

# Aquatic Invasive Species

## Issue

There are many introduced species that can wreak havoc on the District's environment and economy. Those species that cause harm and spread quickly from their point of introduction are often called "invasive." For these species, a single individual may produce thousands of seeds, masses of larvae or reproduce from nothing bigger than bits of stems, roots or leaves. Those that live in or near the water – aquatic invasive species – can be easily dispersed to distant water bodies or new ecosystems by currents, tides, river flows, streams, floods and other water flows (Appendix B, page 76, Appendix C, page 147).

Coon Creek currently faces a variety of significant and lasting impacts from aquatic invaders. In general, these include:

1. Reduced diversity and abundance of native plants and animals (due to competition, predation, parasitism, genetic dilution, introduction of pathogens, smothering and loss of habitat to invasive species).
2. Degradation of wildlife habitat.
3. Stresses on rare, threatened, and endangered species.
4. Alteration of the native food web and declines in productivity.
5. Changes in biogeochemical cycles (including nutrient cycling and energy flow).
6. Losses in fisheries production.
7. Impairment of recreational uses such as swimming, boating, diving and fishing.
8. Impairment of agricultural infrastructure such as irrigation canals.
9. Degradation of water quality.
10. Threats to public health and safety (via parasites and disease).
11. Diminished property values.
12. Erosion and destabilization of shorelines, banks and levees.
13. Increased costs to business, agriculture, landowners and government of invasive pest control, treatment and clean up.

## Ecological Impacts

In terms of ecological impacts, the introduction of invasive species is thought to be second only to habitat loss in contributing to declining native biodiversity throughout the United States. Nationwide, non-native species have contributed to 68% of the fish extinctions in the past 100 years and the decline of 70% of the fish species listed under the Endangered Species Act (Wilcove et al. 1998).

## Economic Impacts

Most of the environmental impacts described above have associated economic costs as managers invest time and money trying to minimize AIS impacts on native species and habitats. Other economic losses are incurred when AIS invasions hamper or jeopardize human activities.

On a national level, invasions are costing American taxpayers billions of dollars every year in environmental degradation, lost agricultural productivity, expensive prevention and eradication efforts and increased

health problems. One nationwide estimate suggests that annual costs in environmental damage and losses, arising from the 50,000 invasive species now in the United States, exceed \$120 billion (Pimentel et al. 2005).

## **Goals**

6.1 To minimize the harmful ecological, economic and human health impacts of aquatic invasive species.

6.2 To be proactive in aquatic invasive species management through education and projects that improves lake and stream water quality and/or reduces the risk of entry of invasive species.

6.3 Control the spread of AIS and minimize their impacts on native habitats and species.

## **Objectives**

1. Implement projects identified in the District's capital improvement plan to manage aquatic invasive species in lakes, streams and wetlands, where these species present a water quality problem or that can lead to or be a cause of water quality degradation.
2. Work to limit the spread of aquatic invasive species to un-impacted lakes, stream segments and wetlands through Education and Involvement program and Research and Monitoring program.
3. Improve coordination and collaboration among the people, agencies, and activities involved with AIS.
4. Minimize and prevent the introduction and spread of AIS into and throughout the waters of the Coon Creek Watershed District.
5. Develop and maintain programs that ensure the early detection of new AIS and the monitoring of existing AIS.
6. Establish and manage systems for rapid response and eradication.
7. Increase education and outreach efforts to ensure awareness of AIS threats and management priorities throughout the Coon Creek Watershed District.
8. Increase research on the baseline biology of AIS, the ecological and economic impacts of invasions and control options to improve management.
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10. Ensure state laws and regulations promote the prevention and management of AIS introductions.

## **Introduction**

Invasive species arrived in Minnesota via vectors – the means or agents that transport species from one place to the next. Vectors, also referred to as pathways, include ships, fishing vessels, recreational boats and gear, sea planes, diving gear, bait, aquariums, pets and water gardens.

Shoreline restoration or construction projects and water-based scientific research or monitoring can also inadvertently move organisms from one place to another. Invasive species cling to boat bottoms and recreational or research gear, construction equipment, wildlife, and floating debris and docks.

Once a highly invasive species arrives, preventing its rapid spread can be difficult if not impossible. Plants can produce thousands of seeds, which may be carried by wind, water, animals or human activities to distant water bodies. Some aquatic plants can reproduce vegetatively with small bits of leaves, stems or roots resulting in new plants. Water flows and currents may also deliver these AIS to new ecosystems.

