Environmental Assessment
For Wisconsin DNR project:

Removal of newly establishing populations of invasive, non-native *Phragmites australis* from western Lake Michigan basin.

Prepared by:
Wisconsin Department of Natural Resources
February 2014

Prepared for:

U.S. Fish and Wildlife Service (USFWS)

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ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED
FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS)
Form 1600-1 Rev. 6-2010

Department of Natural Resources (DNR)

Region or Bureau
Type List Designation

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., Insert Date.

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Title of Proposal: USFWS/DNR/GLRI Removal of newly establishing populations of invasive *Phragmites* from western Lake Michigan basin.

Location: County: Western counties of the Lake Michigan basin, see project location statement for more information.

City/Town/Village: Various

Township Range Section(s): Various, see maps 1 & 3 and project location statement for more information

1. INTRODUCTION

1.1 Project Summary - Brief overview of the proposal including the DNR action (include cost and funding source if public funds involved)

1.1.1 Project Funding

- $200,000 for two field seasons; Sept. 2013 – Sept. 2015
- United States Fish and Wildlife Service (USFWS)
- Great Lakes Restoration Initiative (GLRI)

1.1.2 Project Location

This project is in the process of gathering data on where invasive *Phragmites* is found in the western part of the Lake Michigan basin, and as such we do not have a set list of sites for treatment. We have developed a site selection protocol for this project, based on the goals of finding and eradicating small pioneering populations of *Phragmites* in high quality water areas. Our selection criteria follow:

- Counties on the western edge of the Lake Michigan Basin
- Priority 1 counties: Vilas, Oneida, Forest, Langlade: Within these counties, all mapped and identified populations of *Phragmites* will be treated, provided permissions can be obtained.
- Priority 2 counties: Marathon, Portage, Waupaca, Adams, Waushara, Marquette, Green Lake, Columbia,

Dodge**:** Within these counties, the project is going to focus on areas of newly establishing *Phragmites* and may take place in areas such as wetlands, lakeshores, rights-of-way, State Natural Areas, parks and adjoining private lands. Other criteria such as the availability of partner organizations, prior work done, and the existence of rare species will guide site selection.

- Priority 3 counties: Florence, Marinette, Menominee, Oconto, Shawano, Outagamie, Winnebago, Fond du Lac: Within these counties there will be an effort to find and treat early establishing or isolated populations, particularly those found near important wetlands or lakes, in the western parts of these counties.

1.1.3 Project Description

- Mapping of *Phragmites* in western counties of the Lake Michigan basin.
- Development and implementation of a control strategy for *Phragmites* in the Lake Michigan basin.
- Implementation of an educational campaign to inform property owners about *Phragmites*.
- Control program targeting pioneering infestations according to a site selection protocol. 200 acres are targeted for control across the project.
- Evaluation of treatment effectiveness.

This project meets the USFWS' goals for the Great Lakes Restoration Initiative (GLRI) Action Plan to prevent the spread of 'new invasions' of species into an area. In many parts of Wisconsin, including areas of the Lake Michigan basin, *Phragmites* is a newly establishing invasive wetland plant. Efforts now to prevent its establishment and spread will prevent many of our lakes and wetlands from encountering the problems this plant has caused in other areas of the Great Lakes basin.

1.2 Purpose and Need (include history and background as appropriate)

Department Land Managers spend significant amounts of time and money controlling invasive species. Invasives are one of the most serious and persistent threats to native species and ecosystems. Given the right conditions, non-native invasive species can rapidly spread into natural areas and out-compete, damage and often eliminate native plant and animal communities. Once established, invasive species disrupt ecosystem patterns and processes, such as hydrology, nutrient cycling, erosion, habitat succession, and the frequency and intensity of wildfires. By reducing biological diversity, diminishing ecosystem resources, posing public health risks and impacting agriculture, tourism, fisheries, and outdoor recreation industries, invasive species are inflicting economic damage.

The invasive strain of *Phragmites australis*, or common reed grass, has many negative impacts that range from increased risk of fire due to accumulation of dead material, the prevention of access to lake edges which can impact recreation and property values, and its many effects on species diversity and ecosystem health. This tall, dense growing grass can easily shade or crowd out many wetland and lake edge plants, and infestations of high quality wetlands can have significant impacts on habitats and species of concern.

Many lakes, wetlands and riparian areas throughout the Great Lakes basin have already been significantly impacted by the invasive *Phragmites*. Much time and effort has been spent in controlling this tall grass along the coast of Lake Michigan and Green Bay. To complement these actions and prevent future infestations, Wisconsin needs to strategically target pioneering populations of invasive *Phragmites* and push the species back from high priority water resources. Areas in the western part of the basin have a chance to prevent *Phragmites* infestations that would prevent access to lakes and wetlands, and alter species diversity and hydrology.

This project will map infestations (not needed everywhere), develop a priority control plan, enlist cooperators to assist with the control, evaluate effectiveness, and restore natives where needed. Counties within the Lake Michigan basin (See map 1.) will be targeted for this control effort. Local partners needed to establish a sustainable effort would be asked to implement the control strategy and track the success over time.

1.3 Authorities and Approvals (list local, state and federal permits or approvals required)

FIFRA (Federal Insecticide, Fungicide and Rodenticide Act)

ESA (Endangered Species Act) Section 7

National Historic Preservation Action, Section 106

ATCP (Agriculture, Trade and Consumer Protection)

Wis. Statute ATCP 29	Pesticide Use and Control

NR (Natural Resources)

Wis. Statute Ch. 30	Navigable Waters, Harbors and Navigation
Wis. Admin. Code NR 40	Invasive Species Identification, Classification and Control
Wis. Admin. Code NR 103	Water Quality Standards for Wetlands
Wis. Admin. Code NR 107	Aquatic Plant Management

Private Land Treatments

Herbicide treatment on private land will only occur after written permission is obtained from the landowner. Permission forms will be coordinated and held by the Project Coordinator. These forms will be retained by the project coordinator for at least 3 years or the end of the project, whichever comes first.

2. PROPOSED PHYSICAL CHANGES OF PROPOSED ACTION (more fully describe the proposal)

2.1 Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yard, etc.)

None

2.2 Manipulation of Aquatic Resources (include relevant quantities - cfs, acre feet, MGD, etc.)

Reduce or eliminate invasive *Phragmites australis* populations, focusing on the western edge of the Lake Michigan basin in an attempt to find and halt the western advancing edge. Priority will be given to those that are newly establishing in the western edge counties or pioneering populations threatening high value or sensitive wetland communities. Control work will be done within the Lake Michigan basin. Private contractors, partner organizations and DNR personnel will treat *Phragmites* with herbicide, with at least 200 acres treated.

A site selection protocol will guide the treatment process by identifying pioneering populations of *Phragmites* that are threatening to create new infestations in wetlands and lakes. Treatments are not restricted to lake edges or wetlands, and may include right of ways, public lands and adjoining private lands where permission for treatment is given. Part of the site selection protocol includes sensitive habitats or occurrence of rare species. Identified Conservation Opportunity Areas (COAs) that include State Natural Areas, State Wildlife Areas, State Parks/Forests and wetlands included on the Natural Heritage Inventory (NHI) are likely to be included in treatment priority areas.

Primary treatment method: Imazapyr

The herbicide to be used in the majority of sites is imazapyr, which has been used for other *Phragmites* control projects in areas of WI. Imazapyr is a non-selective herbicide used for the control of a broad range of weeds including terrestrial annual and perennial grasses and broadleaved herbs, woody species, and riparian and emergent aquatic species. It controls plant growth by preventing the synthesis of branched-chain amino acids. Imazapyr is a non-selective broad-spectrum systemic herbicide, absorbed by the foliage and roots of a plant, with rapid transfer to the xylem and phloem to the meristematic regions, where it accumulates and causes disruption of protein synthesis. This leads to interference in DNA synthesis and cell growth of the plants.

For specific rate information, refer to herbicide labels. The following are a list of aquatic-use approved herbicides that have imazapyr as the active ingredient.

EPA Aquatic-Use Approved Herbicides

- **Arsenal®**
- **Habitat®**
- **Polaris®**

One of the herbicides will be paired with a MSO surfactant approved for aquatic use.

Label Recommendations

28.7% Imazapyr a.i.

- 4 to 6 pints per acre applied to actively growing, green foliage after full leaf elongation.
- If stand has a substantial amount of old stem tissue; mow or burn, allow to re-grow to approximately 5 feet tall before treatment.
- Lower rates will control *Phragmites* in the north; higher rates are needed in the south.
- Lower rates (1-1.5% solution) will be used for follow up treatments.

Methylated seed oil (MSO)
Post-emergence applications require the addition of a spray adjuvant. Only spray adjuvants that are approved or appropriate for aquatic use will be utilized. A methylated seed oil or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, concentrates should be mixed at a rate of 1% of the total spray volume.

Application will be done after assessing the site needs, size and distribution of the invasive *Phragmites* population and existence/proximity of any important native species. Ground application techniques may include treatments done with a backpack sprayer, hand-sprayer, boom-mounted sprayer with low pressure nozzles, wick, bundle-cut and treat stem surface, and/or machinery with low impact tread.

Alternative option of glyphosate in very sensitive areas of high plant diversity/sensitivity.

After discussion with some land managers that may have areas to be treated, the option to use glyphosate was requested for wetland areas that are of very high rare plant diversity. Glyphosate is a non-selective, broad spectrum, systemic herbicide that is used to control many grasses, forbs, vines, shrubs, and trees. It is one of the most commonly used herbicides in natural areas because it provides effective control of many species. Glyphosate works by preventing the plant from producing amino acids that are the building blocks of plant proteins. Formulations of glyphosate such as Rodeo© have been approved for use in aquatic systems, and have successfully controlled invasive aquatic species such as common reed (*Phragmites australis).* Because glyphosate is non-selective, appropriate application methods (spot treatment) and seasonal timing similar to use of imazapyr will be used to prevent impacts on non-target species. A perceived benefit to using glyphosate in areas of high plant sensitivity is less persistence in the soil than imazapyr. This should lead to less risk of non-target vegetation being affected by the herbicide, but is likely to include a higher risk of less effective treatment of the *Phragmites*.

Overall, glyphosate is not considered to be as effective in controlling *Phragmites* as imazapyr, therefore a specific case must be made by the land owner/manager to request using glyphosate in order to decrease risk to rare non-target vegetation. When used, it would include the use of the same aquatic-approved surfactant and dye as the imazapyr treatments.

2.3 Buildings, Treatment Units, Roads and Other Structures (size of facilities, road miles, etc.)

None

2.4 Emissions and Discharges (include relevant characteristics and quantities)

Chemical Name - % by weight.

28.7% Isopropylamine salt of imazapyr is standard for aquatic approved herbicides such as Habitat® or Arsenal®. Herbicides will be applied by certified applicators. Applications will be made by ground staff, will be site specific, and will include a variety of methods to include: spraying with backpack, from ATV, or machines mounted with boom sprayers. The bundle-cut-treatment of stems or hand wicking of herbicide may also be used, particularly in areas with sensitive native vegetation.

