National Early Warning and Rapid Response System
For Invasive Plants in the United States

DRAFT ACTION PLAN
March 15, 2002

Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW), Washington, D.C.

Giant Salvinia (*Salvinia molesta* D.S. Mitchell), New Scourge of U.S. Waterways.

(Illustration Courtesy of the University of Florida, Center for Aquatic and Invasive Plants)
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I. INTRODUCTION

In recent years, there has been a growing awareness that introduced invasive species are having significant and increasing impacts on the U.S. economy, ecosystems and native species, and pose increasing threats to human health. The United States, with the greatest biome-level diversity of any nation and a large inventory of relatively intact ecosystems, is particularly vulnerable to biological invasions. Until recent times, this was not much of a threat due to the relative isolation of the North American continent. However, increased trade and travel have created many new pathways for intentional and incidental spread of exotic species, and have significantly increased the threat of new and recurring biological invasions. Increased international trade in ornamental plants (including seeds) is a special concern because many of the currently known exotic invasive plants in the U.S. were originally imported as ornamentals. Increased trade in ornamental plants with megadiversity countries such as China and South Africa will likely increase this problem. While the majority of introduced species are not harmful to the American economy or the environment, a small percentage of them are very damaging and need to be detected as soon as possible.

Once established, invasive species frequently have long lag times. Introduced species that initially escaped many decades ago are only now being recognized as invasives. Due to this lack of attention on free living exotic species, exotic plants now comprise a growing percentage of the flora of all states (e.g., HI 43%, NY 36%, MO 25%, CA 18%, TX 10%). With continual introductions over the past 100 years, it can be expected that some exotics that are not currently identified as invasive will become significant problems in the future. Thus, there is an urgent need to document and address species that were introduced in past years; as well as the potentially larger problem of the species that are being introduced today. Without a coordinated national system for early detection and rapid response which are integrated with general vegetation surveys, free living exotic plants will continue to incubate until they become the invasive plants of tomorrow – the major weeds of the 21st century and beyond.

Under the current U.S. crop protection system, the USDA Animal and Plant Health Inspection Service (APHIS) and cooperating state agriculture agencies work to protect the nation from economically important plant and animal pests and diseases. However, due to a lack of resources and organized constituencies, new invasive plants species (both agricultural and environmental) are seldom addressed on public or private land until they are widespread and eradication is impractical. The recent discovery of the Brazilian floating fern giant salvinia (*Salvinia molesta* D.S. Mitchell) in 30+ water bodies in nine states, is a notable example of the problem, and has highlighted the serious need for a new and systematic approach for addressing new invasive species, and, in particular, invasive plants.

The overall purpose of the National Early Warning and Rapid Response System for Invasive Plants will be to provide a coordinated framework of public and private partners at the local, state, regional, and national levels to more effectively address new invasive plants through:

- Early detection and reporting of suspected new plant species to appropriate officials;
- Identification and vouchering of submitted specimens by designated specialists;
- Verification of suspected new state, regional, and national plant records;
- Archival of new records in designated regional and plant databases;
- Rapid assessment of confirmed new records; and
- Rapid response to verified new infestations that are determined to be invasive.
Once fully implemented across the United States, the proposed early warning and rapid response system will provide an important second line of defense against invasive plants that will work in concert with Federal efforts to prevent unwanted introductions at the ports of entry. With both systems in place, the nation will be better able to defend against future economic and environmental losses due to “plants out of place”.

**Plan Development:** FICMNEW identified development of an early warning and rapid response system as one of its long range strategic goals at the FICMNEW Planning Retreat, which was held in October 1998, in Shepardstown, WV. To begin this process, the U.S. Geological Survey and the USDA Forest Service hosted an Early Warning and Rapid Response Workshop in Ft. Collins, Colorado, in June 2000. Attendees included Federal, state, industry, environmental and private landowner representatives who had been active in noxious weed or invasive plant issues. Subsequently, the proceedings of the workshop were posted on the FICMNEW Home Page.

