

Final Environmental Impact Statement

Columbia County Shooting Range

Mud Lake Wildlife Area

Section 28, Town of Lowville, Columbia County

Prepared by:

Wisconsin Department of Natural Resources

Prepared for:

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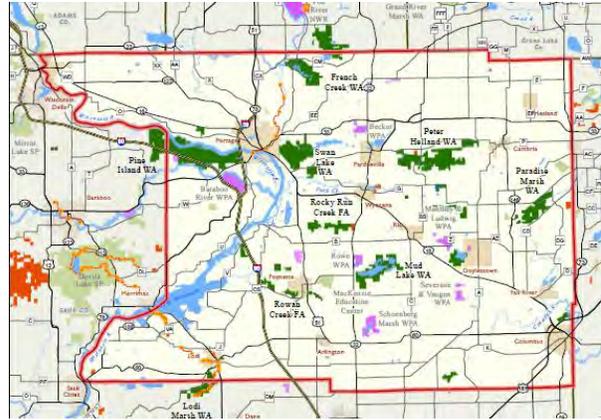
Note to reviewers: This Environmental Impact Statement (EIS) has been prepared by the Wisconsin Department of Natural Resources (WDNR) to be consistent with National Environmental Policy Act (NEPA) and Wisconsin Environmental Policy Act (WEPA) requirements for environmental review. NEPA requirements are relevant since WDNR is seeking federal Pittman-Robertson (P-R) funds for the project. The US Fish and Wildlife Service administers P-R funds and will ultimately decide if NEPA and other applicable federal regulations have been met before a funding decision is made. The purpose of this EIS is to inform decision-makers and the public of the anticipated effects on the quality of the human environment of a proposed action or project and describes the alternatives that were considered to the proposed action or project. The EIS is an informational tool that does not compel a particular decision by the agency or prevent the agency from concluding that other values outweigh the environmental consequences of a proposed action or project. Contact:

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CHAPTER 1 PROJECT SUMMARY, PURPOSE AND NEED

1.1 PROJECT SUMMARY

In 2012, the Natural Resources Board approved the Columbia County Planning Group (CCPG) Master Plan, for DNR-managed wildlife and fishery lands in Columbia County (see Attachment A). The plan identified public safety and neighboring landowner concerns associated with target shooting in parking lots on the Swan Lake (12N-R9E, Sec. 15) and French Creek (T13N-R9E, Sec. 13) wildlife areas and identified the need for a public shooting range in Columbia County. The specific language in the plan indicated:



Shooting Ranges

(Columbia County Planning Group Master Plan, pg. 43)

“There is significant demand for a public shooting range in Columbia County. Several parking lots at the Swan Lake WA and French Creek WA are heavily used for recreational shooting and target practice by locals and out of county individuals. These activities have generated concerns about public safety, quality of life (e.g., noise and litter) and inquiries by local elected officials and law enforcement.

The Department recognizes the need for a designated and managed public shooting facility in the county. DNR staff are collaborating with local officials and interested sporting groups to establish a public shooting range that meets the generally accepted siting criteria. Several of the CCPG properties were considered in these deliberations, but none were selected. Establishing a shooting range on a CCPG property will require an amendment to this master plan. If a public shooting range is established in the county, the DNR will evaluate options to address concerns about target shooting on these wildlife areas.”

In addition to addressing the recommendation of the master plan to establish a target shooting range in Columbia County, promoting hunting,

shooting sports and hunter safety is a long standing Department of Natural Resources objective. One ongoing element of this effort is to provide public shooting ranges (rifle and pistol) that are accessible to those with physical limitations, environmentally friendly and provide safe locations for hunters and shooters to shoot and sight-in rifles and handguns.

In order to narrow down the options for a shooting range in the County, an ad-Hoc work group was formed including representatives from the Wisconsin DNR, local elected officials (1 from each Town where a potential site existed, as well as a representative from the County Board), Columbia Counting Sporting Alliance, Conservation Congress and other conservation organizations from Columbia County. The Ad-Hoc group worked through a process to develop additional evaluation criteria and ultimately narrowed the seven sites to two potential locations, Dekorra Wildlife Area and Mud Lake Wildlife Area. DNR held a public input process to obtain citizen feedback on the two sites which involved Department staff attendance at town board meetings in the Towns of Dekorra and Lowville, an open house held in Portage to answer questions as well as an online survey which collected feedback for 30 days. Information regarding the public meetings and the on-line survey were provided to the public through press releases, meeting notices as well as through the Wisconsin DNR website, specifically the Columbia County Shooting Range webpage.

Following the public input process, the Ad Hoc committee recommended that their preference was for DNR to consider the Mud Lake Wildlife Area on King Road in south central Columbia County first and the Dekorra site second.

Therefore, the Wisconsin Department of Natural Resources is investigating the proposal to develop the Columbia County Shooting Range on Wisconsin DNR owned and managed property identified as the Mud Lake Wildlife Area located at T11N-R10E, Sec. 28, Town of Lowville, Columbia County. The specific site is located approximately 4.2 miles east of the Village of Poynette and .75 miles east of State Highway 22 on the south side of King Road (Lat/Long 43.396063, -89.312269). See Attachment B, Location Map.

The proposed range would consist of four individual shooting lanes with approximately 6 shooting positions each: a 25 foot range; a patterning range;

a 50 yard range; and a 100 yard range. Backstops and separation berms would consist of on-site sand materials. Each berm and backstop would be 20' tall with a top width of 10' and a base (bottom) width of 45' wide. The shooting range is intended for fixed target shooting. The proposed range would not be designed for trap or skeet shooting. These appropriate backstops and longitudinal berms would allow multiple users to occupy and use each lane simultaneously. The new site would include a gravel parking area with an ADA compliant pit toilet and sidewalks.

Range construction would be completed by the Wisconsin DNR operations crew or with a private vendor through a bidding process with DNR oversight to assure compliance with site development plans, environmental and grant commitments. Operation and maintenance (O&M) would be handled by the Wisconsin DNR with a goal of working in conjunction with local groups interested in assisting with the management of the site. O&M responsibilities would mainly consist of litter control, berm and shooting lane mowing (if needed), periodic spent (lead) bullets & brass casing recovery/recycling, shooting bench and target support replacement, pit toilet housekeeping, septic pumping, and other activities needed to keep the range in good condition. The range would not be continually staffed by a Department employee however staffing will be considered on weekends during busy times of the year. Department O&M would be carried out by wildlife management and law enforcement staff in Columbia County. Standard hours of operation for a shooting range are expected to be from sunrise to sunset with potentially one closed day a week to accommodate training opportunities through WDNR programs as well as by law enforcement programs in the area. However, the facility may not have snow cleared in the winter months as use during that time is expected to be low.

1.2 PURPOSE

The purpose of the project is to develop a safe and available public shooting range facility in Columbia County. The shooting range would provide a common place for experienced hunters or law enforcement to refine their skills. This range would also provide a place to promote effective training and education for responsible new hunters and their mentors including youth groups and hunter safety courses.

The purpose of this EIS document is to look at the feasibility and potential for environmental consequences associated with the site selected by an ad-hoc shooting range committee.

1.3 NEED

Promoting hunting, shooting sports and hunter safety is a long standing objective within WDNR. Providing the public with accessible, environmentally friendly and safe public shooting ranges to shoot and sight-in rifles and handguns is one element of this objective. The Milwaukee Journal Sentinel quotes WDNR Secretary Cathy Stepp:

"The best place for someone to learn to shoot and to practice shooting is at a well-managed and maintained range"..."The Shooting Range Grant Program will help range operators and clubs provide high quality shooting opportunities around the state."

With an estimated 800,000 shooters and hunters in Wisconsin and recent strong growth in interest in shooting, providing access to safe places to shoot is a priority for WDNR.

Wisconsin has more than 600 shooting ranges, including 33 on public land (state, county or municipality), according to DNR records. Keith Warnke, DNR hunting and shooting sports coordinator, said one of the most obvious needs is to increase opportunities for shooters and hunters close to home.

The adage that "practice makes perfect" is particularly important considering the safety risk associated with firearm use.

Currently, no public shooting range exists in Columbia County and the surrounding area. The Wautoma shooting range is the closest public shooting range which is approximately 60 miles from Poynette and the Yellowstone Wildlife Area range is approximately 67 miles away. In 2012, the board approved the Columbia County Master Plan for DNR-managed wildlife and fishery lands in the county. The plan identified public safety and neighboring landowner concerns associated with shooting in parking lots on the Swan Lake and French Creek wildlife areas and identified the need for a public shooting range in Columbia County.

Shooting Ranges

(from: Columbia County Planning Group Master Plan, pg. 43)

“Several parking lots at the Swan Lake WA and French Creek WA are heavily used for recreational shooting and target practice by locals and out of county individuals. These activities have generated concerns about public safety, quality of life (e.g., noise and litter) and inquiries by local elected officials and law enforcement.”

In addition to the need identified in the Columbia County Planning Group masterplan, Columbia County falls within a high priority area for range development in the “Strategic Guidance for Shooting Ranges in Wisconsin – 2014 – 2019”(Attachment C). Within this strategic guidance, the goal is to increase opportunities for shooting in a safe environment within a reasonable travel distance for participants and in a location intended for recreational shooting. All areas, including all of Columbia County, lying outside of a 100,000 resident buffer drawn around public shooting ranges have been identified as a high priority for the development of a shooting range.

1.4 BACKGROUND

Outdoor shooting ranges provide recreational facilities for millions of shooting sports enthusiasts in the United States. Ranges are especially important to Wisconsin constituents as demonstrated by Wisconsin range protection legislation. Senate Bill 527, also known as the Shooting Range Protection Bill, expanded the provisions of law concerning zoning conditions related to noise. This bill provides that a person who owns or operates a sport shooting range is not subject to state or local zoning conditions or rules related to noise and non-conforming use. SB 527 also protects the range owner or operator from civil liability, ensuring the future of Wisconsin's shooting ranges. This bill passed the legislature with wide margins, 19 – 13 in the Senate and 65-30 in the House. It was signed into law by Governor Walker on April 9, 2014.

DNR is interested in increasing the number of properly designed shooting ranges in Wisconsin to enhance hunter skills and safety. A side benefit is meeting an increasing demand for shooting practice as a public outdoor recreation pursuit.

Firearm use, while hunting or practicing, carries a high safety risk. Since 1967 DNR has had an established hunter education program that attempts

to prevent firearms incidents in order to maintain a safe and successful recreational experience. Over the last 45 years the number of hunting accidents have progressively decreased while the number of hunters has increased.

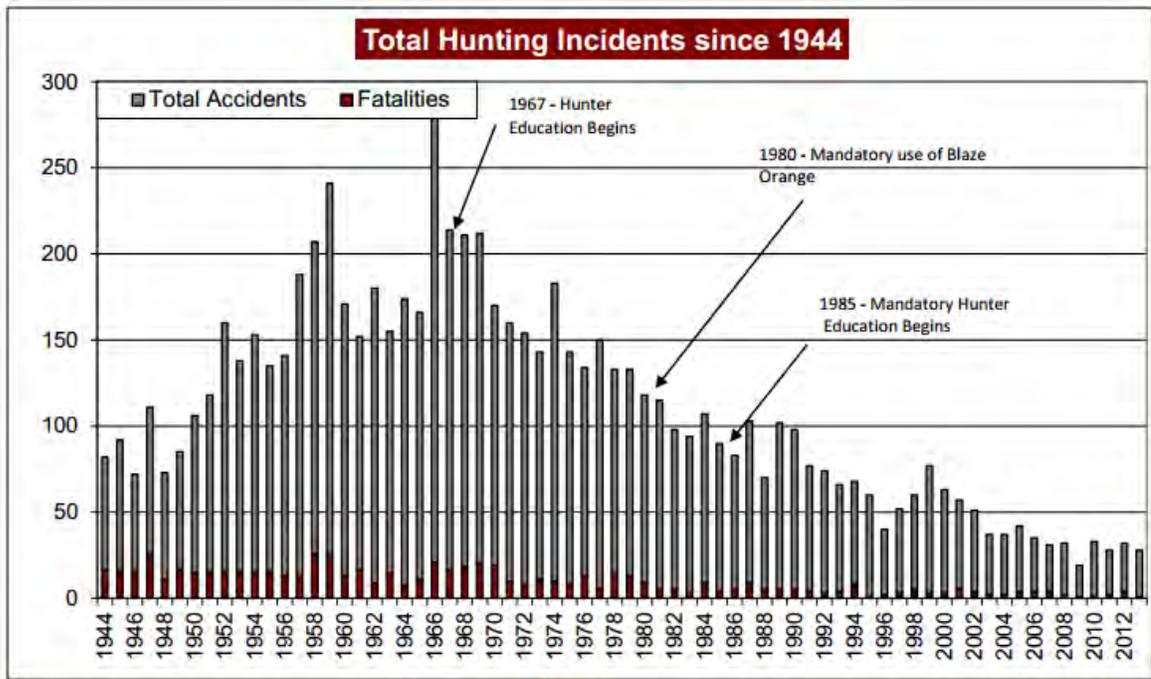


Figure 1

There were 27 total hunting incidents during the 2013 hunting season. One of the 27 incidents was fatal. Thanks to the efforts of Wisconsin hunter education programs, hunting is a safe activity in Wisconsin and is maintaining that safety record. In 2013, Wisconsin finished below the 10-year average of 29 incidents per year. New hunters are now required to complete a Basic Hunter Education course before they can purchase a hunting license.

2013 Hunter Education Program Summary:

- 962 traditional hunter education courses
- 90 online Internet field day courses
- 88 adult test-outs
- 135 archery courses
- About 33,300 students certified
- 26,220 in basic hunter education, 2,007 through the Internet field day,
- 2,762 adults certified and 2,375 students certified in archery.

The WDNR currently has more than 4,100 active volunteer hunter education instructors, 500 Internet field day certified instructors, and 20 DNR employees who support the adult test-out program. Shooting practice is encouraged for graduates to continue to gain experience with safe firearm handling and shooting accuracy. **Ranges are an ideal practice training ground.** (Statistics taken from Wisconsin Hunter Education Annual Incident Report-2013).

Specifically within Columbia County, as a result of the long-standing interest to develop a shooting range in the county and the interest identified in the county as demonstrated by the volume of shooting in wildlife area parking lots, a variety of approaches have been pursued to develop a range. Following a decision by the Columbia County Board to not pursue the development of a range on Columbia County property, DNR staff responsible for property management of Columbia County wildlife and fisheries areas reviewed and evaluated the DNR-managed properties in Columbia County to create a list of potential shooting range sites. The evaluation looked at a variety of elements for siting a shooting range including but not limited to:

- Minimize the number of residences within a 1,000-yard distance to minimize noise concerns
- Avoid wetlands or hydric soils or soils with hydric inclusions
- Avoid State Natural Areas
- Avoid archeological sites
- Direct road access is preferred
- Located adjacent to major highways and roads
- Minimize impact on other recreational users
- Minimize impact on blocks of wildlife habitat
- Topography that provides opportunities to use the terrain to shoot into or minimize potential noise concerns

This effort resulted in the identification of seven potential sites located in the Columbia County Towns of Dekorra, Lowville and Springvale.

An ad hoc citizen work group was formed in January 2014 to further evaluate the list of seven potential sites in Columbia County. The ad hoc

citizens group ultimately identified Mud Lake Wildlife Area – King Road site as their preferred location to establish a shooting range (See Attachment A).

In addition to a need for statewide shooting ranges, DNR is interested in working with local partners to help develop and manage these (new or improved) ranges. In this situation, the Department will be reaching out to groups that have expressed an interest in assisting with the management and where possible, entering into agreements to provide financial assistance to the groups that a willing to meet the operational and management needs identified for the Columbia County shooting range. The range will not be continually staffed by a Department employee however staffing will be considered on weekends during busy times of the year. Department O&M would be carried out by wildlife management and law enforcement staff in Columbia County. The department would not maintain permanent staff at the proposed shooting range.

In all of the alternatives identified, due to the fact that ground disturbance would be greater than 1 acre in size, a storm water permit under ch. NR 216 Wis. Adm. Code would be applied for and Best Management Practices according to ch. NR 151 Wis. Adm. Code would be followed to control construction site erosion. Range construction would be supervised by Wisconsin DNR Lands and Facilities program engineers, Law Enforcement and Wildlife Management program staff.

CHAPTER 2 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

All Wildlife and Fisheries Areas in Columbia County were initially evaluated following the criteria above and narrowed to a total of 7 sites. Following deliberations by the ad-hoc range committee, 5 of the sites were eliminated. Those 5 sites and the pros and cons of each which were identified by the committee and ultimately resulted in their dismissal from further consideration, are summarized below.

Hinkson Creek Fisheries Area (T11N – R09E, S. 21)	
Pros	Cons
Topography	Residences are close, and close to Poynette
Not too far from Poynette	Takes up main parking area for access to the stream.
Relatively close to the Interstate and relatively easy to find	A house in the area was hit by an errant bullet - higher sensitivity
Close to the MacKenzie EEC	Shooting noise may impact quality of fishing experience.
Centrally located in the county	Located on an isolated/remote township road.
	Archeological site identified on the site.

Jennings Creek Wildlife Area (T12N – R11E, S.35)	
Pros	Cons
Topography - Would be shooting into a hill.	Residences are close to the site
A parking lot is currently established on the site	A campground is approximately .6 miles from this location.
Not too far off a county highway	This portion of the property is heavily hunted.
Centrally located in the County	Remote/lightly travel location - dumping could become a problem.
	Difficult to find for new users.

Mud Lake Wildlife Area - Hagen Rd (T11N-R19E, S.14)	
Pros	Cons
Close the MacKenzie EEC	Concerns regarding the WA have been expressed by neighbors in the past
Underutilized portion of the property	Residences are ~300 yards from site.
Centrally located in the county	Soil types may be challenging for

	construction.
	Potential concerns from waterfowl hunters due to the proximity of an important waterfowl hunting area
	The trail through the site is heavily used by bowhunters and other outdoor recreationalists
	Lots of tree clearing would be required.
	Direction of shooting may be challenging due to potential down-range issues.

Peter Hellend Wildlife Area - Sawyer Rd (T12N-R11E, S. 4)	
Pros	Cons
Remote Location - distant from residences	Remote Location - Dumping potential
Topography	Main hunter access location - waterfowl specifically
The property has no history of dumping	Not on a main highway - difficult to find
	20 minute drive from Portage

Rowan Creek Fishery Area - CTH CS (T11N-R09E, S. 32)	
Pros	Cons
Access - Directly off CS and Close to the Interstate	Residences are approximately 220' from site
Easy excavation	1.5 miles from the Columbia County Sportsman's League location that were shooting was shut down by court order.
Amenities are close (gas, food, etc.)	Close to Poynette.
A proposed change to commercial zoning on the adjacent property may reduce conflict.	Flat Topography
Close the MacKenzie EEC	Size and Soils are questionable
Centrally located in the county	Takes up main parking area for access to the stream. This parking lot is also heavily used by non-consumptive users, dog walker's, bird watchers etc.
	Shooting noise may impact quality of fishing experience.
	This area is likely to be a future crossing of the property by the county snowmobile trail system
	Concerns about adjacent development in the area.
	Township has identified the adjacent area as an economic development area.
	Residences are close

Following the elimination of five of the sites, an on-line survey open to the public was completed by the Department which was advertised through press releases as well as on the WDNR website to receive input on the two remaining sites, Mud Lake Wildlife Area – King Road and Dekorra Public Hunting Grounds. The pros and cons of each of those two remaining sites are identified below.

Mud Lake Wildlife Area – King Rd (T11N-R10E, S. 28)	
Pros	Cons
Second least intrusive of the options provided to neighboring landowners - only 2 houses within 1,000 yard distance	Wet soil conditions on portions of the property indicate potential wetland areas.
Close to MacKenzie EEC	SNA is approximately 660' away.
Easy access off of STH 22	The area was identified for different management in the recently completed MP
Adjacent area heavily hunted for pheasant. Proposed footprint is lightly hunted.	If site is chosen, the township may request fencing around the parking lot.
Topography - Hill provides a safe location	Site development will need to avoid disturbing Conservation Rd. due to Town request
Discussed previously with township	
Centrally located in the county	

Dekorra Public Hunting Grounds (T11N-R8E, S. 13)	
Pros	Cons
Topography may limit noise transfer and allow shooting into hillside	Heavy hunter use on the property
Location is highly disturbed adjacent to interstate	Access from the wayside and for the public are currently not allowed and would be challenging
Houses are not adjacent to the parcel - on back side of the hill	Security of the wastewater treatment plant may need to be addressed.
	Endangered species present on the site.
	There are approximately 68 residences within a 1,000 yard distance from site.

A total of 256 people completed the on-line survey which was available from March 13, 2014 – April 15, 2014 with 18% preferring the Dekorra PHG site and 68% preferring the Mud Lake WA site. Following a review of the survey information, the ad-hoc committee recommended that a range be developed at the Mud Lake WA – King Rd site. Survey results are attached

as Attachment D.

2.2 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

2.2.1. Alternative A – Mud Lake Wildlife Area – King Road (Proposed Action)

See Chapter 1, Project Summary.

This proposed action would provide a long term shooting range serving hunters, enthusiasts, and law enforcement. This location can support the appropriate berm heights, individual shooting lanes and a gravel parking lot with ADA accessible pit toilets.

The proposed action would construct a new range to include at least a 25 foot range, 50 yard patterning range, 50 yard, and 100 yard target distances. Based on public input received through the public meetings held on the masterplan amendment, consideration may be given to developing a 200 yard range at the site. The range would be intended for fixed target shooting. Each distance would be separated by an earthen berm at least 20 feet in height. Each berm would have a 10 foot flat top to allow mower access, and the sideslopes would be 1:1. Berms would be finished with topsoil and seeded. The bottom of each shooting lane would be finished with topsoil, seed and hydromulch to establish turf.

On-site construction materials would be used to construct the berms and when necessary, additional material would be brought in from an off-site location. Each shooting lane would have their own individual shooting benches and target supports.

Best Management Practices would be followed to control construction site erosion. Range construction would be supervised by Wisconsin DNR Lands and Facilities program engineers, Law Enforcement and Wildlife Management program staff.

The facility would be open to the public from sunrise to sunset all year as seasonal weather allows and may be closed to the public one day a week to

accommodate training opportunities by the WDNR as well as local law enforcement entities. The facility may not have snow cleared in the winter months as use during that time is expected to be low. The range would not be staffed continually however; the Wisconsin DNR may provide staffing on weekends during busy times of the year. In addition to WDNR staff managing and maintaining the site, the Department is interested in pursuing a management agreement with groups from Columbia County that may be interested in assisting in the management of the site.

2.2.2 Alternative B - No Action.

This alternative would not develop a new range in Columbia County. It is expected that the recreational shooting and target practice that has occurred in several parking lots, including those at Swan Lake WA and French Creek WA would continue. These activities would likely continue to generate concerns about public safety, reduced quality of life (e.g., noise and litter) and inquiries by local elected officials and law enforcement. Safety, shooting skills, education and range accessibility needs would not be met. Having the ability to direct individuals to a designated and properly designed shooting range is expected to reduce the likelihood of haphazard target shooting occurring on public land around the county.

2.2.3 Alternative C – Dekorra Public Hunting Grounds

This proposed action would provide a long term shooting range serving hunters, enthusiasts, and law enforcement. This location can support the appropriate berm heights, individual shooting lanes and a gravel parking lot with ADA accessible pit toilets. Access to the site would be off of County Highway V and would require significant signage to direct users to the site. An access road off of the county highway would need to be upgraded in order to accommodate 2-way traffic into the site.

The proposed action would construct a new range to include a 25 foot, a patterning range, 50 yard, and 100 yard target distances with a 200 yard range being considered. Each distance would be separated by an earthen berm 20 feet in height. Each berm would have a 10 foot flat top to allow mower access, and the sideslopes would be 1:1. Berms would be finished with topsoil and seeded. The bottom of each shooting lane would be

finished with topsoil, seed and hydromulch to establish turf.

On-site construction materials would be used to construct the berms and when necessary, additional material would be brought in from an off-site location. Each shooting lane would have their own individual shooting benches and target supports.

Best Management Practices would be followed to control construction site erosion. Range construction would be supervised by Wisconsin DNR Lands and Facilities program engineers, Law Enforcement and Wildlife Management program staff.

The facility would be open to the public sunrise to sunset all year as seasonal weather allows. The facility may not have snow cleared in the winter months as use during that time is expected to be low. The range would not be staffed continually however; the Wisconsin DNR may provide staffing on weekends during busy times of the year. In addition to WDNR staff managing and maintaining the site, the Department is interested in pursuing a management agreement with groups from Columbia County that may be interested in assisting in the management of the site.

This site was not identified as the preferred alternative by the ad-hoc committee due to public response to the on-line survey. The principle concerns that were expressed during that process included the noise concerns for the large number of residences within the 1,000 yard distance of the range, the lack of easy access to the site from the interstate, as well as concerns regarding potential vandalism at the wastewater treatment facility located adjacent to the proposed site.

CHAPTER 3 AFFECTED ENVIRONMENT

3.1 PHYSICAL CHARACTERISTICS

Alternate A Proposed Alternative:

Construction activities for the proposed action (A) would mostly be confined to the non-wetland areas shown in Attachment A, Location Map. Upland within the project area consists of an old field meadow that transitions to a deciduous hardwood forest around the periphery of the parcel. Dominant plant species primarily included Canada goldenrod (*Solidago canadensis*), multiflora rose (*Rosa multiflora*), wild parsnip (*Pastinaca sativa*), smooth brome grass (*Bromus inermis*), black locust (*Robinia pseudoacacia*), common buckthorn (*Rhamnus cathartica*), and Bell's honeysuckle (*Lonicera x bella*). Scattered black cherry (*Prunus serotina*) and boxelder (*Acer negundo*) are mixed with white ash (*Fraxinus americana*) along Conservation Dr., which leads to a small and unimproved parking area. The wetland portions of the parcel are dominated by silver maple (*Acer saccharinum*). The wetland located on the western side of the property is directly connected to a wetland complex to the west and to the south of the parcel and is influenced by an intermittent stream that runs parallel to the western boundary of the parcel identified. The wetland located on the east side of the parcel is a depressional silver maple community that continues east. King Rd. runs along the parcels northern boundary. The Property is relatively flat, sloping downward from the central area of the site to the west and to the northeast from topographic highs of approximately 970 feet above mean sea level (msl) in the central area of the site to topographic lows of approximately 950 feet msl in the west and northeastern portions of the site.

Most of the vegetation located in the upland portions of the parcel would be cleared and grubbed to make room for the berms, shooting lanes and parking areas.

On-site topsoil would be temporarily stockpiled and subsequently spread on rough graded shooting lanes/berms for vegetation.

A wetland delineation was contracted with a private contractor and specific on-site posts and flagging were installed to accurately identify the boundaries of the wetland areas in order to avoid disturbance. See

Attachment E, Wetland Delineation Report.

Wetlands exist on the periphery of the identified parcel of Alternative A and will be avoided during the construction process. Figure 2 is an overlay of the range area on a WDNR wetland inventory map.



Figure 2 - Wetland Map at Proposed Action

The nearest body of water is Mud Lake which is north of the proposed shooting range, approximately .40 of a mile across King Road. The lake is approximately 2,165 acres. (T11N R10E S21 - 23) This lake is managed for wildlife, primarily waterfowl and the water quality is currently not considered impaired.



Photo of Mud Lake (WDNR Database)

3.2 BIOLOGICAL ENVIRONMENT (HABITAT/VEGETATION)

The specific site identified to establish the range was historically the homestead on the property consisting of a residence, a barn and several outbuildings. Following removal of the buildings, the site has reverted to an old field upland meadow dominated by Canada goldenrod, multiflora rose, wild parsnip, smooth brome grass, black locust, common buckthorn, and Bell's honeysuckle. The perimeter of the site transitions into a wetland community that consists of a lowland deciduous forest dominated by silver

maple, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and rough avens (*Geum laciniatum*). Wildlife usage on the 9-acre portion of the property was not surveyed however provided the size and proximity of the parcel adjacent large expanses of grassland cover, common wildlife species such as robins, sparrows, wild turkey, white-tailed deer, rabbits and mice likely frequent this location.

The proposed range site's topsoil would be windrowed or stockpiled during berm construction. The salvaged topsoil would be placed on the finished berms for vegetative establishment.

3.3 RARE SPECIES AND NATURAL COMMUNITIES

This section discusses the potential impacts to endangered resources that might be affected by construction or operation of the proposed Columbia County Shooting Range.

Endangered resources include rare or declining species, high quality or rare natural communities, and unique or significant natural features.

Endangered resources are tracked via the state's Natural Heritage Inventory (NHI) database which is maintained by the DNR's Bureau of Natural Heritage Conservation. The project area evaluation consists of both the project area and a buffer of 1 mile for terrestrial and wetland species and a 2-mile buffer for aquatic species.

The combined presence of natural habitat and man-made disturbances must be taken into consideration to evaluate whether there is likelihood that rare species are present and the potential for negative impacts to those species. For the purposes of this document, rare species are defined as federal- or state-listed threatened and endangered species, federal candidate and proposed species, and state special concern species. These species are not common which means they are low in numbers or restricted to small geographical areas, i.e., difficult to find. Therefore, while the existing sources of information are important for estimating impacts to rare species, they are incomplete. Additional rare species beyond those identified may actually be present in potentially impacted areas.

Also, the Wisconsin NHI database only has information on rare species for

areas which have been previously surveyed for that species or group, during the appropriate season and the observation recorded.

This section identifies the endangered resources that have been recorded in the vicinity of the project site, the project’s potential impacts to these resources, and the mitigation measures that should be implemented. This list and information are taken from the NHI database.

State Rare Species and Natural Communities*

Taxa Group	Protected Status		
	State Endangered or Threatened	State Special Concern	Not Applicable
Birds	1	1	
Reptiles		1	
Natural Communities			2
Summary	1	2	2

*There are no federally endangered or threatened species or federally proposed or candidate species present in the area.

3.3.1. Birds

Almost all native bird species are protected by the Migratory Bird Treaty Act (MBTA). Under the MBTA, it is unlawful to take, capture, kill, or possess migratory birds, their nests, eggs, and young. This may apply to birds nesting in or adjacent to the project area if construction disturbance results in nest abandonment.

Important Bird Areas (IBAs) are designated by the National Audubon Society, Inc. and managed in partnership with the WDNR and other stakeholders. These sites are of ornithological importance because they provide essential habitat to species of breeding or non-breeding birds of conservation concern. The Northern Empire Prairie IBA overlaps the project site.

Due to the MBTA and the presence of an IBA at the site, it is recommended that impacts to nesting birds be avoided by conducting construction activities in areas of suitable habitat (particularly tree removals) outside the breeding and nesting season which runs from approximately March through August.

One endangered and one special concern bird species were documented within the vicinity of the project area. The Endangered bird species prefers large shallow marshes with abundant vegetation adjacent to open water. The Special Concern bird species prefers freshwater wetlands dominated by bulrush and cattail with small groves of alder, willow, or other brush.

A wetland delineation was completed on the project area and wetland areas are planned to be avoided during project construction. Additionally, areas of open water will not be impacted by the project. If wetland areas are able to be avoided, suitable habitat for these species will not be impacted by this project and no further action will be necessary.

If wetland areas are not able to be avoided, habitat assessments should be conducted to determine if suitable habitat exists at this site for these two bird species. If the habitat assessment indicates that suitable habitat does exist, the work should be conducted outside of the avoidance periods for these two species. The required avoidance period for the endangered bird species runs from May 15th through July 31st. The recommended avoidance period for the Special Concern bird species is from April 15th through July 31st.

3.3.2 Reptiles

A Special Concern turtle has been recorded within the vicinity of the project area. This species nests within 900 feet of suitable wetlands and waterways. This turtle species overwinters in standing water that is typically more than 3 feet deep and with a deep organic substrate but will also use both warm and cold-water streams and rivers where they can avoid freezing.

A wetland delineation has been completed for the project area and wetland areas will be avoided during project construction. Since the site does not

contain permanent areas of standing water, there is no suitable overwintering habitat at the site. The remaining areas of concern are non-overwintering areas and upland areas.

The simplest and preferred method to avoid take of this turtle, is to avoid directly impacting individuals, known locations, and areas of suitable habitat. If suitable habitat cannot be avoided, the following measures will be implemented to avoid impacts:

Non-overwintering areas – If wetland areas are not able to be avoided, the following measures will be followed. For wetlands / water bodies shallower than three feet at the deepest point, conduct work outside of the turtle’s active season (**March 15 – October 15**). The installation and maintenance of exclusion fencing using the WDNR [Amphibian and Reptile Exclusion Fencing Protocol](#) is an avoidance option that can be used during this period as long as the exclusion fencing is installed **between October 16 and March 14**. Work can then be conducted within the fenced area at any time of year as long as the fencing is maintained.

Upland nesting habitat – Avoid work in suitable upland nesting habitat (sandy and/or well-drained soils) within 275 m (900 ft) of a wetland or water body during the turtle’s nesting period (**May 20 – October 15**). The installation and maintenance of exclusion fencing using the WDNR [Amphibian and Reptile Exclusion Fencing Protocol](#) is an avoidance option that can be used during this period as long as the exclusion fencing is installed **between October 16 and May 19**. Work can then be conducted within the fenced area at any time of year as long as the fencing is maintained.

3.3.3. Natural Communities

Natural communities may contain rare or declining species and their protection should be incorporated into the project design as much as possible. Minimizing impacts to and/or incorporating buffers along the edges of these natural communities will occur in order to avoid impacts. Two wetland natural communities were identified in the NHI database within the vicinity of the project area.

One of the wetland natural communities is an open, marsh, lake, riverine and estuarine community with permanent standing water, dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures.

The other wetland natural community is an herbaceous community of aquatic macrophytes that occurs in lakes, ponds, and rivers. Submergent macrophytes often occur in deeper water than beds of floating-leaved or emergent species, but there is considerable overlap. This community type can also be found in deep water wetlands and flowages that have little moving water present.

A wetland delineation was completed for the project area and wetland areas are planned to be avoided during project construction. This fact, along with the absence of permanent standing water, indicates that these two natural communities will not be impacted and no further action will be necessary.

If wetland areas are not able to be avoided during project construction, impacts to these natural communities should be minimized and/or buffers should be incorporated along their edges.

3.3.4. Additional Recommendations

It is recommended that backstops and berms be placed in such a way as to maximize the distance from known or newly recorded wetlands in order to reduce impacts to these areas from accumulation of spent lead. Additionally, it is recommended that periodic recovery and recycling of lead be conducted in order to reduce the potential for lead contamination entering the wetland areas.

3.4 LAND USE

The proposed site for the development of the shooting range is located on Mud Lake Wildlife Area. In order to establish the range on the wildlife area, a master plan amendment will need to occur to change the management classification from “Habitat Management Area” to a “Special Management Area”. This potential habitat classification change would not change the

overall goal and objective of Mud Lake Wildlife Area and a shooting range would be an allowable use on a wildlife area that would have a minimal impact on the primary adjacent use of pheasant hunting on this particular property.

The area outside of the wildlife area boundary is all classified as A-1 Agricultural which should not be negatively impacted by the presence of a shooting range. The Township of Lowville has indicated that there are very few businesses located within their jurisdiction. They have indicated that there is a wedding facility and a corn maze within the township. The wedding facility is located approximately 1 mile from the proposed shooting range and the corn maze is approximately 1.5 miles south of the location.

The nearest residence to the proposed shooting range is approximately .4 miles. Occupants of some nearby residences have expressed concern about the development of the range with specific concerns regarding the increase in noise, impacts on wildlife as well as potential negative impacts on land values.

3.5 CULTURAL/PALEONTOLOGICAL RESOURCES

The Wisconsin Historical Society, Museum Archaeology Program completed a Phase I site identification survey of the Mud Lake WA – King Rd project area. The project area consists of a small hill, which is mainly grassland on the west and dense woods/brush to the east. The far western footslope is low and wet, the location of an intermittent stream draining north into Mud Lake. The eastern footslope is also low and wet with standing water at the southwest intersection of King Road and Conservation Lane. The upland portion was investigated by shovel testing at a 15 m interval.

A historic Euro American farmstead was identified across approximately three acres (about 260 x 460 feet) of the area. The farmstead is located off of a driveway that extends north from Conservation Lane. At least eight structures were identified. These include a house foundation constructed of mortared limestone.



Other barns and outbuildings are constructed with concrete foundation walls or concrete slabs. A circular depression near one foundation may represent a silo. A smaller circular depression adjacent to the house is interpreted as a cistern. A possible well is indicated by an open depression built with large boulders located just to the west of the driveway. Several small depressions located near the house were investigated as possible privies but none were identified. Additional historic trash was observed at the northeast footslope.

Generally light densities of artifacts were recovered during the systematic shovel testing. A majority of artifacts were recovered from shovel tests excavated within the house foundation and adjacent cistern. Recovered artifacts include a mix of construction and domestic items totaling around 100. The assemblage consists primarily of construction related items such as nails (wire and machine cut), mortar/plaster, tiles and brick, window glass. A few ceramics (whiteware, porcelain and stoneware) were recovered. Other items include plastic and organics.

Based on deed research and plat maps, the site had been owned/occupied by four owners prior to it being acquired by the State of Wisconsin Conservation Commission (WisDNR) in 1964. The property was initially acquired by Silas W. Herring as a patent deed in 1849. A house/farm is indicated on the 1861 plat (the earliest available) and remains present on all subsequent plat and topo maps until the 1960s.

Based on the long Euro American occupation record and mixed artifact assemblage the site does not appear to be eligible for listing on the National Register of Historic Places. No additional archaeological investigations are

recommended at the site. The Request for State Historical Society Comment and Consultation form is attached as Attachment E. The complete Phase I Archeological Site Identification Survey is attached as Attachment F.

3.6 LOCAL SOCIO-ECONOMIC CONDITIONS

The project area is rural with agriculture as the primary business in the immediate area. Additional businesses within the area include an event/wedding facility and a seasonal agriculture-based tourist attraction that includes strawberry picking and fall-oriented seasonal activities such as a corn maze and a hayride. Primary hours of operation for the facility occur during June and July as well as primarily late September through October. The conference center/wedding facility is approximately 1 mile from the proposed range and is open year-round based on reservations. The Township of Lowville has indicated that there are very few businesses aside from agriculture within their jurisdiction.

Attachment A identifies the residences within a 1,000 yard distance around the parcel identified for development of the range.

The project would result in increased traffic to the shooting range. The average daily traffic count for King Road, as provided by the Columbia County Highway Department from State Highway 22 to Conservation Drive was 75 vehicles per day in the mid-1990s (personal communication). To provide a perspective of the expected increased traffic, at the recently completed Yellowstone Wildlife Area range, the average vehicle count into the parking lot is 25 vehicles per day.

According to tests completed by the American Association of State Highway and Transportation Officials (AASHTO) and published in a WI Towns Association bulletin, the amount of damage a road sustains is directly related to the weight of the load and how often it is applied. Typically, passenger autos and light duty vehicles are not a problem but rather it is trucks carrying legal weight loads of up to 80,000 GVW over weakened surfaces which do the damage. Some research has provided figures which show a single 18-wheeler loaded to 80,000 lbs. will do as much damage as 3,000 – 9,600 cars, depending on the design specifications of the road itself.

3.7 ECONOMIC ISSUES

The project would use federal Pittman-Robertson funds for range development. 25% of the cost is required to come from non-federal cost share and may be in-kind services. The entire construction cost is estimated to be between \$400,000 and \$667,000. Final cost will depend largely on the final design and is also dependent on how much soil is available on-site and how much (if any) will have to be brought in. If it is required to haul in significant amounts of soil, the cost estimate will now be much higher. The Wisconsin DNR would contract with an engineering firm to provide cost estimates based on past range development work and current construction costs. DNR would then be able to estimate our 25% share of the construction and will consider the use of in-kind services such as DNR providing staff and equipment to clear and level the foot-print of development. There are several other possibilities that the Department could employ to contribute the required match. Range construction will temporarily provide jobs to contractors building the range.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 POTENTIAL IMPACTS FROM RANGE DEVELOPMENT

Endangered/Threatened Species

Refer to Chapter 3.3. One endangered and one special concern bird species were documented within the vicinity of the project area. The Endangered bird species prefers large shallow marshes with abundant vegetation adjacent to open water. The Special Concern bird species prefers freshwater wetlands dominated by bulrush and cattail with small groves of alder, willow, or other brush.

Impacts to nesting birds will be avoided by conducting construction activities in areas of suitable habitat (particularly tree removals) outside the breeding and nesting season which runs from approximately March through August.

Environmental Justice

The development of a shooting range in Columbia County would have the potential to have a minor positive impact on Environmental Justice by providing a quality, free public shooting facility.

Economics

DNR would be using federal Pittman-Robertson funds for the construction of the range and associated entities including parking areas and pit toilets. DNR will be requesting \$300,000 - \$500,000 to help complete this work with the total cost of the project consisting of 75% from Pittman-Robertson and 25% being provided by the WDNR. Range construction would temporarily provide jobs to contractors building the range. Additional resources would be spent in the operation and maintenance of the facility and would primarily be provided by Pittman-Robertson funds. If expended on this project, these funds would not be available for other uses.

The Township of Lowville has expressed concern over the increased traffic that the proposed facility would bring to local roads and the additional road maintenance that this traffic would require. The level of traffic that this facility would generate is unknown; however the Yellowstone Lake shooting range, a similar facility in Lafayette County, generates approximately 25 vehicles per day. An additional 25 passenger vehicles per day would not be

expected to significantly increase road maintenance costs.

Range users may increase sales at nearby communities such as Poynette, WI. The Town of Lowville has commented that there are no existing businesses within their jurisdiction that would benefit from the proposed range. Businesses within the area include an event/wedding facility and a seasonal agricultural based tourist attraction (corn maze). The wedding facility is approximately 1 mile from the proposed range. The economic impact that this facility would have on local property values or businesses is unknown.

The economic impact that this facility would have on local property values is unknown. Land values are based on a variety of factors including local zoning and land division ordinances, physical features of a property, prevailing local markets and local and regional economies. Because these factors vary and may change over time there is no way to predict the influence of local land uses on future real estate markets.

Controversy - Controversy exists from a variety of angles regarding the development of a shooting range in Columbia County. Significant concern and controversy exists regarding the volume of target shooting that is occurring from wildlife area parking lots within the county, primarily on Swan Lake and French Creek Wildlife Areas. A site specific closure occurred at Swan Lake WA and site manipulation occurred at French Creek Wildlife Area which seems to have addressed most of the human health and safety concerns that have been expressed.

Concern exists regarding the development of a shooting range on Mud Lake Wildlife Area without also taking additional action to address target shooting at wildlife area parking lots throughout the county. The Columbia County board, the Town of Pacific Board, and the Columbia County Conservation Congress have passed resolutions asking for this DNR action before the shooting range amendments to the Master Plan are allowed to proceed. The Department has committed to addressing this issue through a NR 45 rule proposal that will be introduced in early 2015.

Although the preferred location for the shooting range as identified by the public involvement survey and consequently the ad-hoc committee was the Mud Lake Wildlife Area – King Road site, there is some concern about siting

the range at that location. Specifically, increases in traffic and the impact the traffic will have on King Rd have been presented. Some neighbors have also expressed concerns about the increase in noise that they will experience from this facility.

4.2 IMPACTS SPECIFIC TO ALTERNATIVES CONSIDERED

4.2.1 Alternative A - Proposed Action, Mud Lake Wildlife Area

Cultural Resources

Archeological features have been reviewed by the State Historical Society and no resources were identified and the site has been cleared for construction.

Habitat Impacts

Minor negative impacts would be expected. The historical use of the proposed site was a homestead prior to being left fallow. This alternative would convert an existing 9-acre old field meadow and a small portion of adjacent hardwood forest to a shooting range. The development of natural habitat and the increased use by humans would likely reduce the use by some species of wildlife on this parcel. However, the habitat that would be lost is not locally or regionally scarce and the majority of the Mud Lake Wildlife Area would remain as it is. Although the adjacent area is heavily hunted for pheasants, the development of a range should not impact the pheasant hunting that occurs on the adjacent property.

Minor and temporary fugitive dust and equipment exhaust emissions would be generated during range construction. The contractors working on this project would be required to follow erosion control best management practices during construction.

Biological Impacts

Minor negative biological impacts would be expected. Wildlife that may be displaced by the construction of the shooting range are common species and should be able to find similar habitat nearby. The proposed facility is not expected to reduce any local wildlife populations.

Economics

Range construction would temporarily provide jobs to contractors building the

range.

Range users may increase sales at nearby communities such as Poynette, Rio and DeForest WI. The Town of Lowville has stated that there are no existing businesses within their jurisdiction that would benefit from the proposed range. Businesses within the area include an event/wedding facility and a seasonal agricultural-based tourist attraction (strawberry patch and corn maze). The wedding facility is approximately 1 mile from the proposed range. Neither of these businesses are within view of the proposed shooting range location. In addition to being isolated from view of these businesses, measures, such as increased backstop and sideberms, a shooting direction away from these businesses as well as the use of shooting tubes should reduce the noise emitted from the range.

The economic impact that this facility would have on local property values is unknown. Land values are based on a variety of factors including local zoning and land division ordinances, physical features of a property, prevailing local markets and local and regional economies. Because these factors vary and may change over time there is no way to predict the influence of local land uses on future real estate markets.

The Township of Lowville has expressed concern over the increased traffic that the proposed facility would bring to local roads and the additional road maintenance that this traffic would require. The level of traffic that this facility would generate is unknown; however the Yellowstone Lake shooting range, a similar facility in Lafayette County, generates approximately 25 vehicles per day. An additional 25 passenger vehicles per day would not be expected to significantly increase road maintenance costs.

According to tests completed by the American Association of State Highway and Transportation Officials (AASHTO) and published in a WI Towns Association bulletin, the amount of damage a road sustains is directly related to the weight of the load and how often it is applied. Typically, passenger autos and light duty vehicles are not a problem but rather it is trucks carrying legal weight loads of up to 80,000 GVW over weakened surfaces which do the damage. Some research has provided figures which show a single 18-wheeler loaded to 80,000 lbs. will do as much damage as

3,000 – 9,600 cars, depending on the design specifications of the road itself.

Social Conditions

Alternative A would meet user needs, improve year-round public access, be handicapped accessible and improve hunter education opportunities.

Safety

There is a safety risk associated with shooter error, firearm malfunction and intentional shooter vandalism. Alternative A would improve safety over the existing condition of target shooting occurring at random wildlife areas around the county that do not have backstops and side berms.

Alternative A will have berms separating the shooting ranges reducing the risk of one user injuring another by stray bullets or ricochets when adjusting or checking targets. Construction of side and back berms and single direction shooting lanes would further help prevent stray fire from escaping the site.

Range use and shooting practice would help promote/retain firearm safety practices for hunters and other range users.

Intentional vandalism is always a possibility, especially in this case where the site will not be continuously manned and supervised. If vandalism becomes a problem increased surveillance from local law enforcement officials will be requested to discourage such activities.

Noise

Alternative A will cause increased use and an associated increase in shooting noise frequency at that location. The new facility would be open year-round from sunrise to sunset. Winter use is unlikely. Noise would be reduced for areas adjacent to the parking lots were target shooting is currently occurring. From a population density perspective, there is less impact to adjacent dwellings for Alternate A than Alternate C. Therefore a positive effect can be recognized for Alternate A as the adjacent land is sparsely populated. A sound study was conducted by the Wisconsin Structures and Materials Testing Laboratory to establish baseline sound level in the surrounding area due to a typical hunting rifle of .308 caliber being fired at the shooting range location, under calm wind conditions

(Attachment H). Following construction of the range, additional features may be added to the range to further reduce the level of noise disturbance associated with the range.

Land Use

Because Alternative A is a new location, ground disturbance and topographic changes are necessary. Primary land use adjacent to the proposed site is agriculture and conservation land and should not be negatively impacted by the development of the range.

Lead Recovery

There is a variety of evidence which indicates that lead is typically highly immobile in soil, both at ranges where lead is deposited as well as at locations where lead naturally occurs in the soil.

Wisconsin DNR data from three outdoor shooting ranges in SCR indicate that lead decreases to background values at depths locally as shallow as 1 ft bgs, and at maximum depths of 2-4 ft bgs. Soil at one of these ranges is sandy, which is the soil type most likely to allow downward migration of lead. At another of the ranges, the fall zone for the lead ammunition was a corn field that was tilled for many years, which is believed to account for some of the downward movement of lead at that range. None of the three ranges have an ES exceedance for lead in groundwater. Groundwater is as shallow as 8 ft bgs at two of the ranges.

Shooting ranges over water, particularly shotgun ranges, are typically discouraged due to concerns regarding breakdown of lead in water and 1) ingestion by wildlife feeding in such areas and 2) surface or groundwater contamination and associated negative human/biological health effects.

An investigation conducted in Washington at six orchards where lead arsenate was formerly used found that elevated concentrations of lead are typically restricted to the upper 40 cm of soil. In this situation, the soils were sandy loam and loam, and the orchards have been irrigated since approximately 1915.

In order to minimize any associated risks of lead in the environment, best

management practices will be utilized which involve periodic reclamation of the lead that accumulates in the berms of the range.

Recreation

The new range under Alternative A would improve opportunity for year round recreational practice shooting for all users. The range will be accessible to all users including minorities and users with disabilities. Some potential current uses on the parcel, including hunting, hiking, and wildlife watching would likely be negatively impacted by the development of a shooting range. These activities would still be available on the rest of the wildlife area and should not be significantly impacted by this proposal.

Cumulative Impacts

Cumulative impact has been defined in the National Environmental Policy Act as “the impact on the environment which results from the incremental impact of the action (in this case new shooting range development) when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other action”.

Chapter 1 describes DNR interest in developing new shooting ranges across Wisconsin to promote hunting safety. No criteria have been set as to the demand for new ranges, how many should be built, location of such facilities, etc. Similarly DNR has no regulations regarding safe setback distances from other types of land uses. It is not expected that so many new ranges would be proposed in near proximity to each other that there would be an additive cumulative effect such as for safety or noise.

Alternatives A or C would not set a precedent resulting in substantial increased demand for such facilities elsewhere. But it would create a safer and more accessible facility to meet local and statewide shooting range demand.

No conflicts with local, state or federal plans or policies are expected. Lead deposition and cumulative spent lead build-up in earthen berms is not known in Wisconsin to present a serious risk of groundwater contamination or other environmental risk (see above Lead Recovery discussion). DNR would not support or seek federal funding for any new shooting ranges over water. At some future time DNR may want to consider a mandatory, unified

lead recovery program for any ranges they seek to develop to help prevent or minimize lead contamination problems.

One possible cumulative effect is that shooting enthusiasts would become accustomed to the new range location and would frequent it more than random, uncontrolled locations in wooded property, gravel pits or open fields.

Controversy

The nearest residence to the proposed shooting range is approximately .4 miles. Some nearby residents have expressed concern about the development of the range with specific concerns regarding the increase in noise, impacts on wildlife as well as potential negative impacts on land values. As discussed above, a proposed range would increase the level of shooting noise that neighbors would experience. As part of the design phase of the range, specific efforts may be incorporated into the shooting range to reduce the noise level including shooting tubes, higher berms and an angle of shooting directed to the southeast.

Regarding the concerns expressed about the increased traffic on the local roads there are a variety of research results which provide some valuable insights. According to tests completed by the American Association of State Highway and Transportation Officials (AASHTO) and published in a WI Towns Association bulletin, the amount of damage a road sustains is directly related to the weight of the load and how often it is applied. Typically, passenger autos and light duty vehicles are not a problem but rather it is trucks carrying legal weight loads of up to 80,000 GVW over weakened surfaces which do much of the damage. Some research has provided figures which show a single 18-wheeler loaded to 80,000 lbs. will do as much damage as 3,000 – 9,600 cars, depending on the design specifications of the road itself.

Considering King Road, currently the average daily traffic count as provided through personal communications with the Columbia County Highway Department from State Highway 22 to Conservation Drive was 75 vehicles per day in the mid-1990s. To provide a perspective of the expected increased traffic, at the recently completed Yellowstone Wildlife Area range, the average vehicle count into the parking lot is 25 vehicles per day.

As a result, based on the research from the American Association of State Highway and Transportation Officials (AASHTO), if the level of traffic use is similar to what we are experiencing at Yellowstone, the increased traffic on King Road due to the shooting range would be negligible.

Significance of Precedence

The development of a range is not a precedence setting action as there are numerous locations where the Department has worked with other entities to develop ranges or independently developed ranges, throughout the state.

Significance of Risk

The risk associated with this action is low as the Department has developed and operates numerous other ranges around the state and has had a minimal number of incidences of errant bullets when the range is designed to NRA design standards.

4.2.2 Alternative B - No Action

Cultural Resources

No known impacts as a result of this action.

Environmental Justice

Negative effect. Without the development of a shooting range in Columbia County, there would not be a free ADA-accessible public shooting facility within a radius of 100,000 people. Those individuals without the financial resources to purchase range time or a membership to a private range will not have the opportunity to target shoot at a range.

Economics

No major impact. Federal funding could be used for other projects.

Habitat Impacts

Slight negative. Target shooting will continue at various wildlife area parking lots around the county. These sites lack the ability to effectively reclaim the lead that is being deposited at these sites while at a properly designed and managed range, the range design allows for proper lead reclamation.

Biological Impacts

None. No new disturbance would take place as a result of this action.

Social conditions

Long term adverse effect as there would be no sanctioned range for individual users, social groups or organizations such as hunter's safety training, boy scouts, or law enforcement training & practice.

Safety

In the short term safety would not change. It is speculated that safety overall would decrease as current users would shoot in uncontrolled or unimproved areas elsewhere.

Noise

Negative. Without the development of a range, it is likely that uncontrolled target shooting at unimproved sites will continue which has resulted in noise complaints, specifically from the residents of the subdivision adjacent to the Swan Lake WA parking lot.

Land Use - None.

Lead Recovery

Negative. Lead reclamation is not possible at the uncontrolled, unimproved sites around the county. At a well-designed and managed site, lead reclamation is a part of the standard operation and management of the facility.

Recreation

Negative. Adverse effect as there would be no sanctioned range for individual users, social groups or organizations such as hunter's safety training, boy scouts, or law enforcement training & practice. In addition, complaints have been received from other recreational users of the wildlife area when uncontrolled target shooting is occurring at wildlife area parking lots in the county.

Cumulative Impacts

None identified by this action.

Controversy

No change. Long term and on-going controversy will continue by not providing a range suitable for current users of the range.

4.2.3 Alternative C – Dekorra Public Hunting Grounds**Cultural Resources**

Unknown however no impact is expected.

Habitat Impacts

Slightly greater than Alternative A due to higher habitat quality.

Biological Impacts

Negative impact due to the loss of grassland habitat and the presence of an endangered species at the site which is dependent on grassland habitat.

Social Conditions

Same as for Alternative A.

Safety

Generally same as for Alternative A.

Noise

Potentially more negative than Alternative A due to the higher number of residences within the 1,000 yard distance of the range, however a noise analysis was not conducted for this site. It should be noted that comments have been received which indicate the increase noise would be unnoticeable due to the presence of the interstate adjacent to the site.

Land Use

Same as for Alternative A.

Lead Recovery

Same as for Alternative A.

Recreation

Generally same as Alternative A.

Cumulative Impacts

Same as for Alternative A.

Controversy

Slightly higher due to the number of residences within 1,000 yard distance of the site.

4.3 Summary Comparison of Environmental Consequences by Alternative

Impact type	Alternative A (Mud Lake WA)	Alternative B (No Action)	Alternative C (Dekorra PHG)
End./Thr. Species	None	No effect	Negative
Cultural Resources	None	No effect	None
Envir. Justice	Positive	Negative	Positive
Economics	None	No effect	None
Habitat	No effect	No effect	Minor negative
Biological	No effect	No effect	Minor negative
Social Conditions	Positive	Negative	Positive
Safety	Positive	Negative	Positive
Noise	Negative	Negative	Negative
Land Use	No effect	No effect	No effect
Lead Recovery	Positive	Negative	Positive
Recreation	Positive	Negative	Positive
Cumulative	No effect	No effect	No effect
Controversy	Minor Negative	Negative	Negative

CHAPTER 5 LIST OF PREPARER(S)

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CHAPTER 6 CONSULTATION AND COORDINATION WITH THE PUBLIC AND OTHERS

The range site is owned by the Wisconsin DNR and is located in the Town of Lowville, Columbia County. A shooting range is an allowable use on a wildlife area that would have a minimal impact on the primary adjacent use of pheasant hunting on this particular property.

Significant public involvement has occurred to narrow down and select the preferred location for the establishment of a range in Columbia County. See Chapter 2 for additional information.

This environmental assessment will be made available as a draft document for public review and comments, further allowing identification of any controversy associated with the project. Per FWS instruction a news release will be sent by DNR to local and statewide media describing the project and requesting comments. If new issues or controversy emerge DNR will attempt to resolve them before forwarding the EIS and grant application to FWS. All comments received and a description of any actions taken to resolve them would be forwarded to FWS as part of the final EA. FWS would make a final determination on the need for an EIS and a decision on the grant application.

CHAPTER 7 – SUMMARY OF PUBLIC INVOLVEMENT AND COMMENTS ON THE DRAFT EIS

April 17, 2015

Background

Public comments were received following the release of the Environmental Impact Statement on December 8th, 2014 through February 27th, 2015 with two formal points in the process as well as through an on-line survey regarding the EIS, a masterplan amendment and various design aspects of the proposed shooting range:

- Twenty members of the public, elected county and town officials and non-DNR agency staff attended an open house for the draft Environmental Impact Statement at the Columbia County Law Enforcement Center on December 17, 2014. A total of 11 comments were provided on the poster boards around the room and 1 additional person completed a comment form and submitted it at the meeting. Attendees included 6 members of the Columbia County Board, 1 member of the Town of Pacific Board and 1 member of the Town of Lowville Board.
- Thirty members of the public, elected county and town officials and non-DNR agency staff attended an open house and the formal hearing for the draft Environmental Impact Statement at the Columbia County Law Enforcement Center on February 5, 2015. Eight individuals provided oral public testimony on the EIS and one individual provided written testimony.
- Thirty two people completed the on-line survey from December 23rd, 2014 through February 27, 2015 and two additional people mailed in a printed copy of the survey.

In addition, staff received three phone calls, four letters and 5 emails during the public comment period. In addition, the Town of West Point presented a resolution regarding target shooting on state lands in Columbia County and in the Town of West Point.

Overview of the Environmental Impact Statement Comments

The table below provides a summary of the comments received through the various methods regarding the EIS and the masterplan amendment Columbia County Planning Group Master Plan. The information provided below provides a summary that includes comments received on the masterplan amendment itself due to the close relationship between the EIS, the CCPG Amendment and the development of the shooting range itself.

Columbia County Shooting Range EIS/Masterplan Amendment Comments			
Comment Method	Strongly Support/Support	Unsure	Strongly Oppose/Oppose
On-line Survey	17	8	9
Letters	1	1	1
Phone Calls	1	0	2
Email Messages	3	1	1

Overall, a total of 45 comments were received specific to the environmental impact statement with 22 comments (49%) in support of the EIS findings, 10 (22%) unsure and 13 comments (29%) opposed.

The individuals that “strongly supported” or “supported” the EIS and the development of the range felt it was a good use of tax dollars and generally felt there is a need for a safe place to shoot in Columbia County. In addition to expressing their support for the range, a group of the respondents also recommended fencing the site and installing a 200 yard range and maintaining a 25’ range.

The individuals that “strongly opposed” or “opposed” the EIS and the development of the range identified a number of concerns related to the range development. Specifically:

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will negatively impact wildlife on the parcel and the property in general.

Response: The specific site identified to establish the range was historically the homestead on the property consisting of a residence, a barn and several outbuildings. Following removal of the buildings, the site has reverted to an old field/upland meadow dominated by Canada goldenrod (*Solidago canadensis*), multiflora rose (*Rosa multiflora*), wild parsnip (*Pastinaca sativa*), smooth brome

grass (*Bromis inermis*), black locust (*Robinia pseudoacacia*), common buckthorn (*Rhamnus cathartica*), and Bell's honeysuckle (*Lonicera x bella*). The perimeter of the site transitions into a wetland community that consists of a lowland deciduous forest dominated by silver maple, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and rough avens (*Geum laciniatum*). Wildlife usage on the 9-acre portion of the property has not been surveyed however provided the size and proximity of the parcel to adjacent large expanses of grassland cover, common wildlife species such as robins, sparrows, wild turkey, white-tailed deer, rabbits and mice likely frequent this location.

Although one endangered and one special concern bird species were documented within the 1 mile buffer of the project area, the endangered bird species prefers large shallow marshes with abundant vegetation adjacent to open water. In addition, the special concern bird species prefers freshwater wetlands dominated by bulrush and cattail with small groves of alder, willow, or other brush. Since the parcel that will be developed for the range is an upland site and the two habitat types do not exist at that location, impacts on the endangered and special concern species should not occur.

In other areas where shooting ranges have developed similar to the proposed range, impacts to wildlife have been undetectable. Wildlife, such as deer, turkeys and songbirds have been identified on shooting ranges and frequently use adjacent property in lieu of the range itself following development of the site.

The development of natural habitat and the increased use by humans would likely reduce the use by some species of wildlife on this parcel. However, the habitat that would be lost is not locally or regionally scarce and the majority of the Mud Lake Wildlife Area would remain as it is. Although the adjacent area is heavily hunted for pheasants, the development of a range should not impact the pheasant hunting that occurs on the adjacent property.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will negatively impact other recreational users on the property.

Response: The primary activity that occurs on Mud Lake Wildlife area is pheasant, waterfowl, deer and turkey hunting as well as wildlife watching. The

site that was chosen is currently a reclaimed homestead site and is on the periphery of a large grassland area primarily used for pheasant hunting. Since the area where the range will be built is surrounded by a small silver maple forest, pheasant hunting does not occur at a significant level on this portion of the property. Regarding other forms of hunting, this portion of the property does not represent a habitat type that is limited or of significance for hunting these alternative species, especially waterfowl.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will negatively impact the conference center and the agricultural-based seasonal business in the Town of Lowville.

Response: The immediate project area is rural with agriculture as the primary business. Additional businesses within the area include an event/wedding facility and a seasonal agriculture-based tourist attraction that includes strawberry picking and fall-oriented seasonal activities such as a corn maze and a hayride. Primary hours of operation for the facility occur during June and July as well as primarily late September through October. The conference center/wedding facility is approximately 1 mile from the proposed range and is open year-round based on reservations. Neither of these businesses are within view of the proposed shooting range location. In addition to being isolated from view of these businesses, measures, such as increased backstop and sideberms, a shooting direction away from these businesses as well as the use of shooting tubes should reduce the noise emitted from the range.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will negatively impact the roads in the Town of Lowville.