All herbicide label formulations are listed as percent active ingredient (a.i.); also referred to as the chemical name, this is the chemical that kills the plant. When an herbicide is purchased it will contain a certain amount of active ingredient.

Herbicide rates:		**Ground Application rate:**	
Imazapyr 28.7%	Initial broadcast spray:	1.5 oz per gallon water	4 to 6 pints per acre
	Follow up spray:	1.5 oz per gallon water	4 to 6 pints per acre

MSO (surfactant)	1.5 oz per gallon water	1 to 2 pints per acre

Imazapyr (the active ingredient in Habitat and Arsenal) is an anionic, organic acid that is non-volatile, and is both persistent and mobile in soil. It may be applied by broadcast application to aquatic freshwater sites to control floating or emergent aquatic vegetation. Application may be made to control undesirable wetland, riparian and terrestrial vegetation growing in or around surface water when applications may result in inadvertent applications to surface water.

MSO (methylated seed oil) is a vegetable oil that is mixed with imazapyr to aid in breaking the waxy surface tension of the leaves, which results in better contact of the herbicide to the plant material. MSO is the surfactant required to mix with imazapyr due to its drift reduction capabilities. The MSO surfactant will make the smaller driftable droplets of the straight herbicide larger, which results in the droplets being heavier and less likely to move around in the air before making contact with the target species. MSO is designed for use with post-emergent herbicides. MSO is not a pesticide.

Colorants are added to the herbicide/surfactant solutions to enable spray crews to see where they have treated areas and are visible after the initial evaporation of the solution. The applicator usually determines the compatibility of a colorant with an herbicide and particular application. The use of colorants can assist in the prevention of overspraying as treated areas are clearly observed by the applicator, preventing re-spraying of an area. Colorants are non-toxic and will disappear in a short time with rainfall.

Environmental Hazards

Imazapyr has low acute toxicity via the oral (mouth) and dermal (skin) routes of exposure. It is not irritating to the skin, and is negative for dermal sensitization; however, imazapyr may cause eye damage. The available data suggest that a single exposure to imazapyr does not result in an effect of concern for risk assessment purposes. Imazapyr does not bioconcentrate in fish.

The U.S. Environmental Protection Agency (EPA) classifies Arsenal and Habitat as category III (Low Toxicity).

Toxicity Category and Signal Word

	High Toxicity (*Danger*)	**Moderate Toxicity (*Warning*)**	**Low Toxicity (*Caution*)**	**Very Low Toxicity (*Caution*)**
Oral LD50	Less than 50 mg/kg	50-500 mg/kg	500-5000 mg/kg	Greater than 5000 mg/kg
Dermal LD50	Less than 200 mg/kg	200-2000 mg/kg	2000-5000 mg/kg	Greater than 5000 mg/kg
Inhalation LC50	Less than 0.05 mg/l	0.05-0.5 mg/l	0.5-2.0 mg/l	Greater than 2.0 mg/l
Eye Effects	Corrosive	Irritation persisting for 7 days	Irritation reversible in 7 days	Minimal effects, gone in 24 hrs
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation

Highlighted categories specify the range for imazapyr.

There are no restrictions on recreational use of treated water, including swimming and eating fish from treated water bodies. If application occurs within a ½ mile of a drinking water intake, then the intake must be shut off for 48 hours following treatment. There is a 120-day irrigation restriction for treated water, but irrigation can begin sooner if the concentration falls below one part per billion (ppb).

Wildlife Toxicity Category

Risk Category	Mammals	Birds	Fish or Aquatic Insects
	Acute Oral or Dermal LD_{50} (mg/kg)	Acute Oral LD_{50} (mg/kg)	Acute LC_{50} (mg/L)
Practically nontoxic	>2,000	>2,000	>100
Slightly toxic	501-2,000	501-2,000	>10-100
Moderately toxic	51-500	51-500	>1-10
Highly toxic	10-50	10-50	0.1-1
Very highly toxic	<10	<10	<0.1

Highlighted categories specify the range for imazapyr cited in this fact sheet. The toxicity of imazapyr to wildlife receptors varies by species.

2.5 Other Changes

There may be areas where cutting, rolling, or burning standing dead phragmites stems may be necessary or beneficial to treatment with herbicides. This will need to be assessed and done on a site by site basis depending on ground conditions, accessibility, and existing ground vegetation.

2.6 Maps, Plans and other Descriptive Material Attached

A) Map of Lake Michigan basin with priority counties

B) Map of identified Conservation Opportunity Areas within Ecological Landscapes

C) Existing distribution map of *Phragmites australis* in Lake Michigan basin of WI (currently known reports as of date of EA submission)

D) Section 7 form (ESA)

3. AFFECTED ENVIRONMENT (describe existing features that may be affected by proposal)

3.1 Information Sources (check all that apply):

☒ Literature/correspondence (specify major sources)

1) DNR – GLRI grant: Aquatic Nuisance Species Management Plan Implementation
2) US EPA – Reregistration Eligibility Decision for Imazapyr, 2006
3) US EPA – Web pages on Pesticides, Ecological Risk Assessments, Risk Reduction
4) Wisconsin Department of Natural Resources web pages:
   a) Wetlands & Wetland Invasive Species Strategy
   b) Invasive Species
   c) Natural Heritage Inventory
   d) Conservation Opportunities
   e) Ecological Landscapes
5) Herbicide Labels and MSDS
   a) Habitat
   b) Arsenal
   c) Polaris
6) MSO – surfactant label and MSDS

☒ Personal Contacts (list in item 26)

Field Analysis By: ☐ Author ☐ Other (list in item 26)

Past Experience With Site By: ☒ Other (list in item 26)

3.2 Physical Environment (topography, soils, water, air)

Due to the scope of the project boundaries covering a wide area, the physical environment, topography and soils will change depending on the county and ecological landscape or wetland habitat. Generally this project will be targeting *Phragmites* populations in or near wetlands that fall into a range of community types. Information on different ecological landscapes can be found on the DNR's website at http://dnr.wi.gov Keywords: Ecological Landscapes. For this project, the primary ecological landscapes and their characteristics are as follow.

- **Northern Highland**

Primarily Vilas and Oneida counties, this landscape consists of 2,081 square miles or 3.7% of the total land area of WI. Most of the Ecological Landscape is an undulating, gently rolling glacial outwash plain with many kettle lakes, wetlands, and bogs. Remnant moraines and drumlins occur often, with their lower slopes covered

with outwash sands. Most soils are sands and gravels, some with a loamy mantle. Soil productivity is low compared to glacial till but relatively high for outwash sands. Wetlands are numerous; most have organic soils of peat or muck. There is a globally significant concentration of glacial lakes in the Northern Highland: 4,291 lakes; 1,543 miles of streams, including the headwaters of the Wisconsin and Manitowish-Flambeau-Chippewa river systems. Many lakes are connected by small streams. Rare aquatic species and extensive wetlands (see below) occur here. This is a high priority area for this project due to the globally significant lakes and wetlands in this area and the need to prevent phragmites from establishing.

The mean annual temperature is 39.5 deg. F, the lowest of any Ecological Landscape in the state and almost 2 degrees lower than other northern ecological landscapes. The mean annual precipitation is 31.6 inches, similar to other northern ecological landscapes. The mean annual snowfall is 68.1 inches, the second largest amount of snowfall in the state. Only about one percent of the Northern Highland is used for agricultural purposes. The climate is favorable for forests, which cover more than 76% of the Ecological Landscape.

- **North Central Forest**

Forest, Florence and Langlade counties form the eastern section of this ecological landscape which in total consists of 9,543 square miles or 17.1% of the state. Landforms are characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest. Two prominent areas here are the Penokee-Gogebic Iron Range in the north (which extends into Upper Michigan), and Timm's Hill, the highest point in Wisconsin (at 1,951 feet) in the south. Drumlins are important landforms in some parts of the North Central Forest. Soils consist of sandy loams, sands, and silts. Organic soils, peats and mucks, are common in poorly drained lowlands.

Rivers, streams, and springs are common and found throughout this Ecological Landscape. Major rivers in the area covered by this project include the Wolf, Pine, Popple, and Peshtigo. Large lakes include Butternut, Metonga, Pine, Kentuck, Pickerel, and Lucerne. The mean annual temperature is 40.3 deg. F. Summer temperatures can be cold or freezing at night in the low-lying areas, limiting the occurrence of some biota. The mean annual precipitation is 32.3 inches and the mean annual snowfall is 63 inches. The climate is especially favorable for the growth of forests, which cover roughly 75% of the Ecological Landscape.

- **Forest Transition**

A large east-west orientated landscape, this project has a number of counties that, in part, fall into the Forest Transition ecological landscape, including Marathon, Langlade, Shawano, Menominee, Portage and Waupaca. The entire landscape consists of 7,279 square miles or 12.9% of the land area of the state. The Forest Transition landscape was entirely glaciated. The central portion was formed by older glaciations, both Illinoian and pre-Illinoian, while the eastern and western portions are covered by deposits of the Wisconsin glaciation. Glacial till is the major type of material deposited throughout, and the prevalent landforms are till plains or moraines. Throughout the area, post-glacial erosion, stream cutting, and deposition formed floodplains, terraces, and swamps along major rivers. Wind-deposited silt material (loess) formed a layer 6 to 24 inches thick. Density of the glacial till is generally high enough to impede internal drainage, so there are many lakes and wetlands in most parts of the Forest Transition landscape.

Because this Ecological Landscape extends east-west across much of Wisconsin, the climate is variable. In addition, it straddles a major eco-climatic zone (the “Tension Zone”) that runs southeast-northwest across the state. Mean annual temperature is 41.9 deg. F, mean annual precipitation is 32.6, and mean annual snowfall is 50.2 inches. The Wisconsin and Wolf rivers drain areas of this ecological landscape, and land cover varies greatly depending on the region, with eastern areas more forested.

- **Northeast Sands**

Northwest Marinette and Oconto counties, as well as eastern Florence and Menominee counties make up the area covered by the Northeast Sands ecological landscape. At 1,542 square miles or 2.8% of the land area of the state, it is the fifth smallest ecological landscape. Forests cover 75% of the landscape with aspen and dry forests the most common type. Dominant soil types are excessively drained and sandy with low available water capacity.

There are a range of rivers and streams as well as scattered lakes throughout the landscape. This landscape

contains a significant amount of tribal holdings. The rivers in this area contain a number of hydrologic modifications such as large dams (on Menominee, Peshtigo and Pine rivers). Shoreline developments along these river systems is a concern in areas.

- **Central Sand Hills**

Portage, Waushara, Marquette, Green Lake, Columbia and Adams counties make up the part of this project that is located within the Central Sand Hills ecological landscape. The landforms in this Ecological Landscape include a series of glacial moraines with pitted outwash extensive in some areas. Glacial tunnel channels occur here, e.g., in Waushara County, just east of and visible from I-39. Soils are primarily sands. Organic soils underlie wetlands such as tamarack swamps and sedge meadows.