The Plan presented here was first drawn from the major recommendations that were developed at that workshop, as well as relevant recommendations under the National Invasive Species Management Plan. The first draft of the plan was released for limited informal review on November 11, 2001. This draft of the plan incorporates comments received from FICMNEW representatives, workshop participants, and selected Federal officials to date. The plan will now enter a formal review period among interested invasive plant/noxious weed groups and the Federal agency members of FICMNEW. Written comments should be sent to the Co-Chairs of FICMNEW (Mike Ielmini and Gina Ramos) by May 1, 2002.

Following analysis of comments received, the plan will be provided to the National Council on Invasive Species staff for presentation to the National Council and Invasive Species Advisory Committee. FICMNEW will then be looking for opportunities for demonstration projects to field test the proposed Early Warning and Rapid Response System. Currently, the Invasive Species Council staff is organizing an All Taxa Subcommittee on Early Warning and Rapid Response. As this occurs, FICMNEW will work with them on integrating this plan into an overall national early warning and rapid response plan for invasive species.

**Key Points for Consideration:** There are a number of areas in this plan that remain undeveloped or are purposely vague at this point in time. Some of the decisions regarding elements can only be made at the Agency head or Under Secretary level, while others simply need more discussion. We would ask you to give special consideration to these points in your comments.

1. Where should the permanent position of National Early Warning Coordinator be housed and which Department/agency should have the primary leadership role?
2. Should the Regional Coordinators be Federal positions, or supported by the States within that region?
3. What are your suggestions on developing a standard biological risk assessment protocol?
4. What are your suggestions for selection criteria for the proposed pilot/demonstration projects
II. STATUS OF MAJOR EARLY WARNING AND RAPID RESPONSE SYSTEM ELEMENTS

The proposed EWRR System for Invasive Plants is comprised of numerous elements including partnership groups, positions, and projects. The following is a list of:

- Existing elements and ongoing projects that are related to EWRR
- New elements and projects that can be developed with existing resources
- New elements and projects that will require new funding.

1. EXISTING ELEMENTS AND ONGOING PROJECTS RELATED TO EWRR

A. Existing Partnership Groups and Positions
   - General Public (Detection and Reporting)
   - Local Contact Agencies (Interface with Public)
   - Designated state herbaria to identify and voucher suspected new plants (crucial link between detectors/collectors and responsible agencies)
   - Field botanists and plant taxonomists
   - USGS Center for Integration of Natural Disaster Information (Reporting of verified new invasive plants to designated officials)
   - FICMNEW (System development and oversight)
   - APHIS New Pest Advisory Group (regulatory weed assessments)
   - State Weed Coordinators and State Extension Weed Specialists
   - North American Biodiversity Information Network (Existing plant databases linked through central WWW gateway; queried by special search engine)

B. Ongoing Projects
   - Online databases to archive new records (PLANTS, INVADERS, etc.)
   - NAWMA Data Collection Standards
   - FICMNEW efforts to develop and publicize the proposed EWRR System for Invasive Plants

2. NEW ELEMENTS THAT CAN BE DEVELOPED WITH EXISTING RESOURCES

A. New Partnership Groups and Positions
   - National Early Warning Coordinator (Invasive Plants) Position (by designation of current Federal position)
   - FICMNEW Early Warning Committee (System Oversight and Project Approval for new national records)
   - FICMNEW Early Warning Technical Advisory Group (Biological Assessments);
   - National Early Detection Network of Amateur and Professional Botanists (Recruited detectors and collectors)
   - Four Regional EWRR Coordinator (Invasive Plants) Positions (by designation of current Federal positions)
   - Regional Interagency Technical Support Teams under the leadership of the Regional EWRR Coordinators (by designation of current Federal positions)
   - New Local Weed Management Areas (Rapid Response)
   - New State Weed Teams (Interagency coordination at state level)
• New State Early Warning Coordinators (designated by the State Weed Team);
• Network of field botanists and plant taxonomists to assist in verifying suspected new plant records
• Volunteer Weed Watch Groups

B. New Projects
• EWRR Website (invasive plants)
• Published models for local, state, and regional interagency invasive plant partnerships
• Early Warning Partner Group Listserv
• Protocols for conducting biological assessments of verified new state and national plant records
• Generic plans for rapid response projects
• EWRR Module in the PLANTS Database
• E-Commerce Monitoring System (now being developed by APHIS, USGS, NCSU)