Response: The project would result in increased traffic to the shooting range. The average daily traffic count for King Road, as provided by the Columbia County Highway Department from State Highway 22 to Conservation Drive was 75 vehicles per day in the mid-1990s (personal communication). To provide a perspective of the expected increased traffic, at the recently completed Yellowstone Wildlife Area range, the average vehicle count into the parking lot is 25 vehicles per day.

According to tests completed by the American Association of State Highway and Transportation Officials (AASHTO) and published in a WI Towns Association

bulletin, the amount of damage a road sustains is directly related to the weight of the load and how often it is applied. Typically, passenger autos and light duty vehicles are not a problem but rather it is trucks carrying legal weight loads of up to 80,000 GVW over weakened surfaces which do the damage. Some research has provided figures which show a single 18-wheeler loaded to 80,000 lbs. will do as much damage as 3,000 – 9,600 cars, depending on the design specifications of the road itself.

Comment: Several individuals questioned the need for the development of a shooting range in Columbia County and generally feel it isn't needed.

Response: Currently, no public shooting range exists in Columbia County and the surrounding area. The Wautoma shooting range is the closest public shooting range which is approximately 60 miles from Poynette and the Yellowstone Wildlife Area range is approximately 67 miles away. In 2012, the board approved the Columbia County Master Plan for DNR-managed wildlife and fishery lands in the county. The plan identified public safety and neighboring landowner concerns associated with shooting in parking lots on the Swan Lake and French Creek wildlife areas and identified the need for a public shooting range in Columbia County.

Shooting Ranges

(from: Columbia County Planning Group Master Plan, pg. 43)

“Several parking lots at the Swan Lake WA and French Creek WA are heavily used for recreational shooting and target practice by locals and out of county individuals. These activities have generated concerns about public safety, quality of life (e.g., noise and litter) and inquiries by local elected officials and law enforcement.”

In addition to the need identified in the Columbia County Planning Group masterplan, Columbia County falls within a high priority area for range development in the “Strategic Guidance for Shooting Ranges in Wisconsin – 2014 – 2019”(Attachment C). Within this strategic guidance, the goal is to increase opportunities for shooting in a safe environment within a reasonable travel distance for participants and in a location intended for recreational shooting. All areas, including all of Columbia County, lying outside of a 100,000 resident buffer drawn around public shooting ranges have been identified as a high priority for the development of a shooting range.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will produce a large amount of noise in the area.

Response: As part of the construction process, measures, such as increased backstop and sideberm heights and establishing a shooting direction away from these businesses and closest residences should mitigate the sound level emitted from the range.

As a part of the evaluation process, a sound study was conducted by the Wisconsin Structures and Materials Testing Laboratory to establish baseline sound level in the surrounding area due to a typical hunting rifle of .308 caliber being fired at the shooting range location, under calm wind conditions. Following construction of the range, this information will provide base-level information to evaluate noise levels emitted from the range and may result in further evaluation to mitigate noise levels if the department determines it is necessary.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will negatively impact on property values in the area.

Response: The economic impact that this facility would have on local property values is unknown. Land values are based on a variety of factors including local zoning and land division ordinances, physical features of a property, prevailing local markets and local and regional economies. Because these factors vary and may change over time there is no way to predict the influence of local land uses on future real estate markets.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area will result in significant litter in and around the range.

Response: The Wisconsin DNR is interested in working with local partners to help develop and manage the Columbia County Shooting Range once it is developed. During the public comment period for the EIS and masterplan amendment, the Columbia County Sporting Alliance has offered to assist with the management of the site. If approved, the Department will meet with the group and further discuss entering into an agreement to provide financial

assistance to them or other groups that are willing to meet the operational and management needs identified for the Columbia County shooting range. The range will not be continually staffed by a Department employee however staffing will be considered on weekends during busy times of the year. Department O&M would be carried out by wildlife management and law enforcement staff in Columbia County with funding primarily provided by Pittman Robertson funding.

Comment: The Town of West Point passed a resolution requesting an amendment to the Columbia County Planning Group masterplan indicating target shooting is not allowed on State Natural Areas, state-owned segments of the Ice Age Trail, State Fisheries Areas and State Wildlife Areas with the exception of Mud Lake Wildlife Area.

Response: Throughout the process that has been used to establish a shooting range in Columbia County, the Wisconsin DNR has indicated that eliminating target shooting on all other DNR-managed properties in the County was excessive. In situations where target shooting creates public health and safety issues and significant neighbor concerns, the Department has committed to addressing this issue through a NR 45 rule proposal that will be introduced in 2015.

Comment: Development of a shooting range on the King Rd site on Mud Lake Wildlife Area may result in lead leaching into the ground water.

Response: There is a variety of evidence which indicates that lead is typically highly immobile in soil, both at ranges where lead is deposited as well as at locations where lead naturally occurs in the soil.

Wisconsin DNR data from three outdoor shooting ranges in SCR indicate that lead decreases to background values at depths locally as shallow as 1 ft bgs, and at maximum depths of 2-4 ft bgs. Soil at one of these ranges is sandy, which is the soil type most likely to allow downward migration of lead. At another of the ranges, the fall zone for the lead ammunition was a corn field that was tilled for many years, which is believed to account for some of the downward movement of lead at that range. None of the three ranges have an ES exceedance for lead in groundwater. Groundwater is as shallow as 8 ft bgs at two of the ranges.

An investigation conducted in Washington at six orchards where lead arsenate was formerly used found that elevated concentrations of lead are typically restricted to the upper 40 cm of soil. In this situation, the soils were sandy loam and loam, and the orchards have been irrigated since approximately 1915.

In order to minimize any associated risks of lead in the environment, best management practices will be utilized which involve periodic reclamation of the lead that accumulates in the berms of the range.

CHAPTER 8 REFERENCES CITED

Copies of references cited can be obtained from DNR contact person listed on page 1.

1. National Rifle Association Range Manual, 2012.
2. Natural Heritage Inventory (NHI) database, Wisconsin Dept. of Natural Resources
3. Hunting, Fishing and Trapping 2000 - A Report Addressing Long Term Planning for the Secretary's Issue of Hunting, Fishing and Trapping in Wisconsin, WDNR, 2000.
4. "Shooting ranges a big target for funding from DNR"; Milwaukee Wisconsin Journal Sentinel, June 29, 2013.
5. Wisconsin Hunter Education Annual Incident Report-2013, WDNR.
6. Best Management Practices for Lead at Outdoor Shooting Ranges, EPA-902-B-01-001, June 2005, Region 2.
7. American Association of State Highway and Transportation Officials study
8. Outdoor Shooting Ranges: Best Practices, 2003, State of Minnesota, Department of Natural Resources.

ATTACHMENTS

Attachment A: Columbia County Planning Group Masterplan

Attachment B: Location Map

Attachment C: Strategic Guidance for Shooting Ranges in Wisconsin – 2014 – 2019

Attachment D: Online Survey Results Overview

Attachment E: Wetland Delineation Report

Attachment F: Request for State Historical Society Comment and Consultation

Attachment G: Phase I Archeological Site Identification

Attachment H: Mud Lake Sound Study

BEFORE THE
DEPARTMENT OF NATURAL RESOURCES

DETERMINATION ON
WISCONSIN ENVIRONMENTAL POLICY ACT COMPLIANCE

For

Columbia County Shooting Range (CCSR)

INTRODUCTION

The Wisconsin Environmental Policy Act (WEPA), s. 1.11, Stats., requires state agencies to fully consider and disclose the environmental impacts of agency actions. Chapter NR 150, Wis. Adm. Code, outlines policy and procedures for implementing WEPA for the Department of Natural Resources (DNR). Section NR 150.35, Wis. Adm. Code requires a final written determination regarding WEPA compliance.

The Wisconsin Department of Natural Resources has prepared an environmental impact statement (EIS) for the CCSR in order to satisfy WEPA as outlined above.

FINDINGS OF FACT

The Department of Natural Resources finds that:

1. The Department proposed an amendment to the Department's Columbia County Planning Group Master Plan to allow for the development of a new public shooting range on the Mud Lake Wildlife Area in the Town of Lowville, Columbia County.
2. The Department determined to follow the EIS process for review of this proposal under s. NR 150.30, Wis. Adm. Code.
3. On December 10, 2014, the Department completed a Draft Environmental Impact Statement (DEIS) and received public comments through February 27, 2015.
4. Pursuant to s. NR 150.30 (3), Wis. Adm. Code, on December 10, 2014 the Department announced the availability of the DEIS for public comment and announced a public meeting at the Columbia County Law Enforcement Center, 711 East Cook Street, Portage at 6 p.m. The DEIS was published on the Department's web site at: <http://dnr.wi.gov/topic/EIA/Current.html>.
5. On December 17, 2014, the Department held a public informational meeting on the

project and DEIS at the Columbia County Law Enforcement Center from 6 to 8 p.m.

6. On January 22, 2015, the Department announced an open house and public hearing would be held on February 5, 2015 on the project and DEIS at the Columbia County Law Enforcement Center, 711 East Cook Street, Portage at 7 p.m.
7. On February 5, 2015, the Department of Natural Resources held a public hearing on the project and DEIS at the Columbia County Law Enforcement Center, 711 East Cook Street, Portage at 7 p.m.
8. Written and verbal comments were received by the Department at the December 17, 2014 informational meeting and at the February 5, 2015 public hearing and open house. Comments were also accepted in letter, electronic mail and over the phone between December 10, 2014 and February 27, 2015.
9. Pursuant to s. NR 150.30 (4)(b), Wis. Adm. Code, the Department prepared a summary of the comments received and responded to the DEIS comments in a document dated April 17, 2015. The Department has prepared a Final EIS.
10. The Final EIS has been published on the Department's web site at:
<http://dnr.wi.gov/topic/EIA/ArchiveTitle.html>.

CONCLUSIONS OF LAW

The Department concludes that:

1. The Department of Natural Resources, under s. 1.11, Stats., and Ch. NR 150, Wis. Adm. Code, has the responsibility to comply with WEPA, and the authority to determine its compliance with that Act.
2. The procedure and analysis identified in the Findings of Fact complies with the requirements of s. 1.11, Stats., and ch. NR 150, Wis. Adm. Code.

DETERMINATION

The DNR has complied with the requirements of WEPA, s. 1.11, Stats. and ch. NR 150, Wis. Adm. Code, for the proposed CCSR project. This determination applies to all subsequent Department actions on the project, the impacts of which are considered in the Final EIS.

Dated at Fitchburg, Wisconsin, this 23th day of April, 2015

STATE OF WISCONSIN
Department of Natural Resources
For the Secretary

By: 
Eric Heggelund, Environmental Analysis and Review
program, South Central Region

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes, and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, ss. 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

By [South Central Region](#) December 10, 2014

Contact(s): Eric Lobner, wildlife supervisor, 608-235-0860

PORTAGE, Wis. - The public is invited to review and comment on two draft documents that are part of the development of a new public shooting range on the Mud Lake Wildlife Area in the Town of Lowville at a public meeting scheduled for Dec. 17 from 6 to 8 p.m. at the Columbia County Law Enforcement Center, 711 East Cook Street, Portage. Comments can also be submitted through Feb. 27, 2015.

A draft of a proposed amendment to the Columbia County Planning Group Master Plan and a draft Environmental Impact Statement are available for review by searching the DNR website, dnr.wi.gov, for keywords "[environmental impact analysis](#)." and clicking on the link for "[current EIA documents](#)" under the "Public involvement" tab.

Comments may also be submitted to: Eric Lobner, Region Program Manager for Wildlife Management, 3911 Fish Hatchery Road., Fitchburg, WI 53711, phone: 608-275-3474, email: Eric.Lobner@Wisconsin.gov.

The Mud Lake location for the new public shooting range was recommended by an ad hoc citizens committee after reviewing the pros and cons of seven possible state-owned sites within the county and public input on two of the sites the committee felt were the best candidates.

The proposed master plan amendment is needed to reclassify approximately 10 acres of the Mud Lake Wildlife Area from "habitat management area" to "special management area." The draft EIS evaluates potential impacts to natural resources at and adjacent to the site.

"Our master planning guidelines require us to craft a plan amendment that reclassifies the area designated for the range to a category that allows this kind of development," said Eric Lobner, a DNR wildlife supervisor for the area. "The EIS identifies potential environmental impacts from the project on habitat, area wildlife and nearby human populations.

"The goals for the meeting and the comment period are to determine if we've missed anything in either the amendment proposal or the EIS and to gather additional feedback from the public on things like orientation of the range on the site, site features and amenities."

Following this public meeting and comment period the department will evaluate all comments and make any needed modifications to the amendment and EIS. The public will again have an opportunity to comment on a final amendment when it's presented to the Natural Resources Board for approval.

Dates and locations for these future comment opportunities will be announced.

Columbia County Planning Group Master Plan



December 2012
Wisconsin Department of Natural Resources
DNR PUB-LF-066



Cathy Stepp - Secretary

Natural Resources Board

David Clausen, Chair

Preston D. Cole, Vice-Chair

Christine L. Thomas, Secretary

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DNR PUB-LF-066

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Photo Credits – Brook trout, Copyright 2000 Wisconsin DNR; **Prairie Burn**, Bureau of Endangered Resources Staff photo; **Dog Trial training at Pine Island** – Sara Kehrli, WDNR; **White Tail Deer**, US Fish and Wildlife Service photo

Columbia County Property Group Master Plan

Wisconsin Department of Natural Resources

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Laurie Osterndorf - Director, Bureau of Endangered Resources
Bob Mather - Director, Bureau of Forest Management
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Each map series consists of the following maps respectively

- 1= current cover types
- 2= infrastructure
- 3= land classifications and state natural areas
- 4= public lands
- 5= future cover types
- 6= boundary adjustments (if applicable)

EXECUTIVE SUMMMARY

Introduction

The Columbia County Planning Group (CCPG) Master Plan was approved by the Natural Resources Board on December 5, 2012. The plan covers twenty properties totaling 24,120 acres of state owned and easement land including fourteen wildlife properties (22,242 acres), five fishery areas (1,714 acres) and one state natural area (164 acres) (**Map A**) (**Table ES-1**).

Table ES-1 CCPG properties	
Wildlife Areas	Acres
Pine Island WA	5,499
Peter Helland WA	3,543
French Creek WA	3,506
Swan Lake WA	2,466
Mud Lake WA	2,283
Paradise Marsh WA	1,588
Lodi Marsh WA	1,186
Grassy Lake WA	779
Jennings Creek WA	530
Columbus PHG	248
Hampden PHG	229
Dekorra PHG	226
Duck Creek PHG	159
Lewiston Marsh PHG	153
Fishery Areas	
Rocky Run FA	737
Rowan Creek FA	651
Hinkson Creek FA	233
Lodi Spring Creek FA	53
Roelke Creek FA	40
Natural Areas	
Rocky Run Oak Savanna	164

This plan builds upon the substantial foundation laid by prior master plans, fish and wildlife program guidance, and habitat and biotic inventory work conducted over the last several decades. The planning process also considered comments received during the open houses held on June 6, 2011 and September 5, 2012, the associated 30 day comment periods, and the dialog with citizens, interest groups, partner agencies and local officials. The recommendations in local land use plans were also considered during this process.

The recreational and habitat goals include:

- Maintaining high quality hunting, fishing, trapping and other compatible recreational experiences.
- Improving habitat for game and non-game species with an emphasis on enhancing native plant and animal communities, especially imperiled habitats such as oak savanna and species requiring grasslands for all or a critical portion of their life cycle.

A significant majority of the current recreation and habitat management activities will continue into the future. The major changes include expanded project boundaries, improved site accessibility for all users and an increase in the number of state natural areas.

The appeal of the CCPG properties is expected to grow as our population continues to expand and access to private lands becomes more difficult. All of these wildlife areas and trout streams are within an hour drive of 500,000 to 1,000,000 people.

Sporting activities are popular in Columbia County with a total of nearly 10,000 fishing licenses, 7,000-8,000 hunting licenses and 300 trapping licenses sold annually to residents and non-residents.

The primary recreational activities on all the properties will continue to be hunting, trapping and/or fishing with some specialized uses at specific properties, such as dog trialing at Pine Island. Annually, an average of 90 active dog training permits at Pine Island have been issued to residents from at least 16 counties and even some non-resident dog trainers. An increase in other outdoor activities such as hiking, wildlife watching, dog walking, berry picking, snow shoeing and cross-country skiing is expected. These other activities are encouraged, but only limited management actions by Department staff will be taken to promote them (e.g., groomed ski trails will not be provided).

These properties have broad regional appeal. About 45% of the deer harvested in Columbia County are taken by hunters who live outside Columbia County. Even though the CCPG properties represent less than 5% of the land base in the county about 12% of the harvested deer come from these public lands. These properties provide 80% of the lands available for public hunting in the county.

Pine Island is popular with birders and is recognized as an Important Bird Area. French Creek and Mud Lake are appealing to birders and waterfowl hunting while Rowan Creek and Rocky Run are regionally popular with trout anglers.

Recreational facilities will continue to focus on user access (e.g., parking lots and water access points) that maintains the rustic character of the properties. Depending on the acquisition of additional parcels and collaborations with community partners, additional parking lots, improved access for mobility impaired individuals and/or enhanced boat access opportunities are part of this approved plan.

Visitors will have walking access to the properties through the Ice Age trail segment at Lodi Marsh, the Pine Island hiking trail at Rowan Creek, service roads, stocking lanes, dikes and informal paths used by hunters, anglers and others. Seven new parking lots and two new boat access points are approved to improve public access to the properties and disperse users to reduce congestion.

The management of the state natural areas is and will continue to be focused on protecting and restoring outstanding examples of Wisconsin's native plant and animal communities. These natural areas are open to fishing, hunting, trapping and other traditional outdoor activities.

The habitat management objectives generally seek to increase the acreage and quality of the pre-settlement native plant communities. About 5,600 acres will be managed as Native Community Management Areas and 18,490 acres will be managed as Habitat Management Areas. Properties will be managed on a landscape scale to create smooth transitions between the plant communities. The Native Community Management communities of interest include Oak Savannas, Oak Woodlands, Oak Barrens and Mesic Prairies in the uplands and Sedge Meadows, Calcareous Fens, Wet Mesic Prairies, Marsh and Tamarack Swamps in the wetlands. An important cover type that will be emphasized in the Habitat Management Areas is Surrogate Grasslands for grassland nesting ducks, pheasants and birds.

Prescribed burning is the favored management prescription for many of these communities with mowing and herbicide used as needed to limit brush and invasive species encroachment.

A critical management activity will be improved monitoring and control of invasive species. Controlling invasive species will be a difficult task due to the presence and abundance of multiple invasive species on several of the properties. Prioritization and coordination of the management efforts between programs is needed to most effectively address this challenge.

Project Boundary and Acreage Goal Adjustments

The approved project boundary adjustments seek to achieve the following goals:

1. Improve public access to meet the expected growth in demand for outdoor recreational activities from a growing population in Columbia County and the region.
2. Link isolated upland parcels to improve public access around the shallow water bodies or wetlands that constitute the majority of these properties.
3. Reduce user confusion about property lines and minimize potential trespass issues.
4. Protect current recreational activities from non-compatible land uses. Gun hunting is not allowed within 100 yards of a home unless the resident provides permission. Expanding boundaries to roads will provide greater certainty these lands can be used for all of the intended purposes.
5. Contract boundaries where significant residential development has occurred, game management priorities have changed and/or achieving habitat management goals are unlikely.
6. Provide larger contiguous blocks of ownership to improve the efficiency of habitat management activities, especially for prescribed burns and controlling invasive species.
7. Expand permanent upland grassland habitat needed by grassland nesting waterfowl, pheasants and grassland birds. A minimum 1:1 ratio of grassland:wetland is desired for these properties though a 3:1 ratio is considered even more productive. The current grassland:wetland ratio is about 0.4:1 indicating a significant deficiency in grasslands. The approved habitat management objectives and project boundary/acreage goal adjustments could improve this ratio to about 0.7:1.
8. Add a minimum of 14,000 feet of public access along trout streams and increased opportunities for trout habitat improvements.
9. Acquire land needed for wetland restoration and habitat improvement projects consistent with program strategic plans and inter-agency initiatives.
10. Protect our existing investment in state land and water by sustaining essential inputs, such as surface and groundwater, and reducing the risk of habitat degradation related to erosion, sedimentation and nutrient runoff.
11. Coordinate our acquisition and property management activities with federal agencies and other partners to maximize habitat benefits, improve recreational opportunities, and leverage limited acquisition funds and staff resources to achieve the greatest results.

To meet these goals the following project boundary and acreage goal adjustments were approved:

- Contract project boundaries by 1,131 acres, primarily on wildlife properties, where significant residential development has occurred, and conservation and public access benefits are minimal.

- Expand the project boundaries by 5,076 acres to enhance access, improve management efficiency and minimize non-compatible developments on the perimeter of the fish and wildlife properties.
- Incorporate 576 acres of land previously purchased by the state, but never included in the project boundaries. Eighty one acres of the 576 acres are on parcels that previous Natural Resources Board actions had indicated should be used for sale or trade purposes. These parcels are located on the Rowan Creek Fishery Area and the Paradise Marsh Wildlife Area. This master plan directs all 81 acres be retained for their habitat and access value.
- Expand the wildlife project boundaries by 3,964 acres and the acreage goal by 2,910 acres.
- Expand the fishery project boundaries and the acreage goals by 424 acres.
- Increase the natural area boundaries from the existing 2,590 acres to 5,339 acres. This action creates five new natural areas and expands four existing natural areas by a total of 2,749 acres. All of the expansions, except for 35 acres at the Rocky Run Oak Savanna, are overlays within existing wildlife and fishery boundaries on state owned lands.

The land uses within the project boundary expansions include 53% cropland, 19% forest/shrubs, 22% wetlands, 4% developed lands and 2% grasslands.

CHAPTER ONE

OVERVIEW OF THE CCPG PROPERTIES

Introduction

The Columbia County Planning Group (CCPG) includes twenty properties totaling 24,120 acres. The regional and county context for these properties are shown on **Maps A and B**. The fourteen wildlife areas contain 22,229 acres, the five fishery areas about 1,714 acres and the one stand alone state natural area contains 164 acres. These properties encompass diverse habitats ranging from large open marshes to remnant prairies and oak woodlands and highly productive trout streams.

Plan Overview

The Columbia County Planning Group Master Plan was approved by the Natural Resources Board on December 5, 2012.

This master plan describes the boundary adjustments and property management objectives and prescriptions needed to provide high quality traditional outdoor recreational experiences. Science based management principles and practices will be applied to provide quality habitat for both game and non-game species, and protect the native plant and animal communities.

Habitat management will be focused on protecting and restoring native wetland communities, native grasslands, increasing the acreage of oak savanna and oak woodlands, and improving trout habitat. These activities will also contribute to improved surface and groundwater quality and quantity in the lakes, wetlands, and streams. Cultural and historical elements on these properties will be protected too.

The appeal of these properties is expected to grow as our population continues to expand and access to private lands becomes more difficult. All of these wildlife areas and trout streams are within an hour drive of 500,000 to 1,000,000 people and those in eastern Columbia County up to 2,000,000 people.

This plan includes input from the US Fish and Wildlife Service (FWS), local sporting clubs, National Park Service (NPS), Ice Age Trail Alliance (IATA), local governments, county land use plans, and citizens. The SCORP report (*WDNR, SCORP (2006a)*) was also consulted and the recreational shortages best addressed by the wildlife and fishery were considered in the planning process. This master plan proposes to improve access by increasing the number and/or quality of the access sites and boat launches for recreational users of all abilities.

Public Investments in Public Land

In Wisconsin, our natural resources are not just a part of our landscape; they are a part of our heritage. Wisconsin residents value their rich traditions of hunting, fishing, trapping, camping and hiking, and our access to our public recreational land and wild places. The state manages about 1.6 million acres of public-owned forests, barrens and savanna, grasslands, wetlands, shrub lands, streams and lakes. Conserving these resources is an investment that pays many dividends, some economic, others social similar to our investments in roads and other infrastructure.

In assessing the economic importance of the Wisconsin State Park System, a study released in 2002 indicated the total visitor expenditures and the “multiplier” effect of new dollars flowing into the state accounted for roughly \$650 million annually (WDNR, 2002). The National Wildlife Refuge System generated almost \$1.7 billion in total economic activity, almost four times the \$383 million federal appropriation to the refuge system in fiscal 2006 (Greenwire, 2007). A 2006 report for the National Parks Conservation Association showed that for every \$1 appropriated in the annual national parks budget, the national park system generates at least \$4 for state and local economies (Hardner and McKenney, 2006). A University of Minnesota study found that for every \$1 invested in conserving natural areas in Minnesota, there is a return of up to \$4 (Minnesota Environmental Partnership, 2010).

According to the U.S. Fish and Wildlife Service’s *National Survey of Fishing, Hunting and Wildlife Report (2006)*, a total of 2.9 million residents and non-residents, 16 years old and older, fished, hunted and/or watched wildlife in Wisconsin spending \$3.7 billion in the process. According to the 2006 national survey, nearly 1.39 million anglers spent 20.8 million days fishing. That accounted for \$1.66 billion in retail sales, \$2.75 billion in overall economic output, generating \$196 million in state and local taxes and providing 30,000 jobs (Southwick Associates, 2008). Nearly 700 thousand hunters spent 10 million days hunting, accounting for \$1.39 billion in retail sales, \$2.19 billion in overall economic impact, generating \$197 million in state and local tax revenue and providing 25,000 jobs (Southwick Associates, 2007).

Our \$12 billion tourism industry (*Tourism Federation of Wisconsin*) and \$23 billion forest industry (WDNR 2009) are inextricably linked to our abundant natural resources and, in part, to our public lands. All of Wisconsin DNR-managed lands have been certified as sustainable by two third-party audit firms. That means these lands meet the social, ecological, and economic rights and needs of the present generation without compromising those of future generations. Timber harvested on state land also has an enhanced value and can be marketed as sustainably harvested.

There is a growing understanding of the role that natural lands play in filtering pollutants and maintaining water quantity and quality for both surface and groundwater. Wetland protection and restoration can help reduce flood peaks and damage, protect human health and safety, and reduce the need for expensive projects such as levees, detention ponds and the reconstruction of flood-damaged roads.

Ingraham and Foster (2008) estimated the value of basic “ecosystem services” from USFWS National Wildlife Refuges in the contiguous United States. The economic value for the wildlife habitat, carbon sequestration, disturbance prevention (e.g. flood control), freshwater management and supply, nutrient regulation and waste management of these services amounted to \$2,900/acre/year. Using the same approach, Wisconsin’s public land provides a total return of \$3.33 billion/year or \$2,400/acre/year.

Our public lands provide cultural and historical connections. They invoke a sense of place in the landscape and are important habitats for people. The majority of Americans agree that preserving undeveloped land for outdoor recreation is important (*Outdoor Foundation, 2011*). Evidence suggests that children and adults benefit from contact with nature that land conservation can now be viewed as a public health strategy (Frumkin and Louv, 2007). They also play an important role in providing access to the outdoors for people with varied physical abilities, support environmental education, and build a public commitment to environmental conservation.

Investments in public land need to balance the capital and operational costs with the full range of long-term recreation, environmental, connections to nature, land health and economic benefits. Conservation related expenditures are an investment that will pay dividends long into the future (Gies, 2009).

Recreational Significance

Wildlife Communities and Habitats

The CCPG properties contain large wetland complexes that are partially surrounded by oak-hickory forests and grasslands that provide excellent habitat for white-tailed deer, wild turkey, ring-necked pheasants, waterfowl (including the Canada goose and wood ducks), mourning doves, woodcock and other small game. Bobwhite quail and ruffed grouse may still be found on some properties. Common furbearing animals on these properties include raccoon, striped skunk, coyotes, foxes, opossum, muskrat, mink and beaver.

Other wildlife species occasionally reported in Columbia County are otter, bobcat and fisher. Increasingly, black bear and gray wolves are using the Wisconsin River corridor as a dispersal route and have been spotted in the county.

These properties provide quality habitat for a range of needs such as reproduction, cover and forage for deer and turkey, and resting areas during fall and spring migrations. However, the properties are deficient in providing permanent upland grassland habitat for grassland nesting waterfowl (e.g., mallards and blue wing teal), pheasants and native grassland birds.

Several DNR sources (*Wildlife Action Plan, 2006; Addis, 1995; and Sample and Mossman, 1997*) state the importance of creating and enhancing native prairie or surrogate grassland on habitat blocks ranging from 40 to 1,000 acres. Given the configuration, size and amount of wetlands on most of the CCPG properties grassland blocks in the 80 to 150 acres range are most practicable. Pine Island WA is the one exception with a large block of contiguous grasslands in excess of 1,000 acres. Expanding grasslands is also consistent with the wildlife management strategic goals to improve waterfowl habitats within focus areas (such as Columbia County) and across the state and Midwest (US FWS Joint Venture, 1992 and DNR Wildlife Action Plan, 2006).

Hunting and Trapping

The CCPG properties provide important opportunities for hunting and trapping. Hunters from sixty Wisconsin counties harvested deer in Columbia County in 2010 and 2011. About 55% of the deer are harvested by Columbia County residents followed by Dane County (13%), Dodge County (6%) and Sauk County (3%). Non-residents of Wisconsin harvested about 3% of the deer each year.

In 2010, about 12% of the deer harvested came off public lands even though they represent less than 5% of the land area of the county. As a consequence, public lands are heavily used so competition and crowding can detract from the quality of the hunting experience, especially on opening day.

Annual license sales in Columbia County have averaged between 7,000-8,000 hunting licenses and 300 trapping licenses (includes both resident and non-resident licenses).

Many excellent waterfowl hunting opportunities exist on the natural and restored wetlands and flowages on the state wildlife areas. Small game hunting, pheasant hunting in particular, is very popular on the grasslands. The Department supplements the wild pheasant population by stocking game farm raised pheasants on some public lands.

The Pine Island Wildlife Area (WA) averages about 90 active dog training permits on an annual basis. This property has regional appeal with permits issued to residents in 16 counties as well as dog trainers from out of state.

The management of the state natural areas is and will continue to be focused on protecting and restoring outstanding examples of Wisconsin's native plant and animal communities. These natural areas are open to fishing, hunting, trapping and other traditional outdoor activities.

Fish Communities, Fishing and Water-based Activities

The fisheries, especially the trout fisheries at Rowan Creek and Rocky Run, are heavily utilized by local, regional and out of state anglers. Of the eight trout streams in Columbia County portions of seven trout streams run through the CCPG properties. They include four miles of Class 1, fourteen miles of Class 2 and two miles of Class 3 trout waters. These waters sustain both brown and brook trout populations as well as a variety of native forage species.

Several of the wildlife areas also provide access to a variety of warm water sport fish communities including Northern pike, walleye, largemouth and smallmouth bass and panfish in the rivers and lakes.

Nearly 10,000 fishing licenses (both resident and non-resident) are sold annually in Columbia County.

Mud Lake, French Creek and Pine Island are also popular destinations for canoers and kayakers.

Wildlife Viewing

Several of the CCPG properties are well known for birding. The Wisconsin River serves as a major staging area for sandhill crane and hundreds will roost on the sandbars in the fall. Whooping cranes use these state lands and nearby federal properties, especially in or near the US Fish and Wildlife Service Schoenberg Marsh Waterfowl Production Area (WPA). Large numbers of bald eagle over winter along the Wisconsin River below the Prairie du Sac Dam as the water remains open through the winter. Osprey populations are recovering in Columbia County, with six nests identified and three nests producing young in 2010.

Birding is becoming more popular with people coming long distances to observe tundra swan, pelicans and other waterfowl associated with the Mississippi flyway during migration. Columbia County is included in the Southern Savanna Region of the Great Wisconsin Birding and Nature Trail (*WDNR, 2008*). Two areas within the county have been approved or nominated as Wisconsin Important Bird Areas (IBA), a designation reserved for select areas that have extreme importance to bird life. These sites include the Grassy Lake, Pine Island, Mud Lake and French Creek Wildlife Areas (*Steele, 2007*).

Lands Providing Public Access

The CCPG lands provide over 80% of the public access lands for hunting, fishing and trapping in Columbia County (Table 1-1). Importantly, these lands are available year round and provide opportunities for a broad range of outdoor activities in lightly developed and rustic settings.

Property Owner	Acres
Wisconsin DNR (CCPG)	24,120
US Fish and Wildlife Service	3,202
Columbia Power Plant Wisconsin Power and Light*	2,420
Voluntary Public Access Lands	427
Total	30,169

* Access may vary depending on safety and work place regulations.

Voluntary Public Access (VPA) is a voluntary program offered by the DNR that provides financial incentives to private landowners who open their property to public hunting, fishing, trapping and wildlife observation. The lease agreements are for periods up to six years. Funding was authorized in the 2008 Farm Bill.

Community Involvement

Several of the properties also have important involvement from local citizens and sporting groups. Examples include the Ice Age Trail (IAT) – Dane County Chapter and Friends of Scenic Lodi Valley at Lodi Marsh WA, Trout Unlimited at several of the trout streams, dog trial interests at Pine Island, snowmobile clubs, Friends of Rowan Creek at the Rowan Creek Fishery Area (FA) and interested adjacent land owners.

The contribution of these groups can be significant as demonstrated by the Dane County IAT group. They are a significant partner in the restoration of native plant communities occurring at Lodi Marsh and have provided as much as 1,000 hours of labor/year plus equipment toward these activities.

Ecological Significance

Landscape and Species Management

The pre-settlement plant communities in Columbia County included savanna, prairie, upland oak forest, marsh, floodplain forest, and tamarack swamp. The savanna and upland oak forests can be further delineated into community types that occurred over droughty sands: black oak savanna, black oak forest, and xeric sand prairie (Tans and Hine, 1976). The amount of prairie and savanna has been significantly diminished and the quality of the remaining plant communities have often been adversely affected by fragmentation, invasive species and past management practices (e.g., wetland draining).

The CCPG properties contain a rich mosaic of these pre-settlement plant communities. The wetland communities include: Calcareous Fens, Southern Sedge Meadow, Wet and Wet-mesic Prairies, Emergent Marsh, Marsh, Submergent Aquatic, Shrub-carr, and Southern Tamarack Swamp (rich). The upland natural communities include: Oak Opening, Southern Dry-mesic Forest, Mesic and Dry mesic Prairie, and Surrogate Grassland (a mix of native and introduced grasses and forbs). These properties continue to offer an opportunity to provide these habitats on a small to moderate landscape scale.

The *Wisconsin Wildlife Action Plan (WDNR, 2006b)* and the *Ecological Landscapes of Wisconsin Handbook (WDNR, in Prep. a)* were used to identify landscape scale conservation opportunities for sustaining various natural communities. Management needs and opportunities for an ecological landscape are often described in terms of “natural communities” - the communities are assemblages of native plants and animals that consistently occur together under similar conditions. “Sustaining natural communities” means ensuring these communities have high potential to maintain their characteristic composition, structure, and ecological function over a long period of time (e.g. 100 years).

The state natural areas embody the best examples of these native communities. A total of 2,555 acres are currently designated as State Natural Areas (SNA) primarily as overlays within the existing properties.

Sites of High Conservation Significance – Primary Sites

Primary Sites are parcels within state lands that offer opportunities to protect rare and representative natural communities, and/or harbor rare species populations. The *Rapid Ecological Assessment for the Columbia County Planning Group (REA) (WDNR, 2010b)* identified sixteen Primary Sites on seven properties. The management objectives for the Primary Sites are found in Chapter Two. The Endangered Resources program has a GAP analysis that provides guidance on the number of state natural areas needed to meet the critical ecological reference area requirements for forest certification, ecosystem/species preservation, research, and education goals of the program. The Primary Sites selected for state natural area status fill the needs identified in the GAP analysis

Emergent Wetlands and Marshes

The CCPG properties contain a diverse mosaic of Calcareous Fen, Emergent Marsh, Southern Sedge Meadow, Wet Prairie, and Wet-mesic Prairie wetlands. A number of these large, open wetland complexes cover over 1,000 acres. These wetlands occur within a landscape matrix of Surrogate Grasslands and oak dominated savannas and forests.

Wetland quality varies considerably between properties as well as within properties. For example, French Creek and Grassy Lake contain high quality wetlands while many of the wetlands at Peter Helland and Paradise Marsh have been heavily impacted by ditching, grazing and invasive species.

The mixed emergent wetlands and large size of the open wetlands at the French Creek and Swan Lake Wildlife Areas create important shorebird stopover sites (*Grveles et al. In Review*). The open wetlands of the CCPG also provide habitat for breeding grassland birds, breeding marsh birds, rare reptiles and amphibians, and invertebrates. Opportunities exist to enhance or protect black tern, rail and heron habitat.

Oak Savannas, Openings and Woodlands

Oak savannas are critically imperiled globally because of their extreme rarity (*WDNR, 2009*). Historically, oak savannas covered 5.5 million acres in Wisconsin and were a dominant cover type in Columbia County. Due to clearing for row cropping, grazing, in-growth of trees, invasion by shrubs, and land use development, intact savannas now cover less than 500 acres in Wisconsin. Oak barrens, a type of savanna occurring on dry, sandy soils, are a very rare community. Oak Openings are also a rare community type and worthy of protection and restoration. Oak Woodlands are relatively common and they are an important cover type for many game and non-game species. Regeneration of the existing Oak Woodlands is a priority where practicable.

The *Ecological Landscapes of Wisconsin (WDNR in Prep)* indicates restoration of oak savannas is a critical need in Wisconsin. Although the *Wisconsin Wildlife Action Plan (2006b)* does not list the Central Sand Hills Ecological Landscape as the most critical area for savanna restoration, it is listed as an important area for protection and management of Oak Barrens. Important oak savanna, woodland or barrens restoration and expansion areas are found at Rocky Run, Pine Island, Lodi Marsh and Swan Lake. Restoration of oak savanna remnants can enhance the habitat for numerous threatened and endangered species and Species of Greatest Conservation Need on the CCPG properties.

Species

The *Rapid Ecological Assessment (DNR, 2010)* documented numerous rare plant and animal species on these properties. Eight plant and 16 animal species on these properties are designated as threatened or endangered. The Endangered (END) and Threatened (THR) as well as Species of Greatest Conservation Need or Special Concern (SC) species are often associated with the natural communities present on the CCPG properties. Additional information about these species and the natural communities can be found in the *REA* and the *Wisconsin Wildlife Action Plan (WDNR, 2006b)*.

Rare Reptiles and Amphibians

Reptile and amphibian (herptile) populations have declined significantly in Wisconsin. This decline is due in large part to habitat degradation, fragmentation, loss of open habitat, invasive plant species reducing habitat quality, road mortality, and egg predation. Many of these species cannot readily migrate to suitable habitats so there is an urgent need to protect sites where viable populations can be sustained.

The CCPG provides crucial habitat for three state-listed species: Blanding's turtle (THR), slender glass lizard (END) and the ornate box turtle (END). Other herptile species include: American bullfrog (SC), Eastern hog-nosed snake (SC), Eastern massasauga (END), false map turtle (SC), pickerel frog (SC), and smooth softshell (SC).

The CCPG provides an excellent opportunity for the conservation of Blanding's turtles due to an abundance of habitat and dispersal corridors. The CCPG contains one of only seven sites in Wisconsin for the recovery of ornate box turtles and one of a few properties that has the potential to support a viable population of slender glass lizards.

Grassland Birds

Grassland bird species are exhibiting one of the most significant declines of any suite of bird species in Wisconsin and across the Midwest (*Herkert, 1995*). The major cause for this decline is the alteration and loss of breeding habitat (*Robbins et al., 1996*). Grassland birds of particular interest include the loggerhead shrike (endangered) and Bell's vireo and the Henslow's sparrow (threatened), and several other species are considered of special concern.

The sedge meadows, Dry-mesic Prairie remnants, marshes, and Surrogate Grasslands of Dane and Columbia counties, especially at the Pine Island WA, are recognized as a priority landscape for grassland bird management. They present an opportunity for savanna restoration and Prairie and Surrogate Grassland expansion (*Sample and Mossman 1997*).

The Pine Island WA grasslands, Sand Prairie, Oak Savanna, and river barrens are recognized as a priority landscape for grassland bird management. These grasslands support several conservative grassland obligate species such as the Henslow's sparrow, eastern meadowlark, bobolink, field sparrow, vesper sparrow, and dickcissel. These species have the potential to increase in density with improved nest productivity if the grasslands are improved and connected to open wetlands.

Other important open habitats on the CCPG include Southern Sedge Meadow, Wet Prairie, Calcareous Fen, and Emergent Marsh. Additional open areas of value around the CCPG include private pastures, idle grasslands, prairie plantings, hayfields (cut late summer) and even row crops.

Grasslands and open habitats greater than 250 acres promote the nesting success and populations of these area-sensitive grassland birds. The management activities and property expansions on many of the CCPG properties will increase the amount of large grasslands and open habitats.

Invasive Species

Invasive species are a growing threat to our native plant and animal communities. Over 20 invasive species are found on the CCPG properties and some are well established, especially in disturbed areas. These species can dominate a community to the detriment, and perhaps the exclusion, of native species. Invasive species can alter natural ecological processes by reducing the interactions of many species to only a few species. These infestations can adversely affect the quality of the habitat for wildlife as well.

Reed canary grass is an aggressive invasive species that is found in many of the CCPG wetlands. It is also one of the few invasive species that has been quantitatively assessed on a statewide basis. Satellite imagery analysis indicated almost 500,000 acres (about 10% of all Wisconsin's wetland acres) are dominated by reed canary grass making this species the most extensive wetland plant invader (*Hatch and Bernthal, 2008*). Reed canary grass infestations (i.e., more than 50% of the vegetative cover in a wetland is composed of reed canary grass) on the CCPG properties conservatively range from 25% on the Peter Helland WA to under 5% on the Lodi Marsh WA.

CHAPTER TWO

SECTION ONE – GENERAL PROPERTY MANAGEMENT, DEVELOPMENT AND USE

This chapter is divided into two sections:

Section One covers management elements applicable to all properties in this planning group.

Section Two provides a brief description of the individual properties followed by habitat and recreation management objectives and prescriptions specific to that property.

Factors considered when developing the management objectives and prescriptions included habitat distribution and quality, game species life cycle requirements, habitat needs of species of greatest conservation need, recreation usage and trends, land use patterns and trends, and public input.

Vision

The Columbia County Planning Group properties will provide abundant outdoor recreational opportunities in lightly developed settings for current and future users. These opportunities will be provided in a mosaic of high quality and ecologically diverse aquatic habitats, open wetlands, grasslands, savannas and forests. These natural communities will be managed for user enjoyment consistent with the purpose and ecological capacity of these properties. The most effective and sustainable habitat and game management includes efforts by citizens, private landowners and resource management agencies working together.

Goals

1. Provide abundant recreational opportunities for hunting, fishing, trapping, birding, wildlife viewing, nature enjoyment, natural vistas and other compatible outdoor activities with an emphasis on non-motorized recreation.
2. Promote quality habitat for desirable game and non-game species, including rare and special concern species.
3. Maintain a variety of high-quality open wetlands, wet prairies, fens and floodplain forests.
4. Restore and protect upland oak communities to promote a mosaic of savannas, barrens, openings and mature forests.
5. Provide large grassland areas to promote nesting success and sustainable populations, especially for area sensitive bird species.
6. Promote sustainable game fisheries with an emphasis on enhancing coldwater habitat to encourage natural reproduction of trout species.

General Property Management

Introduction

The extensive prairies, savannas, wetlands, and forests that covered Columbia County prior to European settlement are gone. Today, the remaining native habitats, especially grasslands and upland forests, are severely fragmented by agriculture, highways, and urban and rural development. Fragmentation presents many significant challenges including adverse impacts on wildlife migration and dispersal, insufficient habitat for species of concern, spread of invasive species and optimal management of state properties.

In general, wildlife benefits for a given habitat type increase as patch size increases. While the minimum area required for maintaining viable populations of many species (e.g., grassland nesting birds) is not known, it is largely accepted that the larger a contiguous grassland is, the more benefits it provides to these species. Similarly, larger blocks of forested habitat provide higher quality habitat for interior bird species. Importantly, the ease and efficiency of habitat management increases as patch size increases.

Management objectives focus on restoring larger blocks of pre-settlement vegetation communities and managing on a landscape scale. Protecting rare cover types is also important to the extent practicable and sustainable.

Protecting or rehabilitating cold water (trout) stream habitats is the highest fish management priority.

The goals in this master plan build upon the achievements of past master plans and general program management priorities. Similarly, the objectives and prescriptions in this master plan incorporate the many successful management activities, both active and passive, already used to manage habitats and protect native communities on these properties.

Authority

The scope of use and management of a state property is governed by its official designation. The CCPG is an assemblage of properties designated as Wildlife Areas, Fishery Areas and State Natural Areas. Wildlife Areas are acquired and managed under the authority of Sec. 23.09 (2) (d) 3 Wis. Statutes and Administrative Code NR 1.51. Wildlife and Fishery Areas are set aside to provide habitat for wildlife and the primary recreational focus is hunting, trapping and fishing. These areas are also open for traditional outdoor uses of hiking, skiing, snow shoeing, nature study and berry picking. As directed by NR 1.51 and NR 1.61, other recreational uses are allowed by the property's Master Plan if those uses do not detract from the primary purpose of the property.

The Federal Aid in Wildlife Restoration Act (i.e., Pittman-Robertson Act) authorizes an excise tax on sporting arms and ammunition to provide funds for acquiring, developing and managing wildlife areas. This funding prohibits a state fish and wildlife agency from allowing recreational activities and related facilities that would interfere with the primary purposes (e.g., hunting, fishing and trapping) for which the land was acquired, developed, or managed.

Natural Areas are defined and authorized in State Statute 23.27-23.29 and Administrative Code NR 1.32 as "an area of land or water which has educational or scientific value or is important as a reservoir of the state's genetic or biological diversity and includes any buffer area necessary to protect the area's natural

value". Section 23.27 (1) defines natural areas as "reserves for native biotic communities...habitat[s] for endangered, threatened, or critical species...or areas with highly significant geological or archaeological features". Section 23.28(1) provides authority to designate areas as State Natural Areas and Section 23.29 provides authority to legally dedicate and protect State Natural Areas in perpetuity.

The State Natural Areas program preserves the best examples of the state's diverse natural communities. They are valuable for research and educational use, the preservation of genetic and biological diversity, and for providing benchmarks for determining the impact of use on managed lands. They also provide some of the last refuges for rare plants and animals. Traditional recreational uses such as hunting and hiking are allowed if those uses do not threaten the natural values designated for protection.

Land Management Classifications

Land management classifications (NR 44) describe the general management objectives for a property or a management unit within a property. These classifications are determined during the master planning process and help identify the preferred set of active and/or passive actions to achieve these objectives. Only those management activities or techniques identified or referenced in this master plan and compatible with the site's ecological capability will be pursued in these management areas.

Properties purchased after the master plan is approved will be classified and managed as Habitat Management Areas unless the desired objectives and prescriptions warrant another classification. In this case a master plan amendment will be pursued.

The three Land Management Classifications applicable to the CCPG properties are as follows:

Habitat Management Area ((NR 44.06(5)) - A significant majority of the CCPG wildlife and fishery areas (18,475 acres) are classified as Habitat Management Areas. The primary objective for this classification is to provide integrated upland, wetland and/or aquatic habitat management that meets critical life cycle needs for a variety of plant and animal species. Typically the emphasis is to provide an appropriate balance of habitats needed to sustain productive game species populations. However, a portion of these lands may be managed for focused species production and protection (e.g., waterfowl production). Areas that initially do not have desired habitat conditions, but have a high potential to be restored may be included under this classification.

Native Community Management Area (NR 44.06(6)) – All state natural areas and selected management units are classified as Native Community Management Areas on the CCPG properties. In total, about 5,605 acres will be placed in this classification. Native Community Management areas are managed to perpetuate pre-settlement plant and animal communities, whether upland, wetland or aquatic, and protect the biological diversity of the native ecosystems. A Native Community is a distinct and reoccurring assemblage of indigenous flora and fauna associated with similar physical settings. Areas that initially do not have the desired community conditions, but have a reasonable potential to be restored may be included in this classification.

All of the traditional recreational uses, such as hunting, fishing, trapping and nature enjoyment, are allowed on the Native Community Management Areas except if the area needs to be closed during breeding season or to protect a very fragile habitat.

Special Management Area (NR 44.06(7)) - This classification provides and maintains an area and/or facilities for special uses not included in the other land management classifications. The only Special Management Area in the CCPG is the 5 acre headquarters area at the Pine Island WA used by department employees, Learn to Hunt students, and dog trial participants (including self-contained campers during dog trial and training events).

Land management classification acreage by property is shown in Table 2-1. Their spatial relationship on each property can be viewed on the respective land classification maps (map series C-3, D-3, etc).

Table 2-1: Land Management Classifications for the CCPG Properties (acres)		
Property Name	Native Community Management	Habitat Management
French Creek WA	1,629	1,877
Lodi Marsh WA	655	531
Mud Lake WA	223	2,060
Paradise Marsh WA	0	1,588
Peter Helland WA	271	3,272
Pine Island WA*	957	4,517
Swan Lake WA	953	1,513
Grassy Lake WA	292	487
Jennings Creek WA	0	530
Columbus PHG	0	248
Dekorrra PHG	0	226
Duck Creek PHG	0	159
Hampden PHG	0	229
Rowan Creek FA	0	651
Rocky Run FA	461	276
Hinkson Creek FA	0	233
Lodi Spring Creek FA	0	53
REM Roelke FA	0	40
Rocky Run SNA	164	0
Total	5,605	18,490

* Pine Island WA also has a 5 acre Special Management Area around the headquarters buildings and a 20 acre easement along the Baraboo River that provides public access, but no management privileges.

The objectives and prescriptions used to manage a Native Community Management Area (NCMA) or a Habitat Management Area (HMA) may significantly overlap, but the desired end point may be decidedly different. For example, fallow fields under both classifications can be treated with herbicides, plowed and replanted. However, in a NCMA the objective is to re-establish native plant and animal communities while in a HMA the field may be leased for crop production, used as a wild game food plot, re-seeded to establish surrogate grasslands or perhaps restored as a prairie community. Another example is the restoration of savannas and prairies. NCMA restorations typically require the use of local native seed sources to protect genetic diversity while a HMA might use non-local seed to achieve restoration objectives.

General Wildlife Habitat Objectives and Prescriptions

The following general wildlife objectives and prescriptions apply to all the properties as appropriate. Property or unit-specific management objectives and prescriptions are described in section 2 of this chapter. These objectives and prescriptions will be applied contingent upon the availability of staff and material resources, or modified as needed to respond to unpredictable or catastrophic events (e.g., storm damage or severe insect/disease infestations).

Waterfowl Habitat Improvements

Protecting and enhancing waterfowl habitat is a wildlife management priority both statewide and on the CCPG properties. Productive habitats help sustain healthy waterfowl populations desired by both hunters and wildlife viewers. A number of the CCPG properties provide high quality breeding and staging area benefits for waterfowl, but have limited nesting value due to the lack of permanent upland grass cover for grassland nesting ducks like mallards and blue winged teal.

The desired ratio of grassland to wetland is 3:1, but a ratio of 1:1 can be productive as well. In contrast, the larger CCPG properties have grassland to wetland ratios of about 0.4:1 indicating a substantial shortage of upland in permanent grass cover. Landscape mosaics containing large blocks of wetlands that provide quality breeding and brooding habitat adjacent to large blocks of permanent upland grass cover for nesting can improve nesting success by reducing predation and eliminating losses due to mowing and other human disturbances.

Waterfowl research conducted in Wisconsin (*R. Gatti WDNR – personal communication*) indicates mallards and blue-winged teal strongly prefer to nest in blocks of permanent grasslands. They prefer to nest in grasslands twice as much as in wet meadows and 5-6 times more than in alfalfa fields. Their nesting success was 28% in larger blocks of permanent upland grass compared to 6% in wet meadows, 4% in linear grasslands and 3% in active alfalfa fields. Nesting success on state owned upland grasslands has equaled or exceeded the values indicated above.

General Wildlife Management Objectives

- Create larger blocks of habitat within a mosaic of lowland to upland habitats.
- Establish and maintain travel corridors for species movement between habitat blocks.
- Enhance and expand native communities at a landscape scale, with an emphasis on Grasslands and Oak Savanna, to benefit both game and non-game species.
- Improve the habitat value of surrogate grasslands, sedge meadow, shrub-carr and savanna habitats for area sensitive bird species.
- Improve the quality of wetlands and grasslands classified as Habitat Management Areas for waterfowl nesting and brood rearing, pheasants and grassland birds. Increase their value as migratory stopover habitat for shorebirds. Maintain existing shrub-carr wetland in areas that do not have high potential for management as sedge meadow, wet prairie or wet mesic prairie.
- Protect, and enhance as practicable, the quality and extent of the wetland communities classified as Native Community Management Areas. Communities of particular interest include wet and wet-mesic prairie, sedge meadow, calcareous fen, emergent marsh and southern tamarack swamp.

- Protect and enhance habitats and populations of threatened and endangered species and species of greatest conservation need.
- Reduce the threat of invasives species to protect the biodiversity of these properties.
- Provide opportunities for habitat and species research and public education consistent with the approved management habitat and species objectives.

General Wildlife Habitat Prescriptions and Actions

The following management prescriptions and actions are authorized on all properties, unless there is a property-specific restriction. Additional authorized prescriptions are described in the General Management Objectives and Prescriptions by Habitat and Forest Type section.

- Actively manage old fields and pastures to create larger habitat blocks of grasslands by removing fence lines, conifer plantations, encroaching brush and isolated patches of trees.
- Convert cropped land to native cover types or surrogate grasslands except where plowing, sharecropping and food plots are being used to aid habitat restoration efforts or is being used to enhance wildlife populations and hunting opportunities, especially for doves and pheasants.
- Use water level manipulations at flowages and impoundments to manage wetland vegetation and improve wildlife habitat.
- Fill ditches to improve water level management and aid wetland restoration efforts.
- Use nest boxes, platforms or similar devices to enhance reproduction of desired wildlife.
- Control beaver and muskrat populations to mitigate dike damage and damming of water control structures, and flooding of neighboring private lands.

Vegetation Management Actions

Prescribed burns are the most important management prescription used to maintain and enhance these grasslands, savannas, oak woodlands and sedge meadow wetlands. A number of the pre-settlement plant and animal communities are fire dependent communities that were shaped over thousands of years by wildfires caused by lightning or set intentionally by Native Americans.

Prescribed burns mimic natural fire disturbance and help control many woody plants and invasive weeds, improve the quality of wildlife habitat, reduce fuels to lessen fire hazard, and liberate nutrients tied up in dead plant material. Upland nesting cover used by pheasants, waterfowl and songbirds is more productive if periodically burned. Even wetlands, such as sedge meadows, benefit from fire. Burning is also the most cost-effective treatment compared to the other management prescriptions.

Burns typically are conducted in late winter/early spring and in the fall. They may be conducted annually or on an as needed basis. Fire management for a given unit will depend on the plant community present, the habitat restoration or maintenance objectives, the physical characteristics of the site, and most importantly, on safety and fire control conditions.

Prescribed fires may be used in other plant communities as deemed appropriate by the property manager in consultation with the Endangered Resources biologists and Forestry staff.

Other management actions that can be used to implement these prescriptions include:

- Mechanically cut (e.g., mowing and brushing), hand cut, pull, bulldoze and/or smother.
- Chemical control of vegetation or pests using approved products and application techniques.
- Bio-control measures may be used as deemed appropriate, safe and effective.

- Grazing.
- Biomass harvests that follow approved Wisconsin Biomass Harvesting Guidelines.
- Seeding or planting native woody and herbaceous species.
- Agricultural activities may be used to achieve proper crop rotations for food patches, hunting cover, brush and invasive species control, and site preparation for native community restoration.
- Forestry practices as described in Department manuals and guidance. This may include salvage of trees after a major natural disturbance if the volume of downed trees inhibits fire or other approved management prescriptions. Endangered Resources shall be consulted before any salvage harvests are planned in state natural areas or primary sites.

Active and Passive Management

The master plan refers to both *active* and *passive* habitat management objectives and prescriptions.

Active Management includes the direct manipulation of the plant and animal communities. Habitat examples include seeding a parcel to re-establish grasslands, conducting prescribed burns, harvesting timber, stocking fish or pheasants, or adding structures in trout streams. Active management activities span a significant range of time scales. Fish may be stocked every year, prescribed burns may occur every three to five years while timber harvests may occur on 15-50 year cycles or even longer.

Passive Management indicates no or very limited direct action is taken to manage a habitat. Passive management is often used in habitats with the following characteristics:

- Size - management activities may be too expensive or difficult to conduct due to small size
- Location – isolated or difficult to reach habitats (such as small islands),
- Habitat quality - Units with good to excellent habitat may be stable thus requiring little to no intervention, or it may be an infestation (i.e., an expansive reed canary grass infestation in a disturbed wetland) of such size and complexity that the tools and/or resources required for restoration are not currently available.

More commonly, some active management is conducted on a property or habitat unit (e.g., prescribed burns, timber harvests, adjusting water levels on a flowage), but the plant communities are allowed to evolve based on natural succession. For example, grasslands may be burned, but the species composition of the grasslands is allowed to evolve based on the competitiveness of the grasses and forbs naturally occurring at the site. This type of management seeks to promote stable and productive natural communities while minimizing the need for unnecessary and potentially expensive human intervention.

Biotic and Cultural Surveys and Research

Additional biotic surveys are needed to assess the effectiveness of the habitat and species management efforts, and the health and sustainability of the native plant and animal communities on the CCPG properties. This need is based on the richness of the natural habitats, the number of rare species and the Rapid Ecological Assessment report that indicated many biological inventories had not been completed.

Within two years after the approval of this master plan a CCPG Biotic Survey and Monitoring Plan shall be developed. Endangered Resources staff will lead this effort and consult with Wildlife, Fishery and other science experts as needed. This plan shall establish the specific surveys and monitoring to be conducted including their frequency, location and objectives, as well as the parties responsible for conducting the surveys. All post-survey reports shall include habitat and/or species management recommendations for

consideration and implementation (as practicable) by Wildlife, Fishery and/or Endangered Resources staff and inclusion in the property master plan as necessary.

Surveys not covered by this master plan or the monitoring plan shall be reviewed and must be approved by the property manager in consultation with the regional ecologist and relevant science experts.

Conduct or allow research and educational activities related to habitat or species management and improved understanding of the cultural resources on the properties.

Invasive Species Actions

The threat of exotic and/or invasive species, including plants, animals, insects and diseases represent a significant and growing threat to our native plant and animal communities. To address this concern, invasive species inventory, monitoring and control actions shall be included in the annual property planning for each property. The inventory, monitoring and control efforts shall follow the guidance provided in the Department's *Property Managers Handbook*. Key activities include:

- Inventory properties annually to detect new infestations. Property-wide inspections are ideal, but not always practicable. At a minimum, inspections should be conducted at entry points such as trails, roads, waterways, rights-of-way, and areas where soil has been disturbed.
- Control new or existing invasive species as practicable.
- Mowing should avoid dispersal of invasive plant seeds and equipment should be cleaned.
- Monitor control activities to assess effectiveness and determine if follow-up is needed.

Infestations of buckthorn, honeysuckle, garlic mustard, spotted knapweed, wild parsnip, sweet clover, burdock, dewberry, Russian olive, crown vetch, Japanese hedge parsley, Japanese knotweed and other exotic species have been noted on these properties. Reed canary grass is a very common invasive on disturbed wet areas. Other wetland invasives include cattails, purple loosestrife, common reed and phragmites. Native species with invasive habits, such as red cedar, black locust, sumac, prickly ash and box elder, are also a management challenge on several properties.

Wildlife Outreach Activities

As time and resources allow, wildlife staff may inform, educate and share information with volunteers, users and private landowners, especially on parcels adjacent to department properties. Issues of particular concern include collaborative habitat management to protect and enhance critical habitat for key game species and species considered endangered, threatened or Species of Greatest Conservation Need, and monitoring and controlling invasive species.

General Fishery Objectives and Prescriptions

Coldwater Streams

Coldwater streams are dominated by groundwater inputs and can sustain fish communities adapted to cold, oxygen rich, flowing water conditions. Important coldwater species include the following game fish - brook trout, brown trout, rainbow trout - and other native species such as white sucker, mottled sculpin and various minnow species. Coldwater streams will often support diverse communities of invertebrates as well as environmentally sensitive flies, stoneflies and caddis flies.

The physical habitat of a trout stream can be quite variable and is generally determined by watershed and landscape characteristics, specifically soils and geologic parent material as well as watershed size and gradient. Larger, lower gradient streams are often sinuous and have bottom material composed of fine grained sands and silts. Smaller higher gradient streams tend to be defined by riffles and runs with gravel and rock substrate. Habitat enhancements in both stream types can increase the carrying capacity, growth and natural recruitment of desirable fish species, specifically trout.

Coldwater streams often rely on external sources of energy for the aquatic food web. Small streams are often shaded by trees and grasses so the invertebrates are adapted to eating leaves and detritus from terrestrial sources. Management of the streamside vegetation can increase the productivity by allowing sunlight to penetrate directly into the stream to increase the production of algae and phytoplankton. This results in increases in invertebrate and fish populations, while balancing the need to remain sufficiently cold to sustain trout populations.

Management Objectives:

- Manage riparian vegetation along classified trout streams to enhance in-stream habitat quality and productivity of trout.
- Maintain, and increase as practicable, the extent and quality of Class 1 and Class 2 trout streams for brown and brook trout populations.
- Protect rare/endangered species and species of greatest conservation need in the streams and on fishery areas.

Management Prescriptions:

- Install and maintain Department approved stream habitat enhancements, bank stabilization using rock rip rap and/or vegetation root systems, lunker and boom cover installations, revetments and current deflectors, and brush bundling to protect or enhance in-stream habitat quality and diversity.
- Remove beaver dams to maintain the free flowing environment coldwater streams required to maintain robust trout populations.
- Consult with Endangered Resources during the planning of in-stream and riparian habitat enhancement projects.
- Follow the Bureau of Fisheries Management guidance on stocking rates of species per acre of surface water.

The following management prescriptions apply to the 132 feet riparian corridor (66 feet on either side of the center line of the stream):

- Fishery Management staff will, as needed, manage vegetation in the streamside corridor to maintain high quality trout habitat and self-sustaining trout populations. Activities to protect in-stream and near stream habitats include the planting of desired native species as needed or removal of understory and young successional vegetation such as tag alder, aspen, box elder, black willow and invasive species to minimize bank erosion, excessive stream shading or degraded habitat quality. Otherwise vegetation on the remaining portions of the fishery areas will follow the Wildlife Management prescriptions.
- Maintain and encourage mature hardwoods in the riparian corridors, specifically swamp white oak, hackberry, hickory, ash, elm and red maple.