There is a mosaic of extensive wetlands and small kettle lakes in the outwash areas, and the headwaters of coldwater streams originating in glacial moraines. Some seepage lakes and ponds exhibit dramatic natural water level fluctuations which create important Inland Beach and Coastal Plain Marsh habitats. The Wisconsin River and a short but ecologically important stretch of the lower Baraboo River flow through this Ecological Landscape. Other important rivers include the Fox, Grand, Mecan, Montello, Puchyan, and White.

Typical of south central Wisconsin; the mean annual temperature is 44.8, mean annual precipitation is 33 inches, mean annual snowfall is 44 inches. Although the climate is suitable for agricultural row crops, small grains, and pastures, the sandy soils somewhat limit agricultural potential.

- **Southeast Glacial Plains**

Winnebago, Fond du Lac, and Dodge counties are the project counties in this ecological landscape, and this landscape entirely covers the three counties. Overall this ecological landscape stretches from Winnebago county south to the counties that border Illinois and covers almost 5 million acres. Its dominant landforms are glacial till plains and moraines, with numerous other glacial landscape features such as eskers, drumlins, kames and kettles.

This ecological landscape contains some of the most productive aquatic environments for plants, invertebrates and fish in the state. There are several important chains or clusters of lakes, as well as important river systems that move through this landscape, including the Wolf, Bark, Rock, Fox, Milwaukee, Sugar, Mukwonago, and Sheboygan. However, many of the riparian zones around these rivers have been degraded.

The climate is typical of southern Wisconsin with a mean annual temperature of 45.9 deg. F, mean annual precipitation of 33.6 inches and mean annual snowfall of 39.4 inches. This climate is suitable for agricultural row crops, small grains and pastures.

3.3 Biological Environment (dominant aquatic and terrestrial plant and animal species and habitats including threatened/endangered resources; wetland amounts, types and hydraulic value)

Due to the scope of the project boundaries covering a wide area, the biological environment (including species composition and habitat) will change depending on the county and ecological landscape or wetland habitat. Generally this project will be targeting *Phragmites* populations in or near wetlands that fall into a range of community types. Information on different ecological landscapes can be found on the DNR's website at http://dnr.wi.gov Keywords: Ecological Landscapes. For this project, the primary ecological landscapes and their biological characteristics are as follow.

- **Northern Highland**

The Northern Highland ecological landscape is especially rich in rare species associated with waters and wetlands, including some of the north's most iconic animals, such as the Bald Eagle, Osprey and Common Loon. Lakes connected by perennial streams are common here and support a diverse aquatic fauna which includes rare and uncommon species such as longear sunfish (*Lepomis megalotis*), Pugnose Shiner (*Notropis anogenus*), and Mink Frog (*Lithobates septentrionalis*). The landscape's rivers and streams include the

headwaters region and upper stretches of the Wisconsin River, as well as the Manitowish, Tomahawk and Squirrel rivers.

The Northern Highland landscape historically consisted of a diverse mosaic of habitats, patch sizes, stand ages, ecotones and aquatic features. The extensive forests here present major opportunities and include the state's greatest acreage of dry-mesic white pine-red pine forests. Other less abundant forest types providing good management opportunities include mesic hemlock-hardwood and northern hardwood forests; swamp conifers of black spruce, tamarack, or white cedar; dry jack pine forests; and hardwood swamps. Abundant wetlands include several of the state's largest and least disturbed acid peatland ecosystems, as well as hardwood swamp, white cedar swamp, shrub communities, emergent marsh and wild rice marsh. These wetlands provide important habitats and are critical for maintaining water quality in the landscape's high-quality lakes and streams. Species of special concern found in these forests and wetlands include northern flying squirrel (*Glaucomys sabrinus*), water shrew (*Sorex palustris*), and black-throated blue warblers (*Dendroica caerulescens*).

- **North Central Forest**

The mesic northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, with some stands containing scattered hemlock, yellow birch, and/or white pine pockets. The aspen-birch forest type group is also abundant, followed by spruce-fir (most of the spruce-fir is lowland conifers on acid peat not upland "boreal" forest). These forests support a range of threatened and special concern wildlife species such as American marten (*Martes americana*), hoary bat (*Lasiurus cinereus*), and black-backed woodpeckers (*Picoides arcticus*). Forested and non-forested wetland communities are common and widespread. These include Northern Wet-mesic Forest (dominated by either northern white cedar or black ash), Northern Wet Forest (acid conifer swamps dominated by black spruce and/or tamarack). Non-forested acid peatlands (bogs, fens, and muskegs), alder thicket, sedge meadow, and marshes (including wild rice marshes) are widespread in the North Central Forest and support uncommon species such as wood turtles (*Glyptemys insculpta*), livid sedge (*Carex livida var. radicaulis*), and trumpeter swan (*Cygnus buccinators*).

Aquatic resources are in good condition compared to many areas elsewhere in the state. Water quality is high, sediment and pollutant loads are low, flow levels tend to follow normal patterns on many streams and the diversity of aquatic organisms is significant. Maintaining the existing high percentage of forest cover within watersheds is, arguably, the most critical factor in maintaining high water quality and supporting all of the aquatic species native to northern Wisconsin's lakes and streams.

Invasive species are, generally, less abundant here than in many other ecological landscapes, especially those in the southern half of the state. However, invasive species detections are increasing in this landscape. Controlling these species before they become abundant, as they have in many other parts of the state, is an important opportunity as both control efforts and costs are more manageable when problems are still localized.

- **Forest Transition**

Once almost completely forested, the Forest Transition's largest blocks of forests are now limited to certain areas. Portions of two large forested areas, the Lakewood-Laona District of the Chequamegon-Nicolet National Forest (CNNF) and the Menominee Indian Reservation, comprise the easternmost and most densely forested end of the landscape. These are largely mesic forests, and the forests of the Menominee Reservation have retained some old forest attributes, including large trees, coarse woody debris and multi-layered canopies. Unlike many other parts of Wisconsin, eastern hemlock remains abundant in some areas, and both it and northern white cedar can be found reproducing here. These forests provide important habitats that are rare or absent elsewhere and offer excellent opportunities for monitoring and research.

Much of this ecological landscape is now quite open and dominated by intensive agricultural use. A few open areas of surrogate grassland (non-native grasses) and adjacent wetlands embedded within agricultural lands are large enough to support declining grassland birds, including the WI threatened greater prairie-chicken (*Tympanuchus cupido*). Bedrock exposures, though localized and uncommon, can provide specialized habitats. Significant outcroppings of Precambrian rock in the Forest Transition include exposures of granites, quartzite and basalt as cliffs, glades and talus slopes in certain areas. Cambrian sandstone exposures occur at a few locations such as the south central part of the landscape.

A number of rivers cross the landscape from north to south, which support high aquatic biodiversity and many rare species. Wetlands and forests forming the corridors of these rivers are used heavily by migratory birds and may be important for other species traveling between northern and southern Wisconsin. Habitats such as floodplain forest and marsh are better represented along the large rivers than elsewhere in the landscape. The wetlands of this landscape support such threatened or special concern species as American bitterns (*Botaurus lentiginosus*), black terns (*Chlidonias niger*), and marsh valerian (*Valeriana sitchensis ssp. uliginosa*).

- **Northeast Sands**

Roughly 75% of the Northeast Sands ecological landscape is forested, playing an important role in the area's high water quality and providing extensive habitat management opportunities. Dry forest types such as jack pine and scrub oak are common, as are aspen woodlands. There are important wet-mesic forests dominated by white cedar that support numerous rare or uncommon plants and animals. These are susceptible to negative impacts from hydrological modifications and browse pressure from whitetail deer. However, there are opportunities to protect this forest type within the Chequamegon-Nicolet National Forest as well as Marinette and Oconto County Forests.

There are a number of rivers and streams that provide high quality aquatic habitats for species such as lake sturgeon (*Acipenser fulvescens*), osprey (*Pandion haliaetus*), and mudpuppy (*Necturus maculosus*). The Menominee, Peshtigo, Oconto, Wolf, Pine and Pike rivers as well as their tributaries flow through this regions, and where they are bordered by bedrock, conifers or relatively old forest they have the potential to support species that are rare elsewhere in the ecological landscape and surrounding region. The ecological landscape also contains a number of undeveloped lakes, ponds and a range of wetland types; both forested and open canopied, that improve the ecological value of this region.

- **Central Sand Hills**

Fire-dependent communities were once common and widespread in the Central Sand Hills. Remnant savannas, both oak barrens and oak openings, occur on dry and dry-mesic sites scattered throughout the Central Sand Hills. All of these communities have high potential to support rare plants, invertebrates and reptiles such as the slender glass lizard (*Ophisaurus attenuates*).

Dry forests of white, black and bur oak are common, though forest management at large scales is constrained by ownership patterns and small tract size and current land uses. Mixed forests of pine and oak are locally common, and the Central Sand Hills is one of two ecological landscapes where good examples of the Central Sands Pine-Oak Forest community have been documented. The mix of natural communities support threatened or special concern species such as red-shouldered hawks (*Buteo lineatus*), the Karner blue butterfly (*Lycaeides melissa samuelis*) or purple milkweed (*Asclepias purpurascens*).

Numerous springs and coldwater streams emanate from the end moraine that forms the western boundary of the Central Sand Hills. Wetland communities associated with these glacial landforms include fen, sedge meadow, low prairie, shrub swamp and tamarack swamp; some of these wetlands are quite alkaline and differ in composition from those found in the more acid environments to the west. Large wetland complexes such as those found at Germania Marsh, Comstock Marsh, Grand River Marsh and Fountain Creek Prairie contain good examples of fen, sedge meadow, wet prairie, shrub swamp and tamarack swamp. The Central Sand Hills contains more occurrences of the globally rare Coastal Plain Marsh community than any other landscape in Wisconsin. Coastal Plain Marsh communities provide habitat for rare vascular plants and invertebrates such as and are associated with sandy or gravelly shores of seepage lakes that exhibit dramatic natural water level fluctuations. Green Lake, Wisconsin's deepest inland lake, is located in the east central portion of the Central Sand Hills.

- **Southeast Glacial Plains**

Although much of this ecological landscape is heavily developed or in agricultural use, there exist important areas of undeveloped lands to provide habitat for native species. The landscape contains the Kettle Moraine region, with large amounts of undeveloped uplands within the Kettle Moraine State Forest. The northern unit of the state forest has extensive upland forests, important wetlands and rivers, and many ephemeral ponds. The southern unit of the KMSF holds many areas of oak savannas and open wetlands such as bogs and fens. The large complex of sedge meadow, marsh and wet prairie associated with the White and Puchyan rivers is

outstanding in terms of size and quality and supports an extremely large range of wildlife including many birds and reptiles. The landscape also contains Horicon Marsh, the Upper Midwest's largest cat-tail marsh, and the Mukwonago River watershed, the most intact watershed in the landscape, with a high diversity of fishes and aquatic invertebrates inhabiting the spring-fed river system. Many private and public partners are working to protect, manage and restore areas of these important watersheds.

