# APPENDIX 1
# Bear Lake Rapid Response Plan

# Bear Lake Rapid Response Plan for Aquatic Invasive Species (AIS)

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# 1. INTRODUCTION

## 1.1. Background

Aquatic invasive species (AIS) are non-native (sometimes called exotic, invasive, or nonindigenous) aquatic animals, plants, or pathogens that invade ecosystems beyond their natural, historic range (EPA, 2005; USFWS, 2015). AIS are detrimental to ecosystems in many ways. Without natural predators, they often out compete native organisms for resources threatening their diversity or abundance; their presence may harm native ecosystems, negatively impact commercial, agricultural, or recreational activities, and potentially pose as a human health concern (EPA, 2005; USFWS, 2015). Humans have aided in the spread of AIS around the globe for centuries, either intentionally or unintentionally (USFWS, 2015; NISC, 2016). Intentional introductions involve the deliberate transfer of invasive species into a new environment, such as the placement aquarium plants and animals into nearby waterways. Unintentional introductions occur when these invasive species are transferred accidentally, such as via ballast water or aquatic hitchhikers on boating vessels or fishing tackle. Preventing introductions of aquatic invasive species is crucial to avoid their establishment and spread.

The first line of defense is Prevention from introductions of new species. Unfortunately, prevention measures are not perfect. The second line of defense is the Early Detection of new and emerging aquatic invasive species, which is essential in order to prevent their establishment, spread, and possible irreversible consequences. Experience has shown that once AIS has become established and widespread, eradication is costly and unlikely (Lodge et. al 2006). Successful early detection programs allow for potential threats to be identified in time for effective, efficient and environmentally sound decisions to be made and rapid response actions to be taken to minimize the ecological and economic impacts. The earlier an infestation is found, the more successful management efforts will be.

This Bear Lake's rapid response plan does not address the issues of prevention. It describes the approach to early detection monitoring and the reporting systems. The primary focus of this plan is on the actions that occur once potential AIS or known high priority AIS [see PRISM list in Appendix] has been detected. In October 2016, WNY PRISM released an Early Detection Reporting Protocol for professionals and citizen scientists alike. This reporting protocol will serve as a means to ensure that infestations of new-to-our-region invasive species are caught early and should not change how the common and/or widespread species are reported.

## 1.2. Problem Statement

Chautauqua County lakes and waterways, including Bear Lake, do not have rapid response plans for invasive species. Successful rapid response plans are a systemic effort to eradicate, or contain invasive species while infestations are still localized (NISC, 2016). To be most effective, a response to an introduction should occur quickly.

### 1.3. Purpose of the Plan

The Bear Lake Rapid Response Plan for AIS is designed to provide the Bear Lake Association and resource managers a defined process with a list of specific procedures in the event new AIS introductions enter into the Lake and waterways, rather than fully established and known AIS populations in Bear Lake.

This document is intended to provide outlined protocol to quickly and efficiently report a new aquatic invasive species in order to respond according when faced with the possible threat of AIS. The plan follows a step-by-step, easy to follow, flow-chart, also called a decision matrix (Figure 1), which follows specific and necessary action steps to facilitate a response to an incident before the AIS becomes established. This plan cannot, and does not attempt to, provide answers or solutions to all of the issues associated with rapid responses. Rather, this document provides a framework to assist any manager in responding thoroughly, professionally and effectively to the many challenges that result from newly detected invasions. This is a working document and revising it will be an ongoing process. As additional information gaps are identified, they will be incorporated into this document.

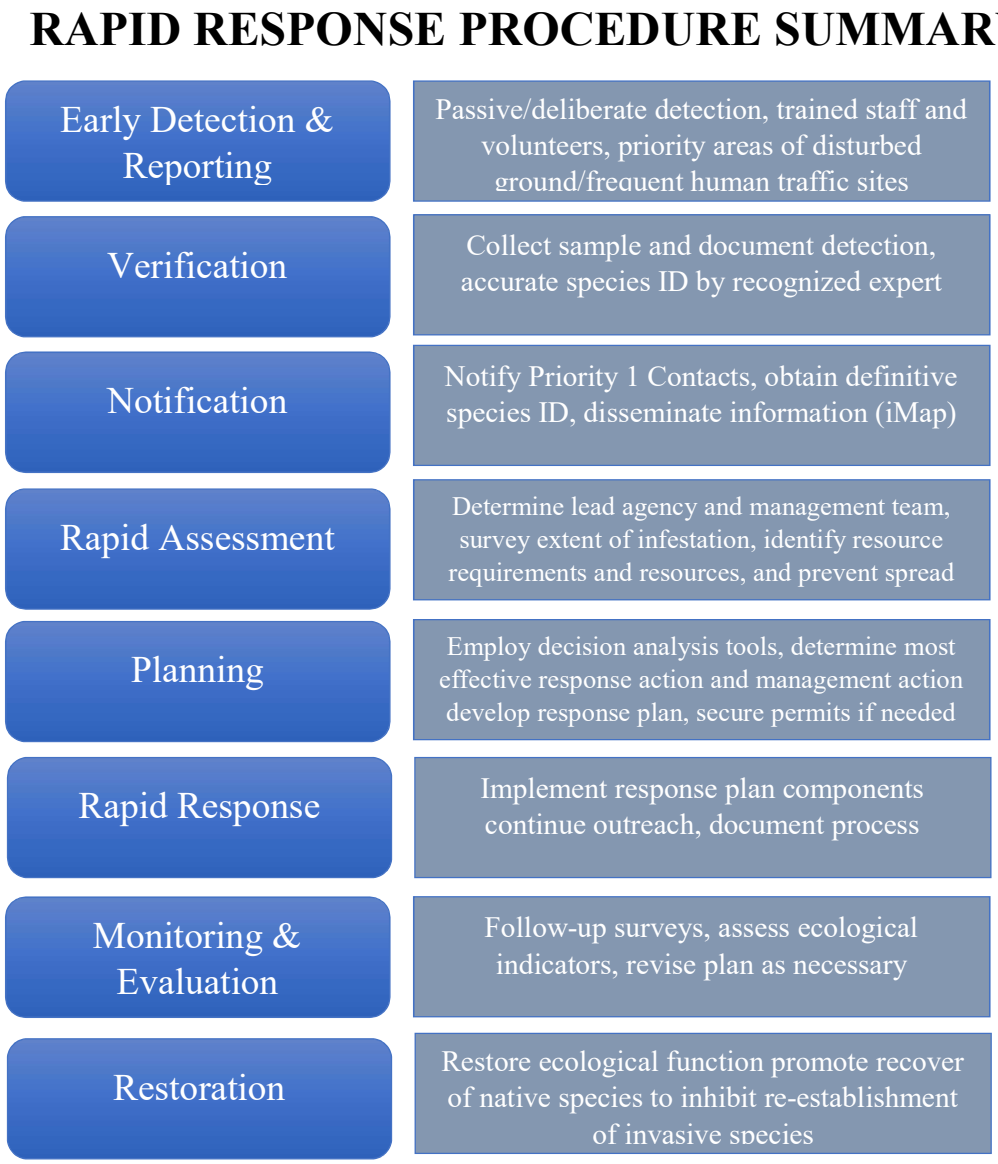
State and federal agencies, local governments, and non-governmental organizations (NGOs) are the primary entities that will be responsible for implementation of this policy. The Partnerships for Regional Invasive Species Management (PRISMs) are the primary local coordinating bodies for invasive species management. There are eight partnerships statewide, funded in part by the NYSDEC through the Environmental Protection Fund. This Bear Lake Aquatic Invasive Species Action Plan was adapted from the New York State Department of Environmental Conservation DEC Program Policy (NYSDEC DLF-16-1; 2016) Rapid Response for Invasive Species: Framework for Response 2016, and from The Partnerships for Regional Invasive Species Management (PRISMs) agency guidelines.

## 2. PLAN OVERVIEW

### 2.1 How to Use This Plan

The Rapid Response Process consists of a series of 8 Action steps (Section 3). A flowchart (Figure 3) details the general plan for responding to possible new AIS. This process provides a holistic approach to quickly and efficiently report a new aquatic invasive species in order to respond according when faced with the possible threat of AIS.

**Figure 1.**




**1.** ***Early Detection & Reporting*** - The most critical step in addressing a new invasive species is to know that it exists. The early detection of new invasions is key and frequently requires a network of well-trained volunteers and professionals who can carry out specimen collection for identification, field surveys, and reporting. Early detection typically falls into one of two categories: passive or deliberate. Passive detection can occur at any location by any person with training or knowledge of invasive species (i.e. public, master gardeners, outdoor recreationalists, etc.). Deliberate detections occur through planned surveillance by trained employees and volunteers in specific designated areas. Sites of ground disturbance, human altered habitats and areas of high human traffic are the most likely places for invasive species to be transported and become established.

The rapid response process begins as soon as a new invasion has been reported New York State Department of Environmental Conservation (NYSDEC), the iMap Invasives Database, and Partnerships for Regional Invasive Species Management (PRISMs), whose mission includes responding to invasions. See Appendix C for PRISM Fact Sheet.

**2.** ***Verification*** - The rapid and accurate identification of a new invasive species is an important first step. A recognized expert must verify sample(s) or accredited laboratory before action can be taken. Samples should be vouchered to authenticate suspected sample(s) with physical evidence.

**3.** ***Notification*** - Relevant resource managers should be notified once the reported invasion has been verified. Notification of the news media and the public should not occur until the initial verification has been confirmed by a second source. The location and relevant observation information should also be submitted to the NYS Invasive Species Database, iMap Invasives.

**4.** ***Rapid Assessment*** - Once a new invasion has been verified, a rapid assessment needs to be completed to determine both the threat(s) posed by the invasion and the potential for an effective rapid response. The first step in a rapid assessment is delimiting the physical extent of the invasion. This is followed by an assessment of the resources (personnel, funds, equipment, supplies, etc.) needed to address the invasion and the establishment of a lead agency and possibly the Incident Command System (ICS). See Appendix D for ICS Flow Chart. The rapid assessment will ultimately determine whether responsible agencies or organizations should attempt spread prevention (containment), eradication, control, or no action.

**5.** ***Planning*** - Once a rapid response action has been determined, planning is needed to address roles and responsibilities, coordination, internal and external communications, marshalling resources, spread prevention, decision-making, and implementation. In most instances, a written response plan should be prepared. Such plans can include information from management plans, recommended practices, site conservation plans, and standards and guidelines. See Section V. Related References for examples.