Warmwater Streams

The lakes, flowages and larger rivers and streams on or adjacent to the CCPG properties provide an abundant, sustainable warmwater game fishery and habitat for diverse semi-aquatic and aquatic plant and animal communities. Currently, no stocking programs or habitat manipulations are being conducted on these resources so passive management will be pursued on all of the warmwater fisheries. If circumstances change, this master plan can be amended to address the opportunities or challenges presented.

Fishery Outreach Activities

Inform and educate landowners, agricultural interests and communities about the adverse impacts of excessive nutrient inputs, sedimentation, stormwater runoff and reduced groundwater inputs to surfacewaters, especially cold water trout fisheries. Activities that lead to high summer water temperatures, low winter water temperatures and degraded in-stream habitats diminish efforts to sustain a high quality, self-sustaining trout fisheries.

General Habitat and Forest Type

Management Objectives and Prescriptions

A general management objective on all of the CCPG properties is to increase the extent and quality of the pre-settlement vegetation communities. All plant communities will be managed on a landscape scale to create smooth transitions between cover types. Protecting watersheds to reduce sedimentation, nutrient inputs and excessive runoff is important too. Maintaining groundwater recharge is critical for protecting cold water springs and seeps feeding trout streams.

Natural processes (e.g., passive management) and active manipulations (e.g. plantings, seeding, controlled burns, brushing and herbicide applications) will be used to manage the structure of the woodlands, prairies and wetlands. Historically, fire played a key role in maintaining many of the plant communities in southern Wisconsin so prescribed fire is the primary management tool used to mimic natural disturbance patterns and promote native communities.

Wetland Habitats (non-forested)

Sedge Meadow, Wet Prairie and Wet-mesic Prairie

Southern Sedge meadow, Wet Prairie, and Wet-mesic Prairie habitats support many rare species such as bobolink, willow flycatcher and rare herptiles. Today, these open wetlands are much less abundant than they once were. Many of these grasslands have been lost or severely degraded by drainage, flooding, lack of fire, or invasive species. Wet Prairie is one of the rarest natural communities in the state with only 300 acres known to be in existence. A statewide GAP analysis of the State Natural Areas Program indicated the need to manage all of the wet prairies for future generations and scientific inquiry.

Degraded Sedge Meadow/Wet Prairies are often dominated by reed canary grass as a result of grazing and/or ditching or are being invaded by woody vegetation due to the lack of disturbance (e.g. fire on the site). Reed canary grass is less desirable for wildlife because it replaces native plant species and creates a monotype with low habitat value. Restoring Sedge Meadows infested with reed canary grass is a difficult task given the tools currently available. Development of cost-effective, environmentally safe methods for removing reed canary grass would significantly benefit the protection or restoration of these native wetland communities.

Management Objective:

- Increase the extent and/or quality of the sedge meadow/wet prairie and wet-mesic prairie community types on all sites where they occur.

Management Prescriptions:

- Use prescribed fire, mowing and herbicides, where practicable, to remove or reduce competition from invading woody species and reed canary grass.
- Restore the original hydrology of disturbed wetlands if compatible with other primary objectives and practicable given adjacent ownership, land uses and agency resources.

Calcareous Fen

Fens have much in common with sedge meadow, wet prairie, and wet-mesic prairie communities. However, fens have attributes such as unique plant species that are supported by the special hydrological conditions that set them apart. Only 87 fens have been identified in Wisconsin and they cover less than 1,000 acres statewide. A statewide GAP analysis of the State Natural Areas Program indicated the need to manage all of the large fens for future generations and scientific inquiry.

The primary threats to calcareous fens are disruption of hydrology and invasion by woody species and reed canary grass. Ditching, damming, dredging, tiling, pumping, and quarrying can all affect the quantity and quality of groundwater needed by fens. Invasive species can be serious threats to calcareous fens, with glossy buckthorn, narrow-leaved cattail, giant reed grass, and purple loosestrife among the potential offenders. Grazing, vehicular traffic, and overuse by hikers or other recreationists can physically damage the surface and destroy sensitive vegetation. The lack of fire in the present landscape has contributed to the encroachment of woody species on open fen habitat, with the consequent suppression or loss of some of the more light-demanding herbs.

Habitat Management Objective:

- Maintain and restore the fen community type on all sites where it occurs.

Habitat Management Prescriptions:

- Manage the surrounding lands and groundwater resources, as practicable, to preserve the fen's hydrologic function.
- Use fire management (and brushing and herbicides as needed) to control encroaching woody species and invasive species, especially reed canary grass, to protect native plant communities. Woody vegetation should be kept short in stature, scattered and toward the periphery of the fen. Prescribed burns should be used to mimic natural disturbance patterns and achieve desired compositional and structural characteristics.
- Routine management should only occur on frozen ground due to the sensitivity of fen's soils.
- Other management activities, such as ground layer augmentation, should only occur after consultation with BER staff and other science experts.
- Where possible, manage fens as an element in wetland complexes that include marsh, wet meadow, low prairie, shrub-carr, and southern tamarack swamp.

Marshes and Submergent Aquatics

Marsh and Submergent Aquatic communities are found in areas with permanent water. These communities are associated with both natural water bodies (e.g., Grassy Lake) and impoundments and ditches where water levels are controlled by dikes, berms and water control structures (e.g., French Creek, Mud Lake and Swan Lake).

Submergent Aquatics occur in deeper water and may include coon's-tail, common bladderwort, pondweeds, water-shield, water lilies, native water-milfoil, and water-marigold. The invasive curly pondweed is an issue in some deep water marshes. Submergent aquatic communities are typically passively managed.

Marshes are typically dominated by emergent vegetation such as common bur-reed, common reed grass, bulrush, pickerel-weed, and wild rice. The invasive narrow-leaved cattail can be a management challenge

in these marshes (i.e., Swan Lake). Marshes can benefit from both active and passive management. For example, periodic water level reductions provide mudflats for shorebirds and increase the amount of submergent and emergent vegetation once water levels are restored.

Marshes and Submergent Aquatics are critical habitats for wildlife species such as ducks, beaver and numerous songbirds, shorebirds and marsh birds. The habitat value of Marshes and Submergent Aquatics can be increased substantially, especially for ducks, if they adjoin grassy uplands that provide vital permanent nesting habitat,

A 50:50 mix of open water (Submergent Aquatics) to emergent vegetation (Marsh) is a desired management objective (*US Fish and Wildlife Service, Waterfowl Management Handbook*). This mix, often called a hemi-marsh, is optimal for breeding migratory birds, including most waterfowl, black and Forster's terns, American coots, and certain blackbirds.

Cattails are prolific and can quickly dominate a hemi-marsh. Monotypic stands of cattails have reduced overall habitat value, but will provide some benefits for wintering white-tailed deer and ring-necked pheasants and habitat for breeding marsh wrens, least bitterns, and various species of blackbirds.

Habitat Management Objectives:

- Maintain the extent and protect or restore the quality and diversity of the marsh and submergent aquatic plant communities.
- Manipulate water levels to enhance waterfowl use, to improve shorebird habitat, to benefit native wetland floral and faunal communities, and to facilitate vegetative management practices

Habitat Management Prescriptions:

- Maintain or restore the original hydrology of the wetlands to the extent practicable.
- Where water control infrastructure exists, conduct periodic partial and/or complete drawdowns every five years, or as needed, to promote the resurgence of desirable wetland species like smartweeds, arrowheads and bidens as a food source for wildlife.
- Coordinate water level management with cutting, crushing, shearing and discing in late spring; prescribed fires in winter; grazing in spring; timely herbicide applications; and grading on sites dominated by monotypic stands of invasive species (e.g., cattails) where practicable and desirable,
- Passively manage the native aquatic communities and allow natural processes to determine the ecological characteristics (i.e., composition and structure of the communities) unless the existing native plant community and/or seed bank in restoration areas does not provide the desired diversity and density of native species.
- Monitor and control invasive plant and animal species that degrade native plant communities and habitat quality to the extent practicable. Species of particular concern include invasive cattails, purple loosestrife, Eurasian milfoil and pondweeds.

Shrub Wetlands (Shrub-carr)

Shrub-carr wetlands provide important wildlife habitat, especially as winter cover for ring-necked pheasants and white-tailed deer. Shrub-carr wetlands often encroach on sedge meadows and wet prairie due to a lack of fire or disturbed hydrology (e.g., lower water levels due to ditching and tiling). This habitat type requires periodic management treatments to maintain the health and vigor of the shrub community and prevent encroachment on other wetland types.

Management Objective:

- Maintain existing shrub-carr wetland in areas that do not have high potential for management as Sedge Meadow, Wet Prairie, or Wet mesic Prairie.

Management Prescription:

- Use prescribed burns, cutting, herbicide treatments and mowing to maintain shrub-carr habitat.

Grasslands, Prairies and Oak Savanna

Native Grasslands and Oak Openings are rare communities and native remnant Mesic Prairies are virtually non-existent on the CCPG properties. While prairie restorations provide only a portion of the biodiversity present in a native prairie, they provide important habitat for many wildlife species. Oak Openings and Oak Barrens are two of the most rare habitat types in the CCPG. Almost all of these areas will be classified in the Native Community Management category. Other Prairie types found on these properties include Dry mesic Prairie and Dry Prairie.

Surrogate Grasslands are the most common type of grassland on the CCPG properties. They are a mixture of native and introduced grasses and forbs that provide important habitat for grassland nesting waterfowl, grassland birds and pheasants.

Management Objectives:

- Maintain and restore prairies and enhance grasslands wherever practicable with an emphasis on control of invasive and woody species.
- Wherever practicable restore or enhance Oak Savanna including Oak Openings and Oak Barrens.

Management Prescriptions:

Management approaches used on individual parcels will vary based on the management potential and opportunities for the site, which in turn are derived from site-based factors such as soils, topography, hydrology, cover type, parcel size and surrounding land uses. The following management practices are to be applied on grassland, prairie restoration and oak savanna restoration sites:

- Remove hedgerows, fence lines, small conifer plantations and small low quality forest and brush patches to increase the size of grassland/prairie blocks. Remove trees in grasslands that serve as perch trees for raptors. Retain oak when appropriate for savanna restorations and plant oaks to expand or establish oak opening sites.
- Use prescribed fire to invigorate native grasses and forbs, suppress the encroachment of woody species, control non-native invasive plants and simulate natural disturbances.
- Use grazing, cutting, mowing, brushing and herbicides (when necessary) to remove trees, shrubs and invasive species. Both commercial and non-commercial timber cutting may be used to achieve the desired structural and compositional characteristics.
- Selective biomass harvests may be used if consistent with the management objectives.
- Plant a diversity of native prairie and savanna species on grassland, prairie and savanna restoration sites from local seed sources to maintain genetic diversity, especially on state natural areas and in management units classified as Native Community Management Areas.
- Where preservation of local genetic diversity is not a management priority, a variety of cool season grasses, legumes or forbs may be planted on sites targeted as cool-season grass habitat.

- Endangered Resources staff shall be consulted during the planning phase for any habitat management activities in Native Community Management Areas.
- Follow DNR Grassland/Savanna Protocol to minimize impact on sensitive animal species.

Upland Shrub

Upland Shrub communities are a minor cover type on the CCPG properties. They are typically found along old fence lines or scattered across the properties on former pastures or in unmanaged woodlands. Deer, pheasant and other wildlife will use Upland Shrub for cover and browse. These shrub communities contain desirable native tree and shrub species, but they may be heavily infested with aggressive, invasive species such as buckthorn, honeysuckle and garlic mustard. Restoring sites heavily infested sites with invasive species can be a difficult and may not be practicable with current tools and techniques.

Management Objectives:

- Maintain native shrub communities where desired to provide a range of habitats for game species, especially game birds such as pheasants.
- Convert Upland Shrub communities dominated by invasive species to grassland, savanna or forest as practicable

Management Prescriptions:

- Use prescribed burns, mowing and other approved techniques to maintain the vigor and diversity of the desirable native shrub communities. Passively manage species composition and allow natural processes to determine the ecological composition and structure of these communities.
- Convert parcels infested with invasive species to adjacent native communities using prescribed burns, cutting, herbicides or other approved technique as practicable. Actively manage species composition to develop the desired composition and structure of these communities.

Agriculture Crops, Farming Practices and Food Plots

Parcels on the wildlife and fishery areas may be temporarily, or permanently, used for agricultural practices compatible with the management purposes of the property. Approximately 350-450 acres is cropped every year on the CCPG properties. Most of these lands are farmed for several years and then converted to permanent cover (e.g., upland grassland cover) or used on an extended rotation as food plots for game species. Farming practices, such as harvesting grassland for hay or using grazing to remove exotic species, may be conducted if consistent with the habitat objectives.

Management Objectives:

- Provide a food source for game and non-game wildlife species, especially pheasant and doves.
- Provide brush and weed control prior to conversion to grasslands, prairies, savannas or woodlands or when compatible as an ongoing management activity.

Management Prescriptions:

- Plant food plots or leave agricultural crops (share crop acreage) standing to provide winter food for various game species.
- Annually plant 100 to 150 acres of food plots on the CCPG properties. They should be planted in five to twenty acres plots on different CCPG properties. Sunflowers or other agricultural crops can be used and the crops manipulated to attract doves (e.g., when sunflowers are mature, mow portions of the fields to disperse the seeds and create open areas where doves prefer to forage).
- Utilize sharecropping to control weeds and prepare the site for native habitat restoration.

General Forest Habitats

All forest management activities shall follow the guidelines in the DNR Silvicultural and Aesthetic Handbook (2431.5), the Public Forest Lands Handbook (2460.5), the Timber Sale Handbook (2461), and the Old Growth and Old Forest Handbook (2480.5), except for southern tamarack swamp. The prescriptions listed below are for the primary forest types found on these properties. The prescriptions include an overview of the general management methods and guidance from the Silvicultural Handbook as well as considerations applicable to the CCPG. Consult the Silvicultural Handbook for more details and management considerations. Where management prescriptions alter or eliminate harvest rotations, the forest reconnaissance data base (WISFIRS) should be adjusted accordingly.

Management Objectives for all Forest Types:

- Manage oaks as a large-scale mosaic of patches along a successional gradient that includes Oak Forest, Oak Woodland, Oak Opening and Oak Savannas/Barrens. Enhance and expand mature oak forest patches as an element of the oak continuum.
- Retain aspen where practicable and consistent with management objectives to benefit wildlife, especially for woodcock.
- Maintain the extent and enhance the quality of Central Hardwoods, Bottomland Hardwoods, Swamp Hardwoods, and southern tamarack swamps with an emphasis on providing wildlife habitat and protecting aesthetic values unless there is a property specific objective/prescription.
- Convert all Red and Scots pine and Norway spruce plantations to native grasslands, savannas or desired forest types to increase wildlife values and increase ecosystem diversity.
- Retain patches of white pine and jack pine to provide cover and food for wildlife and aesthetic enjoyment of users.
- Harvest timber using appropriate silvicultural systems including even aged, uneven-aged, selective harvests, shelterwood, improvement and thinning prescriptions, and salvage harvests to achieve the desired native community or species composition and structure.

Management Prescriptions for all Forest Types

- Use harvest and thinning prescriptions to regenerate desirable woody and herbaceous species in a manner that reduces the spread of harmful insects, diseases and invasive species.
- Where appropriate, extend the rotation age for some stands of oak and central/northern hardwoods to increase the abundance of older-age forest habitat, which is highly limited in the Central Sand Hills and Southeast Glacial Plains ecological landscapes.
- Leave long-lived reserve trees as individuals or in groups to provide wildlife (e.g., den and nesting sites and as a food source), timber and aesthetic values whenever their retention does not conflict with regeneration and other forest management objectives.
- Use intermediate forest treatments, such as release or crown thinning, as appropriate to develop young stands, improve the species composition of the forest and increase timber quality.
- Phase out conifer (e.g., red pine and Norway spruce) plantations using thinning and sanitation cuts. Convert to cover types that increase wildlife and/or native community habitat values.
- Maintain the native white and jack pine cover type with silvicultural practices that encourage natural regeneration and enhance wildlife mast and cover values.
- Retain snags and coarse woody habitat if it does not conflict with other management objectives.
- Trees damaged by wind, ice, fire, insects and disease may be salvaged if it meets the property or unit management objectives and the amount of woody debris would inhibit prescribed fires.

Management Objectives and Prescriptions by Forest Types

Central and Northern Hardwoods

Central Hardwood tree species, such as black cherry, American elm, black walnut, bitternut hickory, and shagbark hickory tend to grow in partial shade to full sun, whereas Northern Hardwood tree species, such as sugar maple and basswood, tolerate more shady conditions. This variation in shade tolerance means that either even-aged or uneven-aged regeneration systems may be used depending upon the tree species being favored. Even-aged silvicultural methods, such as overstory removal or shelterwood, tend to keep all the trees approximately the same age by harvesting the entire stand at 80-150 year intervals. Uneven-aged methods, such as single-tree or group selection, tend to create a stand with trees of three or more distinct age classes.

Management Objective:

- Maintain the health, vigor and diversity of central and northern hardwood stands to provide wildlife habitat and aesthetic value, and secondarily for forest products.

Management Prescriptions:

- Consider the forest conditions on the surrounding parcels when planning stand level management prescriptions, as a variety of age classes and stand sizes across the landscape is beneficial for wildlife and aesthetics.
- Assess the degree of succession to central or northern hardwoods prior to prescribing regeneration system for stand.
- Natural regeneration systems of central hardwoods can utilize both even and uneven-aged methods, including overstory removal, shelterwood, group selection, single-tree selection, coppice, and clearcut. Follow the DNR Silviculture and Forest Aesthetics Handbook guidance on selecting the appropriate regeneration system based on stand composition, advanced regeneration, site, and other factors.
- Use intermediate treatments, such as release or crown thinning, to develop young stands and improve composition and timber quality.
- Artificial regeneration by seeding or planting seedlings of desirable species may be used to where seed source and/or advanced regeneration is lacking.
- Other management techniques that can be used to help regenerate stands include soil scarification, herbicide treatments, and prescribed fire where feasible and safe.

Oak

Oak woodlands historically developed or regenerated following significant disturbance, such as fires that were common prior to European settlement. Oak is highly valuable cover type for a wide variety of game and non-game wildlife species because of the mast production, cover and denning/nesting sites.

Generally, site disturbance is required to regenerate or maintain oak in mixed stands. Management will typically involve even-aged harvest practices of various types and sizes occurring at intervals depending on the species present at the site. Scrub oak may be cut on 40-50 year cycles, northern red oak at 100-150 year cycles and white oak at cycles over 200 years.

Management Objective:

- Enhance and expand oak stands as practicable,.

Management Prescriptions:

- Maintain oak stands through management techniques appropriate for the stand and site conditions. Natural regeneration systems of oak include even-age management techniques, clearcutting, and shelterwood harvesting techniques.
- Oak regeneration by seeding or planting seedlings may be used prior to or after timber harvests when natural regeneration is not adequate. Other management techniques that can be used to help regenerate oak include soil scarification, herbicide treatments, and prescribed fire where feasible and safe. Intermediate treatments, such as release or crown thinning, may be used to enhance young oak stands, improve their composition and timber quality.
- Assess the degree of succession to central hardwood species and advanced regeneration density prior to prescribing oak regeneration harvests. Natural conversion to these species may be prescribed if oak regeneration seems unlikely. If successful regeneration of an existing oak stand is questionable, allow the stand to convert, but retain the oak stand as long as possible. It may be more feasible and desirable to establish an oak stand on a new site through planting.
- On non-forested sites naturally succeeding into oak, passively manage the site (use fire where appropriate) and allow it to convert to oak woodland or oak savanna. If a more rapid conversion is desired oak may be planted. Oak acreage may also be expanded by planting suitable sites (e.g., agricultural fields) adjacent to forested uplands.
- Research prescriptions are allowed though they may vary from standard silvicultural practices.
- Manage all oak woodlands in a manner that limits the spread of oak wilt and other pests.
- Encourage regeneration of other cohort trees, such as hickory and black cherry, and other desirable woodland understory species to provide food and habitat.

Aspen

Aspen is a small component on the forests on these properties. Aspen provides cover for early successional wildlife species, including woodcock and ruffed grouse, which have declined in numbers as woodlands have matured. This early successional forest type requires disturbance and abundant sunlight to regenerate. It is typically managed using complete even-aged harvests at intervals of 45-60 years.

Management Objective:

- Retain aspen stands and aspen as a component of other forest habitat types where practicable, except where it negatively impacts sedge meadow, grassland, prairie and savanna habitats.

Management Prescriptions:

- Regenerate aspen primarily through coppice (i.e., root sprouts) cutting with a management emphasis on its habitat value for ruffed grouse and woodcock populations.
- Where the objective is to develop or maintain a stand of mixed tree species, retain individual longer-lived species, such as oak. These trees can improve stand structure, wildlife habitat, aesthetic beauty, and increase the diversity of the stand.
- Natural conversion to other forest types, such as central hardwoods, may be prescribed if aspen regeneration is unlikely or other hardwood goals take precedence. Harvest aspen and other short-lived species, leaving the long-lived species to develop.

Conifers

A number of coniferous species are found on the CCPG properties. White pine is native to the area, but it has been planted widely to provide wildlife food and cover and contribute to cover type diversity. Limited natural stands of white pine are found on several of the properties, most notably the Pine Island WA. It has also been planted in plantations or mixed with hardwoods at Rocky Run FA, Rowan Creek FA (Pine Island hiking trail) and Grassy Lake WA.

Jack pine may be found in isolated stands and is a very minor species on these properties.

For tamarack please refer to the following Southern Tamarack Swamp section.

Small plantations or shelter belts of red pine, Norway spruce and Scotch pine are found on a number of the properties. These are often monotypic stands with noticeable populations of invasive species in the understory. These small stands offer very little benefit to wildlife species, are a hindrance to managing larger blocks of more desirable cover types and often have poor productivity due to insects and diseases.

Management Objectives:

- Convert conifer plantations and fencerows to another forest or other suitable habitat type.
- Maintain white pine to biological maturity and retain as a component of future mixed hardwood and conifer stands.

Management Prescriptions:

- Use even-aged management practices (e.g., thinning and improvement cuts) to maximize the stands health, vigor and quality until the plantations are harvested.
- Fencerows should be removed during timber harvests or when doing other habitat improvements such as burning, herbicide application or other approved general techniques.
- White pine should be actively managed by thinning and improvement cuts to attain biological maturity and then harvested. White pine may be retained through natural recruitment.

Forested Wetlands - Bottomland Hardwoods and Swamp Hardwoods

The bottomland hardwood and swamp hardwood forest types are associated with wet soils in flood plains, depressions, and stream/river bottoms. The major commercial bottomland hardwood species are eastern cottonwood, green ash, river birch, swamp white oak, and silver maple. The major components of the swamp hardwood type include black ash, American elm, and red maple. Wildlife that utilizes these habitats includes common species such as raccoon, white-tail deer and turkey and Species of Greatest Conservation Need such as cerulean warbler, red shouldered hawk and yellow-billed cuckoo.

Management Objective:

- Maintain the extent and quality of bottomland hardwood and swamp hardwood stands.

Management Prescriptions:

Bottomland hardwoods and swamp hardwoods are intricate and variable forest ecosystems due to species richness, flooding, ice movement and internal drainage patterns. The pattern of deposition and development of soils in these stands is complex. Given the variability of these site conditions, as well as the species mix and silvicultural characteristics, no single regeneration prescription will function adequately on most sites.

- Selection of the most appropriate silvicultural system for these forest stands is site-specific and focuses on the wildlife/fishery management needs. Silvicultural management requires

consultation between the wildlife/fishery manager and the forester with input from the Endangered Resources biologist if needed.

- Riparian zone management will incorporate relevant BMP's and shall implement measures appropriate to protect the scenic and aesthetic qualities of woodlands bordering waterways.
- Silvicultural and other management activities must avoid as practicable the introduction and/or spread of invasives (especially reed canary grass) in the understory of these communities.

Southern Tamarack Swamp (Rich)

Tamarack is found on moist organic soils, peats and mucks of swamps and muskegs, especially at the southern limits of its range. This is a rare habit and is highly valuable for many species such as American woodcock and black billed cuckoo and provides escape cover for white-tail deer. Like the southwest Wisconsin pine relics, these are remnant northern forests from the post glacial age that have persisted in the fire-prone southern Wisconsin landscape due to the wetness of the swamps. Following the recession of the glaciers, fires transformed the boreal forests on dryer sites to prairies/savannas. It is likely that fire did occasionally reach these areas during drought years and set these generally fire intolerant plant communities back for decades, or perhaps longer. It is also likely that in such a single-species dominated stand of trees, pests or wind-throw occasionally decimated stands.

There are significant challenges to successfully managing southern tamarack swamps. This species does not reproduce under its own shade so some naturally occurring events had to set them back periodically – thus, providing an opportunity for tamarack to regenerate. Importantly, these stands are at the southern fringe of their range so they may be highly susceptible to the effects of changes in critical climate variables. Hydrologic changes can quickly convert this community to a shrub swamp. Altered hydrology caused by ditching and/or soil compaction and the deposition of sediments and nutrients from adjacent uplands can affect this community. Invasive plants also pose a serious threat to the southern tamaracks swamp communities. The diverse factors affecting the health and vigor of this community make it difficult to identify the reason(s) for the decline of a tamarack swamp.

Management Objectives:

- Actively maintain the larger and more sustainable tamarack stands to the extent practicable.
- Marginal tamarack stands may be managed to allow a change to other plant communities if the stands are small, low quality and/or on marginal sites where maintaining the stand conflicts with the objectives of a larger, associated wetland community.

Management Prescriptions:

- Where feasible, manage this forest type in conjunction with other complementary forest and wetlands communities. Isolated sites should be buffered from land uses that degrade them.
- Assess the status of the stand to determine its condition and management issues. The assessment should include evaluation of the hydrology of the area (including the impact of ditches, dikes, and runoff from adjacent uplands), impacts from activities on adjacent uplands, invasive species encroachment, development/high capacity wells, and agricultural activities. Develop and implement management recommendations based on this assessment.
- Use management actions such as ditch filling or dike removal as appropriate.
- Use management practices that limit soil damage, erosion, sedimentation, and hydrologic changes on these sites and adjacent lands. Convert adjacent upland crop land to grassland cover whenever possible.

- Management activities following a catastrophic natural event or significant insect/disease infestation shall be determined after consultation between the staff of the Wildlife, Forestry and Endangered Resources programs.
- Use prescribed burning for regeneration purposes, if deemed appropriate by the Wildlife, Forestry and Endangered Resources staff.
- Periodically monitor for and eradicate/control invasive species using mowing, brushing, hand cutting, or herbicides. Exotic species of known concern include glossy buckthorn, purple loosestrife narrow-leaved cattail, giant reed-grass, and reed-canary grass. Red maple, a native species, is a potential concern and has been reported to invade tamarack swamps substantially reducing regeneration potential.
- Bio-control methods may be used for purple loosestrife, or other species as deemed appropriate, safe, and effective.

Additional information about these cover types can be found at the DNR web site and use the following key words – forestry handbooks, forest habitat type classification system, endangered resources, ecological landscapes, natural communities.

General Recreation Management and Use

Introduction

The CCPG properties are popular destinations for deer, turkey, waterfowl and pheasant hunting, trout and warm water sport fishing, and trapping. Several sites also have qualities that make them especially attractive to non-hunting recreational users such as bird watching at the Pine Island WA and hiking the Pine Island trail at the Rowan Creek FA. The CCPG properties, like wildlife, fishery and natural areas statewide, are approved for a wide range of outdoor recreational uses as noted below.

The recreational management objective for these properties is to provide ready access to a variety of high quality recreational experiences in a rustic setting. Recreational facilities are simple, dispersed and provide a modest level of user conveniences while meeting environmental protection needs.

These properties have some (or a number of) limitations that constrain efforts to improve recreational experiences for a broad range of activities. Wetlands and open water are the most common cover types (about 56% of the total) in the CCPG. These wet areas are generally surrounded by small, non-contiguous uplands. This limits the acreage available for upland deer and turkey hunting as well as other recreational pursuits (e.g., hiking). In addition, some of the upland areas are land locked or have limited access. Importantly, the popularity of these properties can result in overcrowding, especially on opening day of the various hunting seasons. This presents both a management challenge as well as detracting from user enjoyment.

Active and passive recreation management activities will occur on these properties. **Active management** includes installing and maintaining buildings, parking lots, boat launches and other infrastructure needed to pursue a recreational activity. **Passive management** indicates an activity can be pursued on the property, but no specific infrastructure or maintenance will be pursued to promote the activity. For example, users may hike, berry pick and bird watch, but designated trails, berry patches and bird watching blinds will not be developed or maintained.

Public Use and Recreation Management

All CCPG properties are open to a wide variety of traditional outdoor recreational uses as required by the state and federal funding sources (e.g., ORAP, LAWCON, Stewardship. etc.) used to purchase and maintain these lands. With a few exceptions (e.g., a waterfowl refuge) the properties are open to hunting, fishing and trapping. Properties closed to the public or closed to specific use are posted. Certain types of hunting opportunities (e.g., dove and pheasant) may occur on all properties, but habitat management to increase hunting opportunities may be focused on selected properties as described in the individual property section of this chapter.

Other activities allowed on these lands include wildlife viewing, hiking, cross country skiing, snowshoeing, nature study and canoeing. Edible fruits and nuts, wild mushrooms, wild asparagus, and watercress may be removed by hand without a permit for the purpose of personal consumption by the collector (Note: collection of seeds, roots, or other plant parts is prohibited). These activities are allowed, but except as noted in the specific property descriptions, no designated infrastructure will be established nor are these activities considered recreational management priorities.

The majority of state natural areas are open to the public though access may vary due to use restrictions for public safety, protection of endangered or threatened species, or unique natural features. Lands may be temporarily closed when specific management activities (e.g., controlled burns) are occurring.

Foot travel is allowed on all service roads, dikes and berms unless restricted during habitat management activities (e.g., temporary closure during a prescribed burn) or safety concerns (e.g., flood periods).

Motorized vehicle access is restricted on all CCPG properties to the designated public access roads and parking lots. Motorized recreational craft (i.e., boats) may be used on flowages and impoundments unless posted, and snowmobiles are allowed on designated snowmobile trails. Requests to route snowmobile trails through all existing and future lands acquired for the CCPG properties will be duly considered and responded to by the appropriate program staff within a reasonable time frame.

Dog trial events at the Pine Island WA are regulated under the Pine Island Field Trial Agreement (*PIFTA*, 2010). PIFTA may allow limited use of ATVs and horses for scheduled dog trial events.

There are some allowances for motorized use of the CCPG properties by individuals with mobility impairments under the Power Driven Mobility Device regulations under the American Disability Act. Please refer to the specific language under “Disabled Accessibility” in the General Property Administration, Management Policy and Provisions section.

Prohibited activities include:

- Horseback riding
- Rock climbing
- Mountain biking, ATVs, aircraft and model aircraft and rocketry.
- Snowmobiles except on trails and roadways designated for their use. Snowmobile trails are allowed at the discretion of the property manager if it is part of a regional trail system. Snowmobile trails are not allowed on natural areas unless the trail was in place prior to parcel acquisition.
- Collection of animals, fungi, rocks, minerals, fossils, archaeological artifacts, soil, downed wood or any other natural material, alive or dead. Collecting for scientific research requires a permit issued by the DNR.
- Collection of plants including seeds, roots or other parts of herbaceous plants such as wildflowers or grasses.
- Camping and campfires.
- Wheeled dog sleds.

Information on rules governing public use of DNR-owned lands is found in Wis. Administrative Code Chapter NR 45.

Recreation Trends

Three important trends will affect future usage, recreational pursuits and infrastructure needs on these properties. These trends include:

1. Aging of the general population. The quality and character of access to our sites will change as our user base changes. For example, there will be an increased need to provide some accommodation to individuals with mobility impairments.

2. There has been a slow decline in the number of hunters and trappers statewide that could negatively impact game population control efforts and program revenues. However, bird watching has increased and there has been a new cohort of non-traditional, non-revenue generating recreational activities (e.g., walking, pet walking and geocaching). Many of these new uses will probably be compatible with the primary purposes of these properties, but may contribute to crowding or conflicts during hunting season or at peak use periods.
3. The growth and diversity of outdoor activities will probably result in increasing year round usage of the properties and present additional management opportunities and maintenance challenges.

In addition, ongoing population growth and non-compatible land uses immediately adjacent to wildlife and fishing areas (e.g., the addition of housing on the boundaries of state properties) can adversely affect the management, use and enjoyment of these public lands. For example, gun hunting is not allowed within 100 yards of a home unless the resident agrees.

Recreation and Public Use Objectives:

- Provide high quality hunting, fishing and trapping opportunities consistent with the capacity and character of the natural resources at the respective properties.
- Provide passive management opportunities for wildlife observation, hiking, non-groomed cross country skiing, snow shoeing, nature study, berry picking, canoeing, nature education and other outdoor activities as practicable given the physical characteristics and primary management objectives.
- Promote safe and enjoyable compatible recreational opportunities with an emphasis on off trail, non-motorized activities in a non-congested and rustic setting.
- Improve accessibility and recreational opportunities for mobility impaired individuals.
- Provide opportunities for research and educational activities consistent with the primary management purposes and user safety.

Recreation and Public Use Management Prescriptions:

- Install, maintain and monitor parking lots, access roads, boat launches and signage consistent with Department policies and rules.
- Access shall be provided appropriate to the management objectives of the property with a focus on providing dispersed access to lower congestion and enhance the experience of users.
- Stock pheasants immediately prior to and during the pheasant hunting season on sites with suitable cover to supplement natural pheasant production and provide improved opportunities for hunting success. Maintain a network of mowed stocking lanes as a means to provide department vehicular access for pheasant stocking and hunter foot access.
- Provide improved trout fishing, boating access and wildlife observation opportunities and infrastructure for mobility impaired individuals as determined practicable.
- Manage the riparian vegetation along classified trout streams to protect in-stream habitat while also providing improved fishing opportunities for anglers.
- Service roads, non-designated trails and dikes may be walked by hunters, anglers and hikers to access the property unless closed for maintenance or other habitat management activities.
- Stock trout in suitable streams according to Fisheries Management guidelines and criteria.

Shooting Ranges

There is significant demand for a public shooting range in Columbia County. Several parking lots at the Swan Lake WA and French Creek WA are heavily used for recreational shooting and target practice by locals and out of county individuals. These activities have generated concerns about public safety, quality of life (e.g., noise and litter) and inquiries by local elected officials and law enforcement.

The Department recognizes the need for a designated and managed public shooting facility in the county. DNR staff are collaborating with local officials and interested sporting groups to establish a public shooting range that meets the generally accepted siting criteria. Several of the CCPG properties were considered in these deliberations, but none were selected. Establishing a shooting range on a CCPG property will require an amendment to this master plan. If a public shooting range is established in the county, the DNR will evaluate options to address concerns about target shooting on these wildlife areas.

Ice Age Trail Routes

The Ice Age Trail is a Wisconsin State Trail and one of eleven National Scenic Trails in the U.S. It is a long-distance hiking and backpacking trail. A 2.5 mile segment of the Ice Age Trail (IAT) is located at the Lodi Marsh WA and an extension of this popular trail segment is anticipated in the near future. In addition, the National Park Service will be leading a planning effort in collaboration with DNR Parks and Recreation to consider trail expansion within a multi-county area, including Columbia, Sauk and Marquette Counties. Portions of these trail alignments may pass through the Pine Island WA and the French Creek WA. Relevant DNR programs (e.g., Wildlife Management and Endangered Resources) will be involved with the planning and decision making for these wildlife areas and the associated natural areas.

The following criteria will be used to assess the suitability of a CCPG property to host an IAT segment:

- soil suitability
- habitat management priorities
- natural heritage inventory information
- compatibility with other recreational uses
- development and maintenance considerations

Additional routing criteria may be applied during the IAT planning process.

A route through the Pine Island WA will need to consider the following issues:

- 1.) Extensive wetlands and wet soils,
- 2.) Dog training and trial areas are inappropriate as designated trail routes, and
- 3.) The Caledonia Levee within the Pine Island WA is a separate management unit that is the responsibility of the Facilities and Lands program. The levee segments are flood control structures with unique safety, maintenance and long-term management considerations that make them unsuitable as a designated IAT route. If the responsibility for managing the levees is shifted to a different program or the containment of the Wisconsin River during high flows is no longer required the use of these sand dikes as a trail routing option may be revisited.

General Property Administration and Policies

The following policies and provisions apply to all state managed lands, including the CCPG properties.

Funding Constraints

Implementation of the master plan actions is dependent upon staffing and funding allocations set by processes outside of the master plan. Funding for land acquisition can come from a variety of federal (e.g., Pittman-Robertson and others), state (e.g., Stewardship), local and private (e.g., land trusts) sources as well as land donations. Capital and operational funding for Department programs are established biannually by the state legislature. Funds are also provided by federal programs and occasionally from private sources. Therefore, these legislative and administrative processes outside of the master plan will determine how and when the actions in this master plan are implemented.

Facility Management

All infrastructure used for habitat management and public access shall be inspected and maintained as required in program guidance and manual codes. This infrastructure includes, but is not limited to, dikes, spillways, water control devices, roads, gates, parking lots, boat launches and buildings.

The property manager may relocate or temporarily close road and trail segments or other public use facilities as deemed necessary after appropriate authorization by normal Department approval processes. The location and design of new roads or trails must be consistent with the land classification requirements (NR 44) and the management objectives for the area in which they are to be located.

Dikes and water control structures are essential for controlling water levels in flowages and enhancing emergent marsh habitats. The following routine activities apply to the maintenance of dikes and water control structures:

- Conduct dike maintenance and approved water manipulation activities;
- Maintain dikes to secondarily provide pedestrian access for hunters and trappers;
- Control beaver and muskrat populations to mitigate burrowing and damming; and
- Plan and implement major maintenance of dikes on approximately 20-year rotations.

Water control structures at dikes or impoundments that cannot provide the range of water fluctuations needed to optimize habitat for wildlife and enhance the native wetland plant communities should be replaced or improved.

NR 17.10(1) authorizes the designation of Department lands for field trials, year-round, except hunting shall have priority.

Public Health and Safety and Emergency Action Plan

All facilities will comply with federal, state, and local health and sanitation codes. The property manager has the authority to close trails and other facilities on the wildlife areas and state natural area when necessary due to health, safety, or environmental damage concerns. Trees and other natural elements deemed public hazards will be removed within designated public use areas (e.g., parking lots and designated trails). Safety inspections of designated public use areas are done at least twice per year.

Refuse Management

Visitors are required to carry out any refuse they produce. Refuse and recycling receptacles are not provided. Burying of refuse is not allowed on the properties.

Road Management Plan and Public Vehicle Access Policy

State properties typically have primitive or lightly to moderately developed service roads for management purposes. All department service roads not open to public vehicles will be maintained as primitive or lightly developed roads (NR 44.07(3)). Primitive roads, such as old farm roads used for management purposes, may not be routinely maintained.

Service roads are open to public walking access, but are closed to public vehicle access except for those leading to public parking lots or boat access sites. Closed roads are gated or signed.

Public access roads managed by the Department shall be constructed and maintained as either lightly developed or moderately developed roads. The property manager may determine which of these road standards to apply on a case by case basis.

The following management prescriptions apply to Department managed roads:

- Maintain permanent service roads and public access roads within the wildlife areas in a sustainable condition according to the Wisconsin's Forestry Best Management Practices for Water Quality.
- Regularly inspect active roads (especially after heavy storm events). Clear debris as needed from the road surfaces, culverts and ditches to decrease unsafe conditions and prevent damage.
- Maintain stable road surfaces to facilitate proper drainage and reduce degradation from traffic during wet or soft conditions.
- Minimize the manipulation/removal of vegetation and soil disturbance to the extent practicable to prevent erosion.
- Design, route and construct roads to minimize habitat fragmentation and impacts to endangered, threatened and species of special concern.
- Restore roads used in timber harvests to non-erosive conditions, in accordance with Wisconsin's Forestry Best Management Practices for Water Quality.
- Roadsides of county and town roads will be managed by county and township staff on their maintenance schedules.

The Department will collaborate with municipal, town and county roadside maintenance crews to protect and enhance the quality of roadside easement areas, especially to control the spread of invasive species.

Public Access on Service Roads, Fire Breaks, Dikes and Paths

The public may hike on service roads, game stocking lanes, fire breaks and dikes to gain access for all of the approved recreational activities. This infrastructure is not designed, designated or maintained as designated hiking trails, but users can utilize them unless posted closed to the public. Non-designated primitive paths formed by years of use by hunters or anglers are found on all the properties. Non-hunters may use these paths as well. Designated hiking trails, such as the Ice Age Trail, may be used by hunters and trappers to gain access to those properties open to hunting.

Snowmobile Trails

A snowmobile trail is allowed to cross wildlife/fishery areas if it provides the most feasible route to maintain a regional snowmobile trail system, does not degrade habitat, is not routed through important winter habitat areas, and is signed and maintained according to applicable state statutes and administrative codes.

Disabled Accessibility

The Department is committed to providing high quality outdoor recreation opportunities for people with mobility impairment. All new construction and renovation of infrastructure will follow guidelines set forth within the Americans with Disabilities Act and be done in a manner consistent with the NR 44 land use classification for the development site.

The property manager has the authority to provide access accommodations for people with disabilities. Users with mobility impairment may be allowed to use power-driven mobility devices (PDMD) with a permit issued by the Department. Approval will depend on factors including (i) the physical characteristics of the device, (ii) the volume of pedestrian traffic at the location, (iii) the design and operational characteristics of the site, (iv) safety considerations, and (v) whether the proposed use creates substantial risk of serious harm to environmental, natural or cultural resources.

Endangered, Threatened and Species of Special Concern Protection

Implementation of all management prescriptions in the master plan will be carried out with consideration of the needs of endangered, threatened, and species of special concern and the potential impacts to the species and their habitat. Management actions will be checked against a database of known occurrences of listed species to assure that no department actions results in the direct taking of any known endangered or threatened resource during the plan implementation phase.

Protection of Archaeological Features

Property managers will prevent physical disturbance of the archeological features (e.g., mounds) on properties. This includes controlling woody species invading the mound. Managers will follow DNR guidelines outlined in "Burials, Earthworks and Mounds Preservation Policy and Plan".

Best Management Practices for Water Quality

All forest management and construction activities shall comply with the most recent guidelines for Best Management Practices for Water Quality (BMPs). Natural shorelines will be maintained in vegetative cover to hold the soil from erosive forces. On banks more difficult to vegetate, other forms of protection should be used ranging from bioengineered banks to hard armoring (e.g., riprap).

Forest Certification

Wisconsin State Forests gained Forest Certification from the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) in 2004. The State Forests were re-certified under FSC and SFI and the balance of DNR-owned land were added to the certification in 2009. Third-party certification means management of DNR-owned land meets standards for ecological, social, and economic sustainability. Forest certification improves competitiveness in global markets that increasingly demand certified raw materials. Management of multi-use lands involves balancing the goals of conserving forestland, supporting economic activities, protecting wildlife habitat, and providing recreational opportunities. Forests on fish and wildlife properties are managed to meet the forest certification principles.

Fire Suppression

Wisconsin Statutes 26.11, states, “The Department is vested with power, authority and jurisdiction in all matters relating to the prevention, detection and suppression of forest fires outside the limits of incorporated villages and cities in the state except as provided in sub (2), and to do all things necessary in the exercise of such power, authority and jurisdiction.” Wildland fire suppression actions will consider the property management goals and the threats of the fire to life and property. Appropriate techniques will be used in each event to provide effective fire suppression while minimizing resource damage.

Forest Pest Control

Wisconsin Statute 26.30 states, “It is the public policy of the state to control forest pests on or threatening forests of the state...” Any significant forest pest events will be evaluated with consideration given to the property management goals and the potential threat of the pest to other landowners. Infestations will be managed according to the respective management plan, if they exist. Responses to significant infestations from pests (e.g., emerald ash borer) include timber salvage or pesticide treatments. Any response to a significant pest outbreak or threat of a significant pest outbreak will be evaluated by an interdisciplinary team of scientists and communicated through press releases and notices to interested parties. If necessary, an immediate emergency response to prevent a major outbreak may be authorized by the State Forester.

Authorized Response to Catastrophic Events

Catastrophic events are rare, but allowances must be made to provide management flexibility when such events occur. These events include severe flooding, ice and wind storms, insect and disease infestations, wildfires or other catastrophic occurrences. The immediate management responses to these events will follow existing Department protocols. If the management objectives and prescriptions need to be revised a variance to the master plan must be approved by the Natural Resources Board.

Wildfires, tree diseases and insect infestations shall be controlled to the degree appropriate to protect the values of each management area. However, emergency actions be taken to protect public health and safety, or as directed by the State Forester to prevent a catastrophic incident from spreading to adjacent forest lands.

Management responses to catastrophic events are determined on a case-by-case basis. Salvage of trees damaged by wind, fire, ice, disease, or insects may occur if consistent with the objectives and prescriptions. Salvage may also occur as part of an emergency response plan authorized by the State Forester.

Control of Invasive Species

Invasive species can significantly harm the habitat and recreational potential of a conservation area so property managers should follow the guidance regarding control of invasive species in the Department’s *Property Managers Handbook*. Proper management will require the inventory, control and monitoring of invasive species on the properties. Invasive species can be managed using the following methods: bio-control, herbicides, grazing, cutting, smothering, hand removal or fire, unless restricted to protect sensitive resources. Best Management Practices (BMPs) for Invasive Species and the guidance in the *Property Managers Handbook* shall be used to direct management practices on these properties.

Administrative rules and voluntary actions taken by informed users will help slow the spread of aquatic and terrestrial invasive species. Examples include cleaning and disinfecting boats and equipment; not transporting live fish or spawn away from their indigenous waters; not transporting bait species between waterbodies, and hunters/hikers cleaning boots and clothing to reduce the spread of seed.

Chemical Use

Herbicides and pesticides may be used to manage invasive plants and insects or limit plant competition in restoration areas except as restricted in the property specific management prescriptions in this master plan. All chemical applications shall follow applicable department procedures and herbicide and pesticides label requirements.

Non-Metallic Mining Policy

The Department may use gravel, sand, fill dirt, or other fill material from department-owned lands for Department use. Under certain circumstances other government bodies or agencies may also have access to these materials. Section 23.20 of the Wisconsin Statutes states, “the department may permit any town, county, or state agency to obtain gravel, sand, fill dirt or other fill material needed for road purposes from any department-owned gravel pit or similar facility if this material is unavailable from private vendors within a reasonable distance of the worksite. The department shall charge a fee for this material commensurate with the fee charged by private vendors.”

Nonmetallic mining is regulated under the requirements of NR 135 Nonmetallic Mining Reclamation, Wis. Adm. Code, except for sites that do not exceed one acre in total for the life of the mining operation. Site reclamation under NR 135 is administered by the county. NR 135 requires mining sites to be located appropriately, operated in a sound environmental manner, and that all disturbed areas be reclaimed according to a reclamation plan. New sites will not be considered if they will impact significant geological or ecological feature or sites within any designated State Natural Area.

Department of Transportation projects are exempt because they have project reclamation requirements.

Real Estate Management

Acquisition Policies

The Natural Resources Board and the DNR acquire lands from willing sellers only. As required by state and federal laws, the Department pays just compensation (e.g., estimated fair market value based on an appraisal) for property. Staff will periodically contact landowners within a project boundary to explain the Department’s land acquisition program and determine if they have an interest in selling their property. Acquisition priorities for the properties vary from year to year and are based on a number of factors, such as resource management or recreation needs and the availability of funds.

Rather than purchasing land in fee title, the Department may acquire an easement from a willing land owner. A number of easement options are available to address the circumstances. For example, fishery easements provide access for anglers, protection of riparian habitat and allow habitat development projects. This option is suited to protecting critical or unique habitat when fee acquisition is not feasible due to costs, local concerns, or an owner’s desire to retain fee title to the land.

Aides in Lieu of Taxes

State law requires the DNR to make payments in lieu of property taxes (PILT). The Department uses an automated process for collecting information and calculating PILT payments. The process is determined by statute with little room for interpretation or calculation by the Department. There are two separate statutes and several formulas under each statute that dictate the amount of each individual payment.

Wisconsin statute s. 70.113 Stats. applies to lands acquired by the Department prior to January 1, 1992. Payments under this statute are made directly to the taxation district in which the land is located. Schools, VTAE and counties do not receive any payment under this law.

Wisconsin statute s. 70.114 Stats. governs the payment in lieu of property taxes for all lands purchased by the Department after January 1st, 1992. This law has been amended several times so the specific formula used by the Department to determine each specific payment varies depending on when and how the property was acquired. Payments are made to each taxing district in January, similar to the way a private citizen would pay their property taxes and each taxing district then makes payments to all taxing jurisdictions in the taxing district. For detailed information on how the Department pays property taxes, visit dnr.wi.gov and search "PILT".

Project Boundary Adjustment Process

Adjustments to project boundaries are needed to remove developed parcels of land and in other cases to add parcels so they can be purchased for resource protection or to meet expanding recreational needs. Boundary changes of 40 acres or more require approval by the Natural Resources Board. Wisconsin Administrative Code Ch. NR 44 provides an amendment process that may be used to make adjustments in the project boundary after the master plan is approved. Where land purchase or easements are being considered the Department can acquire land under the various authorities in State Statute 23.09.

Conveyed Easements and Other Land Use Agreements

There are about 535 acres of conveyed easements on the CCPG properties as of April 2012. Conveyed easements or access permits provide access across state property for utilities, public roads, other public benefit infrastructure or to a landholder surrounded by state property.

Easements, access permits, land use agreements and leases across Department land require consultation and joint action by the affected program and the Bureau of Facilities and Lands Real Estate staff. These actions are subject to sections NR 1.48 and NR 1.485, Wis. Adm. Code and before any rights are conveyed, the Bureau of Facilities and Lands Real Estate must determine if federal funds were used to acquire the land and, if so, obtain the appropriate approvals. Conveyed easements may serve a broader public purpose (e.g., a utility corridor), but they can adversely affect a management unit by:

- restricting future management options;
- limiting the public's full use and enjoyment;
- preventing natural succession of cover types;
- introducing exotic and invasive species;
- introducing additional herbicides and other contaminants; and
- creating liability concerns

Plan Monitoring and Public Communications

Progress on implementing the habitat and recreation management objectives will be reported annually. These annual reports will be available to the public on the DNR Internet Web site and linked to the respective property descriptions. The report will provide information on how the public can become involved in master plan implementation and when significant property management issues arise.

The annual report will summarize the following:

- Management and development activities completed,
- Significant issues addressed,
- Planned management and development activities for the upcoming year, and
- Potential changes to management actions or approaches.

The annual report may also include information on topics related to property management and uses. Examples include: the status of forest insect or disease problems, storm damage, updates on endangered or threatened species, recreation management issues, and recreational use trends.

In the event the Department considers a substantive change to the master plan (i.e., a plan variance or amendment) the public will be informed of the proposal and the review and comment process. As appropriate, news releases will be used to announce master plan amendment/variance proposals and review procedures. The Department will also maintain a contact list of persons, groups, and governments who have requested to be notified of potential plan changes.

The following Department staff may be contacted regarding questions about the Columbia County Planning Group fish and wildlife properties. At the time of this publication, the contact information is:

Sara Kehrli	608-635-8123	saras.kehrli@wisconsin.gov	Columbia County wildlife areas
Nancy Frost	608-275-3250	nancy.frost@wisconsin.gov	Lodi Marsh Wildlife Area
Nate Nye	608-635-8122	nathan.nye@wisconsin.gov	Columbia County fishery areas

CHAPTER TWO

SECTION TWO: INDIVIDUAL PROPERTY PLANS

Project Boundary Adjustments

The Department currently owns 24,120 acres within the twenty CCPG properties. The NRB approved project boundary adjustments include a total of 1,131 acres of project boundary contractions and 5,076 acres of project boundary expansions yielding a net expansion of 3,955 acres. In addition, the 576 acres of Department owned land lying outside of the current project boundaries are to be included within the adjusted boundaries. The acreage adjustments for specific wildlife, fishery and natural areas are described in the following section.

Over the last two decades, the Department has acquired approximately 150 acres/year in Columbia County from willing sellers at fair market value. These expansions have allowed the Department to protect critical habitat and provide high quality recreational experiences to the growing populations in Columbia County and the south central Wisconsin.

The principal reasons for adjusting the project boundaries and acreage goals include:

1. Improve access and recreational opportunities at our wildlife, fishery and state natural areas. Several adjustments are intended to reduce user confusion about property lines and minimize trespass issues. Others are intended to link non-contiguous uplands to improve upland access and recreational opportunities around the water bodies and wetlands. Importantly, the adjustments seek to maintain or improve the quality of the users experience by reducing crowding and improving the aesthetic value of the properties. For example, the approved fishery purchases and easements would provide over 14,000 feet of additional stream frontage for trout fishing.
2. Provide larger contiguous blocks of ownership to improve the efficiency of our habitat management activities, especially for prescribed burn management.
3. Increase upland grassland habitat acreage for grassland nesting waterfowl, pheasants and grassland birds. The desired grassland to wetland ratio for grassland nesting waterfowl ranges between 1:1 and 3:1. The current grassland to wetland ratio is about 0.4:1 indicating a significant deficiency in grasslands on the larger wildlife properties. The approved project boundary adjustments could potentially improve this ratio to about 0.7:1.
4. Protect high quality remnant native plant communities and improve the monitoring and control of invasive species by moving project boundaries out to the roads.
5. Protect current properties and uses from encroachment by non-compatible land uses. Hunting regulations state that gun hunting is not allowed within a 100 yard radius of homes unless the resident provides permission. Expanding boundaries as approved provides greater certainty that Department lands can be fully used for all of the intended purposes.

6. Protect our existing investment in wildlife and fishery lands by sustaining essential inputs, such as surface and groundwater, and reducing the risk of habitat degradation related to erosion, sedimentation and nutrient enrichment.
7. Coordinate boundary and property management activities with the US Fish and Wildlife Service and other partners to maximize habitat and recreation benefits, and optimize the use of limited management and acquisition funds. For example, the DNR-US FWS property groupings include the Pine Island WA and Baraboo River/Fairfield Marsh Waterfowl Production Areas (WPA); the Mud Lake WA and Rowe WPA; the Grassy Lake WA and Manthey/Doylestown WPAs; and the Hinkson Creek FA and Hinkson Creek WPA respectively.

Land Acquisition Guidelines

The Department uses criteria, such as the following, to assess the conservation and recreation merits of property being offered by willing sellers.

1. Lands greater than 40 acres with no or low-value improvements.
2. Lands with high quality wildlife habitats or contain critical habitat for Species of Greatest Conservation Need and/or contain Natural Communities identified as rare within the Central Sand Hills and Southeast Glacial Plains Ecological Landscapes.
3. Lands that could provide high-quality hunting, trapping, and fishing experiences as well as opportunities for other compatible nature-based outdoor activities.
4. Lands adjacent to current state lands or other protected lands, particularly if they can provide a buffer from existing or future incompatible land uses.
5. Lands that currently affect the hydrology of important conservation lands.
6. Lands affected by the restoration of wetlands (e.g., restoration efforts are constrained by flooding impacts on surrounding private lands).

Portions of properties not needed for conservation purposes may be sold/leased back for agricultural or other compatible uses though the state may retain development and public access rights.

Project boundary adjustments often follow roads or natural features (e.g., streams or rivers). This approach creates public access opportunities off the public right of ways along roads and boundaries are easier to portray and define on maps. Nearly all of the project boundaries encompass more land than their respective acreage goals. This provides the Department and partners with flexibility when negotiating the purchase, sale or trade of land for recreation and conservation purposes.

Using roads as boundaries will bring some developed parcels (e.g., homes, farmsteads and other improvements) into project boundaries. The Department does not seek to acquire parcels with improvements. Acquisition criteria reduce the scores of parcels with substantial improvements. When buildings are purchased as part of a larger land holding, the buildings are typically split from the larger parcel and sold according to and consistent with local ordinances. An occasional purchase/easement across developed parcels may be sought to provide public access to an isolated portion of a property.

Project boundary changes of 40 acres or more require approval by the Natural Resources Board. Wis. Administrative Code NR 44 provides a plan amendment process that shall be used to make adjustments

in the project boundary after the master plan is approved. Where land purchase or easements are being considered the Department can acquire land under the various authorities in State Statute 23.09.

Acreage Goal Adjustments

Wildlife - The approved plan directs the acreage goal for these wildlife properties be increased by 2,910 acres. The approved increase in the acreage goal is a collective pool to be used to purchase parcels within the adjusted project boundaries. This approach is consistent with the approach used in the Glacial Heritage Area (2010) master plan.

Fishery – The approved plan directs the acreage goal be increased by 424 acres to improve public access and increase stream and riparian zone habitat available for trout management. Twenty acres of this goal is for access easements rather than fee title purchase along Hinkson and Lodi Spring Creeks.

Natural Areas – The approved plan directs the project boundary and the acreage goal for Rocky Run Oak Savanna Natural Area be increased by 35 acres to improve access, management efficiency and protect wetlands.

Project Boundary Adjustments by Program

Wildlife Areas

Plan approval directs wildlife project boundaries be expanded to include 434 acres owned by the Department, but outside the old project boundaries and net new expansions of 4,637 acres (Table 2-2).

Wildlife Areas	Parcels Outside Previous Boundaries	Expansions	Contractions
French Creek	26	987	0
Lodi Marsh	8	719	0
Mud Lake	154	918	2
Paradise Marsh	45	429	0
Peter Helland	87	782	0
Pine Island	1	231	655
Swan Lake	93	119	450
Grassy Lake	20	214	0
Jennings Creek	0	238	0
Columbus PHG	0	0	0
Dekorra PHG	0	0	0
Duck Creek PHG	0	0	0
Hampden PHG	0	0	0
Lewiston Marsh*	0	0	0
Totals	434	4,637	1,107

*153 acres previously included in the Pine Island WA boundary are included in the Lewiston Marsh PHG.

Sale or Exchange Parcels – A review of the property files indicated four parcels had been purchased, but 81 acres were not included within the former project boundaries. Prior Natural Resources Board approvals directed those portions of the parcels outside the project boundaries be sold or used as exchange lands. Approval of this master plan directs these parcels be retained in state ownership and be included within the adjusted project boundaries.

DNR Real Estate File #	Property	Acreage
W 409	Paradise Marsh Wildlife Area	37
W 534	Paradise Marsh Wildlife Area	8
FI 1616	Rowan Creek Fishery Area	26
FI 1555	Rowan Creek Fishery Area	10

Fishery Areas

Plan approval directs fishery project boundaries be adjusted to include parcels already owned by the Department, but outside the old project boundaries, expansions of 424 acres and contractions of 24 acres (Table 2-3).

Fishery Areas	Parcels Outside Previous Boundaries ¹	Expansions	Contractions
Rowan Creek	73	0	0
Rocky Run Creek	48	94	0
Hinkson Creek	0	227 ²	0
Lodi Spring Creek	21	103 ²	24
Roelke Creek	0	0	0
Totals	142	424	24

¹ Department owned acreage outside the previous project boundaries. Also see Sale or Exchange Parcels above.

² 10 acres of easements is included in this adjustment (public and management access).

Natural Areas

Plan approval directs the Department to establish five new and expand four existing state natural areas on 2,714 acres of state owned wildlife and fishery lands. These expansions will be overlays within existing wildlife and fishery properties. These expansions will protect rare ecosystems and species, improve habitat quality and encourage cross program and division cooperation.

This plan approval also expands the project boundary and acreage goal of Rocky Run Oak Savanna by 35 acres. This adjustment includes private lands adjacent to the state natural area and is intended to improve access, protect wetlands and enhance habitat management.

Refer to the individual property plans in the following section for specific descriptions of the new or expanded state natural areas.

Section Two: Individual Wildlife Property Plans

A variety of DNR, federal and county sources were used to estimate the cover types and land uses on or adjacent to the CCPG properties. They include existing DNR Wildlife, Fisheries, and Facilities and Lands records, Forestry WISFIRS data base, Water Division Wetland acreages and WISCLAND cover types. These data sources use different criteria for assessing habitat types and land uses so different estimates may be developed depending on the source(s) used. Also small inclusions of different cover types may be embedded within a more dominant cover type in the following acreage descriptions and related maps.

Pine Island Wildlife Area

Pine Island, at 5,499 acres, is the largest of the CCPG properties. It straddles both Columbia and Sauk Counties and lies in the floodplains of the Wisconsin River and the Baraboo River. This wildlife area stretches for nearly seven miles along the Wisconsin River and contains many natural sloughs, seasonal ponds and several large islands. All of the Pine Island maps can be found in Map Series C-1 through C-6.

Pine Island offers significant opportunities to maintain and restore oak savannas and floodplain forests. It contains the largest tract (about 1,000 acres) of contiguous public grassland in the county.

This property is very popular property for hunting, dog trialing and other recreational activities, especially bird watching. Public hunting is the most significant type of recreation and Pine Island is the most heavily used CCPG property for deer, pheasant and dove hunting. This property is also used for waterfowl, turkey and small game hunting.

Pine Island hosts a Class 1 dog training ground and a Class I dog trial ground (one of five state training /trial grounds) (**Map C-2**). The trial/training grounds are open year round, but are most heavily used from March through September. Dog trialing activities are regulated by the *Pine Island Wildlife Area Class I Field Trial Grounds & Dog Training Grounds Management Plan (PIFTA 2010) approved in 2010*. This plan permits the use of horses and ATVs during approved dog trial events and overnight camping in self-contained units by participants

Pine Island is part of the Leopold-Pine Island Important Bird Area that covers over 11,000 acres of marsh, grassland, savannas and forest straddling the Wisconsin River in Sauk and Columbia counties west of Portage. Bird watching is an increasingly popular activity on this property. It is also used seasonally for mushroom hunting, berry picking, hiking, cross country skiing and snowshoeing. Fishing and nature enjoyment by power boats and/or paddle craft are popular on the Wisconsin and Baraboo Rivers.

Camping is not allowed on the property, but unauthorized camping is occurring on the state-owned islands, sandbars, and shorelines of the Wisconsin River. Camping is a persistent, but not a significant management issue. Littering and crowding are occasional complaints on this property.

