

# Nebraska Aquatic Nuisance Species Plan Draft V.1

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# **Nebraska Aquatic Nuisance Species Management Plan**

**Draft V.1**

**May 5, 2010**

**To be submitted by**

**State of Nebraska**

**Dave Heineman, Governor**

**Prepared by:**

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## SECTION A

### EXECUTIVE SUMMARY

Aquatic Nuisance Species (ANS) are a source of significant ecological and socio-economic problems throughout North America. Nebraska's aquatic ecosystems have already been invaded by ANS such as Asian carp, white perch, and Phragmites. While their initial impacts have been limited and localized, there is little doubt that these and other ANS pose a serious threat to Nebraska water resources. The future of Nebraska's aquatic resources requires a coherent response to the threat posed by ANS.

The Federal Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 amended by the National Invasive Species Act of 1996, calls for the development of state and regional management plans to control aquatic nuisance species. With approval of a state plan by the national ANS Task Force, matching funds for activities detailed in the management plan are available. Using guidance from the National ANS Task Force and other accepted state agency plans, this management plan was developed to establish management actions in order to address the prevention, control, and effects of non-indigenous aquatic nuisance species that have invaded or may invade Nebraska waters. The Nebraska Aquatic Nuisance Species Management Plan serves as the initial step in establishing a program to specifically address ANS issues in Nebraska.

The goal of the Nebraska Aquatic Nuisance Species Management Plan is to minimize the harmful ecological, economic, and social impacts of ANS through prevention and management of introduction, population growth, and dispersal into, within, and from Nebraska. The Plan includes discussions of existing concerns, a summary of federal, regional, and state policy, a list of non-indigenous species known to exist in Nebraska, and a discussion of regional ANS that pose a threat to Nebraska's aquatic ecosystems. In addition, the Plan sets objectives that will lead to the accomplishment of the Plan goal. These objectives include: the establishment of a management structure that coordinates ANS activities, a strong prevention program, a monitoring program that allows for the early detection and rapid response of pioneering ANS, a control program aimed at established species, research, education, and legislative actions. The Plan is structured for incremental implementation with high priority on establishment of an Invasive Species Steering Committee and an ANS coordinator position.

To ensure that the goals of this plan are being effectively addressed a procedure for monitoring and evaluating the implementation of strategies and tasks will be initiated. This evaluation will focus on the feasibility and cost-effectiveness of management activities. The Plan is a working document and will be periodically updated and expanded based upon the experience gained from implementation, scientific research, and new tools as they become available.

## SECTION B

### INTRODUCTION

Aquatic Nuisance Species (ANS) are non-indigenous plant, animal, or pathogen species that threaten the diversity or abundance of native species, the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities that dependent on such waters. ANS are the cause of significant ecological and socio-economic problems throughout North America. Invasive species, such as zebra mussels, Eurasian watermilfoil, and whirling disease are being introduced into new habitats at an alarming rate. After introduction, populations often grow quickly and spread rapidly due to lack of natural controls. Once established, they often displace native species, clog waterways, impact municipal and industrial irrigation and power systems, degrade ecosystems, reduce or threaten recreational and commercial fishing opportunities, and can cause wildlife and public health problems.

A number of these ANS have become established in the United States and represent a threat to the nation's aquatic resources. As the introduction and spread of ANS continues, the associated problems intensify and create a wide variety of ecological and socio-economic problems for water users. In 1990, the Non-indigenous Aquatic Nuisance Prevention and Control Act (NANPCA) was passed by Congress to address ANS problems in the United States. This legislation provided an opportunity for federal cost-share support for implementation of state plans. While programs created by this national legislation were initially aimed at problems in the Great Lakes region, the reauthorization of NANPCA in 1996 as the National Invasive Species Act (NISA) established a national goal of preventing new ANS introductions and limiting the dispersal of existing ANS in all of the states. NISA specifies, among other things, that state plans identify feasible, cost-effective management practices and measures that can be implemented by the state to prevent and control ANS infestations in a manner that is environmentally sound. Approval of a state ANS management plan by the Federal Aquatic Nuisance Species Task Force is required for Nebraska to be eligible for federal cost-share support. Section 1204 of NISA regarding state ANS management plans, is included in **Appendix A**.

According to Rendall (1997), the following points must be considered in addressing ANS issues and establishing ANS management programs. These points have provided guidance in the development of this ANS management plan.

1. There are many pathways of introduction and spread for ANS, most of which are related to human activities, both accidental and intentional. New species continue to be introduced and spread within North America through these pathways.
2. Introductions have many costs associated with them:
  - a. Economic impacts
    - i. Costs to producers, retailers (loss of tourism dollars), etc. in loss of income
    - ii. Costs to producers, state (i.e. taxpayer) in control, prevention, and monitoring
  - b. Ecological impacts
    - i. Displacement of cash crops, desired harvestable animals and plants

- ii. Loss of native/sensitive plant and animal species
  - iii. Homogenization of the environment
  - iv. Degradation of aquatic environments
  - v. Disruption of food webs and nutrient cycles – reducing productivity
  - vi. Impacts of control measures to non-target organisms
3. Often there are few, if any, acceptable controls available for use in natural water bodies once ANS become established.
  4. Once species are successfully introduced, any control efforts will be very expensive and eradication very unlikely.
  5. Prevention is the best course of action. Management plans, education programs, and regulations are strategies that can help prevent the spread of ANS.

The coordinated efforts contained within this plan are designed to protect residents of Nebraska and the state's aquatic resources from the multitude of potential losses associated with ANS plants, animals, and pathogens. This management plan focuses on preventing the accidental introductions of new ANS, limiting the spread of existing ANS, and controlling or eradicating ANS where environmentally and economically feasible. The intentional introduction of non-indigenous species for aquaculture, commercial, or recreational purposes is also addressed to insure that these beneficial introductions do not result in accidental ANS introductions, and to improve information sharing among those agencies responsible for regulation of intentional introductions.

Nebraska has the opportunity to prevent or prepare for the introduction of one of the most destructive aquatic nuisance species, the zebra/quagga mussel (*Dreissena polymorpha/Dreissena rostriformis bugensis*). In Nebraska, zebra mussels have been found in the Missouri River near Gavin's Point Dam, and until recently, Lake Offutt at Offutt Air Force Base (where they have been eradicated). While zebra or quagga mussels haven't appeared in other water sources in Nebraska, neighboring states are experiencing various levels of infestation. Kansas, Missouri, Iowa, Minnesota, and Colorado all have current, active infestations within the state. While each state is taking measures to help prevent the spread of these ANS, Nebraska receives many aquatic recreational visitors each year, increasing the risk of spread. States where zebra or quagga mussels are present have reported severe environmental and economic damage resulting from their accidental introduction.

The costs and impacts of invasive species in Nebraska have not been determined precisely; however costs are incurred in two main categories. First, is the loss in potential economic output, such as reductions in aquaculture, fisheries, and crop production. Second, is the direct cost of combating and mitigating the impacts of invasion, including all forms of quarantine, control and eradication (Mack et al. 2000). Profitability in agriculture, for example, is reduced by the costs incurred to control non-native aquatic plants which clog irrigation canals. The zebra mussel has the potential to invade Nebraska which would create substantial costs for the maintenance of industrial, hydropower, irrigation, and water supply systems. Impacts of the zebra mussel in the Midwest and Eastern part of the country have been estimated to be \$1 billion annually (Khalanski 1997). Another recent study shows invasive species, including aquatics, are imposing an enormous economic burden (estimated over \$137 billion/year) on the United States (Pimentel et al. 2000). Non-indigenous aquatic nuisance plants, such as Eurasian watermilfoil,

hydrilla, purple loosestrife, salt cedar, and Phragmites quickly establish themselves, displacing native plants. Environmental and economic problems caused by the dense growth of these weeds include; impairment of water-based recreation, navigation and flood control, degradation of water quality and fish and wildlife habitat, accelerated filling of lakes and reservoirs, and depressed property values.

These ANS and the growing list of non-indigenous aquatic species in Nebraska (**Appendix C**) are classic examples of why the Nebraska ANS Management Plan has been developed. This plan is intended to help the state coordinate efforts and secure long term cooperative funding to prevent, eradicate or control new introductions more effectively, before they cause major environmental and economic damage.

The Nebraska Aquatic Nuisance Species Planning Committee developed the Nebraska ANS Management Plan. Members of the committee assumed an active role in preparation for the plan by providing critical information, reviewing draft plans, and providing guidance. A list of the committee members is provided in **Appendix D**. Public comments were solicited from local governments, regional entities, public and private organizations, and resource user groups that have expertise and interest in the control of ANS. Comments will be considered and revisions made to the plan.

The Nebraska ANS management plan will be reviewed and revised annually or more frequently if needed to address the unexpected arrival of new ANS. Advances in knowledge of ANS management techniques could warrant alterations in proposed management strategies. The specific tasks employed to accomplish the goals and objectives of the plan must remain flexible to assure efficiency and effectiveness. While this version of the plan is a good starting point for identifying and integrating existing ANS programs, and implementing new programs, future editions will be necessary to achieve Nebraska's ANS management goals.

## SECTION C

### PROBLEM DEFINITION AND RANKING

Several ANS have already been introduced and dispersed in Nebraska by various pathways. The environmental and socio-economic costs resulting from ANS infestations will only continue to rise with further introductions. Although an awareness of the problems caused by ANS is emerging, the solutions are often not readily available. This comprehensive state plan for the management of ANS provides guidance for preparing management actions to address the prevention, control, and impacts of ANS that have or may invade and alter the aquatic resources of Nebraska.

A newly introduced species can disrupt the natural ecosystems by altering the composition, density, and interactions of native species. A lack of natural controls may allow a new population to increase at an exponential rate and disrupt native species as the introduced species may prey upon, out compete, or transmit disease to the native species. This disruption can cause significant alterations to food webs, nutrient dynamics, and biodiversity. Changes in the ecology of lakes and rivers can degrade habitat value in infested waters and stunt native fish populations.

ANS not only represent a potential threat to the environment; they threaten industry and the economy. These negative impacts include:

- decreased property values
- decreased recreational opportunities
- decreased water quality
- fouled water intakes
- frequently burned-out irrigation and water pumps
- impacts on power generation
- impeded water flow and decreased efficiency of water delivery systems
- increased risk of flooding due to increased biomass in water or clogging lake outlets

The number of new ANS introductions in Nebraska will continue to grow as new and existing ANS become established in Midwestern states, especially those that border Nebraska. There are several major pathways through which ANS are introduced, but most are the result of human activities both intentional and unintentional. Pathways of introduction into water bodies include aquaculture, aquarium trade, commercial navigation, transport via vessel fouling, recreational boating and fishing, sale of bait fish, research activities, and distribution through interconnected waterways. In Nebraska, there is limited regulation of these pathways.

The following sections provide examples of plant, animal, and pathogen species that are identified by the Nebraska Aquatic Nuisance Species Planning Committee as aquatic nuisance species that are established, or have the potential to establish in Nebraska. A complete draft list is included in **Appendix C**. Draft lists are intended to provide a basis for discussion and further work identifying the presence, distribution, status, and threat of non-indigenous species. The lists will be updated as new information is received. Each species will undergo a ranking assessment and a risk assessment to determine which species are of low, moderate, and high priority for management actions. The risk assessment is currently under development by the

Nebraska Aquatic Nuisance Species Planning Committee. For a discussion on priorities for action and more information on the risk assessment, see section G, Priorities for Action.

### **Non-indigenous Aquatic Animals**

Below are examples and descriptions of aquatic species that are identified by the Nebraska Aquatic Nuisance Planning Committee as aquatic nuisance species that are established or have the potential to establish in Nebraska. A draft of non-indigenous aquatic species in Nebraska is included in **Appendix C** and is based on existing data. Information on non-indigenous aquatic species in Nebraska is limited and as such the list will be updated as information becomes available.

#### **Zebra/Quagga Mussel** (*Dreissena polymorpha*/*Dreissena rostriformis bugensis*)

Zebra mussels were first discovered in North America in 1988 and Quagga in 1989 in the Great Lakes. The first account of an established population came from Canadian waters of Lake St. Clair, a water body connecting Lake Huron and Lake Erie. By 1990, zebra mussels had been found in all the Great Lakes. Now, zebra mussels are found in most states along the Mississippi and Missouri Rivers, and quagga mussels are found in the Great Lakes and in a few western states. Zebra mussels are notorious for their biofouling capabilities by colonizing water supply pipes of hydroelectric and nuclear power plants, public water supply plants, and industrial facilities. They colonize pipes constricting flow, therefore reducing the intake in heat exchangers, condensers, firefighting equipment, and air conditioning and cooling systems.

Benson, A. J. and D. Raikow. 2010. *Dreissena polymorpha*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=5>. Revision Date: 8/28/2009. Accessed 2/1/2010.

Benson, A. J., M. M. Richerson and E. Maynard. 2010. *Dreissena rostriformis bugensis*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas3.er.usgs.gov/queries/FactSheet.aspx?speciesID=95>. Revision Date 10/31/2008. Accessed 2/1/2010.

#### **Asian Clam** (*Corbicula fluminea*)

The first collection of *C. fluminea* in the United States occurred in 1938 along the banks of the Columbia River near Knappton, Washington (Counts 1986). Since this first introduction, it is now found in 38 states and the District of Columbia. *Corbicula fluminea* was thought to enter the United States as a food item used by Chinese immigrants. It is known mostly as a biofouler of many electrical and nuclear power plants across the country. As water is drawn from rivers, streams and reservoirs for cooling purposes so are *Corbicula* larvae. Once inside the plant, this mussel can clog condenser tubes, raw service water pipes, and firefighting equipment. Economic problems can result from the decreased efficiency of energy generation. Warm water effluents at these power plants make a hospitable environment for stabilizing populations. With man shown to be the primary agent of dispersal, no large-scale geographic features function as dispersal barriers.

Foster, A. M., P. Fuller, A. Benson, S. Constant, and D. Raikow. 2010. *Corbicula fluminea*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=92> RevisionDate 6/22/2009. Accessed 2/1/2010.

### **Rusty Crayfish** (*Orconectes rusticus*)

Native to Ohio, Tennessee, and Cumberland drainages, the rusty crayfish has now been found outside its native range in over a dozen states. Rusty crayfish displace native crayfish and destroy plant bed abundance and diversity. They are found in streams, lakes, and ponds with varying substrates from silt to rock and plenty of debris for cover. Rusty crayfish need permanent water; they generally do not burrow to escape dry periods. Breeding occurs in the fall and eggs laid the following spring, hatching within several weeks. The introduction of one female carrying viable sperm could start a new population.

United States Geological Survey. 2010. *Orconectes rusticus*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas3.er.usgs.gov/queries/FactSheet.aspx?speciesID=214>. Revision Date 1/30/2008. Accessed 2/1/2010.

### **Bighead Carp** (*Hypophthalmichthys nobilis*)

The bighead carp is a large-bodied planktivore endemic to eastern China. It was first introduced in 1973, by an aquaculturist into Arkansas in an attempt to improve water quality in production ponds. Despite added regulations in 1974, bighead carp dispersed upstream into the Mississippi and Missouri River systems. Currently bighead carp have been found in over 20 states. Although the impact of this species in the United States is not adequately known, because bighead carp are planktivorous and attain a large size, these carp have the potential to deplete zooplankton populations. Bighead carp have been recorded in Nebraska in the Missouri River and Platte River.

Nico, L. and P. Fuller. 2010. *Hypophthalmichthys nobilis*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=551>. Revision Date 3/13/2009. Accessed 2/1/2010.

### **Silver Carp** (*Hypophthalmichthys molitrix*)

Silver carp were first introduced from China in 1973 for phytoplankton control in eutrophic water bodies by an aquaculturist in Arkansas, and by 1980 was found in natural waters. This species has been found in nearly 15 states. In numbers, the silver carp has the potential to cause enormous damage to native species because it feeds on plankton required by larval fish and native mussels. This species would also be a potential competitor with adults of some native fishes and can cause harm to boaters as they jump from the water. Silver carp have been recorded in Nebraska in the Missouri River, and Elkhorn River.

Nico, L. 2010. *Hypophthalmichthys molitrix*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=549>. Revision Date 3/13/2009. Accessed 2/1/2010.

### **White Perch** (*Morone americana*)

The first report of white perch in the Great Lakes drainage was from Cross Lake, central New York, in 1950. The species apparently gained access to the lake via movement through the Erie Barge Canal in the 1930s and 1950s. Currently, white perch are established in all five Great Lakes and their surrounding states. Fish eggs are an important component of the diet of white perch especially in the spring months. White perch generally prey on eggs of walleye, white bass, and other species. White perch have been found in various lakes and sandpits (along the Platte river from flooding) in eastern Nebraska and as far west as Kearney (sandpit).

Fuller, P., E. Maynard, and D. Raikow. 2010. *Morone americana*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=777>. Revision Date 9/29/2006. Accessed 2/1/2010.

### **Non-indigenous Aquatic Plants**

Below are examples and descriptions of aquatic plants that are identified by the Nebraska Aquatic Nuisance Species Planning Committee as aquatic nuisance species that are established or have the potential to establish in Nebraska. A draft of non-indigenous aquatic plants in Nebraska is included in **Appendix C** and is based on existing data. Information on non-indigenous aquatic plants in Nebraska is limited and as such the list will be updated as information becomes available.

#### **Common Reed** (*Phragmites australis*)

This non-native common reed, which was introduced from Europe in the late 1800's, is distributed throughout the US. Over the past several decades, populations of non-native common reed in North America have dramatically increased in both freshwater and brackish wetlands. Once established, populations can expand rapidly to form dense monocultural stands which reduce plant diversity, prevent growth of more desirable species, and create an unsuitable habitat for various bird species, including migrating waterfowl. It is distributed throughout Nebraska, particularly along the Niobrara, Platte, and Republican rivers. It is currently listed as a state noxious weed in Nebraska.

Knezevic, S. Z., A. Datta, and R. E. Rapp. 2008. Noxious Weeds of Nebraska, Common Reed. University of Nebraska-Lincoln Extension, Lincoln, NE.

#### **Purple loosestrife** (*Lythrum salicaria* L.)

Purple loosestrife was introduced to North America in the early 1800's where it first appeared in ballast heaps of eastern harbors (Stuckey 1980). According to the U.S. Fish and Wildlife Service, purple loosestrife now occurs in every state except Florida. It is a wetland plant, growing in freshwater wet meadows, tidal and non-tidal marshes, river and stream banks, pond edges, reservoirs, and ditches. It prefers moist, highly organic soils but can tolerate a wide range of conditions. It grows on calcareous to acidic soils, can withstand shallow flooding, and tolerates up to 50% shade. As it establishes and expands, it outcompetes and replaces native grasses, sedges, and other flowering plants that provide a higher quality source of cover, food, or nesting sites for native wetland animals (U.S.EPA 2008). The highly invasive nature of purple loosestrife allows it to form dense, homogeneous stands that restrict native wetland plant species, including some federally endangered orchids, and reduce habitat for waterfowl. Purple loosestrife has been documented in Nebraska on the Platte, Niobrara, and Missouri Rivers.

Knezevic, S. Z. 2006. Noxious Weeds of Nebraska, Purple Loosestrife. University of Nebraska-Lincoln Extension, Lincoln, NE

Cao, L. 2010. *Lythrum salicaria*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=239>. Revision Date 8/5/2009. Accessed 2/1/2010.

#### **Saltcedar** (*Tamarix ramosissima* Ledeb.)

Saltcedar is thought to have been brought from southeastern Europe and eastern Asia into the U.S. in the mid-1800's for use in landscaping and windbreaks and for stabilizing stream banks. Because of the invasive nature of saltcedar, it often replaces willows, cottonwoods and other native vegetation along streams and wetlands. It can also increase the salinity of the soil,

reducing productivity of native plants, and may utilize soil water to such an extent that it may dry up streams and reduce water levels of rivers and lakes. It is currently widely distributed across Nebraska, and is listed as a state noxious weed.

