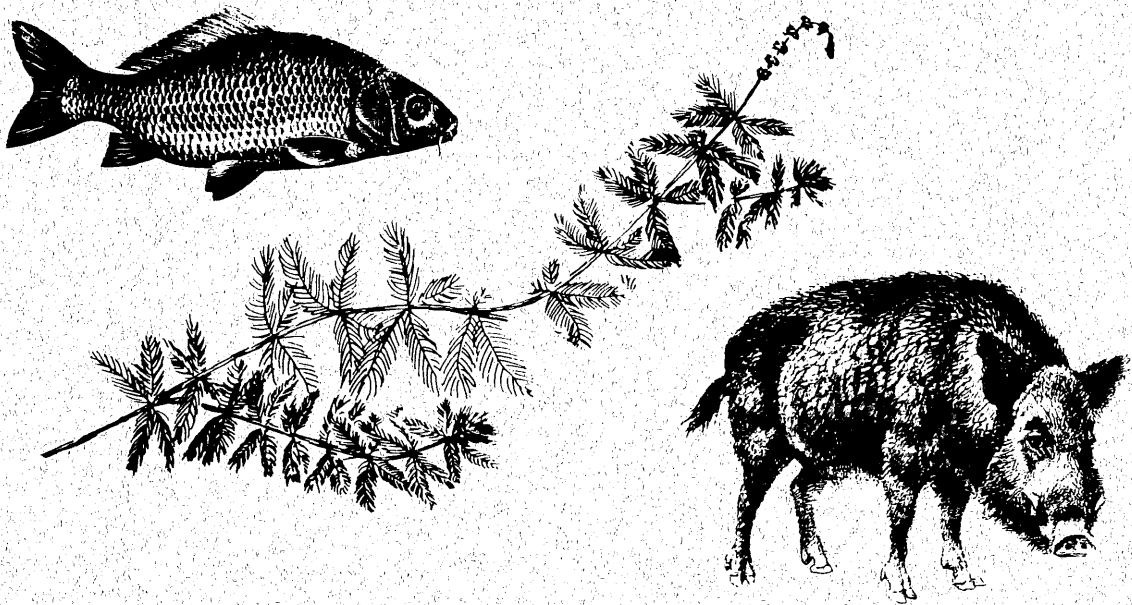




# REPORT and RECOMMENDATIONS

of the

## MINNESOTA INTERAGENCY EXOTIC SPECIES TASK FORCE



**Final Review Draft**

**Submitted to the Natural Resources Committees  
of the  
Minnesota House and Senate**

**April 1991**

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***“We are in a period of the world's history when the mingling of thousands of kinds of organisms from different parts of the world is setting up terrific dislocations in nature.”***

**—Charles S. Elton, *The Ecology of Invasions***

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***“What pesticides were to wildlife in the 1960's, exotic plants are becoming to Illinois forests, prairies and wetlands in the 1980's. These invaders are not annual weeds of tilled land, as the farmer or gardener knows them, but perennials—often shrubs or trees—capable of destroying natural communities of plants and animals.”***

**—John Schwegman, Illinois Dept. of Conservation**

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# Table of Contents

<u>Introduction</u>	<u>Page 1</u>
Legislation	
Task Force Members	
Scope of this Report	
Definitions	
<u>Executive Summary</u>	<u>4</u>
<u>Exotic Species Issues Narrative</u>	<u>8</u>
Background	
Fiscal Impacts	
Source of Introductions	
Invasive Characteristics	
Biodiversity	
Legislation	
<u>Review of Exotic Species Regulations</u>	<u>11</u>
State Regulations:	Department of Natural Resources
	Minnesota Department of Agriculture
	Other State Agencies
	Other States
Federal Regulations	
<u>Categories of Threat and Ranking of Species</u>	<u>17</u>
<u>List of Existing Harmful Nonnative Species in Minnesota</u>	<u>18</u>
Species with Severe Future Threats	
Species with Moderate Future Threats	
Species with Minimal Future Threats	
Species with Unknown Future Threats	
<u>List of Potentially Harmful Nonnative Species</u>	<u>26</u>
<u>Long Term Management Program Plan</u>	<u>27</u>
<u>Recommendations For Legislation and Policy Changes</u>	<u>28</u>
State	
Regional	
National	
International	
<u>Appendix</u>	
A - Minnesota Native Species Authorities	A-1
B - Other Exotic Species Found in Minnesota	B-1
C - References / Bibliography	C-1
D - References for Exotic Pest Lists	D-1
E - Exotic Species Survey Form	E-1
F - Exotic Plant Ranking System for Minnesota	F-1
G - Exotic Animal Ranking System for Minnesota	G-1

## Legislation Establishing a Task Force

During the 1989 legislative session, the Minnesota State Legislature mandated the establishment of an Interagency Exotic Species Task Force. The state statute is duplicated below:

### Sec. 268. [EXOTIC SPECIES MANAGEMENT AND MONITORING]

Subdivision 1. [DEFINITION] *For the purpose of this section, "exotic species" means non-native plants or wild animals that have the potential to harm the environment, or threaten native plants or wild animals.*

Subd. 2. [TASK FORCE] *(a) An interagency task force is created to establish a long-term program on exotic species management. The task force shall be composed of the commissioner or director of the departments of natural resources, agriculture, health, transportation, and the board of water and soil resources, and three people with special expertise in the private sector on exotic plants or animals, to be appointed by the commissioner of natural resources who shall also serve as the chair.*

*(b) Each commissioner or director may designate a delegate from their respective state agencies to represent that commissioner on the task force.*

*(c) The three private citizens on the task force may be reimbursed for their necessary expenses in attending task force meetings according to Minnesota Statutes, section 15.075.*

### Subd. 3 [DUTIES; RESPONSIBILITIES] *The task force shall:*

- (1) identify the existing and potential exotic species threats to the state's environment;*
  - (2) rank the exotic species identified according to their degree of threat;*
  - (3) develop a long term management program for exotic species control;*
- and*
- (4) report on findings and recommendations to the natural resources committees in the house and senate by January 1, 1990, along with any necessary changes in the legislation.*

**Note:** In December of 1989, the commissioner of Natural Resources requested an extension of the January 1, 1990 completion date from the chairs of the House and Senate Environment and Natural Resources committees. This was done because the task force needed additional time gathering information and developing recommendations on this complex and important issue.

## Task Force Members

The five state agencies represented on the Interagency Exotic Species Task Force were determined by the legislation that established the task force. Also, the chair of the task force requested four federal agencies to appoint representatives on an ad hoc basis. All individuals representing the agencies were designated by the commissioner, executive director, or regional director of the agency.

The task force also has three private sector representatives who have knowledge and experience with exotic species. These members were selected from interested candidates by the commissioner of Natural Resources, the lead agency of the task force.

All members of the task force are listed below:

Jay Rendall, Chair	Department of Natural Resources
Chuck Dale	Department of Agriculture
Doug Thomas	Board of Water and Soil Resources
Dr. Larry Foote	Department of Transportation
Dr. Valentine O'Malley	Department of Health
Bonnie Harper-Lore	National Wildflower Institute (Private Sector Representative)
Nelson French	The Nature Conservancy (Private Sector Representative)
John Moriarty	Minnesota Herpetological Society (Private Sector Representative)
Dr. Judy Helgen	Pollution Control Agency (ad hoc)
John Shyne	Army Corps of Engineers (ad hoc)
Larry Smith	U.S. Fish and Wildlife Service (ad hoc)
Victoria Mendiola Grant	National Park Service (ad hoc)
Pamela Deerwood	U.S. Department of Agriculture, Animal Plant Health Inspection Service (ad hoc)

Also, Dr. Mackey of the Board of Animal Health and staff from Minnesota Sea Grant attended task force meetings held late in 1990. The Board of Animal Health and the University of Minnesota (Minnesota Sea Grant) were not active members of the task force from the outset, but they are interested in the regulation and research of exotic species and should continue to participate on future exotic species initiatives.

## Scope of this Report

The Interagency Exotic Species Task Force focused primarily on the environmental and ecological impacts of exotic species, a specific topic the task force was created to address. Although the impacts of exotics to domestic crops, domestic animals, industry, and people are important issues, they were not addressed by the task force because these are for the most part addressed by existing state and federal regulations.

The task force limited its review and discussion of exotic species to plants and animals, including birds, mammals, fish, reptiles, amphibians, insects, mollusks and crustaceans. Genetically engineered native organisms are included in the task force's definition of exotic species. Bacteria, fungi and other microorganisms were not covered by this report.

## Definitions

The legislation establishing the Exotic Species Task Force defines exotic species as non-native species that are potentially harmful. This differs from the standard resource management definition of exotic species which says an exotic is simply a species that is not indigenous to the state. This definition has no reference to the species being harmful. To avoid confusion among its diverse members and other resource managers the following definitions were established by the Interagency Exotic Species Task Force:

**Exotic Species:**

All non-native or nonindigenous species.

**Feral species:**

A domesticated species that has established a breeding population in the wild.

**Indigenous species:**

Same as native species.

**Invasive species:**

A species that can naturalize, has high propagation potential, is highly competitive for limiting factors and causes displacement of native species.

**Native species:**

Those species present in Minnesota before European settlement (circa 1800).

**Naturalized:**

A non-native wild species that has established a breeding population in the wild.

**Non-native species:**

Those species not present before European settlement (unless the state experts noted in Appendix A have determined a natural range expansion has occurred from an adjacent state or country) including unnaturally occurring hybrids, cultivars, non-Minnesotan genotypes, genetically selected strains, genetically engineered species, or other genetically altered species.

Several other related definitions exist in MN Statutes. Those are listed below.

**Protected wild animals (MS 97a.015, Subd 39):**

The following wild animals: big game, small game, game fish, rough fish, minnows, leeches, alewives, ciscoes, chubs, and lake whitefish and the subfamily *Coregoninae*, rainbow smelt, frogs, turtles, clams, mussels, timber wolf, mourning dove, and wild animals that are protected by a restriction in the time or manner of taking, other than a restriction in the use of artificial lights, poison, or motor vehicles.

Protected birds (MS 97a.015, Subd. 38):  
All birds except unprotected birds

Unprotected birds (MS 97a.015, Subd. 52):  
House(English)sparrow, blackbird, crow, starling, magpie, cormorant,  
common pigeon, and great horned owl.  
(The House Sparrow, starling, common pigeon are not protected by either  
state or federal laws.)

Unprotected wild animals (MS 97a.015, Subd. 53):  
Wild animals that are not protected wild animals including weasel,  
coyote (brush wolf), gopher, porcupine, skunk, and spotted skunk (civet  
cat), and unprotected birds.