A study assessing flooding impacts on the regional transportation network could have implications for the Pine Island WA. This issue is beyond the scope of this master plan and can be addressed as needed at a later date. This master plan also did not consider the potential impacts of any changes related to the long-term status and maintenance of the Caledonia levees.

Property Goals

- Contract the project boundary (655 acres) to the north bank of the Wisconsin River to remove parcels no longer needed for goose management and parcels with residential development.
- Increase the project boundary by 231 acres to improve blocking for habitat management activities, improve public access and reduce trespass on private lands.
- Substantially increase the acreage of grassland and oak savanna.
- The PIFTA management plan shall direct the habitat and recreational management objectives and prescriptions for the 1,190 acre dog trial and training area.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-4 details the existing and desired cover types for current state owned land (**MAPS C-1 and C-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acreage Objective	% Cover
Agriculture	50	1	75	1
Grassland	940	17	1,135	21
Aspen	450	8	295	5
Oak	865	16	735	13
Oak Savanna	445	8	700	13
Central Hardwood	470	9	345	6
Upland shrub	185	3	95	2
Bottomland Hardwood	914	17	939	17
Emergent Wetland	760	14	760	14
Shrub Wetland	340	6	340	6
Developed	10	<1	10	<1
Water	50	1	50	1
Total	5,479	100	5,479	100

* 20 acres of public access easement land not managed by DNR is not included in the acreages.

Grasslands, Woods, Wetlands and Agricultural Lands: Habitat Management (3,327 acres)

Management Objectives:

- Increase the extent and the quality of the pre-settlement cover types.
- Increase the amount of open Grassland for grassland birds.
- Protect the habitat and scenic character of the Baraboo and Wisconsin River corridors.
- Phase out red pine plantings and reduce acreage of shrub wetland. Convert to oak savanna, grassland or adjacent cover types.

Management Prescriptions:

- Conduct harvests in the Bottomland Hardwoods to enhance wildlife habitat, but protect aesthetic values and minimize reed canary grass invasion. Allow natural processes to shape the character and composition of the Bottomland Hardwoods.
- Expand and manage Prairies and Grasslands to maintain open landscape favoring grassland birds and secondarily for grassland nesting ducks and pheasants.
- Actively manage the Oak Savanna to favor oaks and retain some native shrubs at low densities as cover for game species.
- Actively manage Aspen and adjacent shrub communities to provide nesting and breeding habitat for woodcock.
- Plant 10-40 acres of scattered food plots, e.g., sunflower or other suitable food crop, on the agriculture lands to encourage dove populations.
- Monitor and control invasive species as practicable.

Oak Savanna Natural Area: Native Community Management (798 acre)**Management Objectives:**

- Protect the Pine Island swamp white oak savanna communities including remnant Pine Barrens and Sand Prairie.
- Manage this site as an ecological reference area.

Management Prescriptions:

- Actively manage the canopy to favor swamp white, white and bur oak and some white pine.
- Actively manage understory and shrub layers to enhance native species and if understory augmentation is desired use local genetic material.

Floodplain Forest: Native Community Management (159 acres)**Management Objective:**

- Maintain the diversity and ecological quality of the Floodplain Forest.

Management Prescriptions:

- Use thinning and improvements cuts to improve stand vigor and structure as needed. Timber harvest management should not create conditions favorable to the introduction or spread of reed canary grass.
- Use passive management (e.g., natural recruitment) to shape the species composition and diversity of the forest.

Grasslands and Field Trial Area: Habitat Management (1,190 acres)

The Pine Island Field Trial Agreement (*PIFTA, 2010*) controls the habitat management objectives and prescriptions for the 1,190 acre dog trial area. The habitat management objectives and prescriptions may be supplemented with the General Habitat Management practices as needed.

Management Objectives:

- Increase the acreage and improve the quality of the Grasslands to enhance habitat for game and non-game grassland birds.
- Increase the acreage and quality of the oak savanna.

Management Prescriptions:

- Actively manage Aspen to provide breeding and nesting habitat for woodcock.

- Use timber harvests, fire wood sales and controlled burns to selectively remove non-oak and less desirable oak specimens to promote Oak Savanna and Grassland restoration.
- Protect the native violet (*Viola* spp.) populations used by the Regal Fritillary butterflies for feedings and egg laying as practicable.
- Consult the Important Bird Area management suggestions prior to conducting habitat management activities.
- Monitor and control invasive species as practicable.

Pine Island HQ and Field Trial facilities: Special Use Area (5 acres)

Management Objectives:

- Retain the current complement of buildings and roadways.
- Continue to host dog trial activities (including self-contained camping units), Learn to Hunt and other educational activities.

Management Prescriptions:

- Maintain the five headquarter buildings (office, maintenance garage and other outbuildings) and roadways per Department policy.
- The Pine Island Field Trial Agreement plan shall be the controlling agreement in regards to the management of the field trial activities, schedules and infrastructure use.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing buildings, service roads, gates, culverts, water control structure and dikes.

Management Prescriptions:

- Maintain the Warden cabin, storage sheds, two miles of service road, 11 gates and one water control structure.
- Update and renew infrastructure recommendations in the Pine Island Field Trial Agreement in 2016 as needed.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Promote quality hunting and traditional outdoor recreational activities and experiences.
- Provide high quality dog trial and training opportunities.
- Support Learn to Hunt programs and other educational efforts as practicable.
- Evaluate Ice Age National Scenic Trail route options on the property.

Management Prescriptions:

- Maintain the current complement of access roads and 24 native surface or gravel parking lots.
- Improve the boat ramp and expand the parking area at the Wisconsin River access site along Levee Road.
- Retain existing dog trial infrastructure and manage dog trial activities under the Pine Island Field Trial Agreement. Update and renew the habitat and recreation elements of the Field Trial Agreement plan in 2016 as needed.

- Add a carry-in canoe launch and 3-5 car parking lot off Tritz Road at the Baraboo River. As practicable, install handicapped accessible shore fishing infrastructure on the Baraboo River in coordination with the Fish Management program.
- Maintain and improve the existing nature interpretation kiosks at the grasslands as practicable.
- Monitor sand bar and island camping to assess impacts on habitat quality, trash, sanitary concerns or other management and law enforcement issues. Take action as needed.
- Collaborate with DNR Parks and Recreation, National Park Service and Ice Age Trail Alliance staff to assess trail route options at the property. Take follow-up action as appropriate.
- Collaborate with relevant state, federal and county recreational experts to assess the potential impacts of changes in flooding and levee management on recreation and habitat opportunities.
- Consult with local officials on maintenance needs of the town roads, including Levee Road.
- Add a 5-10 car parking lot to improve public access if the parcel along Highway 33 on the southeast corner of the property is acquired.
- Coordinate habitat and recreation management as well as land purchases with the US FWS Baraboo River property as appropriate.

French Creek Wildlife Area

The French Creek WA at 3,506 acres is the second largest CCPG property. This wildlife area straddles the border of Columbia and Marquette counties. It is recognized for the large, diverse wetlands dominated by sedge meadows, fens and tamaracks. The uplands are a mix of old field grasslands and oak forests. All of the French Creek maps can be found in Map Series D-1 through D-6.

Waterfowl, deer and turkey hunting are the primary recreational uses of the property. Small game and mourning dove hunting and trapping furbearing animals are also common pursuits. Pheasant hunting is popular and is primarily supported through the pheasant stocking program.

This site offers conservation opportunities of both statewide and Upper Midwest significance. It is also an important shorebird stopover site during migration periods.

French Creek is also used by hikers and birders, and especially by canoeists who enjoy exploring the marshes and waterways. Fishing is a popular activity, particularly below the dam of the French Creek impoundment. Bow fishing is gaining in popularity on this flowage.

The heavy use creates crowding during waterfowl, deer, and pheasant hunting seasons. Unauthorized horseback riding and occasional sign/gate vandalism also is occurring. Littering is a particular problem associated with firearm target shooting on the property, especially off of Wilcox Road. Off-road Vehicles (ORV) use is not allowed on this property, but soil erosion caused by ORV use is evident in the gravel pit off of Wilcox Road.

Property Goals:

- Designate the French Creek North Primary Site (1,389 acres) a state natural area.
- Expand the French Creek Fen natural area from 196 acres to 240 acres by adding high quality sedge meadows, fens, spring runs and white oak stand from the French Creek Fen Primary Site.
- Increase the acreage of Oak Savanna and Surrogate Grasslands.
- Expand the project boundary by 987 acres to expand grassland habitat for nesting ducks and pheasants.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter and as supplemented below. Table 2-5 details the existing and desired cover types for current state owned lands (**MAPS D-1 and D-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Agriculture	51	1	40	1
Grassland	545	16	556	16
Aspen	50	1	50	1
Oak Woodlands	490	14	360	10
Oak Savanna	0	0	170	5
Central Hardwood	10	<1	10	<1
Upland Conifer	25	<1	0	0
Upland Shrub	15	<1	0	0
Tamarack	140	4	140	4
Forested Wetland	36	1	36	1
Shrub Wetland	650	19	650	19
Sedge Meadows	850	24	850	24
Marsh	490	14	490	14
Water	150	4	150	4
Developed	4	<1	4	<1
Total	3,506	100	3,506	100

Wetlands, Woods, Grasslands and Agricultural Lands: Habitat Management (1,877 acres)

Management Objectives:

- Enhance the quality of the Oak Savanna and dry Prairie units for threatened and endangered species habitat.
- Improve the habitat quality of the waterfowl refuge for dabbling ducks.
- Improve navigation for hunters around the refuge.
- Provide improved habitat for woodcock.
- Increase the acreage of upland grass to improve cover and nesting success of grassland nesting ducks and provide habitat for pheasants and grassland birds.

Management Prescriptions:

- Conduct thinning/improvement cuts in red pine plantations with the goal of eventual removal and conversion to Grassland or Oak Savanna.
- Create Surrogate Grasslands on upland sites, especially future acquisitions, to develop permanent grassy cover for grassland nesting ducks, pheasants and grassland birds.
- Manage Aspen and adjacent shrub stands to provide woodcock habitat.
- Assess whether the current 240 acre waterfowl refuge in the French Creek impoundment is of sufficient size and location, and of desired habitat quality to provide the desired resting and feeding benefit for waterfowl. Complete a study by December 2017 and take actions based on study recommendations regarding habitat changes and altering the boundaries of the refuge.
- Plant food plots on a portion of the Agricultural Lands to enhance dove hunting.
- Monitor and control invasive species as practicable.

French Creek Fen Natural Area: Native Community Management (240 acres)

Management Objective:

- Manage this natural area as a Calcareous Fen preserve and as an ecological reference area.

Management Prescriptions:

- Avoid late fall/winter drawdowns of the Spring Creek impoundment to prevent mortality to hibernating turtles.
- Maintain open Fens and Sedge Meadows. Woody vegetation should be kept at low densities and to the periphery of the fens.
- Develop and/or maintain a closed canopy to protect amphibian habitat near the springs and ephemeral pools.
- Increase the amount of permanent water as practicable to enhance habitat for herptile species.
- Monitor and control invasive species as practicable.

French Creek North Natural Area: Native Community Management (1,389 acres)

Management Objectives:

- Protect the quality of the diverse wetland communities including Southern Sedge Meadow, Calcareous Fen, Southern Tamarack Swamp (rich), Shrub-carr, Emergent Marsh and springs.
- Increase the quality of the herptile habitat on 200 acres.
- Protect the Southern Tamarack Swamp (rich) forest habitat.
- Restore degraded Oak Openings and promote native understory species.

Management Prescriptions:

- Manage the Grassland and Oak Savanna habitats for endangered herptiles and grassland birds.
- Convert about 130 acres of Oak Woodlands to Oak Savanna
- Convert about 40 acres of tree lines and pine plantations to Oak Savanna and Surrogate Grassland habitat.
- Consult with ER staff to establish a maintenance regime to protect the Tamarack swamps.
- Enhance Oak Woods with thinning and improvement cuts and seed tree harvests.
- Manage water levels to maintain and enhance native wetland communities, especially open Sedge Meadows used by threatened species.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the majority of the existing service roads, gates, building, dams, dikes and water control structures

Management Prescriptions:

- Maintain the existing 5.5 miles of service roads and 11 gates. Remove one gate.
- Maintain the three dikes (collectively about 0.82 miles long) and three water control structures, one dam/spillway at the outlet of the French Creek Flowage, one dam maintenance building, and the electrical carp barrier system located on the dam.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Provide opportunities for high quality hunting experiences.
- Provide high quality experiences for non-consumptive users with an emphasis on bird observations, non-motorized boating and hiking.
- Assess the feasibility of adding handicapped accessible fishing and boat access infrastructure.
- Evaluate Ice Age National Scenic Trail route options on the property.

Management Prescriptions:

- Maintain the current public access provided by 12 parking lots, and two boat landings.
- Collaborate with DNR Parks and Recreation, National Park Service Ice Age Trail, and Ice Age Trail Alliance staff on assessing trail route options through the property. Take action as appropriate.
- Monitor and document unauthorized horseback riding and off-road vehicle use to assess impacts on habitat quality, trash, sanitary concerns or other management and law enforcement issues. Take action as needed.
- Monitor the problematic target practice activities and develop a short report with recommended actions by December 2014 to address the nuisance impacts of litter and potential safety issue at Wilcox the wildlife area and neighbors.
- Assess the feasibility of developing a mobility impaired accessible boat launch and fishing pier at the parking lot west of the County F bridge and a wildlife observation blind at a suitable site on the property. Develop recommendations by December 2015. Take action as appropriate.
- Assess the feasibility of offering nature interpretation material at French Creek landings, parking lots or wildlife observation areas by 2015. Take action as appropriate.

Mud Lake Wildlife Area

The Mud Lake WA has a diverse mix of open water, marsh and emergent wetlands partially surrounded by scattered oak woodlands and grassy uplands. The wildlife area has three flowages – Mud Lake (800 acres), Hagen Road Flowage (120 acres) and Tollefson Road Flowage (110 acres). Dikes and water control structures are used to regulate water flows and enhance waterfowl habitat. Water levels have been established for the flowages to minimize flooding on adjacent private lands. This wildlife area is the headwaters of the Rocky Run Creek.

Mud Lake WA provides excellent hunting opportunities for waterfowl, white-tailed deer, wild turkey, pheasant and other species of small game. Pheasants are stocked on the property to supplement the upland hunting opportunities. This property is heavily used and crowding can be an issue during opening weekends for waterfowl, pheasants and the nine day deer gun hunting season.

Other uses on the property include trapping of beaver, muskrat and other furbearers, and fishing for northern pike, perch and various pan fish.

Mud Lake WA is part of the larger Northern Empire Prairie Wetlands Important Bird Area (IBA) and is popular with birders during the spring migration. Madison Audubon Society and the Rio Conservation Club have erected and maintain kestrel boxes, bluebird houses, and wood duck houses on the property. The 160-acre closed area is a good location for observing waterfowl..

The impoundments are used by canoers, anglers and bird watchers. Other seasonal activities include mushroom hunting and berry picking in spring/summer/fall and snowshoeing and cross country skiing during the winter. Geocaching is an increasingly popular activity on the wildlife area.

This property has the most extensive invasive species challenges of the CCPG properties. Many upland areas are infested with multiple exotic species including buckthorn, honeysuckle, Russian olive, garlic mustard and particularly Japanese hedge parsley and wild parsnip. The native, but aggressive box elder, is also present in large quantities in the woodlands. In the wetlands, cattails are often dominant with smaller areas infested with reed canary and common reed grass.

Horseback riding is not authorized on the property, but continues to present a management challenge.

All of the maps for Mud Lake can be found in Map Series E-1 through E-6.

Property Goals

- Designate Mud Lake Forest and Ponds unit as a State Natural Area (130 acres).
- Expand the project boundary by 918 acres to increase habitat for grassland nesting ducks, pheasants and grassland birds.
- Rebuild dikes and replace the water control structures, as needed, to allow better control of water levels in the flowages to enhance the wetland habitat for waterfowl.
- Expand Oak Savanna and grassland habitats for grassland songbirds and game birds.

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-6 details the existing and desired cover types for current state owned lands (**MAPS E-1 and E-5**).

Table 2-6: Mud Lake Wildlife Area Desired Cover Types (approximate acreage)					
Cover Type	Current			Desired 50 year	
	Acres	% Cover		Acreage Objective	% Cover
Agriculture	94	4		35	2
Grassland	495	22		524	23
Prairie	43	2		93	4
Oak	458	20		441	20
Oak Savanna	0	0		65	3
Central Hardwood	10	<1		0	0
Upland Conifer	10	<1		0	0
Upland Shrub	40	2		20	<1
Swamp Hardwood	50	2		50	2
Bottomland Hardwood	28	1		0	0
Forested Wetland	30	1		30	1
Sedge Meadow	160	7		160	7
Marsh	455	20		455	19
Shrub Wetland	70	3		70	3
Developed	10	<1		10	<1
Water	330	15		330	15
Total	2,283	100		2,283	100

Wetlands, Woods, Grasslands, Shrub and Agricultural Lands: Habitat Management (1,650 acres)

Management Objectives:

- Manage for pre-settlement plant communities to enhance habitat value for game and native non-game species.
- Improve the productivity of grassland nesting waterfowl.

Management Prescriptions:

- Create larger blocks of open Sedge Meadows, Grasslands, Oak Woodlands and Oak Savanna.
- Increase the amount of permanent upland grass to improve cover and nesting success of grassland nesting ducks, pheasants and grassland birds.
- Convert all or portions of the Upland Shrub, Central Hardwoods, Upland Conifers, Bottomland Hardwoods and Oak Woodlands to Oak Savanna and Grasslands.
- Plant food plots for dove and pheasant.
- Monitor and control invasive species as practicable.

Mud Lake Forest & Ponds Natural Area: Native Community Management (130 acres)

Management Objectives:

- Manage as a closed canopy oak woodland and as an ecological reference area.
- Maintain ephemeral ponds and protect their habitat value for herptiles.

Management Prescriptions:

- Use single tree and group selection harvest as needed to maintain closed canopy Oak Woodland; leave white oak and some hickory and black cherry while removing non-oak species (red maple and other Central Hardwoods).
- Use prescribed fire, mechanical brushing, chemical application to develop desired native understory and foster oak regeneration.
- Protect ephemeral ponds during management activities.
- Monitor and control invasive species as practicable.

Empire Prairie Natural Area – Hagen Prairie Unit: Native Community Management (80 acres)

Management Objectives:

- Protect existing Dry-mesic Prairie remnant and convert current row crop land to dry-Mesic Prairie.
- Manage Hagen Prairie as an ecological reference area.

Management Prescriptions:

- Sow former row crop lands with local seed sources to promote local genetic material and create a diverse prairie community.
- Conduct prescribed burns as time and resources allow.
- Manage the wetlands according to the General Habitat management prescriptions.
- Allow agricultural activities prior to initiating phased prairie restoration.

Empire Prairie Natural Area - Mud Lake Prairie Unit: Native Community Management (13 acres)

Management Objectives:

- Protect the Mesic Prairie and manage as an ecological reference area.
- Manage oaks along the western periphery of the prairie to develop an oak savanna.

Management Prescriptions:

- Conduct prescribed burns as the principal habitat management tool and use mowing or herbicide application as needed to control woody species encroachment of the prairie.
- Develop an Oak Savanna by removing non-oaks and thinning oaks west of the prairie.
- Monitor and control invasive species as practicable.

Mud Lake Woods: Habitat Management (70 acres)

Management Objective:

- Protect and expand the semi-open canopy of mature Southern Dry-mesic Forest.

Management Prescriptions:

- Regenerate white oak and retain mast producing species (e.g., hickory and black cherry).
- Remove maple and other undesirable woody species.

- Endangered Resources (ER) and Wildlife will consult after pre-harvest invasive species removal, but prior to timber sale activities to assess the need for a rare plant or animal survey by ER staff.
- Monitor and control invasive species as practicable.

Field Areas 5a, 6a and 8c: Habitat Management (180 acres)

Management Objective:

- Improve habitat quality and natural regeneration of the Oak Woodlands.

Management Prescriptions:

- Use approved habitat management techniques to encourage oak regeneration.
- Use prescribed fire and brushing to maintain a mosaic of smaller grass and brush openings within the Oak Woodlands.

Field Areas 2 and 8: Habitat Management (160 acres)

Management Objective:

- Create a large contiguous block of Surrogate Grassland.

Management Prescriptions:

- Cut and prevent regeneration of all Bottomland Hardwood species.
- Sow area with native and introduced forbs and grasses to develop a Surrogate Grassland.
- Utilize prescribed burns, and brushing and herbicides as needed, to achieve the desired species composition and to control the regeneration of woody and weed species.

Habitat Management Infrastructure

The following supplement the general habitat objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service roads, gates, dikes and water control structures.

Management Prescriptions:

- Maintain the current 2.25 miles of primitive and lightly developed gravel service roads, nine gates, three dikes (collectively about 0.14 miles long) and five water control structures.
- Replace the water control structure and/or lower the dike at the Mud Lake Flowage to allow greater range of water level fluctuations to improve waterfowl habitat management activities.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Retain the current complement of public access roads, parking lots and boat launches.
- Improve recreational opportunities for mobility impaired individuals.

Management Prescriptions:

- Maintain the current 13 parking lots, about 1.75 miles of primitive and lightly developed gravel public access roads, and two boat landings. Replace the parking lot and carry in access boat landing on Traut Road with an improved site as shown in **Map E-2**.
- Evaluate the feasibility of adding an accessible hunting/observation blind and infrastructure. Report on the feasibility of an accessible site by December, 2015. Take action as appropriate.

Lodi Marsh Wildlife Area

The Lodi Marsh Wildlife Area is located about one mile southwest of the City of Lodi and straddles the Dane County and Columbia County border. This property contains an intact and diverse mix of wetland and upland ecosystems in a very scenic setting. The Lodi Marsh State Natural Area is a large wetland complex with numerous springs and spring runs, Southern Sedge Meadow, fen, shallow marsh, Shrub-carr with some cattail marsh and disturbed-low prairie. The principal upland habitat types are Oak Woodlands, Oak Openings, Surrogate Grasslands and a small remnant Dry Prairie.

The wildlife area provides excellent hunting opportunities for turkey, deer, squirrel, and rabbit. Pheasant hunting opportunities are supported by the Department pheasant stocking program. The ongoing grassland restoration efforts are improving the quality of the habitat for grassland birds and pheasants. Trapping for muskrat, beaver and otter is also popular at Lodi Marsh.

A 2.5-mile segment of the 1,000-mile Ice Age Trail (IAT) crosses the property and is regularly used by hikers and birders who enjoy the scenic vistas and natural setting. Other activities include morel hunting in the spring, enjoying the spring water, the occasional hearty canoe paddlers willing to portage fallen trees in the wetland and winter activities such as cross country skiing and snowshoeing.

This property has an active volunteer group that is assisting with invasive species control and native plant community restoration.

A snowmobile trail enters the property from Coyle Road and traverses the hills and marsh two miles north-west to State Highway 60. The snowmobile trail and associated wooden bridge are maintained by local snowmobile clubs.

All of the maps for Lodi Marsh can be found in Map Series F-1 through F-6. Map F-3 shows the approved project boundary for the Hawk Hill State Natural Area and it's proximity to the Lodi Marsh Wildlife Area. The approved Hawk Hill State Natural Area project is located directly across County Y from the wildlife area. No land acquisition has occurred at this natural area to date.

Property Goals

- Expand the Lodi Marsh State Natural Area from 455 acres to 655 acres to protect the Fens and other desirable wetland that lie within the existing wildlife area.
- Increase Oak Savannas and Grassland cover types while decreasing Upland Shrub acreage.
- Expand the project boundary by 719 acres to improve public access and protect habitat.
- Collaborate with partners on future Ice Age Trail route options.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-7 details the existing and desired cover types for current state owned lands (**MAPS F-1 and F-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acreage Objective	% Cover
Grassland	155	13	160	13
Dry Prairie	10	<1	15	<1
Aspen	20	2	15	1
Oak	215	18	175	14
Oak Savanna	15	1	115	10
Central Hardwood	65	5	55	5
Upland Shrub	75	6	20	2
Forested Wetland	5	<1	5	<1
Emergent Wetland	405	34	405	34
Shrub Wetland	210	18	210	18
Developed	10	<1	10	<1
Total	1,186	100	1,186	100

Lodi Marsh Natural Area: Native Community Management (655 acres)

Management Objectives:

- Maintain the Southern Sedge Meadow, Emergent Marsh, Wet to Wet-mesic Prairie, Shrub Carr, springs, and Fen communities as a diverse wetland mosaic and as an ecological reference area.
- Increase the extent and quality of the Oak Savannas and Dry Prairie ecological reference areas.

Management Prescriptions:

- Maintain open wetlands using prescribed burns and other approved techniques to achieve desired community structure and composition. Retain some native wetland shrubs at low densities for wildlife food and cover.
- Augment ground layer with species that historically would have been found on the site using seeds or plugs from local genetic material.
- Remove selected non-oak and oaks to promote Oak Savanna and Dry Prairie restoration.
- Monitor and control invasive species as practicable.

Woods, Grasslands and Wetlands: Habitat Management (531 acres)

Management Objectives:

- Expand the Oak Savanna and decrease Upland Shrub and Oak Woodlands.
- Provide habitat for woodcock.
- Increase the acreage and amount of permanent upland grass to improve cover and nesting success for grassland birds and pheasants.

Management Prescriptions:

- Actively manage the habitat types structure and extent, but passively manage the species composition unless cover type conversion is desired.
- Manage selected Aspen stands and other critical cover types in younger age classes to provide woodcock habitat.

- Maintain pheasant habitat by providing undisturbed low to medium high grasses near wetlands as cover and winter food supply.
- Continue vegetative restoration efforts to reclaim gullies left from past agricultural practices.
- Ice Age Trail segments will be routed to meet Department sustainability guidelines for trails.
- Monitor and control invasive species (e.g., buckthorn and garlic mustard) as practicable. Continue collaboration with local partners (i.e., Ice Age Trail Alliance, Friends of Greater Scenic Lodi) to control invasives and expand desired native habitats.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service road and gates.

Management Prescription:

- Maintain the 0.75 mile primitive service road and four gates.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Provide high quality recreational experience for hunters, anglers, hikers and other users.
- Maintain the existing public access parking lots and trails.
- Involve community partners in ecological restoration and IAT management activities

Management Prescriptions:

- Maintain the four existing native surface and gravel parking lots.
- Continue the ongoing collaboration with community partners on invasive species control, native community restorations and property planning efforts.
- Continue to host the IAT segment (currently 2.5 mile in length). Collaborate with staff from DNR Parks, National Park Service and Ice Age Trail Alliance as well as community partners on assessing, developing and maintaining a route through this property.

Paradise Marsh Wildlife Area

Paradise Marsh provides excellent habitat for a variety of wildlife and migratory waterfowl. This marsh is considered a satellite wetland for the Horicon Marsh. During migration periods, large numbers of waterfowl and other wetland birds feed and rest in the marsh.

This property has been extensively modified by drainage ditches, stream straightening and agricultural activities. The wildlife area was created to reduce further drainage and improve habitat conditions for waterfowl and pheasant. A 30 acre wetland flowage is maintained by a dike and water levels are managed with a water control structure.

The main recreational activities on this property include deer, waterfowl and small game hunting. It is heavily used during the gun deer seasons and overcrowding can be an issue. A population of wild pheasants provides opportunity for pheasant hunting (this property does not receive supplemental pheasants from the state game farm). Mourning dove hunting is enhanced through the establishment of sunflower food plots. Trapping of furbearing animals, such as mink and muskrat, is also popular.

Hiking and bird/wildlife watching are popular activities. Mushroom and berry picking are common seasonal activities too. Geocaching has become an increasingly popular activity at Paradise Marsh. All of the maps for Paradise Marsh are located in Map Series G-1 through G-6.

Property Goals

- Expand the project boundary by 429 acres to improve public access and habitat management.
- Restore Oak Savanna and expand Central Hardwoods and Agriculture plots.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-8 details the existing and desired cover types for current state owned lands (**MAPS G-1 and G-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acreage Objective	% Cover
Agriculture	30	<1	60	4
Grassland	385	25	370	23
Oak	70	4	70	4
Oak Savanna	0	0	40	3
Central Hardwood	90	6	105	7
Upland Shrub	80	5	10	<1
Shrub Wetland	220	14	220	14
Emergent Wetland	400	25	400	25
Marsh	280	18	280	18
Water	30	2	30	2
Developed	3	<1	3	<1
Total	1,588	100	1,588	100

Grasslands, Woods, Wetlands and Agricultural Lands: Habitat Management (1,588 acres)

Management Objectives:

- Improve the quality of the existing Oak Woodlands.
- Expand Oak Savanna and Central Hardwood by reducing Upland Shrub cover type.
- Expand food plots for doves and birds.
- Improve the productivity of habitat for grassland nesting waterfowl.
- Improve the quality of the shrub wetlands and emergent wetlands.
- Increase open water acreage in the wetlands.

Management Prescriptions:

- Enhance upland Surrogate Grassland habitat for grassland nesting ducks by seeding with a combination of native grasses and forbs and introduced grasses as appropriate.
- Use thinning and improvement cuts to improve the habitat value of Oak Woodlands and promote regeneration of oak, hickory and native understory.
- Restore two small overgrown Oak Savannas and promote regeneration of oak and native understory.
- Improve and expand Central Hardwoods stands using single tree selection, thinning and improvement cuts.
- Provide an additional 10-30 acres of wildlife food plots for doves and other wildlife.
- Use a combination of fire, chemical, mowing or other approved method to control cattail expansion and increase the open water acreage in the wetlands surrounding Beaver Creek and the small impoundment.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service roads, gates, dike and water control structure.

Management Prescriptions:

- Maintain the existing 2.0 miles of primitive and lightly developed gravel surface service roads, six gates, and 0.08 miles of dike and one water control structure.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Provide access to high quality big game, waterfowl and dove hunting opportunities and wildlife observation.
- Maintain current public access infrastructure.

Management Prescription:

- Maintain the existing eight gravel surfaced and native surfaced parking lots.
- Assess the feasibility of adding a mobility impaired wildlife viewing area/parking area.

Peter Helland Wildlife Area

Peter Helland WA consists of small patches of uplands embedded in extensive wetlands that surround the North Branch of Duck Creek. Wetlands cover about 75% of the property. The desirable wetlands include Wet Prairie, Southern Sedge Meadow, Shrub carr and forested wetlands. However, there are significant acreages of disturbed wetlands dominated by reed canary grass and cattails. The remaining 25% of this property consists of former agricultural fields planted to native and introduced grasses, scattered oak and aspen woodlots, and small fields planted to wildlife food plots or as row crops.

The Springvale State Natural Area (271 acres) is located in the north east corner of this wildlife area. It contains one of the largest Wet Prairie and Calcareous Fen complexes in the state and contains 20% (about 60 acres) of the state's known Wet Prairie.

These wetlands have been extensively disturbed by ditching, drainage and farming so this property has been the focus of large and ongoing wetland restoration projects.

Crystal Lake, located on the west side of this wildlife area, is the only natural lake on the CCPG properties. This lake is a popular fishing spot and is noted for having an over abundant bluegill population.

The property is used extensively for deer, turkey, pheasant and waterfowl hunting with the heaviest use during the nine day deer gun season. This property supports a small population of wild pheasants that is supplemented with game farm raised birds to improve hunting opportunities. Mourning dove hunting is becoming popular and food plots are planted to increase dove population and hunting success. Small game hunting is also common. Trapping is very common, especially for muskrat, mink and beaver.

Bird watching is popular due to the significant usage of this property by birds and waterfowl during migration periods. Fishing is popular at Crystal Lake and a rustic experience is provided by the current carry-in boat access and non-motorized policy at the lake.

All of the maps for Peter Helland Wildlife Area are located in Map Series H-1 through H-6.

Property Goals

- Purchase critical parcels along Highway SS needed for ongoing wetland restoration and water level management activities.
- Improve the quality of the existing forest habitats and wetlands.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-9 details the existing and desired cover types for current state owned lands (**MAPS H-1 and H-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Agriculture	30	2	60	2
Grassland	520	14	490	14
Aspen	10	<1	10	<1
Oak	170	5	160	5
Oak Savanna	0	0	20	<1
Central Hardwood	30	<1	30	<1
Upland Shrub	50	1	50	1
Upland Conifer	30	<1	20	<1
Forested Wetland	50	1	50	1
Emergent Wetland	1,711	48	1,711	48
Marsh	330	9	330	9
Shrub Wetland	570	16	570	16
Water	40	1	40	1
Developed	2	<1	2	<1
Total	3,543	100	3,543	100

Wetlands, Grasslands and Woods: Habitat Management (3,272 acres)

Management Objectives:

- Expand food plots for doves and bird species.
- Restore Oak Savanna.
- Improve the productivity of grassland nesting waterfowl.
- Improve the quality of the existing forest habitats and wetlands.
- Restore and maintain open wetlands.

Management Prescriptions:

- Expand the amount of permanent upland grass with a combination of native grasses and forbs and introduced grasses to improve cover and nesting success of grassland nesting ducks and enhance the quantity and quality of habitat for grassland birds and pheasants.
- Restore Oak Savannas (20 acres) east of Crystal Lake.
- Improve the habitat value of Oak Woodlands and promote the regeneration of oak, hickory, desired mast species and native understory species.
- Improve the Central Hardwoods stands and their habitat value using single tree selection, non-commercial thinning and improvement cuts as appropriate.
- Remove red pine plantations and fence rows. Retain white pine component for wildlife cover/food (20 acres).
- Conduct wetland restoration west of County Highway SS and continue the ongoing wetland restorations the east and west sides of Sawyer Road.
- Continue to use limited acreage for agricultural production and as wildlife food plots
- Monitor and control invasive species as practicable.

Springvale Wet Prairie Natural Area: Native Community Management (271 acres)

Management Objective:

- Maintain as a open (treeless) Wet-Prairie and Calcareous Fen reserve and manage as an ecological reference area.

Management Prescriptions:

- Use prescribed fire and other approved techniques as needed to maintain a treeless Wet Prairie and Fen. Allow natural processes to determine the species composition of these communities.
- Monitor and control the invasive species as practicable. Infestations of reed canary grass and cattails have been noted along the drainage ditches in and adjacent to the natural area.

Warmwater Aquatic Habitats: Habitat Management

Management Objectives:

- Protect the Duck Creek watershed and manage as a warmwater creek.
- Maintain the panfish fishery at Crystal Lake.

Management Prescriptions:

- Consult with Fish Management staff and other experts as needed to manage and maintain the habitats along the riparian corridor of Duck Creek. Take action as practicable.
- Passively manage the warmwater fishery in Crystal Lake.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service roads, gates, culverts, dikes and water control structure.

Management Prescriptions:

- Maintain the existing two miles of primitive surface service roads, eight gates, one culvert, one dike and two water control structure to Department standards.
- Construct a new dike and water control structure off County Highway SS for the ongoing wetland restoration efforts.
- Reconstruct the berms and spillways, and replace the water control structures as needed for the wetland restorations off Sawyer Road.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Provide high quality hunting opportunities for deer, turkey, waterfowl, pheasant, dove and other small game and trapping opportunities.
- Continue to provide a rustic fishing and non-motorized recreational experience on Crystal Lake.
- Provide opportunities for bird watching and other non-consumptive uses.
- Retain existing and add additional public access and accessible wildlife viewing infrastructure.

Management Prescriptions:

- Maintain the existing 11 gravel and native surfaced parking lots for public access.
- Retain the walk in boat access and non-motorized boating policy at Crystal Lake.
- Add two small parking lots off Highway P on the northwest and north central portions of the wildlife area.
- Passively manage large and small game populations except for the stocking of farm raised pheasants and providing food plots for doves to enhance hunting opportunities.
- Assess the feasibility of adding a mobility impaired wildlife viewing area and parking lot on the south side of Hwy P overlooking the Springvale State Natural Area. Present findings and recommendations of this assessment by December 2015. Take action as appropriate (**MAP H-2**).

Swan Lake Wildlife Area

The Swan Lake (WA) is nearly 80% wetland habitat with sizeable portions dominated by cattail marshes. The uplands consist of scattered forests (oak woodlands and aspen) and grasslands (both native grasses/forbs and introduced grass species). This wildlife area is an important shorebird stopover site during migration periods.

This wildlife area is most frequently used by deer and waterfowl hunters. Opportunities for turkey, small game hunting and trapping also exist at the property. Canoeing and fishing are popular activities along the Fox River portion of the property. The natural setting of the property provides hiking and wildlife viewing opportunities, especially for neighbors on the southeastern side of the property.

This property also has several management challenges. Target shooting is a popular activity particularly in the parking area off County P. This activity generates frequent complaints from other property users and adjacent residential developments. A sizeable number of the surrounding upland parcels have been developed and this presents a potential conflict (100 yard no hunting buffer near homes) with one of the primary uses of the property (e.g., gun hunting). Off-road Vehicle (ORV) use is not allowed on this property, but soil erosion caused by ORVs is evident in the gravel pit off County P. Littering is a major issue at the County P parking lot and the parking lot at the end of Ontario Street.

An abandoned dike and water control structure is located in the southwest portion of the marsh. Muskrat damage has rendered the dike non-functional, but it does provide foot access to the marsh. Access to this property is limited due to the expansive wetlands and limited public uplands.

All of the maps for Swan Lake can be found in Map Series I-1 through I-6.

Property Goals

- Establish three state natural areas:
 - Swan Lake Sedge Meadow and Barrens – 702 acres;
 - Swan Lake Tamaracks – 205 acres; and
 - Swan Lake Wet-mesic Prairie – 46 acres.
- Contract the project boundary at four locations by 450 acres to remove properties that have significant residential development.
- Expand the project boundary at two locations by a total of 119 acres to increase grassland habitat for duck nesting and grassland birds.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-10 details the existing and desired cover types for current state owned lands (**MAPS I-1 and I-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acreage Objective	% Cover
Grassland	90	4	109	4
Aspen	150	6	130	5
Oak	190	7	90	4
Oak Barrens	0	0	106	4
Upland Conifer	5	<1	0	0
Tamarack	20	1	20	1
Bottomland Hardwood	50	2	50	2
Emergent Wetland	1,227	50	1,227	50
Shrub Wetland	230	9	230	9
Marsh	500	20	500	20
Developed	4	<1	4	<1
Total	2,466	100	2,466	100

Grasslands, Oak Woods & Wetlands: Habitat Management (1,419 acres)

Management Objectives:

- Protect the quality and expand the extent of pre-settlement grasslands, savannas and sedge meadows.
- Improve nesting success of grassland nesting ducks.
- Provide improved grassland habitat for grassland birds.
- Improve the open water to vegetation ratio to improve habitat quality for waterfowl.

Management Prescriptions:

- Actively manage Oak Woodlands to regenerate oak, hickory and other desirable native species.
- Increase the acreage of permanent upland grass.
- Manage Aspen for woodcock and as early successional wildlife habitat.
- Remove Upland Conifer (red pine) plantations and fence rows to expand Aspen.
- Passively manage the small units of Bottomland Hardwoods along the Wisconsin River.
- Create a hemi-marsh condition (50:50 ratio of emergent vegetation to open water) by removing monotypic stands of invasive cattails as practicable. Passively manage wetland communities' species composition. Limit disturbance to minimize the spread of invasive species.
- Monitor and control invasive species as practicable.

Sedge Meadow and Oak Barrens Natural Area: Native Community Management (702 acres)

Management Objectives:

- Restore and expand the Oak Barrens and the Southern Sedge Meadow with Calcareous Fen.
- Manage as an ecological reference area.

Management Prescriptions:

- Restore and maintain Oak Barrens and Oak Openings. Use prescribed burning as the major treatment activity with mowing, herbicides and non-commercial thinning as needed to limit brush encroachment, promote oak regeneration, and achieve desired canopy structure.
- Manage Aspen for woodcock and wildlife habitat unless the goal is to remove Aspen to expand Grassland and Oak Barrens.
- Protect and expand Sand Prairie and Dry Prairie remnants. Remove brush and encroaching trees, and re-seed remnant prairies as needed to augment populations of native species. Protect and expand habitat for endangered and threatened herptiles.
- Monitor and control invasive species as practicable.

Tamaracks Natural Area: Native Community Management (205 acres)**Management Objectives:**

- Protect the quality and expand the extent of the Tamarack Swamp and Southern Sedge Meadow.
- Manage as an ecological reference area.

Management Prescription:

- Consult with ER, Forestry and other science experts as selecting the appropriate management prescriptions. Assess the effectiveness of these treatments.

Wet-mesic Prairie Natural Area: Native Community Management (46 acres)**Management Objectives:**

- Protect the quality and expand the extent of the Wet-mesic Prairie and Southern Sedge Meadow.
- Manage as an ecological reference area.

Management Prescriptions:

- Maintain an open wet-mesic prairie and sedge meadow using prescribed burns and other techniques as needed to regenerate native species.
- Protect and expand habitat for threatened herptile species.
- Remove aspen and eliminate regeneration as practicable.
- Monitor and control invasive species. Reed canary grass infestations exist on this property.

Southern Sedge Meadow Wetlands: Habitat Management (94 acres)**Management Objective:**

- Protect the quality and expand the extent of the Southern Sedge Meadow.

Management Prescriptions:

- Control encroaching shrubs.
- Protect and expand habitat for threatened herptiles.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service roads and gates.

Management Prescriptions:

- Maintain the existing two miles of primitive and lightly developed service roads and five gates.

- Assess moving the gate at Ontario Street closer to the property boundary to deter littering. Take action as necessary.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Promote high quality hunting and traditional outdoor recreational activities and experiences.
- Reduce or eliminate littering and other activities that are generating complaints or affect user/neighbor safety and enjoyment.

Management Prescriptions:

- Maintain the three existing gravel parking areas for public access.
- Add one small parking lot off County G (**MAP I-2**).
- Monitor the abandoned gravel pit at the County Highway P parking area and the parking lot off Ontario Street for littering and other activities. Assess potential management options to reduce or eliminate the target shooting littering, noise and user/neighbor conflict issues and report findings and recommendations by December 2013. Take action as appropriate.

Grassy Lake Wildlife Area

Grassy Lake lies on the western boundary of the Village of Doylestown and is 3 miles southeast of the Village of Rio. The most prominent feature is the shallow, hardwater seepage lake that supports dense stands of emergent and submergent aquatic vegetation. The wetlands and uplands provide good habitat for waterfowl and birds, including one of the largest nesting colonies of black terns in Wisconsin.

The property is heavily used for deer, waterfowl, and pheasant hunting. Trapping muskrats and other furbearing animals is significant too. Other recreational activities include hiking, cross country skiing, berry picking, wildlife viewing and canoeing. This property is considered part of an Important Birding Area.

All of the maps for Grassy Lake can be found in Map Series J-1 through J-6.

Property Goals

- Expand the project boundary by 214 acres to provide more savanna and grassland habitats.
- Improve habitat quality and wildlife corridors, especially between the state and federal lands.
- Coordinate land purchase activities with the adjacent US FWS properties.
- Add 15 acres of Grassy Lake within the Briggs easement to the existing natural area (277 acres).
- Significantly increase the acreage of Oak Savanna habitat and improve the grassland habitat quality for grassland nesting ducks, pheasants and game birds.

Habitat Management

The following habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-11 details the existing and desired cover types for current state owned lands (**MAPS J-1 and J-5**).

Table 2-11: Grassy Lake Wildlife Area Desired Cover Types (approximate acreage)

Cover Type	Current		Desired 50 year Objective	
	Acres	% Cover	Acres	% Cover
Agriculture	33	4	33	4
Grassland	187	24	187	24
Aspen	20	3	10	1
Oak	145	19	20	3
Oak Savanna	10	1	170	22
Upland Conifer	25	3	15	2
Upland Shrub	15	2	0	0
Sedge Meadow	120	15	120	15
Marsh and Open Water	215	28	215	28
Developed	9	<1	9	<1
Total	779	100	779	100

Note: Acreages include cover types for the 84 acre Briggs conservation easement.

Grassy Lake Natural Area: Native Community Management (292 acre)

Management Objectives:

- Passively manage the Marshes and Sedge Meadows as an ecological reference area.
- Protect and promote the population of black tern nesting at Grassy Lake.
- Add the 15 acre lake portion of the Briggs easement to the natural area.

Management Prescriptions:

- Allow natural processes to determine the ecological characteristics of the marsh and aquatic communities with the exceptions of controlling invasive plants and animals.
- Actively manage the Aspen stands to promote woodcock habitat as practicable.
- Consult with ER on the need for installing and maintaining nesting platforms or other management activities to promote black tern nesting. Take action as appropriate.

Oak Savanna, Oak Woods and Grasslands: Habitat Management (487 acres)

Management Objectives:

- Expand the Grasslands and Oak Savanna.
- Improve the quality of the Oak Woodlands.
- Improve the habitat quality for grassland nesting ducks, pheasants and grassland birds.

Management Prescriptions:

- Expand Oak Savanna habitat and retain best examples of Oak Woodlands. Retain some hickory, black cherry and other desirable native species in the Oak Woodlands (see Map J-5).
- Thin as appropriate and eventually harvest all red pine and convert to mixed oak and white pine.
- Conduct thinning and improvement cuts on white pine and allow natural regeneration and retain in a mixed oak and white pine community.
- Convert Upland Shrub infested with black locust to Grassland and Oak Savanna as practicable.
- Enhance the Grasslands habitat quality for nesting ducks and other game birds by removing raptor perches and predator habitat (e.g., fence rows and rock piles).and controlling brush encroachment. Retain some native brush as food and cover for game species (e.g., pheasant).
- Manage the nine (9) acre potential residential building site on the Briggs Conservation Easement as Surrogate Grassland.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the current service roads and gates.

Management Prescription:

- Maintain the existing 900 feet of primitive and lightly developed gravel service roads, two gates and pheasant stocking lanes.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objectives:

- Promote high quality opportunities for public hunting and wildlife viewing, except on the Briggs conservation easement.
- Evaluate the feasibility of adding a handicapped accessible wildlife viewing platform.

Management Prescriptions:

- Maintain the existing three gravel and native surface parking lots and boat launch.
- Continue pheasant stocking as game farm production allows.
- Monitor unauthorized horseback riding activity on the property to assess trends and environmental impacts. Take action as appropriate.
- Add signage to the Briggs conservation easement to indicate this is a management easement and is not open to the public except as indicated in the easement.
- Assess the feasibility of developing a wildlife viewing structure (e.g., platform, blind) with interpretive material. Develop recommendations by December 2015. Take action as appropriate.

Jennings Creek Wildlife Area

Jennings Creek Wildlife Area is located approximately 3 miles northeast of the Village of Rio. The property provides opportunities for hunting, trout fishing and other traditional outdoor activities. All of the maps for Jennings Creek can be found in Map Series K-1 through K-6.

Property Goals

- Expand the project boundaries and acquisition authority by 238 acres to increase public access to the trout stream, improve wetland quality and increase grassland habitat.
- Increase the acreage of Oak Savanna habitat by an estimated 60 acres..

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-12 details the existing and desired cover types for current state owned lands (MAPS K-1 and K-5).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Grassland	5	<1	5	<1
Oak	210	40	165	31
Oak Savanna	0	0	60	11
Central Hardwood	10	1	10	1
Upland Conifer	25	5	10	2
Upland shrub	5	<1	5	<1
Forested Wetland	80	15	80	15
Bottomland Hardwood	30	5	30	5
Sedge Meadow	50	9	50	9
Shrub Wetland	114	22	114	22
Developed	1	<1	1	<1
Total	530	100	530	100

In-Stream and Riparian Zone Management: Habitat Management Area

Management Objectives:

- Protect the Class 2 trout stream designation and the native brook trout stream population.
- Enhance riparian zone vegetation to improve trout habitat and woodcock habitat with secondary benefits for furbearers.

Management Prescription:

- Conduct riparian zone vegetation management in the shrub wetlands to improve sunlight reaching the stream and protect stream banks from erosion.

Woods and Wetlands: Habitat Management (530 acres)

Management Objective:

- Promote the quality of pre-settlement wetland and forest communities and expand the extent of the Oak Savanna.

Management Prescriptions:

- Use Oak Savanna and Oak Woodlands management prescriptions to improve the quality of the habitat and enhance the natural regeneration of oak, hickory and other desirable native species.
- Conduct thinning and improvement cuts on red pine to increase value with eventual removal and conversion to Oak Woodlands.
- Conduct thinning and improvement cuts on white pine and central hardwoods stands to improve habitat value and encourage natural regeneration.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service/access roads.

Management Prescription:

- Maintain the existing 1,900 feet of lightly developed gravel roads that serve as both service roads for habitat management and public access.

Public Use Management

The following supplement the general public use objectives and prescriptions described in Chapter Two, Section One - General Recreation Management and Use (page 40).

Management Objective:

- Provide high quality deer and waterfowl hunting, and outdoor recreation opportunities.

Management Prescriptions:

- Maintain the existing two gravel surface parking lots.
- Manage riparian vegetation to improve angling access along Jennings Creek.

Columbus Wetlands Public Hunting Grounds

Columbus Wetland Public Hunting Grounds (PHG) is located approximately one mile west of the City of Columbus along the Crawfish River. This 248 acre property primarily consists of wetlands and floodplain forests with limited oak woods and brushy uplands. All of the maps for the Columbus Wetlands PHG can be found in Map Series L-1 through L-5.

Property Goal

- Improve the quality and extent of the Oak and Upland Shrub communities as practicable.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-13 details the existing and desired cover types for current state owned lands (**MAPS L-1 and L-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Grassland	35	14	0	0
Oak	35	14	35	14
Upland Shrub	40	16	75	30
Sedge Meadow	10	4	10	4
Forested Wetlands	14	6	14	6
Shrub Wetland	100	40	100	40
Marsh	14	6	14	6
Total	248	100	248	100

Woods, Grasslands & Wetlands: Habitat Management (248 acres)

Management Objective:

- Promote pre-settlement plant communities and improve habitat for pheasant and waterfowl.

Management Prescriptions:

- Regenerate Oak Woodlands and retain desirable mast species, such as hickory and black cherry.
- Passively manage the wetlands.
- Passively convert grassland to Upland Shrub.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Provide deer and waterfowl hunting options and outdoor recreation opportunities.

Management Prescription:

- Maintain the existing gravel surface parking lot for public access

Dekorra Public Hunting Grounds

The Dekorra PHG is located eight miles northwest of the Village of Poynette off County V just west of Interstate 90/94. The property is primarily a mix of woods and grasslands. All of the maps for the Dekorra PHG can be found in Map Series L-1 through L-5.

Property Goal

- Enhance the Oak Woodlands and establish Oak Savanna habitat.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-14 details the existing and desired cover types for current state owned lands (**MAPS L-1 and L-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Grassland	50	19	60	23
Oak	155	72	95	43
Oak Savanna			50	24
Wetlands (emergent/forested)	20	9	20	10
Developed	1		1	
Total	226	100	226	100

Woodlands, Wetlands & Grasslands: Habitat Management (226 acres)

Management Objective:

- Promote pre-settlement plant communities with a significant increase in Oak Savanna.
- Improve habitat quality for turkey and other game species.

Management Prescriptions:

- Follow Oak Woodlands and Oak Savanna management prescriptions to improve habitat quality. Regenerate oak, hickory and other desirable native species
- Passively manage the wetlands.
- Actively manage the Grasslands to expand the extent and improve habitat quality for grassland birds and game species.
- Monitor and control invasive species to the extent practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing service road and gates.

Management Prescriptions:

- Maintain the lightly developed gravel service roads used by the DNR and the two gates.

- Allow continued access along the conveyed easement roadway to the wastewater treatment plant to the Town of Dekorra and DOT.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Provide deer and waterfowl hunting options and outdoor recreation opportunities.

Management Prescription:

- Maintain the existing gravel surface parking lot for public access

Duck Creek Public Hunting Grounds

The Duck Creek Public Hunting Grounds (PHG) is located four miles east of Wyocena on County.G. It is a 159 acre property of primarily open habitat with woods shrub wetlands along Duck Creek. All of the maps for Duck Creek PHG can be found in Map Series L-1 through L-6.

Property Goals

- Enhance habitat value of pre-settlement plant communities.
- Establish a Class II dog training area

Habitat Management

These habitats will be managed in accordance with the Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-15 details the existing and desired cover types for current state owned lands (**MAPS L-1 and L-5**).

Cover Type	Current		Desired 50 Year Objective	
	Acres	% Cover	Acres	% Cover
Agriculture	55	35	40	25
Grassland	54	34	72	45
Aspen	3	2	3	2
Central Hardwood	17	10	14	9
Shrub Wetland	30	19	30	19
Total	159	100	159	100

Woods, Grasslands & Wetlands: Habitat Management (159 acres)

Management Objectives:

- Manage for pre-settlement plant communities and protect the Duck Creek watershed.
- Improve habitat for woodcock, pheasants and doves.

Management Prescriptions:

- Actively manage and increase the extent of Grasslands.
- Manage Aspen for woodcock.
- Passively manage the Central Hardwoods and Shrub Wetland for wildlife habitat.
- Utilize a portion of the agriculture lands as food plots to enhance dove populations.

Infrastructure and Public Use Management

The following supplement the general habitat infrastructure and recreation use objectives and prescriptions described in Chapter Two, Section One, the General Property Administration and Policies (Page 44) and General Recreation Management and Use (Page 40).

Management Objective:

- Provide hunting and fishing opportunities and a Class 2 dog training grounds.

Management Prescriptions:

- Maintain the existing gravel surface parking lot for public access
- Establish a Class II dog training area of approximately 50 acres. Dog training area will be closed to training during the nesting season (April 15-July 31).

Hampden Wetlands Public Hunting Grounds

The Hampden Wetland Public Hunting Grounds (PHG) is located 7 miles southwest of Columbus. This hunting ground is 229 acres and primarily consists of marshy potholes surrounded by shrub wetlands. All of the maps for the Hampden Wetlands PHG can be found in Map Series L-1 through L-5.

Property Goal

- Enhance habitat value of pre-settlement plant communities, particularly for pheasant habitat.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-16 details the existing and desired cover types for current state owned lands (**MAPS L-1 and L-5**).

Cover Type	Current		Desired 50 year Objective	
	Acres	% Cover	Acres	% Cover
Grassland	11	5	11	5
Oak	8	3	8	3
Sedge Meadow	58	26	58	26
Shrub Wetland	152	66	152	66
Total	229	100	229	100

Wetlands, Woods and Grasslands: Habitat Management (229 acres)

Management Objective:

- Promote pre-settlement plant communities and improve habitat quality for game species.

Management Prescriptions:

- Actively manage habitats with an emphasis on improving pheasant habitat..
- Monitor and control invasive species as practicable.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Provide quality opportunities for hunting and wildlife observation.

Management Prescription:

- Maintain the existing native surface parking lot for public access.

Lewiston Marsh Public Hunting Grounds

This property is located 2 miles west of the City of Portage on County O. This 153 acre property consists of shrub wetlands, central hardwoods and young aspen. All of the maps for Lewiston Marsh PHG can be found in Map Series C-1 through 6 for Pine Island WA.

Property Goal

- Promote pre-settlement plant communities and improve the quality of the wildlife habitat.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-17 details the existing and desired cover types for current state owned lands (**MAPS C-1 and C-5**).

Cover Type	Current		Desired 50 year Objective	
	Acres	% Cover	Acres	% Cover
Aspen	30	20	30	20
Central Hardwoods	30	20	30	20
Shrub Wetland	33	22	33	22
Sedge Meadow	60	38	60	38
Total	153	100	153	100

Woods, Wetlands & Grasslands: Habitat Management (153 acres)

Management Objective:

- Promote pre-settlement plant communities and improve the quality of the wildlife habitat.

Management Prescriptions:

- Allow natural processes (passive management) to guide plant succession.
- Actively manage the extent and structure of the shrubs using prescribed burns, mowing and herbicides as resources allow.
- Manage Aspen for woodcock habitat.
- Monitor and control current populations of invasive species to the extent practicable.
- Assess the potential for creating an emergent marsh by building a dike to create a small impoundment. If pursued obtain a plan variance and take action as necessary.
- Assess easement off State Highway 16 for habitat management purposes (DNR access only).

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Provide quality hunting and wildlife observation opportunities.

Management Prescription:

- Maintain the small parking lot for public access on County O.

Individual Fishery Area Plans

Rocky Run Creek Fishery Area

Rocky Run Creek originates in the Mud Lake Wildlife Area and flows 19.5 miles to the Wisconsin River. The fishery area is located between U.S. Highway 51 and State Highway 22 in a broad valley bordered by steep slopes that provides a semi-wild setting for users. The uplands primarily consist of oak forests and grasslands with extensive brushy wetlands dominated by alder and willow along the stream. The Rocky Run Oak Savanna state natural area is located adjacent to and partially overlies this fishery area.

About eight miles of the creek flow through the project area with the upper six miles designated as Class 2 trout water and the lower two miles Class 3 trout water. Brown trout is the dominant trout species in the creek, but brook and rainbow trout as well as many other native fish species are found in the stream. Over 90 springs enter this stretch of creek increasing base flow and stabilizing water temperatures. Rocky Run Creek is a low-gradient stream and substrate for spawning limits natural reproduction of trout.

The primary recreational uses of the property are deer, turkey and small game hunting and trout fishing. Birding is popular, especially in the Oak Savanna portions of the property. Hiking, cross country skiing and snowshoeing are also enjoyed on the property. Mountain bike and horseback riding are not allowed on this property, but there is continuing evidence of these activities occurring at this fishery area.

Maps for the Rocky Run Creek Fishery Area can be found in Map Series M-1 through M-6.

Property Goals

- Increase the project boundary and acreage goal by 94 acres.
- Expand acreage and enhance quality of the Oak Savanna and Grassland habitats.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-18 details the existing and desired cover types for current state owned lands (**MAPS M-1 and M-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Grassland	190	26	200	27
Oak Woodlands	185	25	175	24
Oak Savanna	65	9	95	13
Upland Conifer	30	4	0	0
Upland Shrub	5	1	5	1
Forested Wetland	85	12	85	12
Shrub Wetland	111	15	111	15
Sedge Meadow	60	7	60	7
Water	5	<1	5	<1
Developed	1	<1	1	<1
Total	737	100	737	100

In-Stream and Riparian Zone Management: Habitat Management

Management Objective:

- Protect and expand the quality and extent of the Class 2 and Class 3 trout waters.

Management Prescriptions:

- Install new and maintain existing bank rip rap, bank stabilization and fencing, as well as in-stream habitat structures such as boom covers and brush deflectors as resources allow.
- Remove willow and tag alder along a minimum of 1,500 linear feet of riparian habitat.

Oak Woodlands, Grasslands and Wetlands: Habitat Management (276 acres)

Management Objective:

- Promote pre-settlement plant communities to improve the habitat value of Grasslands, Oak Woodlands, Oak Savannas and wetlands.

Management Prescriptions:

- Use prescribed burning and other approved techniques to limit brush encroachment and improve habitat quality.
- Manage the oak cover types to regenerate oak, hickory, desired mast species and desirable understory species.
- Remove red pine plantations and convert to Oak Savanna and Grassland.
- Manage the dry, sandy areas as grasslands to mimic Dry Prairie and Sand Prairie as practicable.
- Monitor and control invasive species as practicable.

Rocky Run West Oak Savanna and Wetlands: Native Community Management Area (160 acres)

Management Objectives:

- Improve habitat quality and extent of the Oak Savanna and Grasslands to provide high quality habitat for herptiles.
- Improve the quality and character of the Oak Woodlands.
- Protect the mosaic of Southern Sedge Meadow, Shrub Carr and Calcareous Fen.

Management Prescriptions:

- Conduct prescribed burns and timber harvests to expand the Oak Savanna and Grasslands.
- Actively manage the Oak Woodlands to regenerate oak, hickory, desired mast trees and understory.
- Conduct thinning and improvement cuts to reduce the extent of white pine plantation, but allow natural regeneration of white pine to provide continuing wildlife cover and food.
- Augment ground layer vegetation with locally sourced seeds to achieve the desired native species composition and structure.
- Harvest red pine plantations and convert to Oak Savanna and Grasslands.
- Passively manage the species composition of wetlands and limit disturbance to prevent the spread of invasive species, especially reed canary grass.
- Monitor and control invasive species with a priority on this unit.

Rocky Run Oak Savanna Natural Area: Native Community Management Area (301 acres)

Management Objectives and Prescriptions – See Rocky Run Oak Savanna State Natural Area

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Retain the existing habitat management infrastructure.

Management Prescriptions:

- Maintain the existing 4.4 miles of primitive service roads for trout stocking, habitat management purposes and fire management.
- Maintain the dike and water control structure at the 25 acre impoundment on the western portion of the property.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objectives:

- Promote high quality trout fishing, hunting and traditional outdoor recreational experiences.
- Improve access to the property.

Management Prescriptions:

- Maintain the existing five gravel and native surface parking lots.
- Allow continued use of the existing snowmobile trail segment that traverses the property from east to west between State Highway 22 and Dunning Road.
- Monitor mountain bike and horseback riding usage trends.
- Add additional parking if property acquisition occurs. Add a five car parking lot off of Phillips Road if the land purchase occurs.

Rowan Creek Fishery Area

Rowan Creek is a 16.8 mile stream that flows westward through the Village of Poynette to the Wisconsin River. The four miles of creek upstream from Poynette are classified as Class 1 trout waters and the lower eight miles (Poynette downstream to County Trunk Highway J) are designated Class 2 trout waters. Natural brown and brook trout reproduction is occurring in Rowan Creek, but to sustain the current fishery and meet angling pressure stocking is necessary.

Significant efforts to protect and improve trout habitat have occurred over the last 30 years. These efforts include extensive efforts to control riparian vegetation, rip rap and stabilize banks, fence the fish area and install in-stream habitat structures such as boom covers and brush deflectors.

The recreational management priority for Rowan Creek is protecting and enhancing the trout fishing experience. This fishery area also provides opportunities to hunt, trap, hike, cross country ski, berry pick, and view wildlife.

Maps for the Rowan Creek Fishery Area can be found in Map Series N-1 through N-6.

Property Goals

- Enhance up to 2,000 linear feet of stream habitat.
- Increase Oak Savanna and Grassland habitat and remove all red pine plantations.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-19 details the existing and desired cover types for current state owned lands (**MAPS N-1 and N-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acreage Objective	% Cover
Grassland	40	5	40	5
Oak	105	16	105	16
Oak Savanna	20	3	40	6
Upland Conifer	27	4	7	1
Upland Shrub	18	3	18	3
Bottomland Hardwood	130	20	130	20
Swamp Hardwood	24	4	24	4
Forested Wetlands	25	4	25	4
Shrub Wetland	80	12	80	12
Sedge Meadow	180	28	180	28
Water (ponds)	1	<1	1	<1
Developed	1	<1	1	<1
Total	651	100	651	100

In-Stream and Riparian Zone Management: Habitat Management

Management Objective:

- Maintain the Class 1 and Class 2 trout stream designation for Rowan Creek.