Wilson, R., and S. Z. Knezevic. 2006. Noxious Weeds of Nebraska, Saltcedar. University of Nebraska-Lincoln Extension, Lincoln NE.

### **Eurasian watermilfoil** (*Myriophyllum spicatum* L.)

First documented in 1942 from a pond in Washington D.C., Eurasian water-milfoil was probably intentionally introduced to the United States (Couch and Nelson 1985). Spread occurred as the species was planted into lakes and streams across the country. This species is one of the most widely distributed of all nonindigenous aquatic plants; confirmed in 45 U.S. states, and in the Canadian provinces of British Columbia, Ontario and Quebec. Eurasian watermilfoil competes aggressively to displace and reduce the diversity of native aquatic plants. It elongates from shoots initiated in the fall, beginning spring growth earlier than other aquatic plants. Tolerant of low water temperatures, it quickly grows to the surface, forming dense canopies that overtop and shade the surrounding vegetation. Watermilfoil has been observed in Nebraska; although noted as declining at Wildwood Lake, Lancaster County while increasing in Hord Lake, Merrick County.

Jacano, C. C. and M. M. Richerson. 2010. *Myriophyllum spicatum*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=237>. Revision Date 10/15/2008. Accessed 2/8/2010.

### **Curly pondweed** (*Potamogeton crispus*)

Curly pondweed was introduced into the United States in the mid 1800's and has since spread across much of the United States, presumably by migrating waterfowl, intentional planting for waterfowl and wildlife habitat, and possibly even as a contaminant in water used to transport fishes and fish eggs to hatcheries. It can also spread by plant fragments attached to boats and equipment that are not properly cleaned. Curly pondweed competes with and displaces native plant life. Dense colonies of curly pondweed can restrict access to docks and sport fishing areas during spring and early summer months. It may interfere with late spring and early summer recreation due to the formation of dense mats and an increase in phosphorus concentrations causing an increase in algae blooms. Curly pondweed has been documented in various locations across Nebraska.

Cao, L. 2010. *Potamogeton crispus*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=1134>. Revision Date 8/9/2009. Accessed 2/8/2010.

### **Pathogens**

Pathogens include bacteria, viruses or parasites. They may potentially enter Nebraska on plants or animals imported into Nebraska or through the water in which plants or animals are transported. When pathogens are allowed into new aquatic environments they have the capability to infect native or existing plants or animals and cause disease. Below are examples and descriptions of aquatic pathogens that are identified by the Nebraska Aquatic Nuisance Species Planning Committee as aquatic nuisance species that are established or have the potential to establish in Nebraska. A draft of non-indigenous aquatic pathogens in Nebraska is included in **Appendix C** and is based on existing data. Information on aquatic pathogens in Nebraska is limited and as such the list will be updated as information becomes available.

### **Largemouth Bass Virus**

In largemouth bass (*Micropterus salmoides*), signs of the disease may include increased blood flow and darkened skin, distended abdomen, bloated swim bladder, lesions in the membrane lining the body cavity, necrosis (burst cells resulting in inflammation) of gastrointestinal mucosa, pale liver, red spleen, red intestinal caeca, infected gills, lethargic swimming, decreased responsiveness, swimming at the surface and/or in circles, and difficulty remaining upright. The native range of this virus is unknown; however, this virus is very similar to two fish viruses from Southeast Asia. Spread of LMBV has occurred from Florida through adjacent states, and has only recently reached the Great Lakes drainage. Transport of LMBV in North America probably occurs in live wells of fishing boats when infected fish or water are dumped into new habitat or put in contact with uninfected fish, which are then released. Stocking of infected fish could also be a vector. A major largemouth bass die-off occurred in Lake George in 2000. Die-offs involving 100-500 fish deaths (approximately 10% mortality rate) have typically occurred in affected areas throughout Michigan. LMBV has not been reported in Nebraska (Nebraska Game and Parks Commission, pers. comm. 2010); however since bass comprise a large component of recreational angler catch, if introduced could have devastating results.

Kipp, R. M. 2010. *Ranavirus*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=2657>. Revision Date 6/12/2007. Accessed 2/8/2010.

### **Whirling Disease**

Whirling disease is caused by a metazoan parasite that infects cartilage tissue of most Salmonid species. The whirling disease parasite was first introduced into the U.S. from Europe in the 1950's. This parasite has a two-host life cycle which includes both the primary Salmonid host and a common aquatic worm (*Tubifex tubifex*). Infective spores are produced in each host and are capable of spreading the disease in a variety of ways. The disease is known to occur in over 22 states. Whirling disease has become a major problem in some western states, especially in Colorado and Montana and has caused major declines in some wild rainbow trout populations. There has been one instance of whirling disease in Nebraska in one isolated location in a closed private facility (Nebraska Game and Parks Commission, pers. comm. 2010), but there is potential for it to become established if infected fish are imported into the state.

Kipp, R. M. 2010. *Myxobolus cerebralis*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas3.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=2364>. Revision Date 4/23/2007. Accessed 2/8/2010.

### **Heterosporis**

Heterosporis is a microscopic parasite which has the potential to infect several fish species resulting in muscle lesions and can cause serious harm to fish. The parasite was first reported in yellow perch, but may also be found in walleye, northern pike, fathead minnows, or other fish species. The parasite has been reported in Lake Ontario and northern parts of the Mississippi watershed in Wisconsin and Minnesota (Kipp 2010). It has never been reported in Nebraska (Nebraska Game and Parks Commission, pers. comm. 2010), but has the potential to become established if infected fish are imported into Nebraska.

Kipp, R. M. 2010. *Heterosporis*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL. <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=2661>. Revision Date 7/25/2007. Accessed 2/8/2010.

## SECTION D

### GOALS

The goal of the Nebraska Aquatic Nuisance Species Management Plan is to: Minimize the harmful ecological, economic, and social impact of ANS through prevention and management of introduction, population growth, and dispersal of ANS into, within, and from Nebraska.

The goal will be achieved through implementation of a plan that:

- a. emphasizes prevention of introductions at the regional level
- b. focuses on an effective Early Detection and Rapid Response (EDRR)
- c. permits appropriate and timely management response to new and existing populations with an adaptive management approach;
- d. protects and restores native plant and animal communities;
- e. provides for easy access to accurate and up-to-date species distribution and management information;
- f. supports research on ANS in Nebraska, and develops systems to disseminate information
- g. incorporates education and outreach elements;
- h. seeks legislative action to support objectives;
- i. produces agency collaboration;
- j. facilitates inter-jurisdictional coordination with state, federal and tribal agencies
- k. seeks cooperative solutions with the private sector and user groups

The plan aims to achieve these goals by meeting the objectives (outlined below) by 2015. To ensure that the goals of this plan are being effectively addressed a procedure for monitoring and evaluating the implementation of strategies and tasks will be initiated. This evaluation will focus on the feasibility and cost-effectiveness of management activities. The plan is a working document and will be periodically updated and expanded based upon the experience gained from implementation, scientific research, and new tools as they become available.

## SECTION E

### EXISTING AUTHORITIES AND PROGRAMS

#### FEDERAL

No single federal agency has comprehensive authority for all aspects of aquatic invasive species management. Federal agencies with regulatory authority over the introduction and transport of aquatic species that may be invasive or noxious include the U.S. Department of Agriculture Animal Plant Health Inspection Service, the U.S. Department of Agriculture, the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Commerce (DOC), and the U.S. Coast Guard (USCG). Many other agencies have programs and responsibilities that address components of AIS, such as importation, interstate transport, exclusion, control and eradication.

The primary federal authorities for managing and regulating AIS derive from the National Environmental Policy Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act, the National Invasive Species Act, the Lacey Act, the Plant Pest Act, the Federal Noxious Weed Act, and the Endangered Species Act. An Executive Order signed by President William J. Clinton on February 3, 1999 expanded federal efforts to address AIS. The order created a National Invasive Species Council charged with developing a comprehensive plan to minimize the economic, ecological and human health impacts of invasive species. A brief description of the Executive Order 13112, NANPCA, and NISPA are provided below and details can be found in **Appendix A**.

#### **Executive Order 13112 on Invasive Species**

President Clinton signed Executive Order 13112 on Invasive Species (64 Fed. Reg. 6183, Feb. 8, 1999), on February 3, 1999. The Executive Order seeks to prevent the introduction of invasive species, provide for their control, and minimize their impacts through better coordination of federal agency efforts under a National Invasive Species Management Plan to be developed by an interagency Invasive Species Council. The Order directs all federal agencies to address invasive species concerns as well as refrain from actions likely to increase invasive species problems. The National Invasive Species Management Plan was finalized on January 18, 2001. It can be found on the Council website at [www.invasivespecies.gov](http://www.invasivespecies.gov).

#### **Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA; Title I of P. No.101-646, 16 U.S.C. 4701 et seq.)**

This Act established a federal program to prevent the introduction of, and to control the spread of, introduced aquatic nuisance species and the brown tree snake. The U.S. Fish and Wildlife Service, the U.S. Coast Guard, the Environmental Protection Agency, the Army Corps of Engineers, and the National Oceanic and Atmospheric Administration share responsibilities for the implementing this effort. They act cooperatively as members of an Aquatic Nuisance Species Task Force. The mandate is prevention, monitoring, and control with these activities supported by research and education.

#### **National Invasive Species Act 1996 (NISA; P. No.104-332)**

In 1996, NISA amended NANPCA to mandate regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water and other vessel operations. This Act required a U.S. Coast Guard study and report to the Congress on the effectiveness of existing shore-side ballast water facilities used by crude oil tankers.

It authorized funding for research on aquatic nuisance species prevention and control in the Chesapeake Bay, the Gulf of Mexico, the Pacific Coast, the Atlantic Coast, and the San Francisco Bay-Delta Estuary.

In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent aquatic non-indigenous species from being introduced into and spread through ballast water in U.S. waters. It modified: (1) the composition and research priorities of the Aquatic Nuisance Species Task Force; and (2) zebra mussel demonstration program requirements.

**A list of other Acts is listed below and detailed in Appendix A:**

1916 National Park Act  
1931 Animal Damage Control Act  
1970 National Environmental Policy Act (NEPA)  
1972 Clean Water Act  
1973 Endangered Species Act  
1974 Federal Noxious Weed Act  
1976 National Forest Management Act  
1976 Federal Land Policy Management Act  
2000 Plant Protection Act  
2002 Animal Health Protection Act  
2008 Lacey Act

**Federal Authorities and Programs**

Numerous federal agencies have authority to implement the laws and policies described above. Other federal agencies have mandates impacted by aquatic invasive species (AIS) and thus engage in research, monitoring, prevention or control programs. Still others delegate primary responsibility for implementation to state and regional agencies (see next section). The following descriptions attempt to provide a general introduction to the scope of each agency's work, as well as a brief review of the agency's recent (as of 2006) major AIS related activities.

**U.S. Fish and Wildlife Service**

USFWS has multiple programs that address AIS management. USFWS serves as co-chair of the Federal Aquatic Nuisance Species Task Force (ANSTF) and is the agency that provides federal funding for the implementation of Task Force approved state AIS management plans. USFWS also provides technical assistance to states regarding AIS management. USFWS administers the Lacey Act, which prohibits importation and interstate transport of listed species. USFWS prevention programs include the 100th Meridian Initiative, which focuses on preventing the western spread of zebra mussels. In cooperation with the USGS, USFWS supports the national ANS reporting hotline (1-877-STOP-ANS). USFWS refuges support invasive species control programs as part of their overall habitat restoration activities.

**Other Federal Authorities and Programs are listed below and detailed in Appendix A.**

U.S. Geological Survey (USGS)  
U.S. Army Corps of Engineers (COE)  
U.S. Coast Guard (USCG)  
U.S. Department of Agriculture (USDA)  
    Natural Resources Conservation Service (NRCS)  
    Animal and Plant Health Inspection Service (APHIS)  
U.S. Environmental Protection Agency (USEPA)  
National Park Service (NPS)  
National Oceanic and Atmospheric Administration (NOAA)  
National Sea Grant (NOAA – Sea Grant)  
National Marine Fisheries Service (NOAA – Fisheries Service)  
Bureau of Reclamation (BOR)

**Federal Programs**

Aquatic Nuisance Species Task Force  
100<sup>th</sup> Meridian Initiative  
Stop Aquatic Hitchhikers  
Center for Aquatic and Invasive Plants  
North American Weed Management Association  
National Invasive Species Council  
Nature Serve  
National Institute of Invasive Species Science  
Center for Wildlife Damage Management  
Center for Aquatic Nuisance Species

**REGIONAL**

**Regional authorities and programs are listed below and detailed in Appendix A.**

The Western Regional Panel ANS Task Force  
Mississippi River Basin Panel ANS Task Force  
Western Governors' Association  
The Missouri River Watershed Coalition  
Missouri River Futures

**STATE**

The State of Nebraska currently has a limited number of statutory and regulatory authorities to address or potentially address the issue of prevention and control of ANS. Those that exist were developed in response to individual target species and specific concerns as they arose. Nebraska does not have a comprehensive, coordinated, and vigorously enforced policy framework to deal with ANS and their affects. For this reason, one objective of Nebraska's ANS management plan is to identify gaps within state policies and statutes and develop recommendations for improvements. Such improvements may entail developing new legislation and regulations, revising existing authorities, and developing methods for improving

enforcement, coordination, and information dissemination regarding new or existing authorities. Basic information is provided below for each agency, organization, or program and is detailed in **Appendix A**.

### **Nebraska Game and Parks Commission**

Specific rules and regulations under Nebraska Game and Parks Commission authority are found in Game and Parks Commission Regulations; Title 163, Chapter 2 Nebraska Administrative Code.

### **Nebraska Department of Agriculture**

Noxious Weed Control Act; Title 25 Chapter 10 Nebraska Administrative Code  
Noxious Weed Regulations; Title 25 Chapter 10 Nebraska Administrative Code  
Plant Protection and Plant Pest Act Regulations; Title 25 Chapter 13 Nebraska Administrative Code  
Seed Law Regulations; Title 25 Chapter 7 Nebraska Administrative Code

### **Nebraska Department of Environmental Quality**

Standards for Water Quality; Title 117 Chapter 4 Nebraska Administrative Code

### **State Agencies/Organizations**

In addition to the above, the following list represents agencies and organizations that have programs and practices instilled in the state of Nebraska relating to invasive species.

Nebraska Invasive Species Council  
Nebraska Invasive Species Project  
Nebraska Natural Resource Conservation Service  
Nebraska Department of Natural Resources  
USGS NE Cooperative Fish and Wildlife Research Unit  
University of Nebraska-Lincoln Cooperative Extension Service  
Nebraska Weed Control Association  
Nebraska Weed Management Areas and Weed Groups  
County Weed Control Authorities  
The Nature Conservancy  
Institute of Agriculture and Natural Resources  
Nebraska Lakes Association  
Nebraska Department of Roads  
Nebraska Public Power District  
Central Nebraska Public Power and Irrigation District

## **TRIBAL**

The Department of Interior is legally obliged to insure the American Indian resources and lands are properly managed, protected, and conserved. Interior, as a trustee for the tribes, has an affirmative duty to protect tribal health and safety, to fulfill all treaty and statutory obligations and to exercise utmost good faith in all dealings with the tribes. In recognition of the importance of the Department's trust responsibilities, the Secretary of Interior has established policies and procedures for the Departmental bureaus and offices to follow. It also provides policy review and other technical services to all departmental bureaus and offices and other Federal agencies, including education and training, liaison, and information services regarding the Federal Indian Trust responsibilities.

Potential impacts of any activities or proposals on Indian trust resources will be discussed before any activities take place. Discussion will include consultation with the tribal government(s) or their representative when impacts on tribal trust resources, tribal rights, and tribal health and safety are identified.

Four American Indian Tribes exist in Nebraska:

- Omaha Tribe
- Ponca Tribe
- Santee Sioux Tribe
- Winnebago Tribe

## SECTION F

### OBJECTIVES, STRATEGIES, ACTIONS & COST ESTIMATES

#### OBJECTIVE 1: INCREASE COORDINATION OF ALL ANS MANAGEMENT PROGRAMS AND ACTIVITIES IN NEBRASKA.

**Problem 1A:** There is no clear authority or agency in Nebraska charged with limiting and managing ANS. Nebraska needs an organized and centralized approach to ANS management to prevent duplication of effort and eliminate gaps in coverage of ANS issues. State ANS management efforts need to be coordinated with regional and national efforts. Currently, most management activities are focused on isolated problems. The lack of coordination, oversight, and funding has allowed ANS to become established in Nebraska and continues to allow for new introductions. Gaps in ANS management include: unclear authorities, uncoordinated state activities, and staffing and funding shortages.

#### **Strategic Action 1A1: Coordinate all ANS management programs and activities within Nebraska**

**Task 1A1a:** Identify key personnel in state government for ANS responsibilities

**Task 1A1b:** Identify and coordinate with key personnel in federal, tribal governments, and private entities for ANS responsibilities.

**Task 1A1c:** Create an Nebraska ANS Steering Committee

**Task 1A1d:** Create and fund an ANS coordinator position (1.0 FTE)

**Task 1A1e:** Identify all current ANS management activities conducted by the state, federal, local agencies and organizations.

**Task 1A1f:** Identify gaps in ANS authority and develop strategies to amend current and establish new authorities.

**Task 1A1g:** Develop a set of uniform definitions and terms to describe aquatic nuisance species.

**Task 1A1h:** Develop and maintain a list of all non-indigenous aquatic species present in Nebraska or in neighboring states.

**Task 1A1i:** Develop management strategies for dealing with each prioritized non-indigenous species.

**Task 1A1j:** Conduct an annual conference including workshops focused on ANS in Nebraska and the surrounding region.

**Task 1A1k:** Identify funding sources to support implementation of ANS Plan.

#### **Strategic Action 1A2: Participate in and support regional, federal and international efforts.**

**Task 1A2a:** Participate in the Aquatic Nuisance Species Task Force's Western Regional Panel and Mississippi River Basin Panel.

**Task 1A2b:** Participate in and support regional ANS organizations (i.e., Missouri River Futures, Missouri River Watershed Coalition, and others).

**Task 1A2c:** Participate in regional and national forums to ensure that ANS efforts in Nebraska remain current and are coordinated with regional and national programs.

**Task 1A2d:** Develop cooperative agreements with states that share common waters.

**Strategic Action 1A3: Develop a permanent funding mechanism for ANS management in Nebraska.**

**Task 1A3a:** Explore ideas for permanent funding of ANS management activities.

**Task 1A3b:** Work with the Nebraska legislature to establish a permanent funding mechanism for ANS management activities in Nebraska.

**Strategic Action 1A4: Review and evaluate state efforts in addressing ANS.**

**Task 1A4a:** Conduct a periodic assessment of ANS management in Nebraska

**Task 1A4b:** Update the state ANS plan as needed, with annual progress reports and a five-year program report.

**OBJECTIVE 2: MONITOR STATE WATERS TO DETERMINE THE OCCURRENCE AND DISTRIBUTION OF ANS.**

**Problem 2A:** Numerous potentially damaging ANS are currently found in the Midwestern U.S. and are spreading closer to Nebraska. Presently, there are no state or regional mechanisms in place for sharing information concerning the occurrence and distribution of non-indigenous aquatic species. Coordination of regional ANS monitoring is needed to improve Nebraska's ability to immediately recognize and respond to both established and new ANS.

**Strategic Action 2A1: Develop and implement a statewide ANS monitoring program.**

**Task 2A1a:** Identify existing ANS monitoring efforts and data gaps

**Task 2A1b:** Design a monitoring program using a network approach, including federal/regional/ local agencies, public/private groups, and tribes.

**Task 2A1c:** Secure funding to conduct state-wide monitoring program for non-indigenous species.

**Task 2A1d:** Develop a web-based information system for entering monitoring (and viewing) data under the currently planned Invasive Species Project database.

**Strategic Action 2A2: Develop partnerships with regional states to share information concerning the distribution of ANS based on monitoring activities.**

**Task 2A2a:** Establish working partnerships with ANS management programs in regional states to facilitate the sharing of monitoring data.

