

A Minnesota State Plan for Invasive Species

This public review draft was developed by a workgroup of the Minnesota Invasive Species Advisory Council and revised based upon input gathered at a stakeholder workshop.

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Statement of Endorsement and Support

The participants in the development of the Minnesota Statewide Comprehensive Invasive Species Plan agree that the goals, elements, strategies, and actions outlined in the plan provide a structure that, if supported and advanced through individual or cooperative actions, will further the effective management of invasive species across all lands, waters, and jurisdictions in the state of Minnesota.

Supporting organizations:

[Note: insert list following the October 5, 2009 Minnesota Invasive Species Advisory Council meeting]

Executive Summary

Introduction

Under the leadership of Minnesota Invasive Species Advisory Council (MISAC)—a diverse group with a common interest in battling nonnative invasive species in Minnesota—an ad hoc team developed a draft plan framework to address terrestrial and aquatic invasive species issues in the state.

Minnesota Statutes require the Departments of Agriculture and Natural Resources to establish statewide coordinating programs for invasive species. The statutes also require them to prepare this statewide invasive species management plan to coordinate the aspects of invasive species activities in Minnesota. MISAC has taken lead role to develop this plan which can be implemented by MISAC member organizations and other entities in the state. MISAC is co-chaired by the Minnesota Department of Agriculture (MDA) and Minnesota Department of Natural Resources (DNR) and now has 35 members and representatives.

Purpose and Benefit of a Statewide Plan

The primary purpose of this plan and its addendums is to provide a framework to *coordinate and guide* efforts to prevent the introduction, spread, and control of invasive species populations within the State of Minnesota by state, federal, tribal, and local governments, as well as the private sector.

The benefit of implementing a state plan will be:

"Minimizing the negative impacts caused by invasive species to native plants and animals, natural ecosystems, recreation, tourism, agriculture, businesses, and human health in Minnesota".

Many other invasive species plans exist or are being developed at the national, regional, state, and local levels. This plan is intended to work along with those plans and not replace them.

Plan Development and Review

A workgroup of individuals from MISAC (see appendix B for members) began the development of this plan in 2005. In 2006, MISAC scheduled a workshop of its members and many others from throughout the state who have knowledge in invasive species management or who's organizations members are affected by invasive species to review and comment on the first draft of the plan. The draft plan has since been revised based on input from the workshop participants and others. This second draft [is now/was] available for a public comment period. The aquatic portion of the plan and the appropriate portions of the implementation tables will be submitted to the national Aquatic Nuisance Species Task Force (ANSTF) for approval.

Background, Issues, and Problem Definition

Minnesota's natural resources, industries, agribusiness, recreation, stored products and structures, and human health are threatened or harmed by hundreds of invasive species. Examples, such as the zebra mussel, Eurasian watermilfoil, purple loosestrife, sea lamprey, gypsy moth, Emerald ash borer, and leafy spurge may be relatively well known. These species, along with potential future invasives such as yellow star thistle, hydrilla, and water chestnut could be easily introduced and spread within the state if agencies, organizations, citizens, businesses, and visitors don't take necessary steps to avoid introducing or spreading them.

There are many pathways of introduction and spread of invasive species. Most species introductions are the result of people's actions. Some introductions, such as common carp, European buckthorn, and purple loosestrife, were intentional and caused unexpected harm. But many other introductions are unintentional. Invasive species are often unknowingly carried in or on animals, vehicles, ships, commercial goods, produce, wood, water, and even clothing. Ballast water discharge from ships continues to be a pathway of introduction for aquatic species into the Duluth harbor and other Minnesota ports on Lake Superior.

The general approaches to address the invasive species problem are often similar across the range of species. Because there are many federal, state, local, tribal, and private entities involved in addressing the invasive species problem, using a framework established by this plan for all types of invasive species can aid in addressing the issue cooperatively, and using generally accepted and transparent approaches.

While the approaches are often common among species, there are not sufficient resources, capacity, knowledge, or need to treat all invasive species/situations in a similar manner. For many species there are no tools to manage them once introduced and for others, better management tools are needed. There is a need to prioritize prevention, detection, rapid responses, containment or quarantine, and management actions.

Authorities and Programs

Within the state, there are numerous entities who have programs and regulatory authorities related to invasive species. Some of these may exist under programs or address categories of species with different names: noxious weeds, agricultural pests, plant pests, aquatic invasive species, and aquatic nuisance species. There are also many other entities that manage invasive species although they don't have specific programs or responsibilities (e.g., The Nature Conservancy, Lake Minnetonka Conservation District, and Minneapolis Parks and Recreation). Information is provided about the various authorities, responsibilities of agencies, landowners, and others. In addition, the information in Appendix C describes the responsibilities and activities of many agencies and organizations in the state regarding invasive species.

Elements, Goals, Strategies, Actions

This plan includes four Elements, their Desired Outcomes, Strategies, and Actions that form the framework of the state plan. During plan development, planning terms such as goals and objectives were purposefully avoided because of many varied opinions of their meanings. The first three Elements address separate phases of invasive species responses and the fourth Element addresses coordination at multiple levels.

Element I. Prevention

Desired outcome: Participants will actively seek to prevent the introduction of new invasive species in Minnesota

Element II. Early Detection, Rapid Response, and Containment

Desired Outcome: Participants will work to detect new invasive species infestations and support the infrastructure necessary to rapidly eradicate, or suppress, and contain high priority infestations.

Element III. Management of Invasive Species

Desired Outcome: Participants will work to reduce the impacts caused by established invasive species to Minnesota's ecology, society, and economy.

Element IV. Leadership and Coordination

Desired Outcome: Participants will seek to collaborate with intrastate, interstate, and international partners to help coordinate

Implementation Tables and Participating Entities

The plan will include an addendum database of implementable actions, which were completed by diverse partners interested in the common goal to respond to invasive species. It is expected that implementable actions will be dynamic and may change due to changes in authority, priorities, resources and expertise. Information in the implementation database will be a bridge between the strategic planning and operational planning and can be modified without changing this plan framework. The plan will be implemented according to the implementation tables prepared by each plan partner. “Ongoing” actions in the table will be implemented unless replaced by higher priority actions. “Proposed” actions will be implemented when funds or staff resources are made available for those new actions.

Introduction

Many agencies, organizations, scientists, and private citizens presently strive to both minimize the introduction of invasive species, limit their spread, and to control the numbers that are already present in North America. In Minnesota, these include agencies and organizations such as the Departments of Natural Resources, Agriculture, and Transportation, Minnesota Sea Grant Program, the U.S. Fish and Wildlife Service, the University of Minnesota, the Lake Minnetonka Conservation District, the National Park Service, The Nature Conservancy, Minnesota Waters and its members, and counties.

The Minnesota Invasive Species Advisory Council (MISAC), a diverse group with a common interest in battling nonnative invasive species in Minnesota, was initiated in May 2001. The Council was formed in response to Presidential Executive Order 13112 on invasive species, the National Invasive Species Management Plan, and Minnesota Legislation that encouraged the state to plan and take action on invasive species. The council is co-chaired by the Minnesota Department of Agriculture (MDA) and Minnesota Department of Natural Resources (DNR) and now has 35 members and representatives from the following organizations:

- Bailey Nurseries,
- Leech Lake Division of Resource Management,
- Minneapolis Park & Recreation Board,
- Minnesota Assoc. of County Agricultural Inspectors,
- Minnesota Board of Water and Soil Resources,
- Minnesota Crop Improvement Association Minnesota Forestry Association,
- Minnesota Department of Transportation,
- Minnesota Golf Course Superintendents Association,
- Minnesota Native Plant Society,
- Minnesota Nursery and Landscape,
- Minnesota Shade Tree Advisory Committee ,
- National Park Service,
- The Great River Greening,
- The Nature Conservancy,
- U.S. Corp of Engineers,
- University of Minnesota,
- University of Minnesota Sea Grant Program,
- U.S. Army Corp of Engineers,
- U.S. Department of Agriculture,
- U.S. Fish and Wildlife Service, and
- U.S. Forest Service.

The purpose of MISAC is to facilitate statewide coordination and cooperation on invasive species — including 1) review of information concerning the current status, management and spread of terrestrial and aquatic invasive insect, plant, animal and pathogen species into and within Minnesota; 2) to work cooperatively to prevent new

introductions, identify and locate invasive species; 3) to contain established introductions; 4) to manage invasions and take other actions in order to minimize invasive species impacts within Minnesota; and 5) to address these and other existing needs by maximizing available resources.

Minnesota Statutes require the Departments of Agriculture and Natural Resources to establish statewide coordinating programs for invasive species and the statutes also requires them to prepare this statewide invasive species management plan to coordinate the many aspects of invasive species activities in Minnesota. MISAC has taken lead role to develop the plan with the assistance of a State Plan Work Group (see Appendix B).

How a statewide invasive species plan can help

The primary purpose of this plan and its addendums is to provide a framework to *coordinate and guide* efforts to prevent the introduction, spread, and control populations invasive species within the State of Minnesota by state, federal, and local governments, as well as the private sector.

The benefit of implementing a state plan will be:

"Minimizing the negative impacts caused by invasive species to native plants and animals, natural ecosystems, recreation, tourism, agriculture, businesses, and human health in Minnesota".

By making this statewide plan available to Minnesotans, it provides a means to identify the numerous participants, desired outcomes, strategies, and future needs to address the invasive species problem in the state.

Required Content of Plan

Specific contents of this plan are required for various reasons. Plan contents and format are guided by the following sources below.

- Minnesota Statutes 84D.02 describes the plan requirements for the Department of Natural Resources (see Appendix E).
- Minnesota Statutes 18G.12 describes the plan requirements for the Minnesota Department of Agriculture (see Appendix E).
- The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 as amended by the National Invasive Species Act of 1996 (see Appendix D); and
- Guidelines established by the national Aquatic Nuisance Species Task Force describe the components that must be included in the plan so state and tribal governments are eligible for grants from the U.S. Fish and Wildlife Service to implement the plan (see Appendix D).

The state statutes listed above call for “long-term” invasive species management plans

and the Federal act mentioned above calls for “comprehensive” management plans. This state plan is intended to fulfill the requirements of both of these types of management plans.

Plan Development and Review

The development of this plan, which addresses both terrestrial and aquatic invasive species, began in 2005. Some portions of it were formulated even earlier. A workgroup of individuals from the Minnesota Invasive Species Advisory Council (MISAC; see appendix B for members) met regularly to develop the plan, section by section. While in draft, MISAC scheduled a workshop of its members and many others from throughout the state who have knowledge in invasive species management or who’s organizations members are affected by invasive species. The purpose of the workshop was to debut the draft plan; seek input into the framework of elements, strategies and actions; and begin the formulation of implementation tables for numerous entities that may participate in the plan’s implementation.



Following the workshop, the draft plan was revised based on input from the workshop participants and others. This second draft [is now/was] available for a public comment period. Following the public comment period, the plan [will be/was] further revised and finalized. The aquatic portion of the plan and the appropriate portions of the implementation tables will be submitted to the national Aquatic Nuisance Species Task Force (ANSTF) for approval. Once approved, the state will be eligible to apply for grants to implement aquatic portions of the plan from the U.S. Fish and Wildlife Service.

Relation to Other Invasive Species Plans

Many other invasive species plans exist or are being developed at the national, regional, state, and local levels. This plan is intended to work along with those plans and not replace them. State level management plans for high priority species, annual communications and enforcement plans, and other response plans have been or will be

prepared to complement the management framework of this plan. Local management plans may also be developed for individual infested waterbodies or management areas, as needed. As new plans for species, pathways, or activities are developed, it will be beneficial for those developing them to refer to plans previously developed for larger geographic areas, such as national or regional plans, to simplify the process and maximize cooperation and coordination.

A list of Minnesota species-specific plans, regional invasive species plans, and national invasive species plans will be listed on the MISAC web site at www.mda.state.mn.us/MISAC/. Links or PDFs of the plans will also be included, when available.

Background, Issues, and Problem Definition

Invasive Species

Species that have been introduced, or moved, by human activities to a location where they do not naturally occur are termed "nonnative," "exotic," "alien," and "nonindigenous." Nonnative species are not necessarily harmful, in fact many have beneficial purposes. When nonnative species cause ecological or economic problems, they are termed "invasive". Minnesota's natural resources, industries, agribusiness, recreation, stored products and structures, and human health are threatened or harmed by hundreds of invasive species. Examples, such as the zebra mussel (*Dreissena* spp.), Eurasian watermilfoil (*Myriophyllum spicatum*), purple loosestrife (*Lythrum salicaria*), sea lamprey (*Petromyzon marinus*), gypsy moth (*Lymantria dispar*), Emerald ash borer (*Agrilus planipennis*), and leafy spurge (*Euphorbia esula*) may be relatively well known. These species, along with potential future invasives such as yellow star thistle (*Centaurea solstitialis*), hydrilla (*Hydrilla verticillata*), and water chestnut (*Trapa natans*) could be easily introduced and spread within the state if agencies, organizations, citizens, businesses, and visitors don't take necessary steps to avoid introducing or spreading them.

Pathways

There are many pathways of introduction and spread of invasive species. Most species introductions are the result of people's actions. Some introductions, such as common carp (*Cyprinus carpio*), European buckthorn (*Rhamnus cathartica*), and purple loosestrife, were intentional and caused unexpected harm. But many other introductions are unintentional. Invasive species are often unknowingly carried in or on animals, vehicles, ships, commercial goods, produce, wood, water, and even clothing.

Aquatic Pathways - Ballast water discharge from ships continues to be a pathway of introduction for aquatic species into the Duluth harbor and other Minnesota ports on Lake Superior. Ballast water is typically ambient water taken onboard a vessel to assist with vessel draft, buoyancy, and stability. Large vessels (e.g., container ships, bulk carriers, other cargo vessels, tankers, and passenger vessels) normally have dedicated ballast water tanks. The volume of ballast water discharged to Lake Superior is significant. In 2005, more ballast water was discharged to Minnesota Lake Superior harbors than any other Great Lakes port. The Duluth-Superior harbor received approximately 5,387,000,000 gallons of ballast water and the Two Harbors port received approximately 1,876,000,000 gallons (Wiley presentation, January 2008). It was the source of introduction of zebra mussel, New Zealand mudsnail, round (*Neogobius melanostomus*) and tubenose gobies, ruffe (*Gymnocephalus cernuus*), and spiny



waterflea (*Bythotrephes longimanus*) into Lake Superior and the Duluth-Superior harbor.

