DLF-16-1 / Rapid Response for Invasive Species: Framework for Response

New York State Department of Environmental Conservation

DEC Program Policy

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I. SUMMARY

The Rapid Response Framework for Invasive Species is designed to provide resource managers with a defined response system and list of procedures that can be initiated upon discovery of a new invasive species infestation. The goal of this policy is to promote timely decision-making and communication in the event of a new invasive species infestation while limiting authority conflicts and duplication of effort. This policy ensures that managers give adequate attention to all of the necessary components of an effective response including: coordination, communication, public outreach, planning, scientific analysis, information management, and compliance with legal and regulatory requirements, resources and logistics.

II. POLICY

The Rapid Response policy provides a coordinated framework that can be utilized to minimize the establishment and spread of new invasive species.

PURPOSE & BACKGROUND

The purpose of the policy is to provide resource managers with a procedure which can be utilized when responding to newly discovered invasive species infestations. This policy is not just for government agency staff but for anyone who has responsibility for managing lands or other resources that can be harmed by invasive species. It 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.

Pursuant to the Environmental Conservation Law, the role of the New York Invasive Species Council is to *"…prevent the introduction of invasive species; detect and respond rapidly to and control populations of invasive species in a cost effective and environmentally sound manner;*" (ECL 9-1705(5)(b)). An invasive species is defined as as *"…a species that is: a) nonnative to the ecosystem under consideration; and b) whose introduction causes or is likely to cause economic or environmental harm to human health.*" (ECL§9-1703(10)) Implementing regulations list prohibited and regulated invasive species and describe the legal basis for preventing the possession, transport, sale, purchase, and introduction thereof. (6

NYCRR 575). This policy fulfills the statutory mandate that a plan be enacted to rapidly respond to newly detected invasions.

Early detection of new invasions is critical to any rapid response. The value of rapid response is realized only if populations are identified when they are small and manageable. To be most effective, a response to a new introduction should occur quickly. Note that the term "quickly" is subject to the biology and context of each individual invasion. In many cases, the initial stages of rapid response are measured in hours and days, not weeks or months. Conversely, a rapid response could continue for years when a species spreads slowly and can be effectively contained (e.g. hydrilla in Cayuga Lake).

This policy does not include detailed "response plans" for individual species that have not yet invaded because responses must be guided by case-specific facts. In other words, how a species invades – how many individuals, location, their distribution on the landscape, proximity to other known invasions, the time of year, nearby land use, and numerous other factors – determines what actions are possible and useful. Instead of pre-determined plans, the policy relies upon an established process to guide decision-making and response actions for species invasions anywhere in the state. Pre-planning efforts for future invasions are encouraged, but there is a limit to the level of response planning that is useful until an invasion actually occurs. For example, an understanding of possible actions (and real constraints) is very helpful in advance of an invasion. Similarly, establishing communication networks with potential partners and stakeholders can be useful.

The process ensures that managers give attention to all of the necessary components of an effective response: coordination, communication, public outreach, planning, science, information management, laws and regulations, resources and logistics. As an example, one of the first steps following verification of any invasion is to plan and implement a "delimitation" survey to determine the geographic extent of the invasion. Whereas a single or very limited invasion may lend itself to complete elimination of the invading population, invasions at numerous locations over a wide area may preclude eradication and allow only for a strategy of spread prevention. The wide range of possible conditions has a correspondingly wide range of possible response actions. The actions range from the removal of infested and potential hosts to outreach and regulatory efforts, such as quarantines and inspections that are intended to reduce or eliminate the movement of infested materials away from the invaded area. These decisions cannot be made until survey information is available.

The Department of Environmental Conservation's experience with snakehead fish, chronic wasting disease (CWD), hydrilla, oak wilt, Asian longhorned beetle (ALB), and emerald ash borer (EAB) in New York State have been used to help develop and refine this framework.

III. RESPONSIBILITY

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.

IV. PROCEDURE

The Rapid Response Process consists of a series of steps which include:

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 to an agency (e.g., state or federal resource agencies, public land managers) or organization (e.g., Partnerships for Regional Invasive Species Management (PRISMs), private land managers) whose mission includes responding to invasions. **See Appendix C for PRISM Fact Sheet.**

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

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.

