Minnesota Rapid Response Plan for Aquatic Invasive Species

Prepared by Minnesota Department of Natural Resources

January 29, 2013 Draft

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Preface

There is a need for preparing a state rapid response plan for new introductions of aquatic invasive species. The plan is: 1) needed at the department level, 2) desired by local entities, 3) is called for in the state's invasive species management plan (State Plan), and 4) is needed to fulfill requirements of federal grants to implement the aquatic portions of the state's invasive species management plan. This rapid response plan (response plan) is intended to fulfill the state's need to develop such a plan.

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Purpose of Rapid Response Plan

The discovery of a new non-native species in the state's waters is considered an ***introduction.*** When an Aquatic Invasive Species (AIS) that is already present in the state is discovered in another water body it is considered a ***new infestation***. Preventing introductions of new species and new infestations is the foremost strategy in AIS management and is crucial to avoiding their establishment, spread, and irreversible consequences. Experience has shown that once an AIS has become established and widespread, eradication is costly and unlikely (Lodge et. al 2006). If not eradicated, control efforts to limit their distribution and abundance can become perpetual and costly programs (e.g., sea lamprey control in the Great Lakes and Eurasian water milfoil in Minnesota lakes). Unfortunately prevention measures are imperfect, and even the best efforts will not stop all introductions.

Early detection and effective rapid response are a crucial second line of defense to prevent establishment (NISC 2008) and minimize the ecological and economic impacts of an AIS introduction (CDFG 2008). The sooner a new introduction is detected, the greater probability there is that a systematic response effort can be implemented while the population is still localized and not beyond that which can be contained and eradicated (NISC 2003). In many cases, actions must be taken quickly to be effective, possibly within only a few days of the introduction (USEPA 2005). Successful rapid response is therefore dependent upon effective early detection monitoring and AIS reporting programs for alerting managers to new introductions. Government officials and natural resource managers must be prepared and committed to take rapid and effective action following the report of an AIS introduction (Smits and Moser 2009).

This Minnesota based rapid response plan does not address the issues of prevention. It describes the state approach to early detection monitoring and the state's reporting systems. The primary focus of this Minnesota plan is on the actions that can be done (a) in preparation of responses; and (b) those that occur once a potential AIS or known high priority AIS [see draft definition in Glossary] has been reported. General information is provided in this plan on the major components of any rapid response effort, with specific response procedures for fish, invertebrates, and plants developed as supplemental attachments to this document.

Minnesota Experiences with Rapid Response

Following the discovery of a new introduction or a new infestation of an aquatic invasive species in the state, managers have considered the potential to eradicate the species. In the past, the Minnesota Department of Natural Resources (MN DNR) and its partners have attempted to eradicate a number of aquatic invasive species from various bodies of water.

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In the case of Eurasian watermilfoil, Crowell (1999) reported that attempts to eliminate or eradicate the invasive from 31 different lakes were unsuccessful. In the case of Brazilian waterweed, the submersed aquatic plant was discovered in a Minneapolis lake in 2007. This remains the only known introduction of that species in Minnesota. The MN DNR's rapid response was an attempt to eradicate the plant from the lake. It appears to have been successful because Brazilian waterweed has not been observed either in that Minneapolis lake or elsewhere since 2007.

In 2011, rapid response treatments were made to eliminate or eradicate zebra mussels from two lakes where boatlifts with attached zebra mussels had recently been placed in the lake. In both cases, the treatments were not effective at eradicating the mussels.

Related Federal Plans and Requirements

The Great Lakes Restoration Initiative (GLRI) is a major funding source for implementation of Minnesota's Minnesota Management Plan for Invasive Species**.** The GLRI Action Plan, which covers all the Great Lakes states including Minnesota, contains goals, objectives, actions and measures of progress related to early detection and rapid response. They are listed below.

GLRI Action Plan Goal 4: *A comprehensive program for detection and tracking newly identified invasive species in the Great Lakes is developed and provides up-to-date critical information needed by decision makers for evaluating potential rapid response actions.*

GLRI Objective 3: *By 2011, methodology and protocols will be piloted for the coordinated monitoring methodology and shared protocols for basinwide invasive species surveillance. By 2014, a basinwide surveillance program with shared sampling protocols and methodologies to provide early detection of non-native species will be operational.*

GLRI Action Plan Measure of Progress 3. *Number multiagency plans established, mock exercises to practice rapid responses carried out under those plans, and/or actual rapid response actions (cumulative).*

GLRI Principal Action to Achieve Progress: Establish Early Detection and Rapid Response Capability – *Work with government agencies to initiate surveillance activities to detect new ANS and establish the capacity, methods and contingency plans for a rapid response. Joint planning will allow the mobilization of shared resources to create the best opportunity for eradicating species before they become established.*

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Incident Command Systems

Description - Incident Command System (ICS), provides an organizational structure for incident management and guides the process for planning, building, and adapting that structure. It provides a systematic approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work seamlessly to rapidly respond to an AIS introduction, regardless of cause, location, or complexity. ICS establishes common processes for planning and managing resources and allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

The ICS organizational structure has 5 five major functional elements (i.e., command, operations, planning, logistics, and finance and administrations) and develops in a modular fashion as needed based on the size and complexity of the incident. Responsibility for the establishment and expansion of the ICS modular organization ultimately rests with Incident Command, which bases the ICS organization on the requirements of the situation.