Trailered boats and water recreation equipment are a high-risk pathway in the state for introduction and spread of aquatic species such as Eurasian watermilfoil and zebra mussel that are in the state, and hydrilla and European frog-bit (*Hydrocharis morsus-ranae*) that are not known to be in the state.



Aquatic plants imported/ordered via mail or Internet for watergardens and other uses are a pathway for aquatic invasive species (Maki and Galatowitsch, 2004). Release of pets, especially from aquaria is another pathway for introducing nonnative species into the wild.

Commercial, government, tribal, and research activities and related equipment such as nets, boats, and waders that are used in infested waters are potential pathways for spread in the state. Transport or diversion of water is another pathway for aquatic invasive species movement, especially for zebra mussels, spiny waterfleas, and pathogens.

Natural waterways can be pathways for species to arrive without human assistance, once they have been introduced in other waters or in other parts of a waterway. The ongoing spread of four Asian carp species (bighead carp, *Hypophthalmichthys nobilis*; black carp, *Mylopharyngodon piceus*; grass carp, *Ctenopharyngodon idella*; and silver carp, *Hypophthalmichthys molitrix*) up the Mississippi River are examples.



Terrestrial Pathways - There are many pathways to bring invasive species into Minnesota and move them throughout the state. For example, firewood transport and import from other states is a high-risk pathway for forest pest species such as gypsy moth and emerald ash borer, which are invading the state. Straw, gravel, and soil are pathways for seed of many invasive terrestrial plants. Rail, air and other shipments are pathways for insects to be introduced into the state.

International pathways can also bring invasive species from other countries directly into Minnesota. Potential entry points include ports of entry, mail facilities, and warehouses that import or handle foreign goods, dunnage holding areas, and container off loading/unpacking locations where shipments are split up and/or repackaged. Other introductions can be associated with industry and the surrounding environs to their facilities including nurseries, home garden centers, greenhouses/plant trade groups, cut flower wholesalers, timber resource groups (mills, pallet recycle, firewood dealers, mulch producers etc), zoos and botanical gardens, seed wholesalers, research institutions, aquarium fish and plant wholesalers and retailers, produce warehouses and

flea/farmer markets. Minnesotan's activities can also be pathways. Their luggage and mail are also pathways. Internet sales can result in almost anything being shipped directly to the purchaser. People may intentionally smuggle for specialty items, seek species from the "home" country, or introduce species unintentionally through contaminated materials.

Problem Definition

In Minnesota, there are many types of invasive organisms with unique life histories, numerous means of dispersal, varied feasibility of control, and various levels and types of impacts. Too many invasive species occur in the state to describe in detail their threats, pathways, distribution, and management responses in this document (see Appendix D). Appendix A - References provides several references on species and management responses in the state.

Despite these widely varying species, general approaches to address the invasive species problem are often similar across the range of species. Because there are many federal, state, local, tribal, and private entities involved in addressing the invasive species problem, using a framework established by this plan for all types of invasive species can aid in addressing the issue cooperatively, and using generally accepted and transparent approaches.

While the approaches are often common among species, there are not sufficient resources, capacity, knowledge, or need to treat all invasive species/situations in a similar manner. For many species there are no tools to manage them once introduced and for others, better management tools are needed. There is a need to prioritize prevention, detection, rapid responses, containment or quarantine, and management actions. It must be determined which species should receive high levels of attention in terms of resources allocated, research conducted, and regulations established. It may also be determined that other species should receive lower levels of attention and for some species, none at all. Whether or not to invest in responses to individual nonnative species will depend upon an assortment of factors such as levels of risk or potential harm a species poses, its geographical distribution, and the ability to control a species if it establishes in the state. These assessments and prioritization of efforts are key decisions in invasive species management. One of the purposes of this document is to help describe how response allocation choices are made and by whom, what are additional response needs, and describe other aspects of invasive species management that would be less obvious without the plan.

Over time, the priority invasive species, management tools, and resources will likely change. This plan will need to be dynamic and those implementing the plan will need to regularly respond to changing circumstances. Priorities in the implementation tables will need to be reviewed and revised and subsequent actions adjusted to address the current priorities with the available resources. Specific actions are included in this plan for that purpose.

Invasive Species Threats to Minnesota

To assist in understanding the relative threats of individual nonnative species, the Minnesota Invasive Species Council ranked the threat of numerous nonnative species to Minnesota, including those with established populations in the state (established), those that have been found in the state but are not established (invading), and those not known to be here (not in state). Species were placed in several categories of threat: Severe, Moderate, Minimal, and Watch/Unknown Threat. Some species were “considered, but not ranked” if they are unlikely to pose any threats in Minnesota. And other species that are “severe threats in other locations, but could not establish in Minnesota” were identified. Each species was evaluated for its threat to several “impacted areas”: native species/natural communities, use of natural resources, agribusiness, landscaped areas, human health, and structures and stored products.

Of the nonnative species that have been ranked by panels of experts for the Minnesota Invasive Species Advisory Council, there are 39 species of severe threat are established or invading the state such as emerald ash borer, Eurasian water milfoil, and zebra mussels. Thirty-five species of moderate threat are established in the state such as the starling and St. John’s wort. Twenty-six species were identified as species to watch such as the Chinese mystery snail and chickory. A total of 25 species that are not in the state are ranked as severe threats and 17 more are moderate threats to Minnesota. These include black carp, European wild boar, and Hydrilla.

The following is a summary by the type of organism.

Aquatic Animals – severe not in state (5), severe invading (3) severe established (8), moderate established (7), moderate not in state (1), watch (1)

Aquatic plants – severe not in state (4), severe established (3), moderate established (4), watch (2)

Terrestrial plants – severe not in state (7), severe established (25), moderate not in the state (2), moderate established (21), watch (20)

Terrestrial animals – severe not in state (1), severe established (2), severe invading (1), moderate established (3), moderate not in state (2), moderate (3), watch (3)

Insects – severe not in state (5), severe invading (1), moderate invading (1), moderate not in state (11)

The following are examples of rankings in each category:

<u>Rank</u>	<u>Example Species</u>
• Severe Threat (established)	zebra mussel, garlic mustard
• Severe Threat (invading)	emerald ash borer
• Severe Threat (not in the state)	hydrilla
• Moderate Threat (established)	cut leaf teasel, starling
• Moderate Threat (invading)	gypsy moth

- | | |
|--|-----------------------------------|
| • Moderate Threat (not in the state) | Sechuan pheasant, Siberian moth |
| • Minimal Threat (established) | common burdock |
| • Minimal Threat (invading) | no example |
| • Minimal Threat (not in the state) | no example |
| • Watch / Unknown Threat | Japanese hops, |
| • Considered but not listed | Banded nardo, Osage orange |
| • Severe pests in other areas,
but could not establish in Minnesota | Chinese and Japanese mitten crabs |

All ranked species of aquatic plants, aquatic animals, terrestrial plants, terrestrial animals, and insects are listed in Appendix D. A database of ranked species and the criteria used for the rankings will be available on the MISAC website at www.mda.state.mn.us/MISAC/ and will be revised and added to periodically. Additional lists and rankings of other invasive species have been developed by various entities and are available for reference from them (e.g., USDA- APHIS and US Forest Service).

Panels of experts were used to determine the appropriate category for each species. Five panels, one for each of group of species (aquatic plants, aquatic animals, terrestrial plants, terrestrial animals, and terrestrial insects), included representation invited from the following areas: agriculture, conservation / environmental groups, industry, natural resources, local / tribal government, federal government, and at-large.

The ranking information serves a variety of purposes:

In an education and outreach context the rankings can:

- help explain that not all nonnative species are invasive;
- identify knowledge gaps;
- provide recommendations regarding use of species; and
- encourage sightings;

Rankings can help in prioritizing and justifying management efforts by alerting managers of natural areas, agricultural lands, and landscaped areas to currently, or potentially, problematic species and to help determine which invasive species are the most important to manage within a specific area.

For purposes of survey and monitoring, rankings can:

- identify species that should be “watched” if they are in the state and species to “watch for” if they are not yet known to be in the state or a specific area within the state;
- assist in seeking funding to conduct surveys for high priority species (e.g., Cooperative Agricultural Pest Surveys).

State rankings can also aide in formulating policy by:

- identifying species for formal risk assessment as part of potential regulation by MDA, DNR, or counties; and
- assisting in identification of species for state quarantine by MDA.

Aquatic Invasive Species Threats

As indicated by the rankings of aquatic invasive species threats in Appendix D, there are several species in the state that are severe threats to natural resources and their use: common carp, curly-leaf pondweed, Eurasian watermilfoil (photo on right), faucet snails, flowering rush, New Zealand mudsnail, round goby, rusty crayfish, spiny waterfleas, sea lamprey, and zebra/quagga mussels.



Other invasive aquatic species that are also in the state that pose moderate threats: Chinese and banded mystery snails, flowering rush, pink water lilies, and yellow iris.



Several fish species, bighead (photo on left), grass, and silver carp are invading the state via interstate waterways such as the Mississippi River. There is potential for other invasive fish to invade the state from the south via the Mississippi River. They include black carp and the round goby.

Information about these species and their impacts is available at:
www.dnr.state.mn.us/invasives/index.html.

Programs and Regulatory Authorities

Introduction

Within the state, there are numerous entities who have programs and regulatory authorities related to invasive species. Some of these may exist under programs, or address categories of species, with different names: noxious weeds, agricultural pests, plant pests, aquatic invasive species, and aquatic nuisance species. There are also many other entities that manage invasive species although they don't have specific programs or responsibilities: The Nature Conservancy, Lake Minnetonka Conservation District, and Minneapolis Parks and Recreation. The information below provides an overview of the various authorities, responsibilities of agencies, landowners, and others. In addition, the information in Appendix C describes the responsibilities and activities of many agencies and organizations in the state regarding invasive species. Gaps in these authorities will be identified through the evaluation of actions specified in the implementation database that is an addendum to this plan.

Regulations and Enforcement

A variety of regulations related to invasive species exist at federal, state, and local levels and are administered by many agencies. They are shown in the table below and described in the authorities and programs section of this plan.

<u>Regulatory Category (types of species)</u>	<u>Agencies Involved</u>
State Prohibited and Regulated Invasive Species and Unlisted Nonnative Species* (wild animals and aquatic plants)	DNR
State Prohibited and Restricted Noxious Weeds (terrestrial plants)	
• Rules	MDA
• Enforcement	counties, townships & cities
State Restricted (wild boars)	MDA & DNR
State Plant Pest Act (insects and terrestrial plants)	MDA
Federal Noxious Weeds (aquatic and terrestrial plants)	USDA – AHPIS
Federal Plant Protection Act (foreign plant pests and diseases)	USDA - APHIS
Federal Lacey Act / Injurious Wildlife (animals)	USFWS
Federal/State ballast water regulations (aquatic organisms)	U.S. Coast Guard/U.S. EPA/MPCA
Tribal Codes (aquatic plants and animals; terrestrial)	Tribes

* Unlisted nonnative species have not been subject to a risk assessment or classified by DNR.

Before classifying species into regulatory categories, agencies generally conduct risk assessments and develop rationale for the classifications. Federal or State Register notices and Statements of Need and Reasonableness are often prepared prior to classification of species. The involved agencies can be contacted for this information.

Monitoring, Responses, and Management

Many entities can be, and are, involved in the detection, enforcement, and responses to new infestations of invasive species in the state. The type of species and geographic location determine who has responsibilities for detection, rapid responses to keep the species from establishing or spreading if established, and management to reduce nuisance populations. In some situations, there is overlap of responsibilities and often these situations can lead to cooperative efforts.

Examples of the roles of participants in Minnesota:

Role - Preventing introductions (inspections, regulations):

Who	Species	Area
DNR	aquatic plants, wild animals	statewide
MDA	terrestrial plants, plant pests	statewide
USDA-APHIS	terrestrial plants, plant pests	statewide
U.S. Coast Guard	aquatic species/ballast water	Lake Superior
UMSGP	aquatic species	statewide
UME	aquatic species	statewide

Role – Monitoring (early detection, surveys):

Who	Species	Area
Cities, Counties, Townships	noxious weeds, plant pests	county/township
DNR	aquatic plants, wild animals	statewide
MDA	plant pests	statewide
USDA-APHIS	fed. noxious weeds, plant pests	statewide
Landowners	noxious weeds, forest pests	their land
Riparian landowners	aquatic plants and animals	waters of the state
Lake Associations	aquatic plants and animals	waters of the state

Role - Responding to the discovery (rapid response, containment):

Who	Species	Area
Cities, Counties, Townships	noxious weeds, plant pests	county/township
DNR	aquatic plants, wild animals	statewide
MDA	plant pests	statewide
USDA- APHIS	fed. noxious weeds, plant pests	statewide
Private Landowners	noxious weeds	their land
Government landowner	noxious weeds	their land
Lake Associations	aquatic plants	waters of the state
UMSGP	aquatic species	statewide
UME	aquatic species	statewide

Role - Management of established invasive species:

Who	Species	Area
Cities, Counties, Townships	noxious weeds	county/township
DNR	aquatic plants	portions of public waters
	wild animals,	statewide
	forest pests	statewide
MDA	plant pests	statewide
APHIS	[fill in]	
Private landowners	noxious weeds	their land
Government landowner	noxious weeds	their land
Riparian landowners	aquatic plants	nearshore of public waters
Lake Associations	aquatic plant and animals	portions of public waters

Role - Research on species and management tools:

Who	Species	Type
DNR	aquatic plants, wild animals	fund, conduct
	terrestrial plants, plant pests	fund
MDA	terrestrial plants, plant pests	fund, conduct
MnDOT	terrestrial plants	fund
University of Minnesota and other universities	all types of species	fund, conduct
USDA-APHIS	terrestrial plants, plant pests	fund, conduct
U.S. Coast Guard	aquatic species/ballast water	fund

Reporting on Implementation

Two state agencies, the Departments of Agriculture and Natural Resources, are responsible for preparing annual reports on invasive species and progress to address them. Each agency's report is submitted to the State Legislature's Environment Committees by January 15th each year. These and other reports are on those agencies' or the MISAC Websites. Minnesota Sea Grant also submits annual reports concerning responses to aquatic invasive species annually to the National Sea Grant College Program.

Elements, Strategies, Actions

This chapter presents four Elements, their Desired Outcomes, Strategies, and Actions that form the framework of the state plan. During plan development, planning terms such as goals and objectives were purposefully avoided because of many varied opinions of their meanings. The first three Elements address separate phases of invasive species responses and the fourth Element addresses coordination at multiple levels. The plan was built by starting with one Element, developing the statement of desired outcome and brief narrative about the Element, then adding Strategies, and finally adding Actions. The Strategies and Actions shown for each Element are generally organized in a logical progression related to phases of invasion and responses.