Wild animals (MS 97a.015, subd. 55):  
All living creatures, not human, wild by nature, endowed with  
sensation and power of voluntary motion, and includes mammals,  
birds, fish, amphibians, reptiles, crustaceans, and mollusks.

# Executive Summary

## **Mandate**

The 1989 Minnesota Legislature mandated the establishment of an Interagency Exotic Species Task Force, comprised of both public and private sector expertise, to establish a program for long-term exotic species management.

## **Definitions**

The legislation's definition of an exotic species as a potentially harmful non-native species was further clarified. Exotic species are non-native species introduced after European settlement or altered native species.

## **Background Narrative**

For many years exotic species have been recognized as problems for agriculture and human health. Now biologists are recognizing that foreign plants and animals are slowly infiltrating and changing our nation's ecological balance. In Minnesota, 20% of all noncultivated plant species are exotics. Several recently introduced species are: the ruffe, white perch, European water flea, Eurasian water milfoil and zebra mussel.

Human actions, either intentional or accidental, are the main source of introductions. Unintentional introductions come from the pet industry, bait dealers, recreational boating, biological supply houses, bird seed suppliers, grain shipments, horticultural introductions, and international shipping. Intentional introductions, for beneficial purposes, have been common. Many of the well-intended introductions have gone awry. The English sparrow, purple loosestrife, and European carp are well known examples in Minnesota.

## **Ecological Impacts**

The changes of ecological balance resulting from exotic species cost Minnesota by:

- Diminishing biodiversity by outcompeting existing native vegetation,
- Reducing food and cover available to wildlife (waterfowl & fish),
- Degrading pastures, hayfields, native grasslands, and woodlands,
- Threatening rare species by competition and eliminating their habitat,
- Reducing natural area use for recreation and education, and research,
- Reducing resource manager's conservation management options.

## **Economical Impacts**

Economic impacts in Minnesota are significant and could become astronomical.

For example:

- It cost \$300,000 to remove carp from one lake system.
- It costs \$263,000/year to manage milfoil in Lake Minnetonka.
- Purple loosestrife control costs are over \$500,000 since 1987.
- Noxious weed control costs by counties and townships in Minnesota is over \$4 million per year.
- Costs to control zebra mussels in the great lakes states may exceed \$100 million per year.



## Regulation Review

In general, state and federal regulations don't protect Minnesota ecosystems from harmful exotic species.

Department of Agriculture — This agency has noxious weed and seed labeling laws in place that allow for the restriction and prohibition of the transportation, propagation, and the distribution of noxious weeds and other exotic weed species. These programs are an effective framework for controlling weed species. Until 1987, when purple loosestrife was added for ecological reasons, the existing regulations focused on agricultural pests. The MDA has proposed a revision of its noxious weed law to include injurious to "the environment" as part of its definition.

Department of Natural Resources — Two exotic programs (purple loosestrife and Eurasian water milfoil) are housed in the DNR. Several exotic regulations are written as Commissioner's Orders. The commissioner may need clearer authority to allow direct regulation of exotic species.

Other States — Illinois enacted an "Exotic Weed Control Act" to prohibit selling and planting four of their species. Florida, Texas, Ohio also prohibit the sale of transport of ecologically harmful species.

### Federal Regulations

The Lacey Act written in 1900, responded to a wave of introductions by restricting the importation of several exotic species. The Lacey Act in its current form provides inadequate protection from exotic species.

President Carter's Executive Order, in 1977, urged restricted introductions with cooperation of local and state governments. The procedures were never finished and the promise of this order disappeared.

The Aquatic Nuisance Prevention and Control Act, passed in 1990, offers help for controlling the spread of nuisance aquatic species. Although it does not help "terrestrial" nuisances, the act establishes a federal task force and calls for regulations on ballast water treatment, development of an aquatic nuisance species program, and establishment of a process for states to receive grants to implement state management plans.

## Categories of Threat and Ranking of Species

The task force took this mandate very seriously to avoid maligning plants that do not pose an ecological threat to Minnesota. A statewide survey was conducted to identify potential threats. The rankings were then reviewed by an interdisciplinary group before finalizing the list of existing harmful exotic species as well as the list of potentially harmful exotic species. The exotic species were ranked as to their degree of threat. The task force identified: 39 species of severe future threat, 42 of moderate future threat, 32 of minimal future threat, 13 of unknown future threat were identified. Also, 27 species that have not yet been introduced were identified as potential threats.

## **Long Term Management**

The task force suggests that a statewide harmful exotic species plan must be put in place as quickly as practicable to protect our state's natural resources. A coordinating program should be based in the DNR where it could be merged with existing DNR exotic species programs. An interagency committee and a private sector advisory committee should help guide the program. A state process must be established to evaluate and review each intentional introduction that could be ecologically harmful.

The management plan should address:

- Regulation of new introductions,
- Detection and prevention of accidental introductions,
- Investigation of control methods,
- Implementation of control on public lands and waters,
- Technical assistance to private landowners for control of ecologically harmful exotics,
- Collecting and distributing information among and to the public and private sectors.

## **Recommendations and Policy Changes**

Beyond creating a statewide program and interagency committee, the following recommendations are made:

- Establish a uniform review process for intentional introductions
- Designate certain plant species as noxious weeds that require continuous control and eradication efforts
- Designate certain species as either nuisance plants and animals to prohibit their sale and propagation, but not require control (i.e., Tatarian honeysuckle and carp),
- Create a list of injurious species that should not be allowed in the state and would require immediate eradication if introduced (i.e. water chestnut, Asian raccoon dog)
- Create a list of species that are approved for use or propagation by agencies or the private sector (i.e. ringneck pheasant, rainbow trout, Colorado blue spruce),

Funding for state actions could be derived from several new sources or a combination of sources:

- Establish a tax on the sale of nursery products such as exotic trees, shrubs, and flowers,
- Establish a surcharge on trailer licenses,
- Fund the state actions from the general fund because harmful exotics affect all segments of the populations,
- Establish a ballast or other tax on Great Lakes ships,
- Seek federal aid available through the federal 1990 Aquatic Nuisance Act,
- Apply the \$2 surcharge on boat licenses to all boats.

# Exotic Species Issues Narrative

## **Background**

We are in the midst of a quiet environmental crisis. This time the threat isn't wetland drainage or bioaccumulating pesticides, but new foreign plants and animals that are slowly infiltrating and changing our ecosystems. Many introduced species are more aggressive than native species and take over native habitats. They pose increasing threats to our lakes, parks, wildlife areas, roadsides, agricultural lands, and our nation's ecological balance.

Invasive species are widespread. Often we are not aware of the introduced species invasiveness until it is too late. In Minnesota, 20% of all the noncultivated plant species are exotics. Other states have even higher percentages: 26% of aquatic plants in Florida (Schmitz 1990) and 29% of noncultivated plants in Illinois (Schwegman 1988). Pipestone National Monument in southwestern Minnesota has 78 different foreign plants in its prairie landscape (Pestana 1985). The Duluth harbor area, in northeastern Minnesota, has had the ruffe, white perch, European water flea, and zebra mussel introduced since 1986.

Occasionally species are intentionally introduced to solve some local or regional problem. However, if the broad-scale consequences of an introduction are not considered, it may ultimately cause more problems than it solves. This scenario has been referred to as the "Frankenstein Effect" (Moyle et.al.).

## **Fiscal Impacts**

In addition to the ecological consequences of harmful exotic species, their control is expensive. The cost of some control in Minnesota has been significant: \$300,000 to remove carp from one lake system, \$263,000 per year to manage Eurasian water milfoil on Lake Minnetonka (Strommen 1991), and over \$500,000 since 1987 to control the spread of purple loosestrife.

Since 1980, Florida, which may be the state most affected by nuisance aquatic species, has spent over \$112 million to control invasive species introduced to its wetlands and waterways (Schmitz 1990). And the zebra mussel has caused millions of dollars of damage in the Great Lakes states since 1988. The anticipated annual cost to control zebra mussels in the Great Lakes is between \$100 million and \$500 million (Sea Grant Great Lakes Network).

## **Resource Management Implications**

Harmful exotic species add a new dimension to the field of biological conservation. Resource managers must face questions such as, Is it worthwhile to save a prairie that may soon be a field of foreign leafy spurge? and, How can we manage waterfowl habitat, if during a drawdown period that promotes beneficial vegetation, the invasive purple loosestrife begins to replace the cattail and bulrushes?

Resource management responsibilities also increase because of exotic species. Fish and wildlife managers are faced with new responsibilities to protect nautal ecosystems and must spend time and money controlling exotic species that would normally be spent managing native fish and wildlife populations.

## Sources of Introductions

Human actions, intentional or accidental, are the main source of invasive species introductions. Potentially, any plant or animal species from places outside of Minnesota presents risks to our ecosystems. The pet industry, bait dealers, recreational boating, biological supply houses, bird seed importation, grain shipments, horticultural introductions, and international shipping can all bring exotic species to Minnesota. The growth of the international economy and increased trade in plants and animals have resulted in more and more accidental and deliberate releases of non-native species.

Accidental introductions of exotic species date back to the first shipping between Europe and North America. Rock, sand and soil ballast that contained European seeds was carried to North America and dumped in eastern seaports (Thompson 1987). Ballast-borne introductions continue today. Over 150 species of algae and 56 invertebrate species were found in ballast waters of 55 ships sampled in 1981 (Bio-Environmental Services, Ltd. 1981). Each species numbered from 10,000 to 10 billion individuals, an ample number for starting new populations. Many of these species are marine, but we can expect some to become problems as they survive and adapt to fresh water conditions. All of the previously mentioned foreign aquatic organisms in Duluth harbor were introduced by foreign ships.

Intentional introductions are also quite common. The English sparrow and the European carp are well known examples to Minnesotans. These species and others are here thanks to various "Acclimatization Societies" organized in the 1800s to bring us "better" fish and wildlife (Laycock 1966). Conservation agencies have been involved as well. Various state and federal agencies have intentionally released exotics to increase the diversity of hunting and fishing opportunities. In Minnesota, most of these introductions have not created problems.

The Japanese kudzu vine, now known as the "scourge of the south," was introduced and planted for livestock forage and erosion control. The Soil Conservation Service planted about 73 million kudzu seedlings in 1935 (Watson 1989). Several decades and hundreds of thousands of infested acres later, it was apparent that the introduction was an enormous mistake.