**Task 2A2b:** Develop and maintain lists of non-indigenous species known to exist in Nebraska and share the data with regional ANS management programs.

**Task 2A2c:** Compile the results of monitoring activities annually and distribute information to regional states.

**OBJECTIVE 3: NEW ANS INTRODUCTIONS: PREVENTION AND RAPID RESPONSE**

**Problem 3A:** There are many different pathways by which new species can arrive in Nebraska. Species that provide sport-fishing opportunities, erosion control, food, and aesthetic benefits have been intentionally brought into Nebraska and released into the wild or escaped from private ponds or holding facilities. For example, common carp, goldfish, milfoil, and purple loosestrife

can become established through these pathways. Humans, through recreational, developmental, and management activities, may unintentionally introduce ANS. In addition, ANS introduced and established in neighboring states may be dispersed into and throughout Nebraska by natural means such as transport on domestic or wild animals.

Understanding how various pathways function as conduits for ANS into Nebraska is critical for intercepting species and preventing introductions. Prevention is the most cost effective and environmentally sound method of addressing this problem. Implementation of an early detection and rapid response program that reviews and regulates which species are intentionally allowed into Nebraska, and monitors the pathways by which species can be unintentionally transported into Nebraska, is necessary to slow the rate at which newly introduced ANS become established. Nebraska has no comprehensive program to prevent new ANS introductions or address new species if one should arrive.

**Strategic Action 3A1: Develop and implement an early detection and rapid response (EDRR) program.**

**Task 3A1a:** Identify ANS with the greatest potential to infest Nebraska and research pathways of introduction

**Task 3A1b:** Identify current state and regional early detection and rapid response efforts and coordinate with state and regional agencies/organizations for a collaborative rapid response system.

**Task 3A1c:** Facilitate state-wide early detection and rapid response training workshops during annual conference.

**Task 3A1d:** Develop and implement a monitoring program for all ANS (in conjunction with Objective 2).

**Task 3A1e:** Develop a rapid response plan for top priority species.

**Task 3A1f:** Identify possible funding sources for implementing rapid response plan actions.

**Task 3A1g:** Develop an inspection program for watercraft entering Nebraska high-risk waters.

**OBJECTIVE 4: CONTROL AND ERADICATE ESTABLISHED ANS.**

**Problem 4A:** Established ANS often create the most noticeable impacts, yet they are often impossible to eradicate or control. Management activities are most effective when they are directed at limiting the impacts of a population or stopping that population from spreading into new waters. Management activities must be focused on populations of established ANS where there is a clear and significant impact on native species, and where the control or eradication of specific populations is feasible both economically and technically.

**Strategic Action 4A1: Develop and implement control strategies to eradicate or reduce populations of priority ANS in state waters.**

**Task 4A1a:** Establish mechanisms to ensure that the control strategies developed and implemented are done so in coordination with federal agencies, local governments, inter-jurisdictional organizations and other stakeholders.

**Task 4A1b:** Identify current management plans/actions for controlling established ANS.

**Task 4A1c:** Identify established ANS in need of control.

**Task 4A1d:** Identify funding sources for controlling established ANS.

**Task 4A1e:** Identify mechanisms to limit the dispersal of established ANS into new water bodies or to new areas of a water body.

**Task 4A1f:** Develop guidelines and regulations to ensure the cleaning of water-based equipment such as dredges, fishing nets, traps, etc., that may spread ANS when moved from infested to uninfested waters.

**Task 4A1g:** Develop regulations to quarantine infested water bodies to prevent the spread of ANS into uninfested waters.

## **OBJECTIVE 5: SUPPORT ANS RESEARCH AND DISSEMINATE INFORMATION TO RESEARCH AND MANAGEMENT COMMUNITIES**

**Problem 5A:** Little is known about the extent and magnitude of the ANS problem in Nebraska. Research is needed to quantify and clarify the effects that non-indigenous species have on native species and habitat. Research can identify the threat posed by specific species and the mechanism most likely responsible for transportation of those species. In addition, compiling and providing quick access to research information can facilitate quick responses to new introductions, as well as reduce redundancy in ANS research and management.

### **Strategic Action 5A1: Support research that identifies, predicts, and prioritizes ANS introductions and their spread.**

**Task 5A1a:** Review the life histories and impacts of ANS in Nebraska and surrounding states (ecology and management of ANS).

**Task 5A1b:** Identify critical data needed to prevent introductions and/or prevent spread.

**Task 5A1c:** Attend scientific and technical conferences.

**Task 5A1d:** Review current and past ANS research efforts in the region.

**Task 5A1e:** Support research that improves Nebraska's ability to predict ANS introductions and/or spread.

**Task 5A1f:** Conduct research on the economic and ecological impacts of ANS in Nebraska.

### **Strategic Action 5A2: Support research that investigates management strategies that limit the introduction and spread of ANS populations.**

**Task 5A2a:** Investigate and develop new methods of managing ANS with an adaptive management approach.

**Task 5A2b:** Investigate the relationships between anthropogenic disturbance of aquatic systems and ANS invasion, establishment, and impacts.

**Task 5A2c:** Support research to develop effective ANS prevention and control marketing programs.

**Task 5A2d:** Support research on the effectiveness of regulatory, education-based, and incentive-based programs in controlling ANS and their relative values.

**Task 5A2e:** Support scientific research between state and federal agencies and academic institutions that investigates potential alternative control strategies and associated environmental impacts.

**Strategic Action 5A3: Facilitate the collection and dispersal of information, research, and data on ANS in Nebraska.**

**Task 5A3a:** Create a central repository of reference material on ANS.

**Task 5A3b:** Create and coordinate a central database for information on ANS.

**Task 5A3c:** Develop and maintain a list of taxonomic experts for ANS identification.

**OBJECTIVE 6: EDUCATE THE PUBLIC, POLICY MAKERS, NATURAL RESOURCE WORKERS, PRIVATE INDUSTRY, AND USER GROUPS ABOUT THE RISKS AND IMPACTS OF ANS AND THE IMPORTANCE OF PREVENTION.**

**Problem 6A:** The lack of awareness concerning ANS impacts is one of the largest management obstacles. Few people understand the threat some non-indigenous species pose and how their actions might introduce them. Un- (or mis-) informed individuals, through the dumping of an aquarium or bait bucket, launching of a contaminated boat, or stocking of a private pond have introduced many ANS. The improper importation and holding of organisms have also allowed species to escape, or caused the receipt of unwanted organisms mixed with intentionally imported ones. These intentional and unintentional means of introduction can be curtailed by educating people of their potential to transfer ANS species into and around Nebraska. Nebraska currently has some ANS outreach programs (through the Nebraska Invasive Species Project), but activities are limited by time and funding.

**Strategic Action 6A1: Educate the public about ANS, how their actions can prevent the introduction and spread of ANS.**

**Task 6A1a:** Identify current ANS public education programs and activities.

**Task 6A1b:** Develop a cohesive and consistent ANS outreach strategy

**Task 6A1c:** Identify funding for an ANS outreach program.

**Task 6A1d:** Develop and distribute educational materials (posters, fact sheets, ID cards) to the general public and to specific user groups (businesses that import or sell aquatic organisms, private land owners with aquatic habitat, angling clubs, etc.).

**Task 6A1e:** Incorporate ANS information into boater and hunter education classes.

**Task 6A1f:** Produce periodic press releases and public service announcements on specific ANS.

**Task 6A1g:** Create articles, videos, billboards, and web-based media (Facebook, Twitter) concerning ANS.

**Task 6A1h:** Coordinate with the Nebraska Master Naturalist Program to educate volunteers on invasive species in Nebraska.

**Task 6A1i:** Investigate citizen-science based programs (with Nebraska Master Naturalist)

**Task 6A1j:** Give presentations on ANS issues to lake associations, fishing clubs, local conservation groups, gardening clubs, and other affected stakeholders.

**Task 6A1k:** Include ANS information in state hunting, fishing, and boating regulations.

**Strategic Action 6A2: Develop and implement a ‘Next Generation Education Strategy’:**

**Task 6A2a:** Coordinate with Nebraska’s educators and the state science coordinator to educate the next generation of boaters.

**Task 6A2b:** Develop an educational curriculum on ANS for K-12 classrooms.

**Task 6A3c:** Provide training opportunities for K-12 teachers about ANS curriculum (in conjunction with the Missouri River Watershed Coalition – Outreach and Awareness Workgroup).

**Task 6A3d:** Coordinate with local universities and colleges to give ANS presentations to various classes or at organized symposiums.

**Strategic Action 6A3: Develop and distribute identification and management information to resource agency staff.**

**Task 6A3a:** Create and distribute ANS identification and educational material to all Nebraska entities with aquatic resource management responsibilities.

**Task 6A3b:** Organize and facilitate ANS identification workshops for state aquatic resource managers during annual conference.

**Task 6A3c:** Develop and maintain a list of experts to whom ANS samples can be sent for identification and publish on agency websites.

**Task 6A3d:** Give presentations on ANS identification and management to professional resources management organizations (weed management areas, universities, extension service personnel, etc.).

**Task 6A3e:** Facilitate Hazard Analysis and Critical Control Points (HACCP) training program for appropriate personnel.

**Task 6A3f:** Develop and implement state-wide boater inspection and decontamination training program for authorities.

**Strategic Action 6A4: Develop and provide ANS informational briefings and educational materials to key policy and decision makers.**

**Task 6A4a:** Organize and facilitate ANS field days for state legislators and their staff personnel.

**Task 6A4b:** Distribute an annual report of ANS projects and activities to state legislators.

**Task 6A4c:** Distribute educational materials to state legislators and meet with key policy-makers periodically.

**OBJECTIVE 7: PREVENT THE INTRODUCTION AND SPREAD OF ANS IN NEBRASKA THROUGH LEGISLATIVE AND REGULATORY EFFORTS:**

**Problem 7A:** As knowledge of ANS issues improves, new laws must be passes and existing laws adapted to address this new information. The regulatory authority and financial support afforded by integrated state and federal legislation can enable Nebraska to avoid or minimize environmental and economic damage resulting from ANS infestations. While some state laws and regulations have been enacted to address specific problems, there exists no comprehensive effort to deal with ANS.

**Strategic Action 7A1: Review existing laws and regulations governing ANS and amend or add as required to achieve goals of ANS Plan.**

**Task 7A1a:** Compile and maintain list of current state and federal laws, rules, and regulations related to ANS, and identify gaps in regulating ANS in public and private waters.

**Task 7A1b:** Determine statutory authority for new ANS issues.

**Task 7A1c:** Compare Nebraska ANS laws to neighboring state's laws and regulations.

**Task 7A1d:** Develop recommendations for revised and new state ANS legislation, statutes, rules, and regulations addressing gaps in current laws (including importation, enforcement, and penalties).

**Task 7A1e:** Work toward greater regional consistency of ANS regulations and enforcement.

**Task 7A1f:** Secure funding for personnel to enforce ANS regulations.

**Task 7A1g:** Promulgate and publicize legislation to educate public on the importance of gaining legislative support in preventing ANS introductions and spread.

## SECTION G

### PRIORITIES FOR ACTION

Nebraska currently lacks a cohesive ANS management strategy. Thus, in implementing this Plan, focus will initially be given to establishing an ANS Steering Committee as well as creating an ANS Coordinator position as much of the proposed work will be implemented by the coordinator and committee. In addition, the State of Nebraska currently has a limited number of statutory and regulatory authorities to address ANS. Those that exist were developed in response to individual target species and specific concerns as they arose. Nebraska does not have a comprehensive, coordinated, and vigorously enforced policy framework to deal with ANS and their effects. For this reason, another priority of Nebraska's ANS Management Plan is to identify gaps within state policies and statutes and develop recommendations for improvements. Such improvements may entail developing new legislation and regulations, revising existing authorities, and developing methods for improving enforcement, coordination, and information dissemination regarding new or existing authorities.

The Nebraska ANS Management Plan also emphasizes and prioritizes the need for collaboration among organizations in order to avoid duplication of effort and to ensure the same information base for dealing with ANS. In addition, while many organizations responsible for ANS management could develop a list of the top aquatic nuisance species of concern in Nebraska, the importance of addressing each species will often vary among groups. As a result, research, management, and outreach efforts are often disjunct and without a cohesive plan. To help identify current and potential ANS, the Nebraska ANS Plan calls for the development of a species ranking system in order to identify and prioritize current and potential ANS into distinct priority classes.

However, even when ANS are ranked and prioritized, the ability to manage each species varies greatly, and the resources available are often limited. Management efforts must, therefore, be focused on species where actions can produce the greatest benefit. In recognition of the known threats, impacts, and potential problems of certain ANS and the state's current management capabilities, the Nebraska ANS plan also calls for the development of an ANS risk assessment to help guide management activities for each current and potential ANS.

## SECTION H

### IMPLEMENTATION TABLE

(NOTE: Plan implementation is entirely dependent upon acquiring funding)

Outline of objectives, strategic actions, and tasks, financial status, implementing organization(s) and planned efforts for the next 5 years.

#### Legend for Planned Efforts and Funding:

Estimated dollar amounts are provided for general operating costs *needed* to complete each task.

x – Not planned for current year

0 – action planned for current year, but with little or no cost

Legend for identifying acronyms of listed organizations/agencies is located in the footer of the table.

Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
<b>Objective 1: Coordinate &amp; Implement</b>									
<b>Strategy 1A1: Increase coordination of all ANS management programs and activities in Nebraska</b>									
<b>1A1a</b>	Identify key personnel in the state			Coord, NISP, NISC, ANSSC	0	0	0	0	0
<b>1A1b</b>	Coordinate with state, federal, tribal, public, and private entities with ANS responsibilities			Coord, ANSSC	0	0	0	0	0
<b>1A1c</b>	Create ANS Steering Committee			NISC, ANSPC	0	0	0	0	0
<b>1A1d</b>	Create and fund ANS coordinator position	Unfunded	ANS Task Force Grant, others?		35 (to begin mid-year)	70	70	70	70
<b>1A1e</b>	Identify current ANS management activities	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>1A1f</b>	Identify gaps in ANS authority	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0

Organizations alphabetized by abbreviation: ECOE - Army Corps of Engineers, ANSPC – Aquatic Nuisance Species Planning Committee, ANSSC - Aquatic Nuisance Species Steering Committee, BOR - Bureau of Reclamation, CNPP – Central Public Power District, COOP – Nebraska Cooperative Fish and Wildlife Research Unit, Coord – Aquatic Nuisance Species Coordinator, MRBP – Mississippi River Basin Panel, MRWC – Missouri River Watershed Coalition, NDEQ – Nebraska Department of Environmental Quality, NEOC – Nebraska Education and Outreach Campaign, NET – Nebraska Environmental Trust Fund, NGPC – Nebraska Game and Parks Commission, NISC – Nebraska Invasive Species Council, NISP – Nebraska Invasive Species Project, NMN – Nebraska Master Naturalist, NPPD – Nebraska Public Power District, UNL – University of Nebraska-Lincoln

Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
1A1g	Develop uniform definitions	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
1A1h	Develop and maintain list of non-native species in NE	Funded	NISP	NISP, NISC, Coord, ANSSC	0	0	0	0	0
1A1i	Develop management strategies for prioritized non-native species.	Unfunded	See 1A1d, others?	Coord, ANSSC, various	x	0	0	0	0
1A1j	Hold an annual ANS conference/workshop	Unfunded	NET, NPPD, others	Coord, ANSSC, NISP, NISC	15	15	15	15	15
1A1k	Identify funding sources for implementing ANS Plan	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>Strategic Action 1A2: Increase participation in and support regional, federal and international efforts.</b>									
1A2a	Participate in the Aquatic Nuisance Species Task Force's regional panels	Funded	See 1A1d, NGPC, NISP, others	Coord, ANSSC, NGPC, others	0	0	0	0	0
1A2b	Participate in and support regional ANS organizations	Funded	See 1A1d, NISP, various	Coord, ANSSC, NISP, others	0	0	0	0	0
1A2c	Participate in regional and national forums	Funded	See 1A1d, NISP, various	Coord, ANSSC, NISP	0	0	0	0	0
1A2d	Develop cooperative agreements with surrounding states	Unfunded	See 1A1d	Coord, ANSSC, NISC	0	0	0	0	0
<b>Strategic Action 1A3: Develop a permanent funding mechanisms for ANS management in Nebraska</b>									
1A3a	Explore ideas for permanent ANS funding	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
1A3b	Work with NE legislature for short- and long-term funding	Unfunded	See 1A1d	Coord, ANSSC, NISP, NISC, others	0	0	0	0	0
<b>Strategic Action 1A4: Review and evaluate state efforts in addressing ANS</b>									
1A4a	Assess ANS management efforts	Unfunded	See 1A1d	Coord, ANSSC, NISC	0	0	0	0	0
1 A4b	Update ANS plan as needed with annual reports	Unfunded	See 1A1d	Coord, ANSSC, NISC	0	0	0	0	0
<b>Objective 1 Totals</b>					<b>55</b>	<b>85</b>	<b>85</b>	<b>85</b>	<b>85</b>
<b>Objective 2: Monitoring</b>									
<b>Strategic Action 2A1: Develop and implement a statewide ANS monitoring program.</b>									
2A1a	Identify gaps in ANS monitoring	Unfunded	See 1A1d	Coord, ANSSC, NGPC, others	0	0	0	0	0
2A1b	Design /implement monitoring program	Unfunded	QZAP Grant – FWS, others?	Coord, NISP, NGPC, ANSSC, others	20	50	50	50	50
2A1c	Secure funding for state-wide monitoring program	Unfunded	See 1A1d	Coord, ANSSC, NGPC, others	0	0	0	0	0
2A1d	Develop online database for tracking monitoring efforts	Partial funding	NISP, others?	Coord, NISP, NISC, others	x	0	0	0	0
<b>Strategic Action 2A2: Develop partnerships with regional states to share information concerning the distribution of ANS based on monitoring efforts.</b>									
2A2a	Facilitate regional sharing of monitoring data	Unfunded	See 1A1d	Coord, ANSSC, NISP, NISC, others	0	0	0	0	0
2A2b	Share ANS lists with	Unfunded	See 1A1d	Coord, ANSSC,	0	0	0	0	0

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
	region			NISP, NISC, others					
<b>2A2c</b>	Produce annual monitoring reports and distribute regionally	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>Objective 2 Totals</b>					<b>20</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>
<b>Objective 3: Prevention of New Introductions</b>									
<b>Strategic Action 3A1: Develop and implement an early detection and rapid response (EDRR) program.</b>									
<b>3A1a</b>	Identify ANS with greatest threat to invade	Unfunded	See 1A1d	Coord, ANSSC, NISP, NISC, others	0	0	0	0	0
<b>3A1b</b>	Identify current EDDR efforts and coordinate with state/regional	Partially funded	See 1A1d, NISP	Coord, NISP	0	0	0	0	0
<b>3A1c</b>	Facilitate EDDR workshops during annual conference	Unfunded	See 1A1j	Coord, ANSSC, NGPC, NISP, NISC	0	0	0	0	0
<b>3A1d</b>	Develop monitoring program for new ANS (see Obj. 2)	Unfunded	See 2A1b	Coord, NISP, NGPC, ANSSC, others?	0	0	0	0	0
<b>3A1e</b>	Develop rapid response plan for priority species	Unfunded	?	Coord, ANSSC, NISC, others	x	0	0	0	0
<b>3A1f</b>	Identify funding sources for rapid response plan actions	Unfunded	See 1A1d	Coord, ANSSC, NISC, others	x	0	0	0	0
<b>3A2g</b>	Develop/implement watercraft inspection program; high-risk waters	Unfunded	?, NET?	NGPC? Others?	x	x	400	400	400