Management Prescription:

- Enhance and improve 2,000 linear feet of stream with standard riparian and in-stream habitat development practices.

Wetlands, Woods and Grasslands: Habitat Management (651 acres)

Management Objectives:

- Expand the extent and quality of Oak Savanna.
- Improve the quality of the Oak Woodlands.

Management Prescriptions:

- Maintain and restore Oak Woodlands and Oak Savanna using prescribed burns and other approved techniques to limit brush encroachment.
- Conduct thinning and improvement cuts in both white and red pine with complete harvest of red pines within next 15 years. Convert red pine to Oak Savanna or Oak Woodlands as practicable.
- Retain the aesthetic of a mature white pine canopy along the Pine Island loop trail.
- Conduct thinning or improvement cuts as needed to enhance the wildlife and aesthetic value of Swamp and Bottomland Hardwoods.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Maintain existing infrastructure for trout stocking, habitat and fire management activities.

Management Prescription:

- Maintain the existing 1.75 miles of primitive service roads, two bridges and six gates.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objectives:

- Maintain current service roads, trails and public access points.
- Improve handicap accessible fishing opportunities.

Management Prescriptions:

- Maintain the existing six gravel surface parking lots and allow foot access for the public along the 1.75 miles of primitive service roads.
- Maintain the 1.75 mile Pine Island trail as a lightly developed trail. Collaborate with the Village of Poynette on maintaining the connection between the Village and the Department's trail.
- Continue to host the existing north/south snowmobile trail on the eastern part of this property. Trail route changes or additional segments must meet the routing criteria in Chapter Two – Section One of the General Property Administration Section (page 47) of this plan.

- Monitor unauthorized mountain biking activity on the property to assess trends and environmental impacts.
- Collaborate with community partners and the Village of Poynette to assess the feasibility of adding mobility impaired fishing access infrastructure for trout fishing. Initiate a master plan variance if a handicap accessible fishing structure is proposed for Department land.

Hinkson Creek Fishery Area

Hinkson Creek Fishery Area is located about two miles northwest of the Village of Poynette. Hinkson Creek is about six miles long and is a tributary of Rowan Creek. An abundance of springs maintains water temperatures capable of supporting a high quality brook trout fishery. Over 600 acres of marsh adjacent to the creek protect the stream from direct runoff coming from the bordering agricultural fields. The property is used for trout fishing, and deer and turkey hunting.

Maps for the Hinkson Creek Fishery Area can be found in Map Series N-1 through N-6.

Property Goals

- Maintain the Class Two trout stream classification.
- Expand the project boundary and acreage goal by 227 acres along the stream to increase public access (minimum of 8,000 feet of additional stream frontage), maintain a wildlife corridor, and improve habitat management coordination with the US FWS property upstream of this property (**MAP N-6**).
- Obtain 20 acres of stream easement to provide fishing access (**MAP N-6**)

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-20 details the existing and desired cover types for current state owned lands (**MAPS N-1 and N-5**).

Cover Type	Current			Desired 50 year	
	Acres	% Cover		Acres	% Cover
Agriculture	6	3		6	3
Grassland	31	13		31	13
Aspen	46	20		44	20
Oak	20	9		22	9
Central Hardwood	5	2		5	2
Sedge Meadow	12	5		12	5
Shrub Wetland	68	29		68	29
Marsh	12	5		12	5
Forested Wetland	32	14		32	14
Developed	1	<1		1	<1
Total	233	100		233	100

In-Stream and Riparian Zone Management: Habitat Management Area

Management Objective:

- Maintain the Class 2 trout stream designation and the high quality brook trout fishery.

Management Prescription:

- Enhance 1,500 feet of stream with standard riparian and in-stream habitat practices for trout.

Wetlands, Woods and Grasslands: Habitat Management (233 acres)

Management Objectives:

- Manage for pre-settlement cover types.
- Improve habitat quality for game and non-game species.

Management Prescriptions:

- Allow natural processes (passive management) to guide plant succession.
- Manage Aspen stands for woodcock habitat.
- Conduct thinning and improvement cuts in red pine plantations with goal of removal and conversion to Oak Woodlands as practicable.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Maintain existing infrastructure needed for habitat management activities.

Management Prescription:

- Maintain the existing 2,600 feet of primitive and lightly developed gravel service roads and one gate to provide access for trout stocking, habitat management and fire management purposes.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Maintain a high-quality experience for trout anglers.

Management Prescription:

- Enhance fishing opportunities by adding in-stream habitat, stocking fish and brushing banks to improve angler access.
- Maintain current access provided by the two graveled parking areas.

Lodi Spring Creek Fishery Area

The Lodi Spring Creek Fishery Area consists of scattered parcels totaling about 53 acres of state owned land and 6 acres of easements. The fishery area stretches along Lodi Spring Creek from Goeres Park in the City of Lodi to about 2.5 miles downstream. A 21 acre parcel of this property provides access to Bohlmann Branch Creek, a tributary of Lodi Spring Creek. The property is used for trout fishing as hunting opportunities are extremely limited due to the small size of the scattered parcels and proximity to homes.

Maps for the Lodi Spring Creek Fishery Area can be found in Map Series **O-1** through **O-6**.

Property Goals

- Maintain the Class Two Trout Stream classification.
- Expand the project boundary and acreage goal by 103 acres to provide a minimum of 6,000 feet of additional stream frontage for public access and trout habitat management. (**MAP O-6**).
- Contract the boundary by 24 acres within the City of Lodi (**MAP O-6**).
- Install a mobility impaired accessible fishing platform with path if practicable.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-21 details the existing and desired cover types for current state owned lands (**MAPS O-1** and **O-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Upland Brush	11	21	0	0
Mixed Central Hardwood & Oak	0	0	11	21
Forested Wetland	6	11	6	11
Sedge Meadow	36	68	36	68
Total	53	100	53	100

In-Stream and Riparian Zone: Habitat Management Area

Management Objectives:

- Protect and maintain the Class 2 trout stream designation and native brook trout populations.
- Enhance riparian zone vegetation to improve trout habitat.

Management Prescriptions:

- Improve trout habitat by adding in-stream habitat improvement structures, protecting streambanks, reconfiguring stream sections affected by channelization, protecting buffer lands adjacent to the stream to limit surface runoff, and protecting near stream groundwater recharge zones as resources allow.
- Conduct riparian zone vegetation management to improve sunlight penetration and limit bank erosion as needed.

Wetlands and Woods: Habitat Management Area (53 acres)

Management Objective:

- Manage for pre-settlement plant communities.

Management Prescriptions:

- Allow natural processes (passive management) to guide plant succession.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Maintain existing infrastructure for trout stocking and habitat management activities.

Management Prescription:

- Maintain the existing service bridge (Bohlmann Branch), 300 feet of access road and one gate.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objectives:

- Provide a high-quality experience for trout anglers.
- Improve public access to the scattered units of this property, particularly for trout fishing.
- Assess the potential for a mobility impaired trout fishing site on the fishery area.

Management Prescriptions:

- Maintain the existing gravel parking lot at County J and the one bridge.
- Add a small parking lot at Hwy 60 access road for public access to Bohlmann Branch.
- Manage riparian vegetation to improve angling access along Lodi Spring Creek and Bohlmann Branch.
- Collaborate with community partners and City of Lodi to assess the feasibility of siting mobility impaired fishing access infrastructure along the stream. Potential sites include Goeres Park or at the parking area off County J. Initiate a master plan variance if a handicap accessible fishing structure is proposed on Department managed land.
- Continue to host a segment of the existing regional snowmobile trail.

Roelke Creek Fishery Area

Roelke Creek (Class I trout stream) and Middle Branch Duck Creek (Class 3 trout stream) flow through this 40 acre fishery area in the Town of Wycocena. No fishery habitat infrastructure has been added and public access is provided by parking on the side of the road along Waters Road or Schleismann Road. Maps for the Roelke Creek Fishery Area can be found in Map Series L-1 through L-5.

Property Goal

- Maintain the existing trout stream classifications.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-22 details the existing and desired cover types for current state owned lands (**MAPS L-1 and L-5**).

Cover Type	Current		Desired 50 year	
	Acres	% Cover	Acres	% Cover
Grassland (powerline ROW)	5	12	5	12
Oak	14	35	14	35
Bottomland Hardwood	11	28	11	28
Shrub Wetland	10	25	10	25
Total	40	100	40	100

In-Stream and Riparian Zone Management: Habitat Management

Management Objective:

- Retain the Class 1 (Roelke Creek) and Class 3 (Duck Creek) trout stream designations.

Management Prescription:

- Protect and improve in-stream and riparian habitats as resources allow.

Wetlands and Woods: Habitat Management (40 acres)

Management Objective:

- Promote pre-settlement plant communities and improved habitat quality for wildlife.

Management Prescription:

- Allow natural processes (passive management) to guide plant succession.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Maintain current uses and access to the property.

Management Prescription:

- Follow general public use management guidelines.

State Natural Area

Rocky Run Oak Savanna Natural Area

This natural area is located about 2.5 miles south of Wycocena on State Highway 22. This property consists of a 164 acre stand alone state natural area and 301 acres as an overlay within the adjacent Rocky Run Creek Fishery Area.

The property cover types include oak savanna and grasslands with important opportunities for Oak Barrens and Dry Prairie management and restoration. More than 100 species with prairie affinities, including many rare species, have been recorded at this site. The variations in topography, shading and soils create a mosaic of habitats for many ground layer species.

Rocky Run supports notable concentrations of rare species and one of only seven sites in the state that provide the needed habitat for herptile restoration efforts.

This state natural area is used for hunting, hiking, skiing, nature enjoyment and berry picking. Mountain biking and horseback riding are not allowed on this property, but these uses are occurring. They are a concern because of the potential impacts to fragile soils, steep slopes and sensitive lichen species.

All of the maps for the Rocky Run Oak Savanna can be found in Map Series M-1 through M-6.

Property Goals

- Expand the project boundary and acreage goal by 35 acres
- Enhance the quality and extent of the Oak Savanna and Prairie communities.

Habitat Management

These habitats will be managed in accordance with the General Habitat Management Objectives and Prescriptions described in Section One of this Chapter or as supplemented below. Table 2-23 details the existing and desired cover types for current state owned lands (**MAPS M-1 and M-5**).

Cover Type	Current			Desired 50 year	
	Acres	% Cover		Acres	% Cover
Grassland	210	45		180	39
Prairie	0	0		35	7
Oak Woodland	60	13		60	13
Oak Savanna	105	23		130	28
Central Hardwood	10	2		0	0
Upland Conifer	20	4		0	0
Shrub Wetland	60	13		60	13
Total	465	100		465	100

Oak Savanna Natural Area: Native Community Management (465 acres)

Management Objectives:

- Manage the site as an Oak Savanna reserve and as an ecological reference area.
- Protect and expand habitat for herptile species on remnant Dry and Sand Prairies, and Oak Savannas and Woods.

Management Prescriptions:

- Actively manage the Oak Savanna using prescribed burns and other authorized prescriptions identified. Oak overstory management activities should be adjusted to account for the density and quality of the oak overstory and focus on regenerating oak, hickory, desired mast trees and other desirable canopy and understory species.
- Augment ground layer vegetation with seeds or plugs from local sources to achieve the desired native species composition and structure.
- Manage dry, sandy habitats to support endangered and threatened herptile populations.
- Remove the 20 acres of red pine plantations and 10 acres of Central Hardwoods and convert to Oak Savanna and Grasslands to create larger habitat blocks.
- Monitor and control invasive species as practicable.

Habitat Management Infrastructure

The following supplement the general habitat infrastructure objectives and prescriptions described in Chapter Two, Section One and the General Property Administration and Policies (Page 44).

Management Objective:

- Maintain existing infrastructure needed for habitat management activities.

Management Prescription:

- Maintain the existing 2,400 feet of primitive service road for trout stocking, habitat management purposes and fire management.

Public Use Management

The following supplement the general recreation objectives and prescriptions described in Chapter Two, Section One – General Recreation Management and Use (Page 40).

Management Objective:

- Maintain a high-quality experience for property users.

Management Prescriptions:

- Maintain current access provided by the two graveled parking areas.
- Maintain the existing snowmobile alignment unless biotic surveys indicate realignment is warranted.

CHAPTER THREE

Supporting Information

The background and supporting materials for the Columbia County Property Group (CCPG) master plan are incorporated by reference and can be viewed on the web at dnr.wi.gov key words “master planning”. This chapter contains an updated version of the FINDINGS AND CONCLUSIONS from the *CCPG Regional and Property Analysis*.

Individuals interested in learning more about the CCPG properties and the underlying ecological and socio-economic context are encouraged to read the supporting material in the *Rapid Ecological Assessment for the Columbia County Planning Group Second Version* (WDNR ER-810, June 2010) and the *Regional & Property Analysis for the Columbia County Planning Group* (WDNR Pub #059).

The *Regional & Property Analysis* and the FINDINGS AND CONCLUSIONS found below focused on the seven largest wildlife areas, the two largest fishery areas and the Rocky Run State Natural Area. To expedite the master planning process of state properties and two smaller wildlife areas, four public hunting grounds and three small fishery areas were added to the master plan. As a result, the acreage figures in the *Regional & Property Analysis* and the master plan differ. Importantly, the major recreational and ecological management, goals, objectives and prescriptions are similar regardless of the size of the property.

Findings and Conclusions

This section summarizes the major findings and conclusions from the Columbia County Planning Group (CCPG) Regional and Property Analysis. The Findings and Conclusions identified key issues and helped guide the development of this master plan by highlighting significant opportunities and limitations of these properties.

CCPG Properties

The CCPG properties consist of fourteen wildlife areas (22,229 acres), five fishery areas (1,714 acres) and one stand alone state natural area (164 acres). Six existing state natural areas consisting of 2,545 acres are overlays within the boundaries of these wildlife and fishery areas. These properties are primarily located in Columbia County, but three properties cross county borders into Dane (Lodi Marsh), Sauk (Pine Island), and Marquette (French Creek) counties.

Ecological Significance and Capability

Regional Context

The CCPG properties are representative of the Central Sand Hills Ecological Landscape, which is comprised of glacial moraines covered by glacial outwash. The region is characterized by fire-adapted ecosystems consisting of scattered forests, savannas, prairies, wetlands and grasslands populated with diverse game, non-game and rare species. Wetlands, such as fens, sedge meadows, and tamarack swamps, are well-represented here and harbor many sensitive plant and animal species. The CCPG lies at a transition between an agriculture-dominated landscape with large population centers to the south and east and sparsely populated, forested landscapes to the north and west.

The Central Sand Hills present unique opportunities to preserve and manage extensive wetlands composed of Marsh, Wet-mesic Prairie, Wet Prairie, Calcareous Fen and Southern Tamarack Swamps. Significant opportunities exist to restore degraded wetlands by re-establishing pre-settlement water levels where feasible and managing for species that prefer a matrix of Surrogate Grasslands, Sedge Meadow, Shrub-carr and Savanna habitats. In addition, the region is a priority area for identifying, restoring, expanding and connecting remnant Oak Barrens and Oak Openings. The goal is to manage for a mosaic of Oak Forest, Oak Woodland, Oak Opening, Prairies and native or Surrogate Grassland patches along a successional gradient. Preserving mature oak forest patches within this matrix is desired too.

The continental divide separating the Mississippi and Great Lakes Basins runs through Columbia County. Surface waters in the central and southern portion of the county drain to the Mississippi Basin primarily through the Wisconsin River. Surface waters in the northern portion of the county drain to Lake Michigan through the Fox River. The county has a diverse mix of surface waters including large rivers, smaller warmwater rivers and streams, coldwater streams, natural lakes and large impoundments on the river systems. The CCPG fishery areas provide an important opportunity to protect and enhance several high quality coldwater trout streams.

Property Opportunities and Limitations

The CCPG properties have significant cold and warmwater fisheries, large open wetlands, upland and lowland forests, savannas, prairies, grasslands, and populations of rare species situated in the diverse landscape of this region. The major threats to the biodiversity of these properties include ecological simplification, habitat fragmentation, altered ecological processes, changes in surface and groundwater systems, and a growing array of aquatic and terrestrial invasive species.

This section focuses on the most significant opportunities for protecting high quality and/or rare ecological landscapes, many of which are fire-adapted natural communities. Protecting and restoring the habitats at the landscape level promotes the widest variety of plant and animal species. The following discussion describes the major ecological attributes of the CCPG landscapes, the opportunities for threatened, rare and endangered species, and closes with the threats posed by invasive species.

Open Wetlands

The CCPG has a diverse array of high-quality wetlands including: Calcareous Fen, Emergent Marsh, Southern Sedge Meadow, Wet Prairie and Wet-mesic Prairie. It is rare to have such large (i.e., over 1,000

acres) intact wetlands in the southern part of the state that are not dominated by invasive species. Several of these large, open, mixed emergent wetland complexes, such as at French Creek and Swan Lake Wildlife Areas, contain regionally important wetlands. These wetlands provide valuable shorebird stopover sites and habitat for breeding grassland and marsh birds, rare reptiles, amphibians and invertebrates. Opportunities exist to protect and enhance many of these wetlands and to provide more extensive habitat connections with the upland grassland communities. Of the sixteen ecologically significant Primary Sites found on the CCPG properties, eight contain high-quality wetlands and sedge meadows.

While many of the CCPG wetlands remain high-quality due to a lack of invasive species and minimal impacts from draining (e.g., French Creek), others have been heavily impacted by ditching and grazing (e.g., Peter Helland). Opportunities exist to improve these sites through invasive species management and limiting further disturbances.

Oak Savannas

The properties offer significant management opportunities for the restoration and expansion of oak savanna remnants to enhance the habitat for numerous threatened and endangered species and Species of Greatest Conservation Need. Specifically, major opportunities are present at Pine Island, French Creek, Swan Lake and Lodi Marsh Wildlife Areas to restore and/or maintain oak savanna communities. Restoration opportunities also exist on other CCPG properties, but they are limited from an ecological landscape perspective due to the limited size of the areas suitable for restoration and the management effort needed to maintain the savannas.

Wildlife Habitat

These properties provide a variety of high-quality habitats for both common wildlife species as well as rare and sensitive species. Primary game species include white-tailed deer, eastern wild turkey, and ring-necked pheasants. These properties also have significant potential for improved habitat quality and increased capacity to support common wildlife species.

In addition to the wetland, preserving the mosaic of savanna and grassland habitats, oak communities (e.g., ranging from savanna, barrens, openings, open woodlands to closed canopy forests) to flood plain forests will enhance wildlife habitat values at several properties, especially at Pine Island, French Creek and Mud Lake Wildlife Areas. The oak communities are particularly valuable because they provide valuable mast, nesting and foraging habitat for game and non-game species.

Grasslands and Sensitive Bird and Wildlife Habitat

Grassland bird species are exhibiting the most significant declines of any suite of bird species in Wisconsin and across the Midwest. The CCPG presents opportunities to support viable populations of several bird species that require large grasslands with high quality nesting habitat. Grassland birds would benefit by expanding Surrogate Grasslands (a mix of native and introduced grass species) and conducting fire management through ecotones.

Several of the CCPG properties and Primary Sites have quality grasslands that support several conservative grassland obligate species. These species have the potential to increase in density and

potentially improve nest productivity if the open grasslands are maintained and connected to open wetlands.

The Pine Island Wildlife Area Grassland Primary Site offers management opportunities for providing a mosaic of large open grasslands for birds with small pockets of shrubby habitats and early successional forests for game species. Acoustical surveys indicate good quality bat habitat is present on this site and throughout the Pine Island Wildlife Area. Maintaining existing cover types (prairie, savanna, and wetland) can help to protect the six species of bats that were identified during the REA (DNR, 2010b) spring/fall movement and summer residency period surveys.

Fish Communities

Rowan Creek and Rocky Run Creek Fishery Areas protect critical coldwater habitat and provide fishing access to native brook trout and naturalized brown trout. These streams sustain viable populations because of significant groundwater inputs that maintain the coldwater temperature regimes needed by trout. Supplemental stocking of trout occurs where the in-stream habitat limit trout natural reproduction or fishing pressure affect populations. Significant opportunities for enhancing and rehabilitating disturbed stream habitat to improve trout habitat exist on these properties.

Long-term concerns include nutrient loading to both cold and warm water fisheries and groundwater pumping that reduce groundwater inputs to these streams. Protecting wetlands, spawning habitat and minimizing impacts from invasive species, such as carp, zebra mussels and Eurasian milfoil, will be needed to maintain desired game and native species abundance and diversity in the warmwater fisheries.

Reptile and Amphibian Habitat

Reptile and amphibian populations have declined significantly in Wisconsin over the last few decades due in large part to habitat modification and fragmentation. There are significant opportunities on the CCPG to protect and sustain populations of certain species. In particular, management opportunities exist at the French Creek Wildlife Area to provide the shaded environment and protect the springs that provide key habitat for a variety of reptiles and amphibians. There are also management opportunities to increase quality reptile habitat at Rocky Run Fishery Area. In addition, the CCPG provides crucial habitat for three threatened and endangered reptile species and presents an excellent opportunity for the conservation of one of these species, the Blanding's turtle, due to an abundance of habitat and the presence of dispersal corridors between areas suitable for habitation.

Invasive Species

Invasive species are a current and growing threat to native communities. If not managed, they have the potential to significantly harm the general value and fitness of the habitats on all of the properties. Future plans should place a priority on the inventory, monitoring and managing of invasive species.

The major invasive species currently on the CCPG properties include: buckthorn, garlic mustard, honeysuckle, spotted knapweed, Japanese hedge parsley, black locust, and reed canary grass. The Peter Helland WA wetlands are significantly infested with reed canary grass.

Recreational Significance and Capability

Regional Context

The CCPG properties are centrally located and readily accessible to several of the largest metro areas within Wisconsin and the Midwest (e.g., Milwaukee, Madison, Chicago and the Twin Cities). All of the properties are within a one hour drive of 500,000 to 1,000,000 people and those in the eastern third of Columbia County are within an hour drive of 1,000,000 to 2,000,000 people.

The CCPG is close to high population growth areas in southern and southeastern Wisconsin. In Columbia County alone the population is projected to grow by 21% over the next 30 years. This population growth could significantly affect the recreational use on these properties. Population growth and water consumption could also impact land uses and resource utilization (e.g., greater use of groundwater could decrease discharge to local trout streams). The goal of the master planning process is to manage the CCPG so they will continue to provide high-quality, traditional outdoor experiences in an increasingly developed, fragmented and populated landscape.

These properties currently provide excellent hunting opportunities for upland game and waterfowl as well as wildlife observation. Regional demand for these wildlife-related activities is likely to increase usage on these properties. As the user population shifts toward an older demographic over the next 10-20 years, it is anticipated improved accessibility will be needed to accommodate the expected growth in outdoor activities such as walking and wildlife viewing.

Hunting

Recreational users have a significant opportunity to enjoy hunting experiences on properties with quality habitat and abundant wildlife. These wildlife areas are heavily used for upland game and waterfowl hunting and trapping. All properties are heavily used for deer hunting, especially during the nine day gun season.

While overcrowding does not tend to be an issue during the spring turkey season, it can be an issue during the fall deer and waterfowl seasons. Pine Island is the most heavily used property for deer, pheasant and dove hunting, with Mud Lake seeing heavy use for pheasant and deer hunting as well. French Creek has the most waterfowl hunters, followed closely by Mud Lake. Peter Helland also has many hunters during the different hunting seasons. Conflicts between hunters and non-hunters are not frequent as most non-hunters are aware of the hunting seasons.

Requests have been made by neighbors near Rowan Creek to limit hunting to archery only.

Target shooting at the Swan Lake WA and French Creek WA is extremely popular, but extensive littering and noise issues and some safety concerns are serious and ongoing concerns.

Fishing

The surface water resources in the CCPG offer both high quality warmwater and coldwater sportfishing opportunities. Pine Island provides access to the Wisconsin River and has an improved boat ramp suitable for launching small paddle craft to motorized craft. The Wisconsin River has an excellent fishery for walleye, sauger, smallmouth bass, channel and flathead catfish.

The two major Fishery Areas (Rocky Run and Rowan Creek) and four smaller properties (Lodi Spring Creek FA, Hinkson Creek FA and Roelke Creek FA and Jennings Creek WA) all contain coldwater streams that support trout fisheries. These trout streams range from Class 1 (natural reproduction), Class 2 (supplemental stocking) to Class 3 (totally supported by stocked fish). Recent changes to wild source stocked fish have improved the populations and encouraged natural reproduction.

Boating and Water-based Activities

The region is a popular destination for water-based activities and many CCPG properties offer good opportunities for fishing and non-motorized boating. Canoeing is popular at Mud Lake, French Creek and Pine Island. There is a need to increase the number of access points for non-motorized boating on the CCPG properties and to improve the Pine Island trailer boat launch on the Wisconsin River.

Birding

Birding and wildlife viewing are popular activities on the extensive open wetlands that are regionally significant and the diverse grasslands and oak woodlands of the CCPG properties. Columbia County is located in the Southern Savanna Region of the Great Wisconsin Birding and Nature Trail (WDNR 2008) and contains many exceptional birding sites. Specifically, the Northern Empire Prairie wetlands, Pine Island savanna, and French Creek marsh/grasslands have been recognized as Wisconsin Important Bird Areas (IBAs), a designation reserved for select areas that are extremely important to bird life.

Hiking, Cross country Skiing and Snowshoeing

Regionally, hiking, walking for pleasure and sightseeing are among the activities of highest demand by recreational users. All CCPG properties see some hiking use throughout the year. Rowan Creek and Lodi Marsh are the only properties with designated hiking trails and these trails are heavily used year round.

The Ice Age National Scenic Trail (IAT) is the premier hiking venue in the region. A 2.5 mile section of the IAT is located in Lodi Marsh. IAT planners will be looking at Pine Island and French Creek as potential sites for future trail segments. Currently, an active habitat management partnership has been developed between the DNR and volunteers associated with the Ice Age Trail Alliance and the Friends of Greater Scenic Lodi. Opportunities exist to connect and enhance trail infrastructure within the CCPG, but any expansion will need to consider ecologically sensitive sites, compatibility with other major users, the potential to spread invasive species, soil suitability and long-term maintenance issues.

Cross country skiing and snowshoeing also occur on most properties and are likely to increase in usage.

Many of the CCPG properties offer limited potential to develop longer loop trails (e.g., greater than 3 miles) because the upland parcels are often small and non-contiguous.

Dog Training and Trials

The Pine Island Class 1 dog training and Class I dog trial grounds are open year round. Increasingly, local residents are bringing their dogs to Pine Island to run or walk their pets. Complaints of dog trial participants forcing others (dog walkers, dog trainers) to leave the area persist. There has been little request to provide dog training opportunities on other CCPG properties.

Motorized Sports

Segments of regional snowmobile trails cross the following wildlife areas (Lodi Marsh, Peter Helland and Duck Creek) and fishery areas (Rowan Creek, Hinkson Creek and Rocky Run). The trails and associated wooden bridges that cross Rocky Run, Lodi Marsh and Rowan Creek are maintained by local snowmobile clubs. Requests have been made to add a snowmobile trail through the western portion of Rowan Creek. Issues that require coordination between department staff and snowmobile clubs include soil erosion and damage to vegetation along snowmobile trails.

ATV use is currently prohibited on all properties due to the combination of wet or erodible soils and sensitive ecological communities, except at the Pine Island Class I dog trial area during events. ATV and other off-road vehicle uses are generally not compatible with the primary purpose of these wildlife and fishery areas.

Horseback Riding and Mountain Biking

Horseback riding and mountain biking are not authorized uses on the CCPG properties with the exception of horses being allowed at the Class 1 Dog Training and Trial Grounds at Pine Island for the express purpose of dog training and dog trials. Despite this prohibition there is evidence of horseback riding at Mud Lake, French Creek and Rocky Run, and mountain bike usage at Rocky Run and Rowan Creek. These activities are occurring in state natural areas and there is concern about damage to sensitive resources. Regional recreation studies show a need for additional trails, but the potential for trails on the CCPG properties is limited because of the predominance of wet soils and limited contiguous uplands. Opportunities for providing horse and bike use on the properties are further limited by the requirement (NR 1.51) that non-primary uses not significantly detract from the primary purposes of the property.

Camping

Overnight camping in self-contained units is allowed at Pine Island by permit for participants at the dog trial grounds as stated in the Pine Island Field Trial Agreement.

There is also evidence of camping, though prohibited, at Pine Island WA and other islands and seasonal sandbars in the Wisconsin River. Campers assume the practice is acceptable because it is allowed downstream on islands in the Lower Wisconsin State Riverway.

Other Recreation Activities

Pine Island, Mud Lake, Paradise Marsh and Rowan Creek are popular with geocachers and many properties are heavily searched for morels each spring and berries throughout the summer.

Summary

The CCPG properties contain many ecologically significant communities including diverse cold and warmwater fisheries, open wetlands, upland and lowland forests, savannas, prairies, grasslands, and populations of rare species, all situated in the diverse landscape of the region.

From a regional perspective, the CCPG can continue to provide diverse natural communities containing high quality habitat for common wildlife species and critical habitat for many rare and special concern species. These habitats range from large open wetlands and grasslands needed for nesting success and

sustaining viable wildlife populations to forest types ranging from Floodplain Forests to upland Oak Woodlands and imperiled Oak Savanna communities.

These habitats provide regionally significant opportunities for outdoor recreation, particularly deer, turkey, waterfowl and pheasant hunting. Wildlife-viewing will continue to be a popular activity with rich opportunities for watching waterfowl, shorebirds and grassland birds. Many of the CCPG properties are well suited to provide lightly developed, non-motorized recreation experiences such as hiking, cross country skiing, and canoeing.

All of the CCPG properties are within one hour drive of between 500,000 to 1,000,000 people and those in eastern Columbia County are within a one hour drive of up to two million people. The population in southern Wisconsin and Columbia County continues to grow and current trends in outdoor recreation indicate there will be increased pressure to provide for a growing and diverse spectrum of users with quality recreational experiences. This pressure could increase even further depending on factors such as population and economic growth as well as transportation energy prices.

The use and management of these fish and wildlife properties is governed by their official designation which can limit or exclude certain recreational pursuits. Thoughtful planning and management will be needed to maintain high quality wildlife and fishery habitat while also providing for increased demand for a broader array of recreational experiences from an increasing number of users.

Information Sources and References

Acreages estimates in this master plan were generated from several web based intranet data systems. All acreages for existing Department properties were derived from the Department's Bureau of Facilities and Lands Land Records System.

Boundary adjustments and cover type acreages were derived from several data bases including the DNR Lands Division Land Records system, DNR Forestry Division WisFIRS, DNR Water Division surface water and fisheries data, and Endangered Resources state natural areas. Soils information was taken from the NRCS Web Soil Survey. The Columbia County Interactive Web Tool was referenced repeatedly for information about land ownership and prime agricultural soils.

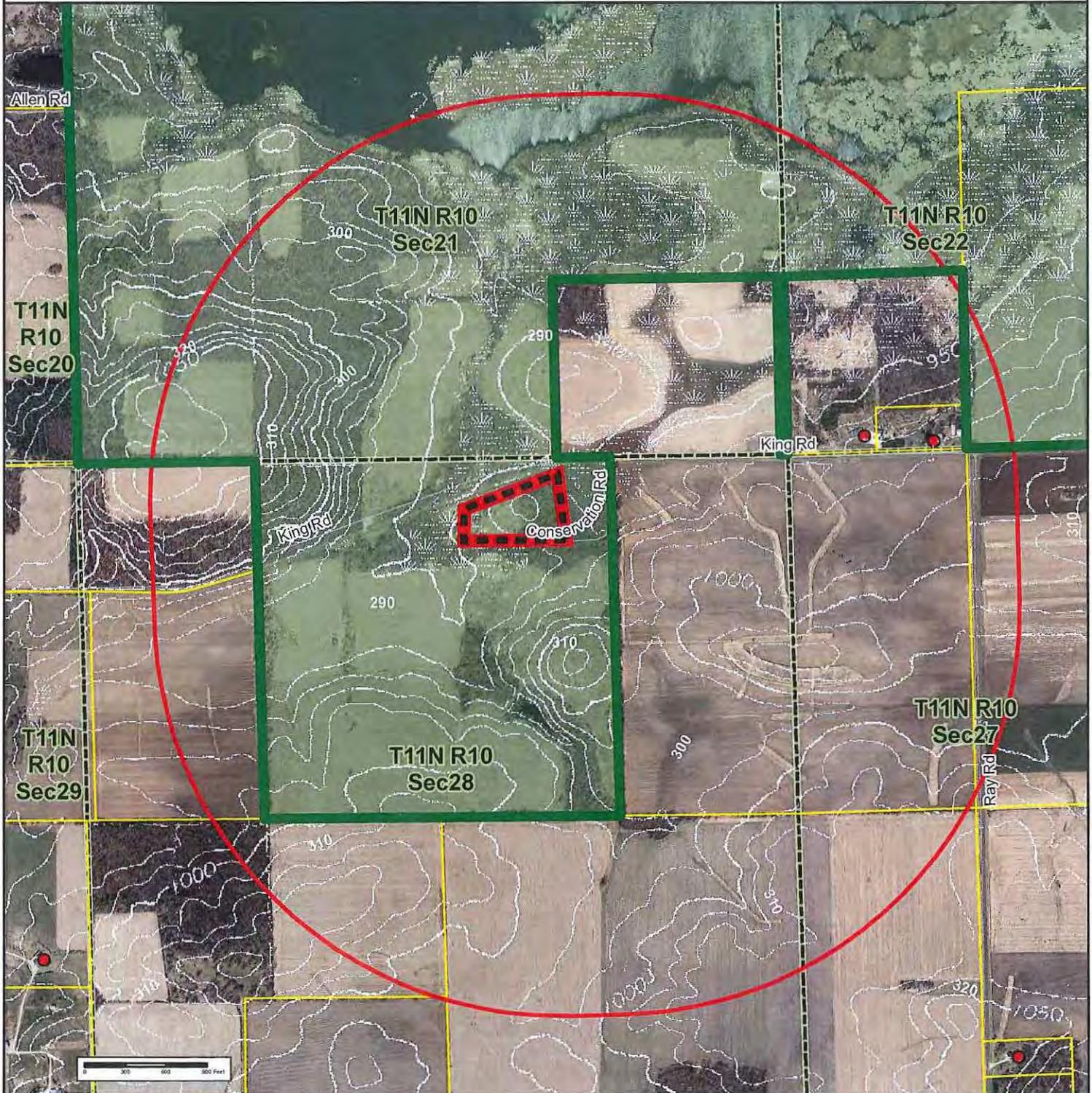
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Mud Lake Wildlife Area - King Rd.

T11N R10E Sec 28, Columbia County



- Subject
- 1000yd. Buffer from possible shooting range site
- DNR Fee Title Land
- DNR Easement Land
- State Natural Area
- Structures
- County Tax Parcels (Merged by Owner)
- Soil Wetland Indicators
- Section Line
- White lines are contours from USGS Topo Quad

Mar 11, 2014 kmh
 Real Estate Section
 Bureau of Facilities and Lands

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Shooting Ranges in Wisconsin

Introduction. The Wisconsin Department of Natural Resources (DNR) has a long history of promoting safe and accessible shooting opportunities for residents and visitors. This history includes a commitment to providing ranges on public lands and a shooting range grant program to assist with maintenance and development on private ranges in exchange for some public access. There are estimated to be over 400 shooting ranges in Wisconsin of which between 30 and 35 are on public land (state, county, or municipality). Five of these public ranges are located in the southeastern third of the state where the majority of the population live.

The public ranges are generally heavily used and several are in need of repair and/or maintenance work. Recent renovations to five public ranges have been completed with at least another dozen in line to be considered in the coming years.

In keeping with its long commitment for shooting opportunities, the Hunting and Shooting Sports Coordinator has developed this strategic plan in consultation with the DNR Office of the Secretary and staff from the bureaus of Law Enforcement, Wildlife Management, Facilities and Lands, and Remediation and Redevelopment. The primary objectives of this five-year strategic plan are to:

- Prioritize shooting range work
- Provide guidance for accessing and focusing available funding toward needs identified at ranges

Current Opportunity. With an estimated 1.7 million firearm owners in Wisconsin and over 400 ranges, including only five public ranges in the southeastern third of the state, there is need for expanded public shooting opportunities.

Vision. In order to maintain and expand recreational shooting opportunities and Wisconsin's hunting heritage and the economic impact those activities have, we will increase opportunities for shooting in a safe environment within a reasonable travel distance for participants and in a location intended for recreational shooting.

Funding Sources. Funding for range projects is available from several sources including public funding from the Pittman-Robertson (PR) grant and private funding from groups such as the National Rifle Association, and the National Shooting Sports Foundation. Furthermore, because the PR grant revenues are taxes paid by shooters and hunters on ammunition and equipment, more people safely using ranges will provide Wisconsin DNR with increased funding.

Goals.

Actions Goal 1: Improve and increase public access to quality, safe shooting opportunities at well designed, safe ranges.

1. **Renovate existing.** Evaluate, prioritize, and implement range renovations at public ranges. Priorities are as follows:
 - a) Renovate, maintain, and build public ranges located within 50 miles of LaCrosse, Eau Claire, Milwaukee, Kenosha, Waukesha, Madison, Janesville, Appleton, or Green Bay.
 - b) Increase public access at private ranges located in the above area through the Shooting Range Grant Program.
 - c) Renovate and maintain public ranges anywhere in Wisconsin.
2. **Plan for future.** Ensure that new shooting ranges are considered in master planning efforts on department lands. (see criteria below)
3. **Site and build new.**
 - a. Identify locations and build new public shooting ranges as budgets and priorities permit.
 - b. Consider identifying suitable locations and purchasing an option to purchase while range siting process is ongoing.

4. **Restore grant program.** Re-start the shooting range grant program (s. NR 50.17) in FY2013. See attached grant program
5. **Enlist partners.** Work with partners to develop agreements for range maintenance at all public land ranges if possible.
6. **Lease where possible.** Evaluate leasing public access to existing ranges as an alternative to building ranges.
7. **Share information.** Inform the public about range availability and locations with media releases, web pages, apps, and social media.
8. **Evaluate annually.** Annually review this strategic plan and adapt as needed.

Actions Goal 2: Decrease target shooting at non-range sites on public lands where necessary.

Actions:

1. Address unsafe target shooting situations on DNR land.
2. **Continue** focus on Goal 1, making adequate shooting opportunity available.
3. **Restore.** Work with partners to clean up unauthorized shooting ranges.
4. **Inform.** Provide shooters at these sites with information about where they should be shooting.

Goal 3: Implement sound environmental stewardship plans for publicly owned and funded ranges.

Actions:

1. **Manage appropriately.** Follow best management practices recommendations from organizations such as the National Shooting Sports Foundation and the US Environmental Protection Agency.
2. **Dispose properly.** Follow EPA's Best Management Practices for Lead at Outdoor Shooting Ranges.
3. **Reclaim lead.** Demonstrate the feasibility and cost effectiveness of lead reclamation at both rifle and shotgun ranges.

Actions Goal 4: Encourage sound environmental stewardship of ranges not under state management.

Actions:

1. **Inventory.** Inventory existing ranges by county.
2. **Adhere to standards.** Encourage range owners and operators to follow best management practices recommendations from the National Shooting Sports Foundation's Environmental Aspects of Construction and Management of Outdoor Shooting Ranges.
3. **Dispose properly.** Encourage range owners and operators to follow EPA's Best Management Practices for Lead at Outdoor Shooting Ranges.
4. **Reclaim lead.**
 - a. Education/communication with non-publicly owned ranges to promote the feasibility and cost effectiveness of lead reclamation.
 - b. If possible, work with ranges shooting over water or wetlands to manage the shot-fall zone, re-orient the range, and/or reclaim the lead.

Existing opportunities. There are four types of public shooting opportunity in Wisconsin, listed in order of permanence from most to least:

1. Publicly owned and operated ranges open to the public. These ranges are owned and operated by all units of government; the main criterion is that they are publicly owned. These opportunities are most limited in the southeastern quarter of the state and making more available is a high priority for the DNR.
2. Public access obtained through the Shooting Range Grant Program. These leases extend for 20 years. It is important to note the number of years remaining on the lease and the amount of public opportunity when considering the permanence of this shooting opportunity.
3. DNR leases of public use at private ranges. These opportunities may extend for a period of months to years but can be terminated or not renewed by either party.

4. Private ranges open to the public at their own discretion. These opportunities are subject to elimination at any time.

Guidance for DNR property managers.

1. General. Most of the populous areas of the state are not near a public shooting range (Figures 1. and 2.) Planning and siting a new public shooting range sites in southeastern Wisconsin between Green Bay, Kenosha, Janesville, and Madison as part of acquisition and master planning is a high priority. Developing outdoor public rifle and handgun shooting opportunities is the top priority. Demand for trap and skeet shooting appears to be growing as well and can be considered in the master planning process where staff and infrastructure are supportive. Property managers should look to partner with local clubs to enhance opportunity. Public archery ranges are becoming more popular and should be considered also.

According to recent surveys by the National Shooting Sports Federation, approximately 30% of Wisconsin residents own firearms. Providing 50 shooting station-days per week (5 days X 10 shooting stations) for 30 weeks (fair weather) per year results in 1,500 shooting stations-days per year in the 100,000 person radius. If 10% of firearm owners use a public range near where they live, meeting this objective will provide each of them with about a half-day of range time per year.

2. Acquisition Feasibility Study- In shaded counties and outside of the 100,000 resident buffer (Figure 1.); acquiring property to build a range is a high priority. If a parcel is located where establishing a range fits within the development criteria, inform the local land leader and the hunting and shooting sports coordinator.
3. Master Planning - If there is not a public rifle and handgun range within the radius of 100,000 residents surrounding the property, building a range will be considered in the property master plan.
 - a. If the property is in a shaded county, a range should be considered. However, if the property is within the 100,000 resident buffer (Figure 1.), the need for another range should be determined in cooperation with the local DNR property manager and the Hunting and Shooting Sports Coordinator.
 - b. If there are fewer than 20 public shooting days at privately owned ranges in the county (includes trap, rifle, or handgun) and the county is shaded, building a range will be considered in the property master plan.
 - c. If there is a public range within 30 miles (Figure 2.) and the property lies within a 100,000 resident buffer (Figure 1.) of another public range, a range can be considered for the property based on public input and compatible uses but is not a high priority.

Examples:

Property is in northern Dodge County. Northern Dodge County is outside of the 100,000 resident radius of other public ranges and Dodge County is shaded. Constructing a range in northern Dodge County will be considered in the master planning process.

Property is in western Oneida County: Western Oneida County is within both the 30 mile and 100,000 resident radii of other publicly owned ranges. A range can be considered for the property based on public input and compatible uses but consideration is not required.

Property is in southwest Dane County: Southwest Dane County is within the 100,000 resident radius of Yellowstone Lake range. However, the county is shaded and Yellowstone Lake range is heavily used. Consult with local property manager and the Hunting and Shooting Sports Coordinator about siting a range.

Figure 1.

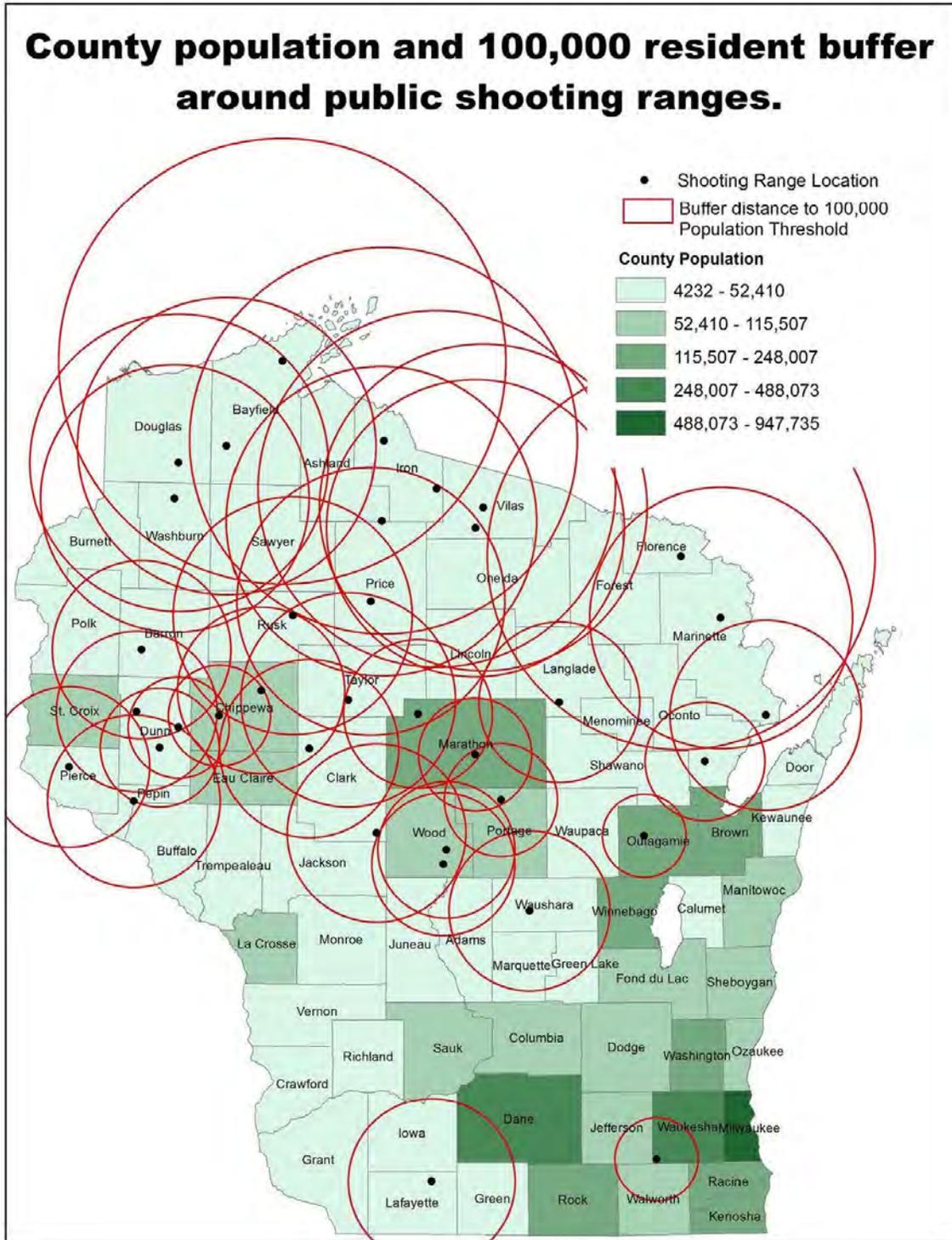
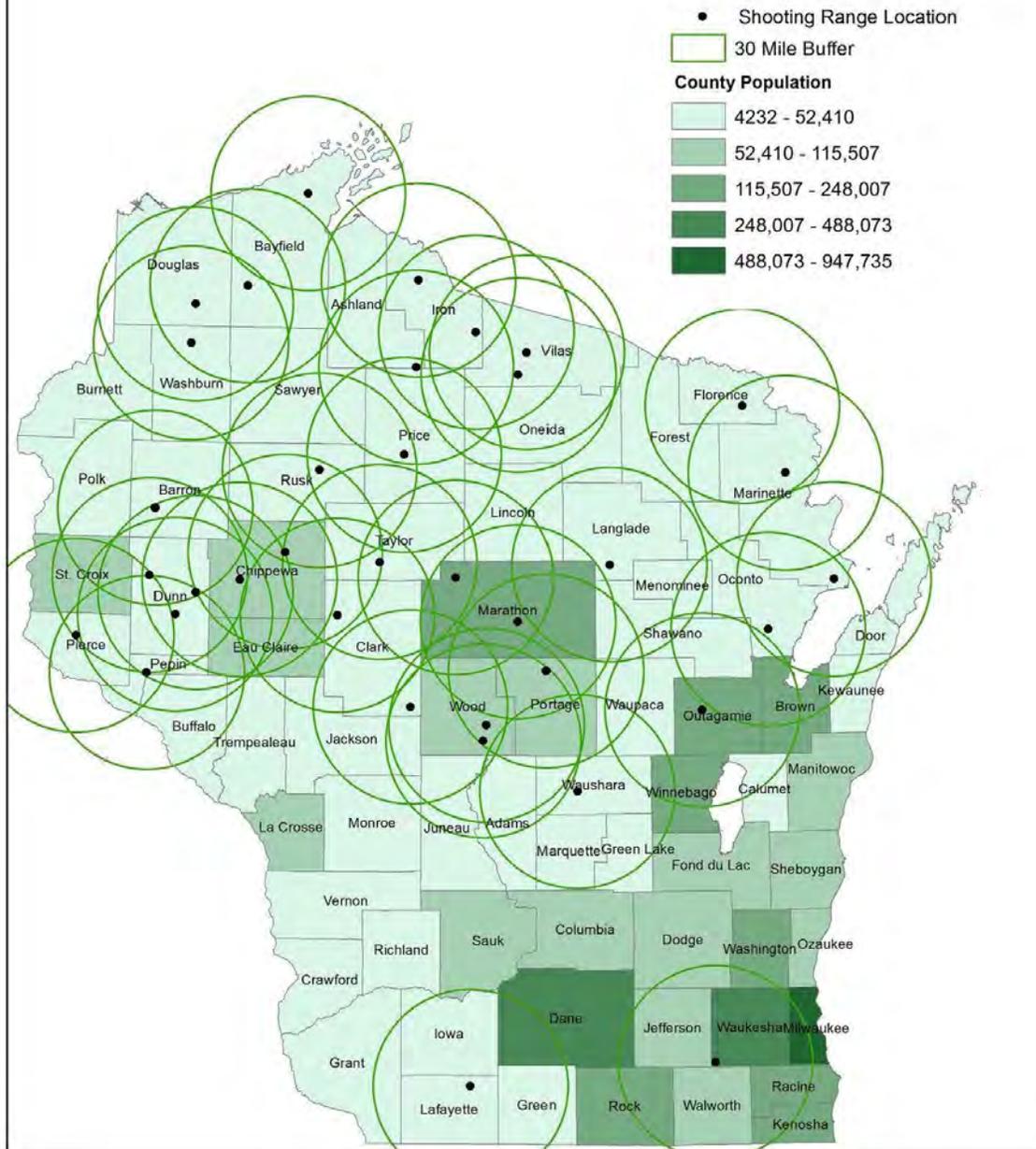


Figure 2.

County population and 30 mile buffer around public shooting ranges



Where to Shoot in Wisconsin. See the DNR web page with links to ranges offering public access:
<http://dnr.wi.gov/education/outdoorSkills/shootingRanges/>

The Wisconsin Shooting Environment and Identification of Needs

Americans, in general, view shooting sports as acceptable. According to a nationwide study conducted by Responsive Management¹ in 2006, 79% of Americans approve of recreational shooting, with most of them *strongly* approving. Responsive Management research also found that 63% of respondents indicated shooting sports perfectly acceptable today. Each year, millions of Americans participate in shooting sports, including target shooting, archery, bow hunting, sporting clays, trap/skeet shooting, and hunting.

Responsive Management (2006) found that the most popular shooting sport is hunting, closely followed by recreational target shooting with a rifle. This study showed that people in the Mid-west participated at a higher rate than elsewhere in the country. An estimated 18.4% of adults in the mid-west participate in some type of target shooting, or an estimated 800,000 people in Wisconsin. There are over 350 shooting ranges in Wisconsin. Assuming even distribution of the ranges relative to the shooters, each range would have to serve over 1000 shooters. However most ranges are seasonal or limited in terms of number of shooters or open only to members resulting in an increased demand at the public ranges.

Responsive Management (2010) found that among hunters, opportunities to shoot with a friend or at a shooting range are reported as situations that would increase participation in the shooting sports. Responsive Management research indicates that the most important reasons for participating in any of the shooting sports (other than hunting) typically include honing skills, having fun, and to be with family and/or friends.

Shooting ranges are essential to the future of hunting and the shooting sports. People need affordable places reasonably close to home to learn and practice safe handling of firearms. Hunters' needs are the same for places to site-in and practice with their firearms. Of the ranges on public land, the majority are not staffed. Several others are staffed and operated by a contractor concessionaires, volunteer groups, and/or county employees.

Public access to shooting opportunities in Wisconsin are particularly limited in the southern half of the state with only three DNR managed ranges south of State Highway 10 to serve well over half of the population. Further, in 18 southern counties target shooting on DNR lands is prohibited, increasing the pressure on off-range shooting public lands where target shooting is legal and demonstrating the need for increased access to shooting ranges. One of the three public ranges in southern Wisconsin (Waushara County) was renovated in spring 2012, and the other two (Yellowstone Lake in Lafayette County and McMiller in Waukesha County) were upgraded in 2013. Projects continue on public shooting ranges around the state.

In northern Wisconsin there are at least 29 shooting ranges on public land and these generally also receive heavy use although shooting outside of an established range is permitted in all northern counties. Two maintenance projects were completed in northern Wisconsin in 2013: Snaketrack in Iron County and Caywood in Vilas County.

¹ Responsive Management is an internationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. Our mission is to help natural resource and outdoor recreation agencies and organizations better understand and work with their constituents, customers, and the public.

Establishing and maintaining shooting ranges on public land is sound environmental management as well. Shooting ranges provide an established and managed location for shooting which provides a safer and manageable alternative to simply shooting on a public land. Since most shooting ranges on public land are managed and maintained by local partners, and lead abatement can be easily performed at an established range, having a managed shooting range on state property can be a preferred alternative in terms of safety and environmental stewardship.

The National Rifle Association, National Shooting Sports Foundation, and EPA all encourage operators of shooting ranges to adopt best management practices and/or environmental stewardship plans for the sites. During the active life of a shooting range, steps can be taken to reduce the amount of lead in the environment. A lead management program, which employs a variety of best management practices (BMPs), should include bullet and shot containment, prevention of lead migration, and periodic lead removal and recycling. There are many techniques available to achieve these objectives, which can be designed to meet the specific needs of individual ranges.

Table 1. Shooting Ranges on Public Land

Name	County	Town	Range	Section
Flambeau River	Ashland	41	1E	34
Owen-Anderson Rifle Range	Barron	33	13W	17
North Boundary Range (county forest)	Bayfield	50	6W	36
Cornell (county forest)	Chippewa	31	7W	24
Tilden Shooting Range (county forest)	Chippewa			
Sherwood Shooting Range	Clark	23	1E	21
Eau Claire Lakes Cons. Club	Douglas	45	9W	25
Northwoods Trap and Rifle Range	Douglas	44	11W	22
Boyceville	Dunn	30	14W	36
Colfax	Dunn	29	11W	29
Menomonie (county forest)	Dunn	28	12W	32
Florence County Shooting Range	Florence	38	18E	5
Northwoods	Iron	42	4E	2
Snaketrack	Iron	45	1E	15
Yellowstone	LaFayette	3	4E	3
Langlade (county forest)	Langlade	31	10E	8
Corbin (county forest)	Marathon	27	7E	5
Amberg Range	Marinette			
Peshtigo Harbor Wildlife Area	Marinette	29	23E	4
Silver Birch Park	Pepin	25	14W	36
Pierce County Public Range	Pierce	26	17W	5
Cranberry Creek	Price	36	1E	18
Dewey (county forest)	Portage	25	8E	27
Machickanee (county forest)	Oconto	27	19E	24
Shiocton	Outagamie	23	16E	28
Josie Creek Park	Rusk	35	5W	14
Taylor County	Taylor	30	2W	1
Boulder Junction	Vilas	42	7E	
Caywood	Vilas	40	6E	14
McMiller Range	Waukesha	5	17E	29
Wautoma	Waushara	19	10E	30
Frog Creek Washburn (county forest)	Washburn	42	11W	31
Wood County Range (county forest)	Wood	22	5E	4

Development Criteria and Priorities for Ranges on Public Land

General criteria for range development

1. Location: Ranges may be built on DNR lands where the range is compatible with the surrounding landuse. Ranges can also be built on county (if consistent with the County Forest Comprehensive Land Use Plan and the County Forestry committee is in favor), federal, or local government lands if consistent with owner's comprehensive plan. General considerations:
 - Be aware of the issue of noise disturbance to residences within 1,000 yards (and in some cases further). Noise mitigation techniques can be employed to mitigate the disturbance
 - Design range to cause all rounds fired at the target to impact the backstop
 - Avoid wetlands or hydric soils or soils with hydric inclusions
 - Avoid State Natural Area's
 - Avoid archeological sites if possible
 - Direct road access is preferred
 - Locate adjacent to major highways and roads
 - Minimize impact on other recreational users
 - Minimize impact on blocks of wildlife habitat
 - Topography that is supportive of developing a shooting range
 - Determine footprint based on the amount and variety of shooting opportunities offered.
2. Minimum Range Specifications:
 - The range will include at least a 50-yard firearm range and a 25-foot handgun range
 - Acceptable target stand design guidance is depicted in drawings A-36 through A-43 in the *NRA Range Source Book* although 4"x4" posts are much more durable than 2"x4"
 - Target height must be set in a manner that results in all rounds fired at the target impacting the backstop
 - Target stands will be non-mobile at fixed distances from the firing line to help ensure that all rounds impact the backstop
 - Paper targets only should be a requirement
 - There must be a minimum of five shooting stations (firing points or benches) at each range and ten per range site (i.e. five at the handgun range and five at the rifle range)
 - Backstops and shot-fall zones may not be in a wetland or over water
 - Backstops must be at least 20 feet in height
 - Parking must be provided at the range
 - The facility will be accessible to people with disabilities
 - Overhead structures to provide shade and protect shooters from rain are optional
3. Consult with the Hunting and Shooting Sports Coordinator for initial concept and design assistance.
4. Range development and renovation plans will be approved by a Range Technical Team Advisor from the National Rifle Association.
5. The *NRA Range Source book* is available and should be used as the guidance for shooting range design and implementation.
6. Range Operations: The range may be operated by a partner, such as a rod and gun club. The range may be open year round, and have established hours. County Forest Land hours, and management agreements are subject to approval of the County Forestry committee
7. If a partner wants to provide additional facilities, such as an archery range, funding will be considered on a case-by-case basis.
8. Some portion of Pittman-Robertson Section 4 funds will be available for range construction and renovation. The amount available will be determined based on priorities in the Hunter Education program, shooting range and hunter recruitment and retention program, available opportunities, and necessary range projects.

Range funding priorities:

Public land range projects will be evaluated considering the following criteria:

1. Range renovation and maintenance projects at existing ranges in shaded counties (Figure 1).
2. Construction of new ranges in shaded counties outside the 100,000 population buffer of present ranges (Figure 1).
3. Renovation projects at other existing ranges.
4. Construction of new ranges where reasonable range access is not available or convenient for public shooting.
5. Demonstration of need, amount of public support, cost, hunter education need, and siting constraints will be considered.
6. More consideration will be given projects to improve an existing range than to develop new ranges in the same locality.
7. Leasing public access at established ranges in shaded counties (Figure 1).
8. The department will evaluate needs (rifle, handgun, trap, skeet, etc.) and establish priorities during range grant cycles (odd numbered fiscal years.)

Privately Owned Ranges

The DNR has a shooting range grant program established in NR 50.17. This program provides cost share funding for qualifying upgrades and maintenance on private ranges in exchange for limited public access. Once popular, use of this program has declined in recent years, but gun clubs and range managers remain interested. Obtaining limited public access through this program or through a lease with existing ranges is often easier than finding a location to build a new range.

The DNR has range development grants available through this program. The details and criteria are available in the Shooting Range Grant Program documents.

Columbia County Shooting Range

Respondents: 427 displayed, 427 total

Status: Open

Launched Date: 03/13/2014

Closed Date: 04/15/2014

1. Which site do you think would:

	Dekorra Public Hunting Grounds	Mud Lake State Wildlife Area	About Equal	Unsure	Response Total	Points	Avg
Cause less disruption to neighbors?	12.5% (32)	76.17% (195)	9.38% (24)	1.95% (5)	256	n/a	n/a
Cause less disruption to other users of the DNR property?	21.57% (55)	64.31% (164)	10.2% (26)	3.92% (10)	255	n/a	n/a
Provide a better experience for shooters?	18.75% (48)	46.09% (118)	19.92% (51)	15.23% (39)	256	n/a	n/a
Have more economic benefits to the local area?	22.05% (56)	44.49% (113)	14.17% (36)	19.29% (49)	254	n/a	n/a
Total Respondents					256		
(skipped this question)					171		

2. Overall, I prefer that the shooting range be constructed at:

	Response Total	Response Percent	Points	Avg
Dekorra	47	18%	n/a	n/a
Mud Lake	174	68%	n/a	n/a
No preference, either is okay	10	4%	n/a	n/a
Unsure	2	1%	n/a	n/a
Neither site meets my approval	22	9%	n/a	n/a
Total Respondents		255	100%	
(skipped this question)		172		

3. Please provide any other comments you'd like the DNR and the ad hoc committee to consider.

Comments	Response Total	Response Percent
	189	53%
Total Respondents		189
(skipped this question)		238

Wetland Delineation Report

Mud Lake Wetland Delineation
Town of Lowville, Columbia County, WI
Stantec Project #: 193703331



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November 26, 2014

Sign-off Sheet

This document entitled Wetland Delineation Report was prepared by Stantec Consulting Services Inc. (Stantec) for Wisconsin Department of Natural Resources (WDNR). **The material in it reflects Stantec's** best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Daniel Praseh

Prepared by _____
(signature)

Daniel Praseh

Kathleen Melland

Reviewed by _____
(signature)

Kathleen Melland

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
INTRODUCTION
November 26, 2014

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WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
INTRODUCTION
November 26, 2014

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) performed a wetland determination and delineation of the Mud Lake property (**the “Property”**) on behalf of the Wisconsin Department of Natural Resources. The Property is approximately 10 acres in size and located in Section 28, Township 11 North, Range 10 East, Town of Lowville, Columbia County, Wisconsin. Specifically, the Property is located east of STH 22 following King Road to Conservation Drive (Appendix A, Figure 1).

The purpose and objective of the wetland determination and delineation was to identify the extent and spatial arrangement of wetlands within the Property. The wetland delineation was completed by Dan Prasch of Stantec on October 15, 2014. Two wetland areas were identified on the Property.

