

## **EXECUTIVE SUMMARY**

### Communication, Education and Outreach Working Group

Human activity drives the introduction and spread of invasive species, and strategies to stem these invasions must focus largely on modifying human behavior. Central to any attempt to change people's behavior is the implementation of an effective communication, education, outreach (CEO) strategy, and therefore the National Invasive Species Management Plan must include a sound CEO component .

The communications strategy must reflect ISAC's guiding principles and result in action by the target audience. It should be based on a clear set of objectives and a well-researched understanding of the people it hopes to engage.

The approach for implementing a carefully targeted, results-oriented program is commonly referred to as "social marketing." The proposed program would establish guidelines and training in social marketing that would help shape local, state, national and international campaigns. This component would include quantitative measures to gauge progress and should be initiated as soon as possible. In general, the CEO campaign must convey the breadth of the impact of invasive species on people's lives and values as well as the concept of protecting biodiversity and natural habitats. This message must elicit action from all stakeholders.

As the CEO strategy develops, certain important target audiences and campaigns to reach them will emerge. This report identifies several potential audiences including the general public, K-12 and university students, the plant-buying public, the maritime industry, and policymakers. The speed and effectiveness of program implementation can be enhanced by tying into existing governmental and private sector CEO efforts. An assessment of existing efforts should be a high priority. Effective programs should be coordinated, supported, expanded, used as models, and complemented by new CEO initiatives. Above all, for the CEO program to succeed, it must be assured of a long-term commitment of funding, staffing, and appropriate infrastructure since the threat of invasive species will be here forever.

## **Scoping Statement**

### **Communications, Education and Outreach Working Group**

Human activity is at the core of invasive species introductions and spread. All segments of society are affected and all citizens have a stake in stemming these trends. Effective long-term strategies to reduce the risk of invasive species must focus on modifying human behavior through education, outreach, legislation, and enforcement. It is imperative that the National Invasive Species Plan engage the public through an effective communication strategy.

The Communications, Education and Outreach working group believes that an effective national communication strategy on invasive species must:

In its messages:

- Be founded on a clear set of practical invasive species management objectives and a well-researched understanding of the needs, apprehensions, and behaviors of the people it hopes to engage in solutions to invasive species problems;
- Convey the breadth of the impact of invasive species on people's health, safety and quality of life (cost of living, physical comfort, recreational opportunities), their livelihoods, their cultural practices and history, as well as our nation's biodiversity and overall economic productivity. Our messages can not be primarily about saving endangered species or "keeping things the way they were" for aesthetic reasons. The program must reach people who already care about biodiversity and natural resources and those who are more focused on health, safety, productivity, and comfort.
- Complement the communication strategies of other nations and multi-lateral groups addressing this issue.

In its operation:

- Promote the success of the many existing local, regional, and national communications, education and outreach programs in the government and private sectors by building their skills and providing coordination and other support where appropriate.
- Be guided by measurable goals and monitored at regular intervals to adjust the strategy as necessary to achieve those goals.
- Be supported by an ongoing, long-term commitment of funding, staffing, and appropriate infrastructure. We are attempting to address a threat that will be with us forever, and that will continually raise new communications challenges; our response must be designed to evolve with the issue.

This Working Group has limited its work to the scope described above. It has not addressed other communications and education functions that will be necessary within the national invasive species plan, such as coordination of agency plans and operations, training and information sharing among field practitioners, etc. The actions called for below are focused on proactive communication to engage key audiences within the public in the implementation of the national invasive species plan. The working group has not yet addressed the critical communications functions of crisis management, which require special preparation and coordination. Our intention is that the assessment and planning work that drives the national communications strategy described in Issues 1 and 2 will also cover crisis communications.

## Communications, Education and Outreach Working Group Issues

### ISSUE 1

There are many existing invasive species communication, education and outreach programs nationwide. These campaigns range from local to global in scope. To date, a comprehensive assessment of all available resources from existing efforts has not been compiled. It is also unclear which topics are being adequately addressed and what issues are "falling through the cracks." In order to formulate an effective National Strategy, there is a need to inventory and evaluate existing programs.

**Response:** Compile a complete assessment of current invasive species communications, education, and outreach programs to serve as the foundation for identifying, prioritizing and optimizing future efforts.

Such an assessment will lend itself to the eventual development of a centralized system to coordinate, integrate and disseminate information while engaging the public (Guiding Principles #5 and #6) and enhance cooperative relationships among all levels of government and stakeholder groups (Guiding Principle #2).

#### What are the desired outcomes?

A clear understanding of the strengths and weaknesses of existing communication, education, and outreach campaigns dealing with invasive species, and of available market research that can guide future efforts to reach target audiences.

The ability to communicate with these campaigns via a web-based network as the basis for continued knowledge sharing and potential campaign coordination.

#### What is our evidence for achieving them?

We will have a written report that documents the inventory of campaigns and contacts, their strengths and weaknesses, available research, etc., and provides recommendations for maximizing the impact of future campaigns on the invasive species threat.

A web site, with links to other sites, and a list server will be in place to promote communication and coordination among campaigns.

#### Where will the program take place?

This project will be carried out under contract to a private or non-profit marketing or public relations organization, and will be administered by a federal agency designated by the ISAC or Executive Council.

The web-site and list server aspects would be contracted for if necessary, and administered by a federal agency designated by the ISAC.

#### When will the program take place?

As this project is a critical starting point for all subsequent communication, education, and outreach work within the National Invasive Species program, it must be initiated immediately. With whom will we work?

A preliminary inventory of current communication, education, and outreach programs conducted by the ISAC working group will provide initial contact information and program summaries for a number of federal, state and local U.S. programs, and for a few foreign or international programs.

The comprehensive inventory and assessment will build upon this base, drawing partners and a steering committee for the proposed assessment from these contacts.

#### What are the potential challenges to success?

Developing a comprehensive scope of work and request for proposals, and selecting the right contractor will be a critical step and a challenge.

Once the contractor is selected a survey must be designed to engender the fullest possible participation by the targeted programs.

A sampling of these programs must be selected for deeper "case study" and analysis to identify strengths, weaknesses, etc.

#### What resources do we already have?

The required resources for contractors and staff funding must be identified as well as the funding agency.

Members of the Communications/Education/Outreach working group can advise the selected project administrator on the desired products and approaches.

Models being developed by Recreational Boating & Fishing Foundation and utilized by USAID's Greencom program will benefit this project.

#### What additional resources do we need?

Funding

This project should be put out to bid to solicit cost and design proposals.

Champions within each agency and at each level of involvement.

What are the steps to project completion?

Complete the Request for Proposals/Scope of Work.

Select a contractor(s)

Develop specifics of scope of work

Implement workplan and prepare reports

Develop basic web site

Review the draft.

Distribute the final report.

Use the final report to help define the communication/education/outreach program and enhance website links and content.