Incident command is accomplished using one of two approaches. When an incident occurs within a single jurisdiction and there is no jurisdictional or functional agency overlap, a single Incident Commander (IC) is designated with overall incident management responsibility by the appropriate jurisdictional authority. However, when an AIS rapid response involves multiple jurisdictions, a single jurisdiction with multiagency involvement, or multiple jurisdictions with multiagency involvement, Unified Command (UC) allows agencies with different legal, geographic, and functional authorities and responsibilities to work together effectively without affecting individual agency authority, responsibility, or accountability. By working together as a team under UC, all agencies with jurisdictional authority or functional responsibility for the incident jointly provide management direction through a common set of incident objectives and a single planning process. Under UC, a single agency may still be designated as the overall lead and that agency's official identified as the IC for incident management.

Federal Requirement - There are federal requirements, applying to federally funded and inter-jurisdictional (interstate, state/federal) responses that require use of Incident Command Systems (ICS). In order to comply with those requirements in Rapid Response situations, the following ICS direction applies. As required by the Aquatic Nuisance Species Task Force, this plan will utilize the Incident Command System (ICS), a component of the National Incident Management System (NIMS), to enable a coordinated response among various jurisdictions and functional agencies in the situations when it is appropriate.

ICS in Minnesota - ICS efforts related to AIS in Minnesota will be initiated by DNR Enforcement Officers who have received ICS training. The Enforcement personnel will be assigned at the time of an incident based on the location and situation. These assignments will be made to a District Supervisor or manager.

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ICS Training - The DNR Enforcement Division will assist in assuring their division staff, such as Water Resources Enforcement Officers, meet the ICS training requirements. Initial ICS training will be provided to key DNR staff in other divisions that may be involved with planning or implementing a rapid response so staff can develop a familiarity with ICS. They would include: regional AIS Specialists, AIS Information Officer, AIS Prevention Coordinator, AIS Management Coordinator, EWR District Managers, and regional Fisheries managers.

Connection with State Invasive Species Management Plan

The "Minnesota state management plan for invasive species (MISAC 2009) includes Element II that addresses Early Detection, Rapid Response and Containment. It also has a specific strategy and actions that call for a general rapid response plan and when needed species-specific rapid response plans. As mentioned in the Purpose/Introduction, this response plan does not address the issue of prevention. It describes early detection monitoring and reporting systems, but its primary focus is on the actions that occur once a potential new AIS introduction or infestation has been reported. These may also include containment. The key parts of the state plan that relate to this response plan are below.

Element II. Early Detection, Rapid Response, and Containment

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

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

Strategies to detect species presence *after* introduction

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

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

Action b. Raise awareness of priority species of concern as well as 'watch' species by

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

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

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

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

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

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

Action j. Establish new or use existing citizen volunteer monitoring networks for early detection of terrestrial and aquatic invasive species.

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

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

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

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

Action b. Develop partnerships to increase invasive species identification and *field surveys* (e.g., lake associations performing annual aquatic invasive species searches; …)

Rapid Response strategies for newly detected infestations

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

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

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

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

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

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

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

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

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

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

Continue to contain infestations where eradication is not possible.

Containment Strategies

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

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

Action g. Publicize new infestations to raise awareness aimed at preventing and containing spread.

Action i. Provide notice of infested locations and waters for high priority species.

10. Enforcement – Enforce federal, tribal, state, and local laws aimed at *containment*

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

…

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Resources and Authorities Available

DNR Staff and Funds
In the event of a rapid response scenario the DNR Invasive Species Unit has federal funds available with the Great Lakes Restoration Initiative Grant (GLRI), and the Invasive Species Account Funds. Other resources include staff from the Invasive Species Unit within the Division of Ecological and Water Resources, Division of Enforcement, and the Section of Fisheries in the Division of Fish and Wildlife.

Many staff in the DNR Invasive Species Program that have responded to new infestations in past years are available to respond to new introductions. The DNR AIS Rapid Response Team includes the: Invasive Species Program Supervisor, Invasive Species Prevention Coordinator, Aquatic Invasive Species Management Coordinator, Watercraft Inspection Coordinator, Regional Invasive Species Specialists, Ecological and Water Resources – Regional and District Managers, DNR Enforcement - Water Resources Enforcement Officers, and local Enforcement Officers.

When responses are to address introductions or new infestations of fish species of AIS, DNR Fish and Wildlife staff and resources may also be available to assist with expertise, staff time, rapid surveillance, and potential eradication resources.

Authorities
There are authorities in Minnesota Statutes 84D that can aid in responses to new introductions or new infestations. Current Minnesota statute provides conservation officer legal authority to prohibit the introduction of water-related equipment with AIS attached and continued authority to order removal and confinement of water-related equipment with AIS attached. Conservation officers have the authority to seize and retain items as evidence and to further restrict the possible infestations to other bodies of water.