3. New Elements that will Require Additional Resources

A. Future Permanent Positions (to Lead Nationwide Implementation of the EWRR System)
• National Early Warning Coordinator (Invasive Plants) Position and Support Staff
• Four Regional EWRR Coordinator (Invasive Plants) Positions
• Regional Interagency Technical Support Teams under the leadership of the Regional EWRR Coordinators

B. New Projects
• EWRR Toll Free Number (Invasive Plants)
• Incentives for collectors to become active in the Early Detection Network
• Brochures and Fact Sheets on the EWRR System for Invasive Plants
• Web based tools to enhance plant identification
• Regional and national meetings of early warning partner groups to foster development of the National Early Warning System for Invasive Plants
• Database of Biological/Regulatory Assessments on new invasive plants;
• Web based expert systems to assist land managers in identifying management options and priorities for addressing new invasive plants
• Development of new technologies for EWRR activities such as remote sensing of new infestations
• New national early warning awareness and outreach strategy; media campaign; directory of specialists to assist in developing literature and materials
• Development of a North American plan for EWRR in cooperation with CAN and MEX.
• Technical Assistance to other countries in developing their own EWRR systems, and ultimately, a Global EWRR System for Invasive Species
• Funding mechanism and funding ($$) for system coordination and support elements
• Funding mechanism and funding ($$) for Rapid Assessments (on site) and Rapid Response (approved field projects)
• Two year pilot project in a few key states that already have state weed teams
• Funding for ongoing support of participating herbaria (crucial element linking public and collectors with responsible local, state, and Federal agencies)
III. SYSTEM COORDINATION AND OVERSIGHT

The National Early Warning and Rapid Response System will be a network of independent elements working together to achieve a common goal...“To detect new invasive plants early and to act quickly”.

Goal: Establish a national early warning coordination capability for Invasive Plants.

Objective 1: Designate positions and establish committees, as necessary, to provide system coordination and leadership.

Action 1: National Early Warning Coordinator. Designate a National Early Warning Coordinator for Invasive Plants, with appropriate staff support, from existing Federal positions.

Action 2: FICMNEW Early Warning Action Committee. Establish a National Early Warning Committee for Invasive Plants, affiliated with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW), with standing and supplemental members, to facilitate an interagency response to new regional and national plant records in the United States.

Standing Members:
- National Early Warning Coordinator for Invasive Plants
- Invasive Species Coordinator, U.S. Department of Agriculture
- Invasive Plant Coordinator, U.S. Geological Survey
- APHIS National Weed Coordinator, APHIS National Botanist
- NRCS National Plant Data Center
- Invasive Species Coordinator, U.S. Department of the Interior
- Program Specialist, U.S. Geological Survey Center for Integration of Natural Disaster Information (CINDI)
- State Partner Agency Representatives from the East, Midwest, and West.

Supplemental Members, when appropriate would include:
- Other FICMNEW or Agency Representatives, as appropriate
- Early Warning System Regional Coordinators
- State Weed Coordinators or other Designated Officials from Impacted States
- Designated County Weed Supervisors and other Local Officials from impacted areas.

In general, the committee is expected to act in a national advisory and oversight role in the development and operation of the Early Warning System. Another important role for the committee would be to solicit information from numerous sources including designated plant databases and the botanical community at large, to verify whether a new plant is actually a new regional or national record. (Suspected new state records would be verified by state partner groups).
**Action 3: Regional Early Warning Coordinators.** Designate Regional Early Warning Coordinators to serve as multi-state region liaisons between the state and national level components of the system.

**Action 4: State Early Warning Coordinators.** Encourage state level interagency partner groups to designate State Early Warning Coordinators to coordinate the development and implementation of the early warning system in each state.
IV. EARLY DETECTION, LOCAL CONTACTS, SPECIMEN IDENTIFICATION AND VOUCHERING, RECORD VERIFICATION, ARCHIVING OF INFORMATION, AND REPORTING

The most critical step in addressing new invasive plant problems is to know they exist. In order to detect new invasive plants, we will need the help of thousands of professional and amateur botanists, and interested citizens. In the process of detecting new invasive plants, we will learn even more about the state of our nation’s flora and fauna.