Lead Agency:

USDA or Dept. of Interior

Cost:

Contract 2 FTE for 6 months at \$80K/FTE to conduct inventory of communications projects: \$80K

Contract web-site and listserve design and start-up to deliver inventory and sustain network of communications projects: \$50K

Total: \$130K

## **ISSUE 2**

Invasive species management programs are often ineffective in part because they fail to engage the actions of key audiences or stakeholders among the general public--i.e., while they may distribute information and even increase public awareness of the invasive species problem, this awareness is not often translated into action that reduces the problem. In many cases this is because the program managers have not clearly identified key actions or stakeholders or set any measures for gauging the impact of their public programs. The necessary approach for implementing more effective public programs is known as social marketing. Examples of issues social marketing can consider include identifying: (1) the most critical target audiences to reach, taking into account the various public and private sectors, including the corporate world, as well as the diversity of cultural backgrounds and languages present in the U.S.; (2) what term or terms best get across the "invasives" concept (e.g. "invasive species," "invasives," "exotic species" "non-indigenous species) and whether there should be more consistency in the use of a limited number of terms by agency representatives; (3) what combination of delivery techniques work best for targeted audiences; and (4) the key actions target audiences can take and how effectiveness of programs is measured.

**Response:** Build the effectiveness of local, state, regional, and national campaigns by establishing guidelines and training for social marketing in invasive species programs.

This program will address the changes in human values, beliefs and behavior that are necessary to alleviate the introduction and spread of invasive species (Guiding Principle #1) and engage the public by targeting the needs of specific audiences (Guiding Principle #5)

### What are the desired outcomes?

- 1) Effective social marketing programs integrated within all national, regional, state, and local level invasive species programs, 2) conducted by members of those teams who have received appropriate social marketing training, 3) supported as needed by a network or central source(s) of professional social marketing support.
- Effective enforcement of and compliance with established national, regional, state, or local invasive species programs.

### What is our evidence for achieving them?

Each national, regional, state, or local invasive species program will be able to clearly articulate their social marketing strategy as part of their strategic plan.

These programs will include quantitative and repeatable measures of public knowledge, attitudes, and practices that can be compared to a baseline to gauge impact toward specified objectives. These can be rolled up into impact reports on a regional and national basis.

### Where will the program take place?

The initiative to establish guidelines and training for social marketing in invasive species programs should be a collaboration among the Departments of Commerce, Interior, and Agriculture, the Academy for Educational Development, and private-sector marketing firms. The administrative home of this program should be determined by the Executive Council.

When will the program take place?

This is a first-priority need of the U.S. invasive species strategy, and so should be launched immediately. It may be useful to approach it as a phased project, with a 6-month first phase focused on completing the project design and enabling partnerships, a 3-year second phase focused on delivering training and establishing measures to a critical mass of national, regional, state, and local programs, and an ongoing, ramped-down maintenance phase to network information and maintain training

With whom will we work?

One of the charges of the ISAC should be to flesh out the lead partners for this initiative (e.g., recruit private sector partners, settle roles among agencies, etc.)

What are the potential challenges to success?

Few invasive species management entities have any experience with social marketing, or even with public awareness campaigns. The learning curve will be steep and may challenge traditional assumptions about staffing needs, priorities, etc. The program may easily undershoot its mission by spending inadequate time on clearly defining its target actions and key stakeholders. Existing funding sources are probably inadequate.

What resources do we already have?

We have a preliminary inventory of current communications programs dealing with invasive species, which will be fleshed out via the actions described under Issue 1 above. The Academy for Educational Development and IUCN's Global Invasive Species Programme have produced a handbook of guidelines for application of social marketing principles to invasive species projects. This will be a valuable basic training tool.

What additional resources do we need?

Direct involvement of private-sector marketing experts.  
Funding.  
Other resources as defined in project design called for below.

What are the steps to project completion?

Phase 1 (6 months)

- 1) Complete the inventory of current communications programs described under issue 1.
- 2) Engage OMB in an audit of current expenditures and sources.
- 3) Establish the partnership of federal, other gov't, non-profit, and private entities that will carry out the project.
- 4) Complete the project design and budget, and obtain Phase 2 funding.

Phase 2 (3 years)

1) Implement the training, networking, and measures programs designed in Phase 1.

- 2) Audit and establish plans and budget for ongoing maintenance program.

Phase 3 (ongoing)

Lead agency:  
USDA or Dept. of Interior

Cost:

Assume OMB audit of existing programs is no cost to this project.  
Also, this audit should be moved into Issue 1 as an adjunct to the inventory.

Contract to form public-private partnership and design the project with these partners, prepare the training materials and curriculum, train the trainers, and provide consulting services on an ongoing basis to the lead agencies carrying out the training:

\$200K for Phase 1 design and start-up, \$100K/year retainer x 3 years for Phase 2 = \$500K (ongoing costs to be determined after Phase 2) Phase 2 staffing: 3FTE shop to sustain network of communications projects, coordinate and maintain training: \$500K/yr for Phase 2 = \$1.5 million (ongoing costs to be determined after Phase 2)

Travel, training assistance, materials development to ensure good participation and technical support for network of communications practitioners: \$500k/yr x 3 years = \$1.5 million (ongoing costs to be determined after Phase 2)

Federal matching funds to promote private, state, local market research for greater communications effectiveness: \$500K fed match to produce \$1 MM match for \$1.5MM annual total. \$500K/yr x 3 years = \$1.5 million

Total: \$5 million federal, \$3 million private/state/local match

**(NOTE— Issues 1 and 2 are considered a high priority and should be implemented before a national campaign can be effectively launched. Issues 3-5 describe elements of a national communications strategy or campaign. There may well be additional elements or more effective ways to combine these elements, as determined in the completed plan called for under Issue 3, Response 1. Additional communication elements may also be identified in the products of other ISAC working groups )**

### **ISSUE 3**

Although there are many existing invasive species communication, education and outreach programs nationwide, the public is largely unaware of the problems associated with invasive species and fails to recognize invasive species as a form of pollution - something that harms the environment and can threaten them personally. The public also has a poor understanding of the pathways of introduction, the hazards associated with introducing new species and is often confused about the risks associated with implementing control measures. Individuals must be able to connect to these problems and solutions on a local level if widespread recognition, successful management and eventual prevention are ever to be realized. (Five responses follow)

**Response #1:** Develop a framework for a national public awareness campaign with emphasis on public/private partnerships. This campaign should recognize that although there are many existing invasive species communication, education outreach programs nationwide, they are poorly-coordinated and often fail to effectively reach many segments of the population.

Through this program, the United States can raise the profile of the invasive species issue, provide leadership in invasive species initiatives (Guiding Principle #2), effectively engage the public (Guiding Principle #5) and provide a centralized system to disseminate information (Guiding Principle #6).

