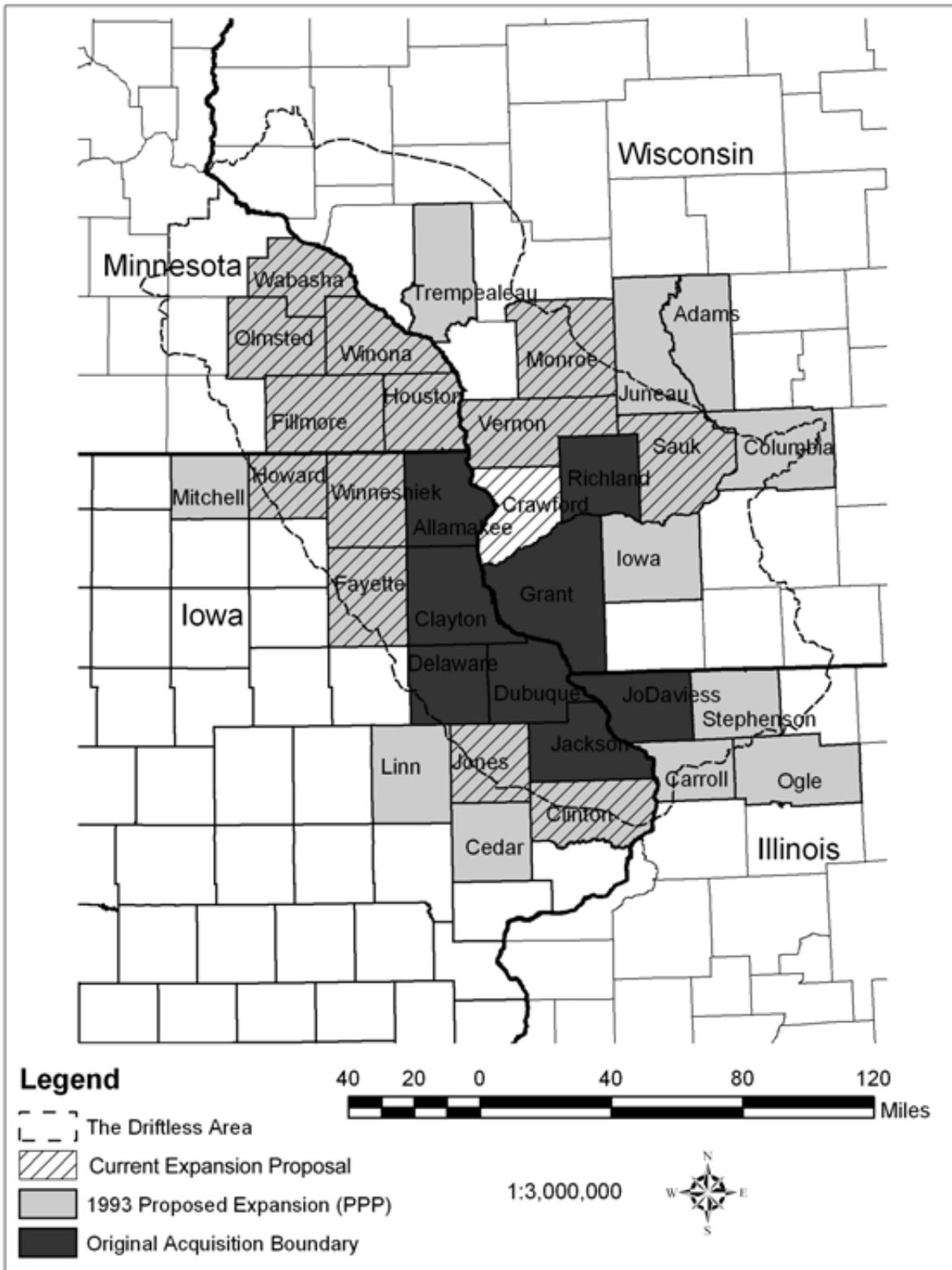


Figure 2: Algific Talus Slopes Illustrated



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).

