

**Plant Conservation Alliance
Alien Plant Working Group (APWG)**

An Action Agenda for Invasive Plants

Report from 1999 workshops held January 12 and 13 as part of the
Native Plant Conservation Initiative Meeting, January 11-15
at the Lady Bird Johnson Wildflower Center in Austin, Texas

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Case Statement

Invasive non-native¹ plants and other organisms are destroying America's natural history and identity. These unwelcome invaders are disrupting natural ecosystems throughout the US, replacing and eliminating native species and greatly reducing our nation's unique and diverse biological resources. America's problem with invasive plants is a mostly unintended result of the introduction of exotic species from around the globe to every corner of the nation—for landscaping, erosion control, range forage and other uses.

Exotic plants, free from the complex array of natural controls present in their native lands (including herbivory, parasites and pathogens), may experience unrestricted growth when introduced to new environments. Many exotics introduced to the US have escaped the bounds of their intended planting sites and now are established over extensive areas. To date, more than 900 species of invasive, non-native plants have been identified as a threat to non-native ecosystems and natural areas in the US. It is these *invasive* exotic species, with their capacity to overwhelm and displace US indigenous flora and fauna, that are the concern of the Alien Plant Working Group and this Action Agenda.¹

Some of the known impacts of invasive plants include extinction and reduction of endangered and threatened species and their habitats; loss of native sources of food and shelter for indigenous insects, birds, and other wildlife; disruption of native plant-animal associations (*e.g.*: pollination, seed dispersal and host-plant relationships); alteration of ecological processes such as plant succession; alterations to the frequency and intensity of natural fires; hydrological changes and other significant ramifications. Invasive species also cause great economic damage each year in the form of crop, forage, and timber losses, and require large annual expenditures for weed control.

Mission

The mission of the Alien Plant Working Group is to promote the conservation and restoration of native plants and natural ecosystems by preventing the use and introduction of invasive species and by removing invasive plants from natural areas. The APWG is addressing these goals by gathering information on invasive species that affect natural areas in the US; sharing this information with the public, land managers, scientists, researchers and policy makers; supporting regional and local invasive plant management efforts, and forming local to international partnerships. Areas of focus identified by the workshop participants are in line with those identified by the National Invasive Species Council (or NISC, an executive committee established through President Clinton's Executive Order 13112), and include the following categories: policy and guidelines, research, information management, on-the-ground management, outreach and education, resources and training, communication, networking and partnerships, and funding.

POLICY AND GUIDELINES

Outcome 1.

Invasive, non-native species are no longer used for landscaping, restoration, wildlife habitat enhancement, range-land forage and other purposes, except where situations indicate there would be no likely movement of the plant, or its reproductive parts, to a natural area or to the environment at large.

Actions:

1. Prohibit use of invasive, non-native species for landscaping, restoration, wildlife enhancement, range-land forage or other purposes at local, regional, state and national levels.
2. Require and encourage the use of native and non-invasive species in landscaping, restoration, wildlife habitat enhancement, range-land forage and other purposes.
3. Develop guidelines for the use of native and non-invasive species for landscaping, restoration, wildlife enhancement, range-land forage and other purposes.
4. Develop incentives for land managers, farmers, ranchers, homeowners and others to control and discontinue the use of invasive species and to use native and non-invasive species.

Outcome 2.

Known or probable invasive, non-native species are no longer imported nor introduced into the US.

Actions:

1. Develop national policy to implement standards for invasiveness testing, in coordination with researchers and the National Invasive Species Council (NISC).
2. Develop a national certification program for non-invasive species.
3. Develop policies that prohibit the importation and introduction of species that have a likelihood of becoming invasive in the US and that have not been certified as non-invasive.

Outcome 3.

Biological control agents used against non-native invasive plants are specific to the target pest plant, and naturally occurring biological controls are encouraged.

Actions:

1. Develop adequate safeguards to ensure that non-native control agents for invasive plants are specific to the target plant, and do not harm native species.
2. Where appropriate, encourage naturally occurring biological controls, such as herbivores and pathogens, that develop on invasive, non-native plants.

Outcome 4.

Known invasive species are no longer exported from the US, nor transported within the US, to locations where there is a likelihood that they will become invasive.

Actions:

1. Develop a national policy to ensure that species with known invasive characteristics are not exported from the US to other countries where they are likely to become invasive.

2. Develop a national policy to ensure that species native to one part of the US are not transported to other parts of the country where they are likely to become invasive.

Outcome 5.

Known invasive species are no longer sold or promoted by the horticultural industry, or others, for use in parts of the country where they are known to be, or are likely to become, invasive.