Goal: Coordinate the development of a National Early Detection and Reporting System.

Objective 1: Develop mechanisms for early detection and reporting of suspected new plants by the general public and a formal network of amateur and professional collectors.


Action 3: Incentives for Plant Collectors. Develop incentives for collectors to become active in the network.

Action 4: Volunteer Training and Certification. Develop a network volunteer training and certification program for target invasive plant, which integrates with native species surveys.

Action 5: Toll Free Number and Website. Provide a toll free number and website for the general public to use in seeking information about suspected new plants. The office of the National Early Warning Coordinator will maintain the toll free number and the EWRR Website for Invasive Plants.

Action 6: Local Contact Agencies. Request local offices of agencies such as The USDA Natural Resource Conservation Service, the County Extension Service, the USDA Animal and Plant Health Inspection Service, and county weed supervisors, to act as local contacts for the public for the Early Warning System. Federal land management agencies will report directly to the state committee and regional coordinator.

Action 7: Brochures and Fact Sheets on the EWRR System. Develop brochures and fact sheets to assist local contact agencies in communicating with the public about the Early Warning System.
Objective 2: Develop standard protocols for early detection, submission of specimens, identification/vouchering, verification, archiving of information, and reporting of suspected new invasive plants.


Action 2: Expert ID Keys. Facilitate development and use of expert keys and other web-based tools to enhance plant identification capabilities with initial emphasis on plants that are known to be invasive in the U.S. and elsewhere.

Action 3: Designated Herbaria and Plant Diagnostic Labs. Request each State Weed Team to designate one or more state level herbaria or plant diagnostic laboratory to assist in developing the National Early Detection Network and to identify and voucher plant specimens that are submitted by network members.

Action 4: Identification of Difficult Specimens. In cooperation with the Flora of North America project, develop a network of recognized plant systematists to assist state botanists in identifying difficult plant specimens that are suspected to be new state, regional, or national plant records.

Action 5: Confirmation of Suspected New State and National Plant Records. Develop a network of professional field botanists and other plant scientists to assist the National Early Warning Committee and state partner groups in verifying whether a newly identified plant is in fact a new state or national plant record.

Action 6: Archival of Confirmed New Plant Records. Designate the USDA PLANTS Database, and certain other regional and national databases to archive new state, regional, and national plant records that are generated through the Early Warning System.


Action 8: Verification of Suspected New Plant Records. Develop a list of criteria for use in verifying suspected new state and national plant records.

Action 9: Reporting of Confirmed New Plant Records to Designated Officials. Designate the USGS Center for Integration of Natural Disaster Information as a primary information dissemination point in the Early Warning and Rapid Response System.
V. LOCAL, STATE, AND REGIONAL PARTNERSHIPS

Currently, there are many agencies and organizations in the United States that are engaged in the “war on weeds”. However, invasive plants freely cross-jurisdictional boundaries and efforts to address them are often fragmented and piecemeal. In order to address them effectively, we need to marshal and focus the resources and expertise of the nation through a coordinated framework of local, state, regional, and national partnerships.

Goal: Foster Interagency Cooperation and Partnerships.

Objective 1: Encourage local, state, and Federal agencies, and appropriate non-governmental organizations to establish local, state, and regional interagency invasive species partnership groups. One of their goals would be early warning and rapid response to new invasive plants.

   Action 1: Partnership Guidelines. Develop and publish models for local, state, and regional invasive species partnerships.

   Action 2: Early Warning Partner Listserve. Develop an Early Warning Partner Listserve, which includes local, state, and regional interagency early warning partner groups.

   Action 3: EWRR Partner Meetings. Sponsor or host regional and national meetings of state and regional invasive species partnerships to encourage information sharing and development of the Early Warning and Rapid Response System for Invasive Plants.