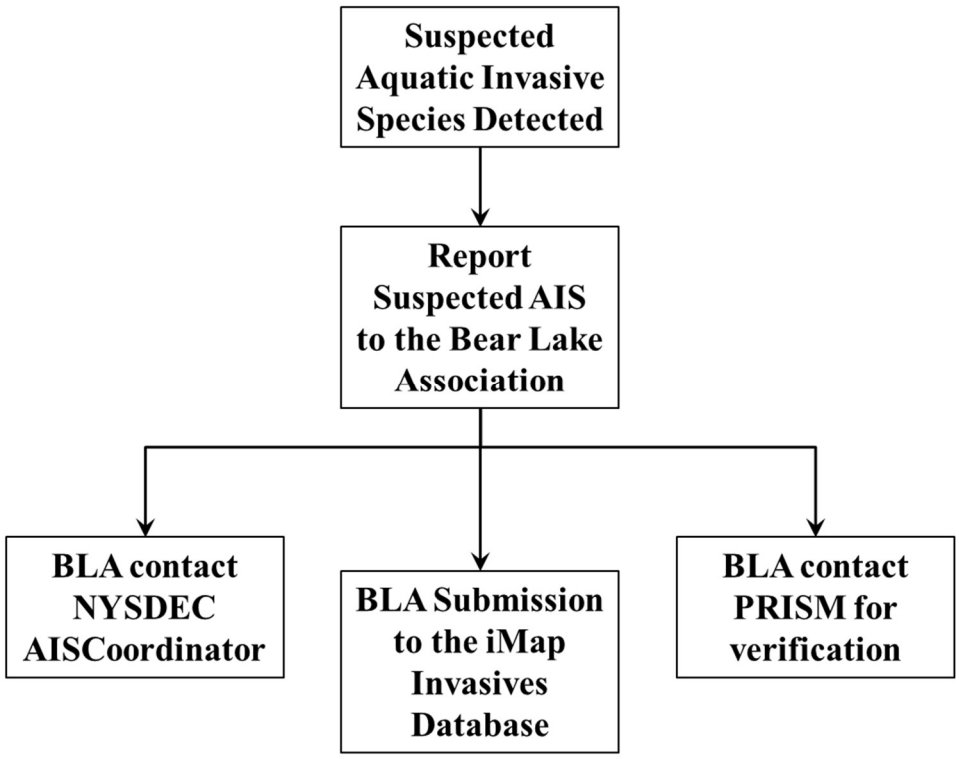
**6.** ***Rapid Response*** - Rapid response is an action or series of actions taken to quickly contain, and if possible, eradicate newly discovered invaders. Actions taken will depend on the scale of the infestation and the priority level of the species. For large-scale detections, eradication may not be possible, so control, containment, and management are the only options.

**7.** ***Monitoring & Evaluation*** - A rapid response is not complete after a management action has been taken. Monitoring after a response is important to determine if management actions were effective. At a minimum, monitoring efforts should focus on treated areas, but should also include adjacent high-risk areas when possible. Monitoring results can indicate the need for repeated or additional response actions. Finally, feedback on the efficacy of response actions and the effectiveness of the Rapid Response Plan will enhance long-term preparedness for response to other invasive species introductions.

**8.** ***Restoration*** - Once a response effort is complete, it may be necessary to restore disturbed areas to their natural ecological function, as determined by the resource manager. Restoration efforts would typically utilize native species whenever possible to help restore ecosystem resiliency and guard against future re-infestations. See Appendix E for Site Restoration Guidance.

The Bear Lake Rapid Response Management Plan outlines the rapid response process for new aquatic invasive animal, plants and pathogens within Bear Lake. These action steps are discussed in detail in Section 3.

2.1. Figure 2. Initial Report Flow-Chart



## 3. ACTION STEPS

### Action 1: EARLY DETECTION & REPORTING - WNY Early Detection Reporting Protocol

1. Infestation Discovered by Observer
    1. Observer should employ due diligence in attempt to positively identify the species
        1. Check www.wnyprism.org for more information and resources for identification
2. Document Infestation
    1. Please obtain the following:
        1. Size – record the number of individuals, acreage, linear feet, percent cover
        2. Location – GPS points, property address and/or location, property owner, location of species within property
        3. Photos – clear photos showing identifying characteristics, entire organism, infestation, and location
        4. Contact information for observer
3. Contact The Bear Lake Association to Report Suspected AIS
    1. Contact President of Lake Association, currently Sidney Potmesil, with documented information at 716-230-0004, spotmesil@aol.com.
    2. Provide the Size, Location, Photos, and Observer information to Reporter at the Lake Association

### Action 2: VERIFICATION

***Who***

The Bear Lake Association (reporter) is the organization that receives and accepts responsibility for handling the initial report, and then coordinates the reporting of AIS information where the initial sighting occurs to the NYSDEC state and local PRISM coordinator should be contacted to aid in this process, see Appendix C PRISM Fact Sheet and Priority Contact Tables.

***Why***

The objectives are to confirm the accuracy of the report, determine the condition (age, reproductive status, vigor, etc.) of the sample, and ensure the consistent and timely handling of reports.

***How***

Interview the reporter(s) to validate detection.

1. Collect contact information from the Observer(s).
2. The reporter should secure a representative sample and/or take digital photographs, if possible (both are preferred). Arrange to have samples and/or photographs sent express mail service to the most accessible recognized expert.

**Action 3: NOTIFICATION**

***Who***

The Bear Lake Association accepts the responsibility to verify and confirm the accuracy of the initial report.

***Why***

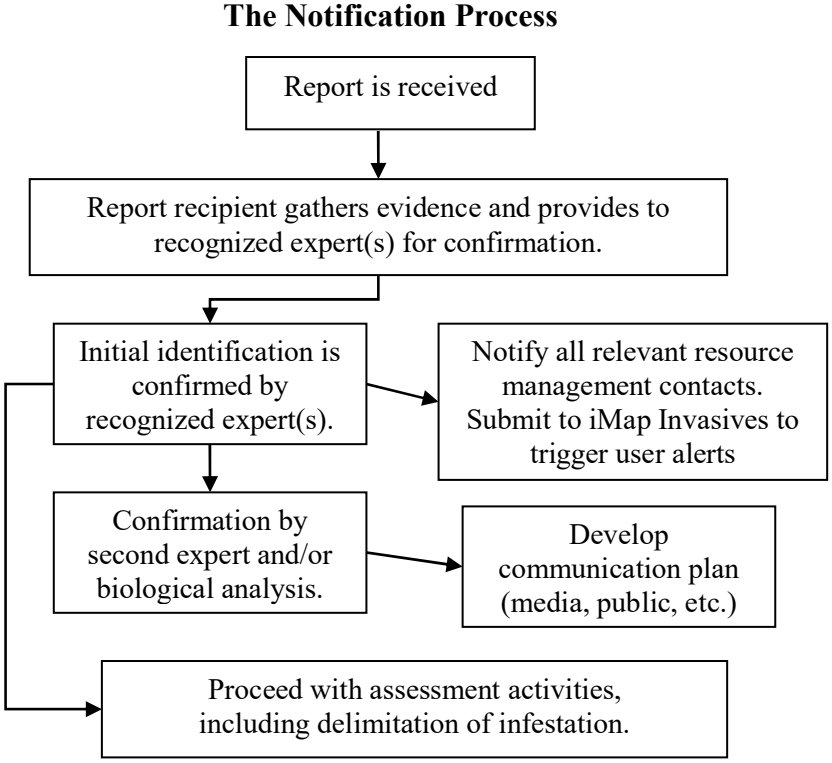
The objectives are to ensure that all parties that may affect a response decision are quickly engaged and to rapidly inform all other interested parties.

***How***

1. Within the first 24 hours, or as soon as practical after the Bear Lake Association confirms a physical sample to be an invasive species, notify all relevant natural resource managers in Table 1 below. Primary contacts are the regional PRISM coordinator, the NYSDEC Invasives Species Section, and a submission to the iMapInvasives Database. Note that for many organizations, only key contacts will be notified. Those primary contacts will then be responsible for further internal notification within their organization (i.e., a primary contact for a state agency would be responsible for contacting other key officials within their state agency).
2. Report AIS to NYSDEC
3. Report and photo can be sent via email to DEC Aquatic Invasive Species Coordinator, Catherine McGlynn, (518) 408-0436 catherine.mcglynn@dec.ny.gov
4. Log Infestation into iMapInvasives – www.nyimapinvasives.org
    1. iMapInvasives triggers alerts to experts, who are able to confirm identification
    2. This information can be entered into iMap Invasives online or via the smartphone app (select "Report an Invasives" at www.nyimapinvasives.org)
    3. By entering into iMap, two levels of alerts are triggered; unconfirmed reports are emailed to state experts for verification, and after confirmation, all other user email alerts are sent
5. Confirmation of Identification
    1. Submit all documentation to WNY PRISM for confirmation
        1. Andrea Locke, WNY PRISM Coordinator, lockeas@buffalostate.edu
        2. Subject Line: "Early Detection Report"
        3. Depending on the species, WNY PRISM may confirm the identification or forward the observation and documentation to Partners for expert identification
6. Secure verification of notifications to confirm that all relevant contacts did, in fact, receive notification (e.g., Internet list server response confirmation requirement, phone list call-backs, etc.).
7. While proceeding with subsequent response activities described below, obtain a definitive confirmation of the invasive species via a second expert(s) and/or a biological analysis. Note

that the general public/media notification (Table 2 below) should not occur until after the second confirmation is achieved.

Figure 3. The Notification Process Flow Chart




The following tables are not comprehensive but provide an initial set of contacts. They presume the identified individuals will directly make further contacts within their organizations.

*****Contact only necessary agencies and organizations*****

| **Table 1.** | **Priority 1 Contacts** |
|---|---|
| | (Notify within 24 hours of **initial report** or as soon as practical) |

**Submit to iMap Invasion Databse**

**State Agencies**

NYS Department of Environmental Conservation

Invasive Species Coordination Section- Central Office (518) 402-9405

Aquatic Invasive Species Coordinator, Catherine McGlynn, (518) 408-0436 catherine.mcglynn@dec.ny.gov

**Others**

Partnerships for Regional Invasive Species Management (PRISM) (716) 878-4708 lockeas@buffalostate.edu

Any agencies and partners deemed appropriate from Table 2.

| **Table 2 .** | **Priority 2 Contacts** |
|---|---|
| | (Notify within 24 hours of **initial report** or as soon as practical) |

**Federal Agencies**

US Department of Agriculture (USDA)

APHIS

Natural Resource Conservation Service

US Environmental Protection Agency (USEPA)

US Fish and Wildlife Service (USFWS)

US Geological Survey (USGS)

**Local Government**

Chautauqua County Soil and Water Conservation District (SWCD) David Spann dspann@soilwater.org

Town Supervisor

Mayor

Other key elected officials

**Non-Government Organizations (NGOs)**

Audubon NY

Chautauqua Watershed Conservancy

Local Lake Associations

NYS Federations of Lake Associations

State University of New York at Fredonia - Dr. Courtney Wigdahl-Perry wigdahl@fredonia.edu

Other key constituents

**Action 5: RAPID ASSESSMENT**

**Step I – Defining Roles and Responsibilities**

***Who***
The Bear Lake Association

***Why***
The objective is to activate a predetermined response management system that expedites decision-making, information sharing, avoids duplication, and minimizes authority conflicts, while preserving flexibility for adaptive management.