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. The rapid assessment will ultimately determine whether responsible agencies or organizations should attempt spread prevention (containment), eradication, control, or no action.

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 VI. Related References for examples.**

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.

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.

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 A for Rapid Response Procedure Summary Diagram and Appendix B for Rapid Response to Northern Snakehead: An Invasive Species Case Study.

How to Use this Document

This document is operational in nature; therefore, the activities outlined below focus on actions that would follow a confirmed introduction. The actions are arranged in the order they should be performed; however, some activities may or should be implemented simultaneously. Some of the tasks identified may already be ongoing, while others will need to be implemented quickly following review and approval. Not all items in this document will be relevant to all invasions. Nevertheless, managers should consider each item as they proceed to plan and implement responses to new invasions.

Successful implementation of this document requires resource managers who are willing to actively respond to the particular circumstances of a new infestation. Ideally, this guidance will prompt improvements in response timing, organizational development, permitting efficiencies, funding mechanisms, outreach strategies, and other tools that in turn will allow this document to evolve further over time.

VERIFICATION

***NOTE:** VERIFICATION AND NOTIFICATION CAN BE SIMULTANEOUS

Who The individual/organization who receives and accepts responsibility for handling the initial report in coordination with the state, tribal, provincial, and/or federal agency where the initial sighting occurs. Local PRISM coordinator should be contacted to aid in this process, see **Appendix C PRISM Fact Sheet.**

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

1. Interview the reporter(s) to validate detection.

    a. Record details of the location such as: County, Township, City/Village, name of water body, land unit area, landmarks, highway mile, and land ownership where the suspect invader was found. Get GPS coordinates if possible. Other suggested tools include iMap Invasives Smartphone App.

    b. Collect contact information from the reporter(s).

    c. Secure a sample, if possible.

    d. Obtain a digital or other photograph (with scale indicator), if possible.

    e. Document the date and time of sighting(s).

    f. Secure an estimate of the number of the individuals found and the extent of the infestation.

    g. Note other relevant conditions (access limitations, etc.)

2. Validate identification as soon as possible via examination of a physical sample.

    a. When feasible, arrange for a site visit by at least one recognized expert (preferably a small team).

    b. If recognized experts cannot feasibly reach the site within a reasonable time frame, arrange to have samples and/or other evidence (e.g., photographs) sent via express mail service to the most accessible recognized expert. Report and photo can also be sent via email to isinfo@dec.ny.gov.

    c. Prior to shipping samples, obtain guidelines from recognized experts (and use any existing protocols) regarding handling of the sample, desired quantity, where and how to deliver the sample, etc.

NOTIFICATION

Who The individual/organization who 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.

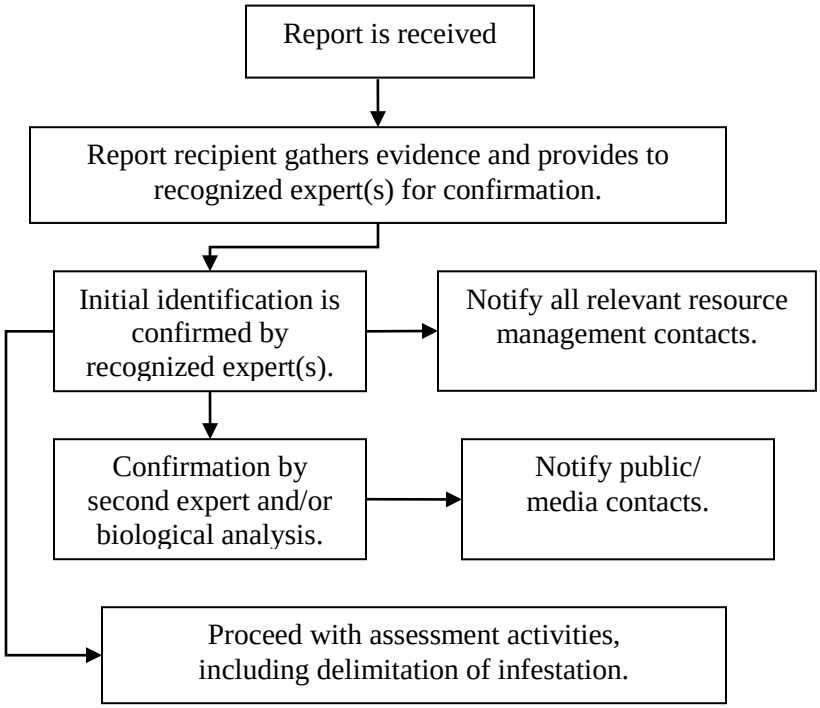
How

1. Within the first 24 hours, or as soon as practical after a physical sample is visually confirmed to be an invasive species by a recognized expert, notify all relevant natural resource managers in Table 1 below. Note that for many organizations, only primary 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. 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.).