Specific information about ongoing and proposed actions to implement the plan by entities in Minnesota will be compiled into a database of implementation tables. Those implementation tables will be an addendum to the plan. Priorities, costs, and other information about implementation of specific actions will be included in the implementation tables for participating entities. Examples of the content in implementation tables for a few participants are included later in this document.

[Note: Terms in italics are defined in the glossary.]

Element I. Prevention

Desired outcome: Participants will actively seek to prevent the introduction of new invasive species in Minnesota

It is generally recognized that the most effective strategy against invasive species is to prevent their introduction and establishment. Preventive measures typically offer the most cost-effective means to minimize or eliminate environmental and economic impacts. Prevention relies on a diverse set of tools and methods, including *inspections*, *outreach*, regulations, and enforcement. Management of existing natural areas and other lands in such a way as to decrease their susceptibility to invasion by nonnative or invasive species may also constitute an element of prevention.

Prevention Strategies:

1. Understand Risks - Improve understanding of the potential risks associated with **nonnative species** and **pathways** of spread and introduction.

Action a. Identify known and new nonnative species of concern, evaluate their level of risk, and **rank/classify** those **species**. [See MISAC Website]

Action b. Support, fund, and coordinate efforts that will allow the responsible agencies to identify, evaluate, rank and classify invasive species.

Action c. Identify known and additional **pathways** of introduction, evaluate their level of risk, and rank the relative level of risk of pathways on a continuing basis.

Action d. Support, fund, and coordinate efforts that will identify, evaluate, and rank **pathways**.

2. Coordination - Improve ability of responsible agencies (e.g., MN DNR, APHIS, UMSG, MDA, USFWS) to communicate, cooperate, and collaborate on priority prevention strategies for species and pathways.

Action a. Establish an interagency council (MISAC) to discuss inspection (in transit or on arrival) and detection (in the wild) and response activities, issues, and responsibilities.

Action b. Distribute lists of prohibited and regulated groups of invasive species and their likely pathways of introduction to agencies in the state responsible for inspection and detection.

Action c. Monitor ports of entry and conduct inspections for prohibited and regulated groups of invasive species.

Action d. Train staff about invasive species, and evaluate effectiveness of inspection efforts.

Action e. State agencies with invasive species responsibilities will monitor federal and regional inspection and detection efforts and coordinate and cooperate on those efforts.

Action f. Determine roles for local agencies and non-governmental entities to assist in prevention and inspection efforts.

3. State Regulations - Review state regulations to optimize legal authority for prevention of the import and introduction of invasive species, while recognizing that regulations reflect unique agency approaches and needs.

Action a. Ensure that enforcement authority is clear and appropriate.

Action b. Review existing regulations to identify gaps and needs.

Action c. Explore the need for new approaches or change in legal approach.

Action d. Adopt effective rules, permits, or other approaches as appropriate within each responsible agency to augment statutory approach.

4. Federal Regulations - Seek and support more comprehensive and improved federal / international regulations regarding invasive species.

Action a. State and non-governmental entities pursue and support passage of more comprehensive federal regulations through congressional members or by responding to proposed rulemaking.

Action b. Modify commodity entry standards as appropriate based on pathway assessment and communicate standards to the Department of Homeland Security.

5. Federal and State Inspections and Enforcement - Continue inspections, enforcement of invasive species regulations, and quarantines by state and federal agencies.

Action a. Use the MDA inspection and enforcement provisions (M.S. Chapter 18) to provide enforcement authority for plant pests consistent with agricultural statutes and programs.

Action b. Monitor markets for prohibited products and when found, conduct investigation to determine and close source

Action c. Collaborate with foreign cooperators in offshore mitigation of pests

Action d. Investigate incidents when invasive species are found related to interstate shipments with trace back and trace forward actions to follow distribution chain and take appropriate safeguarding measures.

Action e. Use DNR Conservation Officers to enforce M.S. 84D and M.R. 6216 and other applicable regulations according to an annual statewide Invasive Species Enforcement Plan.

6. Local Enforcement - Seek and support enforcement efforts by other jurisdictions/agencies (e.g., County Sheriffs and CAI) to enforce state regulations.

Action a. Identify likely local jurisdictions and inquire about cooperative efforts (e.g., DNR to contact lake associations/County Sheriffs and MDA to contact county agricultural inspectors).

Action b. Review use of peace officers from various jurisdictions/agencies to enforce state regulations (e.g., M.S.84D - civil penalties) and conduct training where appropriate.

Action c. Establish a memorandum of understanding between MDA, USDA-APHIS, and DNR regarding enforcement related to illegal invasive plant sales.

Action d. Clarify inspection authorities of each agency/jurisdiction to allow for cross-agency inspections.

7. Research and Technologies - Improve technological options and strategic approaches, and work to implement appropriate standards that will help prevent introductions of invasive species into the state or connected watersheds (e.g., innovative ballast water management technology and technology for barriers in waterways, or alternatives to linking watersheds)

Action a. Conduct, fund, or support research to develop new technologies to prevent/reduce the risks of new introductions of invasive species.

Action b. Support the evaluation of available technology to prevent/reduce the risks of new introductions of invasive species.

Action c. Support use of best available technologies that could prevent the introduction of invasive species into the state. (e.g., development of technological standards)

Action d. Use methods such as AIS-Hazard Analysis and Critical Control Points (AIS-HACCP) to reduce risk of invasive species introduction through business and government operations.

8. Public Awareness - Conduct effective outreach programs targeting people who could potentially introduce invasive species into the state.

Action a. Develop specific messages and actions for priority audiences (e.g., commercial horticultural trade, recreational boaters, construction companies that use barges, biological supply houses, the pet trade especially in aquatic organisms, firewood sales, and logging industries).

Action b. Participate in state, regional, national evaluation efforts of priority audiences to determine the effectiveness of outreach efforts (e.g., boater survey). Use the survey information to revise outreach plans and actions.

Action c. Use enforcement according to the MN DNR statewide invasive species enforcement plan and watercraft inspectors to inform boaters entering state waters about invasive species, state regulations, and precautions for boaters.

Action d. Observe Invasive Species Month with proclamations and visibility events.

Action e. Develop and distribute invasive species identification wallet card (e.g. TNC's invasive plant card) and other materials.

Action f. Encourage local growers and horticultural trade to adopt the St. Louis Codes of Conduct which are voluntary codes designed to limit the use and distribution of invasive plant species throughout the nation (see <http://www.centerforplantconservation.org/invasives>).

9. Regional Approaches - Seek interjurisdictional and watershed-wide cooperation and approaches to prevent introductions of potentially invasive species into watersheds that include Minnesota (e.g., Asian carp in other states, barriers in Illinois waterways).

[Note: Some pathways of introduction transcend the authority of a single state to control. A prime example is ballast water discharge from transoceanic shipping, the largest source of aquatic species invasions world-wide (Carlton 1985). The absence of interjurisdictional authority is problematic in regulating the transoceanic vectors transporting aquatic nuisance species to the Great Lakes. Man-made connections between watersheds outside of the state are another example. A third example of this type of pathway is where species are introduced in other states and can reach Minnesota through their movement in natural waterways such as the Mississippi River.]

Action a. Establish, support, and participate in interstate, international, and watershed-based coalitions (e.g., Great Lakes and Mississippi River Basin Panel) to develop regional prevention approaches regarding invasive species.

Element II. Early Detection, Rapid Response, and Containment

Desired Outcome: Participants will work to detect new invasive species infestations and support the infrastructure necessary to rapidly eradicate, or suppress, and contain high priority infestations.

Early detection and rapid response (EDRR) is sometimes considered the “second line of defense” after prevention. It is a critical component of any effective invasive species management program. When new invasive species infestations are detected, a prompt and coordinated eradication and containment response can reduce the potential establishment, spread, and harmful impacts of a species. This action results in lower cost and less resource damage than implementing a long-term control program after a species is established. Early detection of new infestations requires vigilance and regular monitoring.

A. Strategies to detect species presence *after* introduction

1. Detection - Detect new invasive species **populations** as early as possible and develop a comprehensive system for people to report sightings/presence of high priority nonnative species within Minnesota.

Action a. Identify people and agencies that might observe invasive species.

Action b. Develop and distribute information about how to recognize, collect, and report various invasive species (e.g., reporting card, hot list of priority species, ID cards) to people identified in Action a.

Action c. Establish processes for reporting sightings/presence of infestations/populations and agency verification of these reports.

Action d. Investigate reports of new nonnative species as soon as possible.

Action e. Develop memorandums of understanding between responsible agencies, such as the MN DNR, MDA, USDA-APHIS, MN Sea Grant, NPS, and others regarding monitoring and detection.

Action f. Establish partnership opportunities with existing surveys (such as the DNR County Biological Survey, river surveys, fisheries surveys, and shallow lake surveys, MDA pest surveys, Cooperative Agricultural Pest Surveys), other organizations, and citizens for reporting suspected new sightings/presence of invasive species.

Action g. Conduct field surveys for priority invasive species and monitor invasive species populations.

Action h. Provide and seek funding for survey, outreach, and monitoring when appropriate.

Action i. When feasible use remote sensing to detect significant infestations of invasive species with distinct spectral signatures as appropriate.

2. Database - Maintain inventory of locations of high priority invasive species and watch species within Minnesota.

Action a. Establish and maintain databases of known locations of priority invasive and “watch” species.

Action b. Adopt state data collection standards to facilitate intrastate sharing of invasive species sightings/presence data and that allow Minnesota’s data to be integrated into regional or national data centers of invasive species information (e.g., the North American Weed Management Association (NAWMA), the Midwest Invasive Plant Network or IPANE (Invasive Plant Atlas of New England, e.g., <http://invasives.eeb.uconn.edu/ipane/>), or the USGS –Nonindigenous Aquatic Species web site)

3. Prioritize Detection - Prioritize invasive species and their geographic locations for allocation of available resources.

Action a. Identify high-risk areas for invasive species introductions, establishment and spread, (e.g., popular recreational waterbodies, degraded/disturbed systems, urban areas, ports, shipping and receiving terminals, campgrounds, mills) given what we know about the potential risk of certain pathways (see Risk Assessment above) and the biology of the nonnative in question and focus detection efforts in these areas.

Action b. Develop partnerships to increase invasive species identification and surveys (e.g., lake associations performing annual aquatic invasive species searches; fish “round ups”)

4. Research and Technology - Develop new, practical tools for assessing the presence and identification of invasive species

Action a. Promote technology for identification of non-native species (e.g., genetic fingerprinting).

B. Rapid Response strategies for newly detected infestations

5. Develop Rapid Response Plan - Develop a general and, where needed, a species-specific rapid response plan outlining the actions required for the first detection of an invasive species that is not known to occur in the state

Action a. Develop response plans that incorporate the elements of response, recovery, communication and outreach, monitoring, research and funding.

Action b. Ensure that training is provided to applicable employees regarding the response plan.

Action c. Identify species for rapid response efforts” and prioritize/select “rapid response” species for plan development”.

Action d. Inform the public about the need to have a rapid response plan(s) that might employ toxicants.

Action d. Review and revise response plans on a periodic basis.

6. Implement rapid response plans - Reduce the potential for establishment of a reproducing population through targeted treatment efforts when acceptable treatment options exist.

Action a. Implement quarantines allowed by law or other containment measures to prevent movement of material that may promote the spread of the invasive species.

Action b. Evaluate and implement the use of chemical, biological and/or mechanical methods to eradicate recently detected and isolated invasive species populations.

Action c. Monitor eradication efforts through survey or other means to evaluate eradication success.

7. Research and Technology – Develop new tools for use in a rapid response.

Action a. Encourage, support, and conduct research projects to develop new tools to use in rapid response.

C. Continue to contain infestations where eradication is not possible.

Containment Strategies

8. Awareness - Inform people and businesses of actions they can take to prevent the spread of invasive species and comply with state regulations. Also, inform the public and specific stakeholders as invasive species are found in new locations.

Action a. Conduct watercraft inspections at public water accesses with priority given to infested waters, waters with high boater activity, and where there are local sponsors.

Action b. Provide presentations, training, and assistance to lake associations and other organizations interested in setting up access awareness and other events.

Action c. Encourage /use /support local awareness events and private access awareness activity throughout the state.

Action d. Develop annual communication plans and prepare, distribute, and use various media (e.g., radio and TV ads, brochures) and signs according to the plans.

Action e. Inform buyers and sellers of plants and wild animals of how they can help prevent the spread of invasive species, and comply with state and federal laws.

Action f. Inform home builders associations, developers, county planners, and Soil and Water Conservation Districts of how they can help prevent the spread of invasive species.

9. State Regulations - Establish new and maintain / revise / improve existing regulations that address pathways of spread in the state.

10. Enforcement – Enforce state and federal laws aimed at containment

Action a. Initiate state and federal quarantines to contain invasive species of concern and monitor activity.

Action b. Monitor locations and activities operating under permit to ensure proper safeguards are utilized in handling invasive species or high-risk articles.

Action c. Enforce state and federal laws intended to contain invasive species.

11. Funding - Seek more funding and partners from federal, state, and local sources to increase total funds available for invasive species containment.

Action a. Seek additional funds to implement unfunded actions in the Statewide Management Plan for Invasive Species (for example request Federal funds as authorized by the National Invasive Species Act).

Action b. Maintain partnerships with agencies, academic institutions, non-governmental organizations, and others to seek funds from appropriate sources.

12. Prioritize Containment - Allocate resources to minimize potential spread based on the prioritization of species and pathway of spread (per Element 1, Strategy 1)

13. Monitor spread - Monitor the spread of invasive species within Minnesota.

14. Evaluation - Evaluate the cost effectiveness of actions that have been taken to prevent spread of invasive species within Minnesota.

15. Other – Take actions that help minimize pathways from transporting invasive species from infested locations.

Action a. Clear aquatic plant fragments from public water accesses ramps to help reduce the amount of aquatic plants adhering to watercraft and trailer units exiting waterbodies

16. Research and Technology - Develop new scientific tools for containing invasive species.

Action a. Encourage, support, and conduct research projects to develop new tools to use for containment of invasive species.

Element III. Management of Invasive Species

Desired Outcome: Participants will work to reduce the impacts caused by established invasive species to Minnesota's ecology, society, and economy.