***How***

1. The Bear Lake Association conducts a meeting of all relevant managers and selects a Management Team and Lead Coordinator. At a minimum, this meeting should involve all organizations that have jurisdiction within the infestation area. The lead agency or organization is the one willing and able to take on the role (staff capacity, authority, funds, etc.) and is not necessarily the NYSDEC. The Management Team will assess the risk and analyze all potential management options. The Lead Coordinator will coordinate all management activities. Note that the Lead Coordinator will not be the primary decision-maker or have veto power regarding response strategies; he or she simply will serve as a primary point-of-contact for resolving coordination and logistical problems. Response actions within the boundary of lands, waters, or structures owned/administered by a particular individual, organization, or jurisdiction will be overseen by that owner/administrator unless they concede responsibility to another entity.

    1. The Management Team will:
        1. Identify threat(s) to the State's economic, ecological, and recreational resources. Suggested tools are the PRISM Ranking Form or the statewide assessment tool.
        2. Determine the extent of the infestation and pathways for potential spread.
        3. Identify constraints and limitations, including jurisdictional issues, legislative authority, funding, permitting, personnel training, access to private lands, gaps in knowledge, and ecological uncertainties
        4. Determine if eradication/control/containment is possible and select the appropriate method(s) to be employed.
    2. The Lead Coordinator will:
        1. Coordinate interagency "response team" notification operations.
        2. Facilitate creation of a response management system involving lead representatives of each local, tribal, state, provincial, and/or federal government that has legal authority over the response.
        3. Represent (i.e., be the spokesperson for) the Management Team.
        4. Facilitate a collaborative decision-making process that considers cascading levels of authority within individual agencies.

5. Facilitate development of response priorities.

3. The above actions should take into account the roles, relationships, and inter-agency agreements among:

    1. Local governments
    2. Other interested parties, such as NGOs, universities, nurseries, marinas, etc.
    3. NYSDEC and PRISM

4. The local response team should draw upon technical experts from outside the region to help advise response operations when appropriate.

**Step II – Delimiting Invasion**

***Who***

The Bear Lake Association, in partnership with federal, state and local governments as well as non-government organizations. Lead agency may depend on scale, location, and priority level of invasive species.

***Why***

The objective is to rapidly provide information to guide subsequent management decisions, including survey design.

***How***

1. Determine the geographic extent of the infestation. The Incident Command System (ICS) may be used depending on the size of the area to be surveyed and the resources needed. ICS is a standardized organizational and operational structure for managing emergency responses, and integrating and coordinating multiple organizations and agencies. See Section V. Related References and Appendix D ICS Flow Chart. Survey efforts should follow existing regional or national protocols such as Early Detection of Invasive Plants-Principals and Practices developed by the U.S. Geological Survey.
2. Determine demography of infestation (e.g., age structure). As mentioned in Step 1 above, these efforts should follow existing regional or national protocols; several of which are included in Related References, Section V. Where possible, surveys should assess maturity and reproduction condition of the infested site(s).
3. Identify and survey nearby facilities, habitats or resources (e.g., campgrounds, wetlands, beaches, etc.) that are especially vulnerable to invasion.

4. Identify any nearby facilities, habitats or resources (e.g., nearest known population, ports, terminals, boat launches, railheads, vendors, etc.) that could serve as a source or pathway of invasion.
5. Ensure that field surveys are completed and the results are reported to the Management Team using agreed upon methods. iMap Invasives can be used to report and share results of surveys.
6. Compile existing information on species through literature searches and correspondence with experts.
7. Incorporate the risk to the environment, human health, economy, etc.
8. Determine if financial resources are available for response activities.

**Step III - Planning Internal and External Communications**

***Who***

Lead Coordinator

***Why***

The objective is to develop a joint information center to ensure consistent and effective communication to resource managers and interested external stakeholders, including the media and public.

***How***

1. Notify and educate the affected landowners, and where appropriate, secure written permission to gain access to their properties for response activities.
2. Notify and educate potentially affected landowners and other users.

Develop a response management system as needed. The Incident Command System (ICS) may be used depending on the size and type of response needed (Appendix D FEMA Incident Command System).

3. Develop a public information strategy (consider a formal, written plan) including: press releases, information packets, and public meetings. Provide information to affected public as early as possible. Ideally, public outreach should begin before response decisions are made.

   Key messages should include:

   1. being a “host community” to an invasion is a burden
   2. the risks from the invasion
   3. the available response options
   4. the considerations to be used in decision-making and the process forward

5. The public information/participation strategy should:

1. Identify who the various interests are that may be affected based on the early identification of issues. Examples include: - Individuals or groups known to be affected; - People who may be affected and people who think they may be affected; and - People whose support is needed.
2. Establish and maintain two-way communication between management team and identified interests. State how staff will maintain on-going communication with identified interests using frequent telephone calls, email, work sessions and one-on-one meetings.
3. Draft press releases to announce significant events and progress.
4. Conduct a public scoping session/informational meeting to present the problem and identify issues.
5. Summarize information and comments gathered at public scoping and other meetings and write responses to the comments.
6. Develop and implement general public education and outreach. In situations where a variety of educational materials exist, ensure coordination and agreement on which materials will be used.

**Step IV - Marshalling Resources**

***Who***

Lead Coordinator in partnership with all other involved organizations.

***Why***

The objective is to provide sufficient resources (personnel, equipment, materials, contractors, funding) to initiate control actions and associated activities, including acquisition of required permits.

***How***

1. Develop estimates for staffing needs, facilities and equipment, and funding.
2. Identify potential sources for staffing, facilities, equipment, and funds.
3. Secure commitments for needed staff, facilities and equipment, and funds.
4. Ensure mechanism for dispersal of funds is in place, and when funds are needed, the flow of dollars occurs expeditiously.

**Step V – Preventing Spread**

***Who***

Lead Coordinator and Management Team.

***Why***

The objective is to minimize all vectors that might further spread the original infestation.

***How***

1. Identify dispersal vectors (including movement by humans, fish and wildlife, water traffic, water flow, and other physical processes) and pathways and evaluate associated risks.
2. Restrict dispersal pathways where feasible, including:
    1. Quarantine infested areas as needed to prevent spread (see Section V. Related References).
    2. Assess the likely movement of infested vehicles, equipment, and materials to identify risk and inspection needs at other vulnerable areas.
    3. Establish wash and inspection requirements on vehicles and equipment, if needed.
    4. Ensure that invasive species "alert" signs are adequately deployed.
    5. Begin outreach to alert the public of the risks of spreading the new infestation.
    6. Develop and implement Hazard Analysis and Critical Control Point (HACCP) plans to ensure that response personnel do not further spread the original infestation (Appendix F – Hazard Analysis and Critical Control Point Plans Resource). Work with Joint Information Center (see RAPID ASSESSMENT Step III – Planning Internal and External Communications) to design and implement educational outreach programs using print, electronic media and other avenues.
    7. Install physical barriers, if needed.

**PLANNING**

**Step I – Exploring Alternatives**

***Who***

Lead Coordinator and Management Team.

***Why***

The objective is to evaluate all the available information and then decide which response action (eradication or containment/mitigation) and which management action (hand-pulling, dredging, herbicide, etc.) is appropriate.

***How***

1. Decide if eradication is possible based on rapid analysis of specific nature of invasion, including population dynamics and pathways of spread (i.e. Invasive Plant Management Decision Analysis Tool (IPMDAT), a decision-making protocol (iMapInvasives). Consider the following:

1. Risk to environment, human health, economy, etc.
2. Anticipated cost of eradication effort and subsequent monitoring (relative to available funding).
3. Available resources (personnel, equipment, etc.).
4. Regional and local distribution – single vs. multiple, continuous vs. patchy, isolated vs. widespread.
5. Landscape context – upstream vs. downstream, edge vs. interior, etc.
6. Age of infestation.
7. Neighbors' actions/inaction.
8. Other available management or response plans.
9. Pathways/source – identified, controlled, eliminated, etc.
10. Species track record of eradication/control.
11. Survey and assessment confidence.
12. Habitat type(s).
13. Life stage(s) present.
14. Time of year in relation to reproduction, migration, etc.
15. Land ownership – public vs. private, willing landowner vs. unwilling landowner.
16. Amount of water in the system to be treated. 1) Potential for drawn down or flows reduced before treatment. 2) Flow sources, including springs, and the potential to regulate that flow
17. Land use patterns.
18. Presence of state or federally listed rare, threatened or endangered species.
19. Presence of critical or significant habitats. t. Special status, including:
    1. Water use designation (e.g., Primary & Principal Aquifers)
    2. Wild, Scenic or Recreational River designation
    3. Forest Preserve lands
    4. Wilderness
    5. Historic sites
    6. Cultural resources (State Historic Preservation Office)

2. Consider potential management actions for Aquatic Systems

    1. Physical/Mechanical Activities
        1. Hand-pulling
        2. Suction Harvesting
        3. Trapping/Netting/Capturing
        4. Mechanical Harvesting (cutting/mowing)
        5. Benthic Barriers (matting)
        6. Hydroraking/Rotovating
        7. Dredging
        8. Draining/Drawdown

9. Surface Covers Physical Barriers (creation & removal)

2. Biological Activities (Biocontrols)
    1. Insects
    2. Mammals
    3. Fish
    4. Micro-organisms
3. Chemical Activities
    1. Herbicides: Contact, Systemic, Shading – chemical dyes
    2. Pesticides
4. Regulatory Activities
    1. Statute
    2. Regulation
    3. Policy
    4. Quarantine
5. Assess potential impacts of management actions. Consider the following:
    1. Air Quality
    2. Soils
    3. Cultural Resources
    4. Water Resources
    5. Fish and Wildlife including threatened, endangered and sensitive species
    6. Human Health
    7. Social Environment
    8. Vegetation diversity including threatened, endangered and sensitive plant species
    9. Economic Conditions
    10. Visual Resources and Recreation
    11. Effectiveness of various treatment methods.

**Step II – Develop a Plan**

***Who***

Lead Coordinator and Management Team.

***Why***

The objective is to make a decision on which response action (eradication or containment/mitigation) and which management action (hand-pulling, dredging, herbicide, etc.) to undertake. A plan needs to be ready to implement when resources are ready.

***How***

1. Identify decision-makers and employ decision-making protocols (e.g. Invasive Plant Management Decision Analysis Tool [IPMDAT], see Section V. Related References). Propose a single course of action or offer alternatives to decision-makers.

2. Develop a response plan. The response plan ensures that everyone is working in concert toward agreed upon goals. The plan should provide a coherent means of communicating the overall response objectives in the context of both operational and support activities. At the simplest level, the plan must have the following four elements:

    1. What do we want to do?
    2. Who is responsible for doing it?
    3. How will funds be spent and resources allocated?
    4. How do we communicate with each other?

**Step III – Securing Permits**

***Who***

Lead Coordinator and Management Team.