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
<b>Objective 3 Totals</b>					<b>0</b>	<b>0</b>	<b>400</b>	<b>400</b>	<b>400</b>
<b>Objective 4: Control of Established ANS</b>									
<b>Strategic Action 4A1: Develop and implement control strategies to eradicate or reduce populations of priority ANS established in state waters.</b>									
<b>4A1a</b>	Coordinate control strategies with state and regional stakeholders	Unfunded	See 1A1d	Coord, ANSSC, others	0	0	0	0	0
<b>4A1b</b>	Identify current ANS control plans	Unfunded	See 1A1d	Coord, ANSSC, others	x	0	0	0	0
<b>4A2c</b>	Identify established ANS in need of control	Unfunded	See 1A1d	Coord, ANSSC, others	x	0	0	0	0
<b>4A1d</b>	Identify funding source for managing established ANS	Unfunded	See 1A1d	Coord, ANSSC, others	x	0	0	0	0
<b>4A1e</b>	Identify ways to limit dispersal of established ANS	Unfunded	See 1A1d, NGPC? others?	Coord, ANSSC, others	x	0	0	0	0
<b>4A1f</b>	Develop guidelines for cleaning water-based equipment	Unfunded	?	Coord, ANSSC, NGPC, others	x	0	0	0	0
<b>4A1fg</b>	Develop guidelines to quarantine as needed	Unfunded	?	Coord, ANSSC, NGPC, others	x	0	0	0	0
<b>Objective 4 Totals</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Objective 5: Research</b>									
<b>Strategic Action 5A1: Support research that identifies, predicts, and prioritized ANS introductions and their spread</b>									
<b>5A1a</b>	Review life history, ecology and management	Unfunded	See 1A1d	Coord, ANSSC, NISP, NISC,	x	0	0	0	0

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
	of ANS			UNL, COOP, NGPC, others					
<b>5A1b</b>	Identify critical data needed for prevention	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>5A1c</b>	Attend conferences	Partial funding	various	All	0	0	0	0	0
<b>5A1d</b>	Review studies done within the region	Unfunded	See 1A1d, others	Coord, ANSSC, NISP, NISC, others	x	0	0	0	0
<b>5A1e</b>	Improve ability to predict ANS introduction and spread – risk assessment	Unfunded	See 1A1d	Coord, ANSSC, NISP, NISC, UNL, COOP, NGPC, others	x	x	50	50	50
<b>5A1f</b>	Identify economic and ecological impacts of ANS	Partial funding	NISP, NISC, COOP, others?	Coord, ANSSC, NISP, NISC, UNL, COOP, NGPC, others	0	25	50	25	0
<b>Strategic Action 5A2: Support research that investigates management strategies that limit the introduction and spread of ANS populations</b>									
<b>5A2a</b>	Investigate new management methods w/ adaptive management approach	Unfunded	See 1A1d, others	Coord, ANSSC, NISP, NISC, UNL, COOP, NGPC, others	x	5	0	0	0
<b>5A2b</b>	Review impacts of human disturbance on ANS	Unfunded	See 1A1d, others	Coord, ANSSC, NISP, NISC, UNL, COOP, NGPC, others	x	x	0	0	0
<b>5A2c</b>	Research effective ANS marketing programs	Unfunded	NET? MRBP?	Coord, NISP, others	x	50	50	x	x
<b>5A2d</b>	Research effectiveness of education- and incentive-based programs	Unfunded	See 5A2c	Coord, NISP, others	x	0	0	0	0

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
5A2e	Review alternative control strategies for ANS	Unfunded	?	Coord, ANSSC, NISP, NISC, UNL, COOP, NGPC, others	x	0	0	0	0
<b>Strategic Action 5A3: Facilitate the collection and dispersal of information, research, and data on ANS in Nebraska</b>									
5A3a	Create repository for ANS reference material	Partial funding	NISP, see 2A1e, NET? others?	Coord, NISP, NISC, ANSSC, others?	0	0	0	0	0
5A3b	Create central database for ANS information	Partial funding	NISP, see 2A1e, NET? others?	Coord, NISP, NISC, ANSSC, others?	0	0	0	0	0
5A3c	Maintain list of experts for ANS identification	Partial funding	See 1A1d, NISP	Coord, NISP, NISC, ANSSC, NGPC, others?	0	0	0	0	0
<b>Objective 5 Totals:</b>					<b>0</b>	<b>80</b>	<b>150</b>	<b>75</b>	<b>50</b>
<b>Objective 6: Outreach and Education</b>									
<b>Strategic Action 6A1: Educate the public about ANS, how their actions can prevent the introduction and spread of ANS</b>									
6A1a	Identify all current education and outreach programs	Partially funded	See 1A1d, NISP	Coord, NISP, NISC, ANSSC, others?	0	0	0	0	0
6A1b	Develop cohesive ANS outreach strategy	Unfunded		Coord, NISP, ANSSC, NISC	0	0	x	x	x
6A1c	Identify funding for ANS outreach program	Unfunded	See 1A1d, NISP	Coord, ANSSC	0	0	0	0	0
6A1d	Develop/distribute educational materials to general public and specific user groups	Partial funding	NET? NISP, NGPC, others?	Coord, NISP, NGPC, ANSSC	5	20	20	20	20

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
6A1e	Incorporate ANS info into hunter and boater education	Partial funding	See 6A1d	Coord, ANSSC, NGPC, NISP, NEOC	5	5	5	5	5
6A1f	Produce press releases and PSA's	Partial funding	NET? NISP, NGPC, others	Coord, ANSSC, NISP, NGPC	0	5	5	5	5
6A1g	Create articles and web-based media	Partial funding	NET? NISP, NGPC, others	Coord, ANSSC, NISP, NGPC	0	0	0	0	0
6A1h	Coordinate with NE Master Naturalist to educate volunteers	Funded	NMN	Coord, NISP, NMN, others	0	0	0	0	0
6A1i	Investigate citizen-science based programs	See 3A2d	NET?, NMN, NISP?	Coord, NISP, NMN, others	x	0	0	0	0
6A1j	Give presentations to affected various stakeholders	Partial funding	NET? NISP, NGPC, others?	Coord, NISP, NGPC, others?	0	0	0	0	0
6A1k	Include ANS info in hunting, fishing, & boating regulations	Unfunded	NGPC, NISP	Coord, ANSSC, NGPC, NISP	0	0	0	0	0
<b>Strategic Action 6A2: Develop and implement a 'Next Generation Education Strategy.'</b>									
6A2a	Coordinate with K-12 state science educators and coordinators	Partially funded	See 1A1d, NISP	Coord, NISP, NEOC, others	x	0	0	0	0
6A2b	Develop ANS curriculum for K-12	Unfunded	NET? NISP, MRWC, others?	Coord, NISP, NEOC, others	x	0	0	0	0
6A2c	Train K-12 teachers on ANS curriculum – invasives workshop	Unfunded	NET? NISP, MRWC, others?	Coord, NISP, NEOC, MRWC, NMN	x	8	8	8	8
6A2d	Present ANS information in various classrooms	Partial funding	NISP, others?	Coord, NISP, others?	0	0	0	0	0
<b>Strategic Action 6A3: Develop and distribute identification and management information to resource agency staff.</b>									

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
6A3a	Distribute ANS material to entities with aquatic responsibilities in NE	Partial funding	NET? NGPC, NISP, others?	Coord, NGPC, NISP, ANSSC	0	5	5	5	5
6A3b	Facilitate ANS identification workshops for resource managers at annual conference	Unfunded	See 1A1d, 1A1j	Coord, NGPC, ANSSC, NISP	0	0	0	0	0
6A3c	Maintain a list of experts with whom ANS samples can be verified	Partially funded	See 1A1d, NISP	Coord, ANSSC NGPC, NISP	0	0	0	0	0
6A3d	Give presentations to professional resource management organizations	Partial funding	NET? NISP, NGPC, others	Coord, NISP, NGPC, others	0	0	0	0	0
6A3e	Facilitate HACCP training for appropriate personnel	Funded	NGPC	NGPC, others?	0	0	0	0	0
6A3f	Develop boater inspection training program for authorities across NE	Unfunded	See 3A2g	NGPC, Coord,	0	0	x	x	x
<b>Strategic Action 6A4: Develop and provide ANS informational briefings and educational materials to key policy and decision makers</b>									
6A4a	Facilitate field days and luncheons for legislators/staff	Unfunded	NET?	Coord, ANSSC, NISP	0.5	0.5	0.5	0.5	0.5
6A4b	Provide ANS annual report to legislators/staff	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
6A4c	Distribute educational materials to and meet with key policy-makers	Partial funding	NET? NISP, NGPC, others?	Coord, NISP, NGPC, others?	0.5	0.5	0.5	0.5	0.5

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Objectives and Actions					Planned Efforts and Funding Needed (\$1,000s)				
Task #	Description	Current Financial Status	Potential or Current Funding Source	Implementing Organization(s)	2011	2012	2013	2014	2015
<b>Objective 6 Totals:</b>					<b>11</b>	<b>44</b>	<b>44</b>	<b>44</b>	<b>44</b>
<b>Objective 7: Legislation</b>									
<b>Strategic Action 7A1: Review existing laws and regulations governing ANS and amend or add as required to achieve goals of ANS Plan.</b>									
<b>7A1a</b>	Compile list of current laws, rules, and regulations for ANS and identify gaps	Unfunded	See 1A1d	Coord, ANSSC	0	x	x	x	x
<b>7A1b</b>	Determine statutory authority for ANS issues	Unfunded	See 1A1d	Coord, ANSSC, NISC	0	0	x	x	x
<b>7A1c</b>	Compare NE ANS laws to neighboring states	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>7A1d</b>	Develop recommendations for revised and new NE legislation	Unfunded	See 1A1d	Coord, ANSSC, NISC, others	0	0	0	0	0
<b>7A1e</b>	Coordinate for regional consistency in ANS rules and regulations	Unfunded	See 1A1d	Coord, ANSSC	0	0	0	0	0
<b>7A1f</b>	Secure funding to enforce ANS regulations	Unfunded	See 1A1d	Coord, ANSSC, NGPC	0	0	0	0	0
<b>7A1g</b>	Promulgate legislation to educate public on importance of legislative support	Partial funding	NISP, See 1A1d, others?	Coord, ANSSC, NISP, others?	0	0	0	0	0
<b>Objective 7 Totals:</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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<b>Plan Summary</b>	<b>Planned Efforts and Funding Needed (\$1,000s)</b>				
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Objective 1 – Coordination: Totals	55	85	85	85	85
Objective 2 – Monitoring: Totals	20	50	50	50	50
Objective 3 – Prevention of New ANS: Totals	0	0	400	400	400
Objective 4 – Control of Established ANS: Totals	0	0	0	0	0
Objective 5 – Research: Totals:	0	80	150	75	50
Objective 6 – Education and Outreach: Totals:	11	44	44	44	44
Objective 7 – Legislation: Totals:	0	0	0	0	0
<b>Plan Totals:</b>	<b>86</b>	<b>259</b>	<b>729</b>	<b>654</b>	<b>629</b>

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## **SECTION I**

### **PROGRAM MONITORING AND EVALUATION**

The evaluation process of the Nebraska ANS Management Plan will provide a means of monitoring progress, evaluating needs and problems, coordinating efforts and pursuing the goal of prevention and management of introductions, population growth, and dispersal of ANS into, within, and from Nebraska. Mid-course corrections will be made when and if necessary. The process involves three main components: oversight, evaluation, and reporting.

#### **OVERSIGHT**

A program oversight committee will be established (with several members from the Nebraska Invasive Species Advisory Council), consisting of interested parties identified during the review process, various Nebraska state and federal agencies, tribes and other interested private/public parties including members from the original steering committee who authored the document. The role of this inter-agency committee will be to examine progress on management actions focused on the goal of the state management plan. The committee can evaluate the success of each strategy by examining the level of achievement of the tasks clearly defined within each action.

#### **EVALUATION**

The evaluation effort should not only examine progress, but also place special emphasis on funding needs to successfully accomplish the goals and associated tasks. This information will prove useful for future program planning purposes. Evaluation should also incorporate information from those groups affected by plan implementation. These include organizations involved with the responsibility of implementing management actions and resource user groups.

#### **REPORTING**

An annual progress report will be prepared and disseminated, highlighting the management actions regarding aquatic nuisance plants, animals and pathogens that year. This report will include information on the success in achieving the goals of prevention and maintenance of introductions, population growth, and ANS dispersal into, within and from Nebraska. It will be disseminated to state, federal, local agencies and organizations, tribes, policy-makers, and other interested private and public parties.

A program status report will be written every five (5) years that ties the annual progress reports to the overall ANS management plan, as well as future plans and directions. Successes, failures, and new directions within Nebraska will be evaluated in comparison to and in concert with neighboring states and any regional planning efforts. The annual progress reports and the program status report (5 years) will be made available to the general public, local, state and federal decision makers.

## SECTION J

### Glossary

**Adaptive Management:** a management framework involving a cyclic process with the following components: identify the problem and objectives, develop multiple proposed actions, implement actions, monitor results of each action, evaluate successfulness of each, and adjust if necessary.

**Aquatic Nuisance Species (ANS):** nonindigenous species that threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters. ANS include nonindigenous species that may occur in inland, estuarine and marine waters and that presently or potentially threaten ecological processes and natural resources. In addition to adversely affecting activities dependant on waters of the United States, ANS can adversely affect individuals, including health effects.

**Aquaculture:** farming of freshwater and saltwater organisms such as finfish, mollusks, crustaceans and aquatic plants. Also known as aquafarming, aquaculture involves cultivating aquatic populations under controlled conditions, and can be contrasted with commercial fishing, which is the harvesting of wild fish.

**Baitfish:** fish species commonly sold for use as bait for recreational fishing.

**Ballast water:** any water or associated sediments used to manipulate the trim and stability of a vessel.

**Biodiversity:** the variety and variability among living organisms and the ecological complexes in which they occur.

**Control:** limiting the distribution and abundance of a species.

**Ecosystem:** system formed by the interaction of organisms with their environment.

**Environment:** the external surroundings including all of the living and non-living factors that surround and affect the survival and development of an organism.

**Eradicate:** the act or process of eliminating an ANS.

**Exotic:** any species or other biological material that enters an ecosystem beyond its historic range on the continent. Also referred to as *introduced, foreign, non-indigenous, alien, non-native, immigrant* and *transplants*.

**Habitat:** an ecological or environmental area that is inhabited by a particular animal, plant or other organism. It is the natural environment in which an organism lives, or the physical environment that surrounds (influences and is utilized by) a species population.

**Infested water:** any water body where an aquatic nuisance species is known to occur.

**Invasive:** plant or animal that is not native, and has, or is actively, spreading to new environments. Other terms used to describe non-native species include exotic or alien. In some cases they are extremely damaging to the economy, the environment, or human health.

**Native:** a species occurring naturally in a specified geographic area comprising its ecological range.

**Non-indigenous species:** any species or other viable biological material that enters an ecosystem beyond its historic range, including any such organism transferred from one country into another. Nonindigenous species include both exotics and transplants. Synonyms for NIS include *introduced, foreign, exotic, alien, non-native, immigrant* and *transplants*.

**Non-native:** a species not natural to a specified geographic area, having been introduced either purposely or unintentionally. Also referred to as *introduced, foreign, exotic, alien, non-indigenous, immigrant* and *transplants*

**Pathogen:** a microbe or other organism that causes disease.

**Priority species:** an ANS that is considered to be a significant threat to Nebraska waters and is recommended for immediate or continued management action to minimize or eliminate their impact.

**Population:** a group of individual plant, animal, or pathogen species occupying a particular area at the same time.

**Watershed:** an entire drainage basin including all living and nonliving components.

## SECTION K

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## APPENDIX A

### SECTION 1204 OF THE NATIONAL INVASIVE SPECIES ACT OF 1996

#### (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 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 risk 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) 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 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.

# EXECUTIVE ORDER 13112

Executive Order 13112 of February 3, 1999

## Invasive Species

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and other pertinent statutes, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause, it is ordered as follows:

### **Section 1.** Definitions.

- (a) "Alien species" means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.
- (b) "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions. "
- (c) "Ecosystem" means the complex of a community of organisms and its environment.
- (d) "Federal agency" means an executive department or agency, but does not include independent establishments as defined by 5 U.S.C. 104. (e) "Introduction" means the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.
- (f) "Invasive species" means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.
- (g) "Native species" means, with respect to a particular ecosystem, a species that other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.
- (h) "Species" means a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

(i) "Stakeholders" means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

(j) "United States" means the 50 States, the District of Columbia, Puerto Rico, Guam, and all possessions, territories, and the territorial sea of the United States.

**Sec. 2. Federal Agency Duties.** (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law.

1) identify such actions;

2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and

3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

(b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

**Sec. 3. Invasive Species Council.** (a) An Invasive Species Council (Council) is hereby established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council may invite additional Federal agency representatives to be members, including representatives from subcabinet bureaus or offices with significant responsibilities concerning invasive species, and may prescribe special procedures for their participation. The Secretary of the Interior shall, with concurrence of the Co-Chairs, appoint an Executive Director of the Council and shall provide the staff and administrative support for the Council.

(b) The Secretary of the Interior shall establish an advisory committee under the Federal Advisory Committee Act, 5 U.S.C. App., to provide information and advice for consideration by the Council, and shall, after consultation with other members of the Council, appoint members of the advisory committee representing stakeholders. Among other things, the advisory committee shall recommend plans and actions at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order. The advisory committee shall act in cooperation with stakeholders and existing organizations addressing invasive species. The Department of the Interior shall provide the administrative and financial support for the advisory committee.

**Sec. 4. Duties of the Invasive Species Council.** The Invasive Species Council shall provide national leadership regarding invasive species, and shall:

- (a) oversee the implementation of this order and see that the Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species, such as the Aquatic Nuisance Species Task Force, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, and the Committee on Environment and Natural Resources;
- (b) encourage planning and action at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order, in cooperation with stakeholders and existing organizations addressing invasive species;
- (c) develop recommendations for international cooperation in addressing invasive species; develop, in consultation with the Council on Environmental Quality, guidance to Federal agencies pursuant to the National Environmental Policy Act on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species;
- (d) facilitate development of a coordinated network among Federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health;
- (e) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, to the greatest extent practicable, the Internet; this system shall facilitate access to and exchange of information concerning invasive species, including, but not limited to, information on distribution and abundance of invasive species; life histories of such species and invasive characteristics; economic, environmental, and human health impacts; management techniques, and laws and programs for management, research, and public education; and
- (f) prepare and issue a national Invasive Species Management Plan asset forth in section 5 of this order.

**Sec. 5. Invasive Species Management Plan.** (a) Within 18 months after issuance of this order, the Council shall prepare and issue the first edition of a National Invasive Species Management Plan (Management Plan), which shall detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species. The Management Plan shall recommend specific objectives and measures for carrying out each of the Federal agency duties established in section 2

(a) of this order and shall set forth steps to be taken by the Council to carry out the duties assigned to it under section 4 of this order. The Management Plan shall be developed through a public process and in consultation with Federal agencies and stakeholders.

(b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, including those for identifying pathways by which invasive species are introduced and for minimizing the risk of introductions via those pathways, and shall identify research needs and recommend measures to minimize the risk that introductions will occur. Such recommended measures shall provide for a science-based process to evaluate risks associated with introduction and spread of invasive species and a coordinated and systematic risk-based process to identify, monitor, and interdict pathways that may be involved in the introduction of invasive species. If recommended measures are not authorized by current law, the Council shall develop and recommend to the President through its Co-Chairs legislative proposals for necessary changes in authority.

(c) The Council shall update the Management Plan biennially and shall concurrently evaluate and report on success in achieving the goals and objectives set forth in the Management Plan. The Management Plan shall identify the personnel, other resources, and additional levels of coordination needed to achieve the Management Plan's identified goals and objectives, and the Council shall provide each edition of the Management Plan and each report on it to the Office of Management and Budget. Within 18 months after measures have been recommended by the Council in any edition of the Management Plan, each Federal agency whose action is required to implement such measures shall either take the action recommended or shall provide the Council with an explanation of why the action is not feasible. The Council shall assess the effectiveness of this order no less than once each 5 years after the order is issued and shall report to the Office of Management and Budget on whether the order should be revised.