Management of invasive species is necessary to reduce the harmful impacts they cause. Because there are numerous invasive species in the state, management must be prioritized for programmatic and species-specific activities to effectively use the limited available resources. Prioritization must be a dynamic and flexible process that enables decisions to be made by using the best available scientific information. Risk assessments can be used to help set priorities. Priority setting will occur at different hierarchical levels (for example, spatial, agency, taxonomic) as appropriate. Priorities should be set at the lowest level practical to ensure that the appropriate result is achieved at management sites. When setting management priorities the species characteristics, infestation consequences, and the availability, feasibility, and likelihood of success of treatment versus non-treatment must all be considered. Often management tools are limited or have low efficacy. In these situations better management tools would be beneficial.

Management strategies

1. Prioritize – Establish processes to prioritize species for which control and research is needed, and prioritize areas where management is most useful, to reduce harmful impacts.

Action a. Develop and use risk assessment models to evaluate which species should be managed.

Action b. Use existing or establish criteria for setting priorities such as legal requirements, current technology, costs, and threats determined by risk assessments.

Action c. Maintain database of locations and related information of high priority invasive species.

2. Integrated Pest Management (IPM) Plans – Develop, revise, and implement IPM plans for individual high priority invasive species.

Action a. Develop, revise, and implement IPM plans for individual high priority invasive species.

Action b. Technical experts will maintain contact with other researchers and managers working on management of invasive species.

Action c. Continue to monitor findings of national and international research on invasive species control through research conferences, publications and other venues.

3. Implement IPM Plans - Use IPM to manage populations of invasive species, when feasible (when management tools are available and they can be implemented with acceptable results), in order to reduce their impacts.

Action a. Use integrated pest management to control populations of high priority invasive species (as identified in the species management plans, if they have been written).

Action b. Develop and implement site management plans (e.g., private forest management plans)

4. Coordination/Communication - Coordinate, facilitate, and review control efforts among federal, state and local units of government, and non-governmental organizations in order to improve the efficiency and effectiveness of the management efforts and to ensure compliance with applicable laws.

Action a. Consult with and listen to the needs of local units of government to foster two-way communication regarding local concerns about invasive species.

Action b. Provide technical advice to federal, state and local units of government, and non-governmental organizations who are controlling invasive species. (e.g., presenting lectures for various groups, attending meetings at different agencies, producing articles, newsletters, and other literature about control of invasive species.)

Action c. Use landscape and watershed approaches to management of high priority invasive species that include various levels of government and non-governmental entities (e.g., weed management areas).

5. Research and Technology - Coordinate, conduct, review, fund, and support research to improve management options necessary to reduce the impacts of invasive species.

Action a. Establish a state research committee to assist carrying out this strategy and research needed under other parts of this plan.

Action b. Provide logistical support and technical assistance to researchers working on invasive species in Minnesota.

Action c. Conduct, fund, and support experiments to test the efficacy of existing and develop new potential control methods, and preferably selective so they minimize harm to native species.

Action d. Provide funding for research on high priority species per species plans (e.g., population genetics work, reproductive ecology of flowering rush).

Action e. Seek and leverage funding for research related to management of priority invasive species (e.g., biocontrol of buckthorn and garlic mustard; studies of impacts).

Action f. Sponsor an annual or bi-annual forum on current research and best practices (e.g., a technology transfer forum with expert research and practitioner presenters and attendance by a variety of resource managers).

6. Evaluation - Periodically evaluate long-term and short-term success of control methods for the purpose of improving management practices.

Action a. Monitor the effects of control methods on both target and non-target species.

Action b. Determine which invasive species can be managed effectively.

Action c. Conduct cost-benefit analysis to determine if the benefits (environmental, economical, recreational) of the treatment outweigh the costs.

7. Resources – Ensure sufficient resources are available for invasive species management in Minnesota from federal, state, and local sources.

Action a. Identify appropriate sources and seek funding and cooperation for management work.

Action b. Seek perpetual funding for management projects.

Action c. Work with non-governmental organizations that may be willing and able to assist in seeking funding invasive species prevention and eradication efforts.

8. Rehabilitation and Restoration - Integrate rehabilitation and restoration into eradication and management efforts.

Action a. Conduct research to determine problems that may occur in restoration efforts and develop recommendations for overcoming those problems (e.g., some invasive species may change the soil characteristics that inhibit reestablishment of native plants).

Action b. Use research and other means to increase information and the knowledge base about native species, plant resistance, the role of intact ecosystems, restoration ecology, disturbance ecology, and invasive species.

Action c. Compile, highlight, and share information about existing restoration and rehabilitation successes around the U.S.

Action d. Develop appropriate guidance documents on effective rehabilitation and restoration practices for resource managers.

Action e. Use proven rehabilitation and restoration

Element IV. Leadership and Coordination

Desired Outcome: Participants will seek to collaborate with intrastate, interstate, and international partners to help coordinate invasive species related efforts.

Collaboration and Coordination - Invasive species management activities need to be coordinated at all levels to help avoid duplication, leverage resources, and to share knowledge and expertise among federal, state, and local governments; tribal interests; nongovernmental organizations; and private sector interests. Collaboration also extends outside the state and implies cooperating across ownerships, state lines, and political jurisdictions.

An important factor that spans all elements is the need to clearly communicate information about invasive species and ensure that it is understood. We need communication for the public to gain understanding and acceptance of the magnitude and urgency of the invasive species problem. Outreach, education, communication, and interpretation programs can convey how the public can help prevent, identify, detect, control, and minimize the impacts of invasive species; gather public input into program plans; and promote partnerships in their implementation.

A. Intrastate coordination strategies

1. State Council – Continue the Minnesota Invasive Species Advisory Council to facilitate statewide coordination and cooperation on invasive species — including the review of information concerning the current status, management and spread of terrestrial and aquatic invasive insects, plants, animals and pathogens into and within Minnesota; to work cooperatively to prevent new introductions, identify and locate invasive species; to contain established introductions; to manage invasions and take other actions in order to minimize invasive species impacts within Minnesota; and to address these and other existing needs by maximizing available resources.

2. Communication - Communicate and coordinate activity concerning species of concern with appropriate federal, state, tribal, county, university, nongovernmental organizations, industry, and other stakeholders. Facilitate awareness of invasive species issues within federal, tribal, state and local entities in the state.

Action a. Establish, maintain, and promote listserves for those interested in invasive species issues in the state.

Action b. Establish, maintain, and promote a statewide Website to facilitate education and coordination

Action c. Communicate with and use the Minnesota Environmental Education Board as an entity to assist in raising awareness about invasive species.

Action d. Make implementation information available for all entities as well as reporting on accomplishments through annual reports of involved entities by posting on MISAC Website.

Action e. Facilitate networking through MISAC, Invasion Biology Research Consortium, and other partnerships in the state

3. Local – Foster the development and participation of local partnerships (e.g., with Soil and Water Conservation Districts, Coalitions of Lake Associations, Counties) to address invasive species using landscape and watershed approaches.

Action a. Seek input from local entities to determine what will work best for them in developing local partnerships.

Action b. Establish Cooperative Weed Management Areas, and other partnerships, such as County Coalitions of Lake Associations, to address invasive species.

Action c. Provide grants that encourage involvement in prevention and management of invasive species at local levels.

B. Interstate coordination strategies

4. Regional entities – Participate in regional invasive species panels, boards, workshops, meetings, and events to facilitate interstate cooperation and coordination (e.g., Mississippi River Basin Panel on ANS, Great Lakes Panel on ANS, Great Lakes Sea Grant Network, Midwest Invasive Plant Network).

5. Neighboring states and provinces - Maintain ongoing communication and collaboration with entities in neighboring states and provinces that are involved with invasive species prevention and management.

C. National coordination strategies

6. National entities – Participate in national invasive species panels, boards, workshops, and events to facilitate national cooperation and coordination (e.g., National Invasive Species Council, FICMNEW, Aquatic Nuisance Species Task Force).

D. International coordination strategies

7. Work with appropriate entities to coordinate with international entities (e.g., State Department, IJC, APHIS-PPQ).

Implementation Tables

How the plan will be implemented

The plan will include/includes an addendum database of implementable actions, which were completed by diverse partners interested in the common goal to respond to invasive species. It is expected that implementable actions will be dynamic and may change due to changes in authority, priorities, resources and expertise. Information in the database will be organized, sorted, and used in many ways — by element, by strategy, by entity, by types of species (aquatic/terrestrial or plant/animal), by lead entity, by ongoing or proposed actions, or combinations of these. This will be a bridge between the strategic planning and operational planning and can be modified without changing the plan framework.

The plan will be implemented according to the implementation tables for each plan partner. Priorities for implementing an entity's actions will be determined by the entity who prepared the table. "Ongoing" actions in the table will be implemented unless replaced by higher priority actions. "Proposed" actions will be implemented when funds or staff resources are made available for those new actions.

Descriptions of Information in Table

Action Number – List each action in the table by the three-character identifier (e.g., I-2-d)

Description – Include a two to five word description of the action

Status – Identify if the action is ongoing, proposed, or another status

Participation level – Specify if the entity is the lead, a cooperator, or other participation level within the scale specified in the scale column.

Estimated Annual Cost – Estimate the cost in 2009 dollars to implement the action

Funding Source – Specify the current or proposed funding source for the action. If it is unknown, insert "undetermined."

Entity Priority – Identify the priority level for the action within the entity. Use A, B, C as priority levels.

Scale / Location – Specify the scale of the action or location (e.g., multi-state, statewide, county, city, watershed, private land) including the name(s) of the location. If multiple sites specify the quantity (e.g., 10 wildlife refuges)

Timeline – Describe when the action will occur (e.g., a specific calendar or fiscal year, annual, or biennial)

Example Implementation Tables

[Note: The examples in this table are representative, but are only for demonstration of the implementation table.]

Department of Natural Resources Actions: Aquatic

Action Number	Action Description	Status	Participation Level	Cooperators	Est. Annual Cost (in 2009 \$)	Funding Source	Entity Priority	Scale/ Location	Timeline
Element: Prevention									
I-1-a	Classify aquatic species	Ongoing	Lead		Existing staff time	State Program Funds	A	statewide	Ongoing
I-3-d	Adopt rules	Ongoing	Lead		Existing staff time	State Program Funds	A	statewide	Ongoing
I-4-a	Seek improved Federal regulations – comment on USCG ballast regulations	Ongoing	Partner	MPCA, NGOs	Existing staff time	State Program Funds	A	national	Ongoing
I-9-a	Participate in interstate coalitions – e.g. Mississippi River Basin Panel; Great Lakes Panel	Ongoing	Cooperator	Other states and federal agencies	Existing staff time / \$2,000 travel	State Program Funds/ travel MRBP	A	Miss. River basin	Ongoing
Element: Early Detection, Rapid Response, and Containment									
II-1-b	Produce and distribute ID cards	Ongoing	Partner	Sea Grant, local entities	Existing staff time	State Program Funds	A	statewide	Ongoing
II-1-d	Investigate reports of new infestations	Ongoing	Lead	Sea Grant, USFWS	Existing staff time	State Program Funds	A	statewide	Ongoing
I-2-e	Develop MOUs for monitoring	Proposed	Cooperator	MDA, USDA-APHIS, MN Sea Grant	Existing staff time	State Program Funds	A	statewide	2010
II-8-a	Watercraft inspections	Ongoing	Lead		\$600,000	State Program Funds	A	statewide	Ongoing
II-8-a	Watercraft inspections	Proposed	Lead		\$100,000	Potential USFWS Grants	A	statewide	2010–15
II-8-d	Communication plan	Ongoing	Lead	WI DNR - St. Croix Plan, Wildlife Forever	\$150,000	State Program Funds/ USFWS Grant for St. Croix	A	DNR - statewide	Annual
II-8-d	Communication plan	Proposed	Lead	Wildlife Forever, Sea Grant, USFWS	\$100,000	Potential USFWS Grant	A	DNR - statewide	Annual
II-10-c	Enforce state AIS laws	Ongoing	Lead	County sheriffs	\$250,000	State Program Funds	A	statewide	Ongoing
Element: Management									
III-3-a	Use integrated pest management (IPM) on high priority plants	Ongoing	Lead	Lake assoc., conservation districts, counties	\$200,000	State Program Funds	A	public waters	Ongoing
III-4-d	Fund research on common carp	Proposed	Cooperator	University of Minnesota	\$40,000 (\$20,000/year)	Potential USFWS Grants	B	statewide	FY2010, FY2011
III-4-d	Fund research on invasive aquatic plants	Proposed	Lead	University of Minnesota, Corps of Engineers	\$50,000 (\$25,000/year)	Potential USFWS Grants	B	statewide	FY2010, FY2011

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Element: Coordination									
IV-A - c	Provide grants to local entities	Ongoing	Lead	Lake assoc., COLAs, counties	\$100,000	State Program Funds	A	statewide	ongoing
IV-A - c	Provide grants to local entities	Proposed	Lead	Lake assoc., COLAs, counties	\$100,000	Potential USFWS Grants	A	statewide	2010 2011
IV-5	Communicate and collaborate with GL states – SAH & Habitattitude	Proposed	Partner	AIS Coordinators and Sea Grant in GL states	TBD	Sea Grant Proposal	A	Great Lakes	FY2010, FY2011

Minnesota Pollution Control Agency Actions: Aquatic

Action Number	Action Description	Status	Participation Level	Cooperators	Est. Annual Cost (in 2009 \$)	Funding Source	Entity Priority	Scale/ Location	Timeline
Element: Prevention									
I-3-d	Establish general permit for ballast water discharges	Ongoing	Lead		Existing staff time	State Funds	A	statewide	Ongoing
I-4-a	Seek improved Federal regulations – comment on USCG ballast regulations	Ongoing	Partner	DNR, NGOs	Existing staff time	State Funds	A	national	Ongoing
I-7-a	Fund and Conduct Research on new ballast water technology	Ongoing	Lead	DNR, Great Ships Initiative	\$200,000	LCCMR Recommended State Funds	A	Great Lakes	FY2010-2012
I-9-a	Participate in interstate coalitions – e.g. Great Lakes Panel	Ongoing	Cooperator	Other states and federal agencies	Existing staff time / \$2,000 travel	State Program Funds/ travel MRBP	A	Miss. River basin	Ongoing

Glossary of Terms

Aquatic plant - a plant, including algae and submerged, floating leafed, floating, or emergent plants, that naturally grows in water, saturated soils, or seasonally saturated soils (M.S. 84D.01).

Aquatic Invasive Species (AIS) – For the purposes of this plan, the term AIS will be synonymous with aquatic nuisance species.

Aquatic Nuisance Species (ANS) - a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural or recreational activities dependant on such waters (National Invasive Species Act of 1996 P.L. 104-332).

Classify – the act of determining the appropriate category/classification that a nonnative species fits.

Communication – For the purposes of this plan, the term communication will be used when referring to the distribution and sharing information among many entities, such as interagency communication. (The term outreach will be used to refer to efforts to inform the specific audiences about invasive species to raise public awareness.)