***Why***

The objective is to satisfy all statutory and regulatory requirements, including permits, licenses, certifications, etc.

***How***

1. Consider Commissioner Emergency Authorization (ECL §70-0116 of Uniform Procedures Act). A formal determination of emergency can facilitate numerous aspects of regulatory processes by waiving the procedural requirements in order to immediately respond to an emergency (see Section V. Related References).

2. Identify all State/Federal statutory and regulatory requirements, including any applicable emergency provisions. A partial list of State/Federal permits and regulatory reviews that may apply include:

    1. Rivers and Harbors Act Section 10 permit from the US Army Corp. of Engineers for any work in, over, or under navigable waters of the United States.
    2. Clean Water Act Section 404 permit from the US Army Corps of engineers for the discharge of dredged or fill material into waters of the United States.
    3. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 18 authorizes the Environmental Protection Agency (EPA) to allow states to use a pesticide for an unregistered use in the Untied States for a limited time if EPA determines that

emergency conditions exist. The uses are requested for a limited period of time (no longer than 1 year), to address the emergency situation only. If the need is immediate, a state agency may issue a crisis exemption that allows the unregistered use for 15 days. Under FIFRA, registrations and product labeling may restrict uses of pesticides. Each registration specifies the plants/sites on which it may be applied. Restricted-use pesticides are limited to use by pesticide applicators who are certified, or to people under supervision of a certified applicator.

4. Endangered Species Act Section 7 and consultations with the National Marine Fisheries Service (NMFS) for marine and anadromous species, or the U.S. Fish and Wildlife Service (FWS) for fresh-water and wildlife, for any "action" that may affect listed species or their designated habitat in the United States.
5. NYS Environmental Conservation Law (ECL) Article 15, Title 3, Aquatic Pesticide permit from DEC for the use of a pesticide to control an aquatic pest in New York State.
6. NYS Environmental Conservation Law (ECL) Article 15, Title 5, Protection of Waters permit from DEC for the disturbance of the bed or banks of a protected stream or other watercourse; the construction, reconstruction or repair of dams or other impoundment structures; the construction, reconstruction or expansion of docking and mooring facilities; the excavation or placement of fill in navigable waters and their adjacent contiguous wetlands; and water quality certification for placing fill or undertaking activities resulting in a discharge to waters of the United States.
7. NYS Environmental Conservation Law (ECL) Article 24 Freshwater Wetlands permit from DEC for any action in or within 100 feet of a mapped wetland in New York State.
8. NYS Environmental Conservation Law (ECL) Article 11 Liberation of Fish and Wildlife permit from DEC for the release of fish, wildlife, insects and other invertebrates in New York State.
9. NYS Environmental Conservation Law (ECL) Article 8 State Environmental Quality Review (SEQR) environmental impact assessment for projects or actions proposed by a state agency or unit of local government, and all discretionary approvals (permits) from NYS agency or unit of local government, in New York State. Emergency permits are a Type II action so are effectively exempt.
10. NYS Environmental Conservation Law (ECL) Article 19 Restricted Burning permit from DEC for burning of land clearing and/or demolition materials consisting of wood, trees, tree trimmings, leaves, or brush, generated by land clearing or demolition for the erection of any structure in New York State.
11. The Council on Environmental Quality (CEQ) pursuant to the National Environmental Policy Act (NEPA) Title 1 Section 102 requires federally funded projects to prepare detailed environmental assessments to evaluate impacts.

3. Identify all local regulatory requirements, including any applicable emergency provisions.

4. Identify any cooperative agreements with other agencies/organizations (e.g., MOUs, MOAs, AANRs, etc.).

5. Assign lead person from each regulatory agency to facilitate permit processing in a timely manner within their respective agency.

6. Consult with DEC to determine if an environmental assessment or environmental impact statement is required.

7. Determine timeframe necessary for meeting all regulatory requirements, noting that adjusting or adapting eradication or control methods may result in the need for new or amended permits.

## RAPID RESPONSE

### *Who*

Lead Coordinator and Management Team.

### *Why*

The objective is to implement the response plan.

### *How*

1. Lead Coordinator facilitates implementation of the response plan developed by the Management Team.
2. Continue public outreach efforts. Make sure the public is well informed on response activities and progress by providing information updates as needed.
3. Ensure compliance with emergency rules and regulations, quarantines, or wash and inspection requirements. Identify loopholes and additional regulatory needs.
4. Agencies collaborate to coordinate and deploy field resources; implement ICS if needed (See Appendix D ICS Flow Chart).
5. Management Team monitors eradication/control progress and the impacts of selected methods on the environment and other organisms.
6. Establish a schedule for frequent Management Team meetings to resolve operational issues that cross jurisdictional interests.
7. Adjust eradication/control methods based on new information. Selected methods may be adjusted to improve effectiveness and/or to reduce or minimize impacts.
8. Document efforts in iMap Invasives Database throughout response process for future reporting and evaluation of success. It can also be used to share management steps and pre- and post-treatment assessments.

## MONITORING & EVALUATION

### *Who*

Lead Coordinator and Management Team.

### *Why*

The objective is to provide information and data on treatment success and ecosystem recovery.

### *How*

1. Design a monitoring program to evaluate the status of the invasive species population and to determine if restoration targets are achieved. Monitoring activities should be carried out in coordination with other program field operations.
2. Select ecological indicators and term for monitoring as needed to assess the status and trends in environmental conditions (see Appendix E Site Restoration Guidance). Potential ecological indicators may include:
    1. Streams
        1. The chemical characteristics of stream water that help determine how plants and animals can use water.
        2. The kind and number of living things, other than fish, in a stream.
        3. The kind, number, and edibility of fish present in the stream.
    2. Lake
        1. Turbidity (Secchi readings)
        2. Chlorophyll *a* levels/biomass
        3. The chemical characteristics of lake water that help determine how plants and animals can use water (CSLAP data).
        4. The kind, number, and edibility of fish present in the Lake.
3. Disseminate findings through an easily accessible database and list serve (e.g., iMap Invasives, PRISM network).
4. Conduct a follow-up evaluation of response organizations and other interest groups to identify opportunities for improving rapid response capacity. Disseminate “lessons learned” to other interested organizations.
5. Promptly analyze and revise the rapid response plan and associated documents/guidelines based on evaluation and long-term monitoring results, also known as “adaptive management”. More information can be found in the Adaptive Management Applications Guide developed by the Department of the Interior (see Section V. Related References).
6. Determine the need for long-term funding for the current management effort and seek funding as warranted.

## RESTORATION

### *Who*

Management Team/Lead Coordinator.

### *Why*

The objective is to restore disturbed areas back to their natural ecological function by encouraging the recovery of native species to prevent re-establishment of invasive species.

### *How*

1. Collaborate with partners to share existing restoration protocols, Best Management Practices (BMPs) and contract specifications relating to invasive species. Are natural recolonization/succession processes sufficient?
2. Develop a site restoration plan to restore damaged areas (e.g., roads, lawns, boat launches, staging areas, etc.) and ecosystem functions (see Appendix E Site Restoration Guidance).
3. Identify plant and animal species that should or should not be used within particular ecosystems.
4. Monitor restoration projects to track the control of invasive species and the reestablishment of native species. See Monitoring & Evaluation Step item (2).
5. Ensure that restoration projects “do not spread” or “do not establish” invasive species by using appropriate native species to the greatest extent possible.
6. Promote an ecosystem approach to restoration projects.

V. RELATED REFERENCES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# APPENDIX A
# Decision Matrix Figures/Diagrams

**Figure 1.**

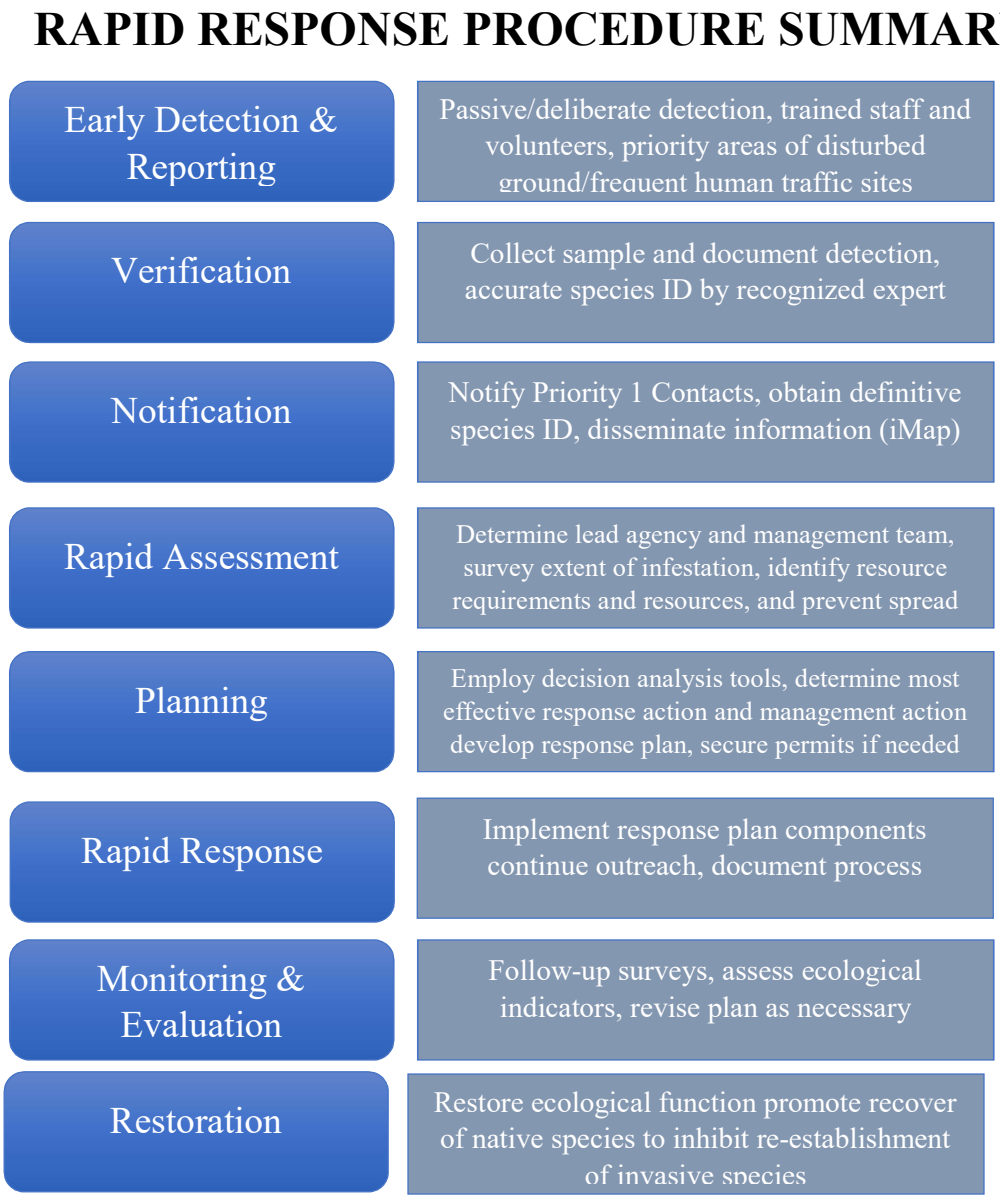

RAPID RESPONSE PROCEDURE SUMMARY
Early Detection & Reporting
Passive/deliberate detection, trained staff and volunteers, priority areas of disturbed ground/frequent human traffic sites
Verification
Collect sample and document detection, accurate species ID by recognized expert
Notification
Notify Priority 1 Contacts, obtain definitive species ID, disseminate information (iMap)
Rapid Assessment
Determine lead agency and management team, survey extent of infestation, identify resource requirements and resources, and prevent spread
Planning
Employ decision analysis tools, determine most effective response action and management action develop response plan, secure permits if needed
Rapid Response
Implement response plan components continue outreach, document process
Monitoring & Evaluation
Follow-up surveys, assess ecological indicators, revise plan as necessary
Restoration
Restore ecological function promote recover of native species to inhibit re-establishment of invasive species

