

# NEBRASKA AQUATIC INVASIVE SPECIES

Nebraska Invasive Species Advisory Council

August 25, 2011

These criteria have been designed to support categorized lists of invasive species to facilitate coordinated prevention and/or control of these species in order to benefit the people and natural communities of Nebraska. These lists are advisory in nature; they are provided as an educational tool and are not intended, alone, to dictate management actions or for regulatory action.

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Criteria and Invasive List Development Committee:

The following document was developed by the Nebraska Invasive Species Advisory Council. Advice was sought from additional professionals in Nebraska, and comments were solicited from professional and public stakeholders.

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#### Acknowledgements

These criteria are adapted from the *Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands* developed by the California Exotic Plant Pest Council, and *A New Tool to Categorize and List Invasive Non-native Plant Species that Threaten Native Biodiversity*, originally developed by The Nature Conservancy and NatureServe in cooperation with the National Park Service and the Plant Conservation Initiative's Alien Plant Working Group (Randall et al. 2003).

The list of Invasive Plants in Nebraska was produced by the Nebraska Invasive Species Council, and include species that have been known to be invasive in at least one habitat type. Some species may not show invasive tendencies in other habitats. These lists are advisory in nature; they are provided as an educational tool and are not intended, alone, to dictate management actions or for regulatory action.

# Part I: Introduction



## Background

Invasive species collectively constitute one of the gravest threats to the biodiversity of wildlands—conservation areas and other native habitats. Two critical components of managing invasions by non-native species are (1) identifying those species that threaten biodiversity and other ecological functions and values, and (2) prioritizing species for management efforts, which must be based, at least in part, on the ecological impacts imparted by the invasive species.

For the purposes of identifying agricultural pests, many states and the U. S. Department of Agriculture have compiled regulatory “noxious weed lists” focusing on species that threaten agricultural production (both cultivated crops and rangeland) and other economic interests. However, existing state and federal lists typically do not focus on species that damage native ecosystems. The Nebraska Invasive Species Advisory Council therefore developed this set of criteria to provide a transparent, repeatable, and credible basis for states to identify invasive species that threaten Nebraska’s land, water and other resources.

During the initial determination of goals and tasks, the list committee adopted the following definitions to guide its work:

**Invasive species** are defined as species that: (1) are not native to Nebraska; (2) have the potential for rapid and widespread dispersion and establishment; (3) have the potential for existing in high numbers away from intensively managed artificial habitats; and (4) do any of the following: displace native species, hybridize with native species, alter biological communities, alter ecosystem processes, or cause economic or

environmental harm, or harm to human health.

**Non-native species** are species introduced to the ecosystems under consideration after European contact and as a direct or indirect result of human activity.

### Goals:

The goals of this project are to:

- Provide a uniform methodology for categorizing invasive species;
- Provide a clear explanation of the process used to evaluate and categorize invasive species (i.e. make the process transparent);
- Provide flexibility so the criteria can be adapted to the particular needs of different regions and states;
- Encourage contributions of data and documentation about any and all species to be evaluated;
- Educate policy makers, land managers, and the public about the biology, ecological impacts, and distribution of invasive species.

### Products:

The products expected from this project include:

- A document explaining the criteria available in print and on the internet;
- State-wide lists of invasive species for Nebraska;
- Compilations of available information on invasive species evaluated and a list of gaps in this information;
- Articles in newsletters and other publications discussing the criteria and its use in creating lists for Nebraska;

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- Widely available forms and an internet interface that can be used to submit or update information on invasive species.

**Limitations:**

These criteria are not intended to:

- Produce a list that itself has regulatory force, though regulators can use the information to determine whether particular species should be added or removed from existing noxious weed lists;
- Provide absolute ranks for any state or region—the invasiveness of most species will differ widely from one state or region to another, depending on geography, climate, ecosystems present, and other factors;
- Dictate management actions for considered species, but rather to be used as one tool in evaluating management options.



**Creating the lists**

**AQUATIC SPECIES**

A list of the non-native aquatic species in Nebraska was compiled based on the previously developed *Aquatic Invasive Species of Nebraska Pocket Guide* (Decker et al. 2010), which includes information pertaining to species specific characteristics and current known location. Species represented were those recommended by experts in the field, although additional species recommendations would be welcomed.

**The supporting data:**

The criteria are primarily intended for use in categorizing and listing invasive species that are most threatening to Nebraska’s

resources. Lists for regions or localities within each state will differ from each other due primarily to differences in the degree of local ecological impacts. The following paragraphs outline the approach used by the Nebraska Invasive Species Advisory Council to create state lists of invasive species.