#### **Desired outcomes**

Initiate a coordinated national campaign to educate the general public about the economic and environmental risks associated with invasive species.

#### **What is our evidence for achieving them?**

Public familiarity with the pathways of invasion and the problems associated with invasive species and a shift in behavior.

National Environmental Education Training Foundation conducts an annual Roper survey of public attitudes/understanding of environmental issues. We could use this resource to gauge success.

### Where will the program take place?

Nationwide. The programs could potentially take place in K-12 schools, as educational exhibits at state fairs, sportsman shows, home and garden shows, etc., in national and state parks, museums of natural history, zoos, botanical gardens, highway systems, airports, ports, and on national television.

### When will the program take place?

A national campaign should only be initiated after a comprehensive assessment of available resources is conducted and target audiences are clearly defined. Once these issues have been resolved, the campaign "kick off" will depend on agency commitment, availability of establishing corporate sponsorship/partnerships and securing funding.

### With whom will we work?

Federal, state, and local natural resource agencies, APHIS, Federal and State Departments of Transportation, parks, museums, zoos, botanical gardens, conservation groups, ANS, FICMNEW, the travel industry, commercial air and cruise lines, the media and private corporations. Invasive species are a global problem. It may be advantageous for the United States to link into other National campaigns such as Australia's "Weedbuster Week."

### What are the potential challenges to success?

Conducting and analyzing a national inventory search of education/outreach materials.

Knowing and understanding our audience(s).

Using language and methods to make the issue real and meaningful to the public.

Finding corporate sponsors and/or government agencies willing to provide funding

Coordinating many different federal, state and local agencies, committees and partnerships and coming to a consensus on what should be done and how to get it done. Buy-in at all levels will be essential to the success of this initiative.

Ensuring equal attention is given to all taxa. In the past, most campaigns have either focused on a single species, plants alone, animals alone, or neglected to adequately address one or the other. This effort needs to get

past disciplinary barriers and focus attention on invasive species as a whole.

There may be some credibility issues because some organizations and agencies were/are proponents of introducing some of these species (for ornament, to reduce erosion, create wildlife habitat or improve fishing and hunting).

Gaining support for the invasive species issue from private museums, zoos and botanical gardens.

Within agencies and NGOs, many natural resource professionals and public supporters continue to regard a number of invasive species as desirable wildlife, wildlife habitat and/or landscape material and continue to introduce, plant and preserve them. We need to gain consistency in this message.

Reaching the traveling public. Most travelers fail to appreciate the seriousness of transporting potentially destructive pests on their person or in their baggage.

A national campaign will require a huge amount of coordination to ensure an effective message, adequate distribution and proper presentation.

Finding a high profile spokesperson (champion).

### What resources do we already have?

This Working Group has already conducted a preliminary assessment and produced "Results from a two-week campaign for information concerning past, current, and future education projects on invasive exotic species."

Work through the Association of Zoos and Aquaria to encourage enhancing displays at museums of natural history, zoos and botanical gardens to include a message about invasive species.

The "Adopt a Highway" program is a popular litter control campaign in many states. This program could be built on to include invasive species.

Sections of highway could be kept "Invasive-Free" by local volunteer organizations, scout troops, agencies and businesses. Roadside signs would declare: "This section of highway kept "Invasive-Free" by Scout Troop X..." This would provide several benefits: sections of highway would be maintained invasive-free, the public would feel "ownership" over a local weed problem, and the traveling public would become aware of the problems of invasive species along the nation's roadsides.

Voluntary guidelines (like the "Voluntary Guidelines for Recreational Activities to Control the Spread of Zebra Mussels and other Aquatic Nuisance Species") that give the public clear, concise information on how the public can avoid spreading invasive species.

The APHIS-PPQ "Don't Pack a Pest" message. This message needs a wider distribution to effectively reach the traveling public. International flights should be required to carry this information - explaining why transporting

some material is dangerous - as in-flight material. Travelers could be encouraged to voluntarily surrender (with no risk of penalty) offending materials at their destination point. Travel industry (travel agents, resorts, etc.) should be notified of available materials.

Established national efforts (i.e. Woodsy the Owl and the Lewis and Clark Bicentennial) offer an excellent forum for education and outreach efforts related to invasive species.

### What additional resources do we need?

Build on CEO Working Group efforts and commission a comprehensive inventory of past, existing and planned programs and initiatives and incorporate social marketing program that can identify target audiences and integrate programs.

Lead/Coordinating agency and funding for carrying out surveys and campaign efforts. This agency should pull together an advisory committee that includes Federal, state and local governments, industry and NGOs. Professionals with expertise in public relations should be tapped to help develop these campaigns, especially when there is a controversial (i.e. eradication programs) aspect.

### What are the steps to project completion?

Take stock in existing programs by establishing a lead agency and/or identifying funding for a comprehensive survey of International, Federal, state and local governments, and NGO (past, present and planned) invasive species educational materials. (Issue 1 above).

Initiate a social marketing program to identify target audiences and develop a framework for an effective campaign. This campaign should be integrated at all levels - from international to local, community-based programs. It should consider all taxa equally important. (Issue 2 above)

Lead/Coordinating agency pulls together interagency/NGO advisory committee to work on specific aspects of campaign. This includes making contact with other nations (such as Australia) that already have national campaigns in place.

Develop budget and implementation plan.

Develop a multimedia presentation to "pitch" the project and secure partners and funding

- Establish official partnership and MOUs with corporations, media, NGOs, federal, state and city governments.
- Implement
- Evaluate

Lead agency:

USDA or Dept. of Interior

**Costs:**

Contract for design and materials production, follow-up market research and testing of campaign effectiveness, with contractor working closely with lead agency(ies): \$1 million for design and initial materials preparation. \$500K annual retainer for follow-up market research, testing, consulting to agencies.

Total: \$1 million in year one.  
\$ 500K/year thereafter

**(NOTE—Responses 2-5 describe specific elements of the proposed national campaign. There may well be other major elements that will be identified in a completed national campaign plan. Because these are meant to serve as examples of elements that may be part of a national campaign, no cost figures are provided and lead agencies are not identified.)**

**Response #2:** Formal classroom instruction on the problem of invasive species is largely absent from K-12 curricula. Expand appropriate science-based K-12 classroom curricula to include invasive species information, so that in the long run, the general public's understanding of this important issue will increase significantly.

This program is an example of how to target the needs of a specific audience (K-12) as part of an effort to engage the public (Guiding Principle #5).

What are the desired outcomes?

Elementary school students will be introduced to the idea that some plants and animals actually harm the environment. The majority of high school students will gain a rudimentary understanding of the invasive species issue as part of the basic biological science requirements of a secondary education.

What is our evidence for achieving them?