**Figure 2. Initial Report Flow-Chart**

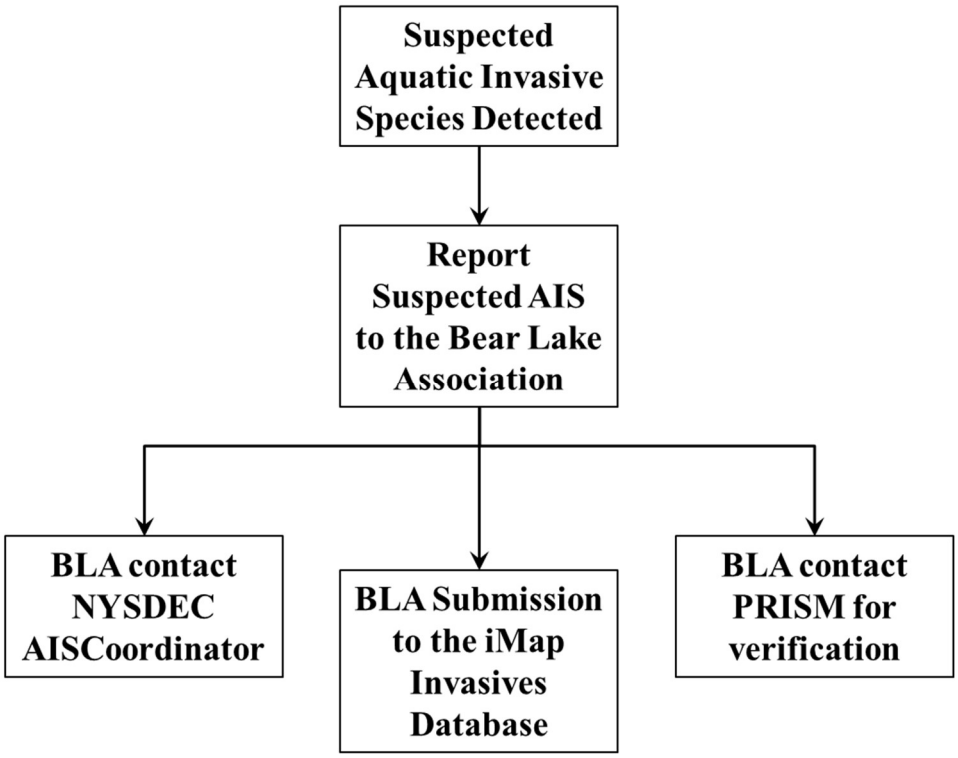
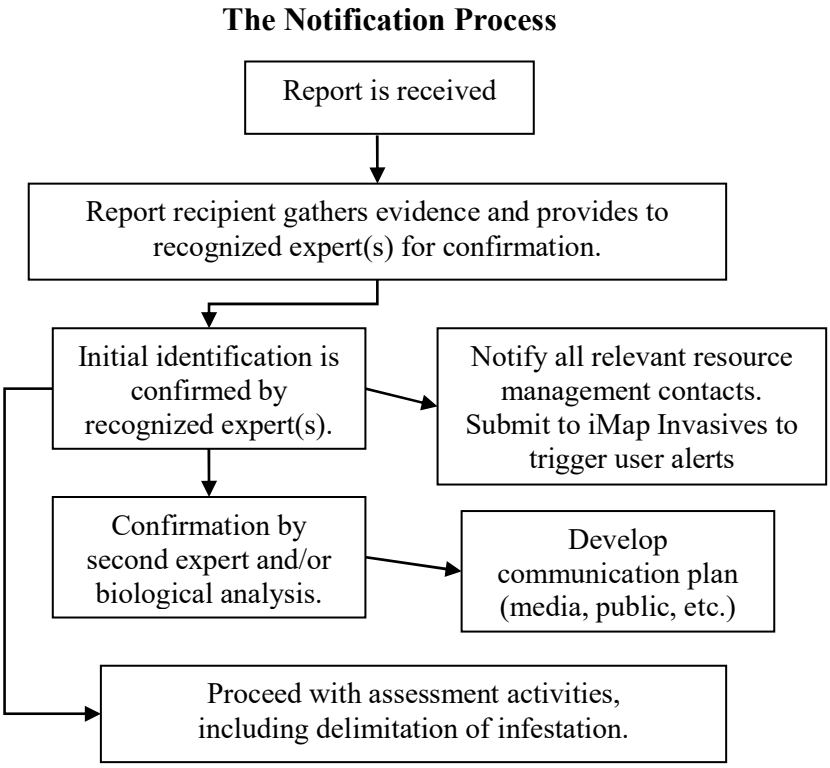


**Figure 3. Notification Process**



# APPENDIX B

# AIS Priority Contact Tables

## Table 1. Priority 1 Contacts

| **Table 1.** **Priority 1 Contacts**<br>(Notify within 24 hours of **initial report** or as soon as practical) |
|---|
| **Submit to iMap Invasion Databse** |
| **State Agencies** |
| NYS Department of Environmental Conservation |
| Invasive Species Coordination Section- Central Office (518) 402-9405 |
| Aquatic Invasive Species Coordinator, Catherine McGlynn, (518) 408-0436 catherine.mcglynn@dec.ny.gov |
| **Others** |
| Partnerships for Regional Invasive Species Management (PRISM) (716) 878-4708 lockeas@buffalostate.edu |
| Any agencies and partners deemed appropriate from Table 2. |

## Table 2. Priority 2 Contacts

| **Table 2 .** **Priority 2 Contacts**<br>(Notify within 24 hours of **initial report** or as soon as practical) |
|---|
| **Federal Agencies** |
| US Department of Agriculture (USDA) |
| APHIS |
| Natural Resource Conservation Service |
| US Environmental Protection Agency (USEPA) |
| US Fish and Wildlife Service (USFWS) |
| US Geological Survey (USGS) |
| **Local Government** |
| Chautauqua County Soil and Water Conservation District (SWCD) David Spann dspann@soilwater.org |
| Town Supervisor |
| Mayor |
| Other key elected officials |
| **Non-Government Organizations (NGOs)** |
| Audubon NY |
| Chautauqua Watershed Conservancy |
| Local Lake Associations |
| NYS Federations of Lake Associations |
| State University of New York at Fredonia - Dr. Courtney Wigdahl-Perry wigdahl@fredonia.edu |
| Other key constituents |

# Appendix C

# PRISMs Fact Sheets

STOP THE INVASION
PROTECT NEW YORK FROM INVASIVE SPECIES

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

PARTNERSHIPS FOR REGIONAL INVASIVE SPECIES MANAGEMENT

# New York State PRISMs

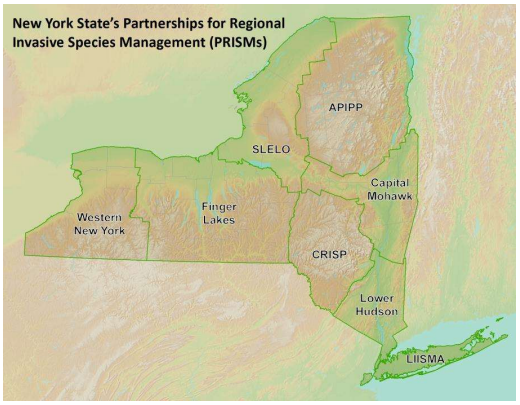
Invasive species are organisms that are not native to an area and harm human health, the economy, or the environment.

## What are PRISMs?

Partnerships for Regional Invasive Species Management (PRISMs), comprising diverse stakeholder groups, were created to address threats posed by invasive species across New York State. PRISMs are key to New York's integrated approach to invasive species management. Partners include federal and state agencies, resource managers, non-governmental organizations, industry, recreationists, and interested citizens. The New York State Department of Environmental Conservation provides financial support, via the Environmental Protection Fund, to the host organizations that coordinate each of the eight PRISMs, resulting in statewide coverage.

## What Do PRISMs Do?

- Plan regional invasive species management activities
- Implement invasive species prevention programs
- Conduct surveillance and mapping of invasive species infestations
- Detect new infestations early and respond rapidly
- Implement control projects
- Implement habitat restoration and monitoring
- Educate stakeholders on invasive species and their impacts
- Coordinate PRISM partners
- Recruit and train volunteers
- Support research through citizen science in collaboration with the Invasive Species Research Institute http://www.nyisri.org/
- Report observations to iMapInvasives http://www.nyimapinvasives.org/
- Act as regional communication hubs



If you are interested in helping NY “stop the invasion,” PRISMs are a great way to get involved by volunteering for monitoring, outreach, or management projects. All are welcome to participate in statewide PRISM monthly conference calls to receive updates, hear excellent presentations and learn about upcoming events. Contact a PRISM leader for more information, or visit WWW.NYIS.INFO

| For more information, or to sign-up for email updates from NYSDEC, visit our website: | **www.dec.ny.gov** | | |
|---|---|---|---|
| **Regional PRISM Contacts** | | | |
| **PRISM** | **Host** | **Contact** | **Listserve & Websites** |
| APIPP<br><br>Adirondack Park Invasive Plant Program | The Nature Conservancy | Brendan Quirion 518-576-2082 bquirion@tnc.org | • cce-apipp-l-request@cornell.edu • http://adkinvasives.com/ |
| Capital Mohawk | Cornell Cooperative Extension of Saratoga County | Laurel Gailor 518-885-8995 lrg6@cornell.edu | • cce-capitalprism-l-request@cornell.edu<br><br>• http://ccesaratoga.org/environment/partners hips-for-regional-invasive-species-management-prisms |
| CRISP<br><br>Catskill Regional Invasive Species Partnership | Catskill Center for Conservation and Development | John Thompson 845-586-2611 jthompson@catskillcenter.org | • cce-crisp-l-request@cornell.edu • http://catskillinvasives.com/ |
| Finger Lakes | Hobart and William Smith Colleges | Hilary Mosher 315-781-4385 mosher@hws.edu | • cce-flprism-l-request@cornell.edu • http://fingerlakesinvasives.org/ |

| | | | |
|---|---|---|---|
| LIISMA<br><br>Long Island Invasive Species Management Area | Long Island Native Plant Initiative | Vacant 631-560-9945<br>liismaprism@gmail.com | • cce-liisma-l-request@cornell.edu • http://www.liisma.org/ |
| Lower Hudson | New York - New Jersey Trail Conference | Linda Rohleder 201-512-9348<br>lrohleder@nynjtc.org | • cce-hudsonprism-l-request@cornell.edu • http://lhprism.org/ |
| SLELO<br><br>Saint Lawrence and Eastern Lake Ontario | The Nature Conservancy | Rob Williams 315-387-3600<br>rwilliams@tnc.org | • cce-slelo-l-request@cornell.edu • http://www.sleloinvasives.org/ |
| Western New York | Buffalo State | Andrea Locke 716-878-4708<br>lockeas@buffalostate.edu | • cce-westernprism-l-request@cornell.edu • http://www.wnyprism.org/ |

## How Do I Join a PRISM?

For more information on PRISM meetings and activities and how you can become involved, visit the website of the PRISM in which you are interested, or contact the coordinator listed above for the PRISM.