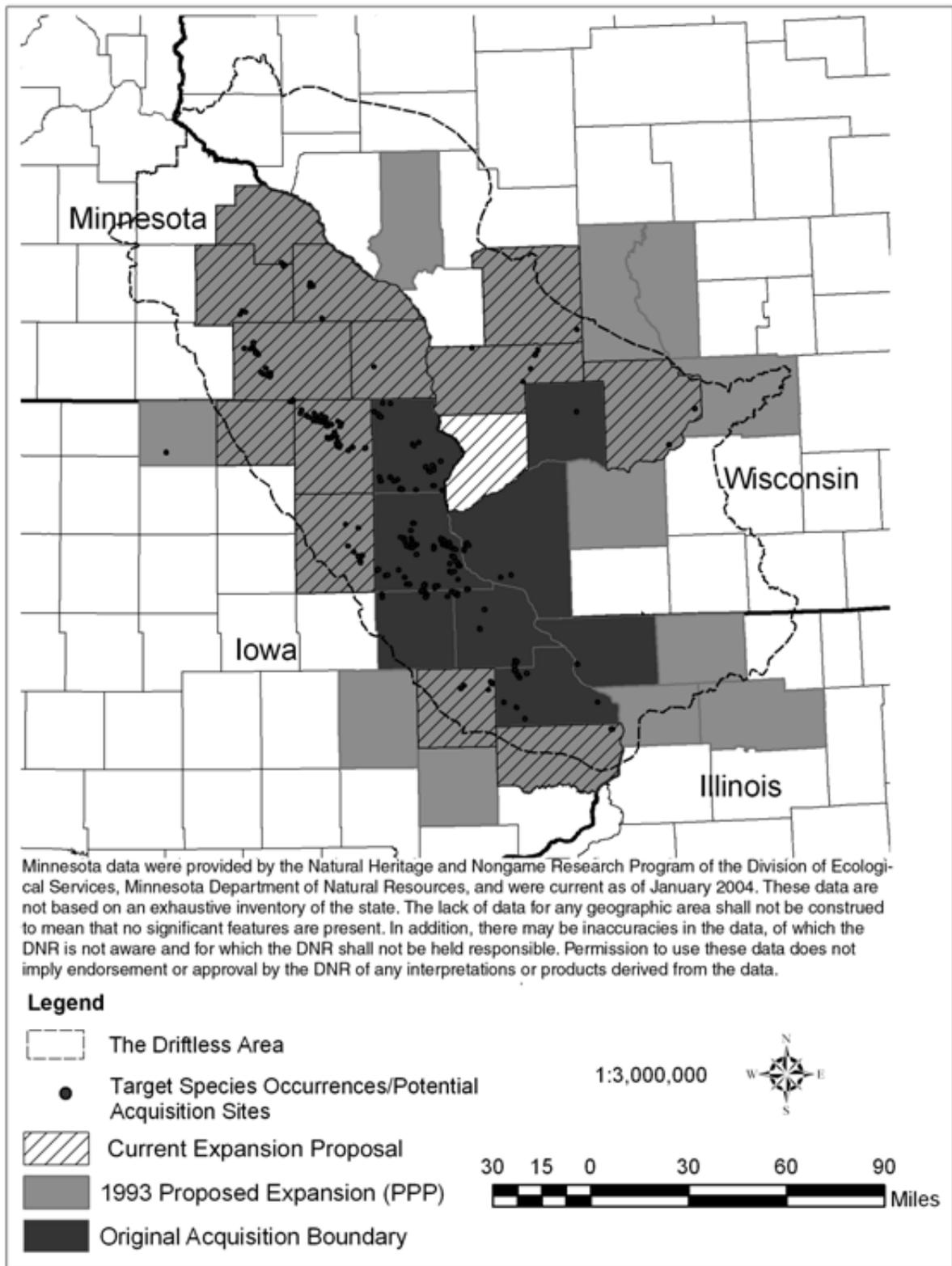
Since that time, sullivaniantia was found to occur more commonly on cliff habitats in Wisconsin and Iowa. It is now state-listed in Illinois and Minnesota and is not a U.S. Fish and Wildlife Service species of concern. Some of the counties proposed in the 1993 PPP were included only for protection of 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 Area 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 195). 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 (TNC) 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 previously had an active acquisition program in Iowa and Wisconsin. The Nature Conservancy 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