Nationwide, state conservation agencies and the horticulture industry have also introduced non-native sources (genotypes) of native trees, shrubs, fish and other species. These non-Minnesota populations bring in new genetic stock, which could be harmful to native populations. Non-Minnesota genotypes of native species should be considered exotics because of this potential problem. The introduction of native species beyond their historical range could also be called an exotic introduction.

There are several examples of horticultural introductions that went awry. The beautiful purple loosestrife plant was sold and planted throughout Minnesota until 1987 under the premise that its horticultural varieties were sterile. Current research shows that to be untrue. Although numerous states ban its sale and declare it a noxious weed, loosestrife still is sold in parts of the United States.

Alder buckthorn and tatarian honeysuckle are two additional invasive horticulture plants sold in Minnesota. These shrubs are commonly planted in residential areas and as windbreaks, where their berries are consumed by birds who carry seeds to new locations.

Another issue in Minnesota is the importation of exotic wild animals such as zebra, llamas, silver pheasants, and sika deer. Exotic animal sales of these and many other species occur across the country including Minnesota. The importation of wild pigs is of particular concern. This species has not yet escaped into the wild. However, it is being imported from southern states into Minnesota for private hunting preserves. Wherever wild pigs have been introduced (e.g. North Carolina, California, and Hawaii) they have caused extensive environmental damage. If accidentally introduced into the wild in Minnesota, they could cause ecological problems and also spread diseases to domestic and wild animals.

### **Invasive Characteristics**

Certain exotic species can be harmful, or invasive, because they have been introduced to ecosystems that have evolved without that particular species. Purple loosestrife for example, has no predators in North America, but in its European home over 100 insects keep it suppressed.

Invasive exotic species might have physiological tolerances that make them preadapted to new ecosystems. Foreign fish species like carp may be successful because they are tolerant of oxygen or temperature conditions that native species cannot tolerate. Other advantages, such as longer growth periods in spring and fall, are used by exotics such as buckthorn and honeysuckle. For example, if you look at an oakwoods in eastern Minnesota or Wisconsin during November, you'll see the green of non-native understory shrubs long after the other native shrubs have lost their leaves. This is one competitive edge that allows these exotic species to outcompete native understory shrubs such as grey dogwood and Juneberry.

### **Biodiversity**

Because some introduced species have a competitive edge over native plants and animals, the result can be a population explosion. Over time this may lead to a reduction of biological diversity in the affected ecosystem. As aggressive invasive species take hold, fewer native species can compete. Many wetlands choked with purple loosestrife have few other species. In parts of Florida the exotic swamp tea tree has reduced plant diversity 60 to 80 percent. Eurasian milfoil can severely reduce biodiversity in littoral areas of lakes and rivers by shading out the native aquatic plants used by fish and waterfowl(Lathrop1989).

# Review of Existing Exotic Species Regulations

## **Regulations and Strategies**

There are a number of different state and federal regulations, enforced by several agencies, to prevent the introduction and spread of exotic species. However, only a fraction of those regulations pertain to ecologically harmful exotic species. State and federal regulations regarding ecologically harmful exotic species are inconsistent, often weakly enforced and as a result inadequate.

The primary preventative exotic species regulations are focused on non-ecological problems. The regulations and programs aimed at ecological problems are often reactive and aimed at one species at a time. The use of a "dirty list" of species that are restricted or banned is common. The problem with using solely a dirty or injurious list approach to control exotics is it doesn't prevent new introductions. For example, a nursery could import potential harmful plants as long as they weren't on a injurious list. If species are added to a dirty or injurious list prior to introduction, it may place the burden of proving that a species is harmful to the environment on the implementing agencies rather than on the importer.

In Minnesota two exotic species, purple loosestrife and Eurasian milfoil, have been the focus of state legislation created to prevent their continued spread. Purple loosestrife has been added to the state noxious weed list which prohibits its transportation and sale. Eurasian milfoil and other milfoils are illegal to transport on a road or highway. The legislation for both of these species creates state programs within the Department of Natural Resources to promote public awareness, inventory, conduct research and control these exotic plants.

Soon after these programs were created, several new ecologically harmful exotics were discovered in Minnesota. It then became obvious to those working to stop the spread of foreign species that responding to each new discovery of a harmful species, with new legislation and a new program, wouldn't provide a long-term solution to protect the state's resources. What was needed was a plan to address all exotics, changes in the laws that provide closer monitoring of new introductions, and coordination among all state and federal agencies that control non-native species.

## State Regulations:

### Department of Natural Resources

The DNR runs two statutorily created programs for controlling the spread of purple loosestrife and Eurasian milfoil. The legislation for both of these species creates state programs within the Department of Natural Resources to promote public awareness, inventory, conduct research and control these exotic plants. The purple loosestrife program is carried out in coordination with the Minnesota Department of Agriculture, MnDOT, and federal agencies.

The enabling legislation reads:

*84.966 Subd. 2. Establishment of a control program. The commissioner of natural resources shall coordinate a control program to curb the growth of purple loosestrife. The commissioners of agriculture and transportation must aid and cooperate with the commissioner of natural resources to establish, implement, and enforce the control program.*

The milfoil program directives are:

*Subd. 2. INVENTORY. The commissioner shall publish and distribute informational materials to lakeshore owners and boaters on the control problems of water milfoil.*

*Subd. 3 MANAGEMENT. The commissioner shall coordinate a control program to manage the growth of Eurasian milfoil with appropriate local units of government, special purpose districts, and lakeshore associations. Technical assistance may be provided by the commissioner upon request.*

*Subd. 4. RESEARCH. The commissioner shall initiate cooperative research with the freshwater Foundation and the University of Minnesota freshwater biological institute to study the use of non chemical methods, including biological control agents, for control of Eurasian water milfoil.*

In 1990, the transportation of milfoil species on roads was prohibited by an addition to the noxious weed statutes. But Eurasian water milfoil is not part of the noxious weed program and enforcement of the statute is through conservation officers and peace officers rather than county agricultural inspectors as is the case with noxious weeds. It is this type of circumstance that calls for a new category of undesirable plants and animals that should not be transported, sold, or propagated.

Several Department of Natural Resources exotic regulations are written as Commissioner's Orders, using the Commissioner's general powers statute. This includes the Commissioner's authority to do "all things the Commissioners determine are necessary to preserve, protect and propagate desirable species of wild animals." This is very broad authority that allows for the development of Commissioner's Orders. However, it is not specific authority to regulate exotic species. The DNR needs clearer authority to effectively regulate and especially to prevent harmful exotic species introductions.

#### DNR Statutes and Commissioners Orders

Commissioner — General Powers and Duties

(97A.045)

Transportation of Carp Fingerlings

(97C.521)

Eurasian water milfoil Education and Management	(103G.617)
Control of Purple Loosestrife	(84.966)
Eurasian or Northern water milfoil	(18.317)
Regulation and prohibiting European Rabbits and Nutria	(DNR C.O. 1516)
Regulation of Live Wild Turkeys	(DNR C.O. 1920)
Taking of Smelt	(DNR C.O. 1969)
Regulation Prohibiting Finn Raccoons	(DNR C.O. 2149)
Regulation of Aquatic Plants and Invertebrates	(DNR C.O. 2210)
Purple Loosestrife — Aquatic Nuisance Control Permits	(DNR C.O. 2244)
Regulations for Importation of Fish Eggs and Live Fish	(DNR C.O. 2329)
Regulations Prohibiting White Perch and River Ruffe	(DNR C.O. 2331)
Regulations of Freshwater Crayfish	(DNR C.O. 2338)

Several of these orders could be replaced if new plant and animal designations and rules were established to protect against harmful exotic species.

The DNR also regulates game farms and shooting preserves. Presently the regulations pertaining to game farms and shooting preserves do not apply to raising and importating exotic animals except the pheasant and chukar partridge. This gap in regulations needs to be covered by new or clearer regulations.

### **Minnesota Department of Agriculture**

Minnesota Noxious Weed Law	(18.171 to 18.323)
Penalty for sale of purple loosestrife	(18.182)
Minnesota Noxious Weed Rules	(1505.0730 to 1505.0760)
Minnesota Seed Law	(21.80 to 21.92)
Minnesota Seed Rules	(1510.0020 to 1510.0360)

These laws allow for the restriction and prohibition of the transportation, propagation, and the distribution of noxious weeds and other exotic weed species. Historically, the laws are enforceable, but the enforcement levels are not able to keep up with the expansive list of species. One of the problems implementing the noxious weed law to control exotic species is the reluctance of state and local government to fund long-term control and inspection.

The primary focus of the noxious weed law has been agricultural pests:

#### *MS 18.171 Noxious weed definitions*

*Subd. Noxious weeds. "Noxious weeds" means the annual, biennial, and perennial plants which are deemed by the commissioner, by the commissioner's order, to be injurious to public health, public roads, crops, livestock and other property.*

In 1987, purple loosestrife was the first species added primarily for ecological reasons. Later, in 1989, other cultivars and species of purple loosestrife were added to the state noxious weed list by commissioner's order. The Department of Agriculture has proposed revisions to the noxious weed law. One revision would help allow species of plants that are injurious to the environment to be eligible to become noxious weeds.



## Other state Agencies

Other state agencies are responsible for protecting human health and domestic animal health from exotic species and diseases, but are not directly concerned about regulating ecological threats. Since there are many reasons for controlling exotics (even for an individual species), such as protection of ecological systems, domestic animals, domestic crops, human health, it is essential for all agencies to cooperate with each other to regulate and stop the spread of harmful foreign species. The Board of Animal Health is one agency that has regulatory authority over importation to protect domestic animal health.

### Minnesota Board of Animal Health

Importation of Swine

(1700.2590 to 1700.3010)

Importation of Bison and Elk

(1700.4800)

## Other States

It does not appear that any states have adopted comprehensive regulations addressing ecologically harmful plants and animals. However, many other states have acted to reduce the spread of certain harmful exotic species. The following are a few examples:

Illinois has enacted the Exotic Weed Act, to prohibit selling and planting exotic species that "*when planted either spread vegetatively or naturalize and degrade natural communities, reduce the value of fish and wildlife habitat, or threaten an Illinois endangered or threatened species*" (IL Conservation Law Chapter 5, 932. Definition). The act exempts species that can be demonstrated by published or current research to not be an exotic weed as defined by the act. The state of Illinois also controls the introduction of species through aquaculture through the use of an official list of animal species that can be used for aquaculture.