To improve communication within and among PRISMs, e-mail listserves, managed by the Cornell Cooperative Extension Invasive Species Program, have been established for each of the eight PRISMs. To subscribe to a PRISM listserve, e-mail the appropriate listserve address in the table above. In the subject line, type the single word “join” (without the quotes). Leave the body of the message blank; do not include a signature block or any other text in the body of the e-mail.




## Bureau of Invasive Species and Ecosystem Health

Division of Lands and Forests

**Western New York PRISM (Partnering to Protect Western New York from Invasive Species) Priority Invasives List**

## Terrestrial Priorities

1. *Adelges tsugae* Hemlock Woolly Adelgid
2. *Agrilus planipennis* Emerald Ash Borer
3. *Cirsium arvense* Canada Thistle
4. *Cynanchum louiseae* Black Swallow-wort
5. *Cynanchum rossicum* Pale Swallow-wort
6. *Lonicera spp.* Bush Honeysuckles
7. *Phalaris arundinacea* Reed Canary Grass
8. *Phragmites australis* Phragmites, Common Reed
9. *Reynoutria spp.* Knotweeds
10. *Rhamnus cathartica* Common Buckthorn

## Aquatic Priorities

1. *Corbicula fluminea* Asian Clam
2. *Hemimysis anomala* Bloody Red Shrimp
3. *Hydrilla verticillata* Hydrilla
4. *Hydrocharis morus-ranae* European Frog-bit
5. *Orconectes rusticus* Rusty Crayfish
6. *Scardinius erythrophthalmus* Rudd
7. *Trapa natans* Water Chestnut

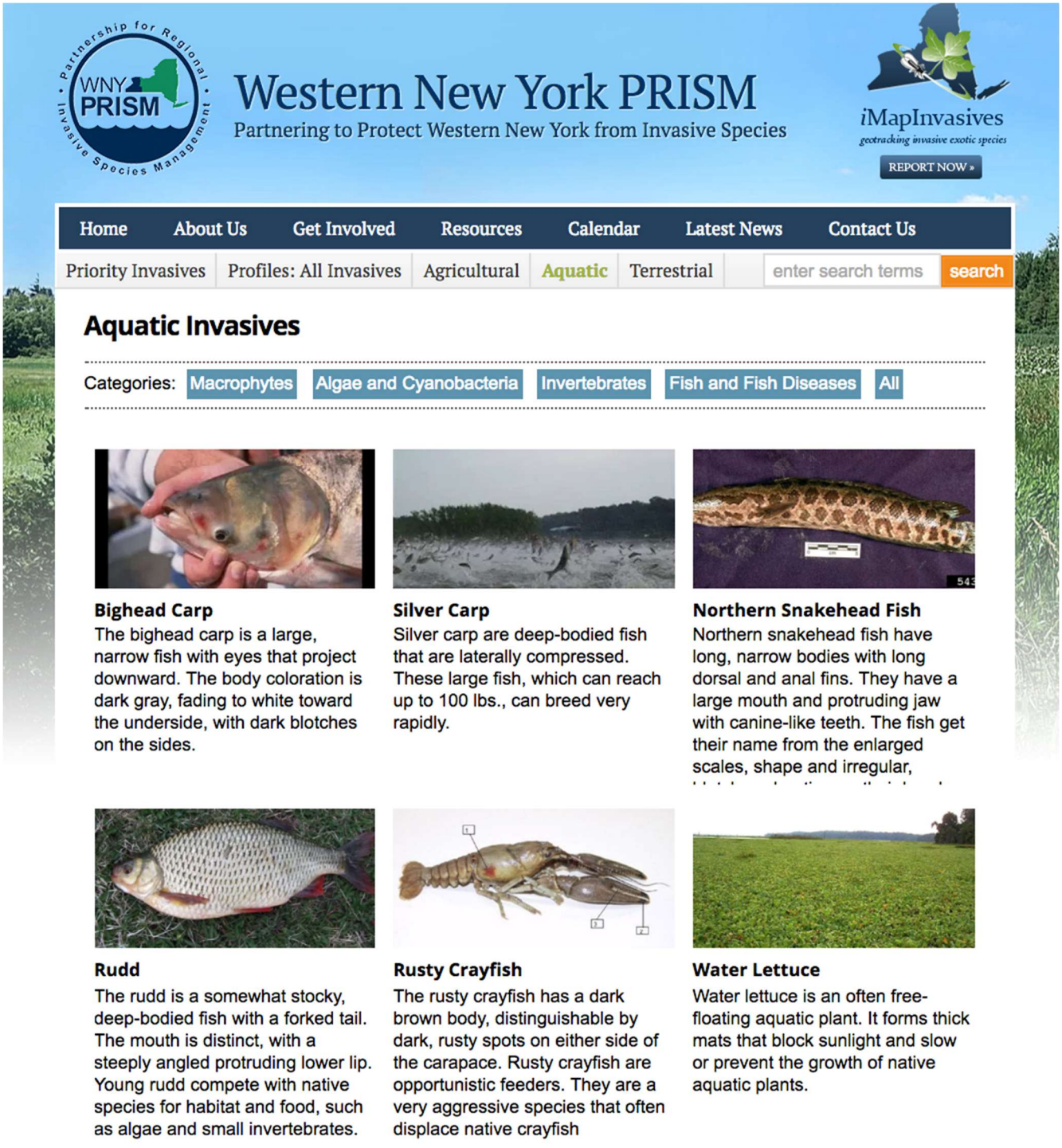
## Early Detection Priorities

1. Anoplophora glabripennis Asian Longhorned Beetle
2. Brachypodium sylvaticum Slender False Brome
3. Channa argus Northern Snakehead
4. Eichhornia crassipes Water Hyacinth
5. Hypophthalmichthys molitrix Silver Carp
6. Hypophthalmichthys nobilis Bighead Carp
7. Microstegium vimineum Japanese Stiltgrass
8. Persicaria perfoliata Mile-a-Minute Vine
9. Pistia stratiotes Water Lettuce

WNY PRISM developed our regional priorities through our Terrestrial Working Group and Aquatic Working Group. These Working Groups are continuing with the development of early detection/rapid response protocols and identifying needs within WNY. Working Groups communicate through in-person meetings and email. If you are interested in being part of our

Working Groups, please contact Andrea Locke, WNY PRISM Coordinator (lockeas@buffalostate.edu).

**WNYPRISM Aquatic Invasive Species Guide**



**Water Hyacinth**

Water hyacinth is a free-floating, perennial, aquatic plant. In climates where it is unable to survive the winter, water hyacinth will grow as an annual. Its leaves are round, curved, glossy bright green and float above the water's

**Bloody Red Shrimp**

The bloody red shrimp are translucent ivory-yellow in color, and exhibit bright red to reddish-orange coloring around the head and tail. The threat to the Great Lakes is currently not well understood.

**Flowering Rush**

Flowering rush is a perennial, herbaceous, aquatic plant that grows 1-4 ft. tall, on an erect stem. The narrow, pointed leaves are triangular in cross section and have smooth edges and parallel veins.

**Starry Stonewort**

Starry stonewort looks like a rooted plant, but is actually an algae related to the native Chara. It can form dense mats on the lake bottom, and has long, uneven-length, gelatinous branches that look angular at each joint. It may

**Alewife**

Alewife is a species of ocean herring with a bluish-grey to olive back with silvery sides. The body is wide, narrows at the belly, and averages 6" in length. They have large eyes, a prominent black spot near the gill cover, and a forked fin.

**Round Goby**

The round goby is a small, soft-bodied fish with a distinctive black spot on its first dorsal fin. It has large, protruding eyes and its body ranges from 4-10" in length. While juveniles are grey, adult round gobies have grey, black, brown

**Yellow Floating Heart**

Yellow floating heart is an herbaceous perennial that has stout, branching stems. The heart-shaped, almost circular, leaves are usually oppositely arranged and frequently purplish underneath. Bright yellow flowers have 5 petals

**Variable-leaf Watermilfoil**

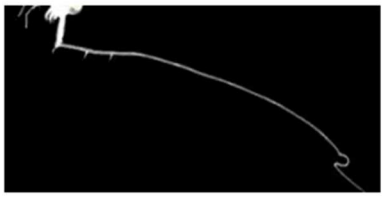
Variable-leaf watermilfoil is a submerged perennial that looks like many native plants, including native watermilfoil species. It has 4-6 feathery leaves whorled around the stem, but some leaves can be alternate. Its leaves are

**Quagga Mussel**

The quagga mussel is a filter-feeding, freshwater, bivalve mollusk. It is pale toward the end of its hinge and about 3/4" wide.

**Asian Clam**

Asian clam is a freshwater bivalve mollusk. The outside shells are yellow-green to brown with elevated concentric rings. If the color chips away, white spots can be seen underneath. The inside of the shells may be light purple.



**Fishhook Waterflea**

Fishhook waterfleas are tiny crustaceans less than 1/2″ long with long, sharp, barbed tails. The fishhook waterfleas have a slender spine and prominent S-shaped loop on the tail. Fishhook waterfleas collect in gelatinous

**Spiny Waterflea**

Spiny waterfleas are tiny crustaceans less than 1/2″ long with long, sharp, barbed tails. Spiny waterfleas collect in gelatinous globs on fishing equipment and lines.

**European Frog-bit**

European frog-bit is a free-floating, short-lived perennial. The leaves are leathery and round with undersides that may be dark purple. Flowers are white with yellow centers, and bloom in the summer.