Other
Resources may be available from other state, federal, tribal, or local sources for rapid responses. If a large-scale project is needed a special appropriation could be sought from the state legislature or grant funds sought for a response project. If a project is on state border waters, there may also be potential funds from adjacent states and Canadian provinces.

EDRR - Summary of Steps

EDRR Steps See Appendix B – Page 21
Rapid Response Procedures for New Introductions or Infestations

Decision Tree See Appendix - Page 2
Overview of Response Effort

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Plan Steps

1.0 Detection and Surveillance

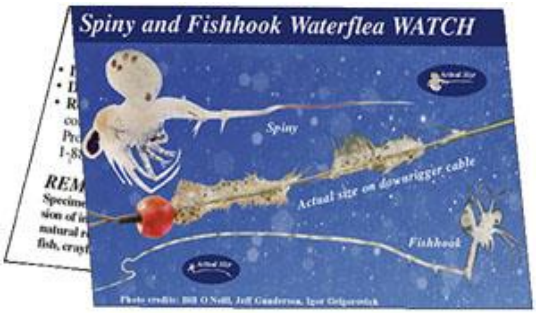
1.1 Reporting AIS Discoveries

The need to detect and communicate new findings of AIS in the state has been a priority by DNR, Minnesota Sea Grant Program, the U.S. Fish and Wildlife Service, lake associations, and many others for many years. The state invasive species plan includes this action - *Establish processes for reporting sightings/presence of infestations/ populations and agency verification of these reports*. The following is a description of the reporting framework in the state.

1.2 Observers

The state invasive species plan includes this action - *Identify people and agencies that might observe invasive species.* Many people and entities have been identified as potential observers of AIS in new locations. For aquatic species, lake residents and organizations, boaters and anglers are priority audiences for reporting information and surveying procedures. Agencies and DNR staff who conduct field surveys should be informed of the need to rapidly report "watch" species.

1.3 Reporting (Watch) information and Reporting Forms



The State Plan action that relates to reporting is - *Raise awareness of priority species of concern as well as 'watch' species by developing and distributing information about how to recognize, collect, and report various invasive species*. AIS "Watch" identification cards (see example – right) have been jointly produced by Minnesota Sea Grant, the Great Lakes Sea Grant Network, DNR, and local organizations to help raise awareness of priority AIS, how to identify them, and how to report suspected new occurrences.

Reporting forms have also been developed by DNR and the Minnesota Invasive Species Advisory Council (MISAC). Identification of priority invasive species and reporting occurrences has been a focus of the annual Minnesota invasive species calendar jointly produced by MISAC members. The calendars and Watch cards provide contact information. The most recently produced cards and new cards in development include information to contact the DNR AIS specialists, while older cards may not have that information.

The DNR Website has instructions for reporting suspected new infestations and introductions of new species at - www.dnr.state.mn.us/invasives/report_invasives.html.

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1.4 Field Surveying - The Early Detection section of the State Plan also includes the following action - *Conduct field surveys for priority invasive species and monitor invasive species populations.*

Lake Superior - Several entities conduct monitoring in Lake Superior and the St. Louis River estuary. They include DNR, EPA, and the USFWS. The USFWS has developed monitoring protocols for detecting nonnative fish and the EPA has protocols for other aquatic species. DNR surveys the fish populations in Lake Superior annually. DNR will be communicating with these other agencies to coordinate monitoring efforts and to share information in a timely manner.

Other 'Large' Lakes - Currently, the DNR collects zooplankton samples from large lakes in the state and the samples are analyzed by aquatic biologists who are experts in identifying zebra mussel veligers, spiny waterfleas, and other aquatic invasive invertebrate species. DNR Fisheries monitors the fish populations annually in the 'large' lakes. This provides one level of field surveys to detect new infestations.

Other Inland Lakes - A zebra mussel volunteer monitoring effort is ongoing at about 120 lakes in the state. Volunteers check equipment removed from lakes in the fall and report any suspected zebra mussels to DNR aquatic invertebrate biologists.

DNR Fisheries staff survey fish populations in state lakes on approximately a five-year cycle. Their field surveys are a method of detecting invasive fish and aquatic plant species in state waters.

The DNR Shallow Lakes Surveys are another ongoing effort that could monitor for AIS in state waters.

Local lake associations and local governmental units often survey lakes for AIS and report findings to DNR. DNR, Minnesota Sea Grant, and University of Minnesota Extension staff have provided training for identification of AIS by those volunteer groups.