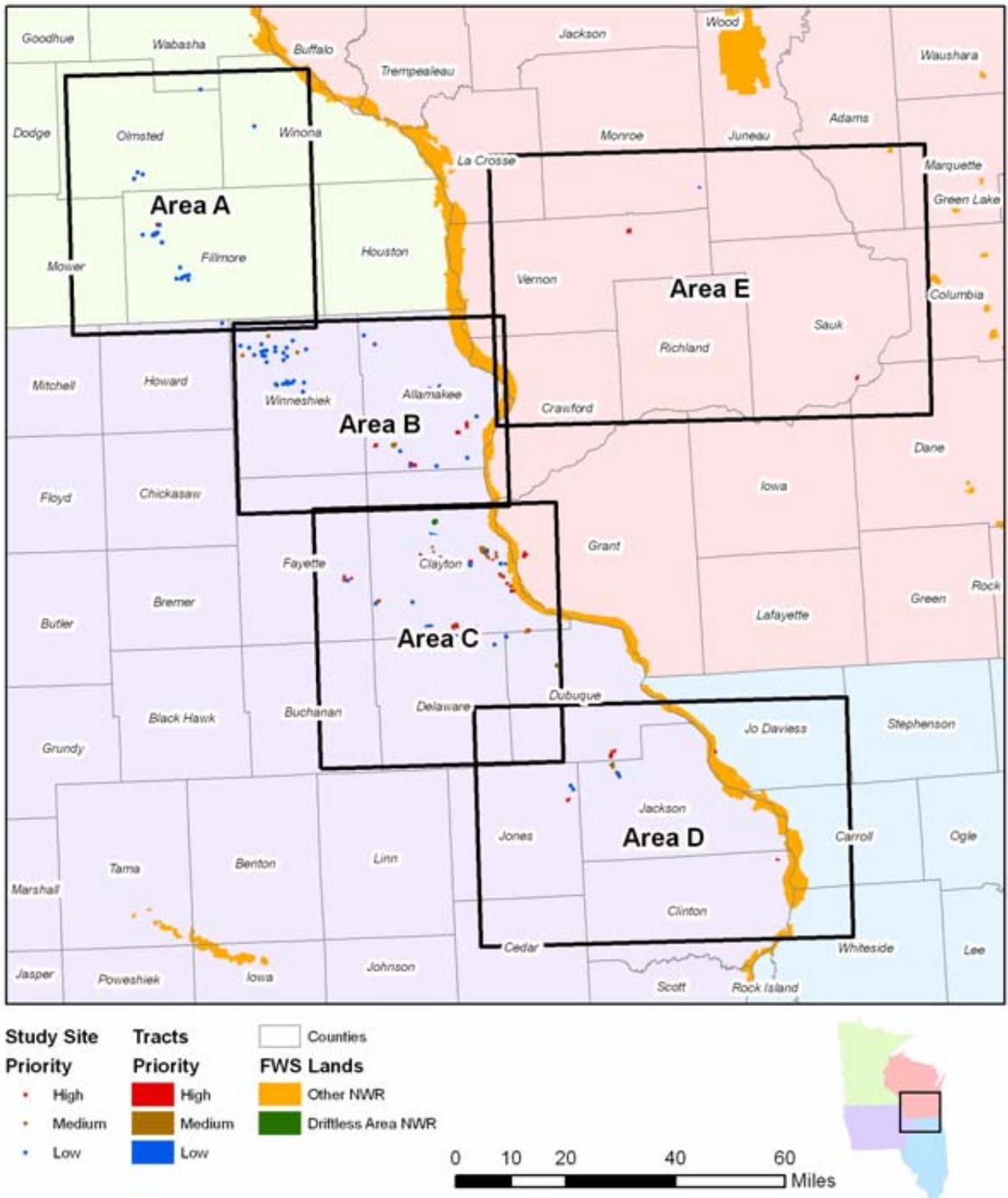


Figure 5: Area A, Driftless Area NWR Land Protection Plan

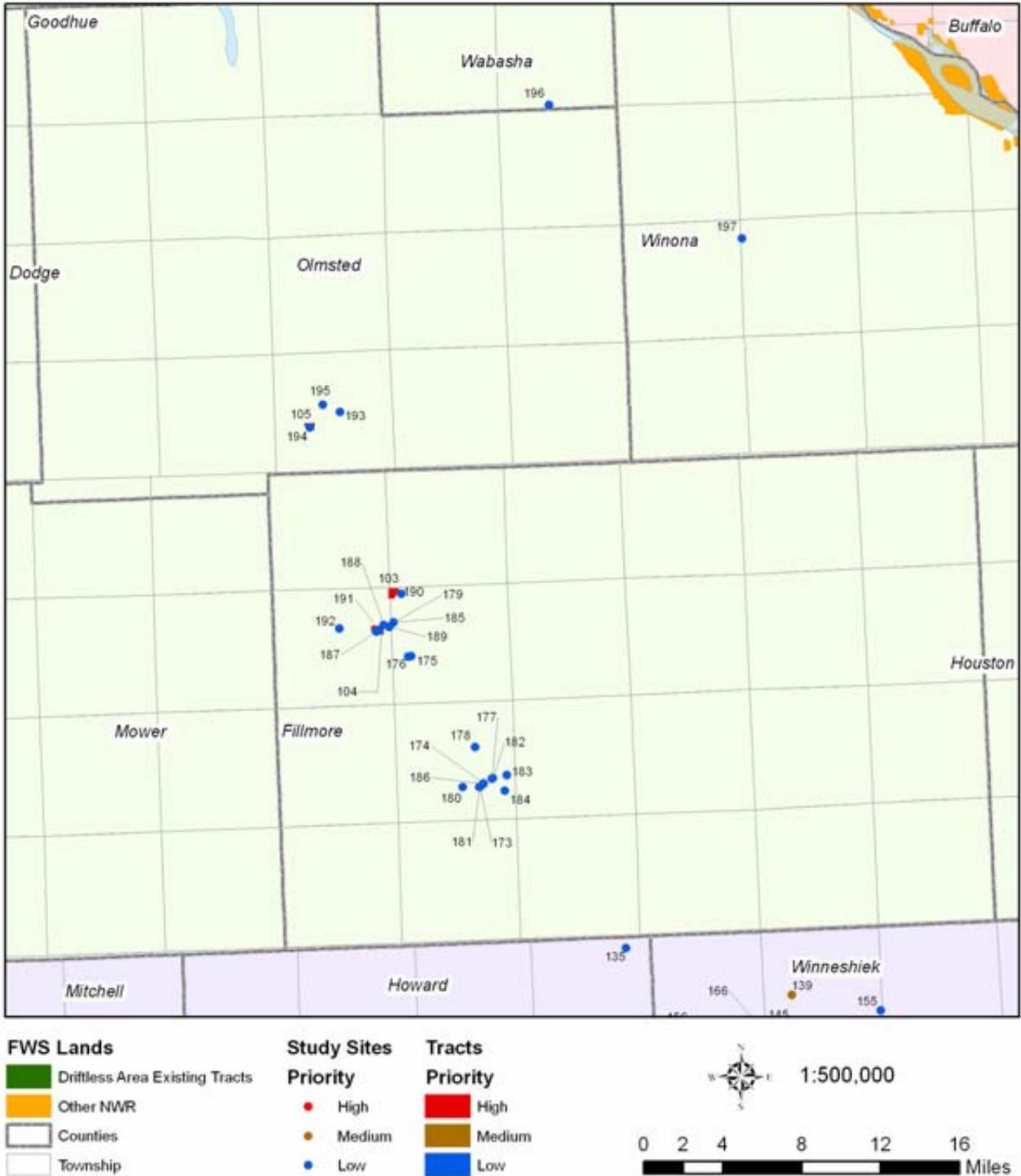