Wetlands and waterways that are considered waters of the U.S. are subject to regulation under Section 404 of the Clean Water Act (CWA) and the jurisdictional regulatory authority lies with the U.S. Army Corps of Engineers (USACE). Additionally, the Wisconsin Department of Natural Resources (WDNR) has regulatory authority over wetlands, navigable waters, and adjacent lands under Chapters 30 and 281 Wisconsin State Statutes, and Wisconsin Administrative Codes NR 103, 299, 350 and 353. Finally counties, townships and municipalities may have local zoning authority over certain types of wetlands and waterways. Stantec recommends this report be submitted to local authorities, the WDNR and USACE for final jurisdictional review and concurrence.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
METHODS
November 26, 2014

2.0 METHODS

2.1 WETLANDS

Wetland determinations were based on the criteria and methods outlined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1 (1987) and subsequent guidance documents (USACE 1991, 1992), and applicable Regional Supplements to the *Corps of Engineers Wetland Delineation Manual*.

The wetland determination involved the use of available resources to assist in the assessment such as U.S. Geological Survey (USGS) topographic maps, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey, U.S. Fish and Wildlife Service (USFWS), WDNR Wisconsin Wetland Inventory (WWI) mapping, and aerial photography.

On-site wetland determinations were made using the three criteria (vegetation, soil, and hydrology) and technical approach defined in the USACE 1987 Manual and applicable Regional Supplement. According to procedures described in the 1987 Manual and applicable Regional Supplement, areas that under normal circumstances reflect a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology (e.g., inundated or saturated soils) are considered wetlands.

Additionally, as climate plays an important role in the formation and identification of wetlands, the antecedent precipitation in the months leading up to the field investigations was reviewed. The current **year's precipitation data was** compared to long-term (30-year) precipitation averages and standard deviation to determine if precipitation was normal, wet, or dry for the area using a WETS analysis as developed by the NRCS.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
RESULTS
November 26, 2014

3.0 RESULTS

3.1 SITE DESCRIPTION

The Property is composed of silver maple dominated wetlands and an old field upland meadow that transitions into upland deciduous forest within the central area of the Property. The wetland located on the western side of the Property is directly connected to a wetland complex to the west and to the south of the Property and is influenced by an intermittent stream that runs parallel to the western boundary of the Property. The wetland located on the east side of the property is a depressional silver maple community that continues east off of the Property. **Also, King Rd. runs along the Property's northern boundary.** The Property is relatively flat, sloping downward from the central area of the site to the west and to the northeast from topographic highs of approximately 970 feet mean sea level (msl) in the central area of the site to topographic lows of approximately 950 feet msl in the west and northeastern portions of the site (Appendix A, Figure 1).

Soils mapped on the Property by the *NRCS Soil Survey of Columbia County* include Gilford fine sandy loam (GaA), Kibbie fine sandy loam (KbA), and Lapeer fine sandy loam (LaB and LaC2), (Appendix A, Figure 2). According to the NRCS List of Hydric Soils for Columbia County, the Gilford series is listed as a predominantly hydric soil unit. Kibbie soils were found in the northeast corner of the site. Although Kibbie soils are not mapped as hydric soils, they are known to contain inclusions of Colwood soils within depressions. Colwood soils are mapped as hydric soils for Columbia County. Wetlands identified during the field investigation are located primarily within the Gilford and Kibbie soil series.

The Wisconsin Wetland Inventory (WWI) map identifies multiple wetlands to the north of the Property area and one wetland to the south of the Property area. However, both wetlands found on the Property were not mapped on the Wisconsin Wetland Inventory (WWI) map (Appendix A, Figure 3).

Average precipitation for the investigation area was obtained from the Arlington Farm University research station in Columbia County and was used for the WETS analysis. Based on the WETS analysis, conditions were drier than normal (Appendix D).

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
RESULTS
November 26, 2014

3.2 WETLANDS

Two wetlands were identified and delineated within the Property Area. Wetland determination data forms were completed for 8 sample points along transects through the wetlands and adjacent uplands and are contained in Appendix B. Photographs of the wetlands and adjacent lands are contained in Appendix C. The wetland boundary and sample point locations are shown on Figure 4 (Appendix A). The wetlands are summarized in Table 1 and described in detail in the following sections.

Table 1. Summary of Wetlands Identified within the Property Area

Wetland	Wetland Type	Adjacent Surface Waters	Acreage (on-site)
Wetland 1 (W1)	silver maple dominated seasonally flooded/ponded	Surface water outlet to Mud Lake via an intermittent drainage way	1.07
Wetland 2 (W2)	silver maple dominated closed depressional swamp	N/A	0.31

3.2.1 Wetland 1

Wetland 1 (W1) is a silver maple (*Acer saccharinum*) and reed canary grass (*Phalaris arundinacea*) dominated seasonally flooded/ponded community adjacent to the northwestern, western, and southwestern, boundaries of the Property. The wetland continues off site and is directly connected to a larger wetland complex to the west and to the south of the Property. The wetland is also associated with an unnamed intermittent waterway identified on the 24k hydro layer mapped by USGS that runs parallel to the west boundary of the Property (Appendix A, Figure 1). The unnamed intermittent waterway associated with W1 flows north under King Road via culverts and eventually discharges into Mud Lake.

Vegetation

Dominant plant species identified at sample points completed within W1 consist of silver maple, reed canary grass, American elderberry (*Sambucus nigra*), stinging nettle (*Urtica dioica*), and nightshade (*Solanum dulcamara*). Other common species identified in the wetland are listed on the data forms contained in Appendix B. The dominant species within the wetland are comprised mostly of hydrophytic vegetation (OBL, FACW, and/or FAC) and meet the hydrophytic vegetation criterion.

Hydrology

The wetland appears to have a seasonally inundated/saturated hydroperiod throughout. The wetland hydrology was identified based on secondary indicators due to the seasonal nature of the hydroperiod and lack of primary hydrology indicators observed during the evaluation. Secondary indicators of wetland hydrology included FAC-neutral test, geomorphic position, moss trim lines and drainage patterns. Therefore, the wetland hydrology criterion was met.

Soils

Soils within the wetland are mapped by the NRCS as Gilford fine sandy loam (Appendix A, Figure 2). The Gilford series consists of very deep, poorly drained or very poorly drained soils formed in loamy over sandy sediments on outwash plains, near-shore zones (relict), and flood-plain steps. The soils observed at the sample points were generally consistent with the Gilford series characteristics. Field indicators of hydric soil identified consisted of NRCS field Indicators F7-Depleted Dark Surface, A11-Depleted Below Dark Surface and F6-Redox Dark surface. Therefore, the hydric soil criterion was satisfied.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
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Wetland Boundary

The wetland boundary was determined based on distinct differences in vegetation, hydrology, soils and topography consisting of the following: 1) Transition from a silver maple and reed canary grass dominated wetland community to an old field meadow upland community dominated by **Bell's honeysuckle (*Lonicera x bella*)**, Canada goldenrod (*Solidago canadensis*), multiflora rose (*Rosa multiflora*), wild parsnip (*Pastinaca sativa*), and smooth brome grass (*Bromus inermis*); 2) Transition from secondary hydrology indicators of moss trim lines and drainage patterns within the wetland to lack of wetland hydrology indicators within the adjacent upland; and 3) Transition from poorly drained hydric soils to well drained non-hydric soils.

3.2.2 Wetland 2

Wetland 2 (W2) is a closed depressional silver maple dominated community adjacent to the northeastern boundary of the Property. Wetland 2 continues outside of the Property and extends to Conservation Dr. to the east and King Rd. to the north.

Vegetation

Dominant plant species identified at the sample point of wetland W2 consist of silver maple, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and rough avens (*Geum laciniatum*). Other common species identified in the wetland are listed on the data form contained in Appendix B. The dominant species within the wetland are comprised mostly of hydrophytic vegetation (OBL, FACW, and/or FAC) and meet the hydrophytic vegetation criterion.

Hydrology

The wetland appears to have a seasonally inundated/saturated hydroperiod throughout. The wetland hydrology was identified based on secondary indicators due to the seasonal nature of the hydroperiod and lack of primary hydrology indicators observed during the evaluation. Secondary indicators of wetland hydrology included FAC-neutral test and geomorphic position. Therefore, the wetland hydrology criterion was met.

Soils

Soils within the wetland are mapped by the NRCS as Kibbie fine sandy loam and as Lapeer fine sandy loam (Appendix A, Figure 2). The Kibbie series consists of very deep, somewhat poorly drained soils on lake plains, ground moraines, outwash plains, and deltas. They formed in stratified loamy and silty glaciofluvial or glaciolacustrine deposits. The Lapeer series consists of very deep, well drained soils formed in sandy loam till on ground moraines and end moraines. The soil observed at the sample point generally consistent with the Kibbie soil series characteristics, specifically Colwood soils. As mentioned earlier, the Colwood series is a hydric inclusion for the Kibbie soils. Field indicators of hydric soil identified consisted of NRCS field Indicator F3-Depleted Matrix. Therefore, the hydric soil criterion was satisfied.

Wetland Boundary

The wetland boundary was determined based on distinct differences in vegetation, hydrology, soils and topography consisting of the following: 1) Transition from a silver maple dominated wetland community to a deciduous hardwood upland community dominated by **Bell's honeysuckle**, common buckthorn (*Rhamnus cathartica*), black locust (*Robinia pseudoacacia*), and poison ivy (*Toxicodendron radicans*); 2) Transition from secondary hydrology indicators of geomorphic position and the FAC-Neutral Test

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
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within the wetland to lack of wetland hydrology indicators within the adjacent upland; and 3) Transition from somewhat poorly drained hydric soils to well drained non-hydric soils. The silver maple depression also exhibits moss trim lines along with a sparsely vegetated concave surface typical of wetland areas that pond or flood for long or very long during the growing season. The closed canopy of silver maple is also visible on aerial photography.

3.3 UPLAND

Upland within the Project area consisted of an old field meadow that transitioned to a deciduous hardwood forest within the central portion of the Property. Dominant plant species seen at upland sample points primarily included Canada goldenrod, multiflora rose, wild parsnip, smooth brome grass, black locust, common buckthorn, and Bell's honeysuckle. Scattered black cherry (*Prunus serotina*) and boxelder (*Acer negundo*) are mixed with white ash (*Fraxinus americana*) along Conservation Dr., which leads to a small and unimproved parking area.

3.4 OTHER ENVIRONMENTAL CONSIDERATIONS

This report is limited to the identification of state and/or federally regulated wetlands and waterways within the Property. However, there may be other regulated environmental features within the Property, including, but not limited to, historical or archeological features, endangered or threatened species, and/or floodplains, etc. Federal, state, and local units of government and regional planning organizations may have regulatory authority to control or restrict land uses within or in close proximity to these features. Stantec can assist with identification and/or assessment of additional regulated resources at your request, to the extent that the work is within our range of expertise.

Specifically, in the state of Wisconsin, Wis. Adm. Code NR 151.12 requires that a "protective area" or buffer be determined from the top of the channel of lakes, streams and rivers, or at the delineated boundary of wetlands. In accordance with NR 151.12, the width of the "protective buffer" for less susceptible wetlands are determined by using 10% of the average wetland width, no less than 10 feet or more than 30 feet. Lakes, perennial and intermittent streams, and highly susceptible wetlands and wetlands in areas of special natural resource interest may require buffers of 50 and 75 feet, respectively. The wetlands identified on the Property do contain invasive plant species, specifically reed canary grass and common buckthorn. Wetland 1 is associated with a mapped intermittent waterway leading to Mud Lake and Rocky Run Creek. Wetland 2 is located within a closed depression although invasive species are limited to the margin of the wetland. Therefore, based on the "protective buffer" standards provided by NR 151.12, it is Stantec's professional opinion that the wetlands meet the criteria for a buffer of 50 feet. However, the jurisdictional authority on wetland buffers rests with the WDNR. The local unit of government and/or regional planning organization may have more restrictive buffers from wetlands than that imposed under NR 151.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
CONCLUSION
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4.0 CONCLUSION

Stantec performed a wetland determination and delineation of the Mud Lake property on behalf of the Wisconsin Department of Natural Resources. The approximately 10-acre Property is located in Section 28, Township 11 North, Range 10 East, Town of Lowville, Columbia County, Wisconsin. The purpose and objective of the wetland determination and delineation was to identify the extent and spatial arrangement of wetlands within the Property.

Two wetlands were identified and delineated on the Property in accordance with state and federal guidelines and were subsequently surveyed with GPS and mapped using GIS software. There were a combined total of 1.38 acres of wetland determined on the Property. Wetlands were mostly composed of Silver maple and reed canary depressions that are seasonally flooded or ponded. Adjacent uplands were composed of old field meadow that transitioned in deciduous hardwood forest.

The USACE has regulatory authority over Waters of the U.S. including adjacent wetlands, and the WDNR has regulatory authority over wetlands, navigable waters, and adjacent lands under Chapters 30 and 281 Wisconsin State Statutes, and Wisconsin Administrative Codes NR 103, 299, 350 and 353. Finally counties, townships and municipalities may have local zoning authority over certain types of wetlands and waterways.

Prior to beginning work at this site or disturbing or altering wetlands, waterways, or adjacent lands in any way, Stantec recommends that the owner obtain the necessary permits or other agency regulatory review and concurrence with regard to the proposed work to comply with applicable regulations. Stantec can assist with identification and/or assessment of additional regulated resources at your request, to the extent that the work is within our range of expertise.

The information provided by Stantec regarding wetland boundaries is a scientific-based analysis of the wetland and upland conditions present on the site at the time of the fieldwork. The delineation was performed by experienced and qualified professionals using standard practices and sound professional judgment. The ultimate decision on wetland boundaries rests with the USACE and, in some cases, the WDNR or a local unit of government. As a result, there may be adjustments to boundaries based upon review by a regulatory agency. An agency determination can vary from time to time depending on various factors including, but not limited to recent precipitation patterns and the season of the year. In addition, the physical characteristics of the site can change over time, depending on the weather, vegetation patterns, drainage activities on adjacent parcels, or other events. Any of these factors can change the nature and extent of wetlands on the site.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
REFERENCES
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5.0 REFERENCES

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WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
Appendix A– Figures
November 26, 2014

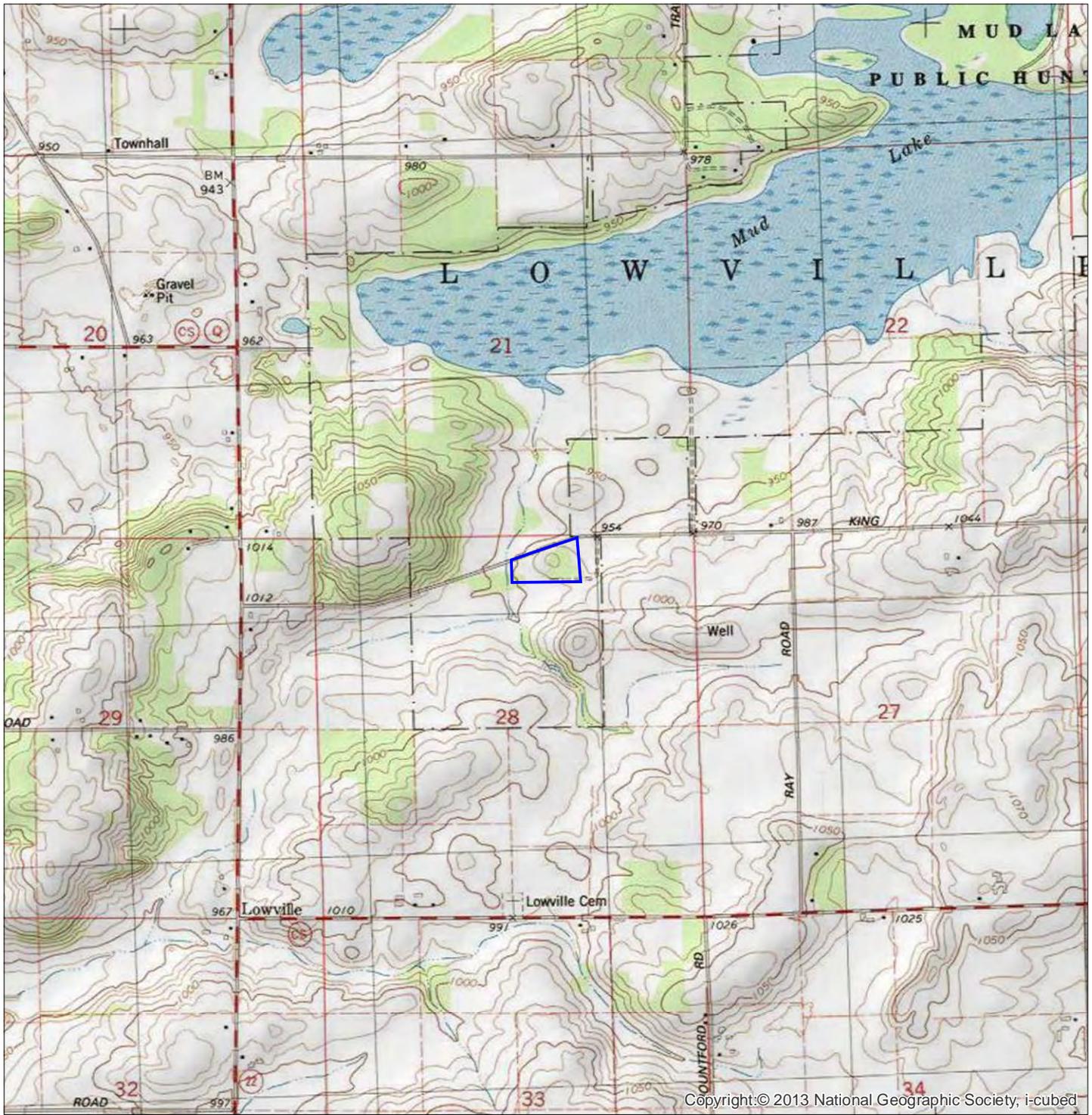
Appendix A – Figures

Figure 1. Project Location and Topography

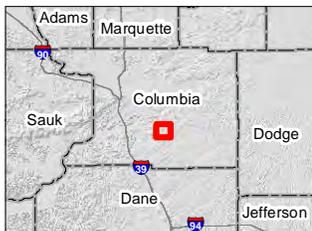
Figure 2. NRCS Soil Survey Data

Figure 3. Wisconsin Wetland Inventory

Figure 4. Field Delineated Wetland Data



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Legend
 Approximate Project Location

Figure No.
1
 Title
Project Location and Topography

Client/Project
 Wisconsin Department of Natural Resources
 Mud Lake Wetland Delineation

Project Location 193703331
 T11N, R10E, S28 Prepared by MCP on 2014-10-21
 T. of Lowville Technical Review by MMP on 2014-10-22
 Columbia Co., WI Independent Review by DP on 2014-11-26

- Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
 2. Data Sources Include: Stantec, WDNR
 3. Background: USGS 7.5' Topographic Quadrangles

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.





Legend

- Approximate Project Location
- NRCS Soil Survey Data
- Predominantly Hydric Soils
- Partially Hydric Soils
- Non-Hydric Soils
- DNR 24k Hydrography
- Perennial Stream
- Intermittent Stream
- Waterbody

Notes
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
 2. Data Sources Include: Stantec, WDNR, WDOT, NRCS
 3. Orthophotography: WROC 2010

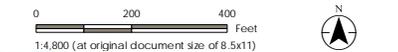
Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No. 2

Title
 NRCS Soil Survey Data

Client/Project
 Wisconsin Department of Natural Resources
 Mud Lake Wetland Delineation

Project Location 19370331
 T11N, R10E, S28 Prepared by MCP on 2014-10-21
 T. of Lowville Technical Review by MMP on 2014-10-22
 Columbia Co., WI Independent Review by DP on 2014-11-26





- Legend**
- Approximate Project Location
 - Wisconsin Wetland Inventory
 - DNR 24k Hydrography
 - Perennial Stream
 - - - Intermittent Stream
 - Waterbody

- Notes**
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
 2. Data Sources Include: Stantec, WDNR, WDOT
 3. Orthophotography: WROC 2010

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No. **3**

Title
Wisconsin Wetland Inventory

Client/Project
Wisconsin Department of Natural Resources
Mud Lake Wetland Delineation

Project Location 193703331
T11N, R10E, S28 Prepared by MCP on 2014-10-21
T. of Lowville Technical Review by MMP on 2014-10-22
Columbia Co., WI Independent Review by DP on 2014-11-26





Legend

- Approximate Project Location
- Sample Point
- Field Delineated Wetland Boundary
- Field Delineated Wetland Area
- ~ Perennial Stream
- - - Intermittent Stream
- Waterbody

- Notes**
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
 2. Data Sources Include: Stantec, WDNr, WDOT
 3. Orthophotography: WROC 2010

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No. **4**

Title **Field Collected Data**

Client/Project
Wisconsin Department of Natural Resources
Mud Lake Wetland Delineation

Project Location 193703331
T11N, R10E, S28 Prepared by MCP on 2014-10-21
T. of Lowville Technical Review by MMP on 2014-10-22
Columbia Co., WI Independent Review by DP on 2014-11-26



WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
Appendix B– Wetland Determination Data Forms
November 26, 2014

Appendix B – Wetland Determination Data Forms

Project/Site: Mud Lake Wetland Delineation		Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources			County: Columbia
Investigator #1: Dan Prasch	Investigator #2:		State: Wisconsin
Soil Unit: Gilford fine sandy loam	NWI/WWI Classification: N/A		Wetland ID: W1
Landform: Toeslope	Local Relief: Convex		Sample Point: W1-1u
Slope (%): 2-4	Latitude: N/A	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Community ID: Old Field Meadow
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		Section: 28	
		Township: 11N	
		Range: 10 Dir: E	

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input type="checkbox"/> D5 - FAC-Neutral Test
---	---	--

<p>Field Observations:</p> <p>Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.)</p> <p>Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.)</p> <p>Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.)</p>	<p>Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: **N/A**

SOILS

Map Unit Name: **Gilford fine sandy loam** Series Drainage Class: **poorly**

Taxonomy (Subgroup): **Typic Endoaquolls**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	6	1	10yr	2/2	100	--	--	--	--	--	Sandy Loam
6	20	2	7.5yr	4/4	100	--	--	--	--	--	Loamy Sand
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

<p>NRCS Hydric Soil Field Indicators (check here if indicators are not present <input checked="" type="checkbox"/>):</p> <input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks) <p><small>¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</small></p>
---	--	---

<p>Restrictive Layer (If Observed) Type: N/A Depth: N/A</p>	<p>Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
---	---

Remarks: **No match for Gilford Series.**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-1u**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)				
	<i>Species Name</i>	% Cover	Dominant	Ind. Status
1.	<i>Prunus serotina</i>	10	Y	FACU
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		10		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	<i>ROSA MULTIFLORA</i>	15	Y	FACU
2.	<i>LONICERA X BELLA</i>	30	Y	FACU
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		45		
Herb Stratum (Plot size: 2 meter radius)				
1.	<i>CENTAUREA STOEBE</i>	20	Y	UPL
2.	<i>Osmorhiza claytonii</i>	15	N	FACU
3.	<i>PASTINACA SATIVA</i>	10	N	UPL
4.	<i>Solidago canadensis</i>	40	Y	FACU
5.	<i>ASPARAGUS OFFICINALIS</i>	5	N	FACU
6.	<i>Solidago gigantea</i>	10	N	FACW
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		100		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		
Remarks: N/A				

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	<u>0</u>	x 1 =	<u>0</u>
FACW spp.	<u>10</u>	x 2 =	<u>20</u>
FAC spp.	<u>0</u>	x 3 =	<u>0</u>
FACU spp.	<u>115</u>	x 4 =	<u>460</u>
UPL spp.	<u>30</u>	x 5 =	<u>150</u>
Total	<u>155</u>	(A)	<u>630</u> (B)
Prevalence Index = B/A =			<u>4.065</u>

Hydrophytic Vegetation Indicators:

- Yes No Rapid Test for Hydrophytic Vegetation
- Yes No Dominance Test is > 50%
- Yes No Prevalence Index is ≤ 3.0 *
- Yes No Morphological Adaptations (Explain) *
- Yes No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present Yes No

Additional Remarks:

N/A

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Gilford fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W1
Landform: Depression	Local Relief: Concave	Sample Point: W1-1w
Slope (%): 0-2	Latitude: N/A	Community ID: Silver Maple FP Forest
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were were dryer than average for this time of year. Intermittent waterway mapped by NRCS and WDNR is located to the west of the study area.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input checked="" type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input checked="" type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
---	---	---

<p>Field Observations:</p> Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____	<p>Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: **Hydrology was determined by secondary indicators**

SOILS

Map Unit Name: **Gilford fine sandy loam** Series Drainage Class: **poorly**

Taxonomy (Subgroup): **Typic Endoaquolls**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	12	1	10yr	3/1	95	10yr	4/6	5	C	M	loamy sand
12	20	2	10yr	6/1	90	10yr	4/6	10	C	M	sand
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

<p>NRCS Hydric Soil Field Indicators (check here if indicators are not present <input type="checkbox"/>):</p> <input type="checkbox"/> A1- Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input checked="" type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input checked="" type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
--	--

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: N/A Depth: N/A	<p>Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
--	--

Remarks: **Match the range in characteristics of Gilford Series. Depleted matrix starts within 12 inches of the soil surface.**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-1w**

VEGETATION (Species identified in all uppercase are non-native species.)																																																	
Tree Stratum (Plot size: 10 meter radius)																																																	
	<i>Species Name</i>	% Cover	Dominant	Ind. Status																																													
1.	<i>Acer saccharinum</i>	60	Y	FACW																																													
2.	--	--	--	--																																													
3.	--	--	--	--																																													
4.	--	--	--	--																																													
5.	--	--	--	--																																													
6.	--	--	--	--																																													
7.	--	--	--	--																																													
8.	--	--	--	--																																													
9.	--	--	--	--																																													
10.	--	--	--	--																																													
Total Cover =		60																																															
Sapling/Shrub Stratum (Plot size: 5 meter radius)																																																	
1.	<i>Sambucus nigra</i>	15	Y	FACW																																													
2.	--	--	--	--																																													
3.	--	--	--	--																																													
4.	--	--	--	--																																													
5.	--	--	--	--																																													
6.	--	--	--	--																																													
7.	--	--	--	--																																													
8.	--	--	--	--																																													
9.	--	--	--	--																																													
10.	--	--	--	--																																													
Total Cover =		15																																															
Herb Stratum (Plot size: 2 meter radius)																																																	
1.	<i>PHALARIS ARUNDINACEA</i>	80	Y	FACW																																													
2.	<i>Urtica dioica</i>	20	N	FAC																																													
3.	<i>CIRSIIUM ARVENSE</i>	10	N	FACU																																													
4.	--	--	--	--																																													
5.	--	--	--	--																																													
6.	--	--	--	--																																													
7.	--	--	--	--																																													
8.	--	--	--	--																																													
9.	--	--	--	--																																													
10.	--	--	--	--																																													
11.	--	--	--	--																																													
12.	--	--	--	--																																													
13.	--	--	--	--																																													
14.	--	--	--	--																																													
15.	--	--	--	--																																													
Total Cover =		110																																															
Woody Vine Stratum (Plot size: 10 meter radius)																																																	
1.	--	--	--	--																																													
2.	--	--	--	--																																													
3.	--	--	--	--																																													
4.	--	--	--	--																																													
5.	--	--	--	--																																													
Total Cover =		0																																															
<p>Dominance Test Worksheet</p> <p>Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)</p>																																																	
<p>Prevalence Index Worksheet</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>OBL spp.</td> <td align="center">0</td> <td>x 1 =</td> <td></td> <td align="center">0</td> </tr> <tr> <td>FACW spp.</td> <td align="center">155</td> <td>x 2 =</td> <td></td> <td align="center">310</td> </tr> <tr> <td>FAC spp.</td> <td align="center">20</td> <td>x 3 =</td> <td></td> <td align="center">60</td> </tr> <tr> <td>FACU spp.</td> <td align="center">10</td> <td>x 4 =</td> <td></td> <td align="center">40</td> </tr> <tr> <td>UPL spp.</td> <td align="center">0</td> <td>x 5 =</td> <td></td> <td align="center">0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td align="center">185</td> <td>(A)</td> <td></td> <td align="center">410 (B)</td> </tr> <tr> <td colspan="4" style="text-align: right;">Prevalence Index = B/A =</td> <td align="center"><u>2.216</u></td> </tr> </table>					Total % Cover of:		Multiply by:			OBL spp.	0	x 1 =		0	FACW spp.	155	x 2 =		310	FAC spp.	20	x 3 =		60	FACU spp.	10	x 4 =		40	UPL spp.	0	x 5 =		0	Total						185	(A)		410 (B)	Prevalence Index = B/A =				<u>2.216</u>
Total % Cover of:		Multiply by:																																															
OBL spp.	0	x 1 =		0																																													
FACW spp.	155	x 2 =		310																																													
FAC spp.	20	x 3 =		60																																													
FACU spp.	10	x 4 =		40																																													
UPL spp.	0	x 5 =		0																																													
Total																																																	
	185	(A)		410 (B)																																													
Prevalence Index = B/A =				<u>2.216</u>																																													
<p>Hydrophytic Vegetation Indicators:</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Rapid Test for Hydrophytic Vegetation</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Dominance Test is > 50%</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Prevalence Index is ≤ 3.0 *</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Morphological Adaptations (Explain) *</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Problem Hydrophytic Vegetation (Explain) *</p> <p align="center">* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p>																																																	
<p>Definitions of Vegetation Strata:</p> <p>Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.</p> <p>Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.</p> <p>Woody Vines - All woody vines greater than 3.28 ft. in height.</p>																																																	
<p>Hydrophytic Vegetation Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>																																																	
Remarks: N/A																																																	

Additional Remarks:

N/A

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources		County: Columbia
Investigator #1: Dan Prasch	Investigator #2:	State: Wisconsin
Soil Unit: Gilford fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W1
Landform: Rise	Local Relief: Convex	Sample Point: W1-2u
Slope (%): 0-2	Latitude: N/A	Community ID: old field meadow
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present?	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input type="checkbox"/> D5 - FAC-Neutral Test
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Field Observations: Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.)	Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks:

SOILS

Map Unit Name: **Gilford fine sandy loam** Series Drainage Class: **poorly**

Taxonomy (Subgroup): **Typic Endoaquolls**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)
			Color (Moist)	%		Color (Moist)	%	Type	Location	
0	8	1	10yr	3/1	100	--	--	--	--	Sandy loam
8	20	2	7.5yr	4/4	80	--	--	--	--	Silty clay loam
--	--	--	7.5yr	4/3	20	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present):

<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
--	--	---

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: N/A Depth: N/A	Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
--	---

Remarks: **The second horizon consists of a mixed matrix**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-2u**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)				
	<i>Species Name</i>	% Cover	Dominant	Ind. Status
1.	<i>Acer negundo</i>	20	Y	FAC
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		20		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	<i>Rubus idaeus var. strigosus</i>	40	Y	FAC
2.	<i>ROSA MULTIFLORA</i>	20	Y	FACU
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		60		
Herb Stratum (Plot size: 2 meter radius)				
1.	<i>Solidago canadensis</i>	40	Y	FACU
2.	<i>PASTINACA SATIVA</i>	25	Y	UPL
3.	<i>Osmorhiza claytonii</i>	20	N	FACU
4.	<i>POA PRATENSIS</i>	15	N	FACU
5.	<i>Lactuca biennis</i>	5	N	FAC
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		105		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	<u>0</u>	x 1 =	<u>0</u>
FACW spp.	<u>0</u>	x 2 =	<u>0</u>
FAC spp.	<u>65</u>	x 3 =	<u>195</u>
FACU spp.	<u>95</u>	x 4 =	<u>380</u>
UPL spp.	<u>25</u>	x 5 =	<u>125</u>
Total		<u>185</u> (A)	<u>700</u> (B)
Prevalence Index = B/A =		<u>3.784</u>	

Hydrophytic Vegetation Indicators:

- Yes No Rapid Test for Hydrophytic Vegetation
- Yes No Dominance Test is > 50%
- Yes No Prevalence Index is ≤ 3.0 *
- Yes No Morphological Adaptations (Explain) *
- Yes No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present Yes No

Remarks: N/A

Additional Remarks:

N/A

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Gilford fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W1
Landform: Depression	Local Relief: Concave	Sample Point: W1-2w
Slope (%): 0-2	Latitude: N/A	Community ID: Silver Maple FP Forest
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present?	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input checked="" type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input checked="" type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
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<p>Field Observations:</p> Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____	<p>Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: **Hydrology was determined by meeting Secondary indicators**

SOILS

Map Unit Name: **Gilford fine sandy loam** Series Drainage Class: **poorly**

Taxonomy (Subgroup): **Typic Endoaquolls**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	12	1	10yr	3/1	95	10yr	4/6	5	C	M	Silt loam
12	20	2	10yr	5/1	60	--	--	--	--	--	Silty clay loam
--	--	--	10yr	4/3	20	--	--	--	--	--	--
--	--	--	10yr	3/1	20	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

<p>NRCS Hydric Soil Field Indicators (check here if indicators are not present <input type="checkbox"/>):</p> <input type="checkbox"/> A1- Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input checked="" type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input checked="" type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks) <p><small>¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</small></p>
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Restrictive Layer (If Observed) Type: N/A Depth: N/A	Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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Remarks: **The second horizon consists of a mixed matrix. Depleted matrix within 12 inches.**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-2w**

VEGETATION (Species identified in all uppercase are non-native species.)				
Tree Stratum (Plot size: 10 meter radius)				
	<i>Species Name</i>	% Cover	Dominant	Ind. Status
1.	<i>Acer saccharinum</i>	60	Y	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		60		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		
Herb Stratum (Plot size: 2 meter radius)				
1.	<i>PHALARIS ARUNDINACEA</i>	60	Y	FACW
2.	<i>Urtica dioica</i>	20	Y	FAC
3.	<i>SOLANUM DULCAMARA</i>	20	Y	FAC
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		100		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		
Remarks: N/A				

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet

<u>Total % Cover of:</u>	<u>Multiply by:</u>
OBL spp. <u>0</u>	x 1 = <u>0</u>
FACW spp. <u>120</u>	x 2 = <u>240</u>
FAC spp. <u>40</u>	x 3 = <u>120</u>
FACU spp. <u>0</u>	x 4 = <u>0</u>
UPL spp. <u>0</u>	x 5 = <u>0</u>
Total <u>160</u> (A)	<u>360</u> (B)
Prevalence Index = B/A = <u>2.250</u>	

Hydrophytic Vegetation Indicators:

Yes No Rapid Test for Hydrophytic Vegetation

Yes No Dominance Test is > 50%

Yes No Prevalence Index is ≤ 3.0 *

Yes No Morphological Adaptations (Explain) *

Yes No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present Yes No

Additional Remarks:
N/A

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Lapeer fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W1
Landform: Base slope	Local Relief: Convex	Sample Point: W1-3u
Slope (%): 2-4	Latitude: N/A	Community ID: old field meadow
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present?	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input type="checkbox"/> D5 - FAC-Neutral Test
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<p>Field Observations:</p> Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____	<p>Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks:

SOILS

Map Unit Name: **Lapeer fine sandy loam** Series Drainage Class: **well**

Taxonomy (Subgroup): **Typic Hapludalfs**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	10	1	10yr	2/2	100	--	--	--	--	--	Sandy loam
10	20	2	10yr	4/3	100	--	--	--	--	--	Sandy clay loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

<p>NRCS Hydric Soil Field Indicators (check here if indicators are not present <input checked="" type="checkbox"/>):</p> <input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks) <p><small>¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</small></p>
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Restrictive Layer (If Observed) Type: N/A	Depth: N/A	Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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Remarks:

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-3u**

VEGETATION (Species identified in all uppercase are non-native species.)				
Tree Stratum (Plot size: 10 meter radius)				
	<u>Species Name</u>	% Cover	Dominant	Ind. Status
1.	N/A	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		N/A		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	N/A	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		N/A		
Herb Stratum (Plot size: 2 meter radius)				
1.	PASTINACA SATIVA	40	Y	UPL
2.	BROMUS INERMIS	30	Y	UPL
3.	CIRSIIUM ARVENSE	20	Y	FACU
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		90		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		
Dominance Test Worksheet				
Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A)				
Total Number of Dominant Species Across All Strata: <u>3</u> (B)				
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)				
Prevalence Index Worksheet				
Total % Cover of:		Multiply by:		
OBL spp.	<u>0</u>	x 1 =	<u>0</u>	
FACW spp.	<u>0</u>	x 2 =	<u>0</u>	
FAC spp.	<u>0</u>	x 3 =	<u>0</u>	
FACU spp.	<u>20</u>	x 4 =	<u>80</u>	
UPL spp.	<u>70</u>	x 5 =	<u>350</u>	
Total		<u>90</u> (A)	<u>430</u> (B)	
Prevalence Index = B/A = <u>4.778</u>				
Hydrophytic Vegetation Indicators:				
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Rapid Test for Hydrophytic Vegetation		
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Dominance Test is > 50%		
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Prevalence Index is ≤ 3.0 *		
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Morphological Adaptations (Explain) *		
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Problem Hydrophytic Vegetation (Explain) *		
* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Definitions of Vegetation Strata:				
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.				
Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.				
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.				
Woody Vines - All woody vines greater than 3.28 ft. in height.				
Hydrophytic Vegetation Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Remarks: N/A				

Additional Remarks:

N/A

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Gilford fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W1
Landform: Depression	Local Relief: Concave	Sample Point: W1-3w
Slope (%): 2-4	Latitude: N/A	Community ID: Wet meadow
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input checked="" type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input checked="" type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
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Field Observations:

Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.) _____	Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.) _____	
Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.) _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: **Hydrology determined by secondary indicators**

SOILS

Map Unit Name: **Gilford fine sandy loam** Series Drainage Class: **poorly**

Taxonomy (Subgroup): **Typic Endoaquolls**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	16	1	10yr	2/1	90	10yr	5/2	10	D	M	silt loam
16	20	2	10yr	5/1	70	--	--	--	--	--	sandy clay loam
--	--	--	10yr	4/3	30	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present):

<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input checked="" type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input checked="" type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
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¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: **N/A** Depth: **N/A**

Hydric Soil Present? Yes No

Remarks: **Second horizon has a mixed matrix. Match for range in characteristics for Gilford Series. Associated redox concentrations and Fe pore linings within and surrounding depletions.**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W1** Sample Point **W1-3w**

VEGETATION (Species identified in all uppercase are non-native species.)				
Tree Stratum (Plot size: 10 meter radius)				
	<u>Species Name</u>	% Cover	Dominant	Ind. Status
1.	N/A	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		N/A		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	N/A	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		N/A		
Herb Stratum (Plot size: 2 meter radius)				
1.	PHALARIS ARUNDINACEA	100	Y	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		100		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		
Dominance Test Worksheet				
Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A)				
Total Number of Dominant Species Across All Strata: <u>1</u> (B)				
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)				
Prevalence Index Worksheet				
Total % Cover of:		Multiply by:		
OBL spp.	<u>0</u>	x 1 =	<u>0</u>	
FACW spp.	<u>100</u>	x 2 =	<u>200</u>	
FAC spp.	<u>0</u>	x 3 =	<u>0</u>	
FACU spp.	<u>0</u>	x 4 =	<u>0</u>	
UPL spp.	<u>0</u>	x 5 =	<u>0</u>	
Total		<u>100</u> (A)	<u>200</u> (B)	
Prevalence Index = B/A = <u>2.000</u>				
Hydrophytic Vegetation Indicators:				
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	Rapid Test for Hydrophytic Vegetation
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	Dominance Test is > 50%
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	Prevalence Index is ≤ 3.0 *
<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	Morphological Adaptations (Explain) *
<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	Problem Hydrophytic Vegetation (Explain) *
* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Definitions of Vegetation Strata:				
Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.				
Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.				
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.				
Woody Vines - All woody vines greater than 3.28 ft. in height.				
Hydrophytic Vegetation Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Remarks: N/A				

Additional Remarks:

Wet meadow dominated by reed canary grass.

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Lapeer fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W2
Landform: Rise	Local Relief: Convex	Sample Point: W2-1u
Slope (%): 0-2	Latitude: N/A	Community ID: Deciduous Forest
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present?	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input type="checkbox"/> D5 - FAC-Neutral Test
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<p>Field Observations:</p> Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____ Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: (in.) _____	<p>Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: _____

SOILS

Map Unit Name: **Lapeer fine sandy loam** Series Drainage Class: **well**

Taxonomy (Subgroup): **Typic Hapludalfs**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	8	1	10yr	2/2	100	--	--	--	--	--	loamy sand
8	20	2	10yr	4/3	100	--	--	--	--	--	sandy clay loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

<p>NRCS Hydric Soil Field Indicators (check here if indicators are not present <input checked="" type="checkbox"/>):</p> <input type="checkbox"/> A1- Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks) <p><small>¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</small></p>
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Restrictive Layer (If Observed) Type: N/A Depth: N/A	<p>Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
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Remarks: **second horizon has a mixed matrix**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W2** Sample Point **W2-1u**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)				
	Species Name	% Cover	Dominant	Ind. Status
1.	<i>Acer saccharinum</i>	60	Y	FACW
2.	<i>ROBINIA PSEUDOACACIA</i>	40	Y	FACU
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		100		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	<i>RHAMNUS CATHARTICA</i>	30	Y	FAC
2.	<i>LONICERA X BELLA</i>	30	Y	FACU
3.	<i>Morus rubra</i>	10	N	FACU
4.	<i>ROSA MULTIFLORA</i>	10	N	FACU
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		80		
Herb Stratum (Plot size: 2 meter radius)				
1.	<i>Toxicodendron radicans</i>	25	Y	FAC
2.	<i>RHAMNUS CATHARTICA</i>	5	N	FAC
3.	<i>Ribes missouriense</i>	5	N	UPL
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		35		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	<u>0</u>	x 1 =	<u>0</u>
FACW spp.	<u>60</u>	x 2 =	<u>120</u>
FAC spp.	<u>60</u>	x 3 =	<u>180</u>
FACU spp.	<u>90</u>	x 4 =	<u>360</u>
UPL spp.	<u>5</u>	x 5 =	<u>25</u>
Total		<u>215</u> (A)	<u>685</u> (B)
Prevalence Index = B/A =		<u>3.186</u>	

Hydrophytic Vegetation Indicators:

- Yes No Rapid Test for Hydrophytic Vegetation
- Yes No Dominance Test is > 50%
- Yes No Prevalence Index is ≤ 3.0 *
- Yes No Morphological Adaptations (Explain) *
- Yes No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

- Tree** - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.
- Sapling/Shrub** - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.
- Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.
- Woody Vines** - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present Yes No

Remarks: N/A

Additional Remarks:

Marginal hydrophytic vegetation at sample point location. On rise with convex surface. Sample point location is approximately 2' in elevation higher than the surface of the delineated wetland. Non-hydric soils and lack of hydrology supports upland determination.

Project/Site: Mud Lake Wetland Delineation	Stantec Project #: 193703331	Date: 10/15/14
Applicant: Wisconsin Department of Natural Resources	Investigator #1: Dan Prasch	County: Columbia
Investigator #2: _____	Investigator #2: _____	State: Wisconsin
Soil Unit: Kibbie fine sandy loam	NWI/WWI Classification: N/A	Wetland ID: W2
Landform: Depression	Local Relief: Concave	Sample Point: W2-1w
Slope (%): 0-2	Latitude: N/A	Community ID: Silver Maple FP Forest
	Longitude: N/A	Datum: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, expl: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Section: 28
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?	Are normal circumstances present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Township: 11N
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		Range: 10 Dir: E

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Remarks: **According to Arlington University Farm (WI0308), WETS analysis determined that antecedent precipitation conditions were dryer than average for this time of year.**

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present):

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input checked="" type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input checked="" type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
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Field Observations:

Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	
Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks: **Understory is sparsely vegetated and located on a concave surface. Wetland area is a closed depression that likely ponds for long or very long during the growing season based on position on the landscape.**

SOILS

Map Unit Name: **Kibbie fine sandy loam** Series Drainage Class: **somewhat poorly**

Taxonomy (Subgroup): **Aquollic Hapludalfs**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	6	1	10yr	2/1	100	--	--	--	--	--	Sandy loam
6	20	2	10yr	5/1	70	--	--	--	--	--	sandy clay loam
--	--	--	10yr	4/3	30	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present):

<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input checked="" type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Mucky Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input checked="" type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p>Indicators for Problematic Soils¹</p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
---	---	---

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: **N/A** Depth: **N/A**

Hydric Soil Present? Yes No

Remarks: **Second horizon has a mixed matrix. Kibbie soils are mapped by NRCS to have inclusions of the hydric Colwood Series in depressions. Soils at the sample point match the range in characteristics for Colwood.**

Project/Site: **Mud Lake Wetland Delineation** Wetland ID: **W2** Sample Point **W2-1w**

VEGETATION (Species identified in all uppercase are non-native species.)				
Tree Stratum (Plot size: 10 meter radius)				
	<i>Species Name</i>	%	Dominant	Ind. Status
1.	<i>Acer saccharinum</i>	80	Y	FACW
2.	<i>Fraxinus pennsylvanica</i>	10	N	FACW
3.	<i>Ulmus americana</i>	10	N	FACW
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		100		
Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	<i>Ulmus americana</i>	20	Y	FACW
2.	<i>Fraxinus pennsylvanica</i>	20	Y	FACW
3.	<i>Sambucus nigra</i>	10	Y	FACW
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		50		
Herb Stratum (Plot size: 2 meter radius)				
1.	<i>Geum laciniatum</i>	15	Y	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		15		
Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		
Remarks: N/A				

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet

<u>Total % Cover of:</u>	<u>Multiply by:</u>
OBL spp. <u>0</u>	x 1 = <u>0</u>
FACW spp. <u>165</u>	x 2 = <u>330</u>
FAC spp. <u>0</u>	x 3 = <u>0</u>
FACU spp. <u>0</u>	x 4 = <u>0</u>
UPL spp. <u>0</u>	x 5 = <u>0</u>
Total <u>165</u> (A)	<u>330</u> (B)
Prevalence Index = B/A = <u>2.000</u>	

Hydrophytic Vegetation Indicators:

Yes No Rapid Test for Hydrophytic Vegetation

Yes No Dominance Test is > 50%

Yes No Prevalence Index is ≤ 3.0 *

Yes No Morphological Adaptations (Explain) *

Yes No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present Yes No

Additional Remarks:
Sparsely vegetated concave surface below nearly closed canopy of silver maple with green ash and elm mixed in the sapling layer.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
Appendix C– Site Photographs
November 26, 2014

Appendix C – Site Photographs



Photo 1. View of wetland 1, sample point 1 (W1-1w) silver maple (*Acer saccharinum*) stand within the wetland, taken along wetland boundary.



Photo 2. view of wetland 1 (W1) looking south from King Rd.



Photo 3. View of wetland 1 (W1), picture taken looking north.



Photo 4. View of wetland 1 (W1), picture taken looking west.



Photo 5. View of wetland 2, sample point 1 (W2-1w), picture taken looking north.



Photo 6. View of wetland 2, sample point 1 (W2-1w), picture taken looking north.



Photo 7. View of upland old field meadow, picture taken looking north.



Photo 8. View of upland old field meadow, picture taken looking south.

WETLAND DELINEATION REPORT

Mud Lake Wetland Delineation
Appendix D– WETS Analysis
November 26, 2014

Appendix D – WETS Analysis

WETS Analysis Worksheet

Project Name: Mud Lake Wetland Delineation
 Project Number: 193703331
 Period of interest: July - September, 2014
 Station: Arlington University Farm (WI0308)
 County: Columbia County, WI

Long-term rainfall records (from WETS table)

	Month	3 years in 10 less than	Normal	3 years in 10 greater than
1st month prior:	September	1.88	3.64	4.44
2nd month prior:	August	2.88	4.24	5.06
3rd month prior:	July	2.75	3.86	4.56
		Sum =	11.74	

Site determination

Site Rainfall (in)	Condition Dry/Normal*/Wet	Condition** Value	Month Weight	Product
1.79	Dry	1	3	3
3.71	Normal	2	2	4
1.88	Dry	1	1	1
		Sum =	7.38	Sum*** = 8

*Normal precipitation with 30% to 70% probability of occurrence

Determination: Wet
 X Dry
 Normal

**Condition value:

Dry = 1
 Normal = 2
 Wet = 3

***If sum is:

6 to 9 then period has been drier than normal
 10 to 14 then period has been normal
 15 to 18 then period has been wetter than normal

Precipitation data source: United States Department of Agricultural Field Office Climate Data

Reference: Donald E. Woodward, ed. 1997. *Hydrology Tools for Wetland Determination*, Chapter 19. Engineering Field Handbook. U.S. Department of Agriculture, Natural Resources Conservation Service, Fort Worth, TX.

REQUEST FOR SHPO COMMENT AND CONSULTATION ON A FEDERAL UNDERTAKING

Submit one copy with each undertaking for which our comment is requested. Please print or type. Return to:

Wisconsin Historical Society, Division of Historic Preservation, Office of Preservation Planning, 816 State Street, Madison, WI 53706

RECEIVED

Please Check All Boxes and Include All of the Following Information, as Applicable:

JUL 21 2014

DIV HIST PRES

I. GENERAL INFORMATION

- This is a new submittal.
- This is supplemental information relating to Case #: _____ and title: _____
- This project is being undertaken pursuant to the terms and conditions of a programmatic or other interagency agreement. The title of the agreement is _____

- a. Federal Agency Jurisdiction (Agency providing funds, assistance, license, permit): USFWS funding
- b. Federal Agency Contact Person: MARK DUDZIK Phone: 414.263.8617
- c. Project Contact Person: same Phone: _____
- d. Return Address: DNR, 2300 N MLK DRIVE, MILWAUKEE, WI 53212 Zip Code: _____
- e. Email Address: MARK.DUDZIK@WI.GOV
- f. Project Name: MUD LAKE SHOOTING RANGE
- g. Project Street Address: _____
- h. County: CO City: _____ Zip Code: _____
- i. Project Location: Township 11N, Range 10E, E/W (circle one), Section 21, Quarter Sections NW/NE
- j. Project Narrative Description—Attach Information as Necessary.
- k. Area of Potential Effect (APE). Attach Copy of U.S.G.S. 7.5 Minute Topographic Quadrangle Showing APE.

II. IDENTIFICATION OF HISTORIC PROPERTIES

- Historic Properties are located within the project APE per 36 CFR 800.4. Attach supporting materials.
- Historic Properties are not located within the project APE per 36 CFR 800.4. Attach supporting materials.

III. FINDINGS

- No historic properties will be affected (i.e., none is present or there are historic properties present but the project will have no effect upon them). Attach necessary documentation, as described at 36 CFR 800.11.
- The proposed undertaking will have no adverse effect on one or more historic properties located within the project APE under 36 CFR 800.5. Attach necessary documentation, as described at 36 CFR 800.11.
- The proposed undertaking will result in an adverse effect to one or more historic properties and the applicant, or other federally authorized representative, will consult with the SHPO and other consulting parties to resolve the adverse effect per 36 CFR 800.6. Attach necessary documentation, as described at 36 CFR 800.11, with a proposed plan to resolve adverse effect(s).

Authorized Signature: _____ Date: 07.17.2014
 Type or print name: MARK J DUDZIK

IV. STATE HISTORIC PRESERVATION OFFICE COMMENTS

- Agree with the ^{modified} finding in section III above.
- Object to the finding for reasons indicated in attached letter.
- Cannot review until information is sent as follows: _____

Authorized Signature: _____ Date: 7-22-14

Phase I Archaeological Site Identification Survey for
the Proposed Mud Lake Shooting Range,
Columbia County, Wisconsin

Research Report in Archaeology Number 255

Museum Archaeology Program
DNR ID: 212-LEHE-3614-LERE
MAP #: 14-6001

prepared by **Norm M. Meinholz**

principal investigator **Kent E. Dickerson**

June 2014



Phase I Archaeological Site Identification Survey for
the Proposed Mud Lake Shooting Range,
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prepared by
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principal investigator
Kent E. Dickerson

June 2014

prepared for
The Wisconsin Department of Natural Resources
DNR ID: 212-LEHE-3614-LERE
MAP #: 14-6001

ABSTRACT

In May of 2014, the *Museum Archaeology Program* of the Wisconsin Historical Society conducted a Phase I archaeological site identification survey of a proposed shooting range, designated the Mud Lake Shooting Range, in Columbia County, Wisconsin. This investigation was conducted on behalf of the Wisconsin Department of Natural Resources (DNR ID: 212-LEHE-3614-LERE; MAP #14-6001). The proposed project is situated on a partially wooded hill and footslopes located at the intersection of King Road and Conservation Lane. Approximately six acres were investigated.

The Phase I survey resulted in the identification of one historic Euro American farmstead, the Prairie Farm (47CO383383) site.

The Prairie Farm (47CO383) site is a historic Euro American farmstead defined by the remains of eight structures and associated scatter of historic artifacts recovered from systematic shovel testing of a grassy and wooded hill. These structures were identified by extant foundations or surface depressions. These structures include a domicile, as well as various out buildings (barn, silo, sheds, etc.) and a well and cistern.

Sixty-nine shovel tests were excavated, 32 of which contained cultural material. A total of 323 historic Euro American artifacts recovered from the Prairie Farm (47CO383) site. Half of the assemblage was recovered from shovel tests excavated within Structures 6 and 7. The remaining items were recovered from systematic shovel testing across the site area and from surface dumps. The recovered artifacts include a variety of architectural, domestic, faunal and personal items associated with a farmstead representing long-term occupation from the mid-nineteenth century to the late twentieth century. In addition, one piece of precontact Native American chipped-stone debitage was also recovered, suggesting some minor use of the area at a much earlier but unknown period of time.

A review of the available historic plat maps indicated the property has a continuous record of a house/farmstead from as early as 1861 until the late 1970s. During this time the property changed ownership five times before being purchased by the State of Wisconsin Conservation Commission (now Wisconsin Department of Natural Resources) in 1973. The buildings were demolished in the late 1970s when King Road was realigned to its current configuration. Much of the site has been disturbed by the removal of the structures and landscaping associated with the subsequent use of the area.

The Prairie Farm (47CO383) site does not appear to meet the criteria for eligibility for listing on the National Register of Historic Places due to the long historic occupation, mixing of cultural material and impacts resulting from the removal of buildings and subsequent landscaping. No additional investigation is recommended.

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INTRODUCTION

In May of 2014, the *Museum Archaeology Program* of the Wisconsin Historical Society conducted a Phase I archaeological site identification survey of a proposed shooting range, designated the Mud Lake Shooting Range, in Columbia County, Wisconsin (Figure 1). This investigation was conducted on behalf of the Wisconsin Department of Natural Resources (DNR ID: 212-LEHE-3614-LERE; MAP #14-6001). The proposed project is situated on a partially wooded hill and footslopes located at the intersection of King Road and Conservation Lane (Figures 2-4). The area of potential effect was staked and covers approximately six acres.

PHYSICAL SETTING

The proposed Mud Lake Shooting Range is located within the Civil Town of Lowville in south central Columbia County, Wisconsin. It is situated in Section 28, T11N R10E. The project area lies within Martin’s (1965) Eastern Ridges and Lowlands physiographic province. The topography of the area is controlled by a series of southwest to northeast trending cuestas (Martin 1965). Formed by the erosional cross cutting of moderately domed, variably resistant limestone, dolomite, and shale bedrock, the cuestas impart a landscape characterized by broad, linear uplands (cuestas) and lowlands (vales). Glaciation has smoothed the cuestas and filled the vales. The resulting landscape is one of overall low relief. The dominant rock underlying the project area is Cambrian age sandstone with some dolomite and shales (Mudrey et al. 1982).

No outcrops of lithic raw materials, utilized in the manufacture of chipped stone tools, are located in the immediate project area. The major bedrock outcrops of Prairie du Chien and Galena cherts, common lithic raw materials utilized by Wisconsin Native American groups, are located further to the south and southwest. Lithic raw materials would have been available locally within the glacial till.

The project area is located within the Lake Wisconsin watershed of the Lower Wisconsin River Basin. Lake Wisconsin is located nearly nine miles northwest of the project area. An intermittent stream at the far western edge of the project area drains north into Mud Lake. This lake is drained by Rocky Run which flows north and then west into the Wisconsin River just north of Dekorra.

Source: DOT County Maps, Columbia County (2014).

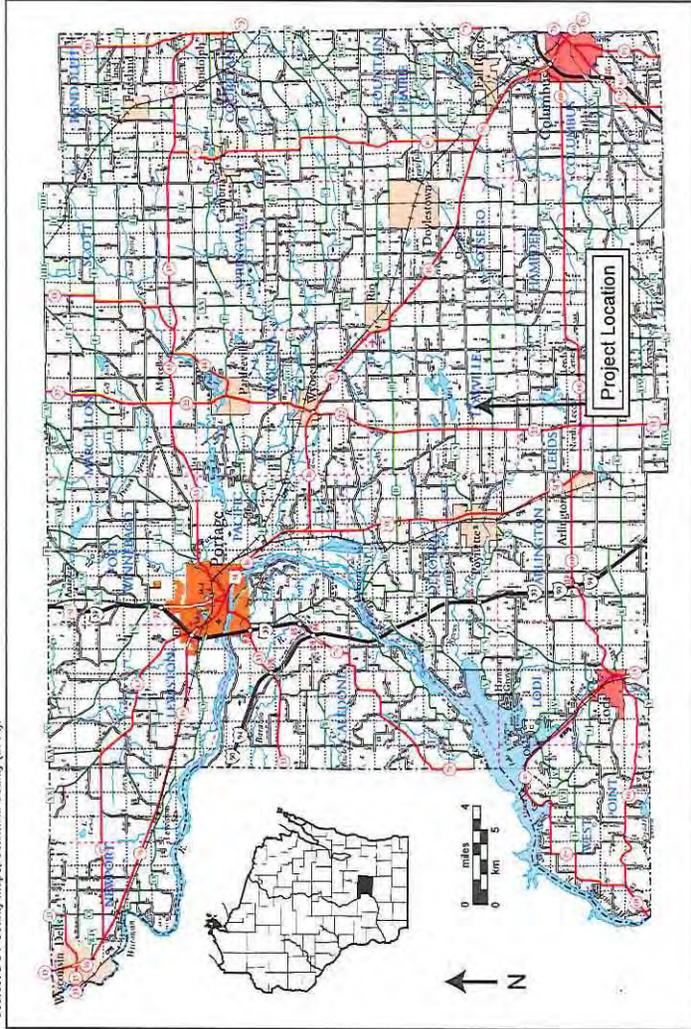


Figure 1. DNR Mud Lake Shooting Range Project Area in Columbia County.



Figure 2. The DNR Mud Lake Shooting Range Project Area Looking East from the Northwest Corner of the Project Area.



Figure 3. The DNR Mud Lake Shooting Range Project Area Looking West along King Road.



MAP 14 May 2014

Figure 4. The DNR Mud Lake Shooting Range Project Area Looking East from the Southwest Corner of the Project Area.

Soils in the project area are defined as Lapeer, Gilford and Kibbie Series (NRCS 2014). Lapeer is a very deep, well-drained soil formed in sandy loam till on ground and end moraines. This sandy loam soil is defined across the hill crest and slopes, ranging from 0 to 60 percent. Native vegetation was an upland deciduous forest. Gilford is a very deep, poorly drained soil formed in loamy over sandy sediments on outwash plains, near-shore zones (relict), and flood-plain steps. This sandy loam soil is defined at the lowland at the western end of the project area bordering the intermittent stream on slopes ranging from 0 to 2 percent. Native vegetation was herbaceous wetland. Kibbie is a very deep, somewhat poorly drained soil on lake plains, ground moraines, outwash plains, and deltas. This loamy soil is defined across the lowlands at the northeast corner of the project area on slopes ranging from 0 to 6 percent. Native vegetation was a rich mesic forest.

At the time of Euro American expansion into the region, the area supported xeric forest-oak openings consisting of patches of bur oak (*Quercus macrocarpa*), white oak (*Q. alba*), red oak (*Q. borealis*), and black oak (*Q. velutina*) and expanses of prairie (Finley 1976). Forest growth was primarily confined to “well-drained sites on either sandy and porous flat lands, on south and west slopes of hills, or on thin soils on hilltops and ridges” (Curtis 1959). Underbrush associated with oak forests included hazelnut (*Corylus Americana*) and gray dogwood (*Cornus racemosa*), along with raspberries and blackberries (*Rubus sp.*) (Curtis 1959). Typical prairie dominants, most notably confined to the flat uplands, were big bluestem (*Andropogon gerardii*), little bluestem (*A. scoparius*), and Indian grass

(*Sorghastrum nutans*) (Eddy 1996; Hole and Germain 1994). Flood plains contained areas of marsh and sedge meadow (Finley 1976). The vegetation in such settings was dominated by grasses including Tussock sedge (*Carex stricta*) and other sedge (*Carex spp.*), bluejoint reedgrass (*Calamagrostis canadensis*), sloughgrass (*Spartina pectinata*), and reed canary grass (*Phalaris arundinacea*) (Curtis 1959).

Prior to Euro American settlement, a variety of faunal resources were available for subsistence, skins for clothing and covers for structures, and for a variety of tools. Native fauna of central Wisconsin included white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), squirrel (*Sciurus spp.*) and other rodents (Order Rodentia), and various mustelids (Family Mustelidae). Other species, valued for their fur, included the gray wolf (*Canis lupus*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), red fox (*Vulpes fulva*), and hares/rabbits (Order Lagomorpha). Avian species common in this region included turkey (*Meleagris gallopavo*), grouse (Family Tetraonidae), ducks and geese (Order Anseriformes), raptors (Order Accipitriformes/Falconiformes), cranes (*Grus spp.*), and prairie chickens (*Typanuchus cupido*). The wetland environments also supported a diverse faunal community including aquatic and semi-aquatic taxa such as beaver (*Castor canadensis*), river otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), turtles (Order Testudinata), fish, and freshwater shellfish (Class Pelecypoda).

CULTURAL CONTEXT

Native Americans have lived in southern Wisconsin since about 9,500 B.C., as evidenced by a complex culture history. Cultural developments were related to larger social fabrics that were not restricted geographically to southwestern Wisconsin. An introduction to Wisconsin’s rich and dynamic culture history is provided by Birmingham et al. (1997).

The Paleo-Indian Tradition (ca. 10,000 to 6,000 B.C.) in Wisconsin is typically divided into Early Paleo-Indian Stage, defined by the use of fluted projectile points, and the Late Paleo-Indian Stage, defined by more diverse lanceolate point types. Late Paleo-Indian sites are identified in Wisconsin based on the presence of lanceolate or stemmed projectile point styles such as Agate Basin, Plainview, Eden, and Scottsbluff (R. J. Mason 1963, 1986). In the unglaciated area, Late Paleo-Indian sites are found along river terraces near wetlands or river-stream confluences, and in rock shelters (Benchley et al. 1997).