3.4 Cultural Environment

Due to the scope of the project boundaries covering a wide area, the cultural environment (including land-use and social/economic features) will change depending on the county and location. The DNR's breakdown of areas based on Ecological Landscapes does contain information on land-use and social features. Generally this project will be targeting *Phragmites* populations in or near wetlands that fall into a range of community types. Information on different ecological landscapes can be found on the DNR's website at http://dnr.wi.gov Keywords: Ecological Landscapes. For this project, the primary ecological landscapes and their primary land-uses and social features are as follow:

3.4.1 Land use (dominant features and uses including zoning if applicable)

- **Northern Highland**

Current land-use in this region is 48% upland forest, 34% wetlands (both forested and non-forested), 13% open water, 5% grassland and open land, and 1% urban. The cool temperatures, short growing season, and sandy soils are not adequate to support agricultural row crops, such as corn. Only about one percent of the Northern Highland is used for agricultural purposes, as opposed to forests, which cover 76% of the ecological landscape.

- **North Central Forest**

Within the total area of the North Central Forest ecological landscape, only six percent of land is in agricultural use compared to forest cover which is roughly 75% of the Ecological Landscape. 42% of land is publicly owned, mostly by federal, state or county governments. Federal ownership includes the Chequamegon-Nicolet National Forest.

- **Forest Transition**

Landcover is highly variable by subsection, dominant landform, and major land use. The eastern part of the ecological landscape remains heavily forested; the central portion is dominated by agricultural uses (with most of the historically abundant mesic forest cleared). The growing season is long enough that agriculture is viable, although climatic conditions are not as favorable for many crops as they are in southern Wisconsin. A large part of the Menominee Indian Reservation is in the Forest Transition and these tribal lands (along with some the adjoining publicly-owned forests) constitute the largest block of contiguous forest in this ecological landscape.

- **Northeast Sands**

Aspen forests are most abundant cover type in this region, with scrub-oak and jack pine dry forests also very common. There are plantation-grown pine, hemlock-hardwoods and northern hardwoods as well, all of which support local forest industry. Only about 7% of the area is used for agriculture, primarily in the southeastern and northernmost parts of the landscape.

- **Central Sand Hills**

Current vegetation is more than one-third agricultural crops, one third forest, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, unvegetated (termed "barren" in WISCLAND), and urban areas. Large contiguous areas of any of the major natural or surrogate vegetation types are uncommon.

- **Southeast Glacial Plains**

Agricultural cropland is the most abundant land-cover in this landscape (58%), while forests only cover 11% of the land area. The only areas of large upland forest are found in the Kettle Interlobate Moraine, where

topography limits intensive agriculture and soils are not as productive. Wetlands are extensive (12% of the landscape) and include marshes as well as floodplain wetlands. Only 4% of the landscape is within public ownership, of which 58% is wetland and 42% is upland.

3.4.2 Social/Economic (including ethnic and cultural groups)

- **Northern Highland**

Retail trade (16%); accommodation and food services (11%), construction (10%) and real estate, rental, and leasing (5%) sectors led in 2002, reflecting high recreation and rural development. Forestry, residential development, and recreation have the largest impacts on the Ecological Landscape's natural resources. Tribal ownership is significant, as the large reservation of the Lac du Flambeau band of the Ojibwa Nation is here. The population of Iron, Vilas and Oneida counties is 65,660, or 1.2% of the state total, with a per capita income of $26,853.

- **North Central Forest**

Government, tourism-related, manufacturing (non-wood) and retail trade sectors in 2002 reflecting high government and tourism-related dependence. Although forestry does not have a large impact on the number of jobs it produces, it is the sector that has the largest impact on the natural resources in the Ecological Landscape. The entirety of this landscape has a population of 244,782, or 4.4% of the state total with a per capita income of $26,738.

- **Forest Transition**

Government, manufacturing (non-wood), health care & social services, and retail trade sectors provided the highest number of jobs in 2007. Agriculture (including commercial ginseng farms) is now the dominant land use in many areas that historically supported mesic forest. Timber and paper production, and recreational uses are highly significant in some parts of the Forest Transition landscape. The entirety of this landscape has a population of 639,625 or 11.4% of the state total with a per capita income of $29,814. A large part of the Menominee Indian Reservation is in the Forest Transition ecological landscape.

- **Northeastern Sands**

Forestry has the largest overall impact on the natural resources of this landscape, with government, non-wood manufacturing and tourism also playing large roles in the economics of this region. It has a high number of public lands including the Chequamegon-Nicolet National Forest, several State parks or State / County forests. Overall only 1.6% of the state population resides in this ecological landscape, with a per capita income of $27,677. Notably, there is a high amount of tribal lands in this region, including the eastern part of the Menominee Reservation.

- **Central Sand Hills**

The largest employment sectors for the Central Sand Hills ecological landscape in 2007 were: Government (13.2% vs. 12.1% statewide); Tourism-related (12.6% vs. 11.2%), Manufacturing (non-wood) (12.0% vs. 11.7%) and Health care & social services (9.4% vs. 10.7%). This landscape has a population of 182,035, or 3.2% of the state total with a per capita income of $30,777.

- **Southeast Glacial Plains**

Manufacturing (13.9%) and government (12.6%) make up the largest areas of employment in this region, with less tourism-related employment than the average in the state (10.6% vs. 11.2% statewide). Overall there are just over 1.5 million people in this ecological landscape, 28.5% of the state total, although the counties in the project area may have less population density than other counties. The per capita income for the landscape is $38,934.

3.4.3 Archaeological/Historical

This project will comply with Section 106 of the National Historic Preservation Act. In Wisconsin, there are a range of archaeological and historic sites including prehistoric villages and burial areas, fur trade era sites, sunken vessels, farmsteads, mining camps and quarries, WPA-era structures, rock art sites, ferries and lighthouses. These cultural resources are a valuable part of Wisconsin's landscape and history, even if some sites may not be immediately visible or apparent. Across the large area that is part of this project, there may be areas of burial sites or mounds, old CCC camps, or historic buildings.

The project is limited to chemical control of *Phragmites* which should not result in any soil disturbance or excavation that would have adverse effects on archaeological or historic sites/artifacts. Some follow up activities such as cutting or burning will also take place above ground and should result in little to no ground disturbance.

At the moment, specific parcels of land to be treated have not been identified. When specific parcels are delineated for spraying, Mark J Dudzik – Department Archaeologist, will be consulted to determine any potential conflicts with reported sites.

3.4.4 Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

There are many areas of the project counties that are State Wildlife Areas, State Natural Areas, State or County parks, or other places that may be considered special resources. The project will be seeking to work in close partnership with land managers of these areas to ensure work is done in a way suitable to the needs of the resources, whether due to ecological, social, or cultural aspects. These partnerships will be key in promoting long-term control of *Phragmites* in these landscapes.

4. ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION (probable adverse and beneficial impacts including indirect and secondary impacts)

4.1 Physical (include visual if applicable)

Imazapyr is an anionic, organic acid that is non-volatile, and is both persistent and mobile in soil. This herbicide will attack certain enzymes found only in plants and does not bind to water. It takes about 4-6 weeks for the herbicide to work its way down through the stem and move into (translocate) the roots. Proper timing of application will allow for better control of the plants. Depending on weather conditions (average year temperatures), treatments will begin in mid to late August, and plants can be treated until mid-October, or before the ground freezes. Treating at this time of year will be when the plant is reversing its energy reserves, and when applied during this transition, the plant will move the herbicide into its roots and rhizomes as it goes into dormancy for the winter. This results in most visual impacts of dead plants being noticeable the following year.

Where *Phragmites* grows in large invasive stands it can negatively impact the visual aesthetics of an area by forming tall monotypic walls of vegetation, preventing access to area and blocking views. In some areas this can pose a safety risk (where it grows near/along roads). Dead vegetation after treatment will have somewhat less visual impact in this regard, as it begins to break down the impact will reduce further.

Early in the following growing season sites that were treated will be evaluated to assess what effect the treatment had, determine what follow-up treatment will be necessary, and monitor the impacts of treatment on other species. In most cases it is assumed that the site will be left for the existing seed-bank to regenerate. If partner organizations have the capacity to assist with vegetation regeneration by introducing appropriate native plants or seeds, this may improve site appearance faster and assist in preventing any new invasive infestations.

Imazapyr is broken down by microbes in the soil and sunlight in water; the half-life of imazapyr is approximately 3 to 5 days in surface water. Field study observations are consistent with imazapyr's intrinsic ability to persist in soils and move via runoff to surface water and leach to groundwater.

Degradation and Metabolism of Imazapyr (from EPA Environmental Fate of Imazapyr & Imazapyr Transformation Products)

Study MRID	Study Type	System	Imazapyr half-life
00132359	Hydrolysis (161-1)	pH 5, 7 and 9 at 25°	Stable
00131617	Photolysis in water (161-2)	pH 5 and 9 at 25° (12 hour exposure cycle)	2.5-5.3 days
41023201	Aerobic Soil Metabolism (162-1)	Loamy sand soil	Stable
45119701	Aerobic Soil Metabolism (162-1) (supplemental)	Loamy sand soil	(~5.9 years) >296 days
00131619	Anaerobic Soil Metabolism (162-2)	Loamy sand soil	Stable (>60 day)
40003712	Anaerobic Aquatic Metabolism (162-3)	Total system	>120 days
41002301	Aerobic Aquatic Metabolism (162-4)	Total system	>120 days
45119702	Aerobic Aquatic Metabolism (162-4) – Degradate metabolism	Total system (CL 119060 metabolism) (CL 9140 metabolism)	 4.9 days 3.6 days
42192101	Terrestrial field dissipation (164-1)	Bare ground / Silt loam soil Hillsboro, Oregon	143 days
42192102	Terrestrial field dissipation (164-1)	Bare ground / sandy loam soil Janesville, North Carolina	64 days
40003714	Forestry Dissipation (164-3)	Aerial application, residues measured	12-40 days (vegetation) 37-44 days (litter)

4.2 Biological (including impacts to threatened/endangered resources)

Because imazapyr is a non-selective herbicide and may therefore harm non-target plants exposed via drift, all applicators will be required to follow use restrictions to help minimize spray drift. Where established *Phragmites* clones are growing, few other native plants are able to compete and grow. There may be populations of other invasive plants such as non-native cattail (*T. angustifolia & T. Glauca*) that intermix with *Phragmites*. Negative impacts to rare plants will be minimal and spot treatments will be done in those areas where the native vegetation is still well represented. By controlling these pioneering populations early, there is likely to be far less impact on native plants in the long-term as fewer are displaced by expansion of *Phragmites* into their habitat. Controlling smaller populations is also likely to result in less chemical use than attempting to treat larger, more established infestations, further decreasing non-target effects.

Negative impacts to shorebirds, marshbirds and colonial water birds as a result of spraying are very minor for several reasons: 1) spraying will commence following the nesting season, 2) spraying will improve marshbird and waterfowl habitat as *Phragmites* is diminished. The EPA's RED paper for Imazapyr lists that "The Agency has determined that there are no risks of concern to terrestrial birds, mammals and bees, or to aquatic invertebrates and fish. For terrestrial organisms, available acute and chronic toxicity data indicate that imazapyr acid and salt are practically non-toxic to birds, mammals and honeybees."