For the compilation of a statewide list, a committee comprised of people with experience in invasive species biology, aquatic ecology and taxonomy, and land management was formed. This “list committee” considered for evaluation any non-native species that was brought to its attention, but for the sake of efficiency the committee also focused on those species already widely acknowledged as invasive (based on existing records and data, such as previously published lists of invasive species or recommendations from observers, managers, scientists, and others). In addition, the committee solicited further information from all available sources, primarily those people with expertise and experience regarding the species to be evaluated.

Information sought was in several formats, including the following: published research and review papers; official reports, book chapters, planning documents, and biological assessments; unpublished data, including sampling or monitoring statistics, photographs, or detailed written descriptions; and personal observations or anecdotes (useful when published information is unavailable). As an integral part of this process, the committee solicited and welcomed contributions from as wide a diversity of potential sources of information as possible, but based its conclusions

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primarily on sources of information that possess the highest degree of reliability.

Once a categorical list is generated from an individual evaluation of each species, the committee will make the list and individual species evaluations public. The information will be published in two formats: a simple list and a list accompanied by the more extensive background information, including supporting documentation.

The evaluation and categorizing is an ongoing, iterative process. The list committee will continue to welcome new information that supplements knowledge about the ecology or distribution of any non-native species. When substantiated new information becomes available, the committee can re-evaluate, especially if the new data would potentially influence the ranking outcome.

The committee is willing to address comments about the composition of the list to the extent possible. The evaluation and ranking process is intended to provide public access to the decision-making process, as well as to serve as an educational resource on the factors that render invasive species a threat to Nebraska's resources.

All lists and supporting documents will be available online at the Nebraska Invasive Species Project website (<http://snr.unl.edu/invasives>)



## Species Evaluation

In order to categorize invasive species, the Nebraska Invasive Species Advisory Council developed an evaluation worksheet that is completed for each species. This evaluation worksheet was developed by incorporating components from other assessment models (e.g., Criteria for Ranking Invasive Plants of Nebraska (Rolfmeier 2007), I-Rank Invasive Species Assessment Protocol (Nature Serve), and Invasive Species Impact and Prevention/Early Action Assessment Tool (Washington Invasive Species Council), in which species are ranked by a series of questions in 5 broad sections: Ecological Impact, Current/Potential Distribution and Abundance, Economic Impact, Human Health Impact, and Management Difficulty/Current Management. **See separate document for complete information on this evaluation.**

**Note: this ranking system is designed to give focus towards being *pro-active* rather than *re-active*; preventing the introduction of new invasive species and the spread of those that are in Nebraska but can still be eradicated; scores are assigned as such.**

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# Part II: The Categories



## The Categories

Statewide lists resulting from the systematic application of these criteria will group invasive species into categories based directly on scores assigned using the evaluation worksheet at the species level.

In order to be considered for categorization, a species must be species that:

- (1) are not native to Nebraska;
- (2) have the potential for rapid and widespread dispersion and establishment;
- (3) have the potential for existing in high numbers away from intensively managed artificial habitats; and
- (4) do any of the following: displace native species, hybridize with native species, alter biological communities, alter ecosystem processes, or cause economic or environmental harm, or harm to human health.

Once these initial criteria are met, a species will receive further evaluation for listing within a particular category.

### **Invasive Species Category Definitions:**

These are draft criteria for categories of invasive species in Nebraska, developed by the Nebraska Invasive Species Advisory Council. The categories are meant to clarify the invasive status of harmful species that occur, or are likely to occur, in the state, and to facilitate coordinated prevention and/or control of these species, in order to benefit the people and natural communities of Nebraska.

These categories apply **ONLY** to species that are non-native to Nebraska. Thus they do not include native species that can become aggressive. These categories are

separate from the noxious weed list, which contains species specifically designated by the Nebraska Department of Agriculture and for which control is mandated.

### **Category 1:**

#### **Potential Future Invasive Species**

##### **Definition:**

Demonstrated invasive species that are not yet in Nebraska but which have the potential to arrive within the next few years. Risk assessment analyses for these species should be conducted and early detection/rapid response plans should be implemented for those shown to present the highest risk.

##### **Strategies for dealing with these species:**

- Risk assessments should be conducted.
- Species should be prioritized based on those risk assessments and listed by the habitat types and geographic areas most likely to be invaded.
- Highest risk species should have early detection/rapid response plans developed and/or should have task forces assembled to deal with them when and if they arrive in the state.