The Archaic Tradition in Wisconsin represents a time of continual adaptation to the conditions caused by major climate changes in the postglacial era. This tradition is marked by a shift from the specialized hunting of large game to the hunting of modern fauna and to a more broad-based exploitation of nuts, fish, and wild plants (Benchley et al. 1997; Meinholz and Kolb 1997). Also defining the Archaic Tradition is a shift from lanceolate and stemmed projectile points to a variety of notched and stemmed forms. In southwest Wisconsin, habitation sites with Archaic components are rarely reported (Stoltman 1997). Those

identified are primarily scattered diagnostic points and surface finds, with point types that have been mainly defined to the south and east of Wisconsin. The Middle Archaic Stage (ca. 6000 to 1200 B.C.) coincides with vegetation changes caused by climatic warming trends. Middle Archaic sites have been identified as surface finds, in rockshelters, and in other stratified contexts. Wisconsin's Late Archaic Stage (1200 to 300 B.C.) is marked by a shift to a cool, moist climate (Benchley et al. 1997) and is characterized by smaller stemmed points such as Durst (Wittry 1959). The Late Archaic Stage in Wisconsin is also renowned for its Old Copper Culture or Complex (Benchley et al. 1997).

The Woodland Tradition is commonly identified by the presences, either individually or as a group, of three primary traits not identified in the region's previous Archaic Tradition: the presence of pottery, the construction of earthen burial mounds, and the first direct evidence for the use of cultigens (Meinholz and Kolb 1997). In some areas, a shift to a more sedentary lifeways is indicated by the presence of middens, houses, and village sites, while in other places Woodland peoples continued to subsist by moving seasonally (Benchley et al. 1997). The tradition has been divided into three smaller stages based on distinctive changes in artifact assemblage composition over time. These include the Early Woodland (500 B.C. to A.D. 100), Middle Woodland (A.D. 100 – 500), and Late Woodland (A.D. 500 – 1600) stages.

Habitation sites relating to the early phase of the Early Woodland are identified on the basis of thick, grit-tempered pottery, usually classified as Marion Thick, and straight stemmed Kramer points (Benchley et al. 1997). Later Early Woodland occupations in southwest Wisconsin are characterized by incised-over-cordmarked ceramics such as Prairie Ware, as well as Waubesa contracting stemmed points and other stemmed point varieties. Many Early Woodland habitation sites in south-central Wisconsin are located on floodplains or river terraces.

Burial mounds appear in much of southern Wisconsin for the first time in the Middle Woodland. Also appearing for the first time is evidence for storage and refuse pits, domesticated plants, and the first evidence of houses. Plant Cultivation included squash, sumpweed, and wild rice (Arzigian 1987). Nuts, including hickory, walnut, and acorn were also harvested. During the Middle Woodland Stage, ceramic vessels are thinner and less ornately decorated, with dentate stamping, cord-wrapped stick impressions, and punctates. During the Middle to Late Woodland transition, villages became larger, supported in part by the cultivation of maize and other native plants. The construction of large conical mounds with multiple burials was replaced by the construction of linear and animal shaped (effigy) mounds, frequently containing only one burial.

Late Woodland peoples in southern Wisconsin were primarily hunter-gatherers, but there was an increasing importance on harvesting and cultivating a variety of plants, particularly as the Late Woodland progressed. There is evidence for population growth and reorganization but little evidence for settled villages. Late Woodland sites are more dispersed across the landscape than in previous stages. The artifact assemblage includes ceramics that are cord and fabric impressed and collared vessels. The bow and arrow first appear clearly in the archaeological record (Benchley et al. 1997). Late Woodland burial mounds appear

throughout Wisconsin, with effigy mounds exclusive to southern Wisconsin, distributed throughout the deciduous forests and extending into the unglaciated areas of southern Wisconsin and northwest Iowa (Benchley et al. 1997).

The Effigy Mound Culture in southern Wisconsin has been designated the Eastman Phase (ca. A.D. 750 – 1050) (Stoltman 1990). The phase is identified by Madison Cord-Impressed ceramics and small stemmed, notched, or triangular arrowheads. The number of Eastman Phase sites increases over preceding phases. Like the preceding phases, the Eastman Phase reflects a reliance on seasonal mobility, and exploiting the resources of the floodplain, terraces, and uplands. The Post Eastman Phase (A.D. 1050 to historic times), as defined by Stoltman (1990), demonstrates more profound changes in the archaeological record. Effigy mound construction was largely abandoned and collared type ceramics were prevalent. Stockaded villages occupied by maize-growing, collared-ware-making Late Woodland peoples are present in southern Wisconsin (Stoltman and Christenson 2000).

Mississippian culture, originating to the south, apparently made limited incursions into present-day Wisconsin, commencing with the Lohmann phase around A.D. 1050 and continuing through the succeeding Stirling phase to circa A.D. 1200 (Green 1997). Lohmann phase components at such sites as Aztalan and Trempealeau and Stirling phase components at Aztalan, Fred Edwards, and Diamond Bluff attest to interactions between southern populations and local Late Woodland cultures. Based perhaps on trade, social alliances, or in some cases refugee populations, these interactions appear to have been of restricted geographic scope. Although perhaps not involving "a massive Middle Mississippian population influx" (Green 1997:214), these cultures may have nonetheless still influenced the Woodland populations of the region.

In the 18th century, the Ho-Chunk (Winnebago), forced west from their traditional homelands, resided within what is now Columbia County (Mason 1988:80). Many scholars agree that the Ho-Chunk, Ioway, and others represent the lineal descendants of the Oneota (see Overstreet 1997). Oneota sites, differentiated by ceramics, concentrate in various localities from La Crosse to the Door Peninsula. The origin of the complex is poorly understood, though it may have developed from Middle Mississippian populations resident in Wisconsin, the amalgamation of Mississippian and Woodland peoples, or it may represent an intrusive population from the south (Overstreet 1997). A successful horticulture based economy, supplemented by fishing and hunting, sustained the Oneota for at least 700 years.

The Euro American settlement in the Town of Lowville occurred in 1843 (Western Historical Company 1880:796). The town was named for Jacob Low whose house in Section 32 became a hotel that served as the first post office until 1853. One of the areas earliest settlers was Silas Herring who settled in the project area by 1845. Columbia County was organized in 1846 with Winnebago settlement (now Portage) becoming the county seat in 1851 (Western Historical Company 1880:376).

Literature Search

Field investigations were preceded by an extensive archaeological literature and records review. The following sources, curated at the State Historical Society of Wisconsin, were examined: Wisconsin Historic Preservation Database, and Archaeological Report Inventory (Division of Historic Preservation and Public History), Charles E. Brown Atlas, Wisconsin Land Economic Inventory, and historical plats and maps (Library and Archives Division).

One archaeological site and one Euro American cemetery have been previously identified within one mile of the project area (Figure 5). The one archaeological site is the Halpin (47CO337) site. This is a scatter of lithic artifacts recovered from the surface of cultivated fields located along the north and west shores of Mud Lake, about one mile north of the project area. A grooved axe and projectile points have reportedly been collected from the site. These diagnostics represent Middle and Late Archaic and Early, Middle and Late Woodland Traditions.

The South Lowville Cemetery (AKA Lowville Cemetery) (BCO-0088) is located on the north site of C.T.H. CS approximately one mile south of the project area.

METHODOLOGY

The field methods employed for this project conform to the *Wisconsin Archaeological Survey Guide for Public Archeology in Wisconsin* (Wisconsin Archaeological Survey Guidelines Committee 2012). The survey area consisted of approximately six acres of lightly wooded grassland and dense, brushy woodland that were investigated using shovel testing techniques.

The Phase I site identification survey utilized systematic shovel testing due to a lack of ground surface visibility. Shovel test transects were placed 15 meters apart with individual tests excavated at a 15 meter interval along each transect. Each shovel test was excavated well into the B horizon with the soil screened through one-quarter inch mesh. After cultural features were identified each shovel test soil profile and vertical location of any recovered artifacts was recorded. The location of all shovel tests and surface features were mapped using a total station.

Laboratory Methods, Analysis, and Curation

Cultural materials collected during the field investigations were returned to the MAP laboratory to be cleaned, catalogued, and curated in accordance with the standard laboratory procedures of MAP. Each artifact was cleaned, sorted into general categories, inventoried, and placed in polyethylene plastic bags with provenience information.

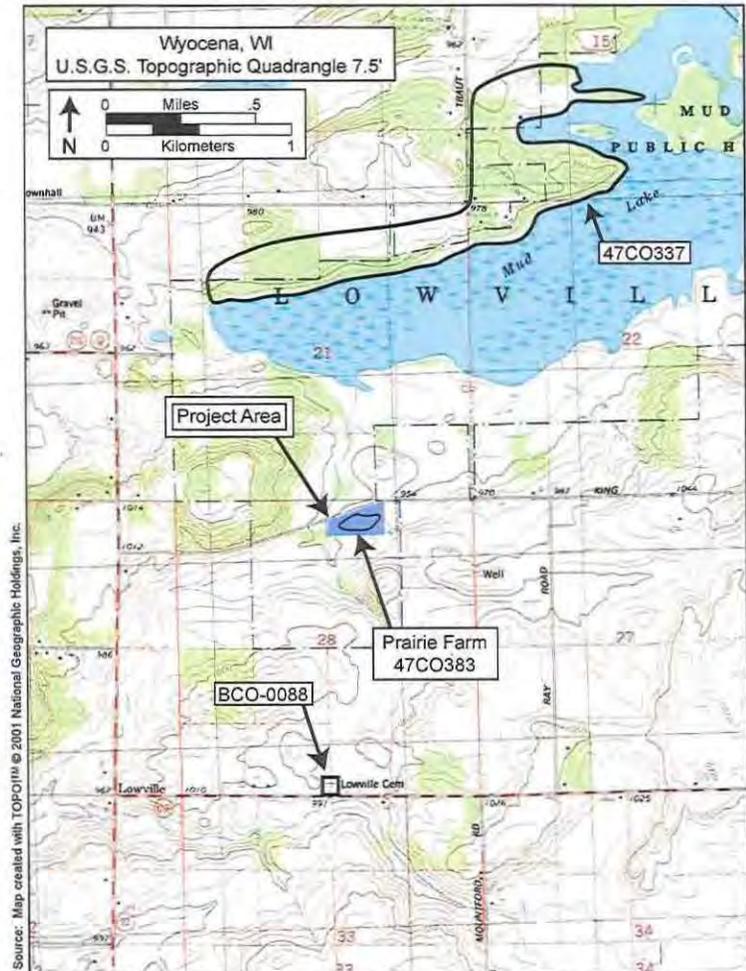


Figure 5. Archaeological Sites within One Mile of the DNR Mud Lake Shooting Range Project Area.

All artifacts were analyzed and described through consultation of a range of archaeological literature, artifact and program guides, and program comparative collections. Once analyses were complete, laboratory staff organized the museum catalogue and prepared the collection for curation. The catalogue lists all artifacts from each provenience for each site. All artifacts, notes, maps, photographs and other documentation generated during this archaeological investigation are curated by the Museum Division of the Wisconsin Historical Society in Madison, under a cooperative agreement with the Wisconsin Department of Natural Resources.

RESULTS OF INVESTIGATION

Archaeological site identification survey of the proposed Mud Lake Shooting Range resulted in the identification of one historic Euro American site. The site is a Euro American farmstead, designated the Prairie Farm (47CO383383) site (see Figure 5).

The Prairie Farm (47CO383) Site

The Prairie Farm (47CO383) site is a historic Euro American farmstead defined by the remains of eight structures and associated scatter of historic artifacts recovered from systematic shovel testing of a grassy and wooded hill. The site is located immediately south of King Road and bordered on the south and to the east by Conservation Drive. The intersection of these roads is located just to the northeast of the site. (Figures 6 & 7). The shovel tests and distribution of building foundations and depressions defined a site area measuring approximately 300 feet north-south and 600 feet east-west, encompassing about three acres. It is situated at an elevation of 960-970 feet above mean sea level. The recovered artifacts include a variety of domestic, construction and personal items associated with a farmstead dating from the nineteenth to late twentieth century.

Field Methodology

The Prairie Farm (47CO383) site was encountered during the initial walkover of the project area. The foundational remains of several structures were identified, flagged and photographed. A series of shovel tests were systematically excavated across the upland at a 15 m interval. Additional shovel tests were excavated within the borders of two of the structures and with several shallow depressions. A total of 69 shovel tests were excavated, 32 of which contained cultural material. All of the soil was screened through ¼ inch mesh. The shovel test profiles were recorded and their locations and surrounding landmarks mapped with a total station. A photographic record of the overall site and area was also made.

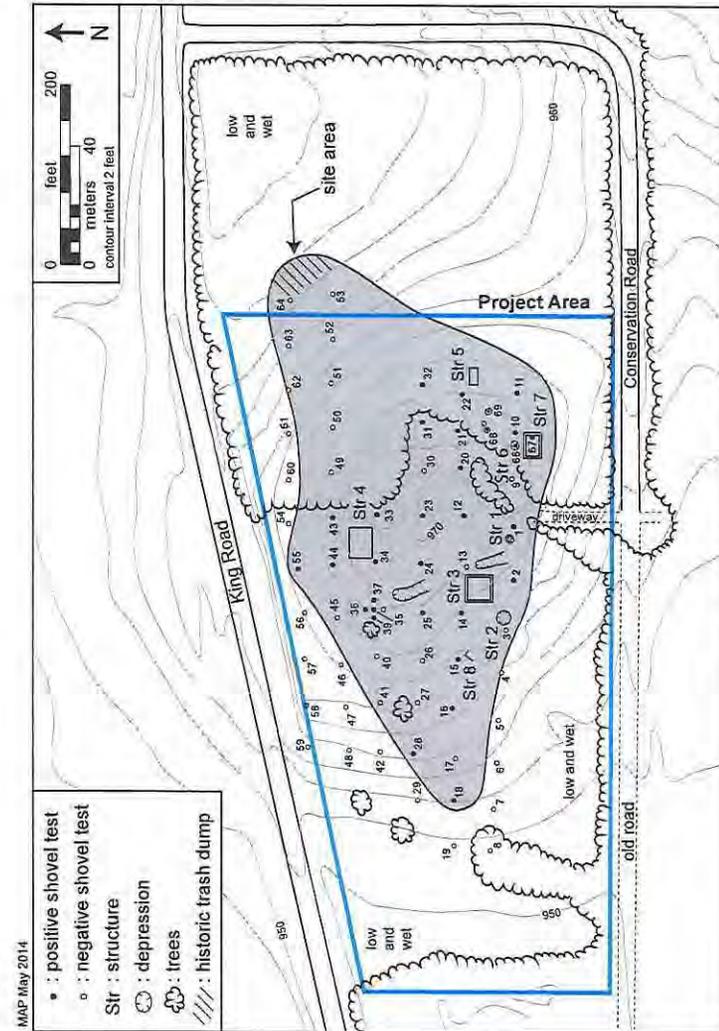


Figure 6. Prairie Farm (47CO383) Site.



MAP 14 May 2014

Figure 7. Looking West across the Prairie Farm (47CO383) Site to the Old Cultivated Fields from the Crest of the Hill at the Edge of the Clearing.

Soils

The soil across the site generally exhibits a plow zone; consisting of very dark brown (10YR 2/2) soil with textures varying from sandy loam to silt loam to loam. The depth of plow zone was generally 25 to 30 cm below ground surface, with overall depths varying from 15 to 34 cm (Figure 8). Tests excavated at the western end of the site exhibited a distinct, deep plow zone indicative of cultivated fields located to the west of the site. Some tests exhibited a shallow, sometimes unplowed A horizon over a transitional AB horizon. The AB horizon consisted of very dark brown (10YR 2/2) sandy loam with inclusions of dark yellowish brown (10YR 3/4). The B horizon generally consisted of dark yellowish brown (10YR 3/4) sandy loam.

Shovel Test 35, excavated along the hill crest to the west of Structure 4, identified a shallow A/Ap horizon buried by historic fill. This shovel test was bracketed by four additional shovel tests, three of which also encountered this same profile. The fill, consisting of brown (10YR 4/3) sandy loam with gravel, was 21 to 32 cm deep. The A/Ap horizon, varying from 9 to 11 cm thick, consisted of black (10YR 2/1) sandy loam. This horizon contained a dense concentration of construction debris including numerous small square and wire nails and mortar. Several possible chert flakes were also recovered. The B horizon consisted of yellowish red (5YR 4/6) sandy clay.

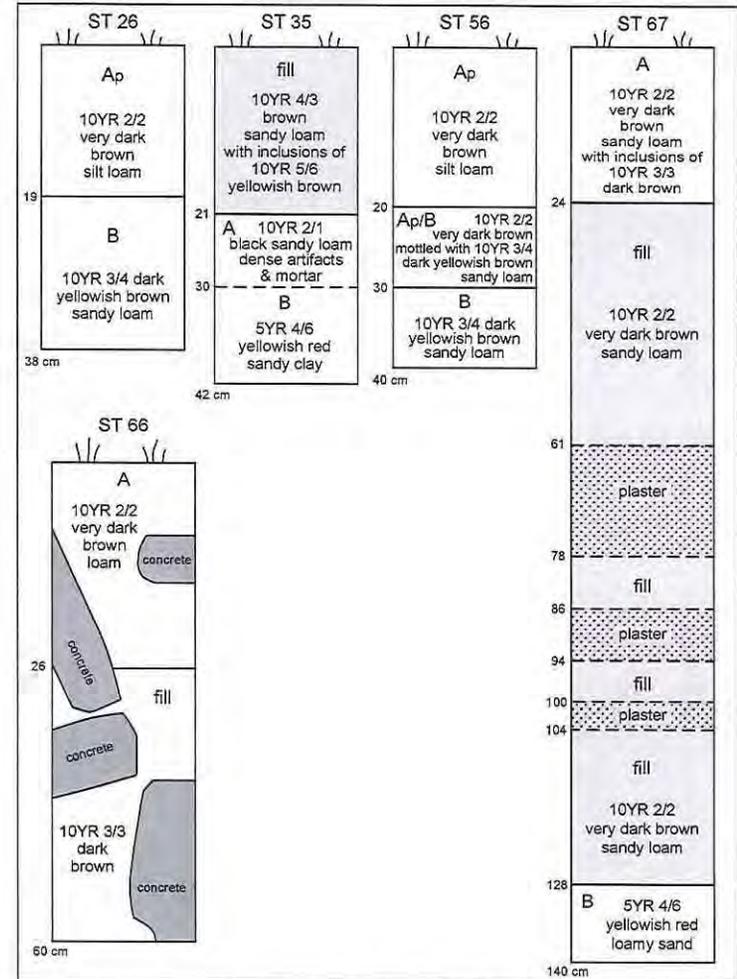


Figure 8. Representative Shovel Test Soil Profiles at the Prairie Farm (47CO383) Site.

A shovel test excavated within Structure 6 (Shovel Test 66), a possible cistern located adjacent to the house foundation (Structure 7), identified a loamy A horizon to a depth of 26 cm below ground surface. A fill zone, consisting of 10YR 3/3 loamy sand extended to 60 cm, the maximum depth that could be excavated due to the inclusion of large fragments of concrete. These concrete fragments were present throughout the shovel test and were associated with construction debris (roofing material, window glass, nails, mortar/plaster and tile) container glass, personal and miscellaneous items totaling 62 artifacts. The concrete may represent the broken and collapsed cover of the cistern.

Shovel test 67, excavated within the foundation of house Structure 7, exposed 128 cm of fill over a B horizon. No concrete floor was identified. An A horizon extended 24 cm below ground surface and consisted of very dark brown (10YR 2/2) sandy loam with 10YR 3/3 inclusions. The A horizon had formed on just over a meter of fill which consisted of layers of mortar/plaster and associated construction debris (roofing material, bricks, nails and window glass), domestic artifacts (ceramics and container glass) and miscellaneous items, a total of 100 artifacts. The underlying B horizon consisted of yellowish red (5YR 4/6) loamy sand to an excavated depth of 140 cm below ground surface.

The soils within the site area are classified as Lapeer sandy loam (Natural Resources Conservation Service 2014). This is a very deep, well-drained soil formed in sandy loam till on ground and end moraines. This sandy loam soil is defined across the hill crest and slopes, ranging from 0 to 60 percent.

Public Records and Historical Literature Review

Plat Maps

A review of the available historic plat maps of Lowville Township indicated that a farm was located within the project area between at least 1861 and 1962. All of the plats show the route of the road prior to the realignment of King Road, which resulted in the termination of Conservation Drive in a dead end. The earliest available plat depicts a house/farm is present as early as 1861 (A. Menges & Co. 1861) when the parcel is owned by S. W. Herring. The plat actually illustrates two houses in the project area as well as a house to the north in the adjacent section, all owned by Herring. By 1873 (Harrison & Warner 1873) the parcel continues to be owned by S.W. Herring but just one house, at the site location, is indicated. The same situation is indicated on the 1890 plat (C.M. Foote & Co. 1890). By 1916 (Hall L. Brooks Co. 1916) the parcel was acquired by M. Tollfson and H. Olson. A structure remains depicted at the site location. Tollfson and Olsen retained ownership of the parcel as illustrated on the 1927 plat (The General Engineering Co. 1927). A 1937 aerial photograph provides a footprint of the farmstead (Figure 9). By 1947 (Marathon Map Service 1947) the parcel is owned by C. E. McFadden, with a house still present at the site location. The 1962 edition of the 15' topographic map (USGS 1962) continues to indicate a house at the site location. By the 1984 edition of the Wycocena 7.5' topographic map (USGS 1984) the current realignment of King Road has occurred and no structures are indicated on the property. An aerial photograph from 1978 is the first to indicate the new route of King Road (USDA 1978). This review indicates the property has a continuous record of a house/farmstead from as early as 1861 until the late 1970s when King Road is realigned to its current alignment.



Image Source: Wisconsin State Cartographer's Office Roll Exp: 17-1458 9/22/1937

Figure 9. 1937 Aerial View of the Prairie Farm (47CO383) Site, Located within the DNR Mud Lake Shooting Range Project Area.

Deed Research

A review of the deed transfers of this property was conducted at the Columbia County Register of Deeds (CRD; Table 1). A land patent for 40 acres located in the NW1/4, NE1/4 Section 28, T11N, R10E was issued to Silas W. Herring on September 1, 1849 (CRD 1849). Silas W. Herring was born April 23, 1821 in Lowville, Lewis County, New York (History of Columbia County 1880?). He arrived in Wisconsin in the spring of 1844 and lived in York, Dane County till the fall of 1845. He then moved to Columbia County, settling on the proposed project location. He helped to organize the Town of Lowville, was the first Treasurer and held the office of Chairman and Assessor. He married T. M. Webb on December 28, 1855 in Wyocena. They had two children, Hubert (b. 1859) and Carl (b. 1863). Mrs. Herring was a member of the Presbyterian Church. Mr. Herring was an old-time Abolitionist, and was a Republican ever since the party was organized. He owned 295 acres of land in 1880 (Western Historical Company 1880)

Table 1. Record of Deed Transfers for the Prairie Farm (47CO383) Site.

Volume / Page	Type of Deed	Grantor	Grantee	Acres or 1/4 Sections	\$	Date
	Patent	United States of America	Silas W. Herring	40		9/1/1849
2/279	Warranty	Harrison S. Haskell & Marie Haskell	Silas W. Herring	120	\$83.63	12/15/1849
106/138	Warranty	Silas W. Herring & Polly M. Herring	Mathias Tollefson & Halfdan Olson	295	\$11,800.00	4/5/02
197/327	Quit Claim	Agnethe Olson & Marie Olson devices and heirs of Halfdan Olson	Grace Mae McFadden	160	\$1.00	2/8/43
197/327	Quit Claim	Carrie Tollefson, Widow of Mathias Tollefson	Grace Mae McFadden	160	\$1.00	3/17/43
196/581	Executor's Deed	Estate of Mathias Tollefson	Grace Mae McFadden	160	\$700.00	2/11/43
209/108	Warranty	Grace Mae McFadden	Ambassador Corporation	160	\$1.00	5/15/1946
12/473	Warranty	Ambassador Corporation	State of Wisconsin (Conservation Commission)	160	\$26,500.00	12/10/1916

It remained in the Herring family until April 5, 1902 when the 295 acres of land is purchased by Mathias Tollefson and Halfdan Olson for \$11,800.00 (CRD 1902). Forty-one years later the property is acquired by Grace Mae McFadden by quit claim deeds on February 8 and 17, 1943 (CRD 1943a and b), and by an executor's deed on February 11, 1943 (CRD 1943c). Three years later the property is acquired by Ambassador Corporation by warranty deed on May 15, 1946 (CRD 1946). The State of Wisconsin Conservation Commission (now Wisconsin Department of Natural Resources) acquired the property by warranty deed on December 10, 1964 (CRD 1964).

Feature Analysis

A total of eight features/structures were identified by extant foundations or surface depressions (Figure 8). These structures include a domicile, as well as various out buildings (barn, silo, sheds, etc.) and a well and cistern.

Structure 1

Structure 1 is located in the open grassland approximately 32 feet west of the driveway (Figure 11). It is defined by a somewhat circular arrangement of large boulders that surrounds an opening about 2.5 feet in diameter (Figure 12). This opening extends about four feet below ground surface and was probed another six feet before rock/debris impeded any further excavation. The overall extent of the structure is estimated to measure about 10 by 13 feet in size. No artifacts were found to be associated. The structure is interpreted as a well although the boulders seem to extend across a larger area than would be expected.

Structure 2

Structure 2 is located in the open grassland approximately 75 feet west of Structure 1 and 15 feet from the southwest corner of Structure 3 (Figure 13). It is defined by an irregular oval depression measuring about 14 feet in diameter with scattered cobbles/boulders around the outer edge which may represent the foundation remnants. The structure is interpreted as a silo foundation.

Structure 3

Structure 3 is a nearly square concrete foundation; measuring 30 feet on a side, located in the open grassland just northeast of Structure 2 (see Figure 13). The structure can be traced by following exposed portions of the foundation and the associated depression. It is oriented in cardinal directions. The walls are approximately one foot thick. Structure 3 is interpreted as a barn associated with a silo (Structure 2).

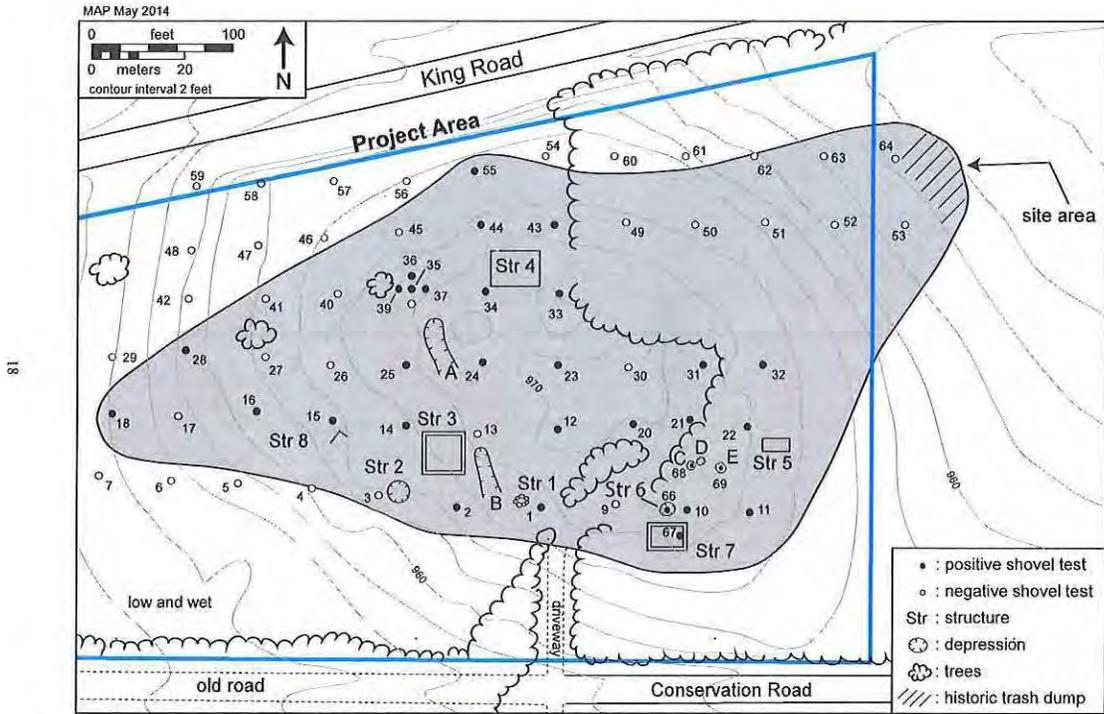


Figure 10. Close-up of the Prairie Farm (47CO383) Site.

18



Figure 12. Structure 1 (Well) at the Prairie Farm (47CO383) Site.

19



Figure 11. Structure 1 (Well) Looking West at the Prairie Farm (47CO383) Site.

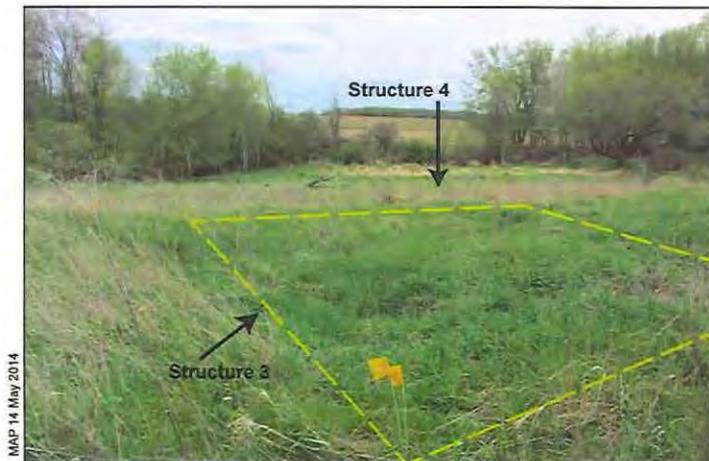


Figure 13. Structures 2 and 3 (Silo and Barn), Looking Southwest at the Prairie Farm (47CO383) Site.

Structure 4

Structure 4 is located approximately 140 feet north of Structure 1 at the crest of the hill in scattered trees (Figures 14 & 15). It is defined by a concrete slab measuring 26 by 33 feet, oriented in an east-west direction. The slab is covered by about a foot of soil and grass. It is interpreted as a barn or shed.

Structure 5

Structure 5 is located approximately 170 feet northeast of Structure 1 in the woods (Figure 16). It is defined by a rectangular concrete slab measuring 11 by 20 feet and oriented in an east-west orientation. It is interpreted as a garage or shed.

Structure 6

Structure 6 is located approximately 90 feet east of Structure 1 in a clearing in the woods (Figure 17). It is defined by a circular depression measuring about 11 feet in diameter and a maximum of two feet in depth. Scattered concrete slabs are exposed along the edge of the depression. A shovel test (ST 66) placed in the center of the structure could be excavated to a depth of 60 cm below ground surface before the presence of large pieces of concrete impeded any further excavation to determine the total depth.



Figure 14. Structure 4 (Barn/Shed) at the Prairie Farm (47CO383) Site, Looking West.



Figure 15. Structure 4 (Barn/Shed) at the Prairie Farm (47CO383) Site, Looking South.



Figure 16. Structure 5 (Garage/Shed) at the Prairie Farm (47CO383) Site, Looking Northeast.



Figure 17. Structure 6 (Cistern) at the Prairie Farm (47CO383) Site, Looking East.

Artifacts recovered from the test included construction debris (nails, window glass, tiles, roofing material and mortar/plaster), container glass, a metal buckle, faunal remains and miscellaneous items (Table 2). It is interpreted as a cistern with the pieces of concrete representing the broken fragments of the cover and upper walls.

Table 2. Artifacts Recovered from Structure 6 at the Prairie Farm (47CO383) Site.

Artifact Type	Quantity	Weight (ounces)
Construction		
Square Nails	2	0.13
Wire Nails	1	0.04
Flat Glass	21	2.12
Tile	1	0.4
Shingle	12	0.34
Mortar	2	3.22
Domestic		
Clear Container Glass	2	0.07
Buckle	1	0.03
Other		
Wire	14	0.52
Misc. Metal	2	0.37
Coal	2	0.15
Faunal Remains	2	0.04
Total	62	7.43

Structure 7

Structure 7 is located five feet south of Structure 6 in a clearing in the woods east of the driveway (Figures 18 & 19). It is defined by a rectangular foundation of mortared limestone measuring about 20 by 30 feet and oriented in an east-west direction. The foundation is approximately 18 inches wide and extends about one foot above the ground surface. A depression was noted in the southwest corner of the structure. One shovel test (ST 67) was excavated within the structure along the eastern foundation wall. This test exposed 50 inches of fill containing a dense concentration of construction debris (nails, mortar/plaster, tiles, window glass, brick and roofing/insulation) as well as container glass, ceramics, faunal remains, charcoal and miscellaneous items (Table 3). The structure is interpreted as a house with a cistern (Structure 6) located immediately to the north.



Figure 18. Location of Structure 7 (House) at the Prairie Farm (47CO383) Site, Looking East.



Figure 19. Structure 7 (House) at the Prairie Farm (47CO383) Site, Looking East. [Note: Lathe at Left Marks Northwest Corner of the Structure]

Table 3. Artifacts Recovered from Structure 7 at the Prairie Farm (47CO383) Site.

Artifact Type	Quantity	Weight (ounces)
Construction		
Square Nails	22	1.79
Wire Nails	11	1.4
Screw	1	0.17
Flat Glass	29	2.01
Plastic	2	0.04
Brick	1	37
Roofing with Nail	1	0.11
Tile	3	2.01
Shingle	9	0.62
Mortar	12	10.06
Domestic		
Whiteware Rimsherd	1	0.02
Clear Container Glass	2	0.34
Brown Container Glass	4	0.25
Other		
Coal	2	0.32
Total	100	56.14

Structure 8

Structure 8 was identified by a corner of a concrete foundation representing a large building. It is located in the southwest corner of the site, about 58 feet west of Structure 3. The foundation fragment was clearly disturbed from its original position, likely during demolition, following farm abandonment. Due to the fragmentary nature the dimensions and function of the structure could not be determined.

Artifacts-Historic Euro American

A total of 323 historic Euro American artifacts and one piece of precontact Native American chipped-stone debitage were recovered from the Prairie Farm (47CO383) site (Table 4). Half of the assemblage (N=162) was recovered from shovel tests excavated within Structures 6 and 7. The remaining items were recovered from systematic shovel testing across the site area and from surface dumps. The entire assemblage includes construction debris (N=230; 71%), domestic items (N=41; 13%), miscellaneous metal items (N= 38; 12%), miscellaneous other items (N=13, 3%) and personal items (N=2, 1%).

Table 4. Artifacts Recovered from the Prairie Farm (47CO383) Site.

Artifact Type	Quantity	Weight (ounces)
Construction		
Square Nail	57	5.80
Wire Nail	55	5.96
Roofing Nail	6	0.40
Unknown Nail	3	0.93
Screw	1	0.17
Flat Glass	56	5.54
Mortar	24	19.29
Shingle	22	0.99
Asbestos(?) Tile	4	2.41
Brick, cream	1	37.00
Roofing with nail	1	0.11
Construction Total	230	78.60
Domestic		
Glass		
Clear Container Glass	19	1.43
Brown Container Glass	8	1.08
Depression Glass, Green	1	2.13
Medicine Bottle	2	6.78
Brown Glass Bottle	1	25.00
Ceramics		
Whiteware bodysherd	2	0.05
Whiteware Rimsherd	3	0.80
Ironstone Bodysherd	1	0.23
Stoneware Bodysherd	2	3.07
Porcelain Blue Transfer	1	0.07
Porcelain Handle Fragment	1	0.72
Domestic Total	41	41.36

Table 4. Artifacts Recovered from the Prairie Farm (47CO383) Site; continued...

Miscellaneous Metal		
Screwcap	1	0.68
Rim Closure	1	0.02
Unidentified Ferrous	10	1.25
Barbed Wire	2	0.20
Wire	15	0.72
Slag	4	2.84
.22 Caliber Shells	2	0.05
Mechanical parts	2	11.30
License Plate, 1935 FARM	1	3.19
Miscellaneous Metal Total	38	20.25
Miscellaneous Other		
Flake, PdC chert	1	0.05
Faunal Remains	4	0.57
Coal	5	0.68
Plastic	2	0.04
Vinyl	1	0.02
Miscellaneous Other Total	13	1.36
Personal		
Metal Clothing Buckle	2	0.10
Site Total	324	141.67

The 230 pieces of construction debris includes primarily nails (N=112), nearly equally divided between machine cut square and wire. Flat window glass totals 56 shards. Mortar/plaster consists of 24 pieces, much of which was recovered in the house fill. Four asbestos tile fragments were also recovered. A total of 29 roofing related items include asphalt shingle fragments, and roofing nails. Other items include a cream brick and metal hardware.

The 41 domestic items include glass and ceramic containers or fragments. The 31 container glass consists mainly of clear glass fragments (N=19). Eight brown or amber glass container sherds were also recovered. Three complete bottles were collected from surface dumps. Two are small medicine bottles. One is plain with a cork enclosure while the other is embossed "SLOAN'S LINIMENT". A large beer bottle is embossed on the base with "W. F. & S. MIL". This bottle was produced by the William Franzen & Son, Milwaukee between 1895 and 1926 (Kroll 1976:4). One green depression glass fragment represents the base of a plate or platter.

A total of ten ceramic sherds were recovered. These include five stoneware sherds, one ironstone sherd, two stoneware sherds, and two porcelain sherds. One large whiteware rim sherd has a narrow yellow band along the lip, likely representative of a late nineteenth century annual ware vessel. One whiteware body sherd has a decal decoration while another has a light blue glaze. The stoneware sherds represent a jug fragment with Albany glaze above the shoulder and a Bristol glaze below. This treatment was common during the mid to late nineteenth century in Illinois (Mansberger 1986:160). The porcelain vessel sherd is decorated with a blue transfer print. The other porcelain fragment represents a handle, possibly from a stove or toilet.

The 38 miscellaneous metal items include 17 pieces of ferrous wire including barbed wire, 10 pieces of unidentified ferrous metal. The remaining items include two unidentified mechanical parts, a metal screw-cap and one rim closure, four pieces of slag, two .22 caliber shells and a fragment of a 1935 farm truck license plate.

Thirteen other miscellaneous items include four faunal remains from large mammals, five pieces of coal, two pieces of plastic and one piece of vinyl.

Two personal items were recovered that represent wire buckles from clothing, possibly overalls. One was recovered in Structure 6, the cistern located adjacent to the house (Structure 7). The other was recovered from Shovel Test 28.

One piece of precontact Native American chipped-stone debitage was also recovered. The secondary thinning flake was made of an oolitic Prairie du Chien chert and was recovered from Shovel Test 37, located west of Structure 4, on the shoulder of the hill slope.

Site Summary

The Prairie Farm (47CO383) site is a historic Euro American farmstead defined by the remains of eight structures and associated scatter of historic artifacts recovered from systematic shovel testing of a grassy and wooded hill. These structures were identified by extant foundations or surface depressions. These structures include a domicile, as well as various out buildings (barn, silo, sheds, etc.) and a well and cistern.

Sixty-nine shovel tests were excavated, 32 of which contained cultural material. A total of 323 historic Euro American artifacts recovered from the Prairie Farm (47CO383) site. Half of the assemblage was recovered from shovel tests excavated within Structures 6 and 7. The remaining items were recovered from systematic shovel testing across the site area and from surface dumps. The recovered artifacts include a variety of architectural, domestic, faunal and personal items associated with a farmstead representing long-term occupation from the mid-nineteenth century to the late twentieth century. In addition, one piece of precontact Native American chipped-stone debitage was also recovered, suggesting some minor use of the area at a much earlier but unknown period of time.

A review of the available historic plat maps indicated the property has a continuous record of a house/farmstead from as early as 1861 until the late 1970s. During this time the property

changed ownership five times before being purchased by the State of Wisconsin Conservation Commission (now Wisconsin Department of Natural Resources) in 1973. The buildings were demolished in the late 1970s when King Road was realigned to its current configuration. Much of the site has been disturbed by the removal of the structures and landscaping associated with the subsequent use of the area.

The Prairie Farm (47CO383) site does not appear to meet the criteria for eligibility for listing on the National Register of Historic Places due to the long historic occupation, mixing of cultural material and impacts resulting from the removal of buildings and subsequent landscaping. No additional investigation is recommended.

PROJECT SUMMARY

In May of 2014, the *Museum Archaeology Program* of the Wisconsin Historical Society conducted a Phase I archaeological site identification survey of a proposed shooting range, designated the Mud Lake Shooting Range, in Columbia County, Wisconsin. This investigation was conducted on behalf of the Wisconsin Department of Natural Resources (DNR ID: 212-LEHE-3614-LERE; MAP #14-6001). The proposed project is situated on a partially wooded hill and footslopes located at the intersection of King Road and Conservation Lane. Approximately six acres were investigated.

The Phase I survey resulted in the identification of one historic Euro American farmstead, the Prairie Farm (47CO383383) site.

The Prairie Farm (47CO383) site is a historic Euro American farmstead defined by the remains of eight structures and associated scatter of historic artifacts recovered from systematic shovel testing of a grassy and wooded hill. These structures were identified by extant foundations or surface depressions. These structures include a domicile, as well as various out buildings (barn, silo, sheds, etc.) and a well and cistern.

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APPENDIX I.

Project Correspondence

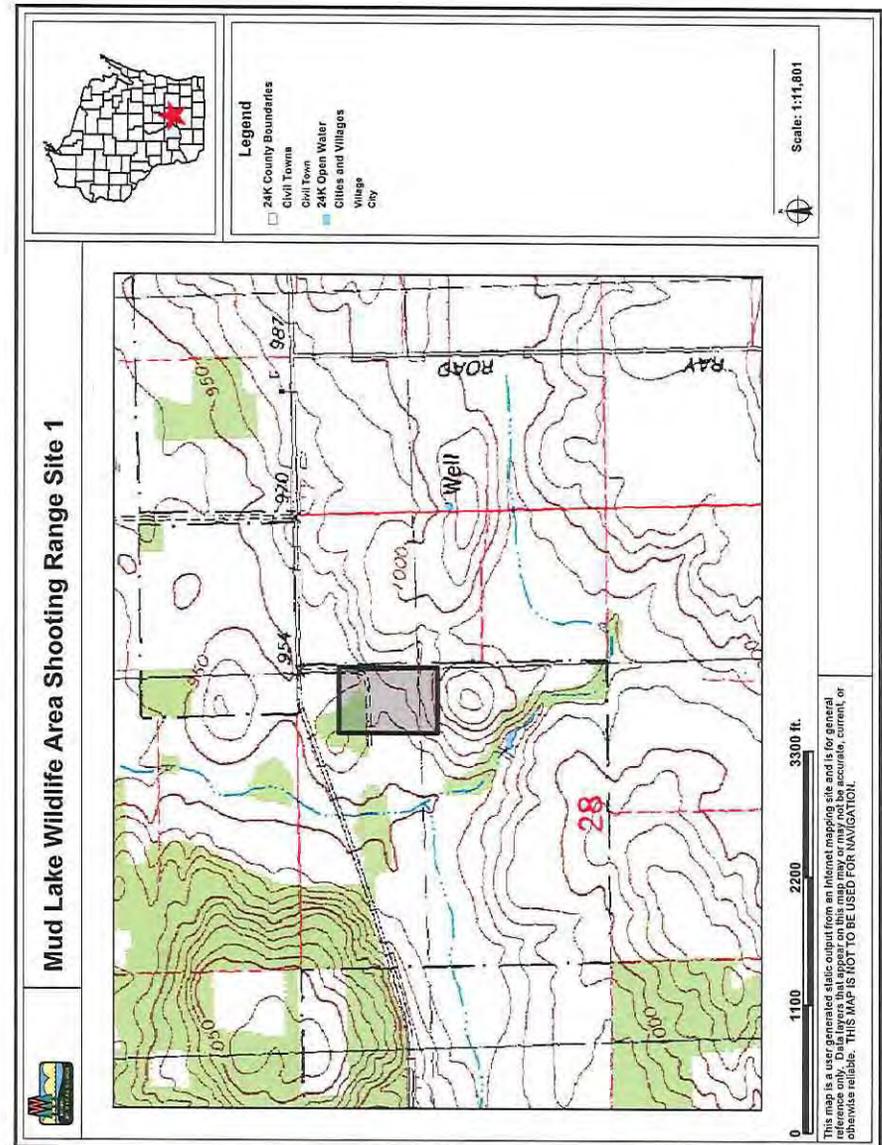
From: [Watt, Michael A - DNR](#)
To: [Dudzik, Mark J - DNR](#)
Subject: Mud Lake and Dekorra sites
Date: Thursday, April 24, 2014 12:55:50 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[Dekorra map.pdf](#)
[Mud lake map.pdf](#)

Here's the 2 maps I made to start the process. I was able to reduce the Dekorra map to around 4 acres of area and the Mud Lake site was around 6 acres. Sorry for the extra work. The budget code for work on this is 212-LEHE-3614-LERE. Please let me know if you need anything else. Talk to you soon. Mike

Michael Watt
 Hunting and Shooting Sports Program
 Bureau of Law Enforcement
 Wisconsin Department of Natural Resources
 ☎ phone: (608) 266-8597
 📠 fax: (608) 266-3696
 ✉ e-mail: michael.watt@wisconsin.gov


How did I do? Provide feedback on my Customer Service to you.
<http://www.surveymonkey.com/s/Warden>

Hunt Safe in Wisconsin!





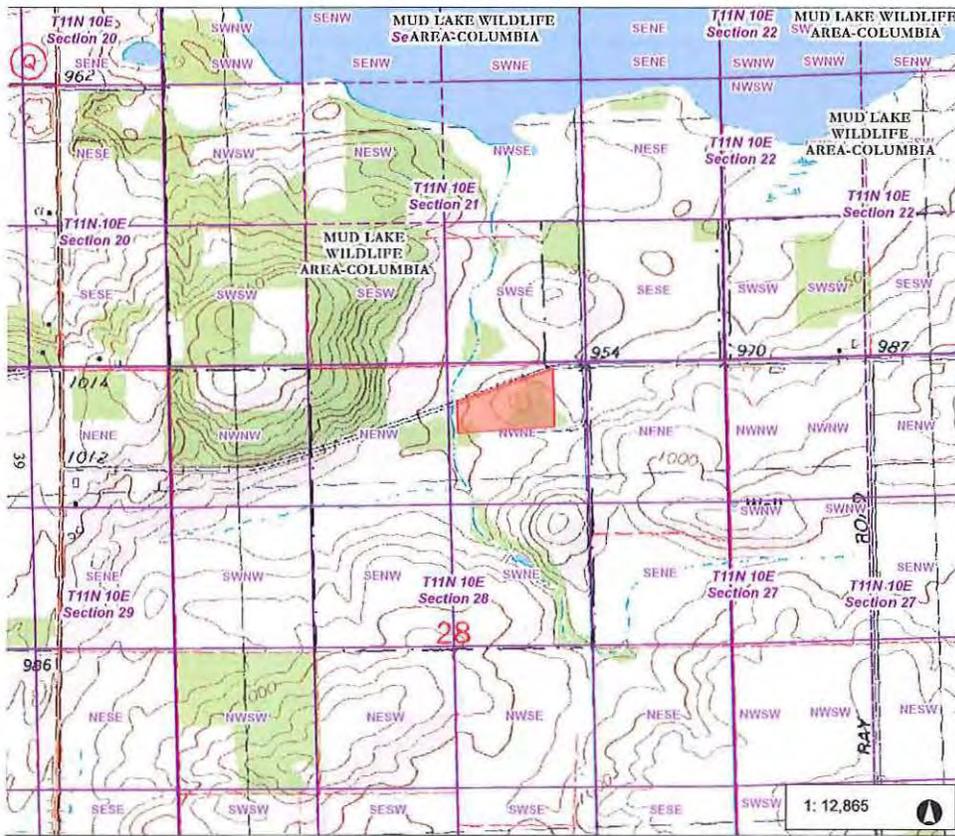

 COLUMBIA COUNTY
 INTERACTIVE MAPPING
**Mud Lake WA Shooting Range 1,
 Columbia Co**

Railroads
 Railroad Centerlines
Roads
 County Trunk Highway
 Other (Interchange, Service, etc.)
 Interstate Highway
 Private Road
 State Trunk Highway
 Local Roads -Town
 Local Roads -Urban
 United States Highway
Municipal Boundaries
 City, Village
 Town
 Water Body (Lines)
 Water Body (Fill)
 HARN GPS Points
 Town & Range
 Sections
 Quarter Sections
 2010 Photography (1ft pixel)

Scale: 1" = 500 Feet
 Printed: 7/23/2013

DISCLAIMER: This map was prepared using the online Columbia County Interactive Mapping System. Information is believed to be correct but is ADVISORY only. Map accuracy is limited to the quality of data obtained from other public records. The user is responsible for verification of all data. Columbia County is NOT responsible for improper use. Please contact the Land Information Department for further information (www.co.columbia.wi.us).





Map Legend

- State Natural Area Labels (40)
- Federal Property Label (250K)
- Stewardship Grant Acquisition:
 - PLSS Town & Range
 - PLSS Sections
 - PLSS Quarter-quarter Section
- Major Roads
 - Interstates
 - US Highways
 - State Highways
 - DOT WISLR County Roads
 - Local Streets
- County
- INTERMITTENT STREAMS
 - Board of Commissioners of Pu
 - DNR Voluntary Public Access
 - Ice Age Trail
 - State Trail
 - County Forest
- State Natural Areas
 - WI DNR
 - Federal
 - County/City/Town
 - Non-Gov't Conservation Org
 - Education Institution
- US Fish & Wildlife Service
- US Forest Service
- National Park Service
- City, Town & Village
- County
- Open Water
- Rivers and Streams

Hamilton, Kelly E - WHS

From: Dudzik, Mark J - DNR
Sent: Tuesday, April 29, 2014 6:44 AM
To: Hamilton, Kelly E - WHS
Subject: RE: LE projects

Importance: High

Kelly –

I have just been asked to put the Mud Lake project on front burner and hold off on the Dekorra project for time being.

And ... the sooner the better as well.

Call if questions.

M

From: Dudzik, Mark J - DNR
Sent: Monday, April 28, 2014 11:26 AM
To: Hamilton, Kelly E - WHS
Subject: FW: LE projects

Parcels can be flagged in advance.

From: Dudzik, Mark J - DNR
Sent: Monday, April 28, 2014 10:14 AM
To: Hamilton, Kelly E - WHS
Subject: LE projects

Kelly –

The two survey projects I spoke of – full coverage/wall-to-wall survey.

Look attached over and call after to chat some.

M

Mark J. Dudzik
Departmental Archaeologist /
Departmental Historic Preservation Officer

Wisconsin Department of Natural Resources
Bureau of Facilities & Lands
2300 N. MLK Drive

Milwaukee, WI 53212

phone: 414.263.8617; fax: 414.263.8483
e-mail: mark.dudzik@wi.gov
cultural resource website: <http://dnr.wi.gov/topic/Lands/CulturalRes>
facebook: www.facebook.com/widnr

Customer service is important to us. Please tell us how we are doing.
Land Division Customer Service Survey: <http://www.surveymonkey.com/s/LandDivision>

<< Message: Mud Lake and Dekorra sites >>

WISCONSIN PUBLIC LANDS FIELD ARCHAEOLOGICAL PERMIT, 2014
 REQUIRED TO CONDUCT ARCHAEOLOGY ON ALL NON-FEDERAL PUBLIC LAND UNDER WIS. STAT. § 44.47
 Wisconsin Historical Society

Name/Organization/Contact Qualified Staff-Museum Arch. Program Telephone 608-264-6560
 Address 816 State Street Room 38 City Madison State WI Zip Code 53706
 E-mail Address kelly.hamilton@wisconsinhistory.org FAX# 608-264-6577
 Institutional Affiliation Wisconsin Historical Society Occupation Archaeologist (& Curators)

Location of work:
 Highway: Hwy/Rd WDNR managed lands statewide County _____
 Project Begin: 9 January 2014 Project End: 31 December 2014

Other Projects: County _____ Civil Town _____ Town _____ Range _____ Section _____
 Quarter Sections (minimum 3) _____

Name of Park, Wildlife Area _____ Site Name: _____ Site Number _____

Type of fieldwork: Phase I/Survey Phase II/Testing _____ Phase III/Excavation _____ Other _____

Purpose of the fieldwork: Federal Compliance State Compliance Education _____ Other _____

Period of field work beginning on 9 January 2014 and ending on 31 December 2014

What institution will curate recovered artifacts, notes, and records? Wisconsin Historical Society
 (Curation agreement must be on file with WHS)

Signature of Archaeologist [Signature] Digitally signed by Kelly Hamilton Date: 2014.01.09 16:55:53 -0600 Date 9 January 2014

Print name Kelly Hamilton continuation sheet or see attachments

Maps and/or Letters of explanation can accompany this application

Landowner or custodian name (print) Mark Dudzik - WDNR Phone 608-266-3462

Signature of Landowner [Signature] Date 01.15.2014

Permit Approved [Signature] Date 13 Jan 2014

John H. Broilahn
 State Archaeologist
 Wisconsin Historical Society
 FAX: 608-264-6504 / PH 608-264-6496
 Email: john.broilahn@wisconsinhistory.org

- Conditions:
- Two copies of the final report must be submitted to the Division of Historic Preservation -- Public History.
 - All artifacts, notes and records must be curated in an appropriate facility that is staffed by trained personnel.

Additional authorization or permitting is necessary to conduct work within the boundaries of uncataloged and cataloged human burial sites under Wis. Stat. § 157.70
 For additional information please see: <http://www.wisconsinhistory.org/Content.aspx?id=1295>
 or contact Sherman Banker at (608) 264-6507 or sherman.banker@wisconsinhistory.org

ARCHAEOLOGICAL LITERATURE AND RECORDS REVIEW

DNR Title: 212-LEHE-3614-LERE Mud Lake Shooting Range County: Columbia
 MAP Project Number: 14-6001 Project Type: PD

Legal Description
 T 11 N R 10 E / W Sec(s) 28 Twp Lewisville
 T _____ N R _____ E / W Sec(s) _____ Twp _____
 T _____ N R _____ E / W Sec(s) _____ Twp _____
 T _____ N R _____ E / W Sec(s) _____ Twp _____

USGS Quadrangle(s) Wyoema 7.5'

SOURCES RESEARCHED
 WHPD-ASI CEB Atlas WI Land Economic Inventory (WLEI)
 OSA Site Files CEB Manuscripts County History

Previous Surveys: Yes / No Reports located Copied/Provided

Archival Maps and Plats (Attach copies of plats):

Publisher: A. Messers & Co Year 1861 Publisher: Harrison & Warner Year 1873
 Publisher: C. M. Root & Co Year 1890 Publisher: Hall L. Brooks Company Year 1916
 Publisher: General Engineering Company Year 1927 Publisher: Globe Map & Atlas Publishers Year 1936
 Publisher: Marathon Map Service Year 1947 Publisher: _____ Year _____
 Publisher: _____ Year _____ Publisher: _____ Year _____

Other: Wisconsin Board of Commissioners of Public Lands, field notes and plat maps of the original Public Land Survey of Wisconsin.

SITES IN PROJECT AREA No See Continuation Sheet
 (Attach copies of WHPD site forms and maps)

Total number of Sites: (note: sites with multiple components may be counted more than once)
 Pre-Contact 0 Historic 0 Cemeteries/Burials 0

Code # 47 _____ Type _____ Affiliation _____
 Code # 47 _____ Type _____ Affiliation _____
 Code # 47 _____ Type _____ Affiliation _____
 Code # 47 _____ Type _____ Affiliation _____

(Continued over)

SITES WITHIN ONE MILE OF THE PROJECT AREA

(Attach copies of WHPD site forms and maps)

No See Continuation Sheet

Total number of Sites: (note: sites with multiple components may be counted more than once)

Pre-Contact 1

Historic 1

Cemeteries/ Burials 1

Code # 47 CO - 0337 Type Lithic Scatter
Affiliation Middle & Late Archaic; Early, Middle & Late Woodland

Code # BCO - 0088 Type Cemetery/Burial
Affiliation Historic Euro-American

Code # 47 - Type _____
Affiliation _____

COMMENTS: _____

0 Sites reported in the project area 2 Sites reported within one mile

Research Conducted by: Neal Moebius Date: 4 / 30 / 2014

X Survey will be conducted and has been scheduled

Survey is not recommended for this project (see attached letter of explanation)

Review Conducted by: [Signature] Date: 5 / 1 / 14

From: [Dudzik, Mark J - DNR](#)
To: [Hamilton, Kelly E - WHS](#)
Subject: PW: LE projects, 212-LEHE-3614-LERE
Date: Thursday, May 08, 2014 6:41:23 AM
Attachments: [Mud Lake Stakes.JPG](#)

FYI

From: Watt, Michael A - DNR
Sent: Wednesday, May 07, 2014 3:03 PM
To: Dudzik, Mark J - DNR; Wamke, Keith - DNR
Subject: RE: LE projects, 212-LEHE-3614-LERE

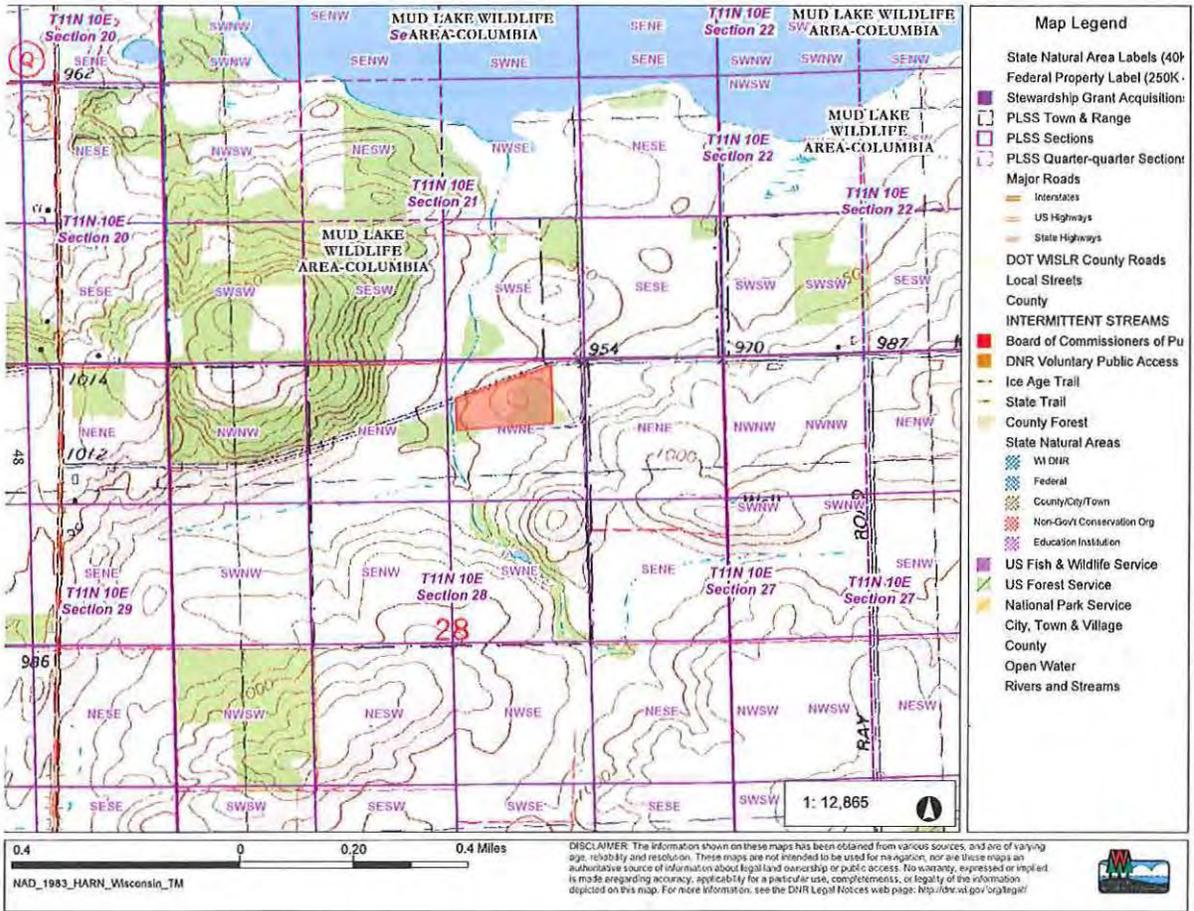
Hey Mark,

I staked out the area at mud lake yesterday and attached a photo of what the 4 corner stakes look like. I used the same tape to make a visible line along the borders between the stakes around a hundred feet apart depending on visibility. Hopefully no one pulls them before the crew gets there. Talk to you soon. Mike



APPENDIX II.

Project Plans with Field Notes.



APPENDIX III.
 Archaeological Site Inventory Form
 and
 Bibliography of Archaeological Reports

Wisconsin Archeological Site Inventory Form

CODE #47- _____ COUNTY: Columbia

SITE NAME (limit 25 characters) Prairie Farm

FIELD NUMBER(S): _____ OTHER NAME: _____

Locational Information (See Appendix B)

CIVIL TOWN(S): Lowville OR MUNICIPALITY: _____

TOWN # 11 North RANGE # 10 E or W SECTION # 28 FRENCH/GOV LOT: _____
 QUARTER-SECTIONS (at least 3) NW1/4, NW1/4, NE1/4 and NE1/4, NW1/4, NE1/4

QUARTER-SECTION GRID ALIGNMENT (edge and corner): north edge and northeast corner

ADDITIONAL TRS DATA: _____
 TOWN # _____ North RANGE # _____ E or W SECTION # _____ FRENCH/GOV LOT: _____
 QUARTER-SECTIONS (at least 3) _____
 QUARTER-SECTION GRID ALIGNMENT (edge and corner) _____

UTM COORDINATES: (110)Zone 16 (112) Easting 577,021 (114) Northing 341,728
 (See Appendix C)

Method: Interpolated from USGS QUAD: GPS Field:

USGS 7.5' QUADRANGLE MAP NAME Wycocena PARCEL ID: 508

GEOGRAPHIC LOCATION & RELATION TO LANDSCAPE FEATURES:

The site is located on a hill immediately south of King Road and bordered on the south and east by Conservation Drive. The intersection of King Road and Conservation Drive is located just to the northeast of the site.