> *Detection Action 1 – Conduct field surveys for priority invasive species. Initiate a statewide sampling effort for AIS in inland lakes and rivers per year* (if funds become available)
>
> *Detection Action 2 - Establish partnership opportunities with existing field surveys (such as the DNR County Biological Survey, river surveys, fisheries surveys, and shallow lake surveys) for reporting suspected new sightings/presence of invasive species. (EWR Regional/District Managers)*

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1.5 Investigate Reports – Once notification of a *potential* new AIS introduction into the state or AIS infestation has been received by the DNR, the rapid response procedure is initiated. The Early Detection section of the State Plan includes the following action - *Investigate reports of new nonnative species as soon as possible*. The primary responsibility for investigating reports is the Minnesota Department of Natural Resource's with assistance from state, federal, and some local partners. Primary contacts are DNR's eight Aquatic Invasive Species Specialists located throughout the state. Reports to any other entity or DNR office should be forwarded to the local specialist for response. Contact information for the specialists is at www.mndnr.gov/AIS and in Appendix A. Verification of reports will be done by specialists, with assistance from other DNR Invasive Species Program staff (Management Coordinator, Prevention Coordinator, Aquatic Invertebrate Biologist), DNR Fisheries staff, and if the species is new to the state with assistance from other species experts.

RR Action 1 – Investigate reports of suspected AIS

1.6 Confirmation

Following notification of a potential AIS sighting, the organism and geographic location of the discovery must be positively identified. The person who reported the discovery should be interviewed to gather more detailed information on the specific location and circumstances of the discovery. The specimen or photographs should be collected if available, and the location identified on a map. If necessary, the Invasive Species Program staff will work with taxonomic/biological experts to confirm the species' identification (see Appendix A – Taxonomic/Biological Experts).

RR Action 2 – Confirm species identity (DNR AIS specialists, other experts)

Once a species' identification has been confirmed by a taxonomic, or other AIS expert, the reported sighting is documented as either a negative or positive potential AIS and acted upon accordingly (See Databases of AIS Locations). If the report was received via the NAS system, then the species' confirmed identification is reported back; otherwise any positive ID should be registered as a new report in the NAS database (http://nas.er.usgs.gov/SightingReport.aspx). NAS reports will be conveyed by USGS to the Great Lakes ANS Information System (GLANSIS).

Negative ID: If the sighting is confirmed to be a native species, or is a known occurrence of a non-native species in the reported water body, then no further action is necessary. The rapid response process is terminated.

If the sighting is confirmed to be a new occurrence of a nonnative species within the state or watershed, then the response process proceeds and a rapid assessment is conducted.

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1.7 Databases of AIS Locations

The State Plan includes the following action - *Establish and maintain databases of known locations of priority invasive and "watch" species.* The DNR has a database of confirmed waters and of connected designated waters that are likely to be infested. Confirmed reports of priority AIS should be added to the DNR's database of infested waters and forwarded to the USGS-NAS database.

RR Action 3 - Information about the confirmed occurrences should be sent to the DNR Invasive Species Prevention Coordinator/Specialist for inclusion in the database, on published lists of infested waters, and for updating the GIS data. Also send confirmed report information to the USGS-NAS database.

RR Action 4 – Designate infested waters via DNR Commissioner's Order and publish in State Register

2.0 Rapid Assessment of Species and Distribution

Rapid Assessment - The positive confirmation of a reported sighting as a new occurrence of a non-native species in the state (a new introduction) will result in a rapid assessment of the species, unless one has already been completed. The rapid assessment is an information gathering step that involves concurrent biological and literature surveys to provide decision support for determining if a response action is warranted. Managers will consult experts from academia, state, and federal agencies, as appropriate, to aid in the rapid assessment.

If it is a new introduction to the state and little is known about the species, a Rapid Assessment Group that includes DNR and possibly external experts, may need to be convened and is responsible for using the best available science and information to determine the species' potential to be invasive. If a full risk assessment has not been conducted prior to the rapid response, a rapid risk screening (Appendix I) will be completed to quickly and efficiently evaluate the species' risk for detrimental impacts.

RR Action 5 – Conduct rapid assessment

Distribution - Once the reported species' identification has been confirmed and determined a potential invasive threat, a brief, but intensive field assessment is conducted to confirm the introduction, delineate the extent of the introduced species' distribution, its potential for further distribution, and to quarantine the area if possible. If the field assessment determines that the species' distribution is sufficiently limited for an attempt at eradication (or alternative control actions), then the assessment is expanded to include a review of potential management options for the size and location of the introduction. If the species' distribution is too wide spread for eradication or other control

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actions to be effective, then alternative management options and containment actions, should be recommended to decision makers.

> *RR Action 6 – Conduct field survey to determine distribution of species in the waterbody; submit report.*

Upon completion of the rapid assessment, the Invasive Species Program will summarize the information and provide an agency brief with a recommendation for "rapid response action", "containment actions", or "no action." *Note:* Managers may determine that control actions other than an in water rapid response are warranted and recommend alternative management actions to agency decision makers; however such alternatives are considered outside the context of a rapid response action and are not addressed in this document.

Potential Non-target impacts –
Prior to any in-water treatments, an assessment of endangered species that could be affected should be completed. In most cases, this would be completed by checking the Rare Features layer of Quick Themes. This information will be necessary in the Decision for Action phase of the response.