Control [noxious weed] - In the context of the state noxious weed law, “Control” means to destroy the above ground growth of noxious weeds by a lawful method that prevents the maturation and spread of noxious weed propagating parts from one area to another (M.S. 18.77, subdivision 3).

Designate – the process of officially declaring the regulatory status of a nonnative species that has been classified (new for state plan).

Eradicate – to eliminate a population of an invasive species from a specific area.

Hybrid - offspring resulting from a cross between two different species, or genetically distinct individuals within the same species, that may be naturally occurring or the result of controlled crosses, or being genetically modified.

Injurious [re: state noxious weeds] - the negative economic, physical, aesthetic, environmental, and other effects an uncontrolled plant may have in completing its life cycle.

Inspection – the act of looking for invasive species that may be introduced via a pathway on its way into the state, at the location of its first point of entry (e.g., customs agents at an airport) (new for state plan).

Integrated Pest Management – the use of a combination of approaches, incorporating the judicious application of ecological principles, management techniques, cultural and biological controls, and chemical methods, to keep pests below levels where they do economic damage (MS 17.114, subdivision 2b).

Intentional introduction - an introduction made deliberately by humans, involving the purposeful movement of a species outside of its natural range and dispersal potential Such introductions may be authorized or unauthorized. (The International Union for the Conservation of

Nature and Natural Resources. - Species Survival Commission - Invasive Species Specialist Group).

Introduction - the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity (Executive Order 13112).

Invasive species (Federal) - an alien [nonnative / exotic / introduced] species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112).

Invasive species (State) - a nonnative species that can naturalize and:

- (1) causes or may cause economic or environmental harm or harm to human health; or
- (2) threatens or may threaten natural resources or the use of natural resources in the state (M.S. 84D.01).

Native species - species naturally present and reproducing within this state or that naturally expands from its historic range into this state (M.S. 84D).

Nonnative species / exotic species / introduced species - a species occurring outside its natural range. One that is not native (NWPEC/MISAC).

Noxious weed (state) - In the context of the state noxious weed law, “noxious weed” means an annual, biennial, or perennial plant that the commissioner designates to be injurious to public health, the environment, public roads, crops, livestock, or other property (M.S. 18.77, subdivision 8 and M.R. 1505.0750, subpart 8).

Outreach – For the purposes of this plan, the term outreach will be used to refer to efforts to inform the specific audiences about invasive species to raise public awareness.

Pathway – Means by which species are transported from one location to another. Natural pathways include wind, currents, and other forms of dispersal in which a specific species has developed morphological and behavioral characteristics to employ. Man-made pathways are those that are enhanced or created by human activity. These are characteristically of two types. The first type is intentional, which is the result of a deliberate action to translocate an organism. The second type of man-made pathway are those that unintentionally move organisms (e.g., ballast water discharge, soil associated with the trade of nursery stock). In these and countless other unintentional pathways the movement of species is an indirect byproduct of our activities. (NISC website)

Plant pest - includes, but is not limited to, an invasive species or any pest of plants, agricultural commodities, horticultural products, nursery stock, or noncultivated plants by organisms such as insects, snails, nematodes, fungi, viruses, bacterium, microorganisms, mycoplasma-like organisms, weeds, plants, and parasitic plants (M.S. Chapter 18G).

Prohibited invasive species - An invasive species that has been designated as a prohibited invasive species in a rule adopted by the commissioner [of Natural Resources] under section 84D.12 (M.S. 84D).

Prohibited noxious weed - Plants designated by the commissioner as a prohibited noxious weed are injurious to public health, the environment, public roads, crops, livestock, and other

property. Plants in this category must be controlled in all locations statewide unless other laws apply (NWPEC).

Quarantine - an enforced isolation or restriction of free movement of plants, plant material, animals, animal products, or any article or material in order to treat, control, or eradicate a plant pest (M.S. Chapter 18G).

Rank – the process of evaluating the relative threats/invasiveness of various nonnative species (new for plan)

Rapid response – actions intended to eliminate the establishment or perpetuation of reproducing populations.

Regulated article - any item, the movement of which is governed by quarantine or this chapter (M.S. Chapter 18G).

Regulated invasive species - an invasive species that has been designated as a regulated exotic species in a rule adopted by the commissioner [of Natural Resources] under section 84D.12 (M.S. 84D).

Survey – the act of looking for invasive species in the environment beyond the original point of entry (e.g., looking for Eurasian milfoil in a lake, placing insect traps near a warehouse).

Unlisted nonnative species - a nonnative species that has not been designated as a prohibited invasive species, a regulated invasive species, or an unregulated nonnative species in a rule adopted by the commissioner under section 84D.12 (M.S. 84D).

Unregulated nonnative species - a nonnative species that has been designated as an unregulated nonnative species in a rule adopted by the commissioner under section 84D.12 (M.S. 84D).

Vector – a biological carrier for a disease or parasite (i.e., an organism that transmits pathogens to various hosts) and is not completely synonymous with the much broader definition of a pathway. (National Invasive Species Council Website)

Glossary of Acronyms

APHIS	USDA-Animal Plant Health Inspection Service
ANSTF	Aquatic Nuisance Species Task Force
DNR	Department of Natural Resources
IPM	Integrated Pest Management
MDA	Minnesota Department of Agriculture
Mn/DOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NPS	U.S. National Park Service
NISC	National Invasive Species Council
UMSGP	University of Minnesota Sea Grant Program
UME	University of Minnesota Extension
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

Appendix A - References

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Appendix B - MISAC State Plan Work Group

The following individuals were involved in numerous meetings to develop the draft plan prior to a holding a workshop to involve numerous other individuals and entities in the plan development.

Val Cervenka, MDA Invasive Species Coordinator

Kevin Conners, USDA-APHIS PPQ

Meredith Cornett, The Nature Conservancy

Tony Cortilet, MDA

Collie Graddick, MDA

Mike Hoff, U.S. Fish and Wildlife Service - Region 3 ANS Coordinator

Bob Jacobson, Mn/DOT and BWSR

Doug Jensen, University of Minnesota Sea Grant Program

Alan Jones, DNR Forest Health Supervisor

Terry McDill, MDA Invasive Species Unit Supervisor and MISAC Co-chair

Nick Palaia/Kelly Hogan, U.S. Fish and Wildlife Service – Region 3 Assist. Refuge Supervisor

Jay Rendall, DNR Invasive Species Program and MISAC Co-chair

Luke Skinner, DNR Invasive Species Program

Rob Vennette, U.S. Forest Service

Appendix C. State, Federal, Tribal, Local, Non-Governmental Authorities and Programs

State Entities

Minnesota Board of Water & Soil Resources

The Minnesota Board of Water & Soil Resources (BWSR) administers many of the state's wetland programs including the Wetland Conservation Act (WCA). This involves regulatory activities, providing oversight and long-term monitoring of wetland replacement sites, and implementing the wetland replacement program for local road authorities and the Minnesota Department of Transportation (Mn/DOT). BWSR is also involved in administering State conservation programs such as Reinvest In Minnesota (RIM), The Native Buffer Cost-share Program, and The Cooperative Weed Management Area Cost-share Program that is focused on bringing together partners for the control of invasive species across geographic boundaries.

Invasive species are a major concern for BWSR statewide because they are a threat to nearly all wetland restoration and creation sites as well as other conservation projects. BWSR works with local units of government and private landowners to establish and managing high quality native plant communities and minimize populations of invasive species and noxious weeds.

Minnesota Department of Agriculture

History - In 1919, concerns were raised over barberry as an alternate host for black stem rust on wheat, and regulated pest control (now known as invasive species management) was born in the state at the Minnesota Department of Agriculture (MDA). Since then, plant health has been the focus of the plant protection regulations, including the Plant Pest Act, the Seed Law, the Noxious Weed Law, and two laws recently modernized in 2003, the Plant Protection Act and Nursery and Export Certification Act.

Responsibilities - MDA is charged with the responsibility of keeping out terrestrial invasive plants, insects and pathogens that would be new to the state, and managing or minimizing the impacts of established terrestrial invasive insects, weeds and plant pathogens in the state. The Invasive Species Unit surveys for pests that pose a high risk of introduction to the state, including emerald ash borer, a pest that has killed millions of ash trees in Michigan. In addition, isolated pest populations that are encroaching into the state are eradicated through treatment programs. MDA is in the process of performing pest risk assessments, to determine which invasive species will require the future focus of resources.

In addition, MDA, in conjunction with US Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS), and US Homeland Security Department Customs and Border Protection (HSD CBP), regulates the movement of plant material into and out of Minnesota, to reduce the risk that invasive species may arrive through global trade. MDA issues phytosanitary certificates for products going out of the country, inspects nursery stock coming in and going out of the state, and regulates seed

distribution within, into and out of the state. This is done to ensure that the trade pathway, normally a high risk for introduction for invasive species, is closely controlled. Along with our USDA-APHIS and HSD CBP partners, MDA is educating the public about the impacts of invasive species, and what can be done to prevent invasive species infestations.

The MDA is charged with overseeing the Minnesota Noxious Weed Statutes (Sections 18.75 – 18.91) and regulating noxious weed seeds (MN Statute, Section 21.86) to protect the state's agricultural and natural resources from the negative economic and environmental impacts resulting from these species. The Noxious Weed Unit works closely with federal, state, and county personnel designated to implement the state's noxious weed statutes by providing expertise with identification, management, and outreach for the eleven prohibited, two restricted, and fifty-two secondary noxious weeds. Additionally, all federally listed terrestrial noxious weeds are regulated in Minnesota as state prohibited noxious weeds. The Noxious Weed Unit is also involved with the implementation of weed biological control projects for leafy spurge, spotted knapweed, and Canada thistle. New and emerging weed species, that are not listed as noxious but are deemed to have potentially serious implications if established in Minnesota, are dealt with by educating landowners/managers on how to identify these invasive plants, how to report a sighting, and assisting with the development of voluntary management plans once a species has been located to quickly deal with small infestations before they become too large to eradicate.

MDA is also involved with the management and survey of established invasive species. MDA is the lead state agency for integrated pest management and functions under the authority of MS 17.114 subdivision 4. The IPM program conducts inventory surveys for invasive pests, provides IPM outreach for agricultural producers, county and local governments, and private landowners, implements and coordinates biological control practices statewide, facilitates host-screening and specificity studies for new biological control candidates through the MDA - U of M Quarantine Facility, and collaborates on research projects with U of M and USDA-ARS scientists to provide empirical evidence of IPM strategies.

Minnesota Department of Natural Resources

History – The Minnesota Department of Natural Resources (DNR) Invasive Species Program was established in 1991 and was the first program of its kind in the nation. DNR has responsibility to develop and coordinate a statewide program to prevent the spread of invasive species of wild animals and aquatic plants (Minnesota Statutes 84D). This comprehensive program was preceded by programs addressing single species. In 1987, the DNR was designated the lead agency for control of purple loosestrife, an invasive plant of particular concern for the state's wetlands. In 1989, DNR was officially assigned a coordinating role for Eurasian watermilfoil control (Minnesota Statutes 84D.02, Subd. 2). Program staff are involved in the testing and use of biological control for species such as purple loosestrife and buckthorn.

Responsibilities for Aquatic Species - The Invasive Species Program works to prevent the introduction of invasive species that have the potential to move into and establish in Minnesota. The DNR Invasive Species Program also addresses management and containment of many invasive species that are present in Minnesota such as Eurasian watermilfoil, curly-leaf pondweed, flowering rush, purple loosestrife, faucet snail, spiny waterflea, zebra mussel, and common carp. They include hydrilla, water chestnut, and Asian carp.

Prevention - A large part of the prevention is outreach to boaters, anglers, and others via radio, newspapers, billboards, and publications. Prevention efforts are often undertaken with other states, agencies, and partners with similar concerns. DNR provides grants to local entities for prevention efforts such as implementing the Stop Aquatic Hitchhikers campaign in their area.

DNR has regulatory and enforcement roles for aquatic invasive species as specified in Minnesota Statutes 84D (www.revisor.leg.state.mn.us/statutes/?id=84D). The agency has adopted Minnesota Rules 6216 (www.revisor.leg.state.mn.us/rules/?id=6216) that designate prohibited and regulated invasive species of wild animals and aquatic plants and establish regulations related to infested waters. The agency designates infested waters through commissioner's orders that are published in the *State Register*.

Management – DNR conducts management of aquatic invasive plants such as Eurasian watermilfoil, curly-leaf pondweed, and purple loosestrife. The agency also provides management grants to local entities for managing aquatic invasive plants such as Eurasian watermilfoil and curly-leaf pondweed. Invasive Species Program staff provide technical assistance to entities interested in conducting management of aquatic invasive plants.

Most of the invasive species prevention and management activities are conducted or directed by staff from DNR's Division of Ecological Resources-Invasive Species Program. In addition, the Invasive Species Program hires about 75 students during the summer to inspect boats at public water accesses and help implement management activities. Staff from the DNR divisions of Fish and Wildlife and Enforcement, as well as the Bureau of Information and Education, also contribute significantly to the implementation and coordination of invasive species activities. In total, the equivalent of over 20 full-time positions are focused on invasive species work. Further information is available in the agencies annual reports — *Invasive Species of Aquatic Plants and Wild Animals in Minnesota* — available at the DNR Website (www.dnr.state.mn.us/eco/invasives/index.html).

Responsibilities for Terrestrial Species - The DNR's Division of Forestry is also involved with invasive species management. Working in cooperation with the MDA, it is charged with surveying and controlling forest pests, including non-native organisms such as bark beetles.

DNR also works to reduce the impacts of terrestrial invasive plants on its managed lands such as state parks, state forests, wildlife management areas, scientific and natural areas, and state trails.

Minnesota Department of Transportation (Mn/DOT)

Mn/DOT manages roadsides on over 12,000 miles of federal and state highways located throughout the state. This transportation system encompasses 250,234 acres of which approximately 175,000 acres is greenspace. Although smooth and clear roads remain the highest priority, controlling state-listed prohibited noxious weeds and emerging invasive weed species ranks near the top of roadside vegetation management activities. Mn/DOT uses an integrated pest management approach that considers mechanical, cultural, chemical and biological alternatives for pest control. Mn/DOT and private licensed applicators engage in selective herbicide applications to control the eleven state-listed prohibited noxious weeds in addition to several secondary noxious weeds and other emerging invasive weeds. Other efforts to control invasives includes requiring certified weed free mulch on construction projects and inventorying noxious weed locations during transportation project design and incorporating control measures into the contract.