Wisconsin established a Nuisance weed classification by statute that reads, "*no person may sell, offer for sale, distribute, plant or cultivate any nuisance weeds or seeds thereof*". Purple loosestrife and multiflora rose are listed in this category. (1987 Wisconsin Act 41)

The state of Florida has a strong statute regarding noxious aquatic plants. The following are partial excerpts:

*No person shall import, transport, cultivate, collect, sell, or possess of any noxious aquatic plant listed on the prohibited aquatic plant list established by the department [of Natural Resources] ...*

*The department has the following powers:*

*(a) To make such rules governing the importation, transportation...*

*(b) To establish by rule lists of aquatic plant species regulated under this section, including those exempted from such regulation, provided the Department of Agriculture and Consumer Services, and the Game and Fresh Water Fish Commission approve such lists prior to the lists becoming effective.*

The 1990 Florida Legislature also enacted a law that prohibits the sale or transport of four harmful exotic plants: melaleuca, Brazilian pepper, two species of Australian pine, and *Mimosa pigra*.

## Federal Regulations:

### **Lacy Act**

In 1900, Congress responded to a wave of introductions by restricting the importation of several exotic species through the Lacy Act. In its original form, the Lacey Act helped states regulate interstate commerce of certain wildlife by restricting the importation of mongooses, fruit bats, English sparrows, starlings, and other birds or animals as the Secretary of Agriculture may from time to time declare injurious to the interest of agriculture or horticulture. Unfortunately, even with its subsequent amendments, the Lacy Act does not provide adequate protection for United States Ecosystems today (Kurdila 1988).

### **50 CFR - Part 16 Injurious Wildlife**

Includes restrictions on importation, transportation, acquisition of "flying fox", mongoose, European rabbit, raccoon dog, etc.

### **Executive Order 11987**

President Carter realizing the need for uniform introduction procedures, created Executive Order 11987 in 1977. This has been the federal government's only attempt to directly regulate exotic introduction into the United States. The order directed executive agencies to restrict the introduction of exotic species into ecosystems that the agencies regulate, and urged the agencies to persuade local and state governments to do the same. Unfortunately the procedures were never completed and the potential of this executive order slowly diminished.

### **Plant Quarantine Act of 1912**

The Plant Quarantine Act of 1912 (1990 version did not pass) allows for quarantines that restrict and prohibit the entry of host plants, plant parts, and products in order to protect U.S. crops from specific plant pests and pathogens.

### **Federal Plant Pest Act (FPPA)**

This act regulates the entry of any organism that can directly or indirectly injure or cause disease in plants. This act also regulates any article or means of conveyance that could carry pests. Other provisions of this Act give authority for emergency action and for issuing regulation necessary to prevent the pests' spread.

### **Federal Seed Act (FSA)**

This act restricts the entry of agricultural and vegetable seed to ensure seed purity, and that the seed is free from noxious weed seed as defined by the FSA.

### **Federal Noxious Seed Act (FNSEA)**

This act restricts the entry and movement of weeds that are determined to be harmful to irrigation, navigation, fish and wildlife resources, or the public health. 7 CFR 360 lists those weeds which are considered noxious.

### **Title 9 CFR**

Part 92 regulates the importation of animals, poultry, pet birds, and animal semen. Part 94 regulates the importation of meat, milk, and milk products of ruminants, swine, meat and eggs of poultry, organs, glands, and regulated garbage.

## **Nonindigineous Aquatic Nuisance Prevention and Control Act**

The Nonindigineous Aquatic Nuisance Prevention and Control Act of 1990 was passed by Congress to prevent unintentional introductions of exotic species from ballast water of ships, establish a federal Aquatic Nuisance Species Task Force, provide grants for research, provide technical assistance to states and local governments, establish an aquatic nuisance educational program through the state Sea Grant network, and provide grants to states with appropriate management plans.

## **Problems and Gates in Federal Regulations**

There appear to be many faults in federal regulations that allow ecologically harmful species to be introduced and dispersed. One of the issues that the task force recognized were the "gates" or loopholes in regulations. The Lacey Act has this example:

"... and this act shall not restrict importations by federal agencies for their own use."

The federal Noxious weed act is not broad enough or enforced adequately to protect against ecologically harmful species. These problems exist with the federal noxious weed law:

- Although it is illegal under the federal noxious weed law, the sale of federal noxious weeds from state to state still occurs primarily because of enforcement problems.
- Many invasive species are not eligible for designation as federal noxious weeds because to criteria are too restrictive.
- Presently, it is very difficult to add new species to the federal noxious weed list. Inclusion should be made simpler.
- Finally, there is no permanent funding to the state, federal, or local authorities for controlling harmful exotic species.

## Categories of Threat and Ranking of Species

The task force, by its legislative mandate, is responsible for ranking the threats of non-native species already present in Minnesota (existing) and species that could become ecological threats in Minnesota (potential introductions).

The task force's process of identifying and ranking the threats of each species involved three steps.

- 1) Conducted a survey of resource managers throughout the state to identify problem species and subjective ranks of their threats (See appendix E).
- 2) Developed an objective ranking process and applied it to certain individual species (It is included as appendix F and G for future use evaluating species.).
- 3) Submitted the lists of species to an interdisciplinary group of experts for review of the current and future degree of threat.

The survey was distributed to state and federal fish and wildlife managers, state and national parks staff, county agricultural inspectors, soil and water conservation district officials, and other interested individuals. The responses to the survey were entered into a database and edited to create lists of existing and potentially harmful exotic species in this report.

The following categories and definitions are the basis for the task force's ranking of each specie's degree of environmental threat.

<u>Rank</u>	<u>Definition</u>
Minimal	Species has <u>some</u> characteristics of invasive species, but species is not known to be a significant threat to native species.
Moderate	Species shows invasive behavior, is known to impact native species, (or) has a wide distribution and statewide abundance.
Severe	Possesses all the characters of an invasive species and is known to have significant negative impacts on native species; and is, or could become, widely distributed.
Unknown	Not enough is known about the traits of this species to assess its invasiveness, ecological impacts, and possible distribution.

The rankings assigned by the task force on the following pages often reflect personal observations of qualified individuals and experiences of other states. The rankings should be reviewed periodically by an interdisciplinary group and revised as new information becomes available.

# EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "SEVERE"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
<b><u>Animals</u></b>			
Grass carp	<i>Ctenopharyngodon idella</i>	eliminates native vegetation and destroys fish habitat	unknown
Common carp	<i>Cyprinus carpio</i>	degrades emergent beds, increases phosphorus cycling, muddies water and destroys natural habitat	severe
Zebra mussel	<i>Dreissena polymorpha</i>	Extensive colonization of littoral zone may displace native mussels and will modify food chain.	minimal
Ruffe	<i>Gymnocephalus cernua</i>	may be a threat to native fish communities	moderate
Rusty crayfish	<i>Orconectes rusticus</i>	destroys aquatic vegetation, consume gamefish eggs; too aggressive for good forage, displaces native varieties	moderate
Sea Lamprey	<i>Petromyzon marinus</i>	catastrophic impact on native species such as white fishes, suckers, and lake trout.	severe
<b><u>Plants</u></b>			
Quackgrass	<i>Agropyron repens</i>	Rapidly invades native prairie grassland, extremely hard to eradicate	severe
Garlic mustard	<i>Alliaria officianalis</i>	Displaces native species	moderate
Smooth brome	<i>Bromus inermis</i>	grows earlier and later than the native prairie plants, therefore, it can successfully invade native prairie	severe
Downy brome	<i>Bromus tectorum</i>	Invades native prairie and grasslands	moderate
Eurasian flowering rush	<i>Butomus umbellatus</i>	Wide range of ecol. tolerances. Can aggressively displace riparian vegetaion by seeds and bulblets.	minimal
Caragana	<i>Caragana spp.</i>	Fast spreading shrub which out competes native shrubs - invades grasslands where shrubs are unwanted	moderate
Musk thistle	<i>Carduus nutans</i>	Invades disturbed areas, especially grazed prairie	moderate
Spotted knapweed	<i>Centaurea maculosa</i>	Aggressive alleopathic species, difficult to control, thrives in dry weather. Displaces native species in dry areas.	moderate
Ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	May displace native plant species, difficult to control	moderate
Canada thistle	<i>Cirsium arvense</i>	Invades native grasslands and woodlands	severe
Crown vetch	<i>Coronilla tectorum</i>	Beginning to spread from the roadsides where it was planted, will out compete most native plants	moderate
Queen Anne's lace	<i>Daucus carota</i>	Can become a dense roadside forb. Invades low quality or disturbed prairies and old pastures	moderate
Russian olive	<i>Eleagnus angustifolia</i>	Encroaches and shades out native vegetation such as riverbanks and native prairie	moderate

## EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "SEVERE"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
Leafy spurge	<i>Euphorbia esula</i>	aggressively displaces native species, difficult to control, does not serve same function as natives displaced.	severe
Yellow locust (Honey locust)	<i>Gleditsia triacanthos</i>	Invades openings. Competes with grasses & several hardwoods	moderate
Tartarian honeysuckle	<i>Lonicera tatarica</i>	Displaces native species in woodlands and prairies, can dominate the understory of oak woods	severe
Bird's foot trefoil	<i>Lotus corniculatus</i>	Agressive, monotypic, invades native grasslands. Forms a dense mat difficult for young precocial birds to walk in.	moderate
Purple loosestrife	<i>Lythrum salicaria</i>	It aggressively crowds out emergent wetland vegetation required by wildlife and invades wet praires.	severe
White sweet clover	<i>Melilotus alba</i>	Establishes itself readily in native grasslands	severe
Yellow sweet clover	<i>Melilotus officinalis</i>	Establishes itself readily in native grasslands	severe
Eurasian water milfoil	<i>Myriophyllum spicatum</i>	Displaces native aquatic plants, reduces plant diversity, may harm fish habitat, can degrade waterfowl lakes	moderate
Watercress	<i>Nasturtium officinale</i>	Displaces native plant species in streams	moderate
Wild parsnip	<i>Pastinaca sativa</i>	Displaces native plant species	severe
Reed canary grass	<i>Phalaris arundinacea</i>	Very aggressive, outcompetes native flora and forming dense monotypes.	severe
Canada bluegrass	<i>Poa compressa</i>	Overtakes and completely dominates thin soil hot and dry prairie sites. Forms pure stands	moderate
Kentucky bluegrass	<i>Poa pratensis</i>	It can successfully establish itself in native prairie and displace native warm season species.	severe
Curly-leaf pondweed	<i>Potamogeton crispus</i>	Outcompetes native species, can create dense monotypic stands difficult to boat through.	severe
Common buckthorn	<i>Rhamnus cathartica</i>	Displaces native understory shrubs - invades prairies, wetlands and grasslands	severe
Alder (tallhedge) buckthorn	<i>Rhamnus frangula</i>	takes over shrub layer, shades out herbaceous species, meadows and fern.	moderate
Black locust	<i>Robinia pseudoacacia</i>	Outcompetes native species, persistent, forms monotype communities.	moderate
Siberian elm	<i>Ulmus pumila</i>	grassland invader that adversely impacts native grassland plant communities.	moderate
Hairy vetch	<i>Vicia villosa</i>	aggressive climber over prairie species; sandy soils	moderate

# EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "MODERATE"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
<b><u>Animals</u></b>			
European waterflea	<i>Bythotrephes cederstroemi</i>	feeds on native zooplankton	unknown
House finch	<i>Carpodacus mexicanus</i>	displaces native cavity nesting birds such as the bluebird	unknown
European needle-bending midge	<i>Contarinia baeri</i>	attacks needle bases of red pine and scotch pine needles causing defoliation	unknown
Asiatic clam	<i>Corbicula fluminea</i>	Moving slowly up the Mississippi River basin, reproduces rapidly and displaces native mussels	minimal
Willow and Poplar borer	<i>Cryptorhynchus lapathi</i>	bores into stems of young aspen and willows	moderate
Mute swan	<i>Cygnus olar</i>	disrupts nesting of native waterfowl, possible threat to trumpeter swans	minimal
Birch leaf miner	<i>Fenusa pusilla</i>	defoliates birch trees, weakens trees to permit attack by bronze birch borer	moderate
White perch	<i>Morone americana</i>	inter-specific competition with native species	minimal
House sparrow	<i>Passer domesticus</i>	displace native cavity nesting birds such as the bluebird	moderate
Elm leaf beetle	<i>Pyrrhalta luteola</i>	defoliates elm making tree more vulnerable to Dutch elm disease	moderate
European pine shootmoth	<i>Rhyacionia buoliana</i>	Deforms native red pine, no mortality	minimal
Smaller European elm bark beetle	<i>Scolytos multistriatus</i>	This is a major vector of dutch elm disease in southern 2/3 of MN. This threat is reducing since little elm is left.	moderate
Starling	<i>Sturnus vulgaris</i>	harasses other birds and carry disease, serious competition to cavity nesters	moderate
Introduced basswood thrips	<i>Thrips calcaratus</i>		moderate
<b><u>Plants</u></b>			
Amur maple	<i>Acer ginnala</i>	shades out prairie plants-stump sprouts-is invasive	minimal
Redtop	<i>Agrostis stolonifera</i>	Invades native grasslands when disturbed	minimal
Common burdock	<i>Arctium minus</i>	colonizes in grazed woodlands and other habitats	moderate
Common wormwood	<i>Artemisia absinthium</i>	Invades disturbed areas, takes over pasture land	moderate
Asparagus	<i>Asparagus officinalis</i>	Invades native grassland and prairie	minimal
Hoary alyssum	<i>Berteroa incana</i>	Displaces native species, particularly in dry prairie and sand blowouts	moderate
Japanese brome	<i>Bromus japonicus</i>	Invades native prairie	moderate

## EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "MODERATE"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
Plumelèss thistle	<i>Carduus acanthoides</i>	Invades disturbed areas, aggressive biennial, dominates in as little as three years. Somewhat difficult to control. l	moderate
Chicory	<i>Chichorium intybus</i>	May displace native plant species	minimal
Field bindweed (creeping jenny)	<i>Convolvulus arvensis</i>	Displaces desirable native plant species, difficult to control	minimal
Hawksbeard	<i>Crepis tectorum</i>	invades all habitat types	minimal
Cypress spurge	<i>Euphorbia cyparissias</i>		minimal
Creeping Charlie (ground ivy)	<i>Glechoma hederacea</i>	Chokes out other herbaceous plants and grasses	moderate
Dame's rocket	<i>Hesperis matronalis</i>	Invades disturbed areas and native grasslands	minimal
Orange hawkweed	<i>Hieracium aurantiacum</i>	Very competitive, spreads rapidly, difficult to control-crowds out desirable vegetation in grasslands.	minimal
Kochia (tumble weed)	<i>Kochia scoparia</i>	Tends to dominate and out compete newly seeded grass and legume species the first year. Diminish after year or	moderate
Motherwort	<i>Leonurus cardiaca</i>	Invades forest edges, floodplain forests and grazed woodlands	minimal
Butter and eggs (toadflax)	<i>Linaria vulgaris</i>	Invades native grassland	minimal
Common forget-me-not	<i>Myosotis scorpioides</i>	invades spring feed streams like watercress	minimal
Silver poplar	<i>Populus alba</i>	It tends to sucker very badly and displace more desirable native species, invades oak savannas	minimal
Tall buttercup	<i>Ranunculus acris</i>	Seems more prevalent in older fields not tilled for 3-5 years; invades prairies and woodlands	moderate
Red sorrel	<i>Rumex acetosella</i>	Native prairie invader	minimal
Bittersweet nightshade	<i>Solanum dulcamara</i>	invades native habitats:forested wetlands and upland edges	minimal
Perennial sowthistle	<i>Sonchus arvensis</i>	invades and degrades wet prairie	minimal
Giant chickweed	<i>Stellaria aquatica</i>	common in forested wetlands	minimal
White clover	<i>Trifolium repens</i>	invades grasslands	minimal
Stinging nettle	<i>Urtica dioica (not v. gracilis)</i>		minimal
Common mullein	<i>Verbascum thapsis</i>	aggressive component of old pastures, invades disturbed areas	minimal



## EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "MINIMAL"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
<b>Animals</b>			
Birch casebearer	<i>Coleophora serratella</i>	defoliates birch trees	unknown
Larch casebearer	<i>Coleophora laricella</i>	feeds on tamarack needles	minimal
Introduced pine sawfly	<i>Diprion similis</i>	defoliates white pine, causes some tree mortality	minimal
European spruce sawfly	<i>Gilpinia fruetorum</i>	It may be a future threat but has been non-existent the past 10- 20 years.	minimal
European fruit lecaniumetle	<i>Lecanium cornisi colora</i>	no threat reported	minimal
European pine sawfly	<i>Neodiprion sertifer</i>	can kill red pine	minimal
Rainbow trout	<i>Oncorhynchus mykiss</i>	compete with native brook trout	minimal
Ringneck pheasant	<i>Phasianus colchicus</i>	restricts prairie chicken range and other native species through aggression, habitat competition, nest parasitism.	minimal
Mountain ash sawfly	<i>Pristiphora geniculata</i>	Defoliates naturally established and planted mountain ash - a bird food plant	minimal
European pine shootmoth	<i>Rhyacionia buoliana</i>	Minimal threat since it can't survive cold weather. It is rare outside SE Wisconsin.	minimal
Brown trout	<i>Salmo trutta</i>	competes with brook trout and excludes them from some locations	minimal
Introduced basswood thrips	<i>Thrips calcaratus</i>	Defoliates basswood. Potential for tree mortality but not confirmed	unknown
<b>Plants</b>			
Crested wheatgrass	<i>Agropyron cristatum</i>	Establishes itself in disturbed sites	minimal
Wild mustard	<i>Brassica kaber</i>	Establishes itself in disturbed areas, both agricultural and non-agricultural	minimal
Creeping bellflower	<i>Campanula rapunculoides</i>	Invades grasslands, a problem in Manitoba	minimal
Mouse-ear chickweed	<i>Cerastium vulgatum</i>		minimal
Lamb's quarters	<i>Chenopodium album</i>	found in disturbed sites but apparently not invasive	minimal
Bull thistle	<i>Cirsium vulgare</i>	Invades native grasslands and woodlands	minimal
Deptford pink	<i>Dianthus armeria</i>	Invades native grassland	minimal
Crab grasses	<i>Digitaria sp.</i>	Invades native grassland	minimal

# EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "MINIMAL"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
Hemp nettle	<i>Galeopsis tetrahit</i>	displaces native vegetation in woodlands	minimal
St. John's wort	<i>Hypericum perforatum</i>	in disturbed sandy soils	minimal
European stickseed	<i>Lappula echinata</i>	Invades native grasslands with grazing disturbance	minimal
Corn gromwell	<i>Lithospermum arvense</i>	Establishes itself in prairie wetland	minimal
Timothy	<i>Phleum pratense</i>	Invades native grasslands, but is not very persistent	minimal
Silvery cinquefoil	<i>Potentilla argentea</i>	Invades disturbed sandy prairie, but primarily a garden weed	minimal
Sulphur cinquefoil	<i>Potentilla recta</i>	common in old fields, invade sandy prairies	minimal
Russian thistle	<i>Salsola iberica</i>	Establishes itself in disturbed areas, common in sandy soil; urban weed	minimal
Soapwort, Bouncing bet	<i>Saponaria officinalis</i>	does occur in native grasslands following disturbance	minimal
Dandelion	<i>Taraxacum officinale</i>	prolific and competitive, crowds out desirable and native species.	minimal
Goat's beard (Oyster plant)	<i>Tragopogon dubius</i>	found in 45 of 61 prairies remnants along lower St. Croix River (incl some WI prairies)	minimal
Goat's beard	<i>Tragopogon pratensis</i>		minimal
Red clover	<i>Trifolium pratense</i>	Invades grasslands	minimal

# EXOTIC SPECIES EXISTING IN MINNESOTA -- FUTURE THREAT RANKING OF "UNKNOWN"

COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL IMPACT	Current Degree of Threat
<b>Animals</b>			
Goldfish	<i>Carassius auratus</i>	similar affects as carp - competition with game fish is the main concern	minimal
European spruce needleminer	<i>Epinotia nanana</i>	defoliate spruce trees by mining needles, mostly saplings	unknown
Pink salmon	<i>Oncorhynchus gorbuscha</i>	may impact lower level food chain through competition	minimal
Coho salmon	<i>Oncorhynchus kisutch</i>	may compete with native brook trout	minimal
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	may be competing with native lake trout for food	unknown
Smelt	<i>Osmerus mordax</i>	affect growth rates & recruitmnt of lake trout, lake herring (cisco), walleye, burbot, & in particular lake, whitefish	minimal
Atlantic salmon	<i>Salmo salar sebago</i>	unknown	unknown
<b>Plants</b>			
Annual grass	<i>Brachiana erucaeformis</i>		unknown
Foxglove	<i>Digitalis lanata</i>	Displaces native plant species	minimal
Hybrid aspen	<i>Populus</i>	None known, but we are concerened, has the potential to outgrow native aspen	unknown
Siouxland poplar	<i>Populus</i>	None known	unknown
Patience dock	<i>Rumex patientia</i>	common in E. MN; a new arrival	unknown
Tansy	<i>Tanacetum vulgare</i>	strong competitor for many herbs & grasses, threat to forest openings	minimal