> *RR Action 7 – a. Consider survey of aquatic community for future assessment and b. determine if endangered species are present by checking the Rare Features layer of Quick Themes*

3.0 Decision for Action

A number of factors must be considered when making a recommendation to attempt rapid response management actions. The complexity and cost of management responses will increase, and likewise the chance for success decrease, as the size of an introduced population and the affected area increases. Potential treatment of AIS can quickly become complicated because of the mobility of the species, the unseen nature of aquatic species and their response to management actions, the open nature of many water bodies, the potential for a response to be a multijurisdictional issue (within or among states), and the extreme value and sensitivity of aquatic habitats. The decision for action can be difficult, as it may require balancing conflicting social, political, and legal issues in a situation where good information is likely scarce. Decision makers are therefore dependent upon the quality of information and science provided from a rapid assessment and a Rapid Assessment Group.

The following factors should be considered prior to treatment:

1. Is there knowledge of the risk of reintroduction, and is the risk low enough to justify eradication?

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2. Taken overall, can controls be initiated rapidly?
    a. Was the invasion detected early? That is, the infestation is small and there are only a few locations?
    b. Can the species continue to be contained to this small location while control measures are planned and implemented?
    c. Was the invader rapidly and accurately identified?
    d. Is information on species biology and management quickly available?
    e. Are treatment methods available?
    f. Are there serious environmental issues or regulatory hurdles that will lead to delays or greatly increase the cost of treatment?
    g. If permits are needed, can they be obtained in a timely fashion?
    h. Has the species been prioritized for response and is there a pre-existing action plan?
    i. If the introduction was on equipment (e.g., boat, boat lift) that is still in the water, is authority available to order its removal?

3. Taken overall, is there a will to act?
    a. Are there decision-making procedures and structures with the power to determine whether attempts at eradication should proceed, how, and who should fund it?
    b. Has there been a clear assessment of technical, field, administrative, funding, and legal resources available for an eradication attempt?
    c. Is there acceptance of the need to proceed on the best information available?
    d. Is there acceptance of short-term, local impacts in return for long-term, wide-area benefits?
    e. Is there acceptance that the "no action" response has serious impacts?
    f. Do a preponderance of the agencies (and their staff) feel they have a clear responsibility to act, or does one agency have a clear mandate and authority to act?
    g. Is there recognition and acceptance that a potential eradication effort can be a long-term effort, almost always taking years in the case of plants or other organisms with resistant resting stages?

4. Taken overall, is organization adequate?
    a. Is there an ability to quarantine the infested area?
    b. Was there a capacity to survey, to determine whether the species is restricted to the quarantine area?
    c. Will program staff with experience in AIS management and eradication be assigned to direct the control efforts and monitor results?
    d. Are funding sources adequate and of sufficient duration?
    e. Is there effective collaboration among the parties carrying out the effort?
    f. Is there regional collaboration where infestations cross jurisdictions?
    g. Are there provisions for monitoring in order to modify, expand, or end an eradication campaign?

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5. Other factors
    a. Is there support for the effort by affected parties, including the public?
    b. Is there effective outreach and education for both the public and government decision makers?

Once a decision is made to implement a rapid response, alternative management actions, or no action, the initial response is documented in a written Incident Brief (adapted from ICS-201 form). A decision for no action is not addressed further in this document and proceeds according to the agency procedures. However, managers may continue to utilize the Planning P to implement and evaluate the alternative management actions.

The decision by DNR to implement a rapid response will initiate the formation of an ICS organizational structure (Figure 2) in the following situations: 1) it involves federal funding or participation; 2) it is multi-jurisdictional and includes other states, Canadian provinces; or 3) it includes Tribes. DNR must decide whether to pursue a single command response with one Incident Commander (IC), or in the case of a multiagency or multi-jurisdictional response, a Unified Command (UC) in which multiple agencies share incident management responsibilities (CDFG 2008). An initial UC meeting is conducted to begin to establish a course of action. During the UC meeting the rapid response objectives are developed and individuals are identified to fill the Command and General Staff positions (Appendix F) that form the remainder of the Incident Management Team (IMT). The initial UC meeting completes the Initial Response phase of the Planning P (Figure 3).

4.0 Implement Response Actions

Minnesota State Plan Strategy - *Reduce the potential for establishment of a reproducing population through targeted treatment efforts when acceptable treatment options exist.* If it is decided to pursue in water eradication or other management actions, the steps should include those in Appendix B.

Implement Treatment Action 1 – Determine treatment method

Implement Treatment Action 2 – Obtain treatment permits

Implement Treatment Action 3 – Arrange funding for treatment

Implement Treatment Action 4 - Contract for treatment

Post Response Actions and Containment

Monitor Effectiveness -
State Plan action states **-** *Monitor eradication efforts through field survey or other means to evaluate eradication [management / treatment] success.*

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Following any attempted eradication or other management response, DNR will work with other appropriate entities to evaluate the effectiveness of the action. [Determining the effectiveness of responses will help determine the next steps such as conducting additional treatments or discontinuing further treatment efforts.

5.0 Public Awareness

There are two applicable actions from the State Plan:

- *Publicize new infestations to raise awareness aimed at preventing and containing spread*.
- *Provide notice of infested locations and waters for high priority species.*

When new introductions or infestations are confirmed a news release shall be drafted by the regional I/O in consultation with the local AIS Specialist and then routed through the DNR process. If the water body is designated as infested waters, Invasive Species Alert signs should be posted at the public water accesses on the new infested water. When possible the signs should be provided to privately owned water accesses.