**Sec. 6. Judicial Review and Administration.** (a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person.

(b) Executive Order 11987 of May 24, 1977, is hereby revoked.

(c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.

(d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.

WILLIAM J. CLINTON

THE WHITE HOUSE,  
*February 3, 1999.*

### **Other relevant Acts are detailed below**

#### **1931 Animal Damage Control Act**

Under the Animal Damage Control Act, the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service has authority to control wildlife damage on federal, state, or private land, including damage from invasive species. The act protects field crops, vegetables, fruits, nuts, horticultural crops and commercial forests; freshwater aquaculture ponds and marine species cultivation areas; livestock on public and private range and in feedlots; public and private buildings and facilities; civilian and military aircraft; and public health.

<http://www.aphis.usda.gov/>

#### **1970 National Environmental Policy Act (NEPA; 42 U.S.C.A. §§ 4321 to 4370e)**

NEPA requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet NEPA requirements federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS). EPA reviews and comments on EISs prepared by other federal agencies, maintains a national filing system for all EISs, and assures that its own actions comply with NEPA.

<http://www.epa.gov/compliance/nepa/index.html>

#### **1972 Clean Water Act**

Administered by the Environmental Protection Agency, the Clean Water Act strives to eliminate introduction of toxic substances into waters of the United States to ensure that surface waters are suitable for human sports and recreation. Additionally the Clean Water Act regulates discharge of dredge and fill materials into wetlands; enforcement as it relates to wetlands is coordinated by the U.S. Army Corps of Engineers. Various sections of the Clean Water Act regulate discharges of pollutants (such as AIS and ballast water) and fill material to waters of the United States.

Section 402 of the act authorizes the National Pollutant Discharge Elimination System (NPDES), a permit program intended to reduce and eliminate the discharge of pollutants from point sources that threaten to impair beneficial uses of water bodies. The act defines point sources to include vessels (Section 502(14)) and prohibits all point source discharges of pollutants into U.S. waters unless a permit has been issued either under Section 402 (NPDES) or Section 404 (dredge and fill activities). <http://www.epa.gov/r5water/cwa.htm>, <http://unds.bah.com/default.htm>

### **1973 Endangered Species Act (ESA; 16 U.S.C.A. §§ 1531 to 1544):**

The U.S. Fish and Wildlife Service administers the Endangered Species Act as part of its authority to effect AIS impacts that could extend to a listed species or listed critical habitat. The act, which is Public Law 93-205, has experienced several amendments across the years, and at its onset repealed the Endangered Species Conservation Act of 1969. The 1969 Act had amended the Endangered Species Preservation Act of 1966. The ESA aims to protect endangered and threatened species. When non-native invasive species threaten endangered species, this act could be used as basis for their eradication or control by the USFWS or by the National Oceanic and Atmospheric Administration– National Marine Fisheries Service (NOAA-Fisheries Service) The potential to harm a federally listed species and the need to obtain a permit from the USFWS or NOAA-Fisheries Service should be taken into consideration when selecting methods to manage AIS. <http://www.fws.gov/endangered/>

### **1974 Federal Noxious Weed Act (7 U.S.C. § 360)**

Enacted January 3, 1975, this established a Federal program to control the spread of noxious weeds. The Secretary of Agriculture was given the authority to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit. The Secretary was also given authority to inspect, seize and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds. He was also authorized to cooperate with other Federal, State and local agencies, farmers associations and private individuals in measures to control, eradicate, or prevent or retard the spread of such weeds. Section 15 of the Federal Noxious Weed Act requires federal land management agencies to develop and establish a management program for control of undesirable plants that are classified under state or federal law as undesirable, noxious, harmful, injurious or poisonous, on federal lands under the agency's jurisdiction (7 U.S.C. 2814(a)). The act also requires the federal land management agencies to enter into cooperative agreements to coordinate the management of undesirable plant species on federal lands where similar programs are being implemented on state and private lands in the same area (7 U.S.C. 2814(c)). The Secretaries of Agriculture and the Interior must coordinate their respective control, research and educational efforts relating to noxious weeds (7 U.S.C. 2814(f)). USDA's Departmental Regulation 9500-10 sets forth departmental policy relating to the management and coordination of noxious weeds activities among the agencies within USDA and other entities.

### **1976 National Forest Management Act, 1976 Federal Land Policy Management Act, and the 1916 National Park Act**

Administered by the U.S. Forest Service, Bureau of Land Management, and National Park Service, respectively, these acts regulate native species, non-indigenous species introductions and habitat health on federal land.

### **2000 Plant Protection Act (7 U.S.C. 7701)**

Administered by the U.S. Department of Agriculture Animal and Plant Health Inspection Service, the Plant Protection Act prohibits introduction and dissemination of plant pests and noxious weeds. The Plant Protection Act (PPA) authorizes the USDA to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article or means of conveyance if the Secretary of Agriculture determines that the

prohibition or restriction is necessary to prevent the introduction into the United States, or the dissemination within the United States, of a plant pest or noxious weed. The PPA specifically authorizes USDA to develop integrated management plans for noxious weeds for the geographic region or ecological range where the noxious weed is found in the United States. In addition, the act authorizes the USDA to cooperate with other federal agencies or entities, states or political subdivisions of states, national governments, local governments of other nations, domestic or international organizations or associations, and other persons to carry out the provisions of the act. <http://www.aphis.usda.gov/>

**2002 Animal Health Protection Act (7 U.S.C Sec. 8301, et seq.)**

The Animal Health Protection Act provides a flexible statutory framework for protecting domestic livestock from foreign pests and diseases. This act authorizes the USDA to promulgate regulations and take measures to prevent the introduction and dissemination of pests and diseases of livestock. The scope of such regulatory authority extends to the movement of all animals, domestic and wild, except humans. The fact that a pest or disease primarily affects animals other than livestock, including humans, does not limit USDA's authority to regulate a species, so long as it carries a pest or disease of livestock. Further, the act defines "livestock" to mean all farm-raised animals, clarifying the USDA's authority to conduct animal health protection activities in connection with farm-raised aquatic animals. <http://www.aphis.usda.gov/>

**2008 Lacey Act (18 U.S.C. 42 through regulations contained in 50 CFR part 16):**

The U.S. Fish and Wildlife Service, amongst other agencies, administer the Lacey Act, which is Public Law 110-246, as part of their authority to prohibit trade in wildlife, fish, and plants that have been illegally taken, possessed, transported or sold. The act, originally passed in 1900, has been amended several times; the most significant ones occurred in 1969, 1981, 1988 and 2008. The act further regulates activities involving specified species deemed to be injurious to the United States. As the first federal act that tried to control importations of nonindigenous species, the Lacey Act prohibits the importation and interstate transport of designated mammals, birds, amphibians, reptiles, fish, crustaceans, mollusks that are injurious to the interests of human beings, agriculture, horticulture, forestry, wildlife or wildlife resources of the United States. The Lacey Act allows for the import of species for scientific, medical, educational or zoological purposes. The USFWS is the lead agency for enforcing the Lacey Act. <http://www.fws.gov/laws/lawsdigest/lacey.html>

**FEDERAL AUTHORITIES AND PROGRAMS ARE DETAILED BELOW**

**U.S. Fish and Wildlife Service**

USFWS has multiple programs that address AIS management. USFWS serves as co-chair of the Federal ANSTF and is the agency that provides federal funding for the implementation of Task Force approved state AIS management plans. USFWS also provides technical assistance to states regarding AIS management. USFWS administers the Lacey Act, which prohibits importation and interstate transport of listed species. USFWS prevention programs include the 100th Meridian Initiative, which focuses on preventing the western spread of zebra mussels. In cooperation with the USGS, USFWS supports the national ANS reporting hotline (1-877-STOP-ANS). USFWS refuges support invasive species control programs as part of their overall habitat restoration activities. <http://www.fws.gov/>, <http://www.100thmeridian.org>

### **U.S. Geological Survey (USGS)**

USGS acknowledged its role in non-native species management in a White Paper on Invasive Species, which identifies the goal of developing new strategies for the prevention, early detection and prompt eradication of new invaders. The USGS further identifies information management and documentation of invasions as a priority for the agency. In keeping with this objective, the USGS developed and maintains an extensive, spatially referenced database of non-native species, which is accessible online. <http://www.usgs.gov> <http://nas.er.usgs.gov/>

### **Bureau of Reclamation**

The Bureau of Reclamation is involved in several important projects related to this issue. The Bureau is investigating more effective coatings for preventing the settlement of quagga and zebra mussels and has partnered with a private company to investigate the potential biological control of these species through the use of native bacteria. <http://www.usbr.gov/>

### **U.S. Army Corps of Engineers**

The COE provides engineering, construction and environmental project services for the military and local governments. Congress authorizes the COE to assist local governments with water resource development needs, which include flood control, navigation, ecosystem restoration and watershed planning. For ecosystem restoration, this includes research on invasive species. Specific programs addressing invasive species issues include the Aquatic Nuisance Species Research Program, the Aquatic Plant Control Research Program and the Water Operations Technical Support Program. COE is also responsible for permitting aquaculture projects, including oyster farms, which often involves AIS considerations. It is the policy of the Corps of Engineers to develop, control, maintain, and conserve the nation's water resources in accordance with the laws and policies established by Congress and the Administration. The Corps' Zebra Mussel Research Program (ZMRP) was authorized by the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, Public Law 101-646, and is the only federally authorized research program for the development of technology to control zebra mussels. The Corps ANS programs were integrated into the ANS Task Force to ensure total coordination and leveraging to address all ANS issues. <http://www.usace.army.mil/>

### **National Oceanic and Atmospheric Administration (NOAA)**

NOAA is the primary federal agency charged with management of marine resources. NOAA is the co-chair of the ANSTF and has been designated the Department of Commerce lead as co-chair of the National Invasive Species Council. <http://www.noaa.gov/>

### **National Marine Fisheries Service (NOAA – Fisheries Service)**

NOAA-Fisheries Service is in charge sustaining the nation's marine fisheries, many of which are being directly impacted by AIS. <http://www.nmfs.noaa.gov/>

### **National Sea Grant (NOAA – Sea Grant)**

The National Sea Grant Program is a partnership between the nation's universities and NOAA (under the Office of Oceanic and Atmospheric Research) that began in 1966. <http://www.seagrant.noaa.gov/>

### **National Park Service**

NPS strives to preserve the unimpaired natural and cultural resources of the national park system for the enjoyment, education and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country. Finally, the NPS actively supports and hosts research projects on impacts of invasive species on ecological communities. [www.nps.gov](http://www.nps.gov)

### **U.S. Coast Guard**

The U.S. Coast Guard gets its authority to regulate ballast water and ANS from NANPCA and NISA. NANPCA directed the Coast Guard to issue regulations and guidelines to control the introduction and spread of ANS in the Great Lakes ecosystem. It also required an assessment of ballast water management practices in all U.S. ports. NISA tasked the Coast Guard with establishing a voluntary ballast water management (BWM) program for virtually all U.S. ports. The Coast Guard's BWM program is the primary emphasis related to ANS in the inland river system. Current Coast Guard efforts include establishing mandatory BWM standards and practices, establishing a program to approve ballast water treatment technologies, establishing penalties for failure to submit required reports, and increasing the applicability to all ships with ballast water tanks bound for all ports or places in U.S. waters. USCG activities focus on enforcement and monitoring to ensure compliance with the program, which includes regular onboard inspections. However, USCG activities related to AIS are diverse. The agency is working on the development of chemical and engineering methods to verify that a mid-ocean ballast water exchange has occurred. It is also evaluating technologies for the treatment of ballast water. USCG has determined that due to difficulties in establishing the effectiveness of ballast water exchange as it varies across ship types, voyages and from tank to tank, treatment technologies are best evaluated through a ballast water discharge standard (a benchmark for maximum numbers of organisms that may be discharged in ballast water). Such a standard will not only be helpful in evaluating the effectiveness of treatment technologies but also clearly establish when the ballast water no longer contains quantities of organisms that pose a significant risk. <http://www.uscg.mil/hq/g-m/mso/bwm.htm>

### **U.S. Department of Agriculture**

USDA provides leadership on food, agriculture, natural resources and related issues. USDA conducts a number of programs and activities related to invasive species. USDA's Animal and Plant Health Inspection Service (APHIS) serves to facilitate safe international trade, monitor the health of animals and plants presented at the border, and regulate the import and export of plants and animals, plant and animal products, and biologicals. It also protects and improves the health, quality, and marketability of our nation's animals (including various wildlife), animal products, and veterinary biologics. The Plant Protection and Quarantine (PPQ) is a program within APHIS that safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests and noxious weeds to ensure an abundant, high-quality, and varied food supply. APHIS deals with invaders like the South American wetland rodent, nutria, in the Mississippi Delta region and has also worked on other invasive animal, fish and crab problems around the country. APHIS has done extensive noxious weed work, including exclusion, permitting, eradication of incipient infestations, surveys, data management, public education, and (in cooperation with other agencies) integrated

pest management of introduced weeds, including biological control. Aquatic weeds are included in the federal noxious weed list through the APHIS Cooperative Agricultural Pest Survey (CAPS). Scientists at these facilities are responsible for research, the transfer of technology for improvement of management and control, and eradication of invasive aquatic and riparian weeds affecting agriculture and natural resources. These projects address three current ARS program priorities: 1) the reduction of dependence on pesticide use (specifically herbicides); 2) implementation of Executive Order 13112 (see above subsection on this order); and 3) water quality improvement. Research is conducted on the biology, reproduction, ecology, management or eradication of several important invasive aquatic weeds. The program provides technology transfer for the eradication and management of several problem species.

<http://www.aphis.usda.gov/>, <http://www.ars.usda.gov/main/main.htm>

#### USDA Natural Resources Conservation Service

The Farm Bill, administered by the Natural Resources Conservation Service, working in close partnership with Nebraska's Conservation Districts, strives to improve private agricultural lands for wildlife habitat and agricultural purposes. In part, they target management of AIS as they affect production of crops or product from private land. **Note:** the Natural Resources Conservation Service manages the National Invasive Species Information Center

[www.invasivespeciesinfo.gov](http://www.invasivespeciesinfo.gov).

#### U.S. Environmental Protection Agency (USEPA)

USEPA leads the nation's environmental science, research, education and assessment efforts. It develops and enforces regulations, offers financial assistance, performs environmental research, sponsors voluntary partnerships and programs, furthers environmental education and publishes information. USEPA is responsible for enforcing the Clean Water Act (CWA). USEPA released its *EPA Authorities for Natural Resource Managers Developing Aquatic Invasive Species Rapid Response and Management Plans* in December 2005. This document provides an overview of USEPA authorities that apply to state or local AIS rapid response and control actions. The document summarizes relevant sections of the CWA and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); summarizes how to apply for CWA Section 404 permits to discharge dredged or fill material; summarizes how to apply for FIFRA Section 18 emergency exemptions and FIFRA Section 24(c) special local need registrations; and describes case studies in which state and local natural resource managers successfully obtained FIFRA emergency exemptions and special local need registrations for AIS eradication or control actions.

[http://www.epa.gov/owow/invasive\\_species](http://www.epa.gov/owow/invasive_species)

#### Federal Programs

Aquatic Nuisance Species Task Force  
100<sup>th</sup> Meridian Initiative  
Stop Aquatic Hitchhikers  
Center for Aquatic and Invasive Plants  
North American Weed Management Association  
National Invasive Species Council  
Nature Serve  
National Institute of Invasive Species Science

Center for Wildlife Damage Management  
Center for Aquatic Nuisance Species

## **REGIONAL**

### **The Western Regional Panel**

The Western Regional Panel (WRP) on Aquatic Nuisance Species was formed under a provision in NISA. The WRP was formed to help limit the introduction, spread, and impacts of aquatic nuisance species into western North America. This panel includes representatives from federal, state and local agencies and from private environmental and commercial interests.

The purposes of the WRP, as described in NISA, are to:

- identify Western Region priorities for responding to aquatic nuisance species
- make recommendations to the Federal ANS Task Force regarding an education, monitoring (including inspection), prevention, and control program to prevent the spread of the zebra mussel west of the 100th Meridian
- coordinate, where possible, other aquatic nuisance species program activities in the West not conducted pursuant to the Act
- develop an emergency response strategy for federal, state, and local entities for stemming new invasions of aquatic nuisance species in the region
- provide advice to public and private individuals and entities concerning methods of preventing and controlling aquatic nuisance species infestations
- submit an annual report to the Federal ANS Task Force describing activities within the western region related to aquatic nuisance species prevention, research and control

### **Mississippi River Basin Panel**

The Mississippi Interstate Cooperative Resource Association (MICRA) has hosted the Mississippi River Basin Panel on Aquatic Nuisance Species (MRBP) since 2003 under the oversight of the National ANS Task Force headquartered in Washington, D.C. The MRBP project area includes the entire Mississippi River Basin, the largest watershed in the United States (see map below). Details on formation of the MRBP can be found on our Panel Formation page. The MRBP adopted a formal Operational Guidance Document on July 15, 2006.

The roles and responsibilities of the MRBP include the following:

- Identify priorities for activities in the Mississippi River Basin (Basin),
- Develop and submit recommendations to the national Aquatic Nuisance Species Task Force (ANSTF) (established via Public Law 101-646),
- Coordinate aquatic nuisance species program activities in the Basin,
- Advise public and private interests on control efforts, and
- Submit an annual report to the ANSTF describing prevention, research and control activities in the Basin.

### **Western Governors' Association**

The Western Governors' Association (WGA) is developing a new program to address undesirable non-indigenous aquatic and terrestrial species in the West because of the significant economic and ecological harm they cause. On June 30, 1998, the Western Governors passed

Resolution 98-018, Undesirable Aquatic and Terrestrial Species, to develop and coordinate Western strategies and to support management actions to control and prevent the spread and introduction of undesirable species; to support the use of Integrated Pest Management concepts; to encourage broad-based partnerships; and to urge adequate support for the U.S. Department of Agriculture – Animal and Plant Health Inspection Service. Then on June 23, 2002, the Western Governor’s passed follow-up Policy Resolution 02-21, Undesirable Aquatic, Riparian, and Invasive Species. A copy of this Policy resolution is in **Appendix A**. This additional resolution reaffirmed the WGA’s commitment to this issue and among other things added riparian systems to the action list. WGA has formed a working group of state and federal agencies, industry, non-governmental organizations and academia to develop Western strategies to limit the spread of these species.

### **The Missouri River Watershed Coalition**

The Montana, North Dakota, South Dakota, Wyoming, Nebraska and Colorado departments of agriculture signed a Memorandum of Agreement in 2006 and an MOA Addendum in 2008 to coordinate the management of invasive plant species in the six-state area. Saltcedar was the first species targeted. MWRC membership—agency personnel, businesses, universities, conservation groups, and private landowners—have drafted a Saltcedar Management Plan for the Missouri River watershed. In May 2008, the Center agreed to provide coordination for the Missouri River Watershed Coalition, a six-state coalition to develop management strategies and priorities for invasive plants and water resources in the region.

### **Missouri River Futures**

Missouri River Futures was established in 2004 to coordinate efforts from various agencies and private landowners on Missouri River issues. MRF primarily focuses its efforts on the 39-mile and 59-mile segments of the Missouri National Recreational River (MNRR). Over 35 different federal, state, local, and nonprofit organizations are working on issues regarding the MNRR

## **STATE**

### **Nebraska Game and Parks Commission**

The mission of the Nebraska Game and Parks Commission is stewardship of the state’s fish, wildlife, park, and outdoor recreation resources in the best long-term interests of the people and those resources. To accomplish that purpose, the Commission plans and implements its policies and programs efficiently and objectively; maintains a rich and diverse environment in Nebraska’s lands and waters; provides outdoor recreation opportunities; manages wildlife resources for the maximum benefit of the people; and attempts to help Nebraskans appreciate their role in the natural world. Specific rules and regulations under Nebraska Game and Parks Commission authority

The following existing policies relative to Nebraska’s management of ANS are administered by the Nebraska Game and Parks Commission.