# EXOTIC SPECIES POTENTIALLY HARMFUL TO THE ENVIRONMENT\*

\* These species are not known to exist in the wild in Minnesota as of January 1, 1991

SITES	COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL THREAT / COMMENT	DEGREE OF THREAT
<b>ANIMALS</b>				
Terrestrial	Balsam wooly Adelgid	<i>Adelges piceae</i>	now common in northeast U.S. and Canada	moderate
Terrestrial	Hemlock Wooly Adelgid	<i>Adelges tsugae</i>	first in U.S. 30 yrs ago in VA. Tree mortality possible within one year.	minimal
Terrestrial	Isopod, crustacean	<i>Asellus aquaticus</i>	It is pollution tolerant in Europe and could reproduce here.	minimal
Terrestrial	European goldfinch	<i>Carduelis carduelis</i>	No threats reported	unknown
Terrestrial	Fallow deer	<i>Dama dama</i>	Unknown. Suspect potential impact to white tailed deer.	minimal
Terrestrial	European spruce sawfly	<i>Diprion hercyniae</i>	Only potential now, parasites and virus now control it	minimal
Aquatic	Chinese mitten crab	<i>Eriocheir sinensis</i>	Unknown if it can reproduce in fresh water. It can in low salinity estuary. Can cause erosion on stream banks, consumes fish food, pest on commercial fish catches	moderate
Aquatic	White catfish	<i>Ictalurus catus</i>	Unknown	unknown
Terrestrial	Pear leaf blister moth	<i>Leucoptera malifoliella</i>	It defoliates trees. Hosts include plum, cherry, Alnus, Betula, Rosaceae families.	unknown
Terrestrial	Gypsy moth	<i>Lymantria dispar</i>	pest of hardwood trees, significant defoliation possible	severe
Terrestrial	Red pine Scale	<i>Matsucoccus resinosae</i>	It is found in NE U.S. and kills red pine. It is slowly expanding its range.	severe
Aquatic	Stripped bass/Hybrids	<i>Morone saxatilis</i> or any hybrid	May compete with native species and be carriers of "IPN".	minimal
Aquatic	Largemouth bass - Florida strain	<i>Micropterus salmoides floridans</i>	Genetic adulteration of native largemouth bass	unknown
Terrestrial	Monk parakeet	<i>Myiopsitta monachus</i>	Aggressive pest and could compete with native birds. Exists in Missouri; questionable if it could survive in Minnesota	minimal
Terrestrial	Asian raccoon dog	<i>Nyctereutes procyonoides</i>	Potential threat - competitive displacement of native spp. - predator on native spp.	severe
Terrestrial	European rabbit	<i>Oryctolagus cuniculus</i>	Unknown	unknown
Terrestrial	Sechuan pheasant	<i>Phasianus colchicus trauchi</i>	Possible competition to ruffed and/or sharptail grouse	moderate
Terrestrial	European snout beetle	<i>Phyllobius ablongus</i>	Defoliates sugar maple and other hardwoods in UP of Michigan and in Ontario, Canada	minimal

# EXOTIC SPECIES POTENTIALLY HARMFUL TO THE ENVIRONMENT\*

\* These species are not known to exist in the wild in Minnesota as of January 1, 1991

SITES	COMMON NAME	SCIENTIFIC NAME	ENVIRONMENTAL THREAT / COMMENT	DEGREE OF THREAT
Terrestrial	Imported willow leaf beetle	<i>Plagioder a versi color a</i>	No personal knowledge of this insect being in MN, but it is found throughout eastern USA and Canada.	minimal
Aquatic	Zander	<i>Stizostedion lucioperca</i>	may displace native walleye populations	moderate
Terrestrial	Wild boar/feral hog	<i>Sus scrofa</i>	Transmit disease to wild species, destroy critical habitats by uprooting native vegetation, compete with native wildlife	severe
Aquatic	Tilapia	<i>Tilapia sp.</i>	Potential threat that survives in heated effluent. May compete with native species.	minimal
<b>PLANTS</b>				
Terrestrial	Jack pine dwarf mistletoe	<i>Arceuthobium americanum</i>	Potential threat to Jack pine - known to be in Manitoba	severe
Aquatic	Cabamba	<i>Cabamba coroliniana</i>	A nuisance plant in the south, has been found in the wild in Michigan. Requirements not easily met here.	unknown
Terrestrial	Difuse knapweed	<i>Centaurea diffusa</i>	rapidly speading in eastern midwest states	severe
Terrestrial	Russian knapweed	<i>Centaurea repens</i>	Displaces natives in dry areas (drier than C. maculosa)	severe
Aquatic	Hydrilla	<i>Hydrilla vertialloti</i>	Probably worst aquatic weed. Dioecious form orginally found in Florida; survives in Potomac River, may not survive Minnesota climate	severe
Terrestrial	Japanese honeysuckle	<i>Lonicera japonica</i>	Displacement of native woodlands plant species, loss of native food plants	severe
Aquatic	Water primrose	<i>Ludwigia uryragensis</i>	Rhizomatous floating aquatic plant; forms floating mats along margins of water bodies. Grows far north as New York	unknown
Terrestrial	Larch needlecast	<i>Moria laricis</i>	Could cause problems for grassland nesting birds	moderate
Terrestrial	Multiflora rose	<i>Rosa multiflora</i>	Spreads aggressively in south, once planted for wildlife food and cover, now has become a pest elsewhere	moderate
Terrestrial	Sorgum alnum	<i>Sorgum alnum</i>	Threat to corn & soybean production, similar to Johnson grass	severe
Aquatic	Water chestnut	<i>Trapa nataus</i>	Perennial, floating leaf aquatic plant. Grows in ponds, lakes, slow moving streams forming impenetrable mats.	severe

## Long Term Management Plan

Minnesota has tremendous natural resources that have been harmed by some non-native species. Damage to the state's lakes and native fish, wildlife and plants in will continue to increase as more species are introduced. The State of Minnesota must be prepared to prevent and restrict potential introductions whether they are intentional or accidental and control or eradicate existing harmful non-native species.

A coordinated statewide exotic species management plan and program is needed to carry out the activities that will protect the state's resources. A statewide management plan should have these objectives:

- Monitor and regulate new intentional introductions in conjunction with other established review and permit processes,
- Coordinate the detection or prevention of accidental introductions,
- Investigate existing exotic species control methods and identify areas of need for research regarding new control methods,
- Coordinate control and eradication activities on public lands and waters,
- Oversee and provide advice for control and eradication on private land,
- Coordinate the gathering and dissemination of information among resource management agencies, educational institutions, conservation groups, and other organizations.
- Raise the public's awareness of the problems caused by harmful exotic species.

The interagency exotic species task force recommends that the DNR coordinate statewide exotic species programs because the agency is already monitoring and managing the state's fish, wildlife, native plants, nuisance aquatic plants such as purple loosestrife and Eurasian watermilfoil, and natural ecosystems in general. A DNR long term management coordinating program would allow for specialization by staff and economies of scale.

For a long term management plan to be effective, coordination and implementation of a state management plan must include other state and federal agencies that have authority and responsibility over exotic species. The Minnesota Department of Agriculture's Noxious weed program is an integral part of statewide harmful exotic species control and should be included in the statewide management plan. Agencies such as the USDA- APHIS, U.S. Fish and Wildlife Service, and U.S. Coast Guard, must be included in a coordinated exotic species management plan.

## Recommendations for Legislative and Policy Changes

### State Recommendations:

The State of Minnesota could and should do several things to strengthen control over the introduction and spread of harmful non-native species. These actions are listed below.

- Continue the task force as an Interagency Exotic Species Committee. (This would improve dialogue among agencies and mandate designated liaisons from each agency.)
- Create a private sector advisory committee and technical review panels to advise the committee.
- Adopt statewide policies limiting the use of exotic species (either through rulemaking or legislation).
- Adopt a statewide policy standardizing the control of harmful exotic species. (This would lead to consistent decision making regarding the control of new and established populations of harmful exotic species.)
- Establish a uniform review process for any proposed intentional introduction of a non-native species. (This process should apply to any introduction of the following: unnaturally occurring hybrids of native species, cultivars of native species, non-Minnesotan genotypes, genetically selected strains of native species, genetically engineered native species, or other genetically altered native species. The cost and responsibility for certifying that a potential introduction will not be ecologically harmful should be borne by the importer or breeder.)
- Provide authority for agencies to regulate exotic species that are, or have the potential to be, harmful to the environment or native plants and animals.
- Establish a statewide coordinating program for ecologically harmful exotic species within the Department of Natural Resources, and merge any new coordinating program with the existing species-specific exotic programs within the DNR, such as the purple loosestrife and Eurasian milfoil programs.
- Compile an official list of native Minnesota species of plants, animals and insects. (The task force, during its efforts to define native and exotic species, realized that there is no sole reference to Minnesota's native species. As this report was published a native plant list was at press but no list of native insects had been compiled. The task force believes native species should be documented so that in the future it will be clear what species are indigenous and which are not.)

- ☛ Establish a process and designate harmful exotic species already in Minnesota into one of the following categories (rulemaking or other process) :
  - a) **State Noxious Animals** that must not be sold, propagated, or transported and must be controlled or eradicated by the public and private sectors (e.g., rusty crayfish, mute swan)
  - b) **State Noxious Weeds** that must not be sold, propagated, or transported and must be controlled or eradicated by the public and private sectors per the existing noxious weed law (e.g., purple loosestrife and leafy spurge).
  - c) **Undesirable Non-native Plants and Animals** that must not be sold, propagated or transported, but don't require control (e.g., Tatarian honeysuckle, Eurasian milfoil and carp).
- ☛ Develop a Potentially Injurious exotic species list of species that may not be intentionally introduced into the state and would immediately be controlled or eradicated if introduced (i.e. water chestnut, wild boar).
- ☛ Create an approved list of species for use or propagation by agencies or the private sector (e.g. ringneck pheasant, rainbow trout). This would help address concerns of aquaculture, horticulture, the pet industry, game farms, and other commercial interests that use exotic species.

Due to the growing magnitude of the problem federal, state, and local programs that control and manage harmful exotic species have inadequate funding. Adequate funding is important to establish new programs and carry out new responsibilities.

The task force has several recommendations for generating revenue to help fund harmful exotic species programs. These sources are targeted at the vectors of exotic species introduction.