### **Category 2:**

#### **Priority Invasive Species**

##### **Definition:**

Demonstrated invasive species for which eradication is still feasible.

##### **Strategies for dealing with these species:**

- Implement rapid response plan if one is in place.
- Immediate action should be to inventory and map occurrences near the initial infestation(s) and in other likely areas.

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- A coordinated control effort should be implemented immediately by the landowner, appropriate local governmental officials and other appropriate parties.
- Quarantines or other similar actions should be taken if appropriate and necessary.
- Information should be provided to media outlets by the Nebraska Invasive Species Council to help landowners and the general public identify and report occurrences of the invader and to provide suggestions as to the actions those individuals should/should not take.

**Category 3:**

***Established Invasive Species***

**Definition:**

Demonstrated invasive species that are well-enough established in the state that eradication is not likely. These species need to be controlled where feasible, and contained as much as possible to avoid further/larger infestations.

**Strategies for dealing with these species:**

- A list of these species should be made widely available to the public and should categorize species by habitat type and geographic area where they are most likely to occur.
- Control and containment techniques should be provided for as many of these species as possible to landowners, land managers, and others.
- Nurseries, gardeners, and/or other potential vectors of spread for these species should be specifically targeted with information on the identification, natural history, risk, and control strategies for these species.

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# Part III: Aquatic Invasive Species List

Scientific Name	Common Name
<b>Category 1: Proposed Future Invasive Species</b>	
<i>Apollonia melanostoma</i>	Round Goby
<i>Chana sp.</i>	Snakehead
<i>Dreissena rostriformis bugensis</i>	Quagga Mussel
<i>Potamopyrgus antipodarum</i>	New Zealand Mudsnaill
<i>Arundo donax</i>	Giant Reed
<i>Egeria densa</i>	Brazilian Waterweed, Elodea
<i>Eichhornia sp.</i>	Water Hyacinth
<i>Hydrilla verticillata</i>	Hydrilla
<i>Myriophyllum aquaticum</i>	Parrot Feather
<i>Najas minor</i>	Brittle Niad
<i>Salvinia molesta</i>	Giant Salvinia
<i>Didymosphenia geminata</i>	Didymo, Rock Spot
	Viral Hemorrhagic Septicemia (VHS)
	Largemouth Bass Virus
	Heterosporosis
	Whirling Disease
<b>Category 2: Priority Species</b>	
<i>Ctenopharyngodon idella</i>	Grass Carp
<i>Hypopophthalmichthys molitrix</i>	Silver Carp
<i>Hypophthalmichthys nobilis</i>	Bighead Carp
<i>Morone americana</i>	White Perch
<i>Corbicula fluminea</i>	Asian Clam
<i>Dreissena polymorpha</i>	Zebra Mussel
<i>Orconectes rusticus</i>	Rusty Crayfish
<i>Potamogeton crispus</i>	Curly-leaf Pondweed
<i>Butomus umbellatus</i>	Flowering Rush
<i>Myriophyllum spicatum</i>	Eurasian Watermilfoil
<i>Nymphoides peltata</i>	Yellow floating heart
<i>Batrachochytrium dendrobatidis</i>	Chytrid Fungus
<b>Category 3: Established Invasive</b>	
<i>Cyprinus carpio</i>	Common Carp
<i>Scardinius erythrophthalmus</i>	Rudd
<i>Rana catesbeiana</i>	North American Bullfrog
<i>Cipangopaludina chinensis</i>	Chinese mystery snail
<i>Cipangopaludina japonica</i>	Japanese mystery snail
<i>Nasturtium officinale</i>	Common watercress
<i>Phalaris arundinacea</i>	Reed canary-grass
<i>Typha angustifolia and hybrids</i>	Narrow-leaf cattail

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Category 4: Listed as Noxious in Nebraska	
<i>Carduus acanthoides</i>	Plumeless thistle
<i>Carduus nutans</i>	Musk thistle
<i>Centaurea diffusa</i>	Diffuse knapweed
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	Spotted knapweed
<i>Cirsium arvense</i>	Canada thistle
<i>Euphorbia esula</i>	Leafy spurge
<i>Phragmites australis</i> ssp. <i>australis</i>	Eurasian common reed
<i>Tamarix ramosissima</i> and hybrids	Salt cedar
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Fallopia japonica</i> and hybrids	Japanese knotweed

## Part IV: Literature Cited

Kaul, R.B., D. Sutherland and S. Rolfsmeier. 2006. The Flora of Nebraska. School of Natural Resources, University of Nebraska—Lincoln.

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