3. 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.

The Notification Process



4. Contact initial observer to confirm invasive species identification.

5. Disseminate information on definitively confirmed invasions through an easily accessible database and list serve (e.g., iMap Invasives).

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** confirmation or as soon as practical)
State Agencies NYS Department of Environmental Conservation Invasive Species Coordination Section- Central Office (518) 402-9405 Division of Lands and Forests - Regional Office Division of Fish and Wildlife - Regional Office Division of Public Affairs and Education - Regional Office NYS Department of Agriculture and Markets NYS Office of Parks, Recreation and Historic Preservation NYS Department of Transportation NYS Canal Corporation NYS Thruway Authority **Others** Partnerships for Regional Invasive Species Management (PRISM) Any agencies and partners deemed appropriate from Table 2.

Table 2. PRIORITY 2 CONTACTS (Notify within 24 hours of **second** confirmation or as soon as practical)
State Agencies NYS Department of State (DOS) Adirondack Park Agency (APA) NYC Department of Environmental Protection (DEP) **Federal Agencies** US Department of Agriculture (USDA) APHIS Forest Service - Northeastern Area Office Natural Resource Conservation Service National Oceanic and Atmospheric Administration (NOAA) National Estuarine Research Reserve System (NOAA - NERRS) National Marine Fisheries Service (NOAA - Fisheries Service) National Marine Sanctuaries (NOAA – NMS) National Sea Grant (NOAA – Sea Grant) National Park Service (NPS) US Army Corps of Engineers (COE)

Table 2. PRIORITY 2 CONTACTS
(Notify within 24 hours of **second** confirmation or as soon as practical)

US Coast Guard (USCG)
US Environmental Protection Agency (USEPA)
National Estuary Program (USEPA – NEP)
US Fish and Wildlife Service (USFWS)
US Geological Survey (USGS)

Local Government
Town Supervisor
Mayor
Other key elected officials

Non-Government Organizations (NGOs)
Adirondack Council
Adirondack Mountain Club (ADK)
Association of Landscape Architects
Audubon NY
Cary Institute of Ecosystem Studies
Catskill Center for Conservation and Development
Cornell Cooperative Extension
Cornell University, Department of Natural Resources
Empire State Forest Products Association
Empire State Marine Trades Association
Lake Champlain Basin Program (LCBP)
Local Lake Associations
Native American Tribes
NY Association of Conservation Districts
NY Farm Bureau
NY Forest Owners Association
NY Sea Grant
NYS Association of Towns
NYS Conservation Council
NYS Flower Industries, Inc.
NYS Forest Owners Association
NYS Nursery and Landscape Association
NYS Turfgrass Association
NYS Urban & Community Forestry Council
PRISM (Partnerships for Regional Invasive Species Management)
Protect the Adirondacks
SUNY College of Environmental Science and Forestry
The Nature Conservancy (TNC)
Wildlife Society (NYS Chapter)
Other key constituents

Media
Local Newspapers

Table 2. **PRIORITY 2 CONTACTS** (Notify within 24 hours of **second** confirmation or as soon as practical)
Local Television Stations Local Radio Stations Other local media outlets

RAPID ASSESSMENT

Step I – Defining Roles and Responsibilities

Who Lead Agency/Organization, as defined below.

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 appropriate Lead Agency or organization with authority where the initial sighting(s) occurred convenes 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 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.

The Management Team will:

a. Determine the extent of the infestation and pathways for potential spread.

b. Determine the risk to the environment, human health, economy, etc.

c. Identify constraints and limitations, including jurisdictional issues, legislative authority, funding, permitting, personnel training, access to private lands, gaps in knowledge, and ecological uncertainties.

d. Determine if eradication/control is possible and select the appropriate method(s) to be employed.