Containment Action 1 - Draft and once final report is completed issue news release about new introduction or infestation.

Containment Action 2 – Inform LGUs critical to the rapid response of new infestation prior to press releases

Containment Action 3 – Post Invasive Species Alert signs at water accesses on the new infested water

Enforcement -
The State Plan has the following action related to enforcement - *Enforce state and federal laws intended to contain invasive species.* Conservation officers can enforce state laws at water accesses and also utilize check stations near the infested water to ensure other water-related equipment are not carrying AIS away from infested waters.

Containment Action 4 – Enforce AIS containment laws at new infested water.

Watercraft Inspections –
An action in the State Plan applying to containment is - *Conduct watercraft inspections at public water accesses with priority given to infested waters, …* Once a water is newly designated, the regional watercraft inspection supervisors will be contacted to facilitate the presence of watercraft inspectors at public water accesses on the waterbody. The amount of time that inspectors can be present will be determined by local factors.

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Containment Action 5 – Conduct watercraft inspections at public water accesses on waters with newly discovered infested waters.

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Appendix A – Contacts and Experts by Topic

Submit suspected occurrences:

Regional AIS Specialists – visit www.dnr.state.mn.us/invasives/contacts.html

Submit confirmed occurrences:

Invasive Species Prevention Coordinator, 500 Lafayette Rd. St. Paul, MN 55110

DNR Species Experts:

Aquatic invertebrates – DNR Aquatic Invertebrate Biologist (EWR)

Aquatic plants – DNR Aquatic Invasive Species Management Coordinator (EWR)

Fish – DNR Brett Nagle, MBS Animal Survey Specialist (EWR)

Aquatic Pathogens – DNR Pathology Lab Supervisor (Fisheries)

Other Species Experts and Resources:

Aquatic plants –

- Eurasian watermilfoil if there is question about whether a sample of Eurasian watermilfoil may be a hybrid with the native northern watermilfoil, then a sample may be sent to Dr. Ryan Thum's Molecular Ecology Laboratory at the Annis Water Resources Institute, Grand Valley State University for genetic identification (see web site below). There s a charge for genetic identification.

  http://www.gvsu.edu/wri/thum/milfoil-genetic-identification-services-15.htm

- Hydrilla or perhaps other members of the hydrocharitaceae, specimens may be sent to:

  Michael D. Netherland, Ph.D
  US Army ERDC
  7922 NW 71st Street
  Gainesville, FL 32653

  In other cases, e.g., non-native haplotypes of *Phragmites,* experts will be found and contacted as necessary.

Fish - Andrew Simmon (University of Minnesota)

The USGS Nonindigenous Aquatic Species (NAS) on-line Sighting Report offers both an upload tool for pictures and a mapping tool to document the sighting.

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Appendix B
Rapid Response Procedures for New Introductions or Infestations

Action	Lead Individual(s)
RR Action 1 – Investigate reports of suspected AIS; Write a report, which may be brief, on the results of visit to the lake and post it on a shared drive	DNR Invasive Species Specialists
RR Action 2 – Confirm species identity	DNR Regional Specialists, ISP staff for that species, other experts (see Appendix A)
RR Action 3 – a. Information about the confirmed occurrences should be sent to the DNR Invasive Species Prevention Coordinator/Specialist for inclusion in the database, on published lists of infested waters, and for updating the GIS data. b. Also send confirmed report information to the USGS-NAS database.	a. DNR Invasive Species Specialists b. Invasive Species Prevention Specialist
RR Action 4 – Designate infested waters via DNR Commissioner's Order and publish in *State Register*	Invasive Species Prevention Coordinator / Specialist through Commissioner's Office
RR Action 5 – Rapid Assessment (skip to RR Action 6 if new infestation rather than a new introduction)	Invasive Species Program staff in consultation with other experts, and if needed a Rapid Assessment Group
RR Action 6 – Conduct field survey to determine distribution of species in the waterbody; Write a report, which may be brief, on the results of the survey and post it on a shared drive	DNR Invasive Species Specialists
RR Action 7 – a. Consider survey of aquatic community for future assessment b. Determine if endangered species present by checking the Rare Features layer of Quick Themes	a. Invasive Species Program and DNR Fish and Wildlife b. DNR Invasive Species Specialists
Implement Treatment Action 1 – Determine treatment method	***Current species*** – Regional staff ***New species to state*** - Treatment/Management Team
Implement Treatment Action 2 – Obtain treatment permits	***Current species*** – Regional staff ***New species to state*** - Treatment/Management Team