Figure 6: Area B, Driftless Area NWR Land Protection Plan

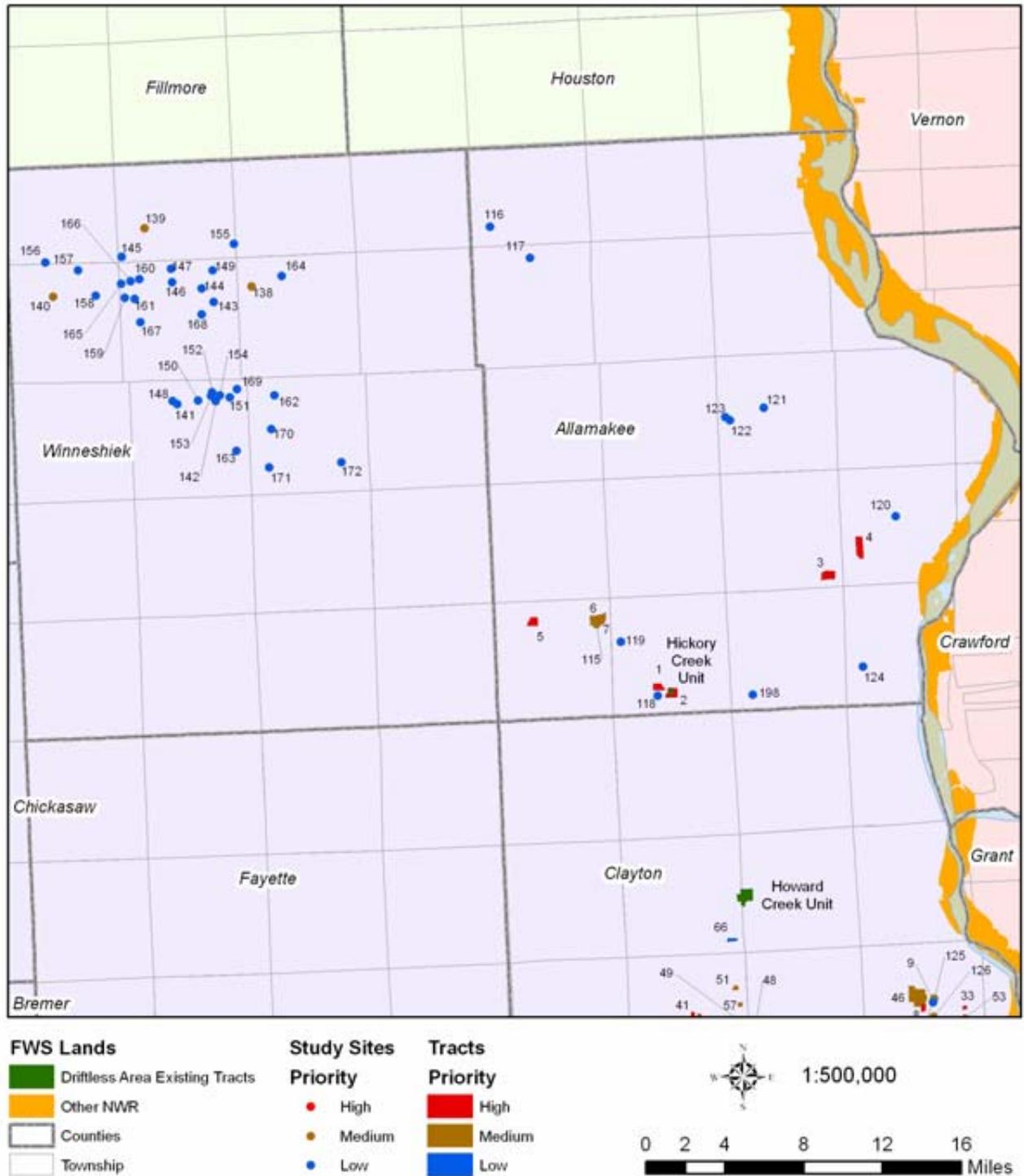