- Establishment of state guidelines or standards on invasives that school districts can follow.  
Surveys of representative elementary and secondary schools will be conducted periodically to determine which of their classes address invasive species awareness, and what percentages of students take those classes.

Where will the program take place?

Nationwide. Curriculum changes will have to take place within elementary and secondary schools themselves but could be encouraged by outside forces.

#### When will the program take place?

Encouragement for schools to incorporate invasive species elements into their curricula should begin immediately. Actual implementation of the recommendation will likely be a gradual process, and not all schools will adopt the suggestions.

Identify pilot sites where success is likely. Work with school districts in regions that have an obvious problem in the nearby community.

#### With whom will we work?

At the K-12 level, work with National Associations such as the National Science Teachers Association and Association for Supervision and Curriculum Development to develop strategies for adoption.

K-12 schools and school districts need to be shown that this curricula will help them meet National, state and/or local standards.

Textbook publishers, State Departments of Education, local school boards, teachers, scouting and camping organizations.

NGOs. Groups like the Ecological Society of America have already developed programs like the Schoolyard Ecology for Elementary School Teachers.

#### What are the potential challenges to success?

Local school boards play a key role in determining district school curricula. This can't be dictated nationally. There may not be adequate local incentives for substantial changes in curricula at the local school level.

Demonstrating how this curricula will help K-12 schools meet their needs.

#### What resources do we already have?

"Weeds are a Growing Pain" is an educational classroom activity guide on the topic of invasive plant species developed recently by the BLM and other sponsors for use in junior high and high school science classes. Its educational activities are adapted from the more extensive "Montana Weed Project" Teachers Guide.

"Kids Journey to Understanding Weeds."

The Maryland State Department of Education's Service Learning model requires all high school students to perform 25 hours of service learning

per year in order to graduate. This model is well-suited for "hands on" invasive species control projects.

### What additional resources to we need?

Resources that are tailored to issues of regional interest/relevance so that they connect to students' everyday lives.

Materials/resources should be evaluated using the North American Association for Environmental Education's "Environmental Education Materials: Guidelines for Excellence." These guidelines assess materials/resources according to their fairness and accuracy; depth; emphasis on skill building; action orientation; instructional soundness and usability.

Elementary and secondary school lesson plans and curriculum guides. Invasive species programs that might include regional "Traveling Trunks." These packages may include resources like slide shows with corresponding scripts, xeroxable fact sheets, classroom activities, field trip ideas posters/maps, etc. for K-12 students in a region.

More resources like "Weeds are a Growing Pain," the "Kids Journey to Understanding Weeds" and the Service Learning model are needed . Enlist service organizations to conduct action projects for invasive species in their communities. Many schools require students to participate in community service programs.

Authors and publishers of high school science text books will need to play a key role in expanding curricula to include invasive species awareness and management. If the subject is included in the latest texts, it becomes "validated" and will usually be taught in the classroom. Demonstrating that the curriculum correlates with National, state or local standards will increase the chances that this subject will be taught in the classroom.

### What are the steps to project completion?

Conduct survey of current curricula to determine the extent of invasive species issue training offered at all levels.

Evaluate existing materials using the "Environmental Education Materials: Guidelines for Excellence."

Correlate existing materials/resources to National, state and local standards.

Develop teaching plans and other needed material for grades K-12.

Encourage authors and publishers to develop general readers devoted to the issue or a case study of the issue. Interdisciplinary integration of this issue is desirable, particularly at the K-8 level.

Promote materials/resources through conferences, national associations, peer-reviewed journals, trade journals and magazines.  
Conduct periodic follow-up surveys at K-12 schools to determine degree of change in curricula.

**Response #3:** There are few university courses that address the issues and techniques associated with invasive species identification, detection, biology, prevention and management. Develop invasive species curricula and courses for University students seeking degrees in natural resources, landscape architecture, biology, or agricultural disciplines.

This program is an example of how to target the needs of a specific audience (university students) as part of an effort to engage the public (Guiding Principle #5).

#### What are the desired outcomes?

University students majoring in fields of natural resources, landscape architecture, biology, and agriculture will receive broad formal classroom instruction on the identification, detection, biology, prevention and management of invasive plant, insect, vertebrate, and disease pest organisms, in both aquatic and terrestrial environments.

#### What is our evidence for achieving them?

Surveys of representative colleges and universities will be conducted periodically to determine what percentages of their biology, ecology, natural resources, landscape architecture, wildlife, and agriculture curricula address invasive species issues.

#### Where will the program take place?

Curriculum changes will have to take place within colleges and universities themselves but could be encouraged by outside forces. For example, Forest Service, BLM, National Park Service, U.S. Fish and Wildlife Service, Natural Resource Conservation Service, Bureau of Reclamation, and other governmental organizations and private industries that traditionally hire graduates from colleges of natural resources could request that future students complete course work in invasive species management. Identify pilot sites where success is likely. Work with colleges and universities in regions that have an obvious problem in the nearby community.

#### When will the program take place?

Encouragement for schools to incorporate invasive species elements into their curricula should begin immediately. Actual implementation of the recommendation will likely be a gradual process, and not all schools will adopt the suggestions.

#### With whom will we work?

College/University Deans, student environmental organizations.

Federal, state and local governments that are likely to hire invasive species specialists.

Various incentives can be developed to help accelerate the development and implementation of invasive species curricula at universities. For example, private industry sponsors could provide substantial scholarships reserved exclusively for students pursuing an education/career in the field of invasive species .

#### What are the potential challenges to success?

Changing university curricula and coursework requirements generally requires considerable time and expense. This change in curricula should be encouraged across disciplines (agronomy, landscape architecture, fisheries, wildlife ecology, etc.) to ensure all taxa are addressed

Students graduating with specialized courses in invasive species will have to realize a competitive advantage in the job market, or the effort of developing and teaching the new curricula will not be considered worthwhile by colleges and universities.

#### What resources do we already have?

In 1998 a letter drafted by the Chief of USDA Forest Service and Director of USDI BLM was sent to the Deans of most Colleges of Natural Resources in the U.S. asking them to include invasive weed training in their core curricula. This letter could be expanded to include all invasive organisms, and re-issued under the co-signature of the heads of additional governmental agencies and influential NGOs.

#### What additional resources do we need?

Incentives for colleges and universities to provide courses in invasive species identification, detection, biology and management.

Incentives for college/university students to pursue an invasive species tract in their studies.

Private industry financial incentives.

### What are the steps to project completion?

Conduct survey of current curricula to determine the extent of invasive species issue training offered at all levels.

Encourage influential sources to promote inclusion of invasive species segments in college/university curricula.

Initiate strong communication from influential sources to college/university Deans to encourage a broadening and/or strengthening of invasive species curricula.

Identify potential corporate scholarship sponsors (i.e., Monsanto, Dow) and initiate an invasive species scholarship program with participating universities.