Actions:

1. Develop laws at all levels that prohibit the propagation and sale of known invasive species in areas where they are, or are likely to become, invasive.
2. Develop incentives for the horticultural industry to market native species and species certified as non-invasive.

Outcome 6.

National, state and local policies fully address the need to control non-native invasive species, including species long-established in the US.

Actions:

1. Analyze and identify gaps in existing policies and regulations on the control of invasive species.
2. Create enforcement options to prevent known invasive plant species from spreading beyond infested areas.
3. Incorporate National Environmental Protection Act (NEPA) process into proposed invasive plant management plans.

RESEARCH

Outcome 1.

Research initiatives effectively address the threat of invasive alien plants.

Actions:

1. Identify research needs for invasive plants of natural ecosystems.
2. Determine research priorities.
3. Develop invasiveness testing procedures and standards.
4. Identify native substitutions for plant species used for forage, landscape and restoration plantings, wildlife habitat enhancement and other purposes.
5. Develop criteria for determining the invasiveness of a species based on qualitative characteristics and quantifiable evidence.
6. Consider researching cause and effect relationships of invasive plants.

INFORMATION MANAGEMENT

Outcome 1.

Agencies and organizations achieve consensus on terminology and come to endorse and use common definitions for words including: “alien,” “exotic,” “invasive,” etc.

Actions:

1. Form a panel to review existing definitions (*e.g.*: those used in Executive Order 13112), develop consensus definitions, and make recommendations for adoption.
2. Create or find a term for describing a species that becomes invasive within its native range.

Outcome 2.

A national web site provides information on invasive species, including distribution, invasiveness, control, native substitutes, etc.

Actions:

1. Support continued development of PCA-APWG projects including:
 - A. Web page “**Weeds Gone Wild: Alien Plant Invaders of Natural Areas**” <http://www.nps.gov/plants/alien> and its following components—
 - Background information (terminology, statement of the problem, and how individuals can help);
 - Database of invasive plants of natural areas (Natural Area Weeds Database);²
 - Fact sheets (include information such as native origin, description, ecological threat, distribution, habitat, management, alternative plants, links to experts);
 - Internet links to information sources, organizations and partners;
 - Publications, press releases, meeting notices, etc.
 - B. Regional invasive plant control manuals (*e.g.*: Weed Busters Handbook for the mid-Atlantic region).
 - C. Regional invasive plant training program for volunteers (*e.g.*: Weed Buster’s Training and Certification Program).
 - D. Slide presentation(s) on invasive plants.
 - E. World Wide Weed Web (Weed Web) global directory of invasive species partners.
2. Continue to develop and update link exchanges to relevant web sites.
3. Support and coordinate with other web-based efforts focused on invasive plants that affect natural ecosystems, combining efforts where beneficial.

Outcome 3.

Information on invasive plants is compiled and accessible to land managers, the scientific community, the plant industry and the public—both electronically and as hard copy.

Actions:

1. Compile publications and other information on invasive species.
2. Make publications and other information available on the national invasive species web site.
3. Ensure that research results and other new information, such as Early Warning System (EWS) announcements, are readily accessible to all users.³

4. Identify information gaps and make recommendations for addressing these.
5. Explore the creation of a physical repository for print materials on invasive plants.

Outcome 4.

National, regional and state lists of invasive plants are compiled and prioritized according to criteria developed by scientists and researchers.

Actions:

1. Build upon resources like the PCA national database of invasive plants of natural areas (Natural Area Weeds Database), which includes invasive plant species identified by Exotic Pest Plant Councils, The Nature Conservancy, state natural resource offices, and other relevant sources.
2. Ensure that species included on lists meet criteria for non-invasiveness, as developed by the research community.
3. Adopt and employ invasive plant ranking criteria, such as the system being developed by The Nature Conservancy, to determine national invasive plant priorities.

ON-THE-GROUND MANAGEMENT

Outcome 1.

Invasive plant control project managers, the public, and others, are aware of the importance of preventing the introduction and spread of invasive plant species to non-infested areas.

Action:

1. Develop guidelines for preventing the spread of invasive plant species between infested areas or other sources to non-infested lands of all types, including parks, preserves, refuges, recreational lands, range lands, national forests, roadways, etc.
2. Encourage creative solutions to prevent the spread and introduction of invasive plants on public and private lands by hikers, campers, cyclists, snow-mobile and other motorized-vehicle users, fire suppression teams, and others.
3. Ensure that prevention is an integral part of approved integrated weed management plans.