A range of endangered or threatened species inhabit the counties covered by this project. An ESA Section 7 form has been completed with guidance from DNR staff for submission. It finds that there will be "*no effect*" to critical habitats identified by the FWS in the project area and that the proposed project "*May Affect, but is Not Likely to Adversely Affect*" Canada lynx, Kirtland's warbler, Whooping crane, Snuffbox, Karner blue butterfly, Fassett's locoweed, Poweshiek skipperling, Eastern prairie fringed orchid, Higgins eye pearly mussel, Sheepnose, Mead's milkweed, Prairie bush-clover, Piping Plover – the species located in the counties covered by this project.

4.3 Cultural

4.3.1 Land Use (including indirect and secondary impacts)

There will be a return of native plant and animal wetland communities along with associated species after *Phragmites*

populations are reduced. Preventing expansion of this plant into sensitive wetlands and lakes will safeguard access for users engaged in a range of activities from boating to bird-watching.

Indirect effects are more difficult to assess because of the many complex effects (positive and negative) that may occur due to pesticide application. For example, herbicide applications that result in substantial decreases in aquatic primary production or plant cover could have indirect effects on listed species habitat or food availability. Conversely, if mostly exotic invasive species are eliminated by the herbicide application, native plants may be able to colonize the area and thrive, improving or extending habitat and food for non-target species including certain listed species of concern.

Several factors will determine the extent to which harmful indirect effects might be an issue for aquatic and aquatic-dependent listed species for each of the various pesticide use patterns. These factors include:

- Properties of the active ingredient (AI) of the herbicide that are non-persistent, have non-toxic degradation products, and are hydrophilic (mix easy with water) are less likely to cause indirect effects on non-target species.
- Species habitat and life history characteristics: those species that are less mobile, spend most or all of their time in a small area or single habitat type, or have longer generation times could be relatively more at risk due to indirect effects. In addition, those listed species that have a very limited population size and/or very limited spatial distribution, could be potentially at greater risk due to herbicide application in, on or near the water because the population is likely to have less resilience to disturbances caused by indirect effects of herbicides (e.g. loss of habitat, cover or prey).
- Ecosystem characteristics: listed species inhabiting aquatic ecosystems that are more spatially isolated (e.g. springs), structurally simpler (e.g. fewer species or functional redundancies naturally), or otherwise less resilient to disturbances in general, might be more susceptible to indirect effects if they are exposed to herbicides used in, on or near the water.

Certain types of listed species may be more or less susceptible to the above factors depending on the pesticide use pattern and the active ingredient in the herbicide. No one pesticide use pattern appears to have less potential effects overall on non-target species. Rather, the type of active ingredient in the herbicide used (i.e. its mode of action), or the combination of active ingredient in the herbicide, and use pattern, may be more important in determining the degree of potential direct and indirect effects on aquatic and aquatic-dependent listed species.

4.3.2 Social/Economic (including ethnic and cultural groups, and zoning if applicable)

Homeowners/landowners will not have their property impacted by *Phragmites* and will have greater use and enjoyment of their shorelines or wetland areas. In State Natural Areas, a wider diversity of plant species will be visible to visitor and negative impacts to activities such as wildlife watching will be reduced.

4.3.2.1 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that the effects on minority and low-income populations within a project area be given special consideration to determine if the proposed action would result in disproportionate adverse effects to their communities. Minority populations include all persons identified by the U.S. Census of Population and Housing to be of Hispanic origin, regardless of race, and all persons not of Hispanic origin other than White (i.e., Black, American Indian, Eskimo or Aleut, Asian or Pacific Islander, or other race).

After utilizing the EPA's "EJView" (Environmental Justice Viewer) and comparing demographic information there to the existing *Phragmites* distribution map being produced by this project, it would not appear that *Phragmites* control treatments show an overall trend in occurring in specific demographic areas. Treatment areas for this project will occur in or near communities with low, middle and high income residents. Treatment areas could occur in minority dominated as well as non-minority communities. In addition, the type of herbicide used and method of application planned by this project is not likely to cause adverse environmental effects that could negatively affect any communities.

As described in the Proposed Physical Changes section of this document under "Emissions and Discharges", health risks and long-term effects on visitors or users of the treatment areas would not be significant. As imazapyr does not bio-accumulate, there would be no significant impacts to low-income or minority fishermen in places where treatment areas were adjacent to waters. Therefore, no disproportionate impacts to minority or low-income populations would result from implementing the control actions as planned by this project.

4.3.2.2 Economics

In the United States, expenses associated with ecological damage and control of invasive species is estimated at $137 billion per year and increasing. In Wisconsin, some industries affected negatively by invasive species include sport and commercial fishing, forestry, hunting, and raw water users (power companies and utilities). These expenses are passed on to Wisconsin's consumers (for example, in the form of higher water and electric bills).

Phragmites stands have aggressively taken over areas of lakebeds, wetlands, and roadside ditches and if left alone, it will eventually outcompete and displace the native plant community and its associated animal species. In areas of Wisconsin that are heavily dependent on tourism, having an infestation of phragmites along lake shorelines can impact visitor enjoyment and may affect tourism. Control of *Phragmites* can range from $70 an acre if applied by air to over $500 an acre for a selective ground application.

4.3.2.3 Ecology

Humans have created conditions where plants and animals can aggressively invade and dominate natural areas and waterways in three ways:

1. Introducing exotic species (from other regions or countries) who lack natural competitors and predators to keep them in check.
2. Disrupting the delicate balance of native ecosystems by changing environmental conditions (e.g. stream sedimentation, ditching, building roads) or by restricting or eliminating natural processes (e.g. fire). In such instances, even some native plants and animals can become invasive.
3. Spreading invasive species through various methods (e.g. moving watercraft from waterbody to waterbody without removing invasive plants and animals, roadside mowing, and moving firewood).

The net result is a loss of diversity of our native plants and animals; as invasive species rapidly multiply and take over. About 42% of the species on the Federal Threatened or Endangered species lists are at risk primarily because of invasive species.

4.3.2.4 Recreation

Hunters, hikers and birdwatchers are finding that they can no longer walk in their favorite natural areas. Boaters and swimmers may find it difficult to access open water from the shoreline. As the habitat is modified by such invasive plant species, the wildlife that depends on it disappears as well.

Fishing and hunting outings can result in disappointment as invasive species modify our lake and stream habitats. *Phragmites australis* has overtaken vast areas of lakebed and wetlands in eastern Wisconsin, often producing areas with little diversity other than non-native cattails, another invasive species. This can impact visitor's enjoyment of our state's natural areas, having negative impacts on tourism – an important revenue generator for the state.

4.3.3 Archaeological/Historical

There is limited potential for project-associated activities which might cause adverse effects to recorded archaeological or historic sites which might be co-incident with the invasive plant treatment areas. Little to no disturbance to the soil is expected, however the use of motorized vehicles in some areas may lead to very minor soil or vegetation disturbance. It is likely the majority of sites will be treated by hand spraying – either using a backpack sprayer or attachment to vehicle on the roadside, therefore, it seems prudent to limit the cultural resource review to those limited areas which require vehicle access for spray application when they are identified (should there be any). *At the time such specific parcels are delineated, a USGS map of same along with T/R/S info will be provided to Mark J Dudzik, Department Archaeologist, to be able to quickly determine if there are potential conflicts with reported sites.*

4.4 Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

Due to the scope of this project, there is the potential for treatment of *Phragmites* in State Natural Areas or other important habitats. However, the habitat quality of the State Natural Areas, Wildlife Areas, Parks and important wetland communities should benefit by removal of *Phragmites* since it will benefit wetland associated species that would otherwise be crowded out and eliminated by *Phragmites*.

Private Lands, below OHWM (Ordinary High Water Mark)

Under Wisconsin's Constitution, lakes and rivers belong to everybody and the DNR manages them for the benefit of

all citizens. The state Supreme Court has rules that the state owns title to lakebeds (not streambeds or flowed lands), and that the ordinary high water mark, (OHWM) establishes the boundary between public lakebed and private land.

Local Access: Regardless of bed ownership, the general public must follow the law to legally gain access to public waters. Adjacent property owners have exclusive use of dry or exposed lakebed below the OHWM. Such areas may be posted, but not fenced. If private land surrounds a land-locked lake, the general public must obtain the landowner's permission to enter. The general public must gain access to a public stream or river or connected lake via a public access such as a public boat landing or a public highway that crosses the river or stream. Someone hunting or fishing on a lake or stream must keep their feet wet unless portaging a physical obstruction by the shortest possible route.

4.5 Summary of Adverse Impacts That Cannot Be Avoided

Adverse impacts that cannot be avoided are the killing of associated non-target wetland plants. The herbicide being used is non-selective and will impact all vegetation it comes in contact with. Personnel using a backpack sprayer can be very selective when spraying *Phragmites,* which can mitigate some of these adverse impacts. Trained applicators paying careful attention to weather conditions and ensuring equipment is functioning correctly will limit chemical drift and impacts to non-target vegetation.

Potential effects of the AI (active ingredient) on biota are evident, not all AI's in a given pesticide will have equivalent potential effects on a particular class of species or on one of the listed species of concern. In general, herbicides are much more toxic to aquatic plants and algae than aquatic or aquatic-dependent animals, while insecticides, molluscicides, and piscicides are more toxic to aquatic animals than plants as expected. Biological pesticides such as *Bacillus spp.* or the gypsy moth pheromone, disparlure, appear to have no effect on biota and aquatic or aquatic-dependent listed species in particular. For most of the AIs examined, direct effects on aquatic and aquatic-dependent birds and mammals are not expected.

Certain types of listed species may be more or less susceptible to the above factors depending on the pesticide use pattern and the active ingredient in the herbicide used. The type of AI (i.e. its mode of action) and the combination of AI and use pattern are more important in determining the degree of potential direct and indirect effects on aquatic and aquatic-dependent listed species.

5. DNR EVALUATION OF PROJECT SIGNIFICANCE

5.1 Environmental Effects and Their Significance

Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are long-term or short-term.

Physical effects of the project in the short term include the sight of tall stands of dead phragmites, with the potential for other dead non-target vegetation. This should be a short-term effect, as observations of other sprayed areas have shown that species present in the area will recover and fill gaps left behind by the *Phragmites* within 2-3 years of treatment.

The effects of treatment on habitat quality, species diversity and recreational access should be long term as we will be working with local partners wherever possible to develop capacity for follow up treatment. The scope of this project being to target pioneer populations will have long term effects on the wider landscape by removing those small populations that if ignored, over time, would spread and dominate far more acres.

Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are effects on geographically scarce resources (e.g. historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered resources or ecologically sensitive areas).

The treatment of newly established populations of *Phragmites* in or near areas that have been evaluated as high quality wetlands will maintain or improve the species diversity of these ecologically sensitive and in some cases, ecologically rare, habitats.