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Implement Treatment Action 3 – Arrange funding for treatment	***Current species*** – Regional staff ***New species to state -*** Treatment/Management Team
Implement Treatment Action 4 - Contract for treatment	***Current species*** – Regional staff ***New species to state*** - Treatment/Management Team
Containment Action 1 – Inform others of new infestation prior to press releases (e.g., Commissioner's Office, MN DNR area and regional staff, MN Sea Grant, USFWS, NPS, Tribes, area and regional staff)	TBD Regions/IO/ Coordinators
Containment Action 2 – Draft and issue news release about new introduction or infestation	***Current species*** – Regional staff with regional Information Officer (I/O), then to ISP I/O ***New species to state*** - ISP Unit Supervisor w/ Lead ISP staff for species and ISP I/O
Containment Action 3 – Post *Invasive Species Alert* signs at water accesses on the new infested water	***Non-DNR Accesses*** - ISP Watercraft Insp. Reg. Supervisors ***DNR Accesses*** – Parks and Trails Staff
Containment Action 4 – Enforce AIS containment laws at new infested water.	DNR Conservation Officers
Containment Action 5 – Conduct watercraft inspections at public water accesses on waters with newly discovered infested waters.	DNR or local government units' Watercraft Inspectors

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Appendix C – Glossary

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

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

Contain / Containment - attempt to stop spread of invasive species from an infested area to other areas.

DNR – means Minnesota Department of Natural Resources

EDRR – means Early Detection Rapid Response

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

EPA – means U.S. Environmental Protection Agency

EWR – means DNR Division of Ecological and Water Resources

High priority species – High priority species are referred to in the State Plan, but are not defined there. For purposes of this plan, high priority species refers to those aquatic nonnative invasive species that are the focus of ongoing prevention efforts (e.g., public awareness and regulations), containment efforts (e.g., watercraft inspections and signage), or management efforts. They would also be species identified as priorities for action in rapid risk assessments that may occur in the rapid assessment portion of this plan. Current high-priority species include the groups of species shown in Appendix F:

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

MDA – means Minnesota Department of Agriculture

NAS – means Nonindigenous Aquatic Species (in relation to the USGS Website)

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

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

USFWS – means United States Fish and Wildlife Service

USGS – means United States Geological Survey

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Appendix D – Table of Aquatic Invasive Species

Threat Ranking*	Status in Minnesota	Common Name	Genus	Species	Classification
Aquatic Animals					
Watch		Chinese mystery snail, Japanese trap door snail	*Cipangopaludina*	*spp.*	*Regulated*
Severe	Invading	Bighead carp	*Hypophthalmichthy*	*nobilis*	*Prohibited*
Severe	Invading	Grass carp	*Ctenopharyngodon*	*Idella*	*Prohibited*
Severe	Invading	Silver carp	*Hypophthalmichthys*	*molitrix*	*Prohibited*
Severe	Not in state	Black carp	*Mylopharyngodon*	*piceu*	*Prohibited*
Severe	Not in state	Fishhook waterflea	*Ceropagis*	*Pengoi*	*Unlisted?*
Severe	Not in state	Rudd	*Scardinius*	*erythrophthalmus*	*Prohibited*
Severe	Not in state	Zander	*Stizostedion*	*lucioperca*	*Prohibited*
Severe	Established	Common carp, Koi	*Cyprinus*	*Carpio*	*Regulated*
Severe	Established	New Zealand mudsnail	*Potamopyrgus*	*antipodarum*	*Prohibited*
Severe	Established	Rainbow smelt	*Osmerus*	*mordax*	*Regulated*
Severe	Established	Round goby	*Neogobius*	*melanostomus*	*Prohibited*
Severe	Established	Ruffe	*Gymnocephalus*	*cernuus*	*Prohibited*
Severe	Established	Rusty crayfish	*Orconectes*	*rusticus*	*Regulated*
Severe	Established	Sea lamprey	*Petromyzon*	*marinus*	*Prohibited*
Severe	Established	Spiny water flea	*Bythotrephes*	*longimanus*	*Regulated*
Severe	Established	Zebra / Quagga mussels	*Dreissena*	*spp.*	*Prohibited*
Moderate	Not in state	Fourspine stickleback	*Apeltes*	*quadracus*	*Unlisted*
Moderate	Established	Alewife	*Alosa*	*pseudoharengus*	*Regulated*
Moderate	Established	Corbicula	*Corbicula*	*fluminea*	*Regulated*
Moderate	Established	Goldfish	*Carassius*	*auratus*	*Regulated*
Moderate	Established	Lumholtzi waterflea	*Daphnia*	*lumholtzi*	*Unlisted*
Moderate	Established	Threespine stickleback	*Gasterosteus*	*aculeatus*	*Unlisted*
Moderate	Established	Tubenose goby	*Proterorhinus*	*marmoratus*	*Prohibited*
Moderate	Established	White perch	*Morone*	*Americana*	*Prohibited*
Severe pest,	not expected to survive in MN	Chinese / Japanese Mitten Crabs	*Eriocheir*	*sinensis and japonica*	*Unlisted*
Aquatic Plants					