Figure 7: Area C, Driftless Area NWR Land Protection Plan

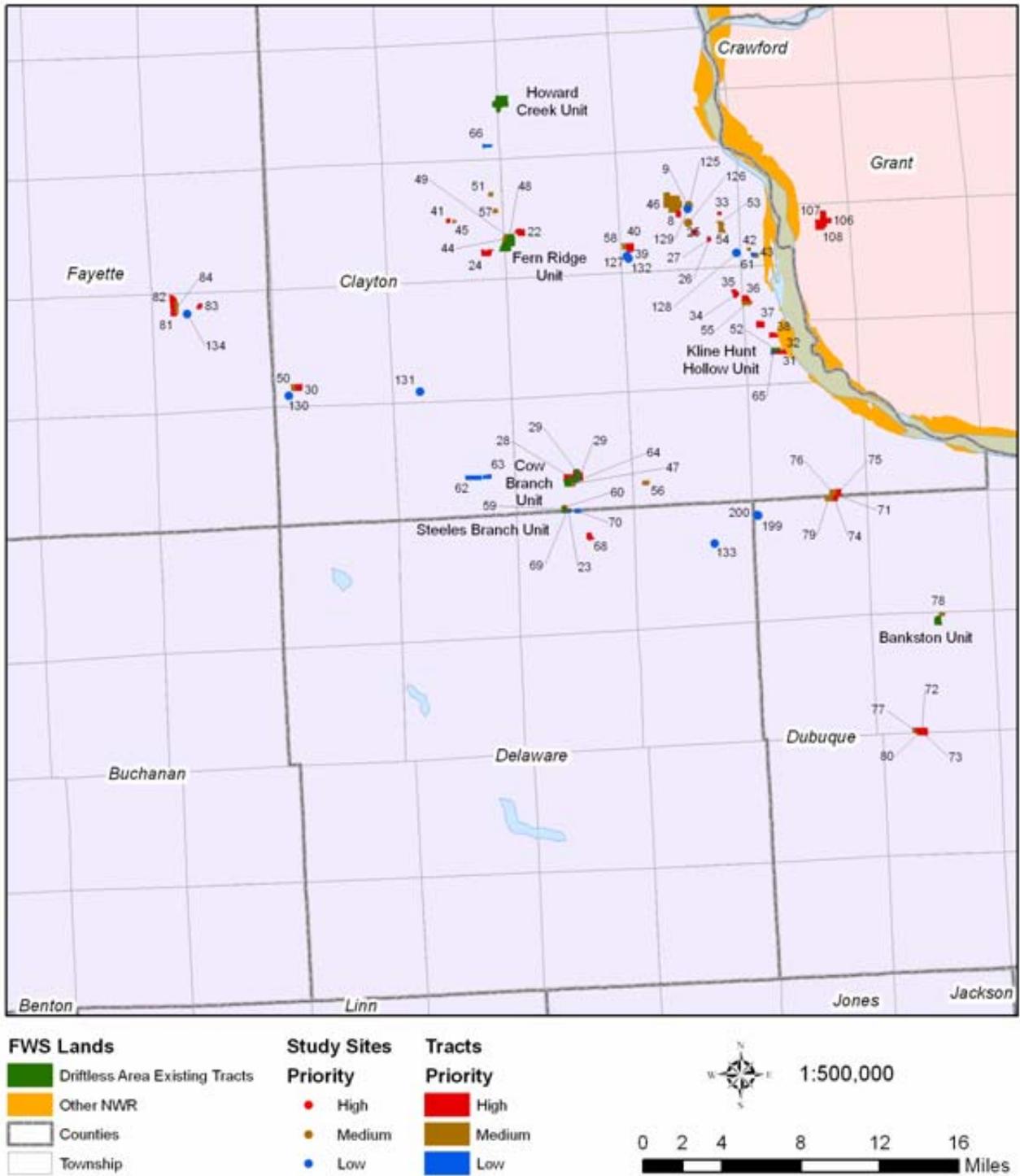


Figure 8: Area D, Driftless Area