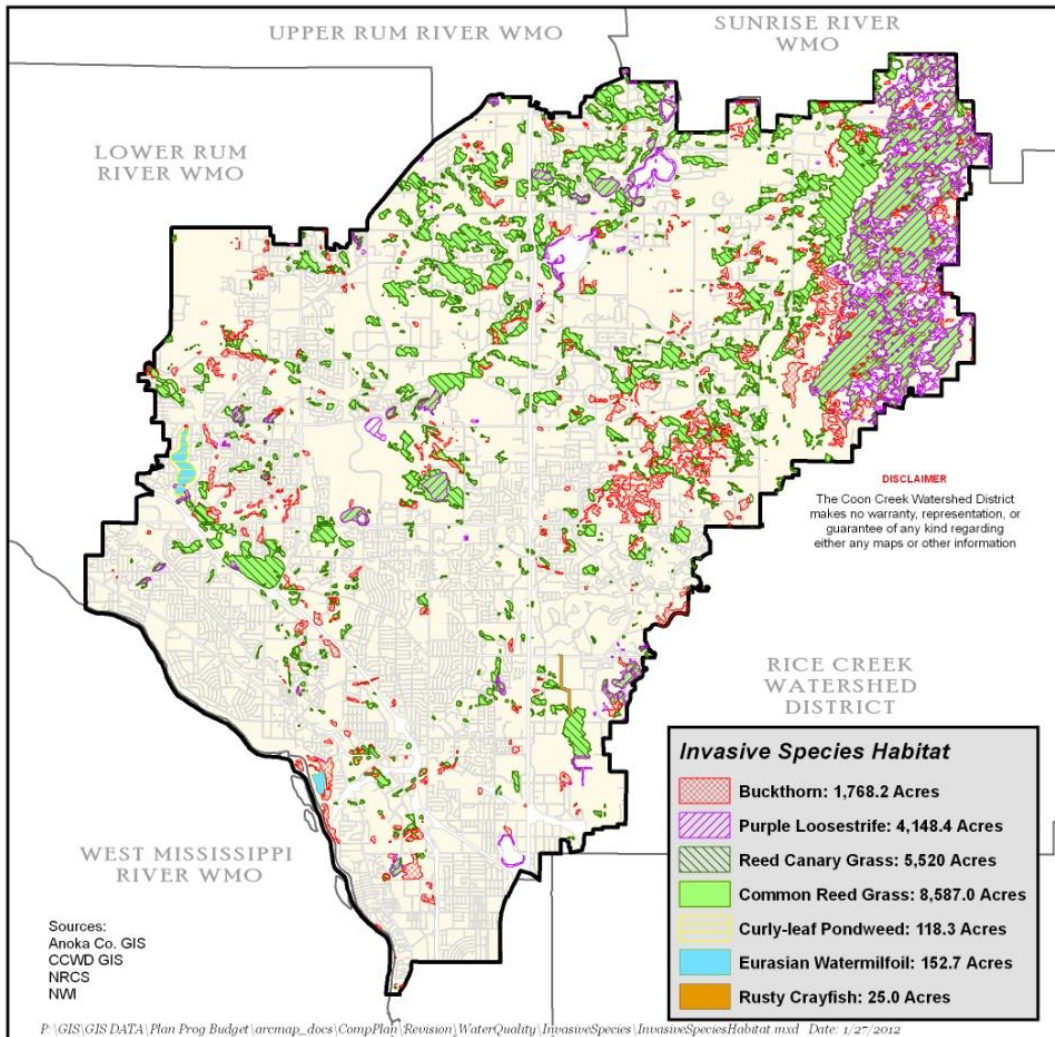
In the past, efforts to control such invasions have focused on managing individual problem species. More recently, however, the concept of focusing on vectors, rather than species, has begun to gain support as a more effective approach for addressing aquatic invaders.

On a general level, invasive species management involves five basic strategies, often in combination:

1. Prevention
2. Early Detection & Monitoring
3. Rapid Response & Eradication
4. Long-Term Control & Management
5. Education & Outreach

**Current Situation**

At present known occurrences of Invasive species within the Coon Creek Watershed District are as follows:



Current efforts to manage aquatic invasive species within the Watershed District have involved chemicals. Mechanical removal, either by hand with a scythe or with the help of "saw boats" which shred plants with rotating blades has been discussed. Recently, management approaches have changed and become more diverse to include everything from hyperspectral remote sensing, ozone treatment and K-12 education curricula to herbicides, electro-fishing, Internet sales precautions, PowerPoint presentations and equipment inspections.

Most long-established programs – both state and federal – are targeted at managing terrestrial agricultural pests, which can spread easily by wind, fog and through the air. Many of these programs are species specific.

Efforts to manage invaders living in and around water present a different set of challenges for containment and control and focus on preventing vectors from bringing in new species and on developing early detection networks.

### **Basic Strategies**

On a general level, invasive species management involves five basic strategies, often in combination:

1. Prevention
2. Early Detection & Monitoring
3. Rapid Response & Eradication
4. Long-Term Control & Management
5. Education & Outreach

In choosing management approaches within this framework, the nature of the invader itself comes into play.