**Water Chestnut**

Water chestnut is a fast-growing, floating annual that can grow to 16 ft. The most distinctive trait of this plant is its thorny nutlets.

**Brittle Naiad**

Brittle naiad is an herbaceous annual that grows in dense clusters. Its leaves have visible serrations and are long, pointed and oppositely arranged on highly branched stems. The plant can reproduce from stem fragments, or

**Brazilian Elodea – NOT YET IN REGION**

Brazilian elodea is a submerged perennial that looks similar to american waterweed (*Elodea canadensis*), a common native aquatic plant. Brazilian elodea has finely-toothed leaves that are bright

**Hydrilla**

Hydrilla is a submerged perennial that looks similar to american waterweed (*Elodea canadensis*), a common native aquatic plant.

**Fanwort**

Fanwort is a submerged perennial with fan-like leaves that are branched and attached to the stem on petioles, appearing whorled. It has small, white flowers that emerge in late summer. Reproduction can occur by seed or

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**Eurasian Watermilfoil**

Eurasian watermilfoil is a submerged perennial that looks like many native aquatic plants, including native milfoil species.

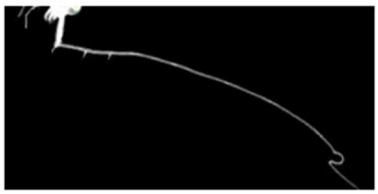
**Zebra Mussel**

Zebra mussels are filter-feeding, freshwater, bivalve mollusks. Zebra mussels are small, ¼" to 1 ½" long, and D-shaped with light and dark brown stripes.

**Curly-leaf Pondweed**

Curly-leaf pondweed is a submerged perennial that resembles many native pondweeds. Care must be taken to correctly identify this species. Rigid, reddish-green, oblong leaves have distinct, finely-toothed,

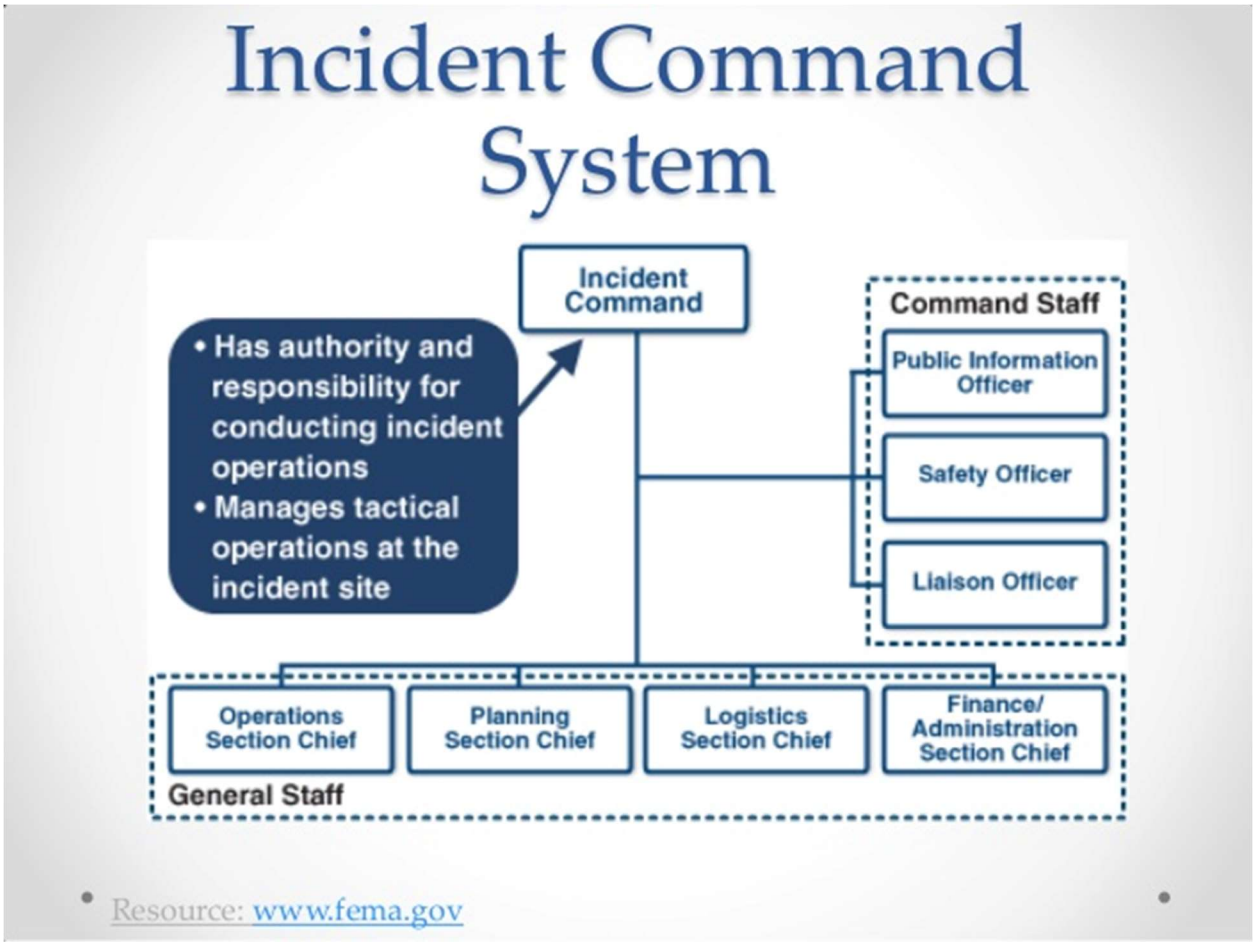
**Asian Clam**
Asian clam is a freshwater bivalve mollusk. The outside shells are yellow-green to brown with elevated concentric rings. If the color chips away, white spots can be seen underneath. The inside of the shells may be light purple.



**Fishhook Waterflea**
Fishhook waterfleas are tiny crustaceans less than 1/2″ long with long, sharp, barbed tails. The fishhook waterfleas have a slender spine and prominent S-shaped loop on the tail. Fishhook waterfleas collect in gelatinous

**Spiny Waterflea**
Spiny waterfleas are tiny crustaceans less than 1/2″ long with long, sharp, barbed tails. Spiny waterfleas collect in gelatinous globs on fishing equipment and lines.

# Appendix D FEMA Incident Command System



# Appendix E

# Site Restoration Guidance

# RESTORATION

Preventing the introduction or spread of an invasive species is the most cost effective and environmentally responsible means by which to limit negative impacts caused by invasive species. Most invasive species are opportunistic and tend to populate areas that have been disturbed, including areas disturbed as the result of prior invasive species management. Once a response effort has been completed, it may be necessary to restore disturbed areas to their natural ecological character and function. Restoration efforts may incorporate natural succession or intentional restoration measures using species native to the particular ecosystem in question to help restore resilience and guard against re-infestations.

The New York State Invasive Species Advisory Committee (ISAC) has developed a Work Plan which includes the development of this short document on the topic of site restoration post treatment of invasive species, the essence of which is to encourage resource managers to close the loop between treatment and restoring sites to their native ecological characteristics and functions.

**Who:** Management Team/Lead Coordinator/Resource Manager assumes the lead role.

**Why:** The objective is to restore disturbed areas back to their natural ecological function by encouraging the recovery of native species to prevent re-establishment of invasive species.

**How:**

**Collaborate with partners** to share existing restoration protocols, Best Management Practices (BMPs) and expertise. Prior to any restoration efforts resulting from a rapid or strategic response, it is recommended that resource managers pool the collective expertise from partners familiar with the given site characteristics. Many questions may arise and if carefully evaluated prior to the onset of restoration, these questions can be vetted which should ultimately lead to successful restoration. Considerations for inclusive collaboration may include:

- If a partnership already exists utilize expertise from all individuals involved through on-line meetings, in-person meetings, presentations, etc. Collect thoughts and expertise from local partners. If a structured partnership does not exist, determine who may bring relevant expertise to the table and engage them.
- Partners that could be considered may include: government organizations, non-government organizations, academia, non-profits, PRISM's, private consultants, ecologists, biologists, soil scientists, botanists, property owners, etc.
- See additional resources at the end of this document.

**Develop a site restoration plan** to restore damaged areas and ecosystem functions. Ideally a site restoration plan should be considered prior to taking a rapid response action. However, some rapid response actions may begin as a small scale effort only to transform into a larger scale effort requiring restoration measures. A well thought out restoration plan will increase the success of the project along with establishing a higher resiliency towards the return of invasive species at the site being restored. Considerations for developing a site restoration plan may include:

- Set clear objectives and a clear vision for the site in question.
- Identify the ecosystem function that you are trying to enhance or maintain including mutualists and antagonists.
- Utilize appropriate expertise identified in Section 1 above.
- Develop a list of what naturally grows there (native species).
- If a terrestrial site, consider soil types, hydric soils versus dry soils.
- For aquatic and terrestrial sites, consider a seed bank assessment of native flora.
- Should the site be left to natural succession? Smaller infestations (example being spot treatment for individual plants) may respond appropriately to natural succession. Other larger sites (example being large patches or sites treated on an acreage scale) may require intentional restoration to expedite the process and to outcompete invasives that may try to reestablish themselves.
- Consider offsite or nearby invasives and evaluate their threat to restored sites (secondary infestations).
- Consider time scale, long term management costs and funding sources.

# EXAMPLES

**Salmon River Corridor Restoration**
*Japanese Knotweed*
*Primary partners: SLELO PRISM, The Nature Conservancy, NYS DEC, private landowners.*

**Connetquot River State Park Preserve Restoration**
*Southern Pine Beetle*
*Primary partners: NYS DEC, Dept. of Parks & Recreation, Americorps.*


**Ridgebury Lake & Catlin Creek Restoration**
*Northern Snakehead*
*Primary partners: NYS DEC*


**Salmon River Restoration**
In 2012 populations of Japanese knotweed (*Fallopia japonica*) were confirmed along portions of the Salmon River corridor. After three consecutive herbicide treatments (foliar and stem injection) of Japanese knotweed a site restoration plan was implemented and monitored for two additional years. Restoration measures included:

- Seeding of sites was achieved by using a cyclone hand spreader and at times broadcasting the seed by hand only. A mix of annual ryegrass, perennial ryegrass and little bluestem (*Schizachyrium scoparium*) at a 3:2:1 ratio was used. The seeding rate was approximately twenty-five pounds per acre.
- Live staking which involves the insertion of live, vegetative cuttings using on-site, native plant materials into the ground in a manner that allows the cutting (stake) to take root and grow.
- Planting of Eastern White Pine (*Pinus strobus*) tree seedlings in strategic locations where treatment occurred.

*Project Costs:* Total project cost (4 years) $71,600. Restoration cost $2,400.
*Lessons learned:* Restoration was more successful in shaded areas verses full sunlight areas.