## Commercial Put and Take Fisheries Regulations (163-001)

163-001-07B Prohibits importation of live fish without being inspected for Viral Hemorrhagic Septicemia (VHS), Spring Viremia (SVCV), Largemouth Bass Virus (LMBV), and Heterosporis.

163-001-12B Imposes immediate import prohibition upon identification of VHS, Infectious Pancreatic Necrosis (IPN), Infectious Hematopoietic Necrosis (IHN), *Renibacterium salmoninarum* (Bacterial Kidney Disease-BKD), *Yersinia ruckeri* (Enteric Redmouth Disease-ERM), *Aeromonas salmonicida* (Furunculosis), *Myxobolus (Myxosoma) cerebralis* (Whirling Disease-WHD), LMBV, and Heterosporis.

163-002-01 Prohibits stock of any species of fish, mollusk, amphibians, or crustaceans without permit

163-002-02 Prohibits the sale or offer of carp, carpsucker, buffalo, gar, quillback, or bowfin as bait.

163-002-03 Prohibits importation or transportation of live amphibians (as listed in section 009), fish, mollusks, or crustaceans into the state without permit (see species list **Appendix B.2**).

163-002-03C Prohibits the purchase, selling, trading, or bartering (or possession) of live members of the family Channidae (snakeheads)

163-002-05 Lists fish, mollusks, amphibians, and crustaceans as non-injurious (economically and ecologically) and therefore may be imported into the state by permit, but not intentionally released in to the wild (see species list **Appendix B.2**).

163-005-03A Prohibits un-permitted aquaculture stocking or transfer of fish infected with BKD, ERM, Furunculosis, VHS, IPN, IHN, EED, OMV, SVCV, WHD, or Heterosporis.

163-005-03B Prohibits un-permitted release of any aquatic organism in to public waters

163-005-03C Lists aquatic organisms approved for importation under an aquaculture permit (see species list, **Appendix B.3**).

163-006-03D1 Prohibits the giving, putting, or leaving of any fish, bullfrogs, snapping turtles, or mussels at any place or in the custody of another person unless tagged by the angler.

163-006-03Y Prohibits the transportation or possession of live white perch away from the water body from which they were captured.

163-009 Lists which species are identified as baitfish (see species list, **Appendix B.1**).

163-009-01A1 Prohibits the sale, import, transport or offer for sale as bait, any live species not defined as baitfish, except alewife and gizzard may not be sold, imported, or transported from the water body in which they were taken. Live black bullhead, yellow bullhead, bowfin, buffalo,

carp, carpsucker, gar, gizzard shad, alewife, or quillback may be used for bait only in the same waters from which they are legally taken.

163-009-02 Provides details as to the legal transport of baitfish taken from the waters of Nebraska out of the State

163-009-03C Prohibits transport away from the river any baitfish collected on the Missouri River below Gavin's Point Dam

163-009-04G Prohibits bait dealers from taking baitfish from the Missouri River below Gavin's Point Dam downstream

### **Nebraska Department of Agriculture**

Exotic Animal Auctions or Swap Meet Statutes 54-7,105 - 54-7,108 Authorizes the Bureau of Animal Industry to require exotic animal auction or swap meet organizers to notify the bureau of any scheduled exotic animal auction or swap meet and to maintain records for animal disease tracking purposes. Exotic animals sold at exotic animal auctions or swap meets are often foreign to the United States or to the State of Nebraska. These exotic animals may carry dangerous, infectious, contagious, or otherwise transmissible diseases, including foreign animal diseases, which could pose a threat to Nebraska's livestock health and the livestock industry.

Noxious Weed Control Act; Title 25 Chapter 10 Nebraska Administrative Code

2-945.02 The Legislature finds and declares that:

(1) The failure to control noxious weeds on lands in this state is a serious problem which is detrimental to the production of crops and livestock and to the welfare of residents of this state and which may devalue land and reduce tax revenue; (2) It is the purpose of the Noxious Weed Control Act to establish a workable framework, delineate responsibilities, encourage education of the public concerning noxious weeds, and provide the necessary authority to effectively control noxious weeds; (3) It is the duty of each person who owns or controls land to effectively control noxious weeds on such land. County boards or control authorities are responsible for administration of noxious weed control laws at the county level; (4) The Department of Agriculture should have responsibility for (a) establishing basic standards such as designating which plants are to be considered noxious weeds and which control measures are to be used in particular situations and (b) monitoring implementation of the act by the control authorities; and (5) A state noxious weed advisory committee shall be convened by the director with broad representation to advise the director.

Noxious Weed Regulations; Title 25 Chapter 10 Nebraska Administrative Code

2-945.01-966 001 Designation and Publication of Noxious Weeds. The following weeds are hereby officially designated and published as noxious: Canada thistle - *Cirsium arvense* (L.) Scop.; leafy spurge - *Euphorbia esula* L.; musk thistle - *Carduus nutans* L.; plumeless thistle - *Carduus acanthoides* L.; knapweed (spotted and diffuse) - *Centaurea* (*maculosa* Lam. and *diffusa* Lam.); Purple Loosestrife - *Lythrum salicaria* L. and *L. virgatum* (including any cultivars and hybrids) saltcedar - *Tamarix ramosissima* Ledeb and *phragmites australis*, subspecies *australis*. Noxious weed shall mean the plant, seed, or seedlings of such weeds.

Plant Protection and Plant Pest Act Regulations; Title 25 Chapter 13 Nebraska Administrative Code

2-1072 to 2-10,117 Public policy declaration; It is hereby declared to be the public policy of the State of Nebraska to protect and foster the health, prosperity, and general welfare of its people by preserving and protecting the plant industry. Because of the importance of the plant industry to the welfare and economy of the state and the damage which can result from the uncontrolled proliferation of plant pests, there is a need to impose standards and restrictions on the movement and care of plants within the state. The Department of Agriculture shall be charged with administering and enforcing such standards and restrictions through the Plant Protection and Plant Pest Act.

Plant Protection and Plant Pest Act Rules and Regulations; Title 25 Chapter 13 Nebraska Administrative Code

2-10,116 The department shall have authority to adopt and promulgate such rules and regulations as are necessary to the effective discharge of its duties under the Plant Protection and Plant Pest Act. The rules and regulations may include, but shall not be limited to, provisions governing: (1) The issuance and revocation of licenses as authorized by the Plant Protection and Plant Pest Act; (2) The assessment and collection of license, inspection, re-inspection, and delinquent fees; (3) The withdrawal from distribution of nursery stock; (4) The care, viability, and standards for nursery stock; (5) The labeling and shipment of nursery stock; (6) The issuance and release of plant pest quarantines and withdrawal-from-distribution orders; (7) The establishment of a restricted plant pest list; (8) The preparation, maintenance, handling, and filing of reports by persons subject to the act; (9) The adoption of the American Association of Nurserymen's American Standard for Nursery Stock insofar as it does not conflict with any provision of the act; (10) Factors to be considered when the director issues an order imposing an administrative fine; and (11) The planting of certified seed potatoes in the state.

Seed Law Regulations; Title 25 Chapter 7 Nebraska Administrative Code

81-2,155 to 81-2,157 No agricultural, vegetable, or flower seed which is incapable of being identified by common seed characteristic or which is incorrectly represented as to kind, variety or origin may be sold unless said seed is accompanied by invoice, grower's declaration or suitable labeling information which will insure the identity to be stated. The grower's declaration, if used, shall be of a form to show the above information. Any lot of agricultural, vegetable, or flower seed not in compliance with the Nebraska Seed Law shall be subject to seizure on complaint of the director to a court of competent jurisdiction in the locality in which the seed is located. In the event the court finds the seed to be in violation of such law and orders the condemnation thereof, it shall be denatured, conditioned, destroyed, relabeled, or otherwise disposed of in compliance with the laws of this state, except that in no instance shall the court order such disposition of the seed without first having given the claimant an opportunity to apply to the court for the release of the seed or permission to condition or re-label it to bring it into compliance with such law.

### **Nebraska Department of Environmental Quality**

Standards for Water Quality; Title 117 Chapter 4 Nebraska Administrative Code

005 Aesthetics. This use applies to all surface waters of the state. To be aesthetically acceptable, waters shall be free from human-induced pollution which causes: 1) noxious odors; 2) floating, suspended, colloidal, or settleable materials that produce objectionable films, colors, turbidity, or

deposits; and 3) the occurrence of undesirable or nuisance aquatic life (e.g., algal blooms). Surface water shall also be free of junk, refuse, and discarded dead animals.  
Enabling Legislation: Neb. Rev. Stat. §§ 81-1505(1)(2).

### **State Agencies/Organizations**

The following list represents agencies and organizations that have programs and practices instilled in the state of Nebraska relating to invasive species.

Nebraska Natural Resource Conservation Service  
Nebraska Department of Natural Resources  
USGS NE Cooperative Fish and Wildlife Research Unit  
University of Nebraska-Lincoln Cooperative Extension Service  
Nebraska Weed Control Association  
Nebraska Weed Management Areas and Weed Groups  
County Weed Control Authorities  
The Nature Conservancy  
Institute of Agriculture and Natural Resources  
Nebraska Lakes Association  
Nebraska Department of Roads  
Nebraska Public Power District  
Nebraska Central Power District

### **TRIBAL**

The Department of Interior is legally obliged to insure the American Indian resources and lands are properly managed, protected, and conserved. Interior, as a trustee for the tribes, has an affirmative duty to protect tribal health and safety, to fulfill all treaty and statutory obligations and to exercise utmost good faith in all dealings with the tribes. In recognition of the importance of the Department's trust responsibilities, the Secretary of Interior has established policies and procedures for the Departmental bureaus and offices to follow. It also provides policy review and other technical services to all departmental bureaus and offices and other Federal agencies, including education and training, liaison, and information services regarding the Federal Indian Trust responsibilities.

Potential impacts of any activities or proposals on Indian trust resources will be discussed before any activities take place. Discussion will include consultation with the tribal government(s) or their representative when impacts on tribal trust resources, tribal rights, and tribal health and safety are identified.

Four American Indian Tribes exist in Nebraska:

- Omaha Tribe
- Ponca Tribe
- Santee Sioux Tribe
- Winnebago Tribe

## APPENDIX B.1

### Nebraska Game and Parks Commission Rules and Regulations Chapter 2

009. Baitfish shall be restricted to the following species.

Family	Scientific Name	Common Name
Minnow	<i>Semotilus atromaculatus</i>	creek chub
	<i>Cyprinella lutrensis</i>	red shiner
	<i>Notemigonus crysoleucas</i>	golden shiner
	<i>Notropis atherinoides</i>	emerald shiner
	<i>Notropis blennius</i>	river shiner
	<i>Notropis stramineus</i>	sand shiner
	<i>Notropis dorsalis</i>	bigmouth shiner
	<i>Pimephales promelas</i>	fathead minnow
	<i>Carassius auratus</i>	goldfish
	<i>Campostoma anomalum</i>	stoneroller
	<i>Hybognathus hankinsoni</i>	brassy minnow
	<i>Phenacobius mirabilis</i>	suckermouth minnow
	<i>Rhinichthys cataractae</i>	longnose dace
Sucker	<i>Catostomus commersoni</i>	white sucker
Topminnow	<i>Fundulus zebrinus</i>	plains killifish
Herring	<i>Dorosoma cepedianum</i>	gizzard shad
	<i>Alsoa pseudoharengus</i>	alewife
Amphibians		
Frogs	<i>Rana blairi</i>	plains leopard frog
	<i>Rana pipiens</i>	northern leopard frog
Salamander	<i>Ambystoma tigrinum</i>	tiger salamander
Crustaceans		
Crayfish	<i>Orconectes neglectus</i>	ringed crayfish
	<i>Orconectes immunis</i>	papershell crayfish
	<i>Orconectes virilis</i>	northern crayfish
	<i>Cambarus diogenes</i>	devil crayfish

## APPENDIX B.2

163-002-05 Lists fish, mollusks, amphibians, and crustaceans as non-injurious (economically and ecologically) and therefore may be imported into the state by permit, but not intentionally released in to the wild

Family	Scientific Name	Common Name
Paddlefish	<i>Polyodon spathula</i>	paddlefish
Catfish	<i>Ictalurus furcatus</i>	blue catfish
	<i>Ictalurus punctatus</i>	channel catfish
	<i>Pylodictis olivaris</i>	flathead catfish
	<i>Ameirus melas</i>	black bullhead
	<i>Ameirus natalis</i>	yellow bullhead
Pike	<i>Esox americanus</i>	grass pickerel
	<i>Esox lucius</i>	northern pike
	<i>Esox masquinongy</i>	muskellunge
Trout* *(eggs only)	<i>Oncorhynchus clarki</i>	cutthroat trout
	<i>Oncorhynchus mykiss</i>	rainbow trout
	<i>Orcorhynchus tshawtshca</i>	chinook salmon
	<i>Salmo trutta</i>	brown trout
	<i>Salvelinus fontinalis</i>	brook trout
Temperate bass	<i>Morone chrysops</i>	white bass
	<i>Morone saxatilis</i>	striped bass
Sunfish	<i>Ambloplites rupestris</i>	rock bass
	<i>Lepomis cyanellus</i>	green sunfish
	<i>Lepomis gibbosus</i>	pumpkinseed
	<i>Lepomis humilis</i>	orangespotted sunfish
	<i>Lepomis macrochirus</i>	bluegill
	<i>Lepomis microlophus</i>	reardear sunfish
	<i>Micropterus dolomieu</i>	smallmouth bass
	<i>Micropterus punctulatus</i>	spotted bass
	<i>Micropterus salmoides</i>	largemouth bass
	<i>Pomoxis annularis</i>	white crappie
	<i>Pomoxis nigromaculatus</i>	black crappie
Perch	<i>Sander vitreus vitreus</i>	walleye
	<i>Sander canadensis</i>	sauger
	<i>Perca flavescens</i>	yellow perch

Minnow	<i>Semotilus atromaculatus</i>	creek chub
	<i>Cyprinella lutrensis</i>	red shiner
	<i>Notemigonus crysoleucas</i>	golden shiner
	<i>Notropis atherinoides</i>	emerald shiner
	<i>Notropis blennioides</i>	river shiner
	<i>Notropis stramineus</i>	sand shiner
	<i>Notropis dorsalis</i>	bigmouth shiner
	<i>Pimephales promelas</i>	flathead minnow
	<i>Carassius auratus</i>	goldfish
	<i>Campostoma anomalum</i>	stoneroller
	<i>Hybognathus hankinsoni</i>	brassy minnow
	<i>Phenacobius mirabilis</i>	suckermouth minnow
	<i>Rhinichthys cataractae</i>	longnose dace
Gar	<i>Lepisosteus osseus</i>	longnose gar
	<i>Lepisosteus platostomus</i>	shortnose gar
Sucker	<i>Carpionoxenus carpio</i>	river carpsucker
	<i>Carpionoxenus cyprinus</i>	quillback
	<i>Ictiobus bubalus</i>	smallmouth buffalo
	<i>Ictiobus cyprinellus</i>	bigmouth buffalo
	<i>Catostomus commersoni</i>	white sucker
Topminnow	<i>Fundulus zebrinus</i>	plains killifish
Herring	<i>Dorosoma cepedianum</i>	gizzard shad
	<i>Alsoa pseudoharengus</i>	alewife

Note: This includes all hybrids of the above species

### Crustaceans

Crayfish	<i>Orconectes neglectus</i>	ringed crayfish
	<i>Orconectes immunis</i>	papershell crayfish
	<i>Orconectes virilis</i>	northern crayfish
	<i>Cambarus diogenes</i>	devil crayfish

### APPENDIX B.3

163-005-03C Lists aquatic organisms approved for importation under an aquaculture permit

Family	Scientific Name	Common Name
Paddlefish	<i>Polyodon spathula</i>	paddlefish
Catfish	<i>Ictalurus furcatus</i> <i>Ictalurus punctatus</i> <i>Pylodictis olivaris</i> <i>Ameirus melas</i> <i>Ameirus natalis</i>	blue catfish channel catfish flathead catfish black bullhead yellow bullhead
Pike	<i>Esox americanus</i> <i>Esox lucius</i> <i>Esox masquinongy</i>	grass pickerel northern pike muskellunge
Trout* *(eggs only)	<i>Oncorhynchus clarki</i> <i>Oncorhynchus mykiss</i> <i>Orcorhynchus tshawtshca</i> <i>Salmo trutta</i> <i>Salvelinus fontinalis</i>	cutthroat trout rainbow trout chinook salmon brown trout brook trout
Temperate bass	<i>Morone chrysops</i> <i>Morone saxatilis</i>	white bass striped bass
Sunfish	<i>Ambloplites rupestris</i> <i>Lepomis cyanellus</i> <i>Lepomis gibbosus</i> <i>Lepomis humilis</i> <i>Lepomis macrochirus</i> <i>Lepomis microlophus</i> <i>Micropterus dolomieu</i> <i>Micropterus punctulatus</i> <i>Micropterus salmoides</i> <i>Pomoxis annularis</i> <i>Pomoxis nigromaculatus</i>	rock bass green sunfish pumpkinseed orangespotted sunfish bluegill redeer sunfish smallmouth bass spotted bass largemouth bass white crappie black crappie
Perch	<i>Sander vitreus vitreus</i> <i>Sander canadensis</i> <i>Perca flavescens</i>	walleye sauger yellow perch
Minnow	<i>Semotilus atromaculatus</i> <i>Cyprinella lutrensis</i> <i>Notemigonus crysoleucas</i>	creek chub red shiner golden shiner

	<i>Notropis atherinoides</i>	emerald shiner
	<i>Notropis blennius</i>	river shiner
	<i>Notropis stramineus</i>	sand shiner
	<i>Notropis dorsalis</i>	bigmouth shiner
	<i>Pimephales promelas</i>	flathead minnow
	<i>Carassius auratus</i>	goldfish
	<i>Campostoma anomalum</i>	stoneroller
	<i>Hybognathus hankinsoni</i>	brassy minnow
	<i>Phenacobius mirabilis</i>	suckermouth minnow
	<i>Rhinichthys cataractae</i>	longnose dace
	<i>Cyprinus carpio</i>	common carp
	<i>Cyprinus carpio</i>	koi
Sucker	<i>Catostomus commersoni</i>	white sucker
Topminnow	<i>Fundulus zebrinus</i>	plains killifish
Herring	<i>Dorosoma cepedianum</i>	gizzard shad
	<i>Alsoa pseudoharengus</i>	alewife

Note: This includes all hybrids of the above species

### Crustaceans

Crayfish	<i>Orconectes neglectus</i>	ringed crayfish
	<i>Orconectes immunis</i>	papershell crayfish
	<i>Orconectes virilis</i>	northern crayfish
	<i>Cambarus diogenes</i>	devil crayfish

### Amphibians

Frogs	<i>Rana blairi</i>	plains leopard frog
	<i>Rana pipiens</i>	northern leopard frog
	<i>Lithobates catesbeianus</i>	American bullfrog
Salamander	<i>Ambystoma tigrinum</i>	tiger salamander

### Mollusks

Freshwater mussels	<i>Actinonaias ligamentina</i>	mucket
	<i>Anodontooides ferussancianus</i>	cylindrical papershell
	<i>Arcidens confragosus</i>	rock pocketbook
	<i>Fusconaia flava</i>	Wabash pigtoe
	<i>Lasmigona complanata</i>	white heelsplitter
	<i>Lasmigona compressa</i>	creek heelsplitter
	<i>Leptodea fragilis</i>	fragile papershell
	<i>Ligumia recta</i>	black sandshell
	<i>Obovaria olivaria</i>	hickorynut

<i>Potamilus alatus</i>	pink heelsplitter
<i>Potamilus ohioensis</i>	pink papershell
<i>Potamilus purpuratus</i>	bleufer
<i>Pyganodon grandis</i>	giant floater
<i>Quadrula quadrula</i>	mapleleaf
<i>Strophitus undulatus</i>	creeper
<i>Toxolasma parvus</i>	lilliput
<i>Truncilla donaciformis</i>	fawnsfoot
<i>Truncilla truncate</i>	deertoe
<i>Unionomerus tetralasmus</i>	pondhorn
<i>Utterbackia imbecillis</i>	paper pondshell