NWR Land Protection Plan

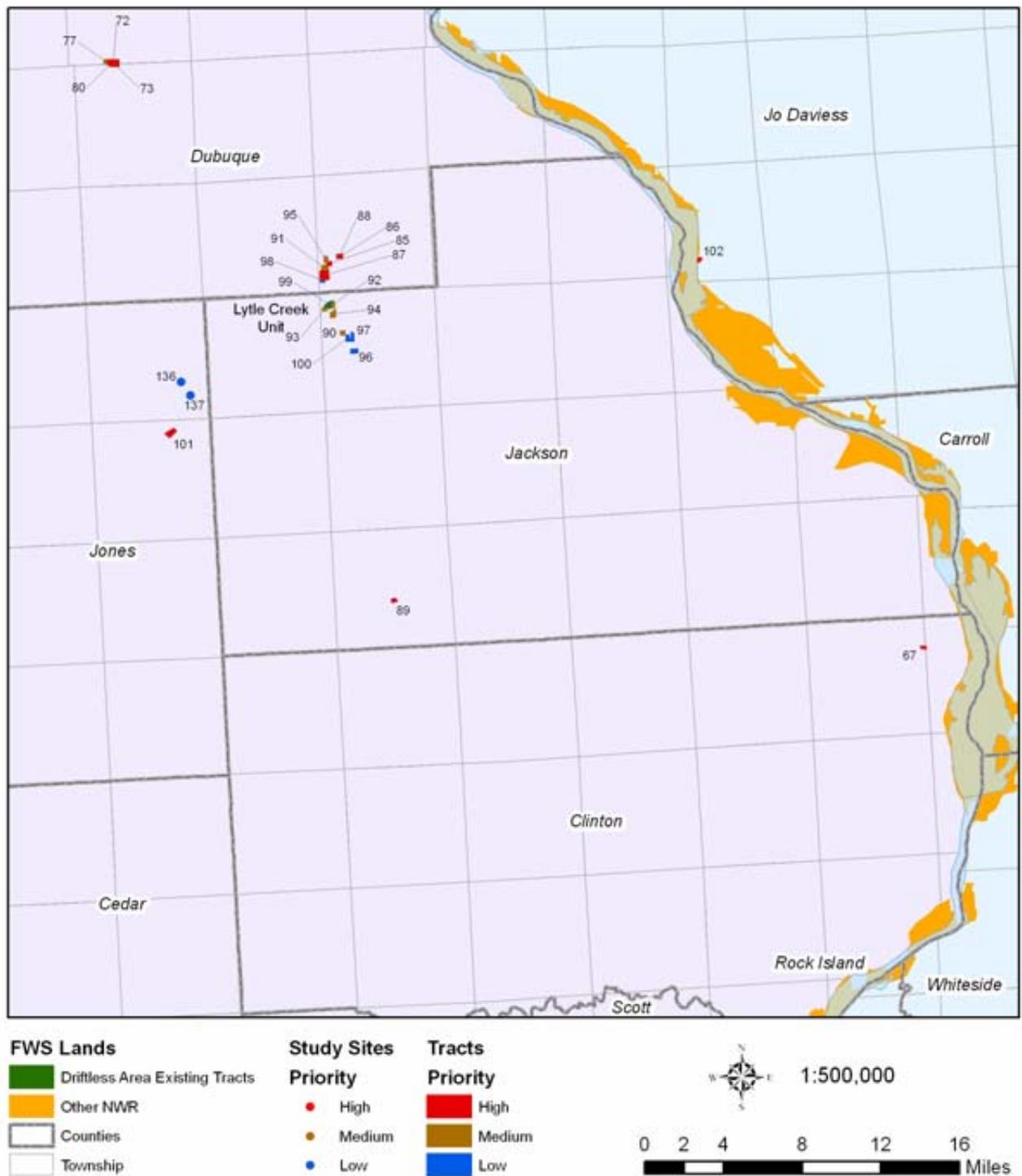


Figure 9: Area E, Driftless Area NWR Land Protection Plan

