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Five-Year Review of Executive Order 13112 on Invasive Species

The National Invasive Species Council (NISC)

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THE NATIONAL INVASIVE SPECIES COUNCIL (NISC)

Five-Year Review of Executive Order 13112 on Invasive Species

Prepared for the Office of Management and Budget

2005

Meet the Invasive Species Challenge | Know the NISC Plan | Manage the Problem

MEMBERS

The Honorable Gale Norton
Co-Chair
Secretary of the Interior

The Honorable Mike Johanns
Co-Chair
Secretary of Agriculture

The Honorable Carlos Gutierrez
Co-Chair
Secretary of Commerce

The Honorable Condoleezza Rice
Secretary of State

The Honorable Norman Y. Mineta
Secretary of Transportation

The Honorable Donald H. Rumsfeld
Secretary of Defense

The Honorable John Snow
Secretary of the Treasury

The Honorable Mike Leavitt
Secretary of Health and Human Services

The Honorable Michael Chertoff
Secretary of Homeland Security

The Honorable Stephen L. Johnson
Administrator
Environmental Protection Agency

The Honorable Michael Griffin
Administrator
National Aeronautics and Space Administration

The Honorable Rob Portman
U.S. Trade Representative

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EXECUTIVE SUMMARY
FIVE-YEAR REVIEW OF EO 13112 on INVASIVE SPECIES

Invasive species inhabit all regions of the United States and every nation. The price society pays for invasives is reflected not only in significant economic damage but also in high levels of environmental degradation, loss of recreational opportunities, and harm to animal, plant, and human health. Executive Order 13112 (EO) was issued in 1999 to enhance federal coordination and response to the complex and accelerating problem of invasive species. As directed by the EO, the National Invasive Species Council has approved this report for the Office of Management and Budget to assess the effectiveness of the EO and evaluate whether it should be revised.

The EO defines an invasive species as a species not native to the region or area whose introduction (by humans) causes or is likely to cause harm to the economy or the environment, or harms animal or human health. This definition encompasses all types of invasive species—plants, animals, and microorganisms. The definition makes a clear distinction between non-native (or alien) species and invasive species. Most introduced species are not harmful. In fact, many non-native species—which include most U.S. crops and domesticated animals—are extremely important sources of food, fiber, or recreation. Only a small percentage of non-native species are invasive. However, even a single invasive species can cause great harm.

The effects of invasive species can be seen in declining wildlife and plant populations, loss of economically important resources, and impacts to human health. Over 40 percent of the species listed as threatened or endangered in the United States under the Endangered Species Act are at risk at least in part due to invasive species. Forests are at risk from invasive insects such as emerald ash borer and plant diseases such as sudden oak death. Zebra mussels and other fouling organisms clog intake pipes for utilities and other industries. On the island of Guam, brown treesnakes cause power outages by climbing onto power cables, and they have eliminated 10 of the 12 native bird species from the island. Since its first appearance in 1999, West Nile virus—an invasive species transmitted by mosquitoes to wildlife, livestock populations, and humans—has caused the deaths of over 700 people in the United States.

Due to the broad and complex nature of invasive species, many agencies and departments across the Federal Government play an important role in the response to invasive species. Because invasive species do not respect jurisdictional boundaries, partnerships and cooperation with State, local, and private organizations are critical. Instead of creating a new department or regulatory authority, the EO established the National Invasive Species Council (NISC) as a high-level, interdepartmental organization to provide leadership, planning, and coordination for current Federal programs. Secretaries and Administrators of the 13 departments and agencies serve as the members of NISC. The Secretaries of the Interior, Commerce and Agriculture serve as Co-Chairs, reinforcing the importance of cooperation and coordination in every action of the Council. The EO also established the Invasive Species Advisory Committee (ISAC), which consists of nonfederal representatives and stakeholders who provide recommendations as well as input and consensus advice to NISC. The Secretary of the Interior provides support for a staff of six, and NISC member agencies have assigned detailees to provide assistance. Each NISC member is represented by a Policy Liaison who provides coordination between his or her department or agency and NISC.

This report details actions taken by NISC during its first 5 years to meet the goals and objectives of the EO:

- Providing national leadership and coordination.
- Monitoring the implementation of the EO.
- Encouraging planning and action at the state and local levels.
- Developing recommendations for international cooperation.
- Developing guidance under the National Environmental Policy Act on invasive species for Federal agencies.
- Tracking and enhancing efforts to document the impacts of invasive species.
- Facilitating a coordinated information (data) sharing system.
- Publishing a national invasive species management plan.

Many of these accomplishments reflect ISAC's invaluable expert and stakeholder input on issues ranging from planning to website development. A great deal still remains to be done to enhance NISC efforts to prevent and control invasive species. However, the EO has proved an effective tool not only in improving coordination across NISC agencies and departments, but also in providing a forum for collaborative programs, outreach, and partnerships with the State, local, and private sectors.

NISC accomplishments include

- Publication and distribution in 2001 of the first national management plan—a comprehensive blueprint—for federal action on invasive species entitled, *Meeting the Invasive Species Challenge* (referred to in this report as "NISC Plan").
- Preparation of the first invasive species performance-based crosscut budget for fiscal years 2004–2006, providing both general budgetary information on invasive species expenditures and specific initiatives highlighting areas of interdepartmental cooperative planning and action on invasive species.
- Completion of a comprehensive list of pathways (the means by which species are accidentally introduced into the United States) for introduction of invasive species.
  - Issuance of draft criteria for ranking pathways' importance.
  - Preparatory work for developing a risk-based