   Action 4: Fostering Participation in EWRR Partner Groups. Encourage all relevant local, state, and Federal agencies to participate in local, state, and regional early warning partner groups.
VI. RAPID ASSESSMENT

Once a new plant has been identified and then verified as a new state, regional, or national record, a rapid assessment will be undertaken to determine its potential threat to different habitats and its appropriate state and Federal regulatory status. Rapid assessment determines what should be done and how to do it.

Goal 1: Ensure accurate and reliable science-based rapid assessments of verified new plants.

Objective 1: Conduct ecological assessments to determine the potential invasiveness of verified new plant species in the U.S.

Action 1: Development of Protocols for Biological Assessments. Conduct a workshop to develop a Protocol for Conducting Biological Assessments for use in evaluating new national plant records for invasiveness, as well the habitats they might invade.

Action 2: FICMNEW Early Warning Technical Advisory Group. Establish a FICMNEW Early Warning Technical Advisory Group (FEWTAG) under the FICMNEW Early Warning Committee. FEWTAG would conduct biological assessments of verified new national plant records, and would assist state partner groups in conducting biological assessments of new state plant records upon request. FEWTAG would share its results with the APHIS New Pest Advisory Group (NPAG), and with interested/impacted state partner groups. FEWTAG would include weed specialists from a variety of local, state, and Federal agencies, and NGOs, as appropriate.

Objective 2: Determine the appropriate state and Federal regulatory status of new state and national plant records.

Action 1: Federal Regulatory Weed Risk Assessments. The APHIS New Pest Advisory Group (NPAG) will conduct regulatory risk assessments of all new national plant records.

Action 2: State Regulatory Weed Risk Assessments. Impacted state partner groups will conduct state level regulatory risk assessments of new state and national plant records.

Action 3: Information Exchange. Establish a mechanism for regular exchange of information between the APHIS New Pest Advisory Group, FEWTAG, and state invasive species partner groups to share ecological assessment information – to avoid maximize resources, and to avoid duplication of effort.

NOTE: An ecological assessment deals solely with evaluating the biological characteristics of a species to determine if its potential invasiveness is ecologically significant. A regulatory assessment combines an ecological assessment with distribution information to determine if a new plant is quarantine significant and could be regulated as a state or Federal Noxious Weed. Quarantine significant pests are species that are deemed to be invasive and either do not occur in the state/country, or are of limited distribution in the state/country.
**Objective 3:** Develop standardized approaches for determining appropriate regulatory and management actions that should be taken against new invasive plants.

**Action 1: Action Classification System.** Develop an action classification system for confirmed new invasive plants that is based on potential invasiveness in particular habitats, distribution, and recommended regulatory action category.

**Action 2: Database of Completed Assessments.** As new plant species are assessed for invasiveness and regulatory status, develop a web-based Database of Pre-assessed Invasive Plants, for use by administrators and decision-makers.

**Action 3: Information Sharing between APHIS, FICMNEW, and State Partner Groups.** Encourage the APHIS NPAG, FICMNEW Early Warning Technical Advisory Group, and impacted state partner groups to share weed assessment information – to avoid maximize resources, and to avoid duplication of effort.

**Objective 4:** Develop regional expertise to provide technical support to early warning partner groups in conducting rapid assessments.

**Action 1: Regional Interagency Technical Support Teams.** Establish Regional Interagency Technical Support Teams to provide on site and distant support on rapid assessment initiatives.
VII. RAPID RESPONSE

Once a rapid assessment has been completed, and action is recommended, impacted landowners and appropriate public officials will be organized to mount an on-the-ground campaign against the invader. Rapid response is where action is taken quickly to contain, deny reproduction, and, if possible eliminate the invader.

Goal: Ensure rapid response to verified new infestations.

Objective 1: Foster the development of local, state and regional capabilities for rapid response.

Action 1: Generic Rapid Response Plans. Develop generic rapid response plans that can be modified for use by local, state, and regional partner groups. Post generic plans on the Early Warning and Rapid Response Website.

Objective 2: Develop regional expertise on rapid response methods and procedures.

Action 1: Regional Interagency Technical Support Teams. Develop Regional Interagency Technical Support Teams to provide on site and distant support on rapid response initiatives. Team members will be designated from existing Federal and state positions, at the discretion of host agencies.