## APPENDIX C

### LIST OF CURRENT/POTENTIAL AQUATIC NUISANCE SPECIES IN NEBRASKA

(Adapted from the USGS NAS List 2010: <http://nas.er.usgs.gov>)

This list to be updated regularly

#### FISHES

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Fishes	Atherinidae	<i>Labidesthes sicculus</i>	brook silverside	Freshwater	Non-native	Range expanding
Fishes	Catostomidae	<i>Erimyzon sucetta</i>	lake chubsucker	Freshwater	Non-native	Limited
Fishes	Centrarchidae	<i>Archoplites interruptus</i>	Sacramento perch	Freshwater	Non-native	Presumed extirpated
Fishes	Centrarchidae	<i>Lepomis gibbosus</i>	pumpkinseed	Freshwater	Non-native	Limited
Fishes	Characidae	<i>Colossoma macropomum</i>	tambaqui	Freshwater	Non-native	Aquarium, not viable
Fishes	Characidae	<i>Colossoma or Piaractus sp.</i>	unidentified pacu	Freshwater	Non-native	Aquarium, not viable
Fishes	Characidae	<i>Piaractus brachypomus</i>	pirapatinga, red-bellied pacu	Freshwater	Non-native	Aquarium, not viable
Fishes	Characidae	<i>Pygocentrus nattereri</i>	red piranha	Freshwater	Non-native	Aquarium, not viable
Fishes	Cichlidae	<i>Astronotus ocellatus</i>	oscar	Freshwater	Non-native	Aquarium, not viable
Fishes	Cichlidae	<i>Cichlasoma cyanoguttatum</i>	Rio Grande cichlid	Freshwater	Non-native	Aquarium, not viable
Fishes	Cichlidae	<i>Heros severus</i>	banded cichlid	Freshwater	Non-native	Aquarium, not viable
Fishes	Clupeidae	<i>Alosa pseudoharengus</i>	alewife	Freshwater-Marine	Non-native	Stable
Fishes	Clupeidae	<i>Alosa sapidissima</i>	American shad	Freshwater-Marine	Non-native	Extirpated*
Fishes	Clupeidae	<i>Dorosoma petenense</i>	threadfin shad	Freshwater-Marine	Non-native	Extirpated
Fishes	Cyprinidae	<i>Carassius auratus</i>	goldfish	Freshwater	Non-native	Stable

Fishes	Cyprinidae	<i>Ctenopharyngodon idella</i>	grass carp	Freshwater	Non-native	Range expanding
Fishes	Cyprinidae	<i>Cyprinella spiloptera</i>	spotfin shiner	Freshwater	Non-native	Baitfish
Fishes	Cyprinidae	<i>Cyprinus carpio</i>	common carp	Freshwater	Non-native	Widespread/nuisance
Fishes	Cyprinidae	<i>Hypophthalmichthys molitrix</i>	silver carp	Freshwater	Non-native	Range expanding
Fishes	Cyprinidae	<i>Hypophthalmichthys nobilis</i>	bighead carp	Freshwater	Non-native	Range expanding
Fishes	Cyprinidae	<i>Leuciscus idus</i>	ide	Freshwater	Non-native	Extirpated
Fishes	Cyprinidae	<i>Scardinius erythrophthalmus</i>	rudd	Freshwater	Non-native	Range expanding
Fishes	Cyprinidae	<i>Tinca tinca</i>	tench	Freshwater	Non-native	Extirpated
Fishes	Esocidae	<i>Esox lucius x E. masquinongy</i>	tiger muskellunge	Freshwater	Non-native	Stocked as sport fish
Fishes	Esocidae	<i>Esox niger</i>	chain pickerel	Freshwater	Non-native	Extirpated
Fishes	Ictaluridae	<i>Ameiurus nebulosus</i>	brown bullhead	Freshwater	Non-native	Limited
Fishes	Labridae	<i>Tautoga onitis</i>	tautog	Marine	Non-native	Extirpated*
Fishes	Moronidae	<i>Morone americana</i>	white perch	Freshwater	Non-native	Range Expanding
Fishes	Moronidae	<i>Morone mississippiensis</i>	yellow bass	Freshwater	Non-native	Limited
Fishes	Moronidae	<i>Morone saxatilis</i>	striped bass	Freshwater- Marine	Non-native	Extirpated
Fishes	Osmeridae	<i>Osmerus mordax</i>	rainbow smelt	Freshwater- Marine	Non-native	Unknown
Fishes	Pimelodidae	<i>Phractocephalus hemioliopus</i>	redtail catfish	Freshwater	Non-native	Aquarium, not viable
Fishes	Poeciliidae	<i>Gambusia affinis</i>	western mosquitofish	Freshwater	Non-native	Range expanding
Fishes	Salmonidae	<i>Coregonus artedi</i>	cisco	Freshwater	Non-native	Extirpated
Fishes	Salmonidae	<i>Coregonus clupeaformis</i>	lake whitefish	Freshwater	Non-native	Extirpated
Fishes	Salmonidae	<i>Oncorhynchus kisutch</i>	coho salmon	Freshwater- Marine	Non-native	Extirpated
Fishes	Salmonidae	<i>Oncorhynchus nerka</i>	kokanee, sockeye	Freshwater- Marine	Non-native	Extirpated
Fishes	Salmonidae	<i>Oncorhynchus tshawytscha</i>	Chinook salmon	Freshwater- Marine	Non-native	Extirpated

Fishes	Salmonidae	<i>Salmo salar</i>	Atlantic salmon	Freshwater- Marine	Non-native	Extirpated*
Fishes	Salmonidae	<i>Salmo salar sebago</i>	landlocked Atlantic salmon	Freshwater- Marine	Non-native	Extirpated
Fishes	Salmonidae	<i>Salvelinus namaycush</i>	lake trout	Freshwater	Non-native	Extirpated
Fishes	Salmonidae	<i>Thymallus arcticus</i>	Arctic grayling	Freshwater- Marine	Non-native	Extirpated
Fishes	Scorpaenidae	<i>Pterois volitans/miles</i>	lionfish	Marine	Non-native	Aquarium, not viable

\* Accidental introduction resulting from a train wreck in 1873 over the Elkhorn River. Species have since been extirpated.

## **MOLLUSKS**

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Mollusks-Bivalves	Corbiculidae	<i>Corbicula fluminea</i>	Asian clam	Freshwater	Non-native	Range expanding rapidly
Mollusks-Bivalves	Dreissenidae	<i>Dreissena rostriformis bugensis</i>	Quagga Mussel	Freshwater	Non-native	Not present, in nearby state
Mollusks-Bivalves	Dreissenidae	<i>Dreissena polymorpha</i>	zebra mussel	Freshwater	Non-native	Indeterminate - Missouri River
Mollusks-Bivalves	Ostreidae	<i>Crassostrea virginica</i>	eastern oyster	Marine	Native Transplant	Extirpated
Mollusks-Gastropods	Viviparidae	<i>Cipangopaludina chinensis</i>	Chinese mysterysnail	Freshwater	Non-native	Stable, slowly expanding
Mollusks-Gastropods	Viviparidae	<i>Cipangopaludina japonica</i>	Japanese mysterysnail	Freshwater	Non-native	Stable, slowly expanding

## **CRUSTACEANS**

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Crustaceans-Cladocerans	Daphnidae	<i>Daphnia lumholtzi</i>	water flea	Freshwater	Non-native	Indeterminate, one known population
Crustaceans-Crayfish	Cambaridae	<i>Orconectes rusticus</i>	rusty crayfish	Freshwater	Non-native	Unknown
Crustaceans-Lobsters	Nephropidae	<i>Homarus americanus</i>	American lobster	Marine	Non-native	Extirpated*

## COELENTERATES

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Coelenterates	Olindiidae	<i>Craspedacusta sowerbyi</i>	freshwater jellyfish	Freshwater	Non-native?	Unknown

## REPTILES AND AMPHIBIANS

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Amphibians-Frogs	Ranidae	<i>Lithobates [=Rana] catesbeianus</i>	American Bullfrog	Freshwater	Native Transplant	Stable
Reptiles-Turtles	Emydidae	<i>Trachemys scripta elegans</i>	Red-eared Slider	Freshwater	Native Transplant	Extirpated
Reptiles-Turtles	Emydidae	<i>Trachemys scripta troostii</i>	Cumberland Slider	Freshwater	Native Transplant	Extirpated

## MAMMALS

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Mammals	Capromyidae	<i>Myocastor coypus</i>	nutria	Freshwater	Non-native	Extirpated

## PATHOGENS

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Pathogens	Myxobolidae	<i>Myxobolus cerebralis</i>	Whirling Disease	Freshwater-marine	Non-native	Isolated in one location in closed private facility Nebraska
Pathogens		<i>Rhabdovirus carpio</i>	Spring Viremia of Carp	Freshwater	Non-native	Unknown

Pathogens		<i>Heterosporis sp</i>	Heterosporis	Freshwater	Non-native	Unknown
Pathogens		<i>Rhabdovirus</i>	Viral Hemorrhagic Septicemia Virus	Freshwater-marine	Non-native	Unknown
Pathogens	Iridoviridae	<i>Ranavirus</i>	Largemouth Bass Virus	Freshwater	Non-native	Unknown
Pathogens			Infectious Pancreatic Necrosis Virus	Freshwater-marine	Non-native	Not identified in Nebraska
Pathogens		<i>Renibacterium salmoninarum</i>	Bacterial kidney disease	Freshwater-marine	Non-native	Has been identified in private aquaculture facilities
Pathogens		<i>Yersinia ruckeri</i>	Enteric redmouth disease	Freshwater-marine	Non-native	Has been identified in private aquaculture facilities
Pathogens		<i>Aeromonas salmonicida</i>	Furunculosis	Freshwater-marine	Non-native	Has been identified in private aquaculture facilities
Pathogens		<i>Edwardsiella ictaluri</i>	Enteric Septicemia of Catfish	Freshwater	Non-native	Has been identified in Nebraska
Pathogens	Rhabdoviridae	<i>Novirhabdivirus spp.</i>	Infectious Hematopoietic Necrosis Virus	Freshwater-marine	Non-native	Not identified in Nebraska
Pathogens			Oncorhynchus Masou Virus	Freshwater-marine	Non-native	Not identified in Nebraska
Pathogens			Epizootic epitheliotropic disease	Freshwater	Non-native	Probably is present in Nebraska
Pathogens	Herpesviridae	<i>Ictalurid herpesvirus 1</i>	Channel Catfish Virus Disease	Freshwater	Non-native	Has been detected in the wild in Nebraska
Pathogens	Herpesviridae	<i>Cyprinid herpesvirus 3</i>	Koi Herpesvirus	Freshwater	Non-native	Has been detected in the wild and in one private facility in Nebraska
Pathogens	Iridoviridae		Pallid Sturgeon Iridovirus	Freshwater	Non-native	Probably is present in Nebraska

## **PLANTS**

Group	Family	Scientific Name	Common Name	Native Habitat	Origin	Status
Plants	Acanthaceae	<i>Justica americana</i>	Common Water-willow		Non-native	
Plants	Acoraceae	<i>Acorus Calamus</i>	Eurasian Sweet-flag		Non-native	no data

Plants	Adoxaceae	<i>Viburnum opulus var. opulus</i>	European Highbush Cranberry		Non-native	
Plants	Alliaceae	<i>Allium vineale</i>	Field Garlic		Non-native	? Present
Plants	Amaranthaceae	<i>Amaranthus palmeri</i>	Palmer's Pigweed		Non-native	sparse, few counties in south (PLANTS)
Plants	Amaranthaceae	<i>Amaranthus retroflexus</i>	Redroot Pigweed		Non-native	widespread (PLANTS)
Plants	Amaranthaceae	<i>Amaranthus spinosus</i>	Spiny Pigweed		Non-native	very sparse, southeast (PLANTS)
Plants	Apiaceae	<i>Conioselinum chinense</i>	Hemlock-parsley		Non-native	very sparse (PLANTS)
Plants	Apiaceae	<i>Conium maculatum</i>	Poison-hemlock		Non-native	2008 Missouri, non-specific (USGS), moderate (PLANTS)
Plants	Apiaceae	<i>Daucus carota</i>	Queen Anne's Lace		Non-native	
Plants	Apiaceae	<i>Foeniculum vulgare</i>	Fennel		Non-native	
Plants	Apiaceae	<i>Pastinaca sativa</i>	Wild Parsnip		Non-native	
Plants	Apocynaceae	<i>Vinca minor</i>	Periwinkle		Non-native	
Plants	Asparagaceae	<i>Asparagus officinalis</i>	Asparagus		Non-native	moderate (PLANTS)
Plants	Asteraceae	<i>Anthemis cotula</i>	Mayweed		Non-native	sparse, mostly southeast (PLANTS)
Plants	Asteraceae	<i>Artemisia annua</i>	Annual Wormwood		Non-native	not present? In nearby states (PLANTS)
Plants	Asteraceae	<i>Cirsium arvense</i>	Canada Thistle		Non-native	moderate, mostly panhandle (PLANTS) Noxious weed
Plants	Asteraceae	<i>Conoclinium coelestinum (Eupatorium coelestinum)</i>	Mistflower		Non-native	? Present
Plants	Asteraceae	<i>Cosmos bipinnatus</i>	Garden Cosmos		Non-native	? Not present, in nearby states (PLANTS)
Plants	Asteraceae	<i>Helenium amarum var. amarum</i>	Bitterweed		Non-native	
Plants	Asteraceae	<i>Helianthus ciliaris</i>	Texas Blueweed		Non-native	
Plants	Asteraceae	<i>Lactuca saligna</i>	Willowleaf Lettuce		Non-native	
Plants	Asteraceae	<i>Lactuca serriola</i>	Prickly Lettuce		Non-native	
Plants	Asteraceae	<i>Matricaria discoidea (M. matricarioides, misapplied)</i>	Pineapple-weed		Non-native	

Plants	Asteraceae	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Brown-eyed Susan		Non-native	
Plants	Asteraceae	<i>Scorzonera laciniata</i>	False-salsify		Non-native	
Plants	Asteraceae	<i>Senecio vulgaris</i>	Groundsel		Non-native	
Plants	Asteraceae	<i>Sonchus arvensis</i>	field sow thistle	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Asteraceae	<i>Sonchus arvensis uliginosus</i>	smooth field sow thistle	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Asteraceae	<i>Sonchus arvensis</i> var. <i>glabrescens</i> ( <i>S. arvensis</i> ssp. <i>uliginosus</i> )	Field Sow Thistle		Non-native	
Plants	Asteraceae	<i>Sonchus asper</i>	Spiny Sow Thistle		Non-native	
Plants	Asteraceae	<i>Sonchus oleraceus</i>	Store-front Sow Thistle		Non-native	
Plants	Asteraceae	<i>Tanacetum balsamita</i> ( <i>Chrysanthemum balsamita</i> )	Costmary		Non-native	
Plants	Asteraceae	<i>Taraxacum erythrospermum</i> ( <i>T. laevigatum</i> , misapplied)	Red-seed Dandelion		Non-native	
Plants	Asteraceae	<i>Taraxacum officinale</i>	Common Dandelion		Non-native	
Plants	Asteraceae	<i>Tragopogon dubius</i>	Yellow Goat's-beard		Non-native	
Plants	Asteraceae	<i>Tripleurospermum inodorum</i> ( <i>Matricaria maritima</i> , in part)	Scentless Chamomile		Non-native	
Plants	Asteraceae	<i>Verbesina encelioides</i> var. <i>exauriculata</i> [ <i>V. encelioides</i> ssp. <i>exauriculata</i> ]	Golden Crownbeard		Non-native	
Plants	Asteraceae	<i>Xanthium spinosum</i>	Spiny Cocklebur		Non-native	
Plants	Berberidaceae	<i>Berberis vulgaris</i>	European Barberry		Non-native	? Present
Plants	Bignoniaceae	<i>Campsis radicans</i>	Trumpet Creeper		Non-native	sparse, mostly southeast (PLANTS)
Plants	Bignoniaceae	<i>Catalpa ovata</i>	Chinese Catalpa		Non-native	? Present
Plants	Bignoniaceae	<i>Catalpa speciosa</i>	Hardy Catalpa		Non-native	sparse, mostly southeast (PLANTS)
Plants	Boraginaceae	<i>Cynoglossum officinale</i>	Hound's Tongue		Non-native	sparse (PLANTS)
Plants	Boraginaceae	<i>Mertensia virginica</i>	Virginia Bluebells		Non-native	
Plants	Brassicaceae	<i>Nasturtium officinale</i>	water-cress	Freshwater	Non-native	2008 Missouri, non-specific

Plants	Brassicaceae	<i>Rorippa sylvestris</i>	Creeping yellow cress	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Brassicaceae	<i>Alliaria petiolata</i>	Garlic Mustard		Non-native	? Present
Plants	Brassicaceae	<i>Armoracia rusticana</i>	Horseradish		Non-native	very sparse, southeast (PLANTS)
Plants	Brassicaceae	<i>Barbarea vulgaris</i>	Wintercress		Non-native	sparse, mostly east (PLANTS)
Plants	Brassicaceae	<i>Camelina sativa</i>	Large-flower False Flax		Non-native	sparse (PLANTS)
Plants	Brassicaceae	<i>Capsella bursa-pastoris</i>	Shepherd's Purse		Non-native	widespread (PLANTS)
Plants	Brassicaceae	<i>Conringia orientalis</i>	Hare's-ear Mustard		Non-native	sparse (PLANTS)
Plants	Brassicaceae	<i>Hesperis matronalis</i>	Dame's Rocket		Non-native	
Plants	Brassicaceae	<i>Lepidium latifolium</i>	Broadleaf Pepperwort		Non-native	
Plants	Brassicaceae	<i>Lepidium perfoliatum</i>	Clasping Pepperwort		Non-native	
Plants	Brassicaceae	<i>Nasturtium microphyllum</i>	Small Watercress		Non-native	
Plants	Brassicaceae	<i>Rorippa austriaca</i>	Austrian Yellowcress		Non-native	
Plants	Brassicaceae	<i>Sibara virginica (Arabis virginica)</i>	Winged Rockcress		Non-native	
Plants	Brassicaceae	<i>Sisymbrium altissimum</i>	Tumble-mustard		Non-native	
Plants	Brassicaceae	<i>Thlaspi arvense</i>	Pennycress		Non-native	
Plants	Butomaceae	<i>Butomus umbellatus</i>	flowering rush	Freshwater	Non-native	1999 Missouri, non-specific (USGS)
Plants	Cannabaceae	<i>Cannabis sativa</i>	Hemp		Non-native	moderate (PLANTS)
Plants	Cannabaceae	<i>Humulus japonicus</i>	Japanese Hop		Non-native	
Plants	Caprifoliaceae	<i>Lonicera japonica</i>	Japanese Honeysuckle		Non-native	
Plants	Caprifoliaceae	<i>Lonicera tatarica</i>	Tatarian Honeysuckle		Non-native	
Plants	Caprifoliaceae	<i>Lonicera x bella (L. morrowii X L. tatarica)</i>	Showy Fly Honeysuckle		Non-native	
Plants	Caryophyllaceae	<i>Arenaria serpyllifolia serpyllifolia spp.</i>	Thyme-leaf Sandwort		Non-native	very sparse, southeast (PLANTS)
Plants	Caryophyllaceae	<i>Cerastium fontanum spp. vulgare</i>	Common Mouse-ear Chickweed		Non-native	sparse, across state (PLANTS)