Outcome 2.

Invasive plant control projects employ Integrated Pest Management (IPM) practices and comply with environmental regulations.

Actions:

1. Incorporate IPM methodologies into the development of invasive plant control projects, using established policies and protocols.
2. Ensure compliance with environmental regulations such as the National Environmental Policy Act (NEPA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), etc., when developing and implementing invasive plant control projects.

Outcome 3.

Invasive plants are controlled and monitored to achieve long-term restoration of natural areas.

Actions:

1. Establish a reliable methodology for monitoring and evaluating invasive plant control projects using, for example, the Bureau of Land Management's technical reference: *Measuring and Monitoring Plant Populations*.
2. Develop measures to ensure that lands not included in invasive plant control projects are surveyed for the occurrence of invasive species and are considered for control as needed.
3. Ensure that new occurrences of invasive species are documented and considered for inclusion in control plans, and reported to the Early Warning System (EWS)-where necessary
4. Support the development of a national program to measure annual changes in invasive plant populations, for example a "no net increase" program, similar to the national "no net loss" program for tracking wetlands.

OUTREACH AND EDUCATION

Outcome 1.

Widespread awareness of invasive species issues reaches the general public, educators, the horticultural industry, the news media, land managers and policy-makers.

Actions:

1. Advertise the invasive plant list serve for information exchange.
2. Widely advertise invasive plant educational materials through APWG's "Weeds Gone Wild" web pages.
3. Ensure that public education programs emphasize the importance of prevention in invasive plant control efforts.
4. Identify audiences that are uninformed about invasive plant issues and take steps to reach them.
5. Explore effective means for distributing APWG and other print materials on invasive plants.
6. Ensure that information about invasive species is included in PCA publications and speakers' bureau presentations.
7. Create a major national campaign to address invasive plant issues through such features as a popular slogan, a mascot (like Australia's "Woody the Weed"), etc.
8. Promote the institutionalization of a national "Weed Awareness Week" and "Weed Busters Day."
9. Develop a "news to use" service for editors of internal newsletters at corporations, partnering organizations, etc., to provide "drop in" articles and graphics on invasive plant issues.

Outcome 2.

Invasive species projects capture attention and draw participation from a wide cross section of the national population.

Actions:

1. Advertise and promote incentive programs to reward home owners, land owners, developers and others for controlling invasive plants and reestablishing native species on their properties (*e.g.*: PCA award certificates, “Weed Buster” awards, etc).
2. Explore new outreach incentives like invasive plant “posses” and “bounties” to involve the public in the control of invasive plants.
3. Promote an adoption system for natural areas, parklands, highways, schools, backyards and other lands in need of invasive plant management (similar to various anti-litter “adopt a highway” initiatives).

Outcome 3.

Invasive plant education efforts are incorporated into relevant public programs and curricula.

Actions:

1. Coordinate education efforts with state cooperative extension service agencies, native plant societies, garden clubs, conservation organizations, the academic community and others.
2. Ensure that invasive plant educational content includes information about the ways in which agriculture, forestry, ranching, landscaping, roadway construction, home-building and other land-development practices cause and contribute to the invasive plant problem.
3. Ensure that new information about invasive plants, reported by researchers and scientists, natural resource managers and others, is accessible to Weed Web partners and the public.

Outcome 4.

Information about invasive species and their control is included in plant science classes at all levels, as well as in the curricula of other relevant programs such as landscape architecture, community planning, etc.

Actions:

1. Work with national education organizations such as the National Science Teachers Association (NSTA), the National Science Education Standards Center (CCE), the North American Association for Environmental Education (NAAEE), the National Academy of Science and other such organizations, along with major science textbook publishers, to develop educational curricula on invasive species for primary, secondary and higher education.
2. Explore opportunities to work with the Association of Governing Boards of Universities and Colleges, and with boards of regents at land grant colleges and other institutions offering programs in horticulture, landscape architecture, community planning and agriculture, to ensure inclusion of invasive plant issues in the curricula of these major fields of influence.
3. Develop invasive plant teaching tools for educators at all levels.

4. Develop self-instructive teaching tools and games (both computerized and non-computerized) on invasive plants for children and adults.

RESOURCES AND TRAINING

Outcome 1.

Training as well as supply of personnel—staff, contract labor and volunteers—is sufficient to achieve invasive plant management goals.