The Lead Coordinator will:

a. Coordinate interagency “response team” notification operations.

b. 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.

c. Represent (i.e., be the spokesperson for) the Management Team.

d. Facilitate a collaborative decision-making process that considers cascading levels of authority within individual agencies.

e. Facilitate development of response priorities.

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

   a. All affected states (e.g., Governor, state agencies, ANS Coordinator, etc.)

   b. Federal agencies (e.g., USFWS, USDA, NOAA, USACOE, etc.)

   c. Canada

   d. Tribes

   e. Local governments

   f. Other interested parties, such as NGOs, universities, nurseries, marinas, etc.

3. 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 appropriate lead agency with authority where the initial sighting(s) occurred, 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. Survey efforts should follow existing regional or national protocols.

2. Determine demography of infestation (e.g., age structure). These efforts should follow existing regional or national protocols. 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 using agreed upon methods.

6. Compile existing information on species through literature searches and correspondence with experts.

7. Identify threat(s) to the State's economic, ecological, and recreational resources. Suggested tools are the PRISM Ranking Form or the statewide assessment tool.

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.

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

4. Develop a public information strategy (consider a formal, written plan) including: press releases, information packets, and public meetings. Provide information to affected publics 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 5) the process forward.

The public information/participation strategy should:

a. 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.

b. 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.

c. Draft press releases to announce significant events and progress.

d. Conduct a public scoping session/informational meeting to present the problem and identify issues.

e. Summarize information and comments gathered at public scoping and other meetings and write responses to the comments.

5. 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:

    a. Quarantine infested areas as needed to prevent spread.

    b. Assess the likely movement of infested vehicles, equipment, and materials to identify risk and inspection needs at other vulnerable areas.

    c. Establish wash and inspection requirements on vehicles and equipment, if needed.

    d. If feasible, determine and eliminate the likely source of inoculation (e.g., infested firewood) as warranted.

    e. Ensure that invasive species “alert” signs are adequately deployed.

    f. Begin outreach to alert the public of the risks of spreading the new infestation.

    g. Develop and implement Hazard Analysis and Critical Control Point (HACCP) plans to ensure that response personnel do not further spread the original infestation. 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.

    h. 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. Consider the following:

    a. Risk to environment, human health, economy, etc.

    b. Anticipated cost of eradication effort and subsequent monitoring (relative to available funding).

    c. Available resources (personnel, equipment, etc.).

    d. Regional and local distribution – single vs. multiple, continuous vs. patchy, isolated vs. widespread.

    e. Landscape context – upstream vs. downstream, edge vs. interior, etc.

    f. Age of infestation.

    g. Neighbors' actions/inaction.

    h. Other available management or response plans.

    i. Pathways/source – identified, controlled, eliminated, etc.

    j. Species track record of eradication/control.

    k. Survey and assessment confidence.

    l. Habitat type(s).

    m. Life stage(s) present.

    n. Time of year in relation to reproduction, migration, etc.

    o. Land ownership – public vs. private, willing landowner vs. unwilling landowner.

p. Amount of water in the system to be treated. Consider the following:

1) Potential for drawn down or flows reduced before treatment.
2) Flow sources, including springs, and the potential to regulate that flow.

q. Land use patterns.

r. Presence of state or federally listed rare, threatened or endangered species.

s. 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) Adirondack or Catskill Park lands
5) Wilderness
6) Historic sites
7) Cultural resources (State Historic Preservation Office)
8) Department of Defense or other restricted access areas
9) Tribal lands

u. Other considerations.

2. Consider potential management actions.

a. Terrestrial Systems

1) Physical/Mechanical Activities

Hand-pulling
Trapping/Netting/Capturing
Burning/Prescribed Fire
Shooting/Depopulation
Flooding
Cutting/Chopping/Mowing
Burying
Excavating/Digging
Physical Barriers (creation & removal)
Cultivation
Grazing

2) Biological Activities (Biocontrols)

Insects

Mammals
Micro-organisms

3) Chemical Activities

Herbicides: Application method (granular, truck spray, hand spray, aircraft, soil drench, stem injection)
Pesticides