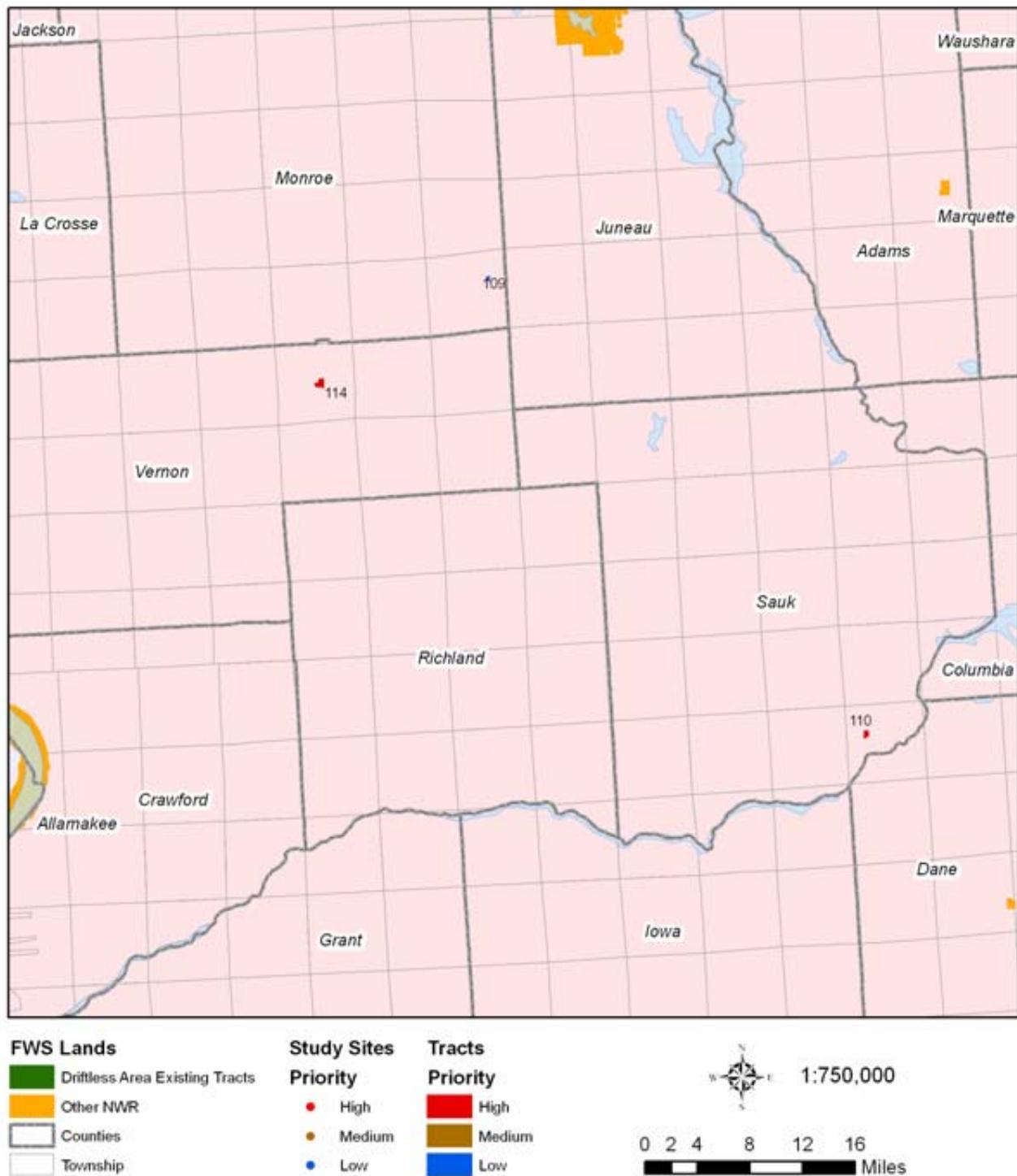


Table 1: Driftless Area NWR Boundary Expansion Tracts (All tracts are currently in private ownership and possible acquisition would be easement or fee title.)

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