Objective 3: Development improved systems and approaches for identify biologically sound management options and priorities.


Action 2: Early Warning Partner Group Listserv. Develop an early warning partner listserv for sharing knowledge and management experiences in addressing new invasive plants (local, state, and regional interagency early warning partner groups; the same listserv mentioned in Element III, Objective 1, Action 2).
VIII. INFORMATION MANAGEMENT AND RESEARCH

A tremendous amount of information has been developed on invasive species over the past several decades. Putting this information in the hands of land owners and responsible officials through a distributed, web based information management system (a system that connects otherwise independent online plant databases) will give them the knowledge and tools needed to mount an effective and proactive campaign against a new invader.

Goal: Facilitate development of web based information management systems for providing easy access to information on new invasive plants.

Objective 1: Foster the development of a web based distributed information system (comprised primarily of existing online databases) that provides readily accessible information on the taxonomy, distribution, ecology, biology, classification (regulatory and ecological), impacts, and management of known and potentially invasive plants.

Action 1: Encourage information sharing between regional, national, and global plant databases such as:
- Aquatic Nonindigenous Species Database (U.S. Geological Survey)
- IUCN Invasive Species Database (Invasive Species Specialist Group, World Conservation Union)
- Invaders Plant Database (University Of Montana)
- Invasive Plant Atlas Of New England (U-CONN)
- Inter-American Biodiversity Information Network (IABIN)
- National Agricultural Pest Information System (NAPIS) (USDA Animal And Plant Health Inspection Service)
- USDA PLANTS Database (USDA Natural Resources Conservation Service)
- Southwestern Exotic Mapping Program (SWEMP) (U.S. Geological Survey)
- BLM, Forest Service, and other Federal or state databases, as appropriate.

Action 2: North American Biodiversity Information Network. Foster development of the North American Biodiversity Information Network (NABIN) to link and integrate existing plant databases through a central, searchable Internet gateway.

Action 3: Early Detection Module in the USDA PLANTS Database. Develop an Early Detection Module within the USDA PLANTS database with information on new invasive plants, as well as information about and links to the National Early Warning and Rapid Response System for Invasive Plants.

Action 4: Early Warning Partner Group Listserve. Develop an Early Warning Partner Listserve for sharing knowledge and management experience relevant to new invasive plants (same listserve as listed in Element III, Objective 1, and Action 2).
Objective 2: Establish electronic mechanisms to assist the public in learning about the Early Warning System, and in reporting suspected new invasive plants.

**Action 1: Establish an Early Warning System Toll Free Number** for reporting of suspected new plants, and for providing state contact information.

**Action 2: Develop an Early Warning System Website.** The toll free number and the website will be maintained by the office of the National Early Warning Coordinator.

Objective 3: Provide/Develop state of the art technologies to ensure continued effectiveness and efficiency of all system elements.

**Action 1: Research Needs.** Identify early warning and rapid response research needs.

**Action 2: State of the Art Technology for Early Warning and Rapid Response.** Encourage partner agencies such as the USDA Agriculture Research Service, and the USGS Biological Resources Division to provide state of the art technologies for early warning and rapid response activities such as remote sensing, geospatial analysis, GIS, and management.
IX. E-COMMERCE IN INVASIVE PLANTS

A new mode of spread of invasive plants is through e-commerce. Monitoring of websites that sell regulated noxious weeds and other invasive plants of concern is an important tool in preventing the spread of invasive species.

Goal: Monitor the sale of invasive plants via the Internet.

Objective 1: E-Commerce Monitoring System. Cooperate with appropriate agencies to develop a web-based system for monitoring the sale of invasive plants via the internet.

  **Action 1: Interagency E-Commerce Monitoring Working Group.** Establish an Interagency E-Commerce Monitoring Working Group to develop and implement the proposed system.

  **Action 2:** Develop a **Database of Online Plant Sellers.**

  **Action 3:** Develop a **Database Of Regulated Noxious Weeds And Other Invasive Plants Of Concern.**

  **Action 4:** Develop a **Dedicated Web Crawler** (search engine) to use in monitoring designated websites that sell recognized invasive plants.