Some of these areas are likely to be found in or near scenic or recreational areas such as State Natural Areas,

areas considered to be 'Wetland Gems' or other areas used by the public to access water/wetlands for recreational purposes. In these cases, the primary environmental effect of eradicating *Phragmites* should provide a long-term benefit to recreational users by removing visual and in some cases, physical, barriers to wetlands.

Discuss the extent to which the primary and secondary environmental effects listed in the environmental consequences section are reversible.

If no future work is done to identify and control new infestations, *Phragmites* could re-establish in the long-term and eliminate associated plants and animals, including rare species. Prevention, early detection and rapid removal of new invasive plants or new infestations are the most cost effective ways to control invasives such as *Phragmites*. This project should provide scope to educate local partners about how to monitor and report newly establishing populations of invasive species, and promote local involvement in control to avoid re-infestation.

Secondary effects of this project that include negative effects on non-target vegetation are expected to be reversible. The best management practices to be followed during treatment will mitigate negative effects to a point where existing vegetation should be able to recover and fill in gaps left in the vegetation layer. There may be areas where it is decided the best option is to assist this re-vegetation by seeding, plantings, etc. which will aid in reversing any negative effects and contribute to the long term goal of maintaining diverse wetland communities.

5.2 Significance of Cumulative Effects

Discuss the significance of reasonably anticipated cumulative effects on the environment (and energy usage, if applicable). Consider cumulative effects from repeated projects of the same type. Would the cumulative effects be more severe or substantially change the quality of the environment? Include other activities planned or proposed in the area that would compound effects on the environment.

Imazapyr has a longer half-life in the soil than other herbicides such as glyphosate, which is what makes it more effective in the long-term control of plants such as *Phragmites*. The areas to be treated will be specific and marked out, and most likely to be treated by certified applicators using backpack sprayers. This provides a high level of accuracy in treatment and lowers the likelihood of non-target vegetation being sprayed. By using a more effective herbicide in the initial treatment, it lowers the chance of needing multiple follow up treatments and lowers the cumulative effect of the herbicide.

The effects of repeated projects in the same area of the same type would be to increase the chance of non-target vegetation being adversely affected. Efforts to monitor each area treated and adjust follow up treatments as necessary for the scale of remaining plants will be done to prevent excess herbicides being used. For example, after the initial treatment with a backpack sprayer, a second year of treatment may only have a few standing plants, which would be better treated by hand wicking – a more accurate method of treatment that causes less non-target vegetation to be exposed to herbicide.

Wetland and riparian habitats have been and will continue to be affected by numerous activities such as urban development, agriculture, and right of way management. These activities can have impacts with regards to removal of native vegetation, draining of wetlands or alterations to hydrology, sediment and nutrient contribution, and new vectors for invasions of invasive species. New invasive plants might be brought into these wetland areas as a result of these land-use activities, which might require follow up herbicide treatments. The DNR has developed a list of Best Management Practices (BMPS) to prevent the spread of invasive species in wetlands, to accompany those already developed for right of way managers, forestry operations, and recreation. Promoting these BMPS to wetland users and other associated groups may reduce the chance of new infestations.

5.3 Significance of Risk

Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analysis would eliminate or reduce these unknowns?

The DNR and other partner organizations have used chemical spraying as a method for controlling *Phragmites* for several years and have participated in research that studied the impacts of spraying. This research found that native species are in the seed bank and germinate following an herbicide application and removal of *Phragmites*.

Regeneration occurs over the next several growing seasons. Follow up to treated sites and a pro-active management plan will be essential to keep populations in check and prevent infestation.

If other invasive plants such as non-native cattails, purple loosestrife or reed canary grass are present, it may be possible that treatment of *Phragmites* will provide a window for these other species to move into the treated area. Sites should be assessed for these secondary infestation risks. It may mean that leaving regeneration of native vegetation to the natural seed bank may not be sufficient, and other actions may be necessary.

Long-term management of private lands beyond the timeline of this project is unknown. Long-term, pro-active management will be needed from land managers and property owners to maintain treated areas and prevent further re-infestation. Attempts to build capacity for upkeep within the initial stages of this project may make this follow up management more achievable.

Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.

Within the scope of this project, reasonably anticipated operating problems include those associated with the transport, mixing and use of chemicals, in this case, herbicides. Spray drift has been identified as an anticipated operating problem. Efforts to reduce spray drift include: ensuring the correct size of droplets, working only under ideal weather conditions, having accurate GPS locations of infestations and ensuring equipment is in good repair.

The proposed action does not create a new threat to listed species nor does it change, in any way, other existing threats to these species. Rather, the proposed action is intended to reduce impacts on listed species through a variety of mechanisms. Current requirements that are required regarding application of pesticides (which include herbicides such as imazapyr) include:

- The FIFRA label is followed in its entirety for the pesticide in terms of application rates, methods, frequency of application, and by any other requirements noted in the label (e.g. required offsets, allowable habitats).
- Pesticide is applied by trained, certified applicators familiar with the equipment and pesticide properties (e.g. drift potential).
- Use of only the lowest effective amount of pesticide product per application at the optimum frequency of application necessary to control the target pest.
- Performance of regular maintenance activities to minimize the potential for leaks, spills and unintended/accidental release of pesticides from pesticide containers into waters of the U.S.
- Maintenance of application equipment including regular calibration, cleaning and repair to ensure correct application as required in the pesticides label.
- Integrated Pest Management (IPM) practices, which include assessment of alternatives to pesticide use; identification of action thresholds; development of species-specific control strategies; source reduction; pre-application surveillance to determine whether pesticide use is necessary; post-application surveillance; and the minimization of environmental impacts.

5.4 Significance of Precedent

Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Describe any conflicts the proposal has with plans or policy of local, state or federal agencies. Explain the significance of each.

The project should not influence future decisions or foreclose options on habitat management of wetland.

5.5 Significance of Controversy over Environmental Effects

Discuss the effects on the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.

The control of *Phragmites* with the use of herbicides in other parts of the Lake Michigan basin has been well supported by the public and private landowners.

Herbicide use can be controversial. Imazapyr is registered for this use and will be applied by certified applicators observing all safety measures required. Imazapyr is also registered for use on a variety of commercial and residential use sites, including forestry sites, rights-of-ways, fencerows, hedgerows, drainage systems, outdoor industrial areas, outdoor buildings and structures, domestic dwellings, paved areas, driveways, patios, parking areas, walkways, various water bodies (including ponds, lakes, streams, swamps, wetlands, stagnant water) and urban areas.

The EPA's Registration Eligibility Decision for Imazapyr contains an ecological risk assessment for imazapyr. The Agency has determined there are no risks of concern to terrestrial birds, mammals and bees, or to aquatic invertebrates and fish. For terrestrial organisms, available acute and chronic toxicity data indicate that imazapyr acid and salt are practically non-toxic to birds, mammals and honeybees. Acute risks to both mammals and birds were not calculated because LC50/LD50 (Median Lethal Concentration/Median Lethal Dose) values were greater than highest concentration tested.

The non-native invasive strain of *Phragmites* has few documented beneficial environmental effects and the negative impacts to biological diversity, land/water access and changes to hydrology are considered to be greater than any beneficial socio-economic effects, particularly when it is growing in wetlands or other important habitats.

6. ALTERNATIVES

Briefly describe the impacts of no action and of alternatives that would decrease or eliminate adverse environmental effects. (Refer to any appropriate alternatives from the applicant or anyone else.)

6.1 No Action

Taking no action would result in the continued expansion of *Phragmites* into new wetland habitats and lake edges. This would, in turn, result in further decreases or elimination of native wetland plants, a decrease in wildlife usage, and less biological diversity in Wisconsin's State Natural Areas and wetland communities.

6.2 Other Control Options

a) Manual Removal
Manual removal of *Phragmites* is very difficult and in most cases has not been shown to be effective. Removal of the growing plants by cutting or mowing has not been shown to be effective as it does not impact the roots of the plant, but can in some cases stimulate growth and stem density.

Removal of *Phragmites* by digging or pulling is ineffective due to its extensive root system. Attempting to remove plants by rototilling or disking the ground may contribute to the rapid spread of the plant as it can propagate through spread of root fragments.

b) Biological Control
There is no known biological control for *Phragmites australis* at this time.

Biological control refers to the use of animals, fungi or diseases to control invasive populations. Control organisms usually come from the native range of the target species. They require a period of study to ensure that they will remain specific to the target population and will not harm native species, crops or other ornamental species. They require both federal and state permits for their use. Biological control typically does not eradicate the invasive species, and usually takes several years to show results.

c) Grazing
Animals can also be used as biological control agents. For effective control, grazing may need to be used multiple consecutive years, generally during the early growth to early flowering stages of the plant, and sometimes with multiple treatments per year. This practice is best used as part of an integrated pest management plan including manual, mechanical or chemical controls. Care needs to be taken when using grazers since they can eat desirable plants as well as invasive plants. Livestock welfare

considerations also need to be taken into consideration when using grazers.

With regards to using grazing as control for *Phragmites* – it is generally not considered to be as effective as other methods since grazing does not directly impact the root systems. As with cutting/mowing, grazing at the wrong time of year can increase plant vigor and stem density. There are also concerns with bringing grazers onto a wetland site with regards to changes in nutrient cycling, impact on native plants, physical disturbance to the soil and safety of the livestock. It is therefore not considered appropriate for the scope of this project.