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Watch/ Unknown		Brazilian elodea	*Egeria*	*densa*	*Prohibited*
Watch		Waterlililes, nonnative or exotic	*Nymphaea*	nonnative spp.	Regulated
Severe	Not in state	European frog-bit	*Hydrocharis*	*morsus-ranae*	*Prohibited*
Severe	Not in state	Hydrilla	*Hydrilla*	*verticillata*	*Prohibited*
Severe	Not in state	Indian swampweed	*Hygrophila*	*polysperma*	*Prohibited*
Severe	Not in state	Water chestnut	*Trapa*	*natans*	*Prohibited*
Severe	Not in state	Curly-leaf pondweed	*Potamogeton*	*crispus*	*Prohibited*
Severe	Not in state	Eurasian watermilfoil	*Myriophyllum*	*spicatum*	*Prohibited*
Severe	Not in state	Purple loosestrife	*Lythrum*	*salicaria*, *virgatum, and any hybrids*	*Prohibited*
Severe	Invading	Water hyachinth	*Eichhornia*	*crassipes*	
Moderate	Not in state	Yellow floating heart	*Nymphoides*	*peltata*	
Moderate	Established	Eurasian flowering rush	*Butomus*	*umbellatus*	*Prohibited*
Moderate	Established	Water cress	*Nasturtium*	*officinale*	*Unlisted*
Moderate	Established	Yellow iris	*Iris*	*pseudacoris*	*Regulated*
Severe pest,	not expected to survive in MN	*Salvinia* complex	*Salvinia*	*spp.*	

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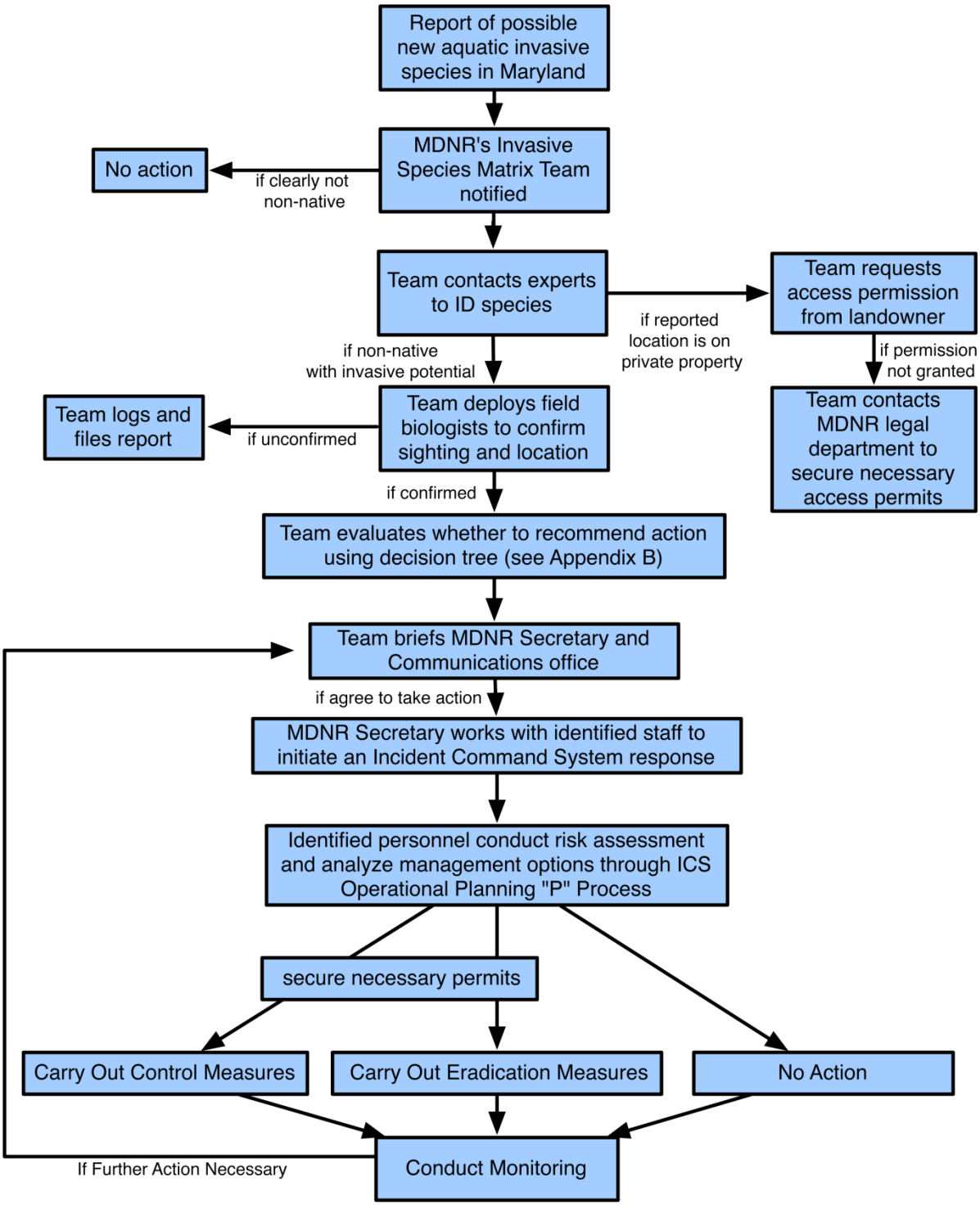
Appendix E – Overview of Response Effort

Overview of Rapid Response Effort



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