  **Action 5:** **Reporting to Appropriate State and Federal Agencies.** Provide information on plants of concern being sold via e-commerce to appropriate state and Federal agencies.

  **Action 6:** **Notification of Sellers.** Inform sellers of regulated noxious weeds and other invasive plants of concern about the impacts of selling (spreading) such species. The system will be set up to automatically inform sellers that they are offering regulated noxious weeds and other invasive plants via the Internet.
X. PUBLIC OUTREACH AND AWARENESS

Since only a small percentage of the population is actively engaged in agriculture and land management, it is vital to bring the message about the threat of invasive species to the American people. Success of our current environmental protection programs is due in large part to a well-informed and supportive citizenry.

Goal: Increase public awareness and understanding of the need for early detection, rapid assessment, and rapid response to new invasive plants.

Objective 1: Develop new outreach strategies.

Action: National Media Campaign on Early Warning. Develop a media campaign to raise general awareness of the problem, and the Early Warning System.

Objective 2: Develop new educational resources for early warning and rapid response.

Action 1: Directory of Specialists. Identify and develop a directory of specialists who can provide information on new species for use in development of weed alerts and other early warning literature.

Action 2: Outreach Multipliers. Develop posters, pamphlets, fact sheets, brochures, and etc., that can be used as outreach multipliers to reach the general public through sport/recreation retailers, horticultural plant distributors, national and state parks, national forests, and etc.

Action 3: Volunteer Training and Certification. Develop training modules on early warning and rapid response for volunteer organizations, wild flower societies, native plant societies, environmental groups, and etc.

Objective 3: Publicize the National Early Warning System.

Action 1: Seminars. Provide seminars and presentations on the system to scientific groups.

Action 2: Articles. Publish articles on the system in magazines and journals.

Action 3: Documentary. Produce a documentary on the system.

Action 4: EWRR System Website. Develop a system website that includes links to all state and local early warning partner groups.

Action 5: Presentations. Talk to community groups, garden clubs, hiking clubs, schools, and etc.

Action 6: Volunteer Weed Watch Groups. Establish volunteer weed watch groups.
XI. INTERNATIONAL COOPERATION AND DEVELOPMENT OF A GLOBAL EARLY WARNING SYSTEM

Since the majority of our invasive species originated in other countries, it is imperative that we begin to explore ways to minimize the global spread of invasive species – including spread of invasive plants from the U.S. to other countries. Ultimately partnering at the international level will improve the effectiveness of our national early warning system here.

Goal: Cooperate with international agencies and organizations to develop early warning and rapid response capabilities in other countries.

**Objective 1: Development of a North American Early Warning System.** Facilitate the development of a North American plan for early warning and rapid response in cooperation with responsible agencies and organizations in Canada and Mexico (e.g., North American Commission for Environmental Cooperation).

**Objective 2: Technical Assistance to other Countries.** In cooperation with international organizations such as the Global Invasive Species Program (GISP), provide technical assistance to other countries in development of early warning and rapid response systems including information management and taxonomic capabilities.

**Objective 3: Global Outreach and Awareness Effort.** In cooperation with international organizations such as GISP, develop a plan for conducting an global education and awareness campaign on the need to strengthen national and global capabilities for early warning, rapid assessment, and rapid response.

**Objective 4: Connection of the EWRR System to Global Trade Initiatives.** Explore ways to tie early warning and rapid response issues to major trade initiatives such as NAFTA and GATT.

**Objective 5: Sharing of Information with International Partners.** Develop protocols for information sharing on new and emerging invasive plants, including e-commerce in species of concern, with agencies in designated partner nations.
XII. SYSTEM FUNDING

As envisioned, the proposed system will serve to link together numerous agencies and organizations that already exist. However, resources are needed to provide a national coordination capability and to fund projects that cannot be totally sponsored by local, state, and regional sources.

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Goal: Ensure adequate Federal funding to support the infrastructure and projects of the National Early Warning System.

Objective 1: System Infrastructure Support. Develop a mechanism within the lead department to provide funding for system coordination and support elements.

Action: Develop a budget within the lead department to provide funding for system coordination and leadership.