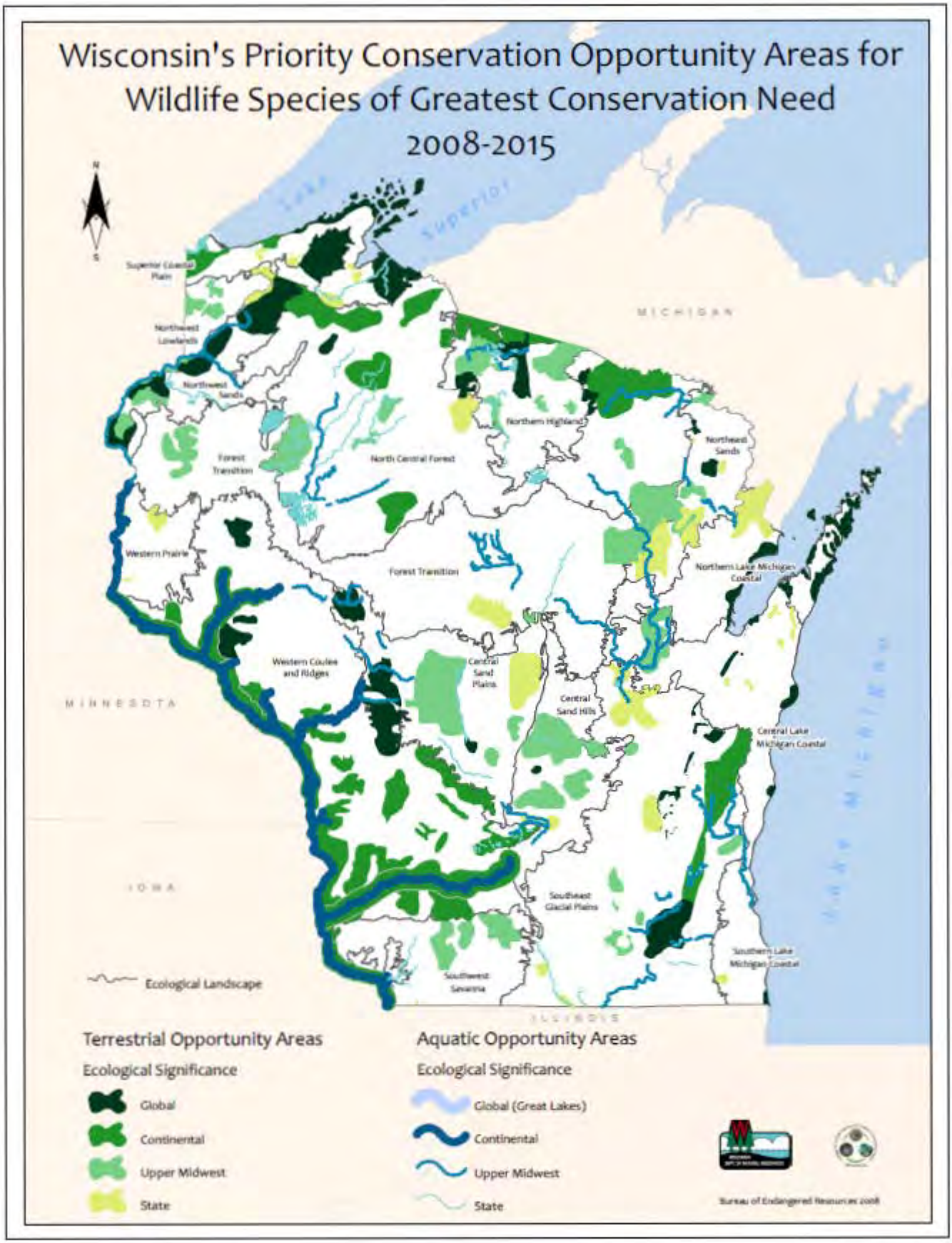
d) Water Depth Manipulation
Although not considered an effective stand-alone treatment of *Phragmites*, flooding cut or burned stands of the plant can be used as part of a multiple-approach project to controlling this invasive plant. However, most areas that are likely to be treated will not have the structures needed to control water levels.

7. Consultation and Coordination

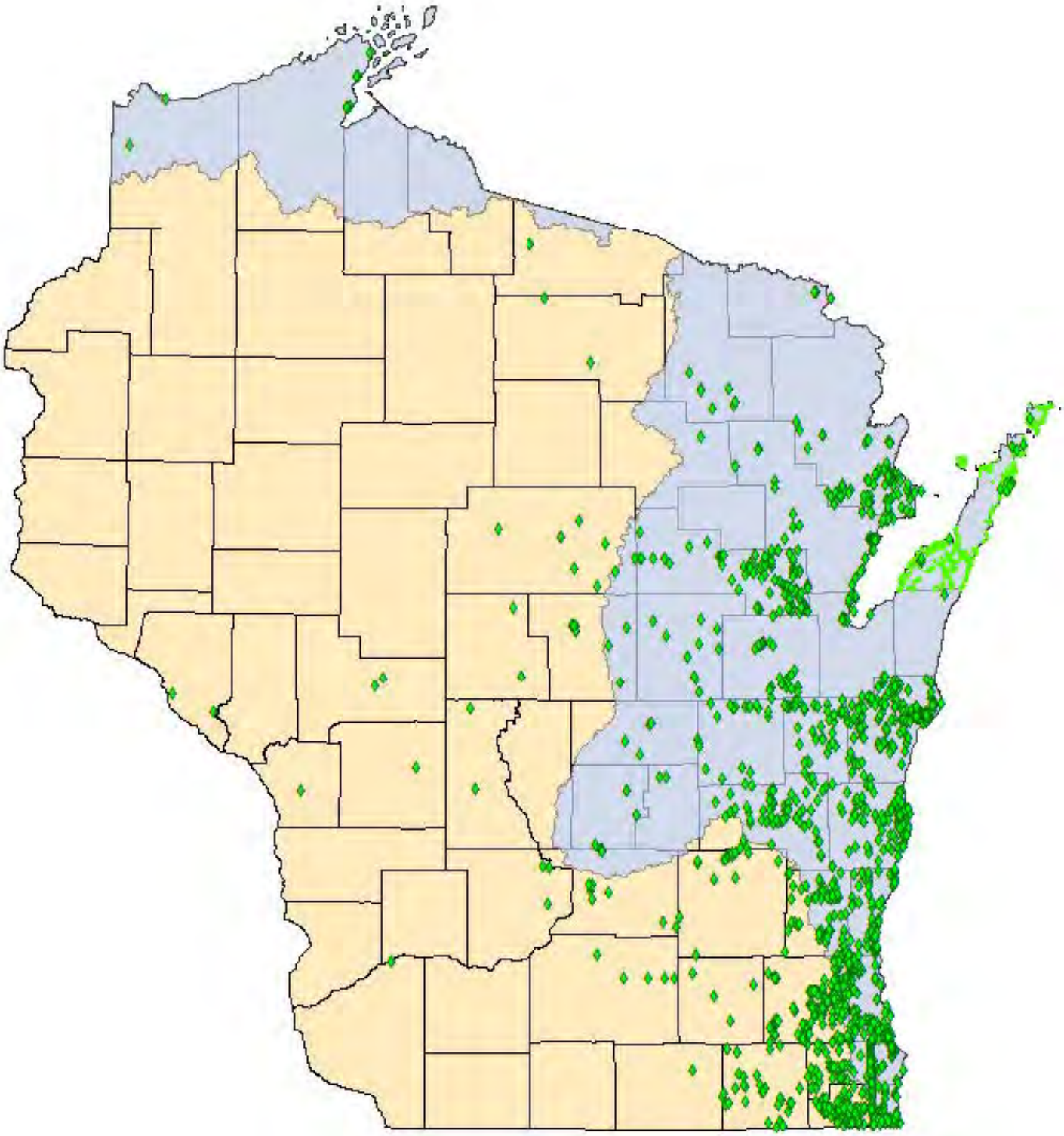
List agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed).

Date	Contact	Comment Summary
ongoing	Brock Woods, WI purple loosestrife biocontrol program manager	Has provided information on habitat assessments, distribution of *Phragmites* and experience working with a range of partner organizations on large-scale control project.
ongoing	Joe Henry, Ecologist	Northeast Region Ecologist. Has provided information and experience with working on a large-scale *phragmites* control project.
ongoing	Mary Gansberg, Water Resources Management Specialist	Providing information and insight into working on large-scale *phragmites* control project.
ongoing	Patricia Trochlell, Water Resources Management Specialist	Providing ongoing information on wetland habitats, rare species, and ecological effects of both *phragmites* and the control of *phragmites* in a wetland habitat.
ongoing	Tom Bernthal, Water Resources Management Specialist	Providing ongoing information on wetland habitats, monitoring programs, and evaluation of data on populations.
ongoing	Jill Hapner, Executive Director of SE WI Invasive Species Consortium (SEWISC)	Executive Director of a large Community Weed Management Area that is involved with its own wetland invasive control project. Provided information on working with partner organizations, roadside survey work, and control options.
ongoing	Tom Ward, Aquatic invasive species coordinator	Provided information on species distribution, project options and site selection protocol.
ongoing	Bob Wakeman, Water Resources Management Specialist	Statewide Aquatic Invasive Species Coordinator, wrote the accepted grant DNR received from USFWS; ongoing lead on project coordination.
ongoing	Stacy Schumacher, Water Resources Management Specialist	Providing data support for project through GIS mapping of *phragmites* reports and landscape features.

Map 1. Great Lakes Basin in Wisconsin with priority counties:
Priority 1 are outlined in red, Priority 2 are outlined in orange.
As funds allow, treatments will continue towards dashed line.



Map 2. Conservation Opportunity Areas (COA's) within Ecological Landscapes



Map 3. Point locations of invasive *Phragmites australis* locations reported as of Feb 15, 2014.
Points are location only and do not indicate area of plant coverage.
Map does not show areas that may have been controlled since report.

REGION 3 WSFR SECTION 7 EVALUATION DOCUMENTATION

PHASE 1: COMPLETED BY GRANTEE
(See Phase 1 Instructions for Completion)

State:WI_____**Grantee: WI DNR**_____ **Grant Program(s): GLRI**_____

Grant Title and Number (add amendment no): _ GLRI – ANS Management Plan Implementation F13AS00109_____

I. Location:

A. List counties where grant activities will occur.

Counties on the western edge of the Lake Michigan Basin:

Priority 1 counties: Vilas, Oneida, Forest, Langlade: Within these counties, all mapped and identified populations of non-native *Phragmites* will be treated, provided landowner permissions can be obtained.

Priority 2 counties: Marathon, Shawano, Portage, Waupaca, Adams, Waushara, Marquette, Green Lake, Columbia: Within these counties, the project is going to focus on areas of newly establishing populations of non-native *Phragmites* and may take place in areas such as wetlands, lakeshores, rights-of-way, State Natural Areas, parks and adjoining private lands. Other criteria such as the availability of partner organizations, landowner permissions, prior work done, and the existence of rare species that need protection from phragmites expansion will guide site selection.

Priority 3 counties: Florence, Marinette, Menominee, Oconto, Shawano, Outagamie, Winnebago, Fond du Lac: Within these counties there will be an effort to find and treat early establishing or isolated populations, particularly those found near important wetlands or lakes, in the western parts of these counties.

B. Describe the action area (see instructions).

This project plans to treat the invasive non-native strain of *Phragmites australis* (phragmites) where it occurs in the counties of the western edge of the Lake Michigan basin. Many of these populations are small (< 1 acre) and dispersed through a wide area. A complete list of sites is still being developed and will be finalized prior to applying for permits to treat identified populations. At the moment all populations identified exist either on lakeshores, the edges of wetlands, or in the ditches of roads. Action areas will include both the area to be treated and the immediate adjacent area. No aerial spraying of phragmites is planned with this project and ground staff will be trained and certified applicators following guidance to prevent chemical drift.