- ☛ Establish a surcharge on trailer licences.
- ☛ Establish a tax on the sale of nursery products such as exotic trees, shrubs and flowers.
- ☛ Establish a ballast tax on foreign ships.
- ☛ Require licenses and license fees for importers.
- ☛ Continue and expand the surcharge on boat licences.



Other funding sources include:

- The state general fund (since harmful exotics affect all segments of the population).
- Federal grants to states with approved management programs for aquatic nuisance species through the federal Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.
- The Environment and Natural Resources Trust Fund (through the LCMR).
- Minnesota Future Resources Fund (through the LCMR)

## Regional Recommendations:

The Governor of Minnesota should develop agreements with other midwestern states' governors regarding the intentional introduction of exotic species. Ideally, the regional states would agree that no one state would introduce exotic species without the consent of the conservation agencies in the other states.

## Federal Recommendations:

The Departments of the Interior and Agriculture should create uniform procedures according to Executive Order 11,987. Alternatively, Congress should enact legislation similar to the Lacy Act, that addresses the introduction of ecologically harmful exotic species directly (Kurdila 1988).

The federal noxious weed law should be revised to address the problems identified in our review of the federal regulations.

## Appendix A - Native Minnesota Species Authorities

This appendix provides references and authorities on the native Minnesota species.

### **Animals:**

#### **Insects**

No statewide list is available

Local experts: Phil Clausen - Curator, Entomology Collection, U of M  
John Harsted - Scientist, Cedar Creek, U of M  
Robert Dana - Ecologist, DNR

#### **Crustacea**

Helgen. *Crayfish of Minnesota*

Local expert: Judy Helgen, Aquatic Biologist, PCA

#### **Molluska**

Bright. *Checklist of Mussels of Minnesota*

Local expert: Robert Bright, Associate Professor and Curator, Bell Museum of Natural History

#### **Fish**

Phillips, et al. *Fishes of the Minnesota Region*

Local expert: James Underhill, Professor and Curator, Bell Museum of Natural History

#### **Amphibians and Reptiles**

Moriarty. *Distribution Maps to the Amphibians and Reptiles of Minnesota*

Local expert: John Moriarty, Wildlife Specialist, Hennepin Parks

#### **Birds**

Janssen. *Birds in Minnesota*

Local experts: Lee Pfanmuller, Nongame Specialist, DNR  
Bud Tordorff, Professor, Bell Museum of Natural History

#### **Mammals**

Hazard. *Mammals of Minnesota*

Local experts: Elmer Birney, Director, Bell Museum of Natural History  
Gerda Nordquist, Animal Coordinator, County Biological Survey, DNR

### **Plants:**

Owenby and Morley. *Vascular Plants of Minnesota — A Checklist and Atlas*  
Fernald. *Gray's Manual of Botany*

Local expert: Welby Smith, Botanist, DNR

## APPENDIX B - SELECTED OTHER EXOTIC SPECIES FOUND IN MINNESOTA

COMMON NAME (synonym)	SCIENTIFIC NAME	COMMENTS
<b>Animals</b>		
Chukar	<i>Alectoris chukar</i>	no threats reported
Alewife	<i>Alosa pseudoharrngus</i>	no documented impacts in Duluth area of Lake Superior
Honey bee	<i>Apis mellifera</i>	no significant ecological impact, may displace native bees
Imported cabbageworm	<i>Artogeia rapae</i>	eats leaves of cole crops, agricultural problem
House mouse	<i>Mus musculus</i>	
European ferret	<i>Mustela putorius</i>	no threats reported
<b>Plants</b>		
White fir	<i>Abies concolor</i>	ability to naturalize is unknown
Velvet leaf	<i>Abutilon theophrasti</i>	Not found in uncultivated areas. highly competitive and adaptable annual-seeds long lived in soil. Not found in disturbed sites but apparently not invasive
Common yarrow	<i>Achillea millefolium</i>	
Pigweed	<i>Amaranthus retroflexus</i>	short lived
Shepherd's purse	<i>Capsella bursa-pastoris</i>	Establishes itself in disturbed areas, but is short lived
American chestnut	<i>Castanea dentata</i>	No threats reported
Maiden pink	<i>Dianthus deltoides</i>	
Stinkgrass	<i>Eragrostis cilianensis</i>	Establishes itself in disturbed areas, but not significantly harmful
Red fescue	<i>Festuca rubra</i>	Establishes itself in disturbed areas
Galinsoga	<i>Galinsoga ciliata</i>	
Day lily	<i>Hemerocallis fulva</i>	not invasive
Prickly lettuce	<i>Lactuca scariola</i>	Invades disturbed areas, but doesn't persist
European larch	<i>Larix decidua</i>	doesn't naturalize
Field pepperweed	<i>Lepidium campestris</i>	Invades recently disturbed soils
Pepper grass	<i>Lepidium ruderales</i>	Invades recently disturbed soils
Perennial rye grass	<i>Lolium perenne</i>	Establishes itself in disturbed areas
White campion (water cockle)	<i>Lychnis alba</i>	Invades native prairie and disturbed grasslands; short lived
Pineapple weed	<i>Matricaria matricarioides</i> Porter	Establishes itself in disturbed urban areas
Black medic	<i>Medicago lupulina</i>	Establishes itself in disturbed areas
Carpet weed	<i>Mollugo verticillata</i>	early succession on beaches and sand dunes
Wild proso millet	<i>Panicum miliaceum</i>	fast growing, prolific, nearly impossible to control in corn-may be detrimental to cover; an agriculture

## APPENDIX B - SELECTED OTHER EXOTIC SPECIES FOUND IN MINNESOTA

COMMON NAME (synonym)	SCIENTIFIC NAME	COMMENTS
Mock orange	<i>Philadelphus coronarius</i>	may not naturalize in MN
Norway spruce	<i>Picea abies</i>	no known problems in MN; have not naturalized
Black hills spruce	<i>Picea glauca</i> var. <i>densata</i>	no known problems in MN; have not naturalized
Colorado spruce	<i>Picea pungens</i>	no known problems in MN; have not naturalized
Austrian pine	<i>Pinus nigra</i>	no known problems in MN; have not naturalized
Ponderosa pine	<i>Pinus ponderosa</i>	no known problems in MN; have not naturalized
Scotch pine	<i>Pinus sylvestris</i>	no known problems in MN; have not naturalized
Common plantain	<i>Plantago major</i>	found in disturbed sites, but not a significant problem
Knotweed	<i>Polygonum achoreum</i>	Establishes itself primarily in disturbed urban areas
Prostrate knotweed	<i>Polygonum aviculare</i>	Establishes itself primarily in disturbed urban areas
Black bindweed	<i>Polygonum convolvulus</i>	short lived perennial
Lady's thumb	<i>Polygonum persicaria</i>	Establishes itself in prairie wetland; not an environmental problem
Common purslane	<i>Portulaca oleracea</i>	not persistent
Douglas fir	<i>Pseudotsuga menziesii</i>	not naturalized
European raspberry	<i>Rubus idaeus</i>	
Curly dock	<i>Rumex crispus</i>	
Golden willow	<i>Salix alba</i>	None
Giant foxtail	<i>Setaria faberi</i>	threat is mainly to MN agricultural crop production, establishes in disturbed areas, competition for e:
Yellow foxtail	<i>Setaria glauca</i>	establishes itself in disturbed areas
Green foxtail	<i>Setaria viridis</i>	establishes itself in rocky areas
Smooth catchfly	<i>Silene cseres</i>	establishes itself in sandy disturbed areas
Tumbling mustard	<i>Sisymbrium altissimum</i>	establishes itself in disturbed areas
Lilac	<i>Syringa vulgaris</i>	doesn't spread in natural areas
Pennycress (Frenchweed)	<i>Thlaspi arvense</i>	establishes itself in disturbed areas; agricultural weed
Yellow hop clover	<i>Trifolium agrarium</i>	uncommon as a naturalized plant
Alsike clover	<i>Trifolium hybridum</i>	; agricultural problem
Low hop-clover	<i>Trifolium procumbens</i>	
Corn speedwell	<i>Veronica arvensis</i>	invades native prairie and grasslands, primarily a lawn weed
Common speedwell	<i>Veronica officinalis</i>	

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Appendix E - Survey Form Used to Identify Harmful Exotic  
Species in Minnesota

**EXOTIC (NON-NATIVE) SPECIES  
COMMENT FORM**

(copy as needed and use one sheet to report harmful and/or  
beneficial aspects of an individual species)

Category: Plant, Animal (circle one)  
Aquatic, Terrestrial (circle one)

Common Name \_\_\_\_\_  
Scientific Name \_\_\_\_\_

Based on your observations in Minnesota, fill in these:

Distribution in Minnesota (county or region) \_\_\_\_\_

Abundance (circle one)

single

a few

many

What Minnesota Habitat(s) Have You Seen It In? (circle appropriate ones)  
woodland, wetland, native prairie, grazed pasture, other grasslands,  
cropland, lake, river other (specify) \_\_\_\_\_

Threat to Minnesota native plant and animal populations and their  
environment (describe) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Current Threat Ranking (circle one)

Severe

Moderate

Minimal

None

Unknown

Potential Threat Ranking (circle one)

Severe

Moderate

Minimal

None

Unknown

Beneficial qualities of the species not provided by native Minnesota species  
\_\_\_\_\_  
\_\_\_\_\_

Comments (specific locations, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggested Literature References or Personal Contacts  
\_\_\_\_\_  
\_\_\_\_\_

This Data Submitted By:

Name \_\_\_\_\_

Agency/Organization \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Return this form to:



# Appendix F - Exotic Plant Species Ranking System for Minnesota

*adapted by the Minnesota Exotic Species Task Force from a methodology developed by  
Ronald D. Hiebert, Indiana Dunes National Lakeshore*

## I. Significance of Impact

### A. Current Level of Impact

1. Distribution relative to unnatural disturbance regime
  - a. found only in sites disturbed within the last 3 years or sites regularly disturbed -10
  - b. found in sites disturbed within last 10 years 1
  - c. found in mid-successional sites disturbed 11-15 yr. BP 2
  - d. found in late-successional sites disturbed 51-100 yr. BP 3
  - e. found in high quality natural areas with no know major disturbance for 100 years 5
  
2. Abundance
  - a. number of counties with populations
    - (1) 1-5 1
    - (2) 5-15 2
    - (3) 16-40 3
    - (4) 41+ 5
  
  - b. Average adult population size
    - (1) 1-10 1
    - (2) 11-100 2
    - (3) 101-1000 3
    - (4) 1001+ 5
  