Encourage authors and publishers to include invasive species segments in new editions of natural resource, agriculture, and general biological science textbooks. Promote or even commission the development of one or more college textbooks exclusively on the subject of invasive species (perhaps by offering a foundation or corporate sponsored grant).

Promote materials/resources through conferences, national associations, peer-reviewed journals, trade journals and magazines.

Conduct periodic follow-up surveys of colleges and universities to determine degree of change in curricula.

**Response #4:** Millions of people visit our National parks, sanctuaries, refuges and forests annually. Millions more visit state and local conservation lands annually. When visiting another part of the country (or another country all together) it is often impossible for even the nature-loving the public to discern native species from invasive exotic species. Compounding this problem, the public is often confused when they encounter invasive species control efforts that temporarily mar the landscape.

Develop and implement cross-agency invasive species awareness programs based on eco-regions in order to address these issues. Within an eco-region, National, State and local parks, sanctuaries, refuges, preserves and forests often face similar invasive species problems. Species tend (but not always!) to become invasive and disrupt natural communities based on that community/ecosystem type. For each eco-region in the country, major invasive species problems (plant and animal) probably number less than 10.

This public education program will target a list of invasive species based on eco-regional areas. By targeting eco-regions, the development of educational material can be minimized as it will be used across agency boundaries to target users at the Federal, State, county and local level. For example, within the Everglades Protection Area, there are 2 National Parks, a National Preserve, a

USFWS Refuge, and several State and county-managed conservation areas. From the northern Everglades, south to Florida Bay, this ecosystem faces a fairly consistent handful of invasive species problems (i.e., Melaleuca, Lygodium, Asian swamp eel). Regional pilot projects, for example, directed at the Everglades Protection Area, should be emphasized. Products might include fact sheets, radio spots, and videos.

This program is an example of how to build cooperative relationships among Federal State and county governments (Guiding Principle #2) in the development of consistent, integrated, and mutually supportive programs (Guiding Principle #3) to engage the public (Guiding Principle #5).

#### What are the desired outcomes?

- Awareness of the problems associated with invasive species in our National, State and local parks, preserves, refuges, sanctuaries, forests and conservation areas and a general understanding that control measures are necessary to keep these species from destroying our natural resources.
- Increased volunteer efforts to remove, control or reduce the impact of invasive species on conservation lands.

#### What is our evidence for achieving them?

Increased awareness by the general public.

Decrease in complaints from visitors about plant and animal control measures that are being implemented by park staff.

Formation or expansion of volunteer efforts for detecting and controlling invasive species.

An entrance/exit survey will be conducted during the pilot project to evaluate the effectiveness of the messages.

Visitor center questionnaires could be used to determine if material has evoked a change in attitude about invasive species in natural areas.

#### Where will the program take place?

- This program will take place at parks, refuges, sanctuaries, forests, preserves and conservation lands nationwide.
- Pilot project to take place at Everglades National Park, Biscayne National Park, Big Cypress National Preserve, Loxahatchee National Wildlife Refuge, Everglades Conservation Areas, and applicable county and city parks in the Everglades Protection Area.

#### When will the program take place?

- Full implementation (nationwide) of the fact sheet/radio segment of the program could be achieved within 18 months. Video production/dissemination would depend on funding and/or commitment of a lead agency.
- A pilot project is being proposed for the Everglades Protection Area. The fact sheet/radio segment of the program could be implemented in 3 months.

#### With whom will we work?

- Department of Interior (National Park Service, US Fish and Wildlife Service, BLM), Department of Commerce (NOAA), Department of Agriculture (US Forest Service), State (DEPs, DNRs, Forestry, Game and Fish/Wildlife agencies) and local (counties, cities) governments, NGOs (TNC, EPPCs) and private interests (i.e. concessions).

#### What are the potential challenges to success?

- No major challenges have been identified.
- Coordination among Federal, State and local agencies will be necessary to implement this program.
- Funding issues will need to be resolved. The fact sheet/radio program will need limited funding. Video production will need a more substantial funding commitment.

#### What resources do we already have?

- Millions of people already visit these resources annually. While touring these areas, they are essentially a "captive audience." This program will use existing infrastructure (visitor's centers, park radio announcements etc.) to educate the public about invasive species. Key staff can adequately identify the region's problem species and help in the development and technical review of fact sheets. Docents, volunteers and concession guides (i.e., airboat tours, horseback riding, etc.) can be educated on species identification and made familiar with the problems associated with invasive species so that they can become a resource in educating the public on this issue.
- A generic manual for creating a volunteer program and developing support for it within a government agency has been developed by "Partners in Parks."
- Small-scale volunteer efforts are already underway in many parks nationwide.

- Regional Exotic Pest Plant Councils and the Cooperative Extension Service sponsor workshops and/or technical support to plant control volunteer efforts.

#### What additional resources do we need?

- Species-specific fact sheets for each eco-region will need to be developed. These fact sheets will detail the invasive plant and animal species that the visitor is likely to encounter while visiting the park. Information would include how to identify the plant/animal and a description of the problems it is causing. This fact sheet would also describe regional invasive species control efforts - should the visitor encounter an area where control work is being conducted, he/she will hopefully view it in a positive light. The fact sheet should also include a "what can you do to help" section (i.e., be sure to clean weed seed from your clothing, shoes, off-road vehicle, boat trailer, don't plant invasive species in your yard, etc.)
- Docents, volunteers, guides and rangers will need minimal training on identification and problems associated with of the region's target species. In some areas, funding will need to be identified to for new positions aimed at coordinating these volunteer programs.
- A sample script of a radio "Invasive Species Announcement" should be developed and provided to parks that have visitor radio announcements. Each park can then tailor announcements for site-specific activities (i.e., if there is an aerial treatment of WeedX being conducted in an area that visitors are likely to observe, the announcement could educate the public on the need for this type of control measure.)
- Funding for and/or development of partnerships with corporate sponsors who are willing to fund short generic regional videos which would be shown in all National, State and local park visitor centers.

#### What are the steps to project completion?

- Identify a lead agency(s) to coordinate program among Federal, State and local agencies and non-governmental organizations. This lead role, which should probably be with a Federal agency (most likely Interior) can be delegated to local levels (either individual Parks or to State or local governments) to ensure regional issues are adequately addressed. This may be best addressed through regional interagency/NGO advisory committees.
- The lead agency's role should be to assure some level of consistency in the program nationwide. The lead agency would identify regions of the country based on habitat/eco-region. These regions should, by definition, share similar invasive species problems.
- All National, State and local parks, preserves, sanctuaries, refuges, conservation areas and forests within each eco-region need to be identified

and contacted. A survey of each region should: 1) Determine which invasive species are problematic (and/or which species the general public is likely to encounter during a visit). 2) Determine status of control operations (and if visitors are likely to encounter/observe control "in progress") 3) Solicit annual visitor projections 4) Determine which of these parks have visitor's centers, kiosks, and/or radio announcements and 5) Identify if any language barriers exist for large segments of the visiting public.