Plants	Caryophyllaceae	<i>Gypsophila scorzonerifolia</i>	Garden Baby's-breath		Non-native	
Plants	Caryophyllaceae	<i>Myosoton aquaticum (Stellaria aquatica)</i>	Giant Chickweed		Non-native	
Plants	Caryophyllaceae	<i>Saponaria officinalis</i>	Bouncing Bet		Non-native	
Plants	Caryophyllaceae	<i>Scleranthus annuus</i>	Annual Knawel		Non-native	
Plants	Caryophyllaceae	<i>Stellaria pallida</i>	Lesser Chickweed		Non-native	
Plants	Chenopodiaceae	<i>Atriplex heterosperma</i>	Russian Orache		Non-native	? Present
Plants	Chenopodiaceae	<i>Atriplex hortnesis</i>	Garden Orache		Non-native	sparse (PLANTS)
Plants	Chenopodiaceae	<i>Atriplex patula</i>	Common Spearscale		Non-native	moderate, central (PLANTS)
Plants	Chenopodiaceae	<i>Atriplex rosea</i>	Red Orache		Non-native	very sparse, south (PLANTS)
Plants	Chenopodiaceae	<i>Chenopodium album</i>	Lamb's Quarters		Non-native	moderate (PLANTS)
Plants	Chenopodiaceae	<i>Chenopodium capitatum</i>	Strawberry Goosefoot		Non-native	? Not present, in nearby states, foliosum present (PLANTS)
Plants	Chenopodiaceae	<i>Chenopodium glaucum</i>	oak-leaved goosefoot	Freshwater	Non-native	2008 Missouri, non-specific (USGS)
Plants	Chenopodiaceae	<i>Dysphania ambrosioides (Chenopodium ambrosioides)</i>	Mexican Tea		Non-native	
Plants	Chenopodiaceae	<i>Dysphania botrys (Chenopodium botrys)</i>	Jerusalem-oak		Non-native	
Plants	Chenopodiaceae	<i>Kochia scoparia</i>	Kochia		Non-native	
Plants	Chenopodiaceae	<i>Salsola collina</i>	Slender Russian Thistle		Non-native	
Plants	Chenopodiaceae	<i>Salsola tragus (S. iberica)</i>	Prickly Russian Thistle		Non-native	
Plants	Commelinaceae	<i>Commelina communis</i>	Asiatic Dayflower		Non-native	sparse, mostly southeast (PLANTS)
Plants	Convolvulaceae	<i>Ipomoea hederacea var. hederacea</i>	Ivyleaf Morning-glory		Non-native	
Plants	Convolvulaceae	<i>Ipomoea hederacea var. integruscula</i>	Ivyleaf Morning-glory		Non-native	
Plants	Convolvulaceae	<i>Ipomoea purpurea</i>	Common Morning-glory		Non-native	
Plants	Cyperaceae	<i>Carex melanostachya</i>	Ditch Sedge		Non-native	? Present
Plants	Cyperaceae	<i>Carex squarrosa</i>	Squarrose Sedge		Non-native	very sparse (PLANTS)

Plants	Cyperaceae	<i>Cyperus difformis</i>	Variable Flat Sedge		Non-native	? Present
Plants	Cyperaceae	<i>Cyperus fuscus</i>	Brown Flatsedge		Non-native	sparse (PLANTS)
Plants	Elaeagnaceae	<i>Elaeagnus angustifolia</i>	Russian Olive		Non-native	
Plants	Fabaceae	<i>Lespedeza cuneata</i>	Chinese Bush-clover		Non-native	
Plants	Fabaceae	<i>Lotus corniculatus</i>	Bird's-foot Trefoil		Non-native	
Plants	Fabaceae	<i>Lotus tenuis</i>	Narrow-leaf Trefoil		Non-native	
Plants	Fabaceae	<i>Medicago lupulina</i>	Black Medick		Non-native	
Plants	Fabaceae	<i>Melilotus albus</i>	White Sweet-clover		Non-native	
Plants	Fabaceae	<i>Melilotus officinalis</i>	Yellow Sweet-clover		Non-native	
Plants	Fabaceae	<i>Trifolium fragiferum</i>	Strawberry Clover		Non-native	
Plants	Fabaceae	<i>Trifolium hybridum</i>	Alsike Clover		Non-native	
Plants	Fabaceae	<i>Trifolium pratense</i>	Red Clover		Non-native	
Plants	Fabaceae	<i>Trifolium repens</i>	White Clover		Non-native	
Plants	Fabaceae	<i>Quercus palustris</i>	Pin Oak		Non-native	
Plants	Gentianaceae	<i>Centaurium pulchellum</i>	Showy Centaury		Non-native	? Present
Plants	Haloragaceae	<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	Freshwater-brackish	Non-native	Established, Platte, Salt
Plants	Hemerocallidaceae	<i>Hemerocallis fulva</i>	Orange Day-lily		Non-native	
Plants	Hyacintheaceae	<i>Ornithogalum umbellatum</i>	Star-of-Bethlehem		Non-native	
Plants	Hydrocharitaceae	<i>Egeria densa</i>	Brazillian waterweed	Freshwater	Non-native	1984 Missouri, 1977 Middle Platte
Plants	Hydrocharitaceae	<i>Hydrilla verticillata</i>	Hydrilla	Freshwater	Non-native	Not present, in neighboring states
Plants	Iridaceae	<i>Iris pseudacorus</i>	yellow iris	Freshwater	Non-native	1986 Missouri, 1977 Big Blue
Plants	Iridaceae	<i>Iris versicolor</i>	Northern Blue-flag		Non-native	
Plants	Juncaceae	<i>Juncus compressus</i>	Flattened rush	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Lamiaceae	<i>Ballota nigra</i>	Black-horehound		Non-native	? Present

Plants	Lamiaceae	<i>Dracocephalum moldavica</i>	Moldavian Dragonhead		Non-native	
Plants	Lamiaceae	<i>Galeopsis bifida</i>	Common Hemp-nettle		Non-native	
Plants	Lamiaceae	<i>Glechoma hederacea</i>	Ground-ivy		Non-native	
Plants	Lamiaceae	<i>Leonurus cardiaca</i>	Motherwort		Non-native	
Plants	Lamiaceae	<i>Leonurus marrubiastrum</i>	Horehound Motherwort		Non-native	
Plants	Lamiaceae	<i>Leonurus sibiricus</i>	Siberian Motherwort		Non-native	
Plants	Lamiaceae	<i>Marrubium vulgare</i>	Horehound		Non-native	
Plants	Lamiaceae	<i>Mentha gracilis</i>	Creeping whorled mint, gingermint	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Lamiaceae	<i>Mentha spicata</i>	Spearmint	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Lamiaceae	<i>Mentha x gracilis (M. arvensis x M. spicata)</i>	Scotch Mint		Non-native	
Plants	Lamiaceae	<i>Mentha x piperita (M. aquatica x M. spicata)</i>	Peppermint		Non-native	
Plants	Lamiaceae	<i>Nepeta cataria</i>	Catnip		Non-native	
Plants	Lamiaceae	<i>Perilla frutescens</i>	Perilla-mint		Non-native	
Plants	Lamiaceae	<i>Physostegia virginiana spp. Praemorsa</i>	Obedient Plant		Non-native	
Plants	Lamiaceae	<i>Prunella vulgaris var. vulgaris</i>	Lawn Prunella		Non-native	
Plants	Lythraceae	<i>Lythrum salicaria</i>	purple loosestrife	Freshwater	Non-native	Established, Noxious Weed
Plants	Malvaceae	<i>Althaea officinalis</i>	Common Marsh-mallow		Non-native	? Present
Plants	Martyniaceae	<i>Proboscidea louisianica</i>	Devil's Claw		Non-native	
Plants	Menyanthaceae	<i>Nymphoides peltata</i>	yellow floating-heart	Freshwater	Non-native	2007 Benson Park Lake
Plants	Moraceae	<i>Morus alba</i>	White Mulberry		Non-native	
Plants	Myrsinaceae	<i>Anagallis arvensis</i>	Scarlet Pimpernel		Non-native	very sparse, southeast (PLANTS)
Plants	Myrsinaceae	<i>Lysimachia punctata</i>	Dotted Yellow-loosestrife		Non-native	
Plants	Najadaceae	<i>Najas marina</i>	Spiny naiad	Freshwater-brackish	Native Transplant	2008 Missouri, non-specific

Plants	Oleaceae	<i>Ligustrum obtusifolium</i>	Border Privet		Non-native	
Plants	Oleaceae	<i>Ligustrum vulgare</i>	European Privet		Non-native	
Plants	Plantaginaceae	<i>Plantago lanceolata</i>	English Plantain		Non-native	
Plants	Plantaginaceae	<i>Plantago major</i>	Common Plantain		Non-native	
Plants	Plantaginaceae	<i>Veronica anagallis-aquatica</i>	Eurasian Water Speedwell		Non-native	
Plants	Plantaginaceae	<i>Veronica arvensis</i>	Corn Speedwell		Non-native	
Plants	Plantaginaceae	<i>Veronica hederifolia</i>	Ivy-leaf Speedwell		Non-native	
Plants	Poaceae	<i>Agropogon lutosus (Polypogon interruptus)</i>	Ditch Rabbitfoot Grass		Non-native	
Plants	Poaceae	<i>Agrostis gigantea</i>	Redtop	Freshwater	Non-native	Isolated, Lewis & Clark Lake (USGS)
Plants	Poaceae	<i>Agrostis stolonifera var. palustris</i>	Creeping Bentgrass		Non-native	widespread (PLANTS)
Plants	Poaceae	<i>Alopecurus arundinaceus</i>	Garrison Creeping-foxtail		Non-native	? Present
Plants	Poaceae	<i>Alopecurus geniculatus</i>	water foxtail, marsh meadow foxtail	Freshwater	Non-native	1900 record, not recorded since (USGS)
Plants	Poaceae	<i>Alopecurus pratensis</i>	Field Meadow-foxtail		Non-native	sparse, few counties in east (PLANTS)
Plants	Poaceae	<i>Arrhenatherum elatius var. elatius</i>	Tall Oat Grass		Non-native	very sparse (PLANTS)
Plants	Poaceae	<i>Bromus intermis</i>	Smooth Brome		Non-native	widespread (PLANTS)
Plants	Poaceae	<i>Bromus japonicus</i>	Japanese Brome		Non-native	widespread (PLANTS)
Plants	Poaceae	<i>Chasmanthium latifolium</i>	Indian Wood-oats		Non-native	? Not present, in nearby states (PLANTS)
Plants	Poaceae	<i>Cynodon dactylon var. dactylon</i>	Bermuda Grass		Non-native	very sparse (PLANTS)
Plants	Poaceae	<i>Cynodon transvaalensis</i>	African Dog's-tooth Grass		Non-native	? Present
Plants	Poaceae	<i>Dactylis glomerata</i>	Orchard Grass		Non-native	
Plants	Poaceae	<i>Deschampsia cespitosa</i>	Tufted Hair-grass		Non-native	
Plants	Poaceae	<i>Digitaria ciliaris var. ciliaris</i>	Southern Crabgrass		Non-native	

Plants	Poaceae	<i>Digitaria sanguinalis</i>	Hairy Crabgrass		Non-native	
Plants	Poaceae	<i>Echinochloa crusgalli</i>	barnyard grass	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Poaceae	<i>Echinochloa frumentacea</i>	Japanese-millet		Non-native	
Plants	Poaceae	<i>Eleusine indica</i>	Goosegrass		Non-native	
Plants	Poaceae	<i>Elymus elongates</i> var. <i>ponticus</i> ( <i>Agropyron elongatum</i> )	Tall Wheatgrass		Non-native	
Plants	Poaceae	<i>Elymus hispidus</i> ( <i>Agropyron intermedium</i> )	Intermediate Wheatgrass		Non-native	
Plants	Poaceae	<i>Elymus junceus</i>	Russian Wildrye		Non-native	
Plants	Poaceae	<i>Elymus repens</i> ( <i>Agropyron repens</i> )	Quackgrass		Non-native	
Plants	Poaceae	<i>Eragrostis cilianensis</i>	Stink Grass		Non-native	
Plants	Poaceae	<i>Eriochloa villosa</i>	Woolly Cupgrass		Non-native	
Plants	Poaceae	<i>Festuca rubra</i>	Red Fescue		Non-native	
Plants	Poaceae	<i>Festuca trachyphylla</i>	Hard Fescue		Non-native	
Plants	Poaceae	<i>Lolium multiflorum</i> ( <i>L. perenne</i> var. <i>aristatum</i> )	Perennial Ryegrass		Non-native	
Plants	Poaceae	<i>Lolium perenne</i>	Perennial Ryegrass		Non-native	
Plants	Poaceae	<i>Panicum miliaceum</i> spp. <i>miliaceum</i>	Broom-corn Millet		Non-native	
Plants	Poaceae	<i>Panicum miliaceum</i> spp. <i>runderale</i>	Broom-corn Millet		Non-native	
Plants	Poaceae	<i>Phalaris canariensis</i>	Canary Grass		Non-native	
Plants	Poaceae	<i>Phleum pretense</i> spp. <i>pratense</i>	Timothy		Non-native	
Plants	Poaceae	<i>Phragmites australis</i> spp. <i>australis</i>	Common Reed		Non-native	
Plants	Poaceae	<i>Poa annua</i>	Annual Bluegrass		Non-native	
Plants	Poaceae	<i>Poa compressa</i>	Canada Bluegrass		Non-native	
Plants	Poaceae	<i>Poa pratensis</i>	Kentucky Bluegrass		Non-native	
Plants	Poaceae	<i>Poa trivallis</i>	rough-stalked meadow grass, bluegrass	Freshwater	Non-native	2008 Missouri, non-specific

Plants	Poaceae	<i>Polypogon monspeliensis</i>	Rabbitfoot Grass		Non-native	
Plants	Poaceae	<i>Puccinella distans</i>	Weeping alkali grass	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Poaceae	<i>Schedonorus arundinaceus</i> ( <i>Festuca arundinacea</i> )	Tall Fescue		Non-native	
Plants	Poaceae	<i>Schedonorus pratensis</i> ( <i>Festuca pratensis</i> )	Meadow Fescue		Non-native	
Plants	Poaceae	<i>Setaria italica</i>	Foxtail Millet		Non-native	
Plants	Poaceae	<i>Setaria pumila</i> spp. <i>pumila</i> ( <i>S. glauca</i> , misapplied)	Yellow Foxtail		Non-native	
Plants	Poaceae	<i>Setaria verticillata</i>	Bristly Foxtail		Non-native	
Plants	Poaceae	<i>Setaria viridis</i> var. <i>viridis</i>	Green Foxtail		Non-native	
Plants	Poaceae	<i>Setaria viridis</i> var. <i>major</i>	Green Foxtail		Non-native	
Plants	Poaceae	<i>Sorghum halepense</i>	Johnson Grass		Non-native	
Plants	Poaceae	<i>Sporobolus pyramidatus</i>	Whorled Dropseed		Non-native	
Plants	Polemoniaceae	<i>Phlox paniculata</i>	Garden Phlox		Non-native	
Plants	Polygonaceae	<i>Fallopia convolvulus</i> ( <i>Polygonum convolvulus</i> )	Black-bindweed		Non-native	
Plants	Polygonaceae	<i>Fallopia japonica</i> var. <i>japonica</i> ( <i>Polygonum cuspidatum</i> )	Japanese Knotweed		Non-native	
Plants	Polygonaceae	<i>Persicaria hydropiper</i> ( <i>Polygonum hydropiper</i> )	Water-pepper		Non-native	
Plants	Polygonaceae	<i>Persicaria longiseta</i> ( <i>Polygonum caespitosum</i> var. <i>longisetum</i> )	Creeping Smartweed		Non-native	
Plants	Polygonaceae	<i>Persicaria maculosa</i> ( <i>Polygonum persicaria</i> )	Lady's-thumb Smartweed		Non-native	
Plants	Polygonaceae	<i>Persicaria minor</i>	Small Water-pepper		Non-native	
Plants	Polygonaceae	<i>Persicaria orientale</i> ( <i>Polygonum orientale</i> )	Kiss-me-over-the- garden-gate		Non-native	
Plants	Polygonaceae	<i>Polygonum aviculare</i> spp. <i>aviculare</i>	Yard Knotweed		Non-native	
Plants	Polygonaceae	<i>Polygonum aviculare</i> spp. <i>depressum</i> ( <i>P. arenastrum</i> )	Common Knotweed		Non-native	
Plants	Polygonaceae	<i>Polygonum aviculare</i> spp.	Narrow-leaf Knotweed		Non-native	

		<i>neglectum (P. neglectum)</i>				
Plants	Polygonaceae	<i>Polygonum caespitosum</i>	oriental lady's thumb	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Polygonaceae	<i>Polygonum persicaria</i>	spotted knotweed, lady's thumb	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Polygonaceae	<i>Rumex acetosella</i>	Sheep Sorrel		Non-native	
Plants	Polygonaceae	<i>Rumex crispus</i>	Curly Dock		Non-native	
Plants	Polygonaceae	<i>Rumex obtusifolius</i>	bitter dock	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Polygonaceae	<i>Rumex obtusifolius</i>	Bitter Dock		Non-native	
Plants	Polygonaceae	<i>Rumex patientia spp. orientalis</i>	Patience Dock		Non-native	
Plants	Polygonaceae	<i>Rumex patientia spp. patientia</i>	Patience Dock		Non-native	
Plants	Polygonaceae	<i>Rumex stenophyllus</i>	Narrow-leaf Dock		Non-native	
Plants	Pontederiaceae	<i>Eichhornia crassipes</i>	Water Hyacinth	Freshwater	Non-native	Not present, in neighboring states
Plants	Potamogetonaceae	<i>Potamogeton crispus</i>	curly pondweed	Freshwater	Non-native	1977 established, several rivers
Plants	Primulaceae	<i>Lysimachia nummularia</i>	moneywort	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Ranunculaceae	<i>Ranunculus hispidus var. nitidus</i>	Bristly Buttercup		Non-native	
Plants	Ranunculaceae	<i>Ranunculus repens</i>	Creeping Buttercup		Non-native	
Plants	Ranunculaceae	<i>Ranunculus sceleratus var. sceleratus</i>	Cursed Crow's-foot		Non-native	
Plants	Rhamnaceae	<i>Frangula alnus (Rhamnus frangula)</i>	European Alder-buckthorn		Non-native	
Plants	Rhamnaceae	<i>Rhamnus cathartica</i>	Common Buckthorn		Non-native	
Plants	Rosaceae	<i>Potentilla argentea var. argentea</i>	Silver Cinquefoil		Non-native	
Plants	Rosaceae	<i>Potentilla indica (Duchesnea indica)</i>	Mock Strawberry		Non-native	
Plants	Rosaceae	<i>Sanguisorba minor</i>	Salad Burnet		Non-native	
Plants	Rubiaceae	<i>Galium verum</i>	Yellow Bedstraw		Non-native	
Plants	Salicaceae	<i>Salix alba</i>	White willow	Freshwater	Non-native	2008 Missouri, non-specific

Plants	Salicaceae	<i>Salix fragilis</i>	Crack willow	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Salicaceae	<i>Salix x rubens (S. alba X S. fragilis)</i>	Hybrid Crack Willow		Non-native	
Plants	Salviniaceae	<i>Salvinia molesta</i>	Giant Salvinia	Freshwater	Non-native	SE United States
Plants	Saururaceae	<i>Anemopsis californica</i>	Yerba Mansa		Non-native	? Present
Plants	Simaroubaceae	<i>Ailanthus altissima</i>	Tree-of-heaven		Non-native	sparse, mainly SE (PLANTS)
Plants	Solanaceae	<i>Datura stramonium</i>	Jimson Weed		Non-native	
Plants	Solanaceae	<i>Solanum dulcamara</i>	Bittersweet nightshade	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Tamaricaceae	<i>Tamarix ramosissima</i>	Salt-cedar		Non-native	
Plants	Typhaceae	<i>Typha angustifolia</i>	Narrow-leaved cattail	Freshwater	Non-native	2008 Missouri, non-specific
Plants	Typhaceae	<i>Typha domingensis</i>	Southern Cattail		Non-native	
Plants	Ulmaceae	<i>Ulmus pumila</i>	Siberian Elm		Non-native	
Plants	Violaceae	<i>Viola striata</i>	Striped Cream Violet		Non-native	

## APPENDIX D

### ANS COMMITTEE AND TECHNICAL ADVISORS

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