  - c. Average number populations per county
    - (1) 1-5 1
    - (2) 6-15 2
    - (3) 16-40 3
    - (4) 41+ 5
  
3. Effect on natural processes/character
  - a. delays establishment of native species in disturbed sites up to 10 years 1
  - b. long term (more than 10 years) modification or retardation of succession towards potential natural vegetation 3
  - c. invades and modifies existing native communities 4
  - d. invades and replaces native communities 6
  
4. Significance of threat
  - a. threat to significant resources negligible 0
  - b. threat to areas secondary resources 1
  - c. endangerment to areas secondary resources 2
  - d. threat to areas primary resources 4
  - e. endangerment to areas primary resources 5

5.	Detectability	
	a. very difficult (special methods required)	5
	b. difficult	4
	c. moderate	2
	d. obvious	0
	TOTAL POSSIBLE	31
B.	Innate ability of species to be a pest	
1.	Ability to complete life cycle (reproduce) in area of concern	
	a. not observed to complete life cycle	-10
	b. observed to complete life cycle	0
	c. proven not to over winter	stop eval.
2.	Mode of reproduction	
	a. reproduces almost entirely by vegetative means	1
	b. reproduces only by seeds	2
	c. reproduces vegetatively and by seed	4
3.	Vegetative reproduction	
	a. no vegetation reproduction	0
	b. vegetative reproduction rate maintains population	1
	c. vegetative reproduction rate results in moderate increase in population size	2
	d. vegetative reproduction results in rapid increase in population size	4
4.	Frequency of sexual reproduction	
	a. almost never reproduces sexually in area	0
	b. once every 5 years or more	1
	c. every other year	2
	d. one or more times/year	4
5.	Number of seeds/plant	
	a. 1-10	0
	b. 11-100	1
	c. 101-1000	2
	d. 1001+	4
6.	Dispersal ability	
	a. no special adaptations for long distance dispersal	0
	b. special adaptations for long distance dispersal	3
7.	Germination requirements	
	a. requires open soil/disturbance to germinate	0
	b. can germinate in vegetated areas, but in narrow range/ special conditions	2
	c. can germinate in existing vegetation in a wide range of conditions	4
8.	Competitive ability	
	a. poor competitor for limiting factors	0
	b. moderately competitive for limiting factors	2
	c. highly competitive for limiting factors	4
	TOTAL POSSIBLE	27

## II. Feasibility of Control

### A. Abundance

1. Ave. number of populations per infested county
  - a. 51+ 1
  - b. 16-50 2
  - c. 6-15 3
  - d. 1-5 5
2. Average adult population size (plants per acre)
  - a. 1001+ 1
  - b. 101-1000 2
  - c. 11-100 4
  - d. 1-10 5

### B. Ease of Control

1. Seed Banks
  - a. seeds remain viable in the soil for at least 10 years 1
  - b. seeds remain viable in the soil for 2-10 years 3
  - c. seeds remain viable in the soil for 1 year or less 5
2. Vegetative reproduction
  - a. any plant part is a viable propagule 1
  - b. sprouts from roots and/or stumps 2
  - c. no regrowth following removal of above ground plant parts 4
3. Level of effort required on population
  - a. repeated chemical and mechanical control measures required 1
  - b. one or two mechanical and chemical treatments required 2
  - c. can be controlled with one chemical treatment 3
  - d. effective control with one mechanical treatment 5

### C. Side effects of control measures

1. Control measures will cause major negative impacts to community -5
2. Control measures will cause moderate negative impacts to community -2
3. Control measures will have little or insignificant impact on community 0

### D. Effects of delay in action

1. Delay in action will result in large increase in effort required for successful control 0
2. Delay in action will result in moderate increase in effort 2
3. Delay in action will result in little increase in effort required for successful control 4

### E. Biological control

1. Biological control not feasible 0
2. Biological control feasible 2

TOTAL POSSIBLE

30

# EXOTIC PLANT RATING FORM

## I. SIGNIFICANCE OF IMPACT

- A. Current level of Impact \_\_\_\_\_
- Distribution \_\_\_\_\_
- Number of populations \_\_\_\_\_
- Average population size \_\_\_\_\_
- Effect on process/character \_\_\_\_\_
- Significance of threat \_\_\_\_\_
- Visual impact \_\_\_\_\_

subtotal

- B. Innate ability of species to be a pest \_\_\_\_\_
- Ability to complete life cycle \_\_\_\_\_
- Mode of reproduction \_\_\_\_\_
- Vegetative reproduction \_\_\_\_\_
- Frequency of sexual reproduction \_\_\_\_\_
- Number of seeds/plant \_\_\_\_\_
- Dispersal ability \_\_\_\_\_
- Germination requirements \_\_\_\_\_
- Competitive ability \_\_\_\_\_

subtotal

Total A & B

## II. FEASIBILITY OF CONTROL

- Number of populations \_\_\_\_\_
- Average population size \_\_\_\_\_
- Seed banks \_\_\_\_\_
- Vegetative reproduction \_\_\_\_\_
- Level of effort \_\_\_\_\_
- Side effects \_\_\_\_\_
- Effects of action delay \_\_\_\_\_
- Biological control \_\_\_\_\_

Total

## Appendix G - Exotic Animal Ranking System for Minnesota

*adapted by the Minnesota Exotic Species Task Force from a methodology developed by  
Ronald D. Hiebert, Indiana Dunes National Lakeshore*

### I. Significance of Impact

#### A. Current Level of Impact

##### 1. Abundance

##### a. number of counties with populations

(1) 1-5	1
(2) 5-15	2
(3) 16-40	3
(4) 41+	5

##### b. Average adult population size

(1) 1-10	1
(2) 11-100	2
(3) 101-1000	3
(4) 1001+	5

##### c. Average number populations per county

(1) 1-5	1
(2) 6-15	2
(3) 16-40	3
(4) 41+	5

##### 2. Effect on native populations

a. little effect on native populations	1
b. May lower native plant or animal populations	3
c. invades and modifies existing native species or communities	4
d. eliminates or replaces native species or communities	6

##### 3. Significance of threat

a. threat to significant native plant and animal resources negligible	0
b. threat to areas secondary resources	1
c. endangerment to areas secondary resources	2
d. threat to areas primary resources	4
e. endangerment to areas primary resources	5

TOTAL POSSIBLE 31

#### B. Innate ability of species to be a pest

##### 1. Ability to complete life cycle (reproduce) in area of concern

a. not observed to complete life cycle	-10
b. observed to complete life cycle or considered likely to complete lifecycle	0
c. proven not to over winter or breed	stop eval.

##### 2. Mode of reproduction

a. reproduces almost entirely by asexual means	1
b. reproduces only sexually	2
c. reproduces asexually and sexually	4

3.	Parthenogentive asexual reproduction	
a.	Parthenogenetic reproduction	0
b.	Parthenogenetic reproduction rate maintains population	1
c.	Parthenogenetic reproduction rate results in moderate increase in population size	2
d.	Parthenogenetic reproduction results in rapid increase in population size	4
4.	Frequency of sexual reproduction	
a.	once a year or longer	1
b.	twice year	2
c.	3 or more times/year	4
5.	Number of young per brood/litter	
a.	1-2	0
b.	3-10	1
c.	11-100	2
c.	101+	4
6.	Dispersal ability	
a.	no special adaptations for long distance dispersal	0
b.	special adaptations for long distance dispersal	3
7.	Time to reproductive activity	
a.	1 year or more	1
b.	2 months to 1 yr	2
c.	less than 2 months	4
8.	Competitive ability	
a.	poor competitor for limiting resources	0
b.	moderately competitive for limiting resources	2
c.	highly competitive for limiting resources	4
	TOTAL POSSIBLE	27

## II. Feasibility of Control

### A. Abundance

1.	Ave. number of populations per infested county	
a.	51+	1
b.	16-50	2
c.	6-15	3
d.	1-5	5
2.	Average adult population size (plants per acre)	
a.	1001+	1
b.	101-1000	2
c.	11-100	4
d.	1-10	5
3.	Number of counties affected	
a.	40+	1
b.	15-40	2
c.	5-14	3
d.	1-4	5

B.	Ease of Control	
1.	Persistence	
a.	eggs or dormant stages remain viable for at least 10 years	1
b.	remain viable for 2-10 years	3
c.	remain viable for 1 year or less	5
2.	Level of effort required on population	
a.	repeated chemical and / or mechanical control measures required	1
b.	one or two mechanical and / or chemical treatments required	2
c.	can be controlled with one chemical treatment	3
d.	effective control with one mechanical treatment	5
3.	Detectability of eggs (young) for monitoring	
a.	eggs/larva hard to find	1
b.	eggs/larva identifiable	3
c.	eggs/larva _____	5
C.	Side effects of control measures	
1.	Control measures will cause major negative impacts to natural community	-5
2.	Control measures will cause moderate negative impacts to natural community	-2
3.	Control measures will have little or insignificant impact on natural community	0
D.	Effects of delay in action	
1.	Delay in action will result in large increase in effort required for successful control	0
2.	Delay in action will result in moderate increase in effort	2
3.	Delay in action will result in little increase in effort required for successful control	4
E.	Biological control	
1.	Biological control not feasible	0
2.	Biological control feasible	2
	TOTAL POSSIBLE	30

# EXOTIC ANIMAL RATING FORM

## I. SIGNIFICANCE OF IMPACT

- A. Current level of Impact \_\_\_\_\_
- Distribution \_\_\_\_\_
- Number of populations \_\_\_\_\_
- Average population size \_\_\_\_\_
- Effect on process/character \_\_\_\_\_
- Significance of threat \_\_\_\_\_
- Visual impact \_\_\_\_\_

subtotal

- B. Innate ability of species to be a pest \_\_\_\_\_
- Ability to complete life cycle \_\_\_\_\_
- Mode of reproduction \_\_\_\_\_
- Vegetative reproduction \_\_\_\_\_
- Frequency of sexual reproduction \_\_\_\_\_
- Number of seeds/plant \_\_\_\_\_
- Dispersal ability \_\_\_\_\_
- Germination requirements \_\_\_\_\_
- Competitive ability \_\_\_\_\_

subtotal

Total A & B \_\_\_\_\_

## II. FEASIBILITY OF CONTROL

- Number of populations \_\_\_\_\_
- Average population size \_\_\_\_\_
- Seed banks \_\_\_\_\_
- Vegetative reproduction \_\_\_\_\_
- Level of effort \_\_\_\_\_
- Side effects \_\_\_\_\_
- Effects of action delay \_\_\_\_\_
- Biological control \_\_\_\_\_

Total \_\_\_\_\_