- The lead agency should assess the surveys, fine-tune eco-region groupings and work with local interests to develop species-specific fact sheets (and/or videos if funding exists) for each region. These fact sheets should be specially tailored to the eco-region. They may need to be provided in Spanish, German or Japanese based on region of the country and visitor profiles. Key staff at participating parks will provide technical review and editing as an in-kind service.
- Lead agency should provide appropriate species-specific fact sheets to each park.
- Lead agency should develop a sample script for "Invasive Species Announcement" to be aired on park-wide radio where applicable.
- Distribute script to parks with radio resources.
- Lead agency should identify funding for production of "Invasive Species Video." Based on available funding, video(s) would either be generic or specific in scope.
- Lead agency (or contractor) produces video(s) with technical input from participating agencies.
- Lead agency distributes "Invasive Species Video" to park visitor centers that have A/V resources.

**Response #5:** The plant-buying public is largely unaware of the problems that can result from ornamental plantings of invasive species. When purchasing plants at retail outlets, it is often difficult for them to easily determine which plants are native to their region and/or which plants have the potential to escape from their landscape and degrade nearby natural areas. Actions to help improve these situations include:

(A) Label plants with pertinent information on native range and known invasive potential. By labeling species, the consumer can make an educated choice in purchasing plant material.

(B) Develop an "Invasive-Free Nursery" certification program. By agreeing to stock a predetermined percentage (maybe 100%?) of non-invasive species, a nursery could qualify as a certified "Invasive-Free Nursery."

(C) Develop local and regional alternative plant substitution lists. These lists would help the public replace invasive species with suitable non-invasive species in landscapes.

These programs strive to change human values, beliefs and behaviors as related to invasive species (Guiding Principle #1), extend incentive programs that encourage voluntary cooperation (Guiding Principle #4), and engage the public in becoming involved in efforts to address the problem (Guiding Principle #5).

#### What are the desired outcomes?

- A voluntary program that would encourage retail nurseries nationwide to label plants for genus, species, country of origin and invasive potential, if known.
- Increased awareness about species used in landscaping.
- 
- Consumers could seek certified "Invasive-Free Nurseries." Retail nurseries could, in turn use it as a marketing tool.
- Federal, State and local agencies could help to promote the certification program by requiring plant material (for landscaping facilities, planting roadways and restoration projects) be procured from an "Invasive-Free" source.
- Regional alternative/substitution plant lists that provide the public with information about choosing suitable non-invasive species to replace invasive species in their landscapes.

#### What is our evidence for achieving them?

- A shift in demand from invasive exotic species to non-invasive species.
- A shift in supply - by changing the demand, nurseries would be more likely to move away from producing invasive exotics and find it more profitable to grow non-invasive species.
- Federal, state and local agency participation (through requiring plant material from invasive free sources) would provide an economic incentive for nurseries to participate in the voluntary "Invasive Free" certification program.

#### Where will the program take place?

Nationwide.

Possibly start with a statewide voluntary pilot project.

#### When will the program take place?

As soon as possible

With whom will we work?

USDA, American Nursery & Landscape Association, State Departments of Agriculture, Exotic Pest Plant Councils, native plant societies, State and Regional Grower's Associations, landscape architects and designers, other Federal, State and local agencies, retail outlets such as Target, Lowes, Home Depot, etc.

What are the potential challenges to success?

- 
- Similar programs have been initiated elsewhere (New Zealand) with limited success. These overseas programs need to be assessed prior to implementation in the United States.
- There are also potential challenges in ensuring correct identification to species level and in determining where and when a plant exhibits "invasive qualities."
- State Prohibited Plant lists and the Federal Noxious Weed list will not be useful in determining invasiveness as species that appear on these lists are already prohibited, and by definition should not be available for sale. (There are exceptions, i.e., plants may be prohibited in one state and not in another.) Who determines invasive qualities could be problematic.
- Communication will be needed to encourage Federal, State and local agencies to use the certification program when procuring plant material.
- There is resistance by the seed and nursery trade, because of the expense (perceived or real) involved in shifting to new stock.
- There is a lack of awareness among landscape architects, landscape designers, and those who choose plantings for highways and parks of the aesthetic and functional values of native plants.

What resources do we already have?

- 
- Groups like the American Nursery & Landscape Association could work with the Exotic Pest Plant Councils to determine which commercially-important invasive species are available in the trade.
- Master Gardeners/Cooperative Extension officers could be trained to certify nurseries if program was voluntary.

- The EPA has developed an effective website "Landscaping with Native Plants" ([www.epa.gov/glnpo/greenacres/nativeplants](http://www.epa.gov/glnpo/greenacres/nativeplants)), fact sheets and is hosting workshops on the benefits of using native plants.
- Executive Order 13148, Greening the Government through Leadership in Environmental Management (April 22, 2000). This EO requires environmentally sound landscaping practices within the Federal government, including promotion of regionally native plant species in site design and implementation.

#### What additional resources do we need?

- A lead agency needs to be identified.
- Taxonomic identification standards and a method for determining invasiveness.
- Need to develop messages to convince the nursery industry that invasive plants are a problem.
- Voluntary certification program needs to be developed.
- Agency staff (including landscape architects and designers) needs to be educated on the use of non-invasive plants in landscapes and other planted areas.
- Regional alternative/substitution plant lists need to be developed.
- A major increase in scope of production (by the National Plant Materials Center as well as state and private sources) of native and non-invasive plants for the nursery and seed trade.
- Continued media coverage (by gardening magazines, television shows and garden columnists).
- Buy-in from groups like the Federated Garden Clubs of America and professional organizations of landscape architects and designers of the threats posed by invasive species.

#### What are the steps to project completion?

- Identify a lead agency(s).
- Lead agency develops taxonomic identification standards for labeling requirements and works with other groups to determine invasive qualities of commercially important species.
- Lead agency develops requirements for "Invasive-Free" certification program.
- Lead agency advises retail nurseries of program and asks for voluntary participation.

- Lead agency identifies who (either an agency/extension/master gardeners) would act as inspectors/record keepers for certification program.
- Regional committees made up of industry and agency representatives develop alternative/substitute plant lists.
- Plant lists and other relevant educational material are made available to public through participating retail outlets, cooperative extension offices, local garden clubs and societies and on the Internet.

## ISSUE 4

There is no definitive "Web Clearinghouse" for invasive species issues.

**Response:** Under the auspices of the Invasive Species Council in cooperation with state and local agencies, organize a one stop clearinghouse of web-based information to link web-based information on invasive species.

This program would foster cooperative relationships (Guiding Principle #2), engage the public (Guiding Principle #5) and provide a centralized system to coordinate and integrate invasive species information (Guiding Principle #6).