4) Regulatory Activities

Statute
Regulation
Policy
Quarantine

b. Aquatic Systems

1) Physical/Mechanical Activities

Hand-pulling
Suction Harvesting
Trapping/Netting/Capturing
Mechanical Harvesting (cutting/mowing)
Benthic Barriers (matting)
Hydroraking/Rotovating
Dredging
Draining/Drawdown
Surface Covers
Physical Barriers (creation & removal)

2) Biological Activities (Biocontrols)

Insects
Mammals
Fish
Micro-organisms

3) Chemical Activities

Herbicides: Contact, Systemic, Shading – chemical dyes
Pesticides

4) Regulatory Activities

Statute

Regulation
Policy
Quarantine

3. Assess potential impacts of management actions. Consider the following:

    a. Air Quality
    b. Soils
    c. Cultural Resources
    d. Water Resources
    e. Fish and Wildlife including threatened, endangered and sensitive species
    f. Human Health
    g. Social Environment
    h. Vegetation diversity including threatened, endangered and sensitive plant species.
    i. Economic Conditions
    j. Visual Resources and Recreation
    k. Effectiveness of various treatment methods.

Step II – Making Decisions

Who Lead Coordinator and Management Team

Why The objective is to seek a decision on which response action (eradication or containment/mitigation) and which management action (hand-pulling, dredging, herbicide, etc.) to undertake.

How

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

2. Develop a response plan. The response plan ensures that everyone is working in concert toward an 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 three elements:

    a. What do we want to do?
    b. Who is responsible for doing it?
    c. 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). A formal determination of emergency can facilitate numerous aspects of regulatory processes.

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:

    a. 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.

    b. 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.

    c. 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.

    d. Endangered Species Act Section 7 and consultations with the National Marine Fisheries Service (NMFS) for marine and anadromus 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.

    e. 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.

    f. 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.

g. 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.

h. NYS Environmental Conservation law (ECL) Article 25 Tidal Wetlands permit from DEC for any action in or within 300 feet (150 feet within New York City) of a mapped tidal wetland in New York State.

i. NYS Executive Law Article 27 Freshwater Wetlands permit from the Adirondack Park Agency (APA) for any action in a wetland over one acre in size or any size wetland adjacent to open water within the Adirondack Park of New York State.

j. 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.

k. 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.

l. 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.

m. 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 approval 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.

RAPID RESPONSE

Who Lead Coordinator and Management Team

Why The objective is to implement the eradication or control strategies.

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 loop-holes and additional regulatory needs.

4. Agencies collaborate to coordinate and deploy field resources; implement ICS if needed.

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 throughout response process for future reporting and evaluation of success.

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. 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. Potential ecological indicators may include:

    a. Forests
        1) The health of forest plants.
        2) Habitat quality for birds and deer.
        3) Woodland productivity for forest products.
        4) Vernal pool activity.

    b. Streams
        1) The chemical characteristics of stream water that help determine how water can be used by plants and animals.
        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.

    c. Landscapes
        1) The environment's ability to provide habitat for different kinds of wildlife, including game and rare species.
        2) The environment's ability to resist and recover from a variety of disturbances.
        3) The environment's ability to filter and maintain water quality, and to reduce flooding (i.e. wetland function, floodplain stability).
        4) The diversity and pattern of land cover types (forest, water, agriculture, etc.) and which land cover type is dominant.

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. Revise the rapid response plan and associated documents/guidelines based on evaluation and long-term monitoring results.

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.

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 re-establishment of native species. See Monitoring & Evaluation section 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.

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Appendix A
Rapid Response Procedure Summary