Actions:

1. Provide invasive plant training workshops for organizations such as cooperative extension agencies (*e.g.*: Master Gardeners and Master Naturalists), botanic gardens, garden clubs, etc.
2. Provide training for natural resource managers, maintenance staff, and others, on invasive plant identification and control.
3. Support implementation and expansion of national programs, such as the National Park Service’s Exotic Plant Management Teams (EPMT).
4. Support the development of volunteer invasive plant control groups, for example, a National Weed Corps, the PCA “Weed Busters” force, etc.
5. Find ways to engage other groups, such as non-violent offenders, in invasive plant control projects.

COMMUNICATION, NETWORKING & PARTNERSHIPS

Outcome 1.

Communication is effectively established between traditional (natural resource fields) and non-traditional (horticultural industry, botanical gardens and arboreta, landscape architects, etc.) partners.

Actions:

1. Establish an Internet-based list serve and formalize communication among Weed Web partners.
2. Continue to develop and expand the APWG’s World Wide Weed Web (Weed Web) to identify all existing and potential partners for inclusion in national invasive species efforts.
3. Identify committed “point person” for each institution or organization on the Weed Web.
4. Ensure that nursery industry professionals and others working outside the field of natural resources are invited to participate in invasive plant meetings, work shops and events organized by natural area partners.

Outcome 2.

Nursery industry, arboreta, seed trade associations and others involved with importation, marketing and distribution of plant materials become leaders in developing responsible importing, testing, sales and marketing practices and in

educating the public about the negative impacts and costs of invasive exotic species.

Actions:

1. Work to remove highly invasive plants from market regions where they would be disruptive to natural area ecosystems.
2. Develop local or regional market area lists for native plant substitutes and certified non-invasive plants.
3. Develop guidelines for gardeners and landscapers on the control of invasive species.
4. Develop and adopt a code of ethics regarding use, trade or sale of invasive species (like the North Carolina Botanical Garden's "Chapel Hill Thesis and Challenge").

Outcome 3.

An Early Warning System (EWS) provides urgent communication Weed Web partners about newly detected invasive species occurrences.

Action:

1. Connect with and support ongoing efforts by the federal government and others to develop and implement an EWS (Early Warning System) for invasive species:
 - A. Review existing methods for other national alert systems, such as those in use for severe weather alerts.
 - B. Establish procedures to ensure correct identification (*i.e.*: specimen vouchers; DNA testing, etc.) of plants announced through the EWS.

Outcome 4.

An Early Warning System (EWS) provides urgent communication to land managers about detected locations of highly invasive species in the US (at various points of entry, and elsewhere) and about their level of threat.

Action:

1. Connect with and support ongoing efforts by federal government and others to develop and implement an EWS (Early Warning System) for invasive species.
 - A. Review existing methods for other national alert or warning systems (*e.g.*: weather);
 - B. Establish procedures to ensure correct identification (*i.e.*: specimen vouchers; DNA testing, etc.) of plants announced through the EWS.

FUNDING

Outcome 1.

Adequate funding exists to accomplish invasive plant management, research, outreach and educational goals.

Actions:

1. Secure congressional appropriations.
2. Identify and pursue private funding sources for invasive species projects.
3. Maximize cost shares for invasive plant projects by seeking cooperative agreements and other fiscal arrangements with partners.

4. Create and facilitate partnerships to share resources for invasive plant efforts.
5. Periodically reassess use of existing funds for invasive species projects and redirect to higher priorities where appropriate.
6. Ensure that appropriate foundations and institutions are informed about the resource needs and funding priorities for invasive plant management, research, outreach and education. ☸

Footnotes

¹Definitions

The following definitions are consistent with those developed by the President's Invasive Species Council and Executive Order Number 13112 on Invasive Species, dated February 3, 1999.

^{1a} A native or indigenous species is one that occurs in a particular place (e.g., habitat and ecosystem) as a result of natural forces, exclusive of human actions. Species native to the US and other parts of North America are generally recognized as those occurring on the continent prior to European settlement.

^{1b} Non-native (alien, exotic, non-indigenous) species are those that exist at a site as a result of direct, indirect, accidental or intentional human actions. This term can be used to describe a species introduced to the US from another country or continent as well as a US native species that has been introduced to a part of the US outside of its known natural range.

^{1c} An invasive species is one that has the capacity to grow and spread rapidly, establish over large areas, and become dominant.

²Swearingen, J. Natural Area Weeds Database, 2000. A draft in process for the Plant Conservation Alliance, Alien Plant Working Group. Located at US National Park Service, National Capital Region, office of Jil M. Swearingen, IPM Coordinator.

³See APWG Action Agenda category Communication, Networking and Partnerships, Outcome 3 and Outcome 4.

☸ APWG Action Agenda stops here