### Background

The web is an invaluable tool for invasive species information that will be available to increasing numbers of individuals. The web can provide information for a variety of purposes and audiences; for example, K-12 education, public awareness, background information for non-technical individuals, higher education, research purposes, international trading sessions, global bodies concerned with invasive species and biodiversity issues. The web can be organized in a wide variety of categories for invasive species, for example, taxa based information, ecosystem and region based, agency based, activity based. Information on the web is diffuse and the breadth of information is not easily grasped. Information on the web is diffuse and the breadth of information is not easily grasped. In addition, language translators need to be included for international access to information.

In 1998, a workshop on invasive species databases was held to address several issues and needs related to web based information on invasive species (Ridgway et al. 1999. Invasive Species databases). Electronic copies of the workshop proceedings are available on the web:

[http://www.nbii.gov/invasive/workshops/proceeds\\_iv.html](http://www.nbii.gov/invasive/workshops/proceeds_iv.html)

This workshop was organized by the CV Riley Memorial in collaboration with the Depts of Interior, Agriculture, and Commerce. Printed copies are available. A recent article has highlighted the needs for a global information system for invasive species (Ricciardi et al. 2000. BioScience 50: 239-244).

### Desired Outcome

A web based clearinghouse for invasive species information, which would include an assessment of information currently on the web. The clearinghouse should provide links to all currently available sites and include language translators. A needs assessment may need to be done first to determine -- Is there a need for a web based clearinghouse on invasive species? Based upon current summaries of this issue in the literature, it appears that there is a need. The results of a survey of invasive

species databases can be found at  
<http://www.nbio.gov/invasive/workshops/dbsurveys.html>

### Evidence for achieving outcome

Establish and maintain a web based clearinghouse for invasive species.  
This will require a long-term commitment to maintain this web site.

### Where will the program take place ?

One option would be under the auspices of the Invasive Species Council, a federal agency will assume responsibility for this clearinghouse activity which would include close cooperation with appropriate private, academic, and state partners. As pointed out by Ron Stinner, in Ridgway et al (1999) Invasive Species Database Proceedings (page 31), " .. in view of the large number of highly diverse databases and the many different perspectives that the developers of those databases have, it is probably unrealistic to attempt to develop a national plan that would deal with all of the integration, ownership, and use issues."

### When will the program take place ?

This could start immediately. Based upon the literature, activity has already started.

### With whom will we work ?

All federal, state, local, private, university, and international partners with web based information.

### What are the potential challenges to success?

A long-term commitment to maintaining this web site, changes in web based technology. Development of integration among clusters of invasive species databases that have common themes may be an issue (Stinner 1999)

### What resources do we already have ?

Numerous invasive species is available on the web, however the information is not easily accessible from one gateway location. In addition, there are gaps in needed information. A needs based assessment and survey or web resources may be required. Several surveys of databases have been completed (Ridgway et al. 1999, Ricciardi et al 2000), workshops have organized that focused on invasive species databases, and some

limited activity continues through the CV Riley Foundation. However, the scope of these previous surveys needs to be examined relative to the need for a national web-based clearinghouse of information.

#### What additional resources are needed ?

Commitment of information technologists to this project; necessary computer equipment and funding for adding translations and developing information to fill gaps in needed information. Funds are also needed to (1) develop clusters of invasive species databases on the web, (2) create models for the integration of these web clusters, and (3) maintain and update the systems. This could be accomplished with a combined federal, state and local effort. One possible mechanism would be a competitive grants program that will fund development of clusters of invasive species web based databases.

#### What are the steps needed to complete the project ?

Evaluate the current surveys of web based information.

From this information determine if a needs based survey for a web based clearinghouse site on invasive species is desirable. This activity would include an assessment of the types of information on invasive species available on the web.

Decide which federal, state and local agencies are best suited to develop and maintain this web site.

Develop a network to provide information to this clearinghouse. For example, clusters of databases could be organized around common themes to develop integration plans. These clusters may form around taxa, or pest status, or regions.

Decide how local, state and federal agencies can form partnerships to develop and maintain clustered integrative web sites on invasive species.

Develop the models needed to access and provide information to these interconnected invasive species web sites.

Support the necessary local, state and federal personnel and computer equipment required for this integrated system.

## ISSUE 5

Most policy makers in the legislative and executive branches of federal, state, and local government are poorly informed about invasive species.

It is vital that these policy makers better understand the invasive species issue because government is in a position to supply much of the leadership, legal framework, and funding needed to combat invasive species. Government leaders must have the best available information in order to make the best possible decisions. Typically, communication, education, and outreach programs regarding invasive species are underemphasized and underfunded, but government needs to fully support such programs.

**Response # 1:** We must design and implement a communication strategy aimed at policy makers in the legislative and executive branches of federal, state, and local government. We must inform them of the enormous conservation, economic, and social costs associated with invasive species and the potential solutions to the problem. In particular, we must make sure policy makers understand the vital ways in which government policy--or the lack thereof--helps determine success or failure in dealing with invasive species.

This program is an example of how to reach a target audience (policy makers). By reaching this target audience, positive policy decisions can be made (Guiding Principles #2 and #4).

### What are the desired outcomes?

- Policy makers grasp that biological invasions are a form of global change that will fundamentally alter the ecosystems on which all life, including human life, depends. Policy makers know that invasive species cost Americans tens of billions of dollars a year. Policy makers understand that such high ecological and economic costs lead to huge social costs.
- Policy makers know that these costs are growing rapidly and will continue to escalate if society doesn't implement a major, comprehensive, and well-funded anti-invasives effort.
- Policy makers understand the pathways of invasion and become aware that preventing the entry and spread of invasive species is the least costly and single most important step that needs to be taken to address the invasive species problem.
- Policy makers understand that solutions exist and that effective anti-invasive policies are among the most important of those solutions.
- Policy makers know that they need to move beyond awareness to an acceptance of the urgency of this issue and of their responsibility to act to provide the leadership, laws, regulations, and funding needed to deal with invasive species.

Policy makers understand the need to form partnerships among the various levels of government and with the private sector.

#### What is our evidence for achieving the desired outcomes?

- Informal (or formal, where possible) surveys among policy makers and their staffs to determine their level of knowledge about the costs and solutions associated with invasive species.
- Surveys to determine policy makers' knowledge about and acceptance of the government's critical role in preventing, controlling, and eradicating invasive species.
- The establishment, at various levels of government, of invasive species caucuses.
- The establishment of partnerships among various levels of government and between government and the private sector.
- Hearings and briefings for policy makers at all government levels regarding the costs and solutions related to invasive species.
- Discussions of invasive species appear in the Congressional Record (and equivalent state and local publications), agenda-setting publications, forums/executive sessions, etc., indicating that policy makers are talking about invasive species even when advocates are not around.
- site visits by policy makers to places with invasive species problems and to places where solutions are being implemented.
- Any relevant actions by policy makers, such as increased funding for invasive species efforts, effective invasive species laws and regulations, or public-private partnerships that successfully address on-the-ground invasive species problems.