RAPID RESPONSE PROCEDURE SUMMARY

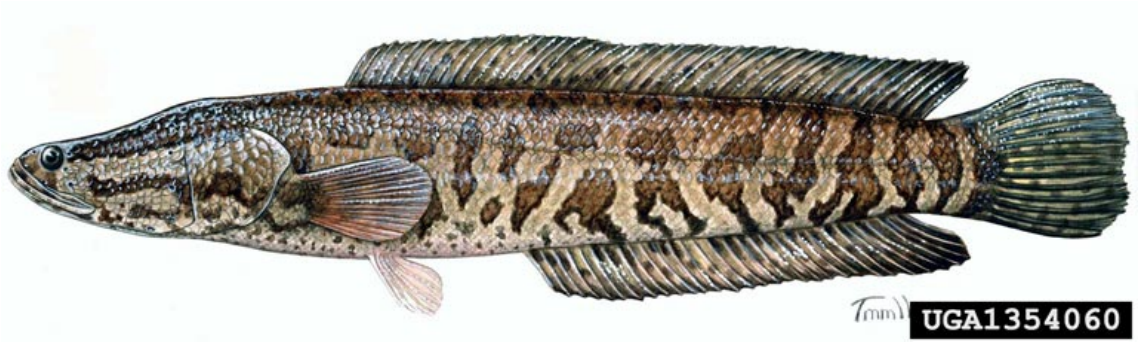
Early Detection	Passive/ deliberate detection, trained staff and volunteers, priority areas of disturbed ground/ frequent human traffic sites
Verification	Collect sample and document detection, accurate species ID by recognized expert
Notification	Notify Priority 1 Contacts, obtain definitive species ID, disseminate information
Rapid Assessment	Determine lead agency and management team, survey extent of infestation, identify resource requirements and resources, 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, revised plan as necessary
Restoration	Restore ecological function, promote recovery of native species to inhibit re-establishment of invasive species

Appendix B
Rapid Response to Northern Snakehead:
An Invasive Species Case Study

Rapid Response To Northern Snakehead

An Invasive Species Case Study

The Rapid Response framework ensures that managers give attention to all of the necessary components of an effective response: early detection and reporting, verification, notification, rapid assessment, planning, rapid response, monitoring and evaluation, and restoration. The 2008 response to Northern snakehead (*Channa argus*) in Orange County is an example of the successful use of this framework in addressing a high priority aquatic invasive species.



Snakehead are air breathing invasive freshwater fish that are native to parts of Asia and Africa.

Detect Invasive Species Early & Report

The early detection of new invasions is key to successful management and frequently requires a network of well-trained volunteers and professionals who can carry out field surveys, report findings, and when necessary, collect specimens for identification.

Case study. On May 29, 2008, DEC regional fisheries staff received a phone call and pictures indicating that a resident along Catlin Creek took two snakehead from an in-stream pond while fishing.

Verify the Report

Quick and accurate identification of a new invasive species detections by taxonomic experts is an important first step in the rapid response process.

Case study. On May 30, 2008, DEC fisheries staff collected the two suspect fish and confirmed identification as Northern snakehead.

Notify Managers and Stakeholders

Relevant resource managers and key stakeholders should be notified, using various communications tools such as individual letters and public meetings, once the reported invasion has been verified.

Case study. The Regional DEC fisheries manager, natural resource supervisor and Invasive Species Coordination Unit leaders were notified immediately following verification. Letters were

sent to residents in the areas around Ridgebury Lake and Catlin Creek to inform them of the response plan as it progressed:

- June 25 - announced a plan for DEC to use a fish toxicant to eradicate snakeheads from the watershed.
- July 8 - a public meeting was held to inform interested stakeholders of DEC's response plan.
- July 29 - provided feedback from questions and concerns.
- August 13 - provided an update on treatment.
- November 25 - announced a public discussion on fisheries management within Ridgebury Lake and Catlin Creek that residents and concerned citizens could attend and which was subsequently held on December 9.

Assess the Situation Rapidly

Once a new invasion has been verified, a rapid assessment needs to be completed to determine both the threats posed by the invasion and the potential for an effective rapid response.

Case study. DEC took lead agency status, working in collaboration with the local municipality. Seven days of sampling using electrofishing and a variety of nets yielded several Northern snakehead in one of the waterways surveyed on June 12, 2008, which led to the conclusion that a small breeding population was present. As noted above, a number of communications initiatives were planned. Funding options for the various response components were explored. In early June temporary fish barriers were put in place. Later in the month a permanent fish weir was installed at the Route 6 culvert to minimize fish movement downstream.

RAPID ASSESSMENT

- Step 1: Define Roles and Responsibilities
- Step 2: Delimit Invasion
- Step 3: Plan Internal and External Communications
- Step 4: Marshal Resources
- Step 5: Prevent Spread

Create a Plan

Once it is determined that a rapid response action is necessary, appropriate planning is needed. Key planning components include exploring alternatives, making decisions and securing permits.