Minnesota Pollution Control Agency

The Minnesota Pollution Control Agency (MPCA) has responsibilities and authorities related to vessel discharges such as ballast water of ships. MPCA issued a ballast water general permit under the State Disposal System (SDS) permit program defined in Minnesota Statute 115.07 and Minnesota Rule 7001.0020, subp. D. Minnesota's Lake Superior harbors receive ballast water discharges from both ocean-going vessels (Salties) and Great Lakes-only vessels (Lakers).

The Duluth Seaway Port Authority estimates that approximately 5% of the ballast water discharged to Lake Superior is from Salties and 95% is from Lakers. The MPCA has determined that a general permit is an appropriate permitting mechanism for these vessels to minimize the threat of aquatic invasive species (AIS) into the Minnesota State waters of Lake Superior.

In May 2008, the Minnesota Legislature passed S.F. 3056 that contains language related to ballast water management. The legislation became effective on July 1, 2008. The legislation specifies requirements related to ballast water management and ballast water record books for vessel owners and operators. Specifically, S.F. 3056 details what a ballast water management plan and ballast water record book should contain, and provides for the MPCA's approval of the management plan. The MPCA's ballast water general permit reflects the requirements in the legislation.

University of Minnesota Sea Grant Program

The University of Minnesota Sea Grant Program is a part of a nationwide network of 30 university-based programs administered through the National Oceanic and Atmospheric Administration (NOAA) with a legislative mandate (PL 107-299) to "increase the understanding, assessment, development, utilization, and conservation of the nation's

ocean and coastal resources.” As one of the pressing issues related to the health and sustained well-being of our coasts and inland waters, aquatic invasive species (AIS) is one of ten priority areas that Sea Grant addresses.

The University of Minnesota Sea Grant Program is known as a leader in supporting scientific research, and conducting outreach, education, communication and training on AIS. By integrating these disciplines, Sea Grant is positioned to: 1) support development of novel, environmentally-safe solutions for control and management of AIS; 2) examine economic, ecological, recreational and human health impacts of AIS; and 3) identify and target pathways with innovative outreach strategies and technologies – all aimed at preventing, containing, and minimizing the impacts AIS. Sea Grant programming is often offered in collaboration with multiple agencies and organizations to avoid duplication of effort, leverage resources, and combine expertise to effectively address AIS issues in Minnesota and beyond.

Minnesota Sea Grant co-leads *Habitattitude*TM, a national public education campaign aimed at preventing the release of unwanted fish and aquatic plants by aquarists and water gardeners. Launched in fall 2004, *Habitattitude*TM, was created by a government-industry-academia coalition of the Pet Industry Joint Advisory Council, the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration’s Great Lakes Sea Grant Network. It is building upon efforts to extend and evaluate the *Stop Aquatic Hitchhikers!* campaign along key invasion corridors in Minnesota, Wisconsin, and Iowa, in collaboration with multiple partners – aimed at preventing the spread of AIS by resident and non-resident boaters and anglers. On behalf of the Great Lakes Sea Grant Network, Minnesota Sea Grant continues to promote the successful Aquatic Invasive Species-Hazard Analysis and Critical Control Point (AIS-HACCP, has-sip) training, which is aimed at preventing the spread of AIS or providing AIS-free certification for aquaculturists, wild baitfish harvesters, hatchery operators, fisheries managers, and conservation officers.

University of Minnesota – Invasion Biology Research Consortium

Many faculty at the University of Minnesota are involved with invasive species research, education, and collaborative efforts. The Invasion Biology Research Consortium was established by the University to promote discussions and research on invasion biology in plants, invertebrates, and animals in Minnesota and elsewhere.

Federal Agencies

USDA – Animal Plant Health Inspection Service (APHIS)

Responsibilities - USDA-APHIS has the responsibility to prevent the introduction of foreign plant pests and diseases with the potential for adversely impacting agriculture and the environment. USDA has legislative authority under the Plant Protection Act to control the importation of commodities that may serve as pathway for the introduction of foreign plant and animal pests and diseases.

Some APHIS-PPQ activities to help meet responsibilities:

- Prohibit or require appropriate treatment of host material moving into the United States that may serve as a pathway for introduction.
- Modify commodity entry standards as appropriate based on the pathway assessment and communicate standards to DHS.
- Collaborate with foreign cooperators in the offshore mitigation of pests to reduce the risk of entry into the continental United States.
- Identify pathways & high-risk sites receiving regulated articles and prioritize for survey;
- Monitor markets for prohibited products and when found, conduct investigations to determine and close source;
- Investigate incidents when pests are found related to interstate shipments with trace back and trace forward actions to follow distribution chain and take appropriate safeguarding measures;
- Communicate & coordinate activity concerning pests of concern with appropriate federal state university and industry stakeholders;
- Provide identification and confirmation services for foreign pests as appropriate; - Inform public and other stakeholders as pests of concern are found;
- Transfer technology, methods for survey and eradication and resources as appropriate through the CAPS program;
- Initiate federal quarantines to contain pest of concern and monitor activity;
- Monitor locations operating under permit to ensure proper safeguards are utilized in handling pests or high-risk articles.

USDA Forest Service

Responsibilities - The Forest Service has the authority to directly manage 192 million acres of national forests and grasslands. It also has the responsibility and authority to provide technical and financial assistance (primarily for insect, disease, and invasive plant suppression) for all the Nation's 731 million acres of forest lands, including urban, State, private, and tribal lands, and forested lands managed by other Federal agencies.

The Forest Service is recognized internationally for its land management and research expertise. It conducts research, scientific collaboration, and reviews to fill priority information gaps on a scientific foundation. In addition to more than 500 research scientists, its thousands of specialists include forest entomologists, forest pathologists, botanists, wildlife and fisheries biologists, and ecologists. Forest Service Technology and Development Centers specialize in developing and applying the latest in technology. Other Forest Service staff that support invasives programs include experts in public communication, legislative affairs, technology transfer, and education.

The Forest Service has working relationships with other agencies involved in invasive species, including the Animal and Plant Health Inspection Service (APHIS) and the other government departments in the National Invasive Species Council. In addition, it maintains working relationships with leading national and international organizations that focus on invasive species and has ongoing partnerships with each State and territorial agency with invasive species responsibility. It has a long history of providing technical and financial assistance to States and territories to handle natural resource

problems. The Forest Service has formal working relationships with most major colleges and universities and with international partners.

The Forest Service has a national strategy for the management of invasive species that may affect trees and forests. The four main elements of that plan are Prevention, Early Detection and Rapid Response, Control and Management and Rehabilitation and Restoration. The three primary divisions of the Forest Service (National Forest System, State and Private Forestry, and Research and Development) coordinate activities within the organization and with other partner institutions to achieve the goals of that plan. The Forest Service is represented in Minnesota by the Superior National Forest, the Chippewa National Forest, the Northeastern Area office of State and Private Forestry, and the Northern Research Station with research work units in Grand Rapids and St. Paul.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is the principal federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The agency administers the Lacey Act of 1900 (as amended in 1998), and has authorities and responsibilities under the Endangered Species Act of 1973 (as amended), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (as amended by the National Invasive Species Act of 1996), and National Environmental Policy Act of 1970. The Lacey Act enables the USFWS to help prevent the introduction and spread of animals listed as injurious under the act, by prohibiting their importation and interstate transportation, and by enforcing those prohibitions. Under the Endangered Species Act, the USFWS can protect and restore species listed as either Threatened or Endangered by implementing programs to control and eradicate invasive species. The Nonindigenous Aquatic Nuisance Prevention and Control Act established the Aquatic Nuisance Species Task Force (ANSTF), which is co-chaired by the USFWS, to coordinate governmental efforts related to nonindigenous aquatic species in the United States with those of the private sector and other North American interests. The National Environmental Policy Act requires that actions taken by the USFWS, and with funding provided by that agency, must comply with the act.

The USFWS supports several programs that include invasive species prevention, management, and control activities. Within the region including Minnesota, the Aquatic Nuisance Species Program is administered by Regional Office in Fort Snelling, Minnesota. Staff coordinate activities of the USFWS Fisheries Program and its partners, and also provide technical assistance designed to prevent introductions of aquatic invasive species and control and manage populations after establishment. Two Fishery Resources Offices support invasive species programs in Minnesota that are led by the Department of Natural Resources. The Ashland (Wisconsin) Fishery Resources Office is responsible for program activities in the Great Lakes watershed of Minnesota, while the La Crosse (Wisconsin) Fishery Resources Office is responsible for programs in the remainder of the state.

The National Wildlife Refuge System (NWRS) developed a National Strategy for the Management of Invasive Species that will guide invasive species management on refuges nationwide. The strategy emphasizes assessment information, monitoring recommendations and best management practices. Guided by this national strategy, NWRS invasive species operations include preventive activities, control and eradication, research and monitoring, cooperative partnerships and cost-share projects, and public education about invasive species. The Partners for Fish and Wildlife Program is a voluntary habitat restoration program that provides restoration expertise and financial assistance to private landowners, tribes, and other conservation partners who voluntarily restore fish and wildlife habitat on their properties. Habitat restoration activities supported by the Partners Program include managing and controlling invasive species.

The Great Lakes Coastal Program funds projects that seek to protect and restore Great Lakes coastal ecosystems for the benefit of fish, wildlife, and people. Habitat restoration activities funded by the Coastal Program may include invasive species management and control.

Two national public awareness campaigns (Stop Aquatic Hitchhikers!, and Habitattitude) are cosponsored by the USFWS. Risk assessments are conducted by the USFWS, and by their contractors, to evaluate the injurious nature of species that either are or may be imported into the U.S. USFWS provides support for ecological surveys conducted to acquire baseline information on abundance and distribution of aquatic invasive species in ports where ballast water is discharged, and in waters connected to those ports.

USFWS provides support for implementation of Management and Control Plans approved by the ANSTF. Management and control plans relevant to Minnesota include the Ruffe Control Plan, and the Asian Carp Management and Control Plan. USFWS provides the federal cost-share to implement State and Interstate Management Plans approved by the ANSTF. In addition to providing the federal share to support this plan, USFWS is providing the federal share of the St. Croix Interstate Plan that is implemented by Minnesota, Wisconsin, and the Great Lakes Indian Fish and Wildlife Commission.

National Park Service

National Park Service (NPS) units within the State of Minnesota include the St. Croix NSR, Pipestone NM, Voyageurs NP, Mississippi NRR, and Grand Portage NM. Most of these have monitoring programs in place to identify and assess species of concern. On the St. Croix National Scenic Riverway, the Park has had a zebra mussel/AIS prevention plan since 1992. Elements of the Plan include information (brochures, billboards, etc.) and education (programs, lectures, etc.); inspections (boats at launches or moored boats at marinas) and access management (see regulations below); monitoring using stationary samplers and active searches employing SCUBA. Research and the development of a remediation plan are also central to the response. To date, zebra mussels have been confined to the lower 22 miles of the river.

The National Park Service restricts upstream travel at the Soo Line Railway High Bridge (mile 28.5) to protect Riverway aquatic resources from the accidental introduction of the zebra mussel and certain other aquatic invasive species. Using existing regulatory authority found in the Code of Federal Regulations Title 36 Sections 3.3 and 7.9, the National Park Service may provide a special use permit for upstream travel past the Zebra Mussel Checkpoint under case-by-case conditions.

Vessels traveling upstream beyond the High Bridge must meet certain conditions. Vessel owner/operators not conforming to these conditions are in violation of 36 CFR Sections 2.32 Interfering with Agency Functions, 3.3 Permits, and 7.9(c) Vessels. Violators may be required to appear before a federal magistrate and may be subject to a fine of up to \$5000.00 and/or imprisonment for up to 6 months.

Vessel owner/operators in violation of the above regulations (e. g.: with a vessel containing zebra mussels), are also in violation of 36 CFR section 2.1(a)(2) Preservation of Natural, Cultural, and Archeological Resources, and may be in both civil and criminal violation of 16 U. S. Code Chapter 53 Control of Illegally Taken Fish and Wildlife, Section 3372(a) Prohibited Acts - Offenses other than Marking Offenses. Violators will be subject to a mandatory court appearance before a federal magistrate and may be subject to a fine of up to \$5000.00 and/or imprisonment for up to 6 months.

Other species of concern on the Riverway are addressed with varying degrees of effort. As an example, the Park has a purple loosestrife management plan, tries to reduce to zero Grecian foxglove and Japanese barberry, engages in buckthorn and garlic mustard removal where practicable, and monitors Eurasian watermilfoil, curly-leaf pondweed, and spotted knapweed. Finally certain AIS will require action plans (Asian Carp), or have been addressed through regulation and regular monitoring programs (Rusty Crayfish – illegal use of live bait).

Voyageurs NP has similar crayfish regulation to the St. Croix and monitors for spiny waterflea. Grand Portage monitors for gypsy moths. Mississippi removes buckthorn and will have an Asian carp response plan. Pipestone has a prairie restoration program which includes removal of non-native invasives.

All national parks in the Great Lakes Network (include all Minnesota units) enjoy the efforts of the exotic plant management team. This small group of specialist travels from park to park performing intensive removal/restoration work on park lands of high value. The Park Service is committed to addressing invasive species concerns, even within the constraints of staff and funding.

Tribal Entities

There are several ongoing Tribal efforts in the state to address the prevention, management, and impacts of invasive species. The Leech Lake Band and Mille Lacs

Band of Ojibwe have invasive species specialists who work on terrestrial and aquatic invasive species issues, as well as invasive forest pests.

Leech Lake is working cooperatively with the MN DNR to address the faucet snail population in Lake Winnibigoshish that is responsible for causing die-offs of the Lesser scaup and American coots. The Leech Lake Band is also managing garlic mustard cooperatively with the US Forest Service. The Band is leading grassroots efforts to increase awareness of invasive species impacts and initiate community-based management. Grassroots projects have been conducted in collaboration with Onigum community to control wild parsnip. The Leech Lake Association has committed to future grassroots project support with help from Leech Lake property owners.

The Great Lakes Indian Fish and Wildlife Commission

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) is an organization exercising delegated authority from 11 federally recognized Ojibwe tribes in Minnesota, Wisconsin, and Michigan. These tribes retain hunting, fishing, and gathering rights in the territories ceded to the United States through various treaties. The degradation of native ecosystems by invasive species poses a serious threat to the continued exercise of these rights and the traditional lifeways they sustain. Because this direct and critical link exists between native people and natural resources, impacts to the function of native ecosystems are greater in areas that support traditional lifeways.