#### Where will the program take place?

- In the legislative and executive branches of federal, state, and local governments.
- Special attention will be given to "acceptors": those policy makers who are open to the issue of invasive species and supportive of or engaged in government matters related to invasive species.
- Among the policy makers' constituents and other private sector people whose interests connect them to the policy makers; these are the folks who must be rallied to provide information and tell their stories to their representatives.

#### When will the program take place?

- A major campaign should be launched as soon as possible, but it shouldn't commit the bulk of its resources until sufficient social marketing research has been done to ensure that the resources are efficiently used.
- After the initial push scales back, the program must continue indefinitely at a lower but sufficient intensity level.

#### With whom will we work?

- A wide variety of local people and organizations. Most of the time the messages should come from the constituents of the policy makers, including ranchers, farmers, conservationists, fishers, utility companies, local land managers, timber companies, and others harmed by and concerned about invasive species.
- University and extension experts.
- Policy makers (and key staffers) who champion anti-invasive efforts. They also can help inform their colleagues and other policy makers at different levels of government.

#### What are the potential challenges to success?

- lack of interest regarding a topic with which few policy makers have more than a passing familiarity and their misperception that the issue is not important enough to learn more about: hence, a catch-22.
- the danger that, in today's polarized political climate, the issue of invasive species, though a quintessentially bi-partisan matter, will somehow be labeled as a partisan issue and sink into the mire of political bickering.
- misinformation and political pressure from special interests.
- a degree of scientific uncertainty and scarcity of research, which can lead to both legitimate delays in policy makers acting and unjustified delays engineered by interests who simply are looking for an excuse to avoid acting.
- Insufficient time and money to properly convey the message.

#### What resources do we already have?

- ISC and ISAC members with access to policy makers
- a handful of policy makers and their staffs who already know the invasive species issue well and are advocating for increased attention to invasive species on the part of their fellow policy makers.
- Engaged, though not yet organized, constituents who could powerfully carry the message.
- Numerous experts willing to communicate with policy makers.

- Numerous published materials that, if culled and properly packaged, could convey in a reasonably concise form much vital information about invasive species.

#### What additional resources do we need?

- more champions among policy makers.
- more constituents to carry the message to policy makers.
- an effective, concise informational packet geared to policy makers, tailored to each level of government.
- the establishment of a national communication, education, and outreach office that has ample funding to vigorously carry out its mandate.

#### What are the steps to project completion?

- Find out what information regarding invasive species already is reaching policy makers and build on that where possible. In particular, find out what is being done already by policy makers who are advocating for invasive species efforts and support the effective initiatives.
- Develop new materials as needed.
- Set up an information flow that will keep policy makers up-to-date on invasive species.
- Build a coalition with the private sector parties harmed by invasive species, the aforementioned ranchers, farmers, et al.
- Identify and contact potential new champions within government.
- Engage policy makers and their staffs in developing communication, education, and outreach programs--the bottom-up approach that will encourage buy-in and make use of their inside knowledge regarding how to reach their respective institutions.
- Set up a system to monitor the effectiveness of communication, education, and outreach efforts to policy makers and re-tool as necessary, bearing in mind that unless our outreach leads to desired policy goals and on-the-ground improvements, it is not truly succeeding.

**Response # 2:** Most policy makers know little about the executive order on invasive species or about the developing National Invasive Species Management Plan, nor is it likely under the status quo that many policy makers will become sufficiently familiar with the plan once it is finished and in place. A coordinated campaign to familiarize policy makers with the EO must be developed.

This program will engage policy makers (Guiding Principle #5) and educate them as to how they can be involved in the efforts to address the problem of invasive species.

What are the desired outcomes?

- Policy makers in the legislative and executive branches of federal, state, and local government learn about the executive order and the management plan, both now and as they develop over the years.
- Policy makers understand what they can do to support the executive order and the management plan and how, over time, they can improve the implementation of the e.o. and the plan.

What is the evidence for achieving the desired outcomes?

- Surveys of policy makers regarding the E.O. and the plan.
- Discussions of the E.O. and the plan in hearings, briefings, and relevant government meetings and publications.

Where will the program take place?

see response 1

When will the program take place?

see response 1

With whom will we work?

- see response 1
- ISC and ISAC members.
- Those managers and staffers who are implementing the E.O. and the plan.

What are the potential challenges to success?

- see response 1
- if the E.O. . doesn't get strong support and the national plan turns out to be tepid and toothless, it will be difficult to excite much interest in them.

What resources do we already have?

see response 1

What additional resources do we need?

- see response 1
- a forcefully implemented E.O. and a robust national plan.

#### What are the steps to project completion?

- adapt steps listed in response 1.
- enlist help of ISC, ISAC, and others involved with the E.O. and plan.

**Response # 3:** No broad, organized effort exists to plan and carry out the much-needed communication, education, and outreach regarding invasive species. Policy makers hear only bits and pieces, if they hear anything at all about invasive species, so very few have an accurate or complete picture of the issue. Infrastructure must be developed to coordinate communication, education, and outreach efforts.

This program will strive to engage the public (Guiding Principle #5) through a cooperative (Guiding Principle #2) centralized system that coordinates and integrates information (Guiding Principle #6).

#### What are the desired outcomes?

- The establishment of a national (and perhaps state and local equivalents) communication, education, and outreach office with ample funding to vigorously carry out this vital function.
- The linking and occasional coordination of outreach efforts around the country and world via this office.

#### What is evidence for achieving the desired outcomes?

- The establishment of such an office, or significant progress towards its establishment.
- Broad outreach efforts in which various smaller communication, education, and outreach entities work together.

#### Where will the program take place?

probably the Washington, D.C. area.

#### When will the program take place?

- Simultaneous with the adoption of the National Plan—which will be produced right on schedule, of course--and continue for as long as there are still invasive species in the U.S.

#### With whom will we work?

- The ISC, the ISAC, the working groups, and those implementing the executive order.
- Experts who can advise on setting up such an office.

#### What are the potential challenges to success?

- Lack of funding
- The misperception that communication, education, and outreach are relatively unimportant.

#### What resources do we already have?

- The communication, education, and outreach ISAC working group.
- A multitude of existing outreach efforts around the nation from which to learn and with which to link up.

#### What additional resources do we need?

- money
- people who know the invasive species issue, who know how to conduct outreach, and who are looking for full-time work in D.C.

#### What are the steps to project completion?

- Get the ISC, ISAC, and communication, education, and outreach working group behind the idea of creating an office.
- Insert the idea of establishing the office into the national plan.
- Work out some details regarding the nature, size, and mandate of the office.