Case study. Treatment alternatives include use of chemicals to eradicate Northern snakehead, contain the population by installing barriers, or no action. Between July 11 and July 31, CFT Legumine, a form of rotenone and the preferred pesticide for this response effort, was registered for use in NYS; holding tanks were constructed for fish collected from treatment areas; emergency approval was obtained to treat with rotenone at label concentrations of up to 5 ppm and a pesticides permit was issued to DEC; and dilute CFT Legumine was tested by Adirondack Environmental Services, Inc. to confirm there were no non-label chemicals of concern present in the product.

Respond Rapidly

Rapid response is an action or series of actions taken to quickly contain, and if possible, eradicate newly discovered invaders.

Case study. Treatment of Ridgebury Lake and Catlin Creek began August 5 and 6 after which DEC collected and disposed of dead fish from the treatment areas, including 227 snakehead. During 2009, two adult snakeheads were captured below a small pond within the area of Catlin Creek during routine monitoring. Follow-up treatment was conducted in Catlin Creek and adjoining wetlands on October 6, 2009 using Marshmaster vehicles, resulting in another 28 snakehead collected.

Monitor & Evaluate the Response

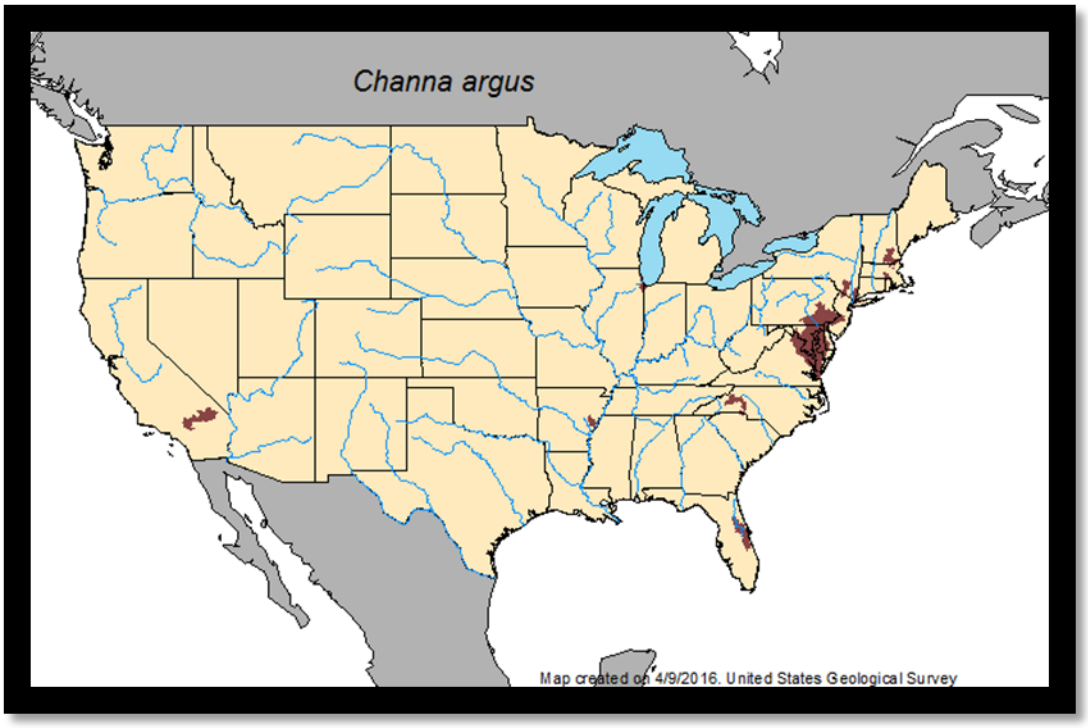
A rapid response is not complete after a management action has been taken. Monitoring after a response is important to determine if management actions were effective.

Case study. Several forms of monitoring were employed post treatment. Water quality monitoring documented the breakdown of the pesticide in Ridgebury Lake and Catlin Creek. DEC staff surveyed the treatment areas in both 2008 and 2009, using electrofishing to test the effectiveness of the response. In 2013 and 2014, 290 two liter water samples were collected from 12 New York sites and tested for the presence of Northern snakehead DNA. While two water samples tested positive from the Wallkill drainage, no detections of live Northern snakehead have been obtained using traditional sampling equipment.

Restore

Once a response effort is complete, it may be necessary to restore disturbed areas to their natural ecological function.

Case study. On September 3, 2008, DEC staff restocked Ridgebury Lake with the fish removed via electrofishing before treatment and stored in holding tanks, including largemouth bass and seven other species. During 2009, the DEC and the local municipality stocked largemouth bass, golden shiner, fathead minnow, bluegill, yellow perch, black crappie and crayfish. In addition, 175 sterile triploid grass carp were stocked in Ridgebury Lake in 2009 to control aquatic vegetation.



Appendix C
PRISM Fact Sheet

PARTNERSHIPS FOR REGIONAL INVASIVE SPECIES MANAGEMENT

New York State PRISMs

NEW YORK STATE OF OPPORTUNITY | Division of Lands and Forests

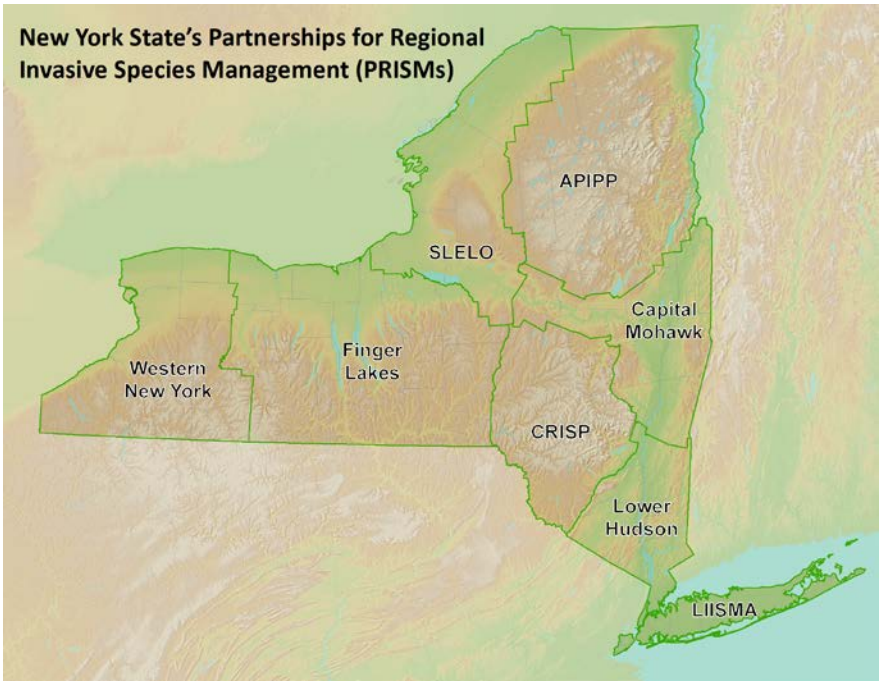
Invasive species means a species that is nonnative to the ecosystem under consideration, and whose introduction causes or is likely to cause harm to the environment, the economy, or the health of humans.

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 eradication 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

STOP THE INVASION – PROTECT NEW YORK FROM INVASIVE SPECIES

Regional PRISM Contacts			
PRISM	**Host**	**Contact**	**Listserve & Websites**
APIPP 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 • http://ccesaratoga.org/environment/partnerships-for-regional-invasive-species-management-prisms
CRISP Catskill Regional Invasive Species Partnership	Catskill Center for Conservation	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 Long Island Invasive Species Management Area	NY Natural Heritage Program, SUNY ESF	Steve Young 518-402-8951 smyoun26@esf.edu	• cce-liisma-l-request@cornell.edu • http://www.liisma.org/
Lower Hudson	New York - New Jersey Trail Conference	Linda Rohleder 201-512-9348 lrohleder@nynjtc.org	• cce-hudsonprism-l-request@cornell.edu • http://lhprism.org/
SLELO Saint Lawrence and Eastern Lake Ontario	The Nature Conservancy	Rob Williams 315-387-3600 rwilliams@tnc.org	• cce-slelo-l-request@cornell.edu • http://www.sleloinvasives.org/
Western New York	Buffalo State	Andrea Locke 716-878-4708 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.

CONTACT INFORMATION

Invasive Species Coordination Unit

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