GLIFWC's invasive species program consists of four comprehensive elements – education outreach, inventory and monitoring, control, and evaluation. Each of these elements is coordinated with local cooperators to maximize the efficient use of limited resources. GLIFWC's educational outreach efforts center around its web site (www.glifwc.org/invasives) which provides basic information on invasive species and provides access to a regional GIS database (www.glifwc-maps.org) of invasive species survey efforts, distribution records and control efforts. In addition, GLIFWC distributes and develops print material to raise awareness of invasive species issues.

Local Entities

Cities and Counties

Several local government organizations are involved in the management of invasive species. For example, parks and environmental departments at the city or county level often invest resources to manage invasive species on their lands and waterways. County Agricultural Inspectors and Townships are key players in the implementation of the state Noxious Weed Law.

Conservation Districts

Soil and Water Conservation Districts and Watershed Districts play an important role in working with landowners to plan and implement conservation projects including invasive species removal. Soil and Water Conservation Districts in 18 counties have led the establishment of Cooperative Weed Management Areas (CWMAs), and additional

CWMAs will be forming in coming years. Involvement of local government organizations is essential to effectively coordinate invasive species prevention and control.

The Lake Minnetonka Conservation District and White Bear Lake Conservation District have roles in managing aquatic invasive species such as Eurasian watermilfoil and preventing introductions of new aquatic invasive species into those waters.

Non-governmental

The Nature Conservancy*

Responsibilities - The mission of The Nature Conservancy (TNC) is to preserve the plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive. TNC has identified invasive species as a top threat to achieving our mission in priority conservation areas around the world. Conservation success therefore depends on preventing new invasions and effective management of invaded areas. Building on years of experience in invasive species management, TNC has created the Invasive Species Initiative to address this urgent and pervasive threat.

Our Strategy - TNC's Invasive Species Initiative works with a network of private and public partners worldwide to pursue the following tactics as part of a comprehensive strategy:

- Prevention: This strategy offers the greatest benefit for the least cost. TNC is supporting enhanced port inspections and voluntary efforts to eliminate intentional introductions of non-native, invasive species.
- Early Detection/Rapid Response: Mimicking initiatives like the one under way in Chicago, where hundreds of local residents have been trained and have volunteered their time to check trees for signs of invasive Asian long-horned beetles.
- Restoration: Working with local organizations at thousands of sites to remove and prevent the spread of invasive species.
- Research: Working with leading academic institutions, like the University of California and the University of Florida, to develop new research to improve the management and control of invasives.
- Outreach: Working with government agencies and international organizations to develop policies for invasive species awareness, management, and prevention.

Putting our Strategy into Action - This comprehensive strategy is woven through the Initiative's work, both within TNC and with external partners, as we strive towards the ultimate goal of preventing and abating invasive species threats to biological diversity. We put this strategy into action by:

- Assessing Problems and Setting Priorities. We work with other TNC programs and partners to encourage comprehensive regional assessments of invasive

species threats to biodiversity, of efforts underway to prevent and abate those threats, and of important gaps in those efforts.

- Engaging in Public Policy. To improve government programs and regulations that prevent, contain, and manage invasions, we were with TNC staff and external partners across the globe to identify and coordinate activities promoting the highest priority policies.
- Creating Strategies and Tools. We develop information, tools, and templates on invasive species biology, impacts, assessment, prevention, and management to aid staff and partners in management, public education, and policy decisions for conservation projects.
- Working with Industry & Professionals. We are working with partners in the nursery industry, landscape architects, botanical gardens, and garden clubs to reduce the use and spread of invasive horticultural plants. We are also working with other TNC programs and partners to identify other industries, such as oceanic shipping, where adoption of voluntary practices could prevent new invasions and stop the spread of existing ones.
- Training and Networking. We lead Conservation Learning Networks to solve problems on invasive species assessment, prevention, management, and monitoring. We develop materials on best practices, available through our practitioner's website, including a photo gallery, weed control handbook, information about new plant, animal, insect, and disease invaders, success stories and other resources (<http://tncweeds.ucdavis.edu/>)

* For more information, please see The Nature Conservancy's Invasive Species Initiative website (<http://www.nature.org/initiatives/invasivespecies/>)

Lake Associations and Coalitions of Lake Associations

Hundreds of lake associations exist in the state and many are active in aquatic invasive species prevention and management efforts. County coalitions of lake associations (COLAs) are also concerned about aquatic invasive species. Both of these levels of organizations contribute hundreds of thousands of dollars of funds, volunteer hours on awareness, prevention, monitoring and management of aquatic invasive species. Lake associations, COLAs, Lake Improvement Districts (LID), and watershed groups have worked for years throughout the state to address local aquatic invasive species needs that are not addressed by state resources. These organizations are also recipients of DNR grants for prevention and management of aquatic invasive species.

Minnesota Waters

The Minnesota Waters (formerly the Minnesota Lakes Association and Minnesota Rivers Council) has been active in promoting strong state policies and programs for preventing and managing aquatic invasive species problems. Their strong focus on aquatic invasive species prevention and management is primarily citizen-led initiatives.

Appendix D - MISAC Rankings of Species Threats to Minnesota

* Each species threat to the following impacted areas was determined by a panel of experts. This rank represents the most severe rank of those assigned by the experts.

Ranking*	Common Name	Genus	Species
Aquatic Animals			
Watch	Chinese mystery snail, Japanese trap door snail	<i>Cipangopaludina</i>	<i>spp.</i>
Severe/Invading	Bighead carp	<i>Hypophthalmichthys</i>	<i>nobilis</i>
Severe/Invading	Grass carp	<i>Ctenopharyngodon</i>	<i>Idella</i>
Severe/Invading	Silver carp	<i>Hypophthalmichthys</i>	<i>molitrix</i>
Severe/Not in state	Black carp	<i>Mylopharyngodon</i>	<i>piceu</i>
Severe/Not in state	Fishhook waterflea	<i>Ceropagis</i>	<i>Pengoii</i>
Severe/Not in state	New Zealand mudsnail	<i>Potamopyrgus</i>	<i>antipodarum</i>
Severe/Not in state	Rudd	<i>Scardinius</i>	<i>erythrophthalmus</i>
Severe/Not in state	Zander	<i>Stizostedion</i>	<i>luciperca</i>
Severe/Established	Common carp, Koi	<i>Cyprinus</i>	<i>Carpio</i>
Severe/Established	Rainbow smelt	<i>Osmerus</i>	<i>mordax</i>
Severe/Established	Round goby	<i>Neogobius</i>	<i>melanostomus</i>
Severe/Established	Ruffe	<i>Gymnocephalus</i>	<i>cernuus</i>
Severe/Established	Rusty crayfish	<i>Orconectes</i>	<i>rusticus</i>
Severe/Established	Sea lamprey	<i>Petromyzon</i>	<i>marinus</i>
Severe/Established	Spiny water flea	<i>Bythotrephes</i>	<i>longimanus</i>
Severe/Established	Zebra mussels	<i>Dreissena</i>	<i>spp.</i>
Moderate/Not in state	Fourspine stickleback	<i>Apeltes</i>	<i>quadracus</i>
Moderate/Established	Alewife	<i>Alosa</i>	<i>pseudoharengus</i>
Moderate/Established	Corbicula	<i>Corbicula</i>	<i>fluminea</i>
Moderate/Established	Goldfish	<i>Carassius</i>	<i>auratus</i>
Moderate/Established	Lumholtzi waterflea	<i>Daphnia</i>	<i>lumholtzi</i>
Moderate/Established	Threespine stickleback	<i>Gasterosteus</i>	<i>aculeatus</i>
Moderate/Established	Tubenose goby	<i>Proterorhinus</i>	<i>marmoratus</i>
Moderate/Established	White perch	<i>Morone</i>	<i>Americana</i>
Known pest, not expected to survive in MN	Chinese / Japanese Mitten Crabs	<i>Eriocheir</i>	<i>sinensis and japonica</i>
Aquatic Plants			
Watch/Unknown	Brazilian elodea	<i>Egaria</i>	<i>densa</i>
Watch	Waterlilies, nonnative or exotic	<i>Nymphaea</i>	nonnative spp.
Severe/Not in state	European frog-bit	<i>Hydrocharis</i>	<i>morsus-ranae</i>
Severe/Not in state	Hydrilla	<i>Hydrilla</i>	<i>verticillata</i>
Severe/Not in state	Indian swampweed	<i>Hygrophila</i>	<i>polysperma</i>
Severe/Not in state	Water chestnut	<i>Trapa</i>	<i>natans</i>
Severe/Established	Curly-leaf pondweed	<i>Potamogeton</i>	<i>crispus</i>
Severe/Established	Eurasian watermilfoil	<i>Myriophyllum</i>	<i>spicatum</i>
Severe/Established	Purple loosestrife	<i>Lythrum</i>	<i>salicaria, virgatum, and any hybrids</i>
Moderate/Established	Eurasian flowering rush	<i>Butomus</i>	<i>umbellatus</i>
Moderate/Established	Water cress	<i>Rorippa</i>	<i>mastutium-aquaticum</i>
Moderate/Established	Yellow floating heart	<i>Nymphoides</i>	<i>peltata</i>
Moderate/Established	Yellow iris	<i>Iris</i>	<i>pseudacoris</i>

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Ranking*	Common Name	Genus	Species
Known pest, not expected to survive in MN	Salvinia complex	<i>Salvinia</i>	<i>spp.</i>
Known pest, not expected to survive in MN	Water hyacinth	<i>Eichhornia</i>	<i>crassipes</i>
Considered/not listed	Banded nardo	<i>Marsilea</i>	

Terrestrial Animals

Watch	European rabbit	<i>Oryctolagus</i>	<i>Cuniculus</i>
Watch	House finch	<i>Carpodacus</i>	<i>Maxicanus</i>
Watch	Red-eared slider		
Severe/Not in state	Eurasian swine, European wild boar	<i>Sus</i>	<i>scrofa scrofa</i>
Severe/Invading	Mute swan	<i>Cygnus</i>	<i>Olor</i>
Severe/Established	Earthworms, nonnative	see separate list	
	Norway rat		<i>norvegicus and rattus</i>
Severe/Established		<i>Rattus</i>	
Moderate/Not in state	Asian raccoon dog	<i>Nyctereutes</i>	<i>Procyonoides</i>
Moderate/Not in state	Sechuan pheasant	<i>Phasianus</i>	<i>colchicus strauchii</i>
Moderate/Established	House mouse		
Moderate/Established	House sparrow	<i>Passer</i>	<i>Domesticus</i>
Moderate/Established	Starling	<i>Sturnus</i>	<i>vulgaris vulgaris</i>
Minimal/Established	Ringnecked pheasant	<i>Phasianus</i>	<i>Colchicus</i>

Terrestrial Insects

Severe/Invading	Emerald ash borer	<i>Agrilus</i>	<i>Planipennis</i>
Severe/Not in state	Asian Longhorn Beetle	<i>Anoplophora</i>	<i>Glabripennis</i>
Severe/Not in state	European Gypsy Moth	<i>Lymantria</i>	<i>Dispar</i>
Severe/Not in state	Mountain Pine Beetle	<i>Dendroctonus</i>	<i>Ponderosae</i>
Severe/Not in state	Spruce Engraver Beetle	<i>Ips</i>	<i>Typographus</i>
Severe/Not in state	Wood wasp	<i>Sirex</i>	<i>Noctilio</i>
Moderate/Invading	Asian Gypsy Moth	<i>Lymantria</i>	<i>Dispar</i>
Moderate/Not in state	Balsam Woolly Adelgid	<i>Adelges</i>	<i>Picea</i>
	Brown Spruce Longhorn Beetle	<i>Tetropium</i>	<i>Fuscum</i>
Moderate/Not in state	Douglas Fir Tussock Moth	<i>Orygia</i>	<i>Pseudotsugata</i>
Moderate/Not in state	European Oak Bark Beetle	<i>Scolytus</i>	<i>Intricatus</i>
Moderate/Not in state	Fir Engraver	<i>Scolytus</i>	<i>Ventralis</i>
Moderate/Not in state	Great spruce bark beetle	<i>Dendroctonus</i>	<i>Micans</i>
	Japanese Cedar Longhorn Beetle	<i>Callidiellum</i>	<i>Rufipenne</i>
Moderate/Not in state	Nun Moth	<i>Lymantria</i>	<i>Monacha</i>
Moderate/Not in state	Red-Haired Pine Bark Beetle	<i>Hylurgus</i>	<i>Ligniperda</i>
Moderate/Not in state	Siberian moth	<i>Dendrolimus</i>	<i>Sibiricus</i>
Moderate/Not in state		<i>Scolytus</i>	<i>Schevyrewi</i>

Terrestrial Plants

Watch/Unknown	Baby's-breath	<i>Gypsophila</i>	<i>Paniculata</i>
Watch/Unknown	Burdock, Woodland	<i>Arctium</i>	<i>Nemorosum</i>
	Burning Bush, Winged		
Watch/Unknown	Euonymus	<i>Euonymus</i>	<i>Alatus</i>
Watch/Unknown	Celandine	<i>Chelidonium</i>	<i>Majus</i>
Watch/Unknown	Chicory	<i>Chicorium</i>	<i>Intybus</i>
Watch/Unknown	Daisy, Portuguese	<i>Leucanthemum</i>	<i>Lacustre</i>