Site Description Information

SITE/FEATURE DESCRIPTION:

The site is an historic Euroamerican farmstead. Fieldwork revealed the remains of eight structures including a house foundation built with limestone, an adjacent circular depression thought to represent a cistern, a large concrete barn foundation, several cement slab buildings, and a circular structure consisting of large boulders thought to represent a well. Several smaller depressions were also observed. Surface concentrations of historic trash were noted near the house and along the lower northeast slope. Artifacts recovered include building material (wire and square nails, window glass, mortar/plaster, tiles), ceramics, container glass, miscellaneous metal, faunal remains and charcoal. A few pieces of lithic debitage were also identified.

SITE DIMENSIONS: 300 x 600 feet OR meters (check one)

SITE AREA: or ca. 3.0 acres OR hectares (check one)

SITE TYPE(S): (Check all that apply. See Appendix D.)

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> Abandoned Community | <input type="checkbox"/> Enclosure/earthworks | <input type="checkbox"/> Mound(s)- effigy | <input type="checkbox"/> Trading/fur post |
| <input type="checkbox"/> Cabin/homestead | <input type="checkbox"/> Experimental | <input type="checkbox"/> Mound(s)- conical | <input type="checkbox"/> Traditional Cultural Property |
| <input type="checkbox"/> Cache/pit/hearth | <input checked="" type="checkbox"/> Farmstead | <input type="checkbox"/> Mound(s)- linear | <input type="checkbox"/> Transportation site |
| <input type="checkbox"/> Campsite/village | <input type="checkbox"/> Fish weir | <input type="checkbox"/> Mound(s)- other/unk | <input type="checkbox"/> Tower |
| <input type="checkbox"/> Cave/rockshelter | <input checked="" type="checkbox"/> Foundation/depression | <input type="checkbox"/> Non-arch Feature | <input type="checkbox"/> Well |
| <input type="checkbox"/> CCC/WPA site | <input checked="" type="checkbox"/> HCM concentration | <input type="checkbox"/> Paleontological | <input type="checkbox"/> Workshop site |
| <input type="checkbox"/> Cemetery/burials | <input type="checkbox"/> Ice House | <input type="checkbox"/> Quarry/mine | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Church/Mission | <input type="checkbox"/> Isolated find | <input type="checkbox"/> Recreational | |
| <input type="checkbox"/> Commercial | <input type="checkbox"/> Industrial | <input type="checkbox"/> Redeposited artifacts | |
| <input type="checkbox"/> Corn hills/garden beds | <input type="checkbox"/> Kiln | <input type="checkbox"/> Rock art | |
| <input type="checkbox"/> Cultural Landscape | <input type="checkbox"/> Kill site/bone bed | <input type="checkbox"/> Rock feature/petroform | |
| <input type="checkbox"/> Cultural Site | <input checked="" type="checkbox"/> Lithic scatter | <input type="checkbox"/> School/Government | |
| <input type="checkbox"/> Dam/historic earthwork | <input type="checkbox"/> Logging camp | <input type="checkbox"/> Shell midden | |
| <input type="checkbox"/> Dance Ring | <input type="checkbox"/> Military site | <input type="checkbox"/> Shipwreck | |
| <input type="checkbox"/> Dock/pier/crib | <input type="checkbox"/> Mill/sawmill | <input type="checkbox"/> Sugar bush | |

CULTURE(S): (Check all that apply. See Appendix E.)

- | | | |
|---|--|---|
| <input type="checkbox"/> Paleo-Indian | <input type="checkbox"/> Woodland | <input type="checkbox"/> Upper Miss./Oneota |
| <input type="checkbox"/> Early Paleo-Indian | <input type="checkbox"/> Initial Woodland | <input type="checkbox"/> Late Pre-contact |
| <input type="checkbox"/> Late Paleo-Indian | <input type="checkbox"/> Early Woodland | <input type="checkbox"/> Post-Contact American Indian |
| <input type="checkbox"/> Archaic | <input type="checkbox"/> Middle Woodland | <input checked="" type="checkbox"/> Euro-American |
| <input type="checkbox"/> Early Archaic | <input type="checkbox"/> Late Woodland | <input type="checkbox"/> Unknown / Indeterminate |
| <input type="checkbox"/> Middle Archaic | <input type="checkbox"/> Terminal Woodland | <input type="checkbox"/> Unknown Post-Contact |
| <input type="checkbox"/> Late Archaic | <input type="checkbox"/> Middle Miss. | <input checked="" type="checkbox"/> Unknown Pre-Contact |
| <input type="checkbox"/> Red Ocher | <input type="checkbox"/> Old Copper | |

INVESTIGATION TYPE(S) COMPLETED: (Check all that apply.)

- | | | |
|---|--|---|
| <input type="checkbox"/> Avocational Survey | <input type="checkbox"/> Major excavation/Mitigation/PIII | <input checked="" type="checkbox"/> Soil core |
| <input type="checkbox"/> Chance Encounter | <input type="checkbox"/> Mechanical Stripping | <input checked="" type="checkbox"/> Surface Survey |
| <input type="checkbox"/> Faunal Analysis | <input type="checkbox"/> Monitoring | <input type="checkbox"/> Test excavation/PII |
| <input type="checkbox"/> Floral Analysis | <input type="checkbox"/> Osteological analysis | <input type="checkbox"/> Traditional Knowledge |
| <input type="checkbox"/> Geomorphology | <input checked="" type="checkbox"/> Records/Background | <input type="checkbox"/> Underwater |
| <input checked="" type="checkbox"/> Historical Research | <input type="checkbox"/> Remote Sensing | <input checked="" type="checkbox"/> Walk Over (Reconn.) |
| <input type="checkbox"/> Interview/informant | <input checked="" type="checkbox"/> Shovel Testing/Probing | |

PHASE/COMPLEX: (Enter all that apply. Please see Appendix F for list of choices.) _____

TRIBE/ETHNIC GROUP: (Enter all that apply. Please see Appendix F for list of choices.) _____

MODERN LAND USE (AT LAST UPDATE): (Check one or two.)

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Agriculture | <input type="checkbox"/> Marked cemetery | <input type="checkbox"/> Pasture/grassland |
| <input checked="" type="checkbox"/> Forest | <input type="checkbox"/> Recreational | <input type="checkbox"/> Residential |
| <input type="checkbox"/> Industrial/commercial | <input type="checkbox"/> Submerged | <input type="checkbox"/> Military |
| <input type="checkbox"/> Transportation corridor | <input type="checkbox"/> Unknown | <input type="checkbox"/> Energy corridor |

DEGREE OF DISTURBANCE (AT LAST UPDATE): (Check one.)

- Minimal(0-25%) Moderate(25-50%) Heavy(50-75%) Completely destroyed Unknown

IMPACTS TO SITE: (Check all that apply.)

- | | | |
|--|---|--|
| <input type="checkbox"/> Residential, urban | <input type="checkbox"/> Residential, rural | <input type="checkbox"/> Agricultural |
| <input type="checkbox"/> Commercial, urban | <input type="checkbox"/> Commercial, rural | <input checked="" type="checkbox"/> Recreational |
| <input type="checkbox"/> Energy corridor | <input type="checkbox"/> Impoundment | <input type="checkbox"/> Collecting/Looting |
| <input type="checkbox"/> Transportation corridor | <input type="checkbox"/> Logging | <input type="checkbox"/> Defacing/Vandalism |
| <input type="checkbox"/> Military Training | <input type="checkbox"/> Quarry/Mining | <input type="checkbox"/> Natural Threats |

Ownership Information:

OWNERSHIP TYPE: (Check all that apply.)

- Public-Federal
- Public-State
- Public-Local
- Private
- Indian
- Unknown

OWNER'S NAME(S) Wisconsin Department of Natural Resources

OWNER'S ADDRESS(ES) 101 South Webster St. PO Box 7921. Madison, WI 53703

YEAR OWNERSHIP DETERMINED 2014

Artifact /Archival Information

ARTIFACT/RECORDS REPOSITORY: MAP-WHS

MATERIAL CLASS(ES): (Check all that apply.)

- Aboriginal ceramics
- Euro-American ceramics
- Debitage
- Faunal remains
- Features
- Fire-altered rock
- Floral remains
- Glass
- Other: _____
- Ground/pecked /battered stone
- Historic building material
- Standing Structures
- Houses/Structures (in ground)
- Human bone
- Metal
- Other chipped stone
- Projectile points

ARTIFACT LIST:

DATES: Nineteenth to late twentieth centuries

DATING METHOD(S):

- Artifact style/cross-dating
- Informant/Oral History
- Thermoluminescence DATE: _____
- Historic records
- Radiocarbon DATE: _____
- Site type
- Traditional Knowledge
- Other: _____

Investigator/Reporter Information:

NAME OF INVESTIGATOR(S)

Norm Meinholz

ORGANIZATION(See Appendix G.)

MAP-WHS

DATE(S) OF INVESTIGATION

13-15 May 2014

NAME OF SITE REPORTER

Norm Meinholz, Nick Ostrem

ORGANIZATION (See Appendix G.)

MAP-WHS

DATE SITE REPORTED

20 May 2014

BIBLIOGRAPHIC REFERENCES:

Upcoming volume in MAP Research Report in Archaeology series, N. Meinholz Field Notes 2014 vol. 1, pp. 55-65.

Investigator's Recommendation- (Check all that apply.)

- Additional Field Investigations
- Additional Archival Research
- Protect During Construction
- No Additional Investigation
- Redesign-avoid
- Preserve in Place

Comments: _____

Site Recorded For -

- Section 106/Compliance WHS Project# _____
- State Regional Archaeological Program WHS Project# _____
- WHS Survey & Planning Grant WHS Project # _____
- THPO WHS Project# _____
- Personal/Private Site Investigation WHS Project# _____
- Education WHS Project# _____

ARCHAEOLOGICAL REPORTS INVENTORY FORM

WHS PROJECT # _____ COUNTY Columbia

AUTHORS: Norman M. Meinholz and Kent E. Dickerson

REPORT TITLE: Phase I Archaeological Site Identification Survey for the Proposed Mud Lake Shooting Range

DATE OF REPORT (MONTH AND YEAR): May 2014

SERIES/NUMBER: MAP Research Report in Archaeology

PLACE OF PUBLICATION: Museum Archaeology Program, Wisconsin Historical Society, Madison, WI

LOCATIONAL INFORMATION [LEGAL DESCRIPTION OF SURVEY AREA (T-R-S)]

T11 N, R10 E, Section 28

U.S.G.S. QUAD MAP(S): Wycocena 7.5'

SITE(S) INVESTIGATED: Prairie Farm (47CO)

ACRES INVESTIGATED: 6 AGENCY # 212-LEHE-3614-LERE, DNR-MAP#14-6001

INVESTIGATION TECHNIQUES COMPLETED (Check all that apply.)

- | | | |
|--|---|---|
| <input type="checkbox"/> Avocational Survey | <input type="checkbox"/> Chance Encounter | <input checked="" type="checkbox"/> Historical Research |
| <input type="checkbox"/> Faunal Analysis | <input type="checkbox"/> Floral Analysis | <input type="checkbox"/> Interview/Informant |
| <input checked="" type="checkbox"/> Literature Background Research | <input type="checkbox"/> Major Excavation/Phase III | <input type="checkbox"/> Mechanical Stripping |
| <input type="checkbox"/> Monitoring | <input type="checkbox"/> Osteological Analysis | <input type="checkbox"/> Geomorphology |
| <input checked="" type="checkbox"/> Records/Background | <input checked="" type="checkbox"/> Surface Survey | <input type="checkbox"/> Soil Core |
| <input type="checkbox"/> Remote Sensing | <input checked="" type="checkbox"/> Shovel Testing/Probing | |
| <input type="checkbox"/> Test Excavation/Phase II | <input type="checkbox"/> Traditional Knowledge | |
| <input type="checkbox"/> Underwater | <input checked="" type="checkbox"/> Walk Over/Visual Inspection | |

ABSTRACT: Included in report Written in space below



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and Tom Villand

Report of Sound Measurements

Second Round

June 12, 2014

Tests Conducted by Jacob Zeuske of the Wisconsin Structures and Materials Testing Laboratory

Report Prepared by Jacob Zeuske

For the Wisconsin Department of Natural Resources

Site Location: Mud Lake Wildlife Area – Columbia County

Date: May 29, 2014

Objective

The Wisconsin Structures and Materials Testing Laboratory was contacted May 21, 2014 by Michael Watt of the Wisconsin Department of Natural Resources for the purpose of conducting follow-up sound measurements in the area surrounding a proposed public shooting range. Previous measurements were made on May 6, 2014 during a period of high winds of approximately 20 mph, sustained (gusts nearly 30 mph). The range location is to be at the Mud Lake Wildlife Area near Poynette in Columbia County. This second round of measurements, reported here, was conducted on May 29, 2014. The goal of the measurements was to establish a baseline sound level in the surrounding area due to a typical hunting rifle of .308 caliber being fired at the shooting range location, under calm wind conditions.

Background

Sound is the ear's interpretation of pressure waves occurring within a frequency range of roughly 20 Hz to 20 kHz. Pressure is generally measured in Pascals (Pa), with 20 μ Pa corresponding to the lower threshold of human hearing. The decibel scale is used to better describe the sound pressure level (SPL) with the more familiar dB unit. At 20 μ Pa the SPL is equivalent to 0 dB. The dB unit system is a logarithmic scale which allows for better graphical representation of the wide range of pressure level sensitivity of the human ear. The dB scale also gives a better relation of the SPL to our ear's physical perception of sound.

To better mimic the human ear's sensitivity to sound at various frequencies and intensity levels, weighting functions are applied to measured sound data. The A-weighting function is the most widely used of these, and has been applied for the measurements reported here. Sound pressure level is converted from Pa to dB with the following equation:

$$\text{dB} = 20 \log_{10} \left(\frac{\text{Pressure}}{20 \mu\text{Pa}} \right).$$

Some common sounds and their respective decibel levels are listed in Table 1.

0 dB	Threshold of Hearing
60 dB	Normal Conversation
90 dB	Lawnmower
110 dB	Car Horn
120 dB	Airplane Take-Off
140 dB	Threshold of Pain

Table 1. Decibel levels of common sounds.

Description of Equipment and Methods

Sound measurements were made with a PCB 130D20 ¼” free-field microphone fitted with a 60-mm diameter windscreen. The microphone was calibrated April 18, 2014. Data acquisition was performed with a Brüel & Kjær Lan XI Type 3160-A-042 and a laptop computer.

Seven measurement locations along with one location for the shot source were chosen by Michael Watt. Mr. Watt was responsible for firing shots from a .308 caliber rifle at the shot source location. Jacob Zeuske travelled to each measurement location and coordinated with Mr. Watt to begin the shot sequence, consisting of a series of three shots fired seconds apart from one another. At each location, two sets of measurements were made. The first measurement was a 30-second acquisition, during which Mr. Watt fired a three shot sequence. The microphone was supported on a tripod and directed toward the shot source location. The second 30-second acquisition at each location was made with no shots fired in order to establish ambient conditions at each location. Winds were moderate with variable direction, but predominantly from the southeast.

Measurement Locations and Conditions

Table 2 lists the seven measurement locations, described using the Universal Transverse Mercator (UTM) coordinate system. The UTM system describes position with a set of Cartesian coordinates given in meters. Approximate distance between each measurement location and the shot location was calculated using Pythagorean’s Theorem and converted into feet. At each location, the microphone was directed toward the source of the shot. Figure 1 is an aerial photo of the survey area. Each of the measurement locations are identified with a dot and corresponding location number. The shot source and location 1 share a marker. All locations were consistent, both in numbering and location, with the measurements conducted on May 6, 2014, except that location 1 was moved further away (southward) to 150 ft, and a seventh measurement location was added. Shots were fired from a .308 caliber rifle at the source location. For a safe backstop, the shots were fired toward the east at a slight hillside approximately 30 feet away, as shown in Figure 2. This is the same shot caliber, location, direction, and backstop as used on May 6th.

Weather conditions were more favorable than May 6th, with winds gusting to approximately 12 mph from the east/southeast. Measurement location 1 and the shot source were again located in a well sheltered area, with no cover or geography disturbing the line of sight between the shot and microphone (see Figure 2). At the second measurement location, Figure 3, winds were breezy coming out of the east. Measurement location 3 (Figure 4) experienced winds from the east, again breezy but not near the level of

May 6th. At each of the locations foliage was abundant. Figure 5 shows the fourth measurement location, where winds were mild from the east. As seen in in Figure 6, measurement location 5 has significantly more vegetation when compared to the May 6th conditions (Figure 23, Appendix). At location 5, winds began to pick up out of the east, and rustling of leaves and grasses were audible. At measurement location 6 winds were mild and swirling, coming predominantly from the north and east (see Figure 7). Measurement location 7 (Figure 8) was added to create a location approximately equidistant to the north from the shot source, with respect to location 4. Location 7 is separated from the shot source by varied terrain, including woods and a large marsh, as seen in Figure 1. Here winds were breezy from the east, and a chipmunk was frequently calling at ~30 yards behind the microphone.

Location	UTM Coordinates (16T)	Distance to Source (approx.)
Source	4807401 N 312745 E	-
1	4807356 N 312745 E	150 ft
2	4807696 N 313410 E	2,300 ft
3	4807284 N 312119 E	2,100 ft
4	4805934 N 312624 E	4,800 ft
5	4807531 N 313011 E	900 ft
6	4807385 N 312450 E	1000 ft
7	4809138 N 312624 E	5700 ft

Table 2. Sound source and seven measurement location UTM coordinates with approximate line of sight distance between the source and each measurement location.

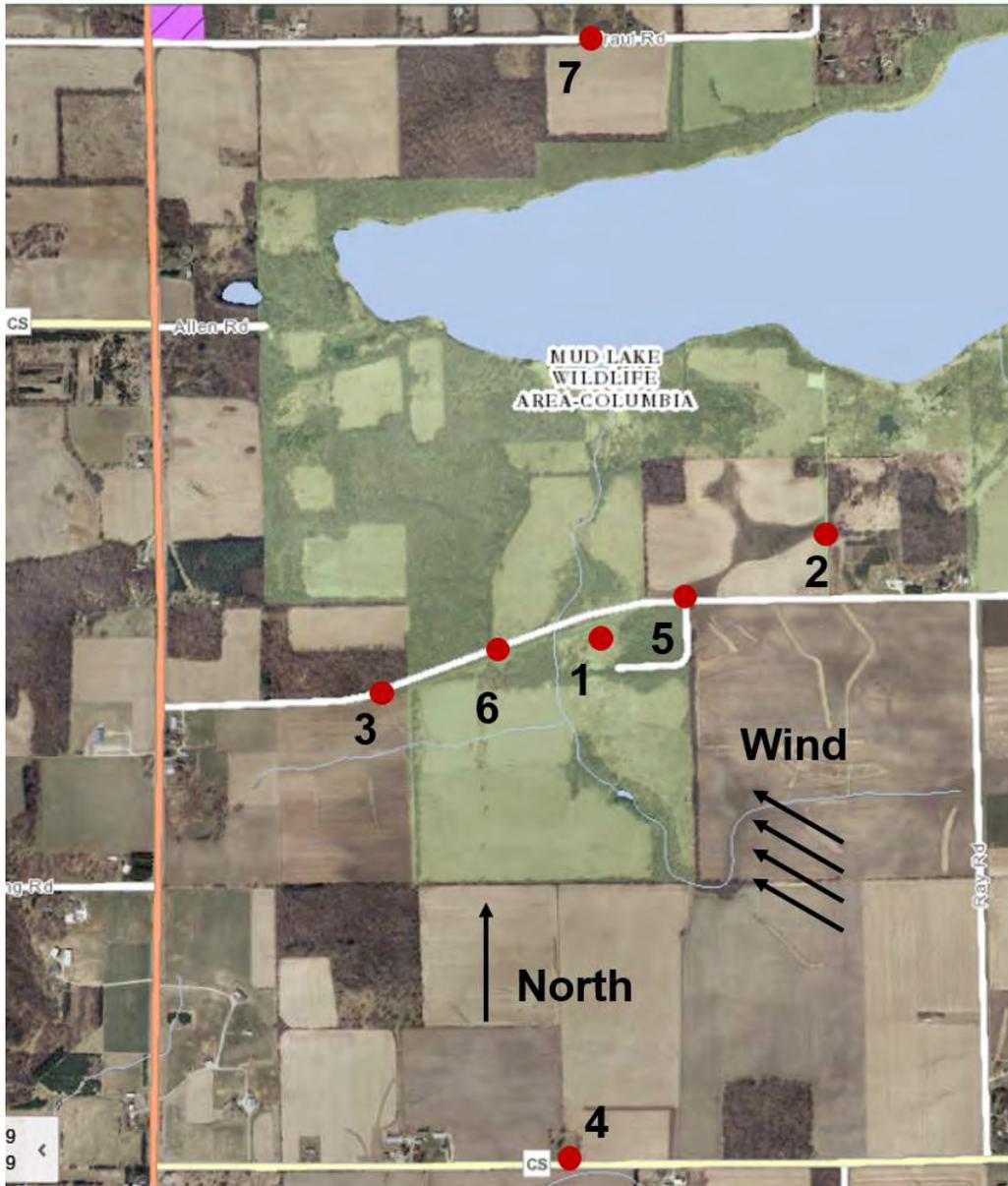


Figure 1. Aerial imagery of the measurement locations. Marker 1 represents the location of the source as well as the first measurement site. Approximate wind direction is shown as coming predominantly from the southeast.



Figure 2. Photograph of a shot scenario with slight hillside 30 feet to the east. Image is facing east. Data for location 1 was collected with the microphone at 150 feet from the shot source, as shown here.



Figure 3. Second measurement location. The microphone is pointed toward the source (marked by arrow), which is ~2,300 feet away beyond the trees. Image is facing southwest.



Figure 4. Third measurement location. The source is ~2,100 feet away beyond the trees, marked by the arrow. Image is facing east.



Figure 5. Fourth measurement location. The source is ~4,800 feet away over the hill, marked by the arrow. Image is facing north.



Figure 6. Fifth measurement location. The source is ~900 feet away through the trees, marked by the arrow. Image is facing west.



Figure 7. Sixth measurement location. The source is ~1000 feet away at the edge of the trees, marked by the arrow. Image is facing east.



Figure 8. Seventh measurement location. The source is ~5700 feet away beyond the far trees, marked by the arrow. Image is facing south.

Results Summary

Data from a three-shot sequence and ambient conditions at each location are plotted in Figures 9 through 22. Each shot occurrence in the data plot is noted on the figures with letters A, B, or C marking the first, second, and third shot peak signals, respectively. In general, the ambient conditions at each measurement location were much quieter than on May 6th. For this round of measurements there was additional background noise due to increased foliage rustling, along with birds and chipmunks calling.

Measurement location 1 was moved 75 feet further to the east from where it was on May 6th, to be at 150 feet from the shot source. Figure 9 shows the ambient conditions, which were quite calm. The data from the three-shot sequence is shown in Figure 10. The peak sound level was around 127 dB, just a few decibels lower than what was measured on May 6th. Location 1 is a sheltered area, so it is expected that there would be minimal sound level change with wind speed reduction.

Figure 11 shows the ambient conditions at location 2. Shot sequence sound pressure levels at the second measurement location, as seen in Figure 12, were at about 65 dB, very similar to May 6th (62-70 dB). In each of these two figures, signal traces due to bird calls are seen and are nearly the same magnitude as the shot sound level. Approximately equidistant from the shot source, but to the west, sound levels at

location 3 are shown in Figures 13 and 14. Ambient conditions at location 3 were quite calm. Figure 14 shows sound levels of 85 - 93 dB, very similar to the previously measured 85-92 dB on May 6th.

Results of the measurements at location 4 are shown in Figures 15 and 16. The three-shot sequence resulted in sound pressure levels of 55-65 dB, compared to the 60-70 dB range recorded on May 6th. Measurement location 7 was added to have an approximately equidistant location to the north of the shot with respect to location 4. Figures 21 and 22 show the measurement results from location 7. During these measurements, a chipmunk was calling twice a second as seen in Figure 22. The signal from the three shots resulted in peak sound pressure levels of 66-73 dB

Measurement location 5 results, displayed in Figures 17 and 18, show an average peak SPL of 80 dB during the shot sequence. On May 6th the three shot group also averaged 80 dB. Measurement location 6 ambient and shot sequence results are shown in Figures 19 and 20, respectively. The three-shot sequence resulted in an average peak signal of 85 decibels at location 6. Again, this compares similarly with measurements from May 6th, when the SPL was around 85-90 dB.

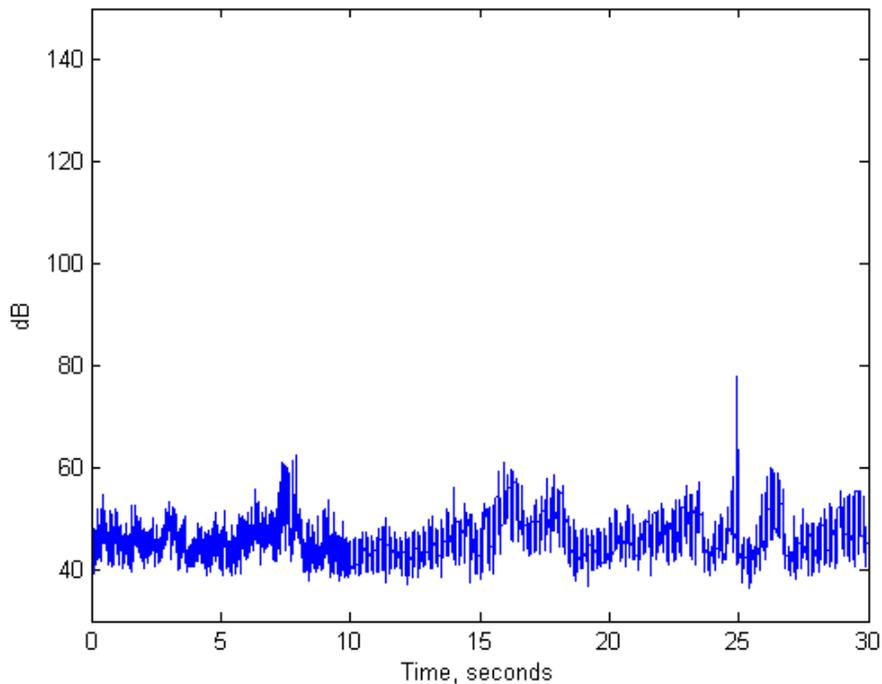


Figure 9. Measurement of ambient conditions at location 1.

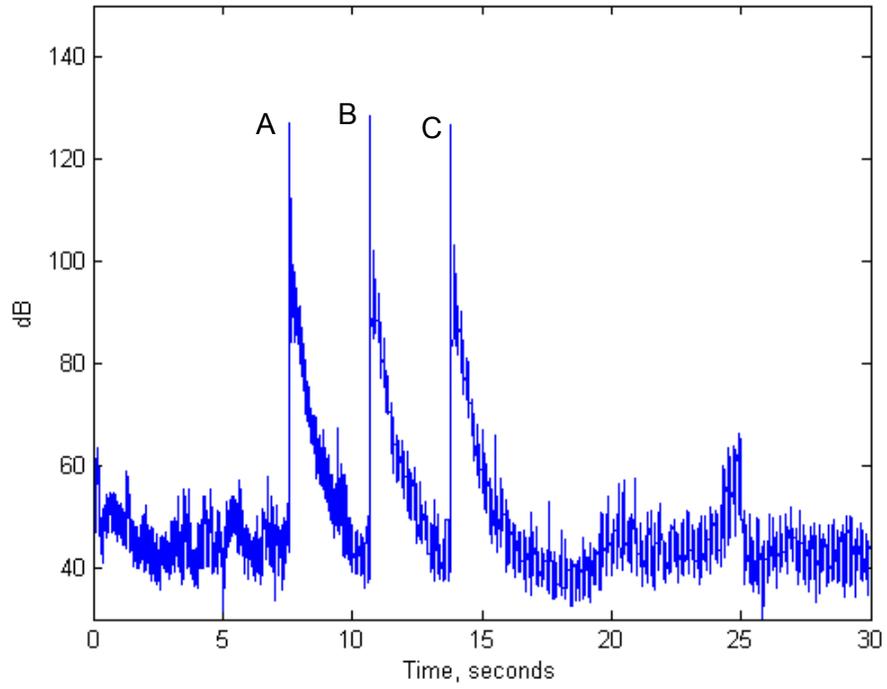


Figure 10. Location 1 three shot group (shot peaks at A, B, C).

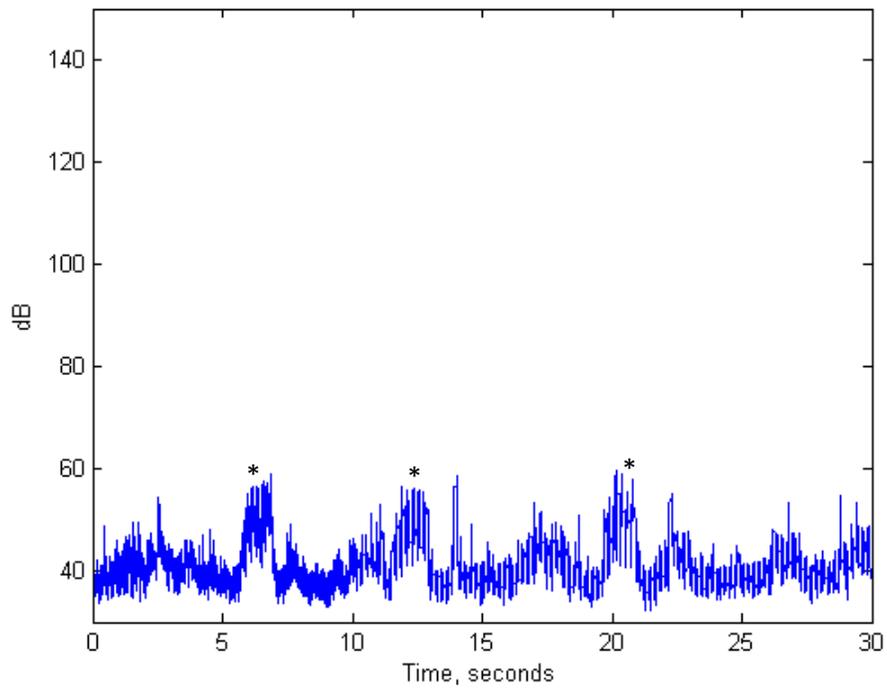


Figure 11. Measurement of ambient conditions at location 2. Bird calls (*) were common at this location.

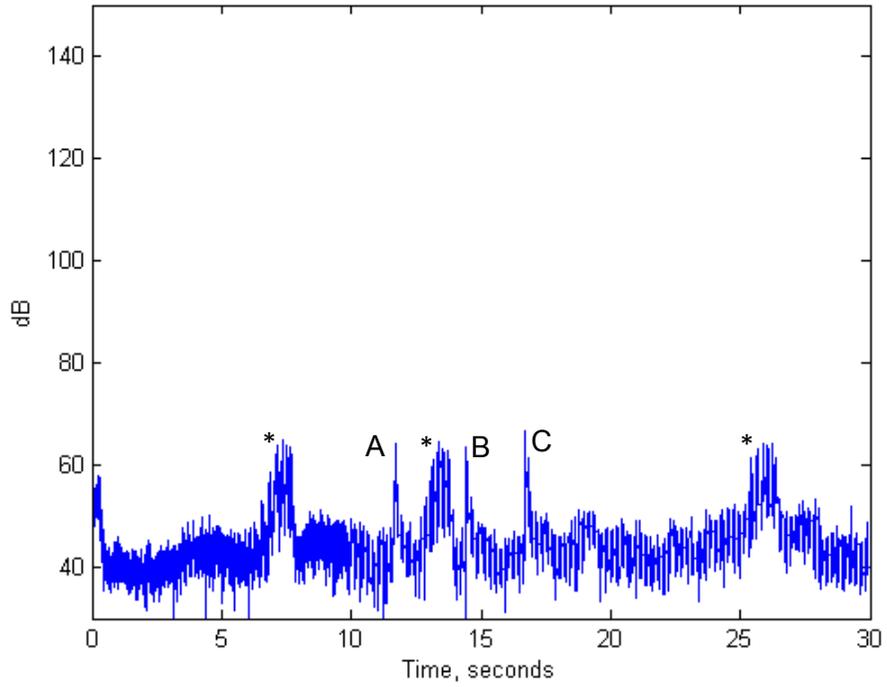


Figure 12. Location 2 three shot group (shot peaks at A, B, C). Bird calls are marked (*)

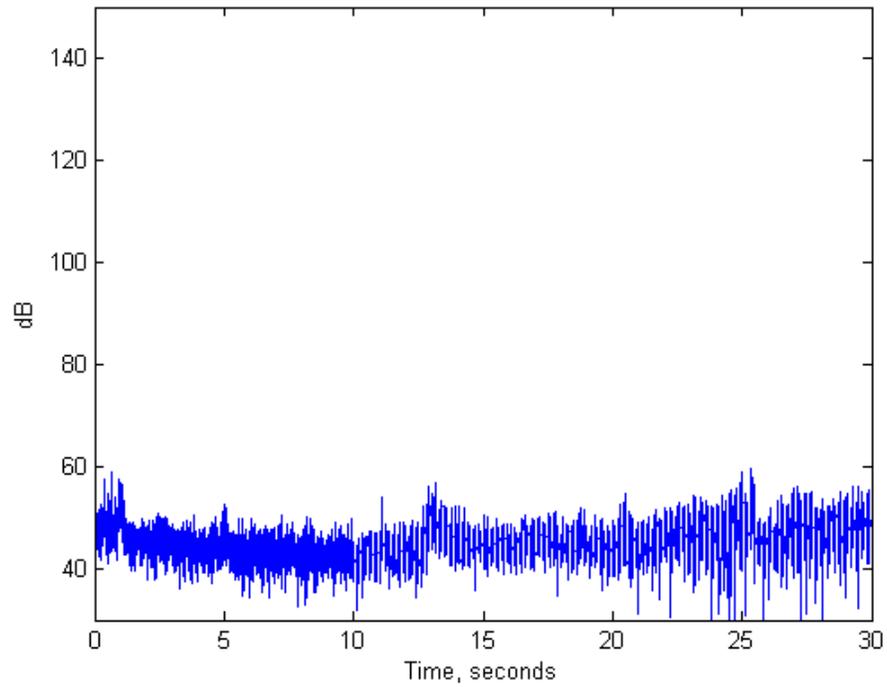


Figure 13. Measurement of ambient conditions at location 3.

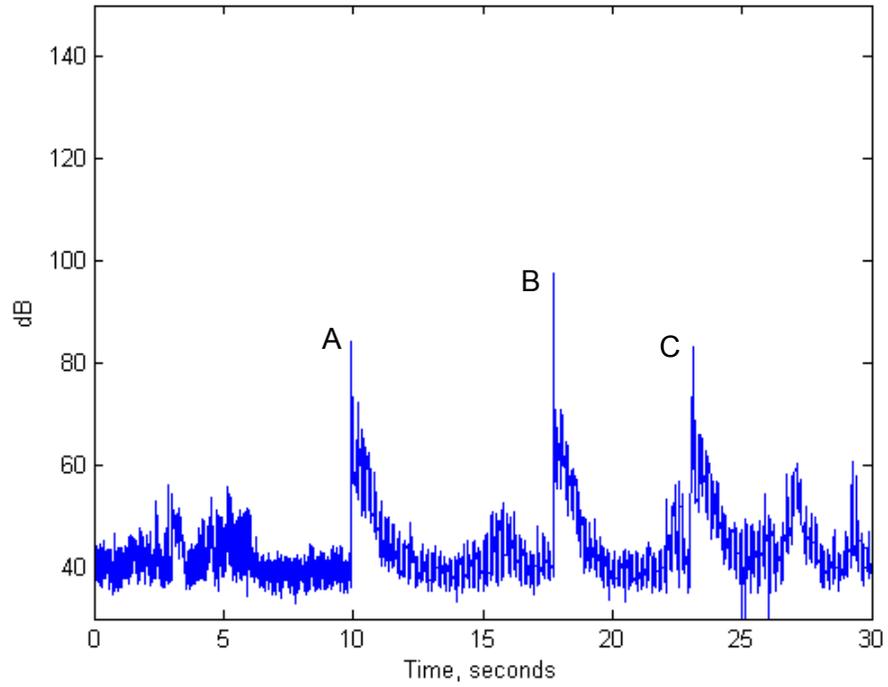


Figure 14. Location 3 three shot group (shot peaks at A, B, C).

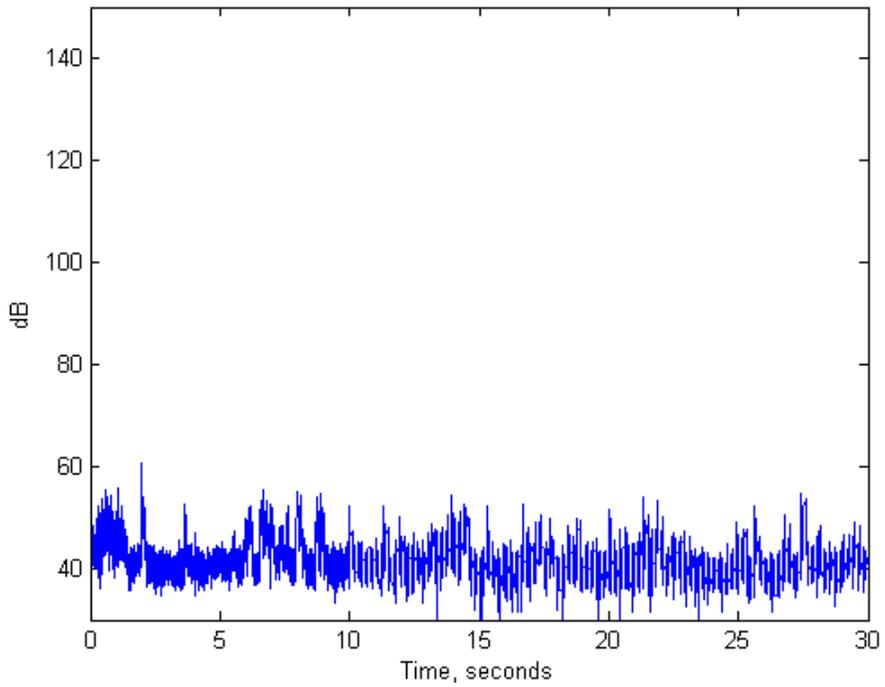


Figure 15. Measurement of ambient conditions at location 4.

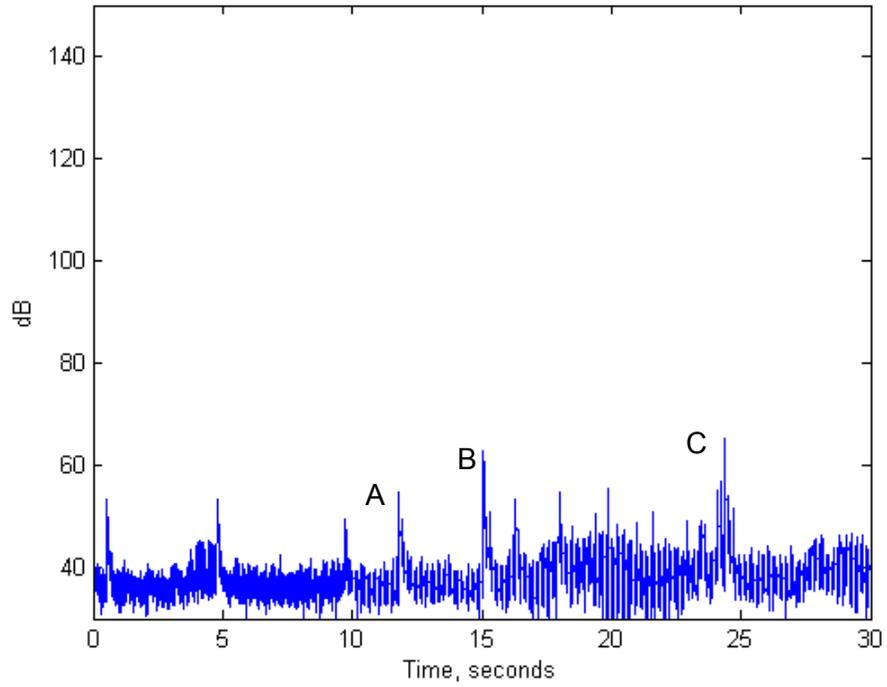


Figure 16. Location 4 three shot group (shot peaks at A, B, C).

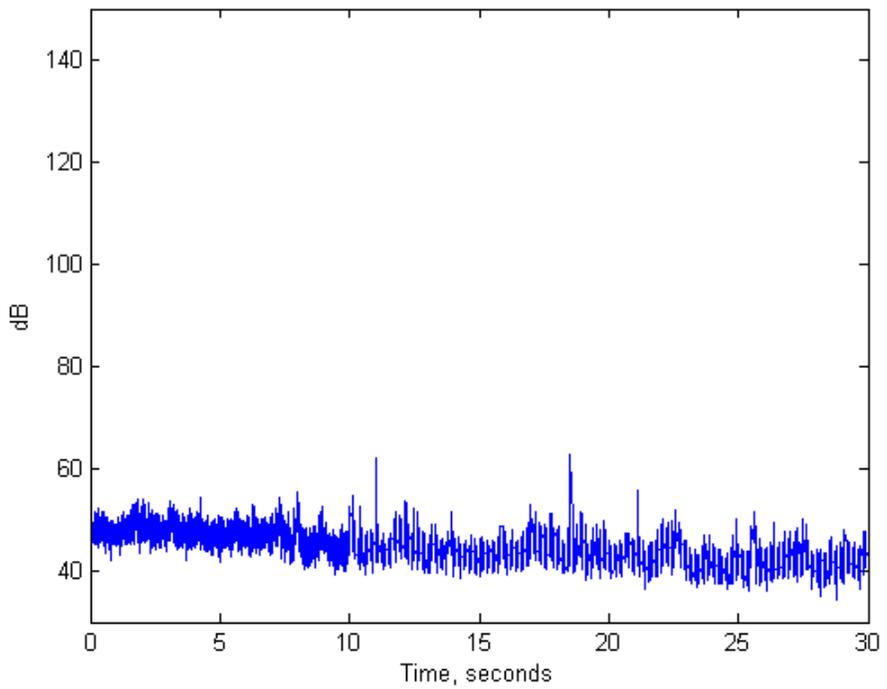


Figure 17. Measurement of ambient conditions at location 5.

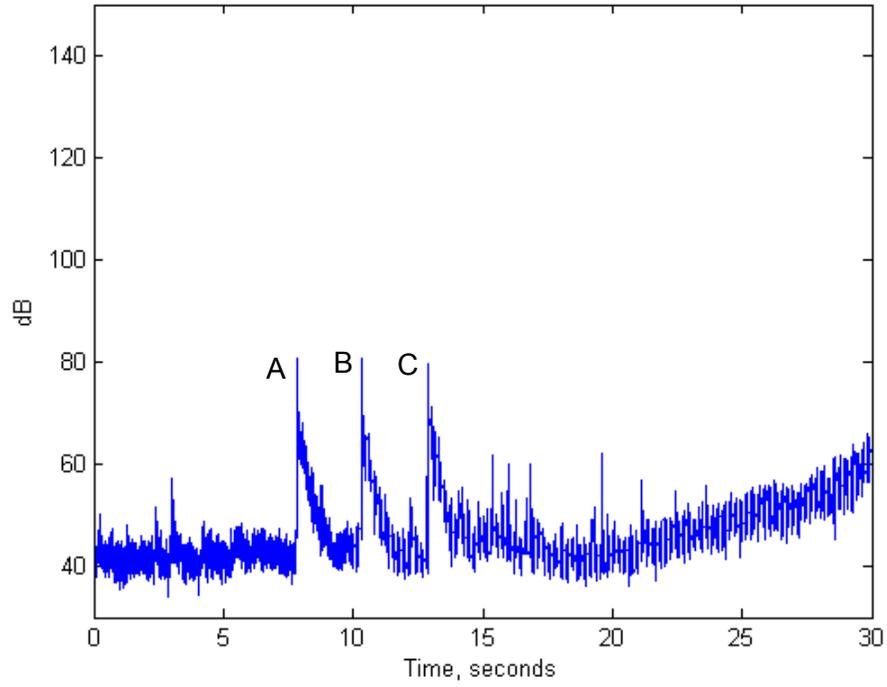


Figure 18. Location 5 three shot group (shot peaks at A, B, C). After 20 seconds the baseline noise level is increasing due to a car approaching from down the road.

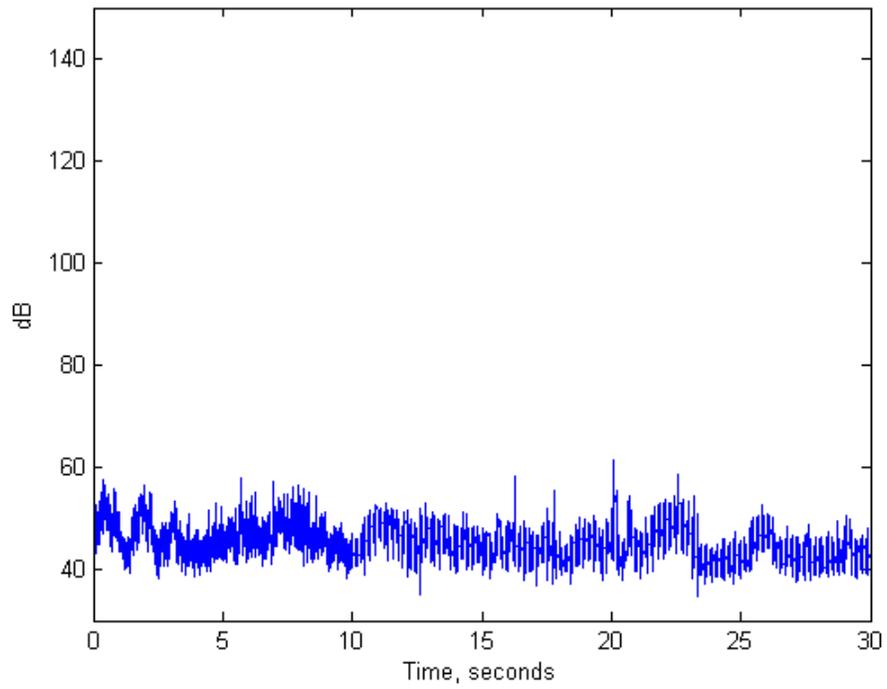


Figure 19. Measurement of ambient conditions at location 6.

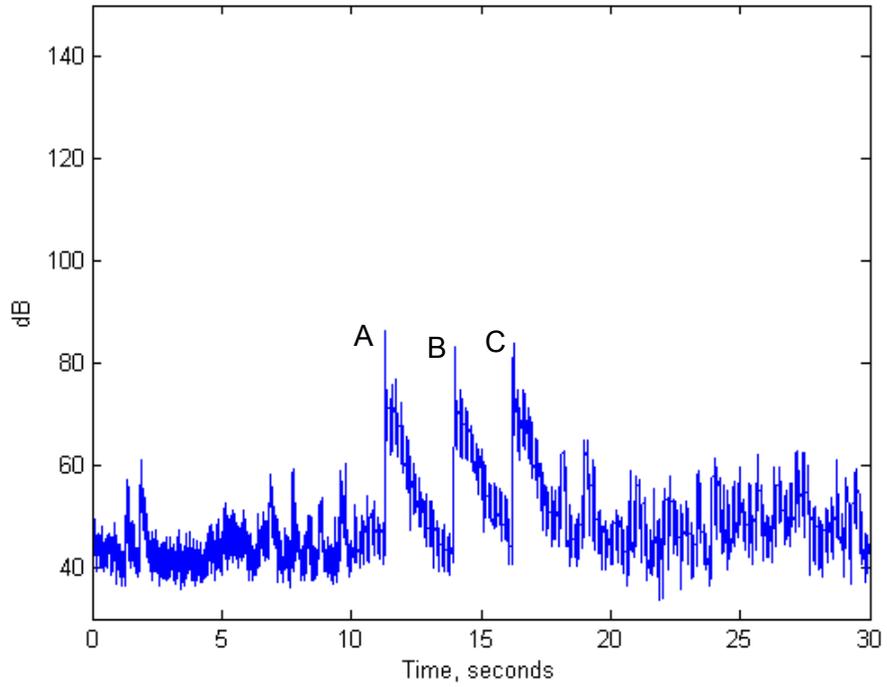


Figure 20. Location 6 three shot group (shot peaks at A, B, C).

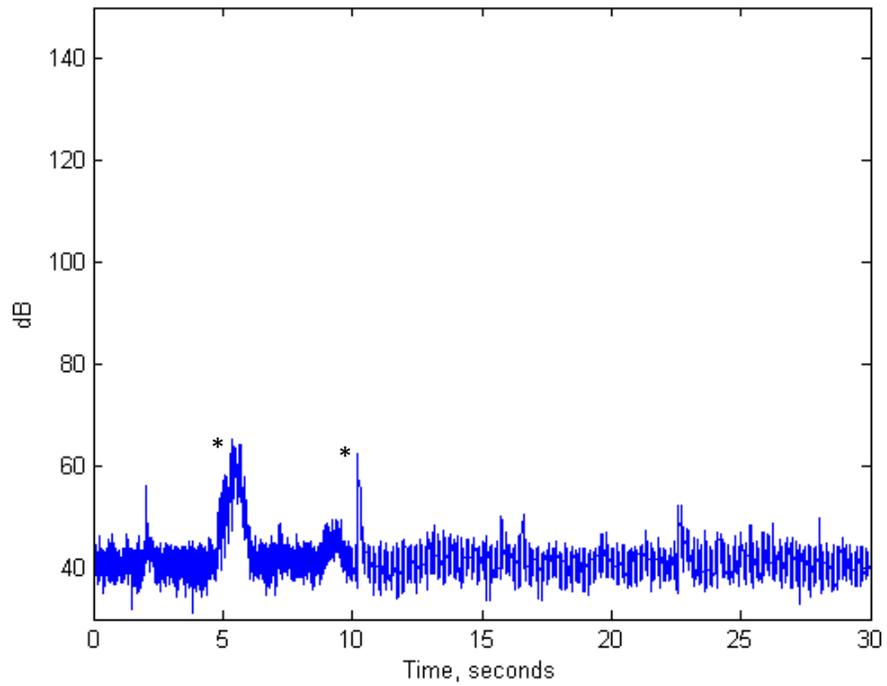


Figure 21. Measurement of ambient conditions at location 7. Bird and chipmunk calls are marked (*).

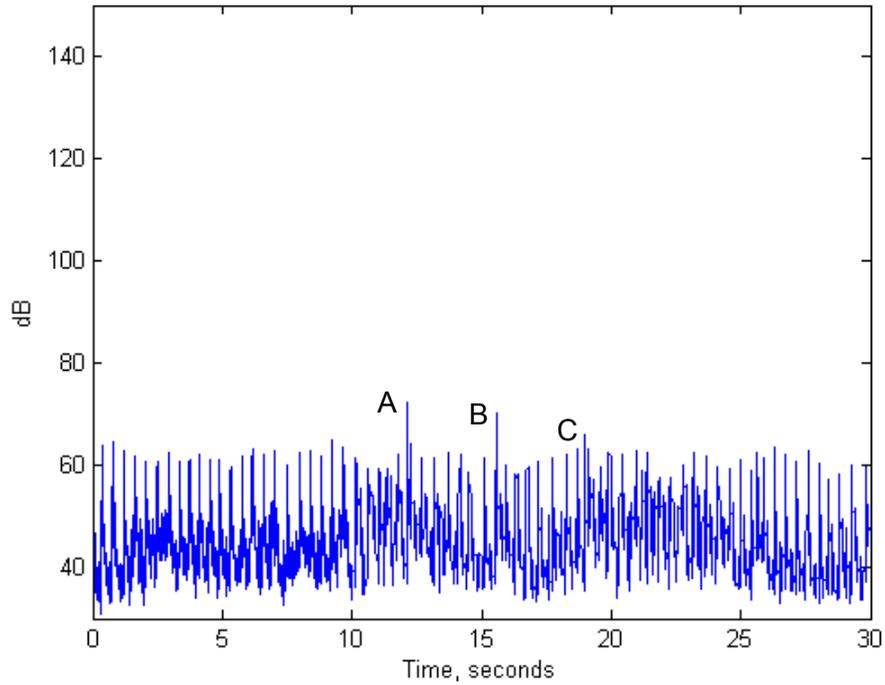


Figure 22. Location 7 three shot group (shot peaks at A, B, C). Each of the other peaks, occurring roughly 2 times each second over the entire 30 seconds, are from a chipmunk calling 35 yards behind the microphone.

Appendix



Figure 23. May 6th, 2014 photo showing the lack of vegetation at measurement location 5.

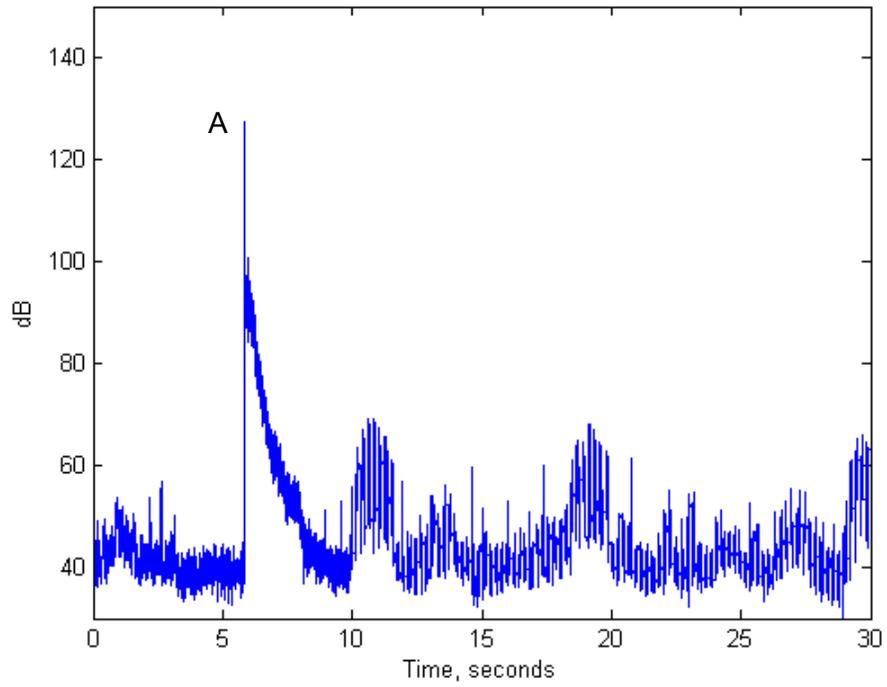


Figure 24. Location 1 single shot peak at A.

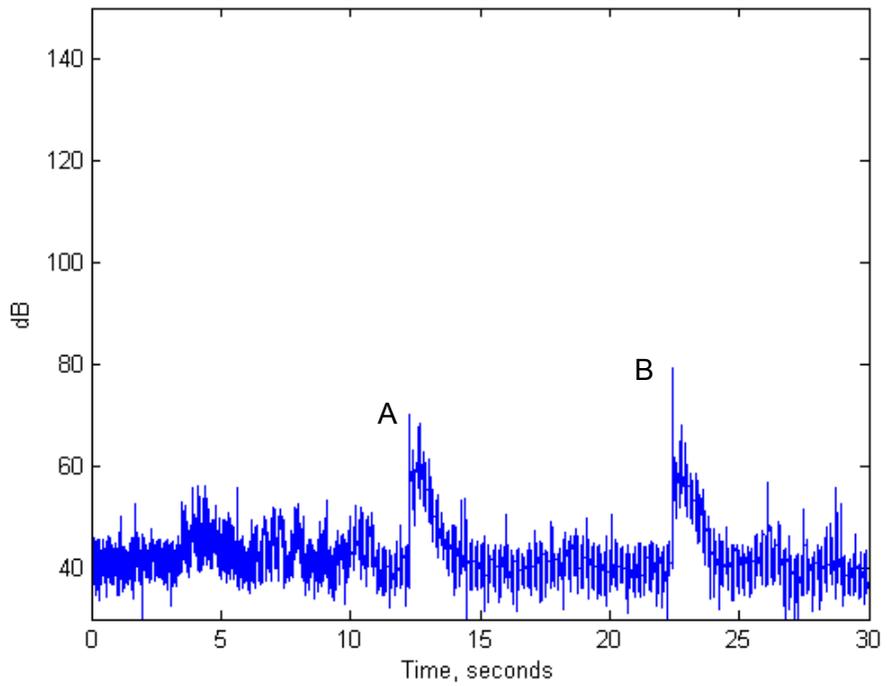


Figure 25. Location 3 two shot group (shot peaks at A, B).

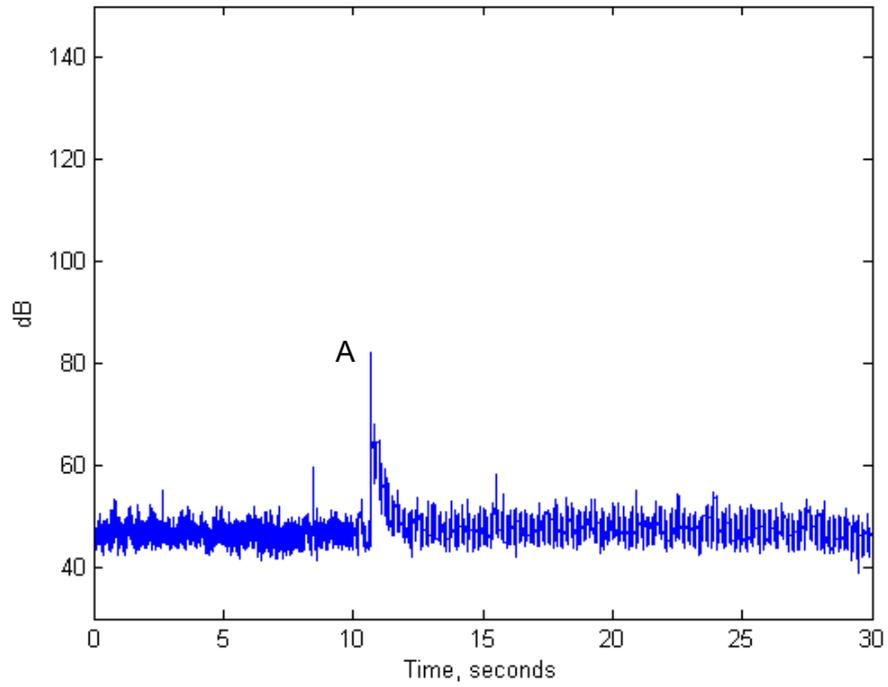


Figure 26. Location 5 single shot peak at A.

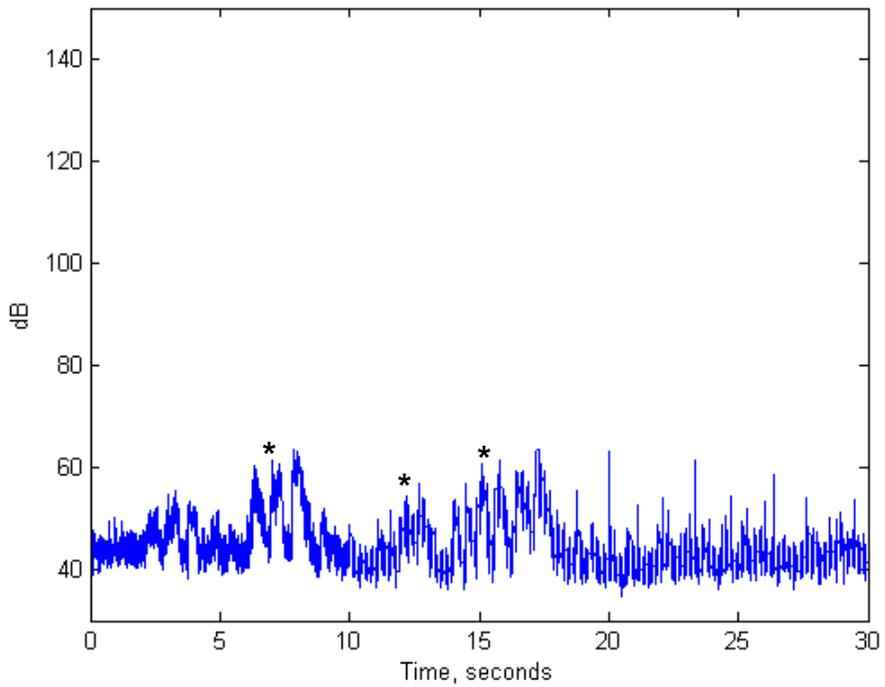


Figure 27. Measurement of ambient conditions at location 5. Crows were calling in the woods, denoted by *.

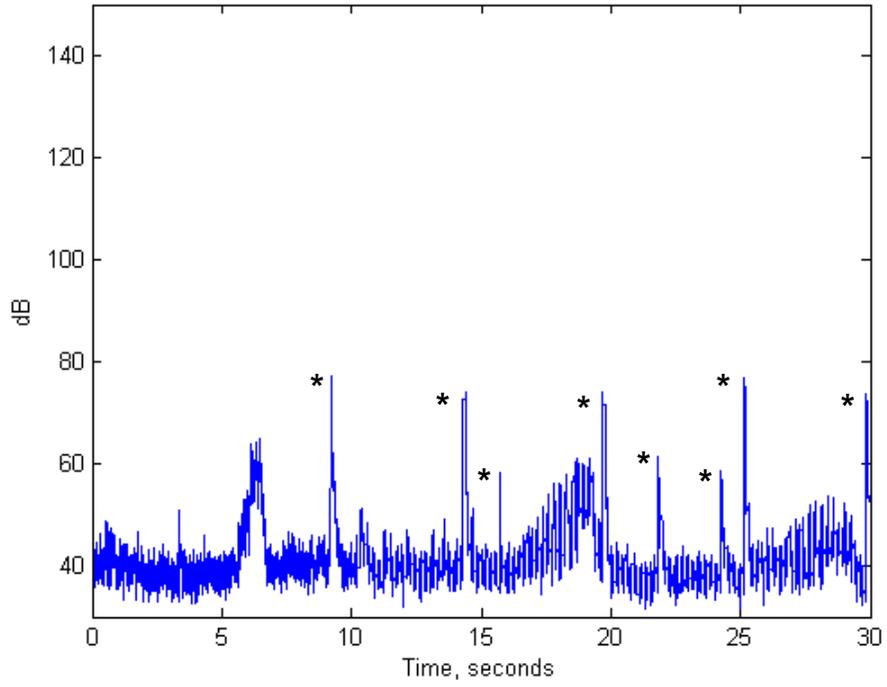


Figure 28. Measurement of ambient conditions at location 7, with a chipmunk calling (*) from within 30 yards directly behind the microphone.