II. Species/Critical Habitat:

A. Species information

1. Using the FWS web site (http://www.fws.gov/midwest/Endangered/), list species that are/or may be present in the county(ies):

   Vilas: Canada lynx, Northern long-eared bat (proposed), Kirtland's warbler
   Oneida: Canada lynx, Northern long-eared bat (proposed)
   Forest: Canada lynx, Northern long-eared bat (proposed)
   Langlade: Northern long-eared bat (proposed)
   Marathon: Northern long-eared bat (proposed), Whooping crane
   Shawano: Northern long-eared bat (proposed), Whooping crane, Snuffbox, Karner blue butterfly
   Portage: Northern long-eared bat (proposed), Karner blue butterfly, Fassett's locoweed
   Waupaca: Northern long-eared bat (proposed), Snuffbox, Karner blue butterfly
   Adams: Northern long-eared bat (proposed), Kirtland's warbler, Whooping crane, Karner blue butterfly
   Waushara: Northern long-eared bat (proposed), Whooping crane, Snuffbox, Karner blue butterfly, Fassett's locoweed
   Marquette: Northern long-eared bat (proposed), Whooping crane, Karner blue butterfly
   Green Lake: Northern long-eared bat (proposed), Whooping crane, Karner blue butterfly, Poweshiek skipperling, Eastern prairie fringed orchid
   Columbia: Northern long-eared bat (proposed), Whooping crane, Higgins eye pearly mussel, Sheepnose, Mead's milkweed, Prairie bush-clover
   Dodge: Northern long-eared bat (proposed), Whooping crane
   Florence: Canada lynx, Northern long-eared bat (proposed)
   Fond du Lac: Northern long-eared bat (proposed), Whooping crane
   Marinette: Canada lynx, Northern long-eared bat (proposed), Kirtland's warbler, Piping plover
   Menominee: Northern long-eared bat (proposed), Karner blue butterfly
   Oconto: Northern long-eared bat (proposed), Whooping crane, Karner blue butterfly
   Outagamie: Northern long-eared bat (proposed), Snuffbox
   Winnebago: Northern long-eared bat (proposed), Whooping crane, Eastern prairie fringed orchid

2. List species, from "1." above, that are not in the action area, and explain why:

B. Using the FWS web site, identify whether federally designated or proposed critical habitat is present within the action area: Piping Plover (Marinette County)

*Note: If II.A and II.B above have no species or critical habitat, skip sections III and IV and go to V.

III. Description of Proposed Action: In the space provided or on an attached sheet, describe the action(s) in sufficient detail so that the potential effects of the action can be identified and fully evaluated.

Areas of non-native phragmites that have been identified and verified will be treated with herbicide in late summer/early autumn 2014 when the plant begins to translocate energy down to its rhizomes. This will be after the bird nesting season and is generally recognized as the most effective time to treat phragmites with herbicides. 28.7% Isopropylamine salt of imazapyr is standard for aquatic approved herbicides such as Habitat® or Arsenal®. Herbicides will be applied by certified applicators. Applications will be made by ground staff, will be site specific after assessing the site needs, size and distribution of the invasive *Phragmites* population and existence/proximity of any important native species. Methods used will include spraying with backpack-sprayers, from ATVs, or machines mounted with boom sprayers. The bundle-cut-treatment of stems or hand-wicking/swiping of herbicide may also be used, particularly in areas with sensitive native vegetation.

There may be areas where cutting, rolling, or burning standing dead phragmites stems may be necessary or beneficial to treatment with herbicides. This will need to be assessed and done on a site by site basis depending on ground conditions, accessibility, and existing ground vegetation. This activity would occur outside the bird nesting season (ideally in very late autumn 2014 or over winter 2014/2015).

Follow up treatment is planned for the late summer/early autumn 2015. Sites will be assessed in spring/summer 2015 when phragmites begins growing again to assess the success of herbicide treatment and need for follow up. Based on treatments elsewhere in the state, a >80% kill rate is expected and most follow up actions will be done by spot spraying with hand/backpack sprayers or with hand-swiping of herbicide, both highly specific treatments with low risk of damage to surrounding vegetation.

Treatments are most likely to occur along shorelines of inland lakes, in or along the ditches of roads, or in wetlands. Phragmites does not tend to grow in upland environments or under a forest canopy, so it would be unlikely that sites would be found in these habitats. This project is not excluding the possibility that small or sparse populations might be found in these areas.

IV. Description of Effects: In the space provided or on an attached sheet, describe the effects, including beneficial, of the project actions on the identified species, species habitats and federal critical habitat (see II above).

Because imazapyr is a non-selective herbicide and may therefore harm non-target plants exposed via drift, all applicators will be required to follow use restrictions to help minimize spray drift. Where established *Phragmites* clones are growing, few other native plants are able to compete and grow. There may be populations of other invasive plants such as non-native cattail (*T. angustifolia & T. Glauca*) that intermix with *Phragmites*. Negative impacts to rare plants such as eastern/western prairie fringed orchid, Mead's milkweed, Fassett's locoweed, and prairie bush clover will be minimal. Spot treatments will be done in those areas where the native vegetation is still well represented. By controlling these pioneering *Phragmites* populations early, there will be a positive impact on rare species present as there will be far less impact on native plants in the long-term as fewer are displaced by expansion of *Phragmites* into their habitat. Controlling smaller populations is also likely to result in less chemical use than attempting to treat larger, more established infestations, further decreasing non-target effects.

For mobile species such as lynx, crane, or Kirtland's warbler, there should be no adverse effects as a result of treatment (*see EPA information below as well*). Patches of phragmites to be treated tend to be small and surrounded by other suitable habitat, where species could move if necessary. None of the listed species use reed beds as a primary habitat or food source. For the Piping plover which is listed in Marinette county, there will be no adverse effects as this project will not extend to the Lake Michigan shoreline, but is restricted to early establishing populations in the northwest part of the county.

The EPA's RED paper for Imazapyr lists that "The Agency has determined that there are no risks of concern to terrestrial birds, mammals and bees, or to aquatic invertebrates and fish. For terrestrial organisms, available acute and chronic toxicity data indicate that imazapyr acid and salt are practically non-toxic to birds, mammals and honeybees." Assessing the impacts to butterflies by using bees as a surrogate for all terrestrial insects suggests that imazapyr is 'practically non-toxic'. The treatment actions will take place outside the flying season for the Poweshiek skipperling, and phragmites is not a host plant for this species. The Karner blue butterfly is very unlikely to overlap with action areas as its habitat requirements tend to fall into drier upland sites where phragmites is unlikely to be found. It also does not use phragmites as a host plant.

V. Recommended Determination(s) of Effect(s): For all species and critical habitat identified in the action area, mark (X) the appropriate determinations.

A. Listed, Proposed and Candidate Species

___ *a) "No Effect"*
List species for which this recommendation is applicable (or attach list): _____
_____

_x__ b) *"May Affect, but is Not Likely to Adversely Affect"*
List species for which this recommendation is applicable (or attach list):
Canada lynx, Kirtland's warbler, Whooping crane, Snuffbox, Karner blue butterfly, Fassett's locoweed, Poweshiek skipperling, Eastern prairie fringed orchid, Higgins eye pearly mussel, Sheepnose, Mead's milkweed, Prairie bush-clover, Piping Plover
_____

___c) *"May Affect, and is Likely to Adversely Affect"*
List species for which this recommendation is applicable (or attach list):
_____

B. Federal Designated and Proposed Critical Habitat

_x__ *a) "No Effect"* to Critical Habitat
List critical habitat(s) for which the recommendation is applicable. _____
_____Piping Plover_____

___ b) *"May Affect, but is not likely to Adversely Affect"*
List critical habitat(s) for which the recommendation is applied. _____
_____

___c) *"May Affect, and is Likely to Adversely Affect"*
List critical habitat(s) for which the recommendation is applied. _____
_____

Grantee Signatures:

Prepared by:
Name/Title: Stacy Schumacher, Water Resources Management Specialist

Signature: Stacy Schumacher Date: _02/17/2014___
Telephone No. 608-264-8955_____ email: stacy.schumacher@wi.gov _____

Reviewed by:
Name/Title: __Rori Paloski/Conservation Biologist_____

Signature: Rori A. Paloski Date: _2/14/2014___
Telephone No. _608-264-6040_____ email: _rori.paloski@wi.gov_____

O:/Forms/Phase1Sec7090217.doc

Project Name: Removal of newly establishing populations of invasive, non-native Phragmites australis from western Lake Michigan basin County: Western counties of the Lake Michigan basin

PRELIMINARY DECISION

In accordance with s. 1.11, Wis. Stats., and Ch. NR 150, Wis. Adm. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code.

The Department has made a preliminary determination that the Environmental Impact Statement process will not be required for this action/project. This recommendation does not represent approval from other DNR sections which may also require a review of the action/project.

Signature of Evaluator	Date Signed
	03/31/2014

FINAL DECISION

The public review process has been completed. The Department received and fully considered 0 responses to the news release or other notice.

Pursuant to s. NR 150.22(2)a., Wis. Adm. Code , the attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action, and therefore the environmental impact statement process is not required prior to final action by the Department.

The Department has determined that it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code. This decision does not represent approval from other DNR sections which may also require a review of the action/project.

Signature of Environmental Analysis Program Staff	Date Signed
	03/31/2014

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

CONTACT: Stacy Schumacher, Water Resources Management Specialist, 608-264-8955, stacy.schumacher@wi.gov

SUBJECT: Plan for removal of nonnative phragmites, an invasive plant, open for comment

MADISON – A plan to treat with an herbicide up to 200 acres of an aggressive invasive plant in Wisconsin's Lake Michigan basin counties to prevent it from spreading to inland lakes and wetlands is available for public comment through March 24.

Department of Natural Resources received $200,000 from the US Fish and Wildlife Service's Great Lakes Restoration Initiative fund to implement the starting in 2014 of a new project within Wisconsin's Lake Michigan basin to find the leading western edge of the phragmites invasion and "push" it back toward Lake Michigan. The plan is patterned after an earlier project on the western shores of Green Bay and parts of Lake Michigan, which showed an average 90 percent reduction in phragmites abundance after treatment. Nonnative phragmites can decrease wildlife habitat and shade out native plant species.

"In many Wisconsin counties, especially in the western Lake Michigan basin, the non-native strain of phragmites is a newly establishing invasive wetland or lakeshore plant," says Stacy Schumacher, a DNR water resources management specialist. "We are hoping we can build on the success of an earlier project to prevent phragmites from getting established and spreading to many of our inland lakes and wetlands and causing problems there."

This project will focus first on eliminating nonnative phragmites in those counties in the far northwestern part of the Lake Michigan basin, then move south and east through the counties along the western edge of the basin, as funding allows. The goal is to treat at least 200 acres of nonnative phragmites, beginning in late summer 2014, with follow-up treatments in 2015.

Appropriate formulas of imazapyr or glyphosate will be applied by certified personnel to prevent the herbicides affecting non-target plants. The herbicides are nontoxic for fish, wildlife and humans. In areas where this treatment method has been used, phragmites populations have decreased by up to 95 percent and allowed native vegetation in the seed bank to recover, Schumacher says.

The proposed DNR action is not anticipated to result in significant adverse environmental effects and DNR has made a preliminary determination that an environmental impact statement will not be required for this action.

Copies of the environmental assessment that led to the DNR's preliminary determination can be found on the internet at: http://dnr.wi.gov/topic/CompAssist/EADocs.html, or obtained from Stacy Schumacher, Water Resources Management Specialist, 608-264-8955, stacy.schumacher@wi.gov.

Public comments, either written or oral, on the environmental assessment are welcome and must be submitted to Stacy Schumacher no later than 4:30 p.m. on March 24, 2014.

-30-