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<u>Ranking*</u>	<u>Common Name</u>	<u>Genus</u>	<u>Species</u>
Watch/Unknown	English Ivy	<i>Hedera</i>	<i>Helix</i>
Watch/Unknown	Everlasting Pea	<i>Lathyrus</i>	<i>Latifolius</i>
Watch/Unknown	Foxglove, Garden	<i>Digitalis</i>	<i>Purpurea</i>
Watch/Unknown	Japanese Cork Tree	<i>Phellodendron</i>	<i>Amurense</i>
Watch/Unknown	Japanese Honeysuckle	<i>Lonicera</i>	<i>Japonica</i>
Watch/Unknown	Japanese Hops	<i>Humulus</i>	<i>Japonicus</i>
Watch/Unknown	Locust Bristly	<i>Robinia</i>	<i>Hispida</i>
Watch/Unknown	Locust, clammy	<i>Robinia</i>	<i>Viscose</i>
Watch/Unknown	Porcelain Berry	<i>Ampelopsis</i>	<i>Brevipedunculata</i>
Watch/Unknown	Princess Tree	<i>Paulownia</i>	<i>Tomentosa</i>
Watch/Unknown	Queen of the meadow	<i>Filipendula</i>	<i>Ulmaria</i>
Watch/Unknown	Rugosa Rose	<i>Rosa</i>	<i>Rugosa</i>
Watch/Unknown	Sawtooth Oak	<i>Quercus</i>	<i>Accutisima</i>
Watch/Unknown	Timothy	<i>Phleum</i>	<i>Pratense</i>
Severe/Not in state	Black Swallow-wort	<i>Vincetoxicum</i>	<i>Nigrum</i>
Severe/Not in state	Giant Hogweed	<i>Heracleum</i>	<i>Mantegazzianum</i>
Severe/Not in state	Honeysuckle, Amur	<i>Lonicera</i>	<i>Maackii</i>
Severe/Not in state	Lespedeza, Chinese	<i>Lespedeza</i>	<i>Cuneata</i>
Severe/Not in state	Oriental Bittersweet	<i>Celastrus</i>	<i>Orbiculatus</i>
Severe/Not in state	Thistle, marsh	<i>Cirsium</i>	<i>Palustre</i>
Severe/Not in state	thistle, milk	<i>Silybum</i>	<i>Marianum</i>
Severe/Established	Alyssum, hoary	<i>Berteroa</i>	<i>Incana</i>
Severe/Established	Autumn Olive	<i>Eleagnus</i>	<i>Umbellata</i>
Severe/Established	Bird's-foot trefoil	<i>Lotus</i>	<i>Corniculatus</i>
Severe/Established	Buckthorn, common or European	<i>Rhamnus</i>	<i>Cathartica</i>
Severe/Established	Buckthorn, glossy (all cultivar)	<i>Frangula</i>	<i>Alnus</i>
Severe/Established	Crown Vetch	<i>Coronilla</i>	<i>Varia</i>
Severe/Established	European or Common		
Severe/Established	Barberry	<i>Berberis</i>	<i>Vulgaris</i>
Severe/Established	Foxglove, Grecian	<i>Digitalis</i>	<i>Lanata</i>
Severe/Established	Garlic Mustard	<i>Allaria</i>	<i>Petiolaria</i>
Severe/Established	Giant Knotweed	<i>Polygonum</i>	<i>Sachalinense</i>
Severe/Established	Honeysuckle, Bela	<i>Lonicera</i>	<i>x bella</i>
Severe/Established	Honeysuckle, Morrow's	<i>Lonicera</i>	<i>Morrowii</i>
Severe/Established	Japanese Knotweed	<i>Polygonum</i>	<i>Cuspidatum</i>
Severe/Established	Knapweed, spotted	<i>Centaurea</i>	<i>Maculosa</i>
Severe/Established	Locust, black	<i>Robinia</i>	<i>Pseudocacia</i>
Severe/Established	Maple, Norway	<i>Acer</i>	<i>Platanoides</i>
Severe/Established	Multiflora Rose	<i>Rosa</i>	<i>Multiflora</i>
Severe/Established	Purple Loosestrife	<i>Lythrum</i>	<i>Salicaria</i>
Severe/Established	Reed canary grass	<i>Phalaris</i>	<i>arundinacea</i>
Severe/Established	Spurge, Leafy	<i>Euphorbia</i>	<i>escula</i>
Severe/Established	Tansy	<i>Tanacetum</i>	<i>vulgare</i>
Severe/Established	Tartarian Honeysuckle	<i>Lonicera</i>	<i>tatarica</i>
Severe/Established	Thistle, Canada	<i>Cirsium</i>	<i>arvense</i>
Severe/Established	Thistle, musk	<i>Carduus</i>	<i>nutans</i>
Severe/Established	Thistle, plumeless	<i>Carduus</i>	<i>acanthoides</i>
Not likely to establish	Chinese Yam	<i>Dioscorea</i>	<i>oppositifolia</i>
Not likely to establish	Japanese Stilt Grass	<i>Microstegium</i>	<i>vimineum</i>
Not likely to establish	Kudzu	<i>Pueraria</i>	<i>montana</i>
Not likely to establish	Mimosa	<i>Albizia</i>	<i>julibrissin</i>
Not likely to establish	Tree of Heaven	<i>Ailanthus</i>	<i>altissima</i>

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Ranking*	Common Name	Genus	Species
Moderate/Not in state	Globe Thistle	<i>Echinops</i>	<i>sphaerocephalus</i>
Moderate/Not in state	Teasel, common	<i>Dipsacus</i>	<i>sylvestris</i>
Moderate/Established	Buttercup, tall	<i>Ranunculus</i>	<i>acris</i>
Moderate/Established	Carrot, wild	<i>Daucus</i>	<i>carota</i>
Moderate/Established	Clover, White	<i>Trifolium</i>	<i>repens</i>
Moderate/Established	Creeping Charlie	<i>Glechoma</i>	<i>hederacea</i>
Moderate/Established	Daisy, oxeeye	<i>Leucanthemum</i>	<i>vulgare</i>
Moderate/Established	Dalmation Toadflax	<i>Linaria</i>	<i>dalmatica</i>
Moderate/Established	Dame's Rocket	<i>Hesperis</i>	<i>matronalis</i>
Moderate/Established	Elecampane	<i>Inula</i>	<i>britannica</i>
Moderate/Established	Europ. Highbush Cranberry	<i>Viburnum</i>	<i>opulus</i>
Moderate/Established	Field bindweed	<i>Polygonum</i>	<i>convolvulus</i>
Moderate/Established	Japanese Barberry	<i>Berberis</i>	<i>thunbergii</i>
Moderate/Established	Lily-of-the-Valley	<i>Convallaria</i>	<i>majalis</i>
Moderate/Established	Maple, Amur	<i>Acer</i>	<i>ginnala</i>
Moderate/Established	Mulberry, White	<i>Morus</i>	<i>alba</i>
Moderate/Established	Orange Day Lily	<i>Hemerocalus</i>	<i>fulva</i>
Moderate/Established	Quackgrass	<i>Elytrigia</i>	<i>repens</i>
Moderate/Established	Sowthistle, perennial	<i>Sonchus</i>	<i>arvensis</i>
Moderate/Established	Spurge, Cypress	<i>Euphorbia</i>	<i>cyparissias</i>
Moderate/Established	St. Johns'swort	<i>Hypericum</i>	<i>perforatum</i>
Moderate/Established	Teasel, cut leaf	<i>Dipsacus</i>	<i>laciniatus</i>
Moderate/Established	Willow, Hybrid	<i>Salix</i>	<i>x rubens</i>
Minimal/Established	Barnyard grass	<i>Echinochloa</i>	<i>crusgalli</i>
Minimal/Established	Big-leaf Lupine	<i>Lupinus</i>	<i>polyphyllus</i>
Minimal/Established	Bittersweet Nightshade	<i>Solanum</i>	<i>dulcamara</i>
Minimal/Established	Black medic	<i>Medicago</i>	<i>lupulina</i>
Minimal/Established	Bouncing Bet	<i>Saponaria</i>	<i>offinalis</i>
Minimal/Established	Burdock, Common	<i>Arctium</i>	<i>minus</i>
Minimal/Established	Butter-and-eggs	<i>Linaria</i>	<i>vulgaris</i>
Minimal/Established	Campion, Bladder	<i>Silene</i>	<i>vulgaris</i>
Minimal/Established	Campion, White	<i>Silene</i>	<i>latifolia</i>
Minimal/Established	Clover, Red	<i>Trifolium</i>	<i>pratense</i>
Minimal/Established	Common Bugloss	<i>Anchusa</i>	<i>arvensis</i>
Minimal/Established	Creeping Bellflower	<i>Campanula</i>	<i>rapunculooides</i>
Minimal/Established	European Mountain-ash	<i>Sorbus</i>	<i>acuparia</i>
Minimal/Established	Goutweed	<i>Aegopodium</i>	<i>podagraria</i>
Minimal/Established	Helleborine	<i>Epiactis</i>	<i>helleborine</i>
Minimal/Established	Hemp	<i>Cannabis</i>	<i>sativa</i>
Minimal/Established	Motherwort	<i>Leonurus</i>	<i>cardiaca</i>
Minimal/Established	Mullein	<i>Verbascum</i>	<i>thaspus</i>
Minimal/Established	Poplar, White	<i>Populus</i>	<i>alba</i>
Minimal/Established	Russian Olive	<i>Eleagnus</i>	<i>angustifolium</i>
Minimal/Established	Thistle, bull	<i>Cirsium</i>	<i>vulgare</i>
Minimal/Established	Willow, Crack	<i>Salix</i>	<i>fragilis</i>
Minimal/Established	Willow, White	<i>Salix</i>	<i>alba</i>
Considered/not ranked	Black Alder	<i>Alnus</i>	<i>glutinosa</i>
Considered/not ranked	Cinquefoil, Silver	<i>Potentilla</i>	<i>argentina</i>
Considered/not ranked	Cinquefoil, Sulphur	<i>Potentilla</i>	<i>recta</i>
Considered/not ranked	Clover, Alsike	<i>Trifolium</i>	<i>hybridum</i>
Considered/not ranked	Lombardy Poplar	<i>Populus</i>	<i>nigra</i>
Considered/not ranked	Osage Orange	<i>Maclura</i>	<i>pomifera</i>
Considered/not ranked	Sweet Woodruff	<i>Galium</i>	<i>odoratum</i>

Appendix E - Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 – Section 1204 (as amended)

SEC. 1204. STATE AQUATIC NUISANCE SPECIES MANAGEMENT PLANS.

(a) STATE OR INTERSTATE INVASIVE SPECIES MANAGEMENT PLANS. —

(1) **IN GENERAL.**— After providing notice and opportunity for public comment, the Governor of each State may prepare and submit, or the Governors of the States and the governments of the Indian tribes involved in an interstate organization, may jointly prepare and submit—

- (A) a comprehensive management plan to the Task Force for approval which identifies those areas or activities within the State or within the interstate region involved, other than those related to public facilities, for which technical, enforcement, or financial assistance (or any combination thereof) is needed to eliminate or reduce the environmental, public health, and safety risks associated with aquatic nuisance species, particularly the zebra mussel; and
- (B) a public facility management plan to the Assistant Secretary for approval which is limited solely to identifying those public facilities within the State or within the interstate region involved for which technical and financial assistance is needed to reduce infestations of zebra mussels.

(2) **CONTENT.**— Each plan shall, to the extent possible, identify the management practices and measures that will be undertaken to reduce infestations of aquatic nuisance species.
Each plan shall—

- (A) identify and describe State and local programs for environmentally sound prevention and control of the target aquatic nuisance species;
- (B) identify Federal activities that may be needed for environmentally sound prevention and control of aquatic nuisance species and a description of the manner in which those activities should be coordinated with State and local government activities;
- (C) identify any authority that the State (or any State or Indian tribe involved in the interstate organization) does not have at the time of the development of the plan that may be necessary for the State (or any State or Indian tribe involved in the interstate organization) to protect public health, property, and the environment from harm by aquatic nuisance species; and
- (D) a schedule of implementing the plan, including a schedule of annual objectives, and enabling legislation.

(3) **CONSULTATION.**—

- (A) In developing and implementing a management plan, the State or interstate organization should, to the maximum extent practicable, involve local governments and regional entities, Indian tribes, and public and private organizations that have expertise in the control of aquatic nuisance species.
- (B) Upon the request of a State or the appropriate official of an interstate organization, the Task Force or the Assistant Secretary, as appropriate under paragraph (1), may provide technical assistance in developing and implementing a management plan.

(4) **PLAN APPROVAL.**— Within 90 days after the submission of a management plan, the Task Force or the Assistant Secretary in consultation with the Task Force, as appropriate under paragraph (1), shall review the proposed plan and approve it if it meets the requirements of this subsection or return the plan to the Governor or the interstate organization with recommended modifications.

(b) **GRANT PROGRAM.**—

(1) **STATE GRANTS.**— The Director may, at the recommendation of the Task Force, make grants to States with management plans approved under subsection (a) for the implementation of those plans.

(2) **APPLICATION.**— An application for a grant under this subsection shall include an identification and description of the best management practices and measures which the State proposes to utilize in implementing an approved management plan with any Federal assistance to be provided under the grant.

(3) FEDERAL SHARE.—

(A) The Federal share of the cost of each comprehensive management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 75 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

(B) The Federal share of the cost of each public facility management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 50 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

(4) **ADMINISTRATIVE COSTS.—** For the purposes of this section, administrative costs for activities and programs carried out with a grant in any fiscal year shall not exceed 5 percent of the amount of the grant in that year.

(5) **IN-KIND CONTRIBUTIONS.—** In addition to cash outlays and payments, in-kind contributions of property or personnel services by non-Federal interests for activities under this section may be used for the non-Federal share of the cost of those activities.

(c) **ENFORCEMENT ASSISTANCE.—** Upon request of a State or Indian tribe, the Director or the Under Secretary, to the extent allowable by law and in a manner consistent with section 141 of title 14, United States Code, may provide assistance to a State or Indian tribe in enforcing an approved State or interstate invasive species management plan.

(16 U.S.C. 4724)

Appendix F – Minnesota Statutes Related to Invasive Species Management Plans

M.S. 18G.12 Invasive species management and investigation.

Subd. 3. **Invasive species management plan.** The commissioner [of Agriculture] shall prepare and maintain a long-term terrestrial invasive species management plan which may include specific plans for individual species. The plan must address:

- (1) coordination strategies for detection and prevention of accidental introductions;
- (2) methods to disseminate information about harmful invasive species to the general public and appropriate agricultural and resource management agencies or organizations;
- (3) coordination of control efforts for selected harmful terrestrial invasive species; and
- (4) participation by local units of government and other state and federal agencies in the development and implementation of local management efforts.

M.S. 84D.02 Invasive Species Management Program.

Subd. 3. Management plan. The commissioner [of Natural Resources] shall prepare and maintain a long-term plan, which may include specific plans for individual species and actions, for the statewide management of invasive species of aquatic plants and wild animals. The plan must address:

- (1) coordinated detection and prevention of accidental introductions;
- (2) coordinated dissemination of information about invasive species of aquatic plants and wild animals among resource management agencies and organizations;
- (3) a coordinated public education and awareness campaign;
- (4) coordinated control of selected invasive species on lands and public waters;
- (5) participation by lake associations, local citizen groups, and local units of government in the development and implementation of local management efforts;
- (6) a reasonable and workable inspection requirement for watercraft and equipment including those participating in organized events on the waters of the state;
- (7) the closing of points of access to infested waters, if the commissioner determines it is necessary, for a total of not more than seven days during the open water season for control or eradication purposes;
- (8) maintaining public accesses on infested waters to be reasonably free of aquatic macrophytes; and
- (9) notice to travelers of the penalties for violation of laws relating to invasive species of aquatic plants and wild animals.

Appendix G. Comments Received on the Plan and Responses

[This section will be added after the public review period and ANS Task Force review.]