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**Connetquot River State Park Preserve Restoration**
In 2014 the Southern Pine Beetle was confirmed in the Connetquot River State Park Preserve. After removal or inoculation of 8,000 trees, natural succession allowed for sunlight to reach the ground and seeds from the parent trees began sprouting new trees. In addition, volunteers assisted with the intentional planting of two year-old (seedling) pitch pine and white pine trees provided by DEC's Saratoga Tree Nursery. These trees helped to replace many that were lost by this forest pest.

- Natural succession allowed for native seed germination and regrowth.
- Intentional planting of pitch pine and white pine trees by volunteers and AmeriCorps - Student Conservation Association.

*Project Costs:* Included 25 volunteers and the purchase of seedlings at $250.
*Lessons learned:* Early detection and responding rapidly was key to restoring this site.

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**Ridgebury Lake & Catlin Creek Restoration**
After the confirmation of Northern Snakehead in Ridgebury Lake and Caitlin Creek in 2008 and after preparing a rapid response and restoration plan, chemicals were used to eradicate Northern Snakehead. Subsequently, Ridgebury Lake was restocked with the native fish removed via electrofishing prior to treatment and stored in holding tanks. Restocked species included largemouth bass, golden shiner, fathead minnow, bluegill, yellow perch, black crappie and crayfish.

*Project Costs:* Included the application of aquatic pesticides and the removal, storage and restocking of native fish and the purchase of 175 sterile grass carp.
*Lessons learned:* Removing, storing and restocking native species increased success.

# RESOURCES

There is a multitude of resources available to assist you with rapid response efforts and subsequent ecological restoration efforts.

For more information about the New York State Rapid Response Program Policy, contact:

NYS Department of Environmental Conservation Invasive Species Coordination Section Central Office, Albany NY
(518) 402-9405
isinfo@dec.ny.gov

**Additional Resources by Subject:**

**Collaboration:**
- NYSDEC - www.dec.ny.gov/animals/265.html
- NYISRI - www.nyisri.org
- iMap Invasives – www.nyimapinvasives.org
- NYSDOT - www.dot.ny.gov/divisions/engineering/design/landscape/trees/invasive-species
- NYS Agriculture & Markets - www.agriculture.ny.gov/PI/PIHome.html
- Western New York PRISM - www.wnyprism.org/
- St. Lawrence Eastern Lake Ontario PRISM - www.sleloinvasives.org
- Lower Hudson PRISM – www.lhprism.org
- Long Island PRISM – www.liisma.org
- Finger Lakes PRISM - http://fingerlakesinvasives.org/
- Catskill Region PRISM - http://catskillinvasives.com/
- Capitol Mohawk PRISM - www.capitalmohawkprism.org/
- Adirondack PRISM – www.adkinvasives.com/

**Site Planning:**
- Resiliency Concepts - http://oregonstate.edu/dept/eoarc/sites/default/files/824_using_resistance_resilience_2014.pdf
- http://www.cal-ipc.org/ip/climateadaptation/IncorporatingClimateChangeResilience.pdf
- Integrated Vegetation Management – http://www.ivmpartners.org/
- http://www.rowstewardship.org/resource_pdfs/ivm_framework.pdf
- Salmon River Knotweed Feasibility Study - http://www.sleloinvasives.org/wp-content/uploads/2009/08/Salmon-River-Knotweed-Feasibility-PDF2.pdf

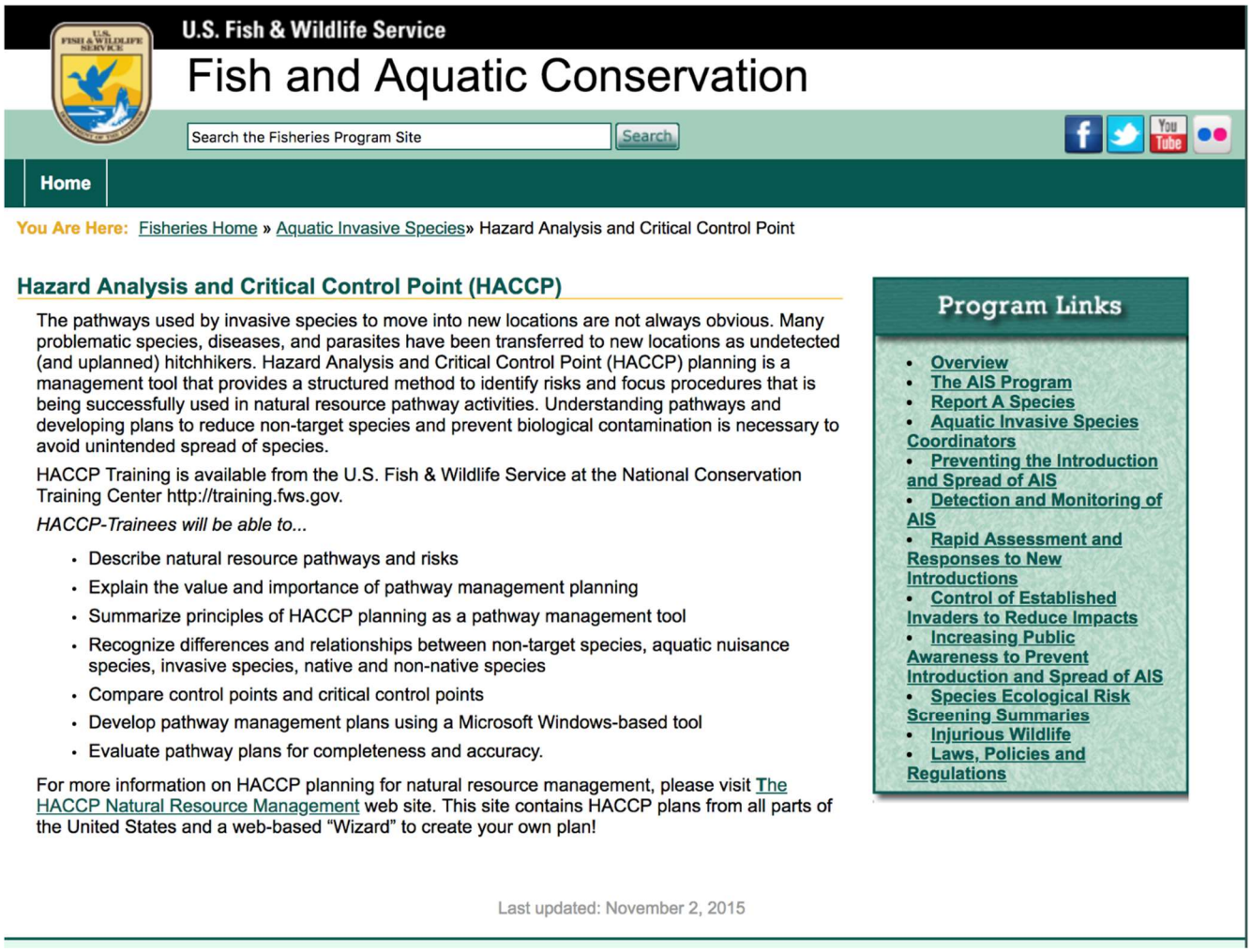
**Ecological Restoration:**
- Forest restoration project example - http://www.dec.ny.gov/press/106053.html
- Salmon River Restoration Initiative - http://www.sleloinvasives.org/wp-content/uploads/2015/10/FINAL-PROJECT-REPORT-2015-PDF1.pdf
- NOAA – Habitat Restoration - http://www.habitat.noaa.gov/restoration/

**Monitoring:**
- Forest Inventory & Analysis - http://www.fia.fs.fed.us/tools-data/
- Measuring and Monitoring Plant Populations http://www.blm.gov/nstc/library/pdf/MeasAndMon.pdf
- http://digitalcommons.unl.edu/usblmpub/17/
- Salmon River Restoration Final Report - http://www.sleloinvasives.org/wp-content/uploads/2009/08/Salmon-River-Knotweed-Feasibility-PDF2.pdf

**Best Management Practices**:
- Clean Equipment Protocol - http://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf
- Non-native Invasive Species Best Management Practices - http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5412628.pdf
- Best Management Practices for Preservation and Restoration of Soil - http://www.dnr.state.mn.us/water_access/bmp/soil_retention_bmp.html

# Appendix F

# Hazard Analysis and Critical Control Point Plans Resource



U.S. Fish & Wildlife Service

Fish and Aquatic Conservation

Search the Fisheries Program Site | Search

Home

You Are Here: Fisheries Home » Aquatic Invasive Species» Hazard Analysis and Critical Control Point

## Hazard Analysis and Critical Control Point (HACCP)

The pathways used by invasive species to move into new locations are not always obvious. Many problematic species, diseases, and parasites have been transferred to new locations as undetected (and uplanned) hitchhikers. Hazard Analysis and Critical Control Point (HACCP) planning is a management tool that provides a structured method to identify risks and focus procedures that is being successfully used in natural resource pathway activities. Understanding pathways and developing plans to reduce non-target species and prevent biological contamination is necessary to avoid unintended spread of species.

HACCP Training is available from the U.S. Fish & Wildlife Service at the National Conservation Training Center http://training.fws.gov.

*HACCP-Trainees will be able to...*

- Describe natural resource pathways and risks
- Explain the value and importance of pathway management planning
- Summarize principles of HACCP planning as a pathway management tool
- Recognize differences and relationships between non-target species, aquatic nuisance species, invasive species, native and non-native species
- Compare control points and critical control points
- Develop pathway management plans using a Microsoft Windows-based tool
- Evaluate pathway plans for completeness and accuracy.

For more information on HACCP planning for natural resource management, please visit The HACCP Natural Resource Management web site. This site contains HACCP plans from all parts of the United States and a web-based "Wizard" to create your own plan!

Program Links

- Overview
- The AIS Program
- Report A Species
- Aquatic Invasive Species Coordinators
- Preventing the Introduction and Spread of AIS
- Detection and Monitoring of AIS
- Rapid Assessment and Responses to New Introductions
- Control of Established Invaders to Reduce Impacts
- Increasing Public Awareness to Prevent Introduction and Spread of AIS
- Species Ecological Risk Screening Summaries
- Injurious Wildlife
- Laws, Policies and Regulations

Last updated: November 2, 2015

# RAPID RESPONSE PROCEDURE SUMMARY

| | |
|---|---|
| Early Detection & Reporting | Passive/deliberate detection, trained staff and volunteers, priority areas of disturbed ground/frequent human traffic sites |
| Verification | Collect sample and document detection, accurate species ID by recognized expert |
| Notification | Notify Priority 1 Contacts, obtain definitive species ID, disseminate information (iMap) |
| Rapid Assessment | Determine lead agency and management team, survey extent of infestation, identify resource requirements and resources, and prevent spread |
| Planning | Employ decision analysis tools, determine most effective response action and management action develop response plan, |
| Rapid Response | Implement response plan components continue outreach, document process |
| Monitoring & Evaluation | Follow-up surveys, assess ecological indicators, revise plan as necessary |
| Restoration | Restore ecological function promote recover of native species to inhibit re-establishment of invasive species |