Some invaders such as the Asian carp, specifically bighead carp and silver carp, are increasing their range up the Mississippi river and could invade inland waters such as CCWD lakes and streams. While they may not have yet arrived in Coon Creek, a management response focused on monitoring, education and early detection would be the most appropriate.

Other invaders (such as curly leaf pond weed (*Potamogeton crispus*) and Eurasian watermilfoil (*Myriophyllum spicatum*)) are so well-established, that eradication may be infeasible and ongoing chemical and/or mechanical removal is selected to minimize the harmful effects of the infestations.

Still others such as Zebra mussels (*Dreissena polymorpha*) may present no management options whatsoever since there is no environmentally acceptable way to treat or remove widespread benthic invertebrates in open waters. Whatever the species, the possible human management responses generally narrow as any invasion progresses (Lodge et al. 2006).

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### **Strategies to Achieve the Goal**

#### **Regulation & Prevention**

Minimize and prevent the introduction and spread of AIS into and throughout the waters of the Coon Creek Watershed.

Develop a watercraft inspection program.

Develop guidelines for water access inspections.

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**Operations & Maintenance**

Establish and manage a rapid response and eradication program.

Reduce unauthorized stocking of non-native species.

Develop and implement a rapid response plan for detecting and eradicating AIS.

Develop species and/or location-specific rapid response plans.

Review effectiveness of eradication programs.

Prioritize control efforts for existing and new organisms of concern.

Continue existing control programs.

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**Planning, Programming and Budgeting**

Develop species and/or location-specific control plans.

Develop or update Lake or resource specific management plans.

Ensure that state laws and regulations promote the prevention and management of AIS introductions.

Annually update the list of AIS as high risk for introduction.

Identify lead agencies for particular AIS, water bodies and invasion vector.

Every 5 years assess the effectiveness and gaps in State AIS programs and provide to elected officials and state agencies.

Establish stable long-term funding to help implement this plan.

Plan for and provide funding for AIS rapid response actions.

Encourage a statewide approach to early detection.

Explore permanent funding for rapid response.

Standardize criteria for identifying priority species for control & eradication.

Use volunteer monitors to conduct AIS inspections.

Prioritize ecologically sensitive areas at risk for AIS impacts.

Develop GIS maps showing coincidence of AIS and critical ecosystems.

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**Public &  
Governmental  
Relations**

Improve coordination and collaboration among people, agencies, lake associations and activities involved with AIS.

Use Citizen and Technical Advisory Committees for consultation process on actions concerning AIS.

Increase education and outreach efforts to ensure awareness of the threats and management priorities throughout the Coon Creek Watershed.

Invite community groups and NGOs for AIS planning and education.

Identify and apply for state and national grant funding.

Rank AIS vector importance.

Develop a recreational boating outreach and management program.

Develop a recreational fishing outreach and management program.

Develop guideline for:

1. Disposal of AIS at boat landings and fishing piers
2. Cleaning out fishing gear and equipment
3. Disposal of live bait

Develop a bait outreach and management program.

Work with industry to develop equipment documentation guidelines.

Develop a construction outreach and management program.

Encourage use of native species.

Develop a restoration outreach and management program.

Create and train a citizen monitoring network for AIS.

Engage professional & recreational divers in early detection work.

Evaluate and coordinate existing systems for reporting AIS sightings.

Provide technical assistance to Cities, Lake Associations and Homeowner Associations.

Encourage Boat washing stations and disposal facilities at infested waters.

Facilitate installation of AIS warning and information signs in infested areas.

Use volunteer monitors to conduct AIS inspections.

Inventory education and outreach efforts and develop a District AIS communication strategy.

Partner with ongoing outreach programs.

Develop posters, brochures and articles for industry sectors and user groups.

Present AIS information at public gatherings.

Partner with stakeholders and interest groups to broaden education efforts.

Educate shoreline property owners about AIS.

Brief decision makers and legislators on AIS management progress.

Increase local TV, radio and newspaper media coverage.

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**Research and Monitoring**

Develop and maintain a monitoring program that ensures early detection of new AIS and the monitoring of existing AIS.

Support increased research on the baseline biology of AIS, the ecological and economic impacts of invasions, and control options to improve management.

Quantify and assess recreational boating as an AIS vector.

Quantify and assess recreational fishing as an AIS vector.

Quantify and assess bait as an AIS vector.

Quantify and assess research, resource management and educational activities as AIS vectors.

Quantify and assess construction activities as an AIS vector.

Quantify and assess restoration activities as an AIS vector.



Assess current and long-term monitoring of the District's waters for early detection opportunities.

Monitor locations with a high invasion rate.

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