Objective 2: System Project Funding. Develop a mechanism to provide support for system projects.

Action 1: Federal Cost Share Program for EWRR Projects. Develop a Federal interagency program to provide cost share funding for local and state partner projects.

Action 2: The FICMNEW National Early Warning Committee will review and recommend funding of selected field project proposals.
XIII. PHASED DEVELOPMENT OF THE NATIONAL EARLY WARNING SYSTEM

It will take some time to work out all of the unforeseen glitches in the proposed system. However, with commitment, a nationwide early warning and rapid response system could be fully operational within five years.

Goal: Develop and implement the proposed National Early Warning and Rapid Response System on a nationwide basis within 5 years.

Objective 1: Implement the system on a limited basis.

   Action: Two Year EWRR Pilot Project. Conduct a two-year pilot project in a few key states that already have organized partner groups.

Objective 2: National Implementation within Five Years. Based on the results of the pilot project, expand the system, per available funding, to include more states until a nationwide program is established within five years.
Associated Websites.


Bureau of Land Management (BLM)  <http://www.blm/weeds.gov/>

Center for Integration of Natural Disaster Information (CINDI) (U.S. Geological Survey)  
<http://cindi.usgs.gov/>


Council on Environmental Quality (CEQ) <http://www.whitehouse.gov/ceq/>


FICMNEW Early Warning Workshop Proceedings  
<http://refuges.fws.gov/FICMNEWFiles/FICMNEWHomePage.html>

Flora of North America Project <http://hua.huh.harvard.edu/FNA/>

Giant Salvinia (*Salvinia molesta* D.S. Mitchell) Fact Sheet and Distribution Map  

Global Invasive Species Program (GISP)  <http://jasper.stanford.edu/GISP/>

Integrated Taxonomic Information System (ITIS)  <http://www.itis.usda.gov/>


Natural Resources Conservation Service  <http://www.nrcs.usda.gov/>


North American Weed Management Association (NAWMA)  <http://www.nawma.org/>

Plant Databases (Web Based)
- AQUATIC NONINDIGENOUS SPECIES DATABASE (U.S. Geological Survey)  
<http://nas.er.usgs.gov/>
- GLOBAL INVASIVE SPECIES DATABASE (Invasive Species Specialist Group, World Conservation Union)  <http://www.issg.org/database/welcome/>
- GLOBAL INVASIVE SPECIES PROGRAMME  
- INTER-AMERICAN BIODIVERSITY INFORMATION NETWORK (IABIN)  
<http://www.iabin-us.org/index.html>
- INVADERS Plant Database (University of Montana)  
<http://invader.dbs.umt.edu/>
- INVASIVE PLANT ATLAS OF NEW ENGLAND (U-CONN)  
<www.eeb.uconn.edu/invasives/ipane>
- NATIONAL AGRICULTURAL PEST INFORMATION SYSTEM (NAPIS) (USDA Animal and Plant Health Inspection Service)  <http://www.ceris.purdue.edu/napis>
- PLANTS Database (USDA Natural Resources Conservation Service)  <http://plants.usda.gov>

United States Department of Agriculture (USDA)  <http://www.usda.gov/>

United States Department of the Interior (DOI)  <http://www.doi.gov/>

United States Environmental Protection Agency (EPA).  <http://www.epa.gov/>


United States Geological Survey (USGS)  < http://www.usgs.gov/>

USDA Agriculture Research Service  <http://www.ars.usda.gov/>

USDA Forest Service (FS)  <http://www.fs.fed.us/>

USGS Biological Resources Division  <http://biology.usgs.gov/>

FICMNEW Contact Information.

For more information about The Federal Interagency Committee for the Management of Noxious and Exotic Weeds, or this report, contact the current Co-Chairs:

Mike Ielmini
U.S Fish and Wildlife Service  
Division of Refuges  
4401 N. Fairfax Drive  
Arlington, VA 22203  
(703) 358-2340  
E-mail: Michael_Ielmini@fws.gov

Gina Ramos
Bureau of Land Management  
1620 L Street, N.W.  
Washington, D.C.  
(202) 452-5084  
E-mail: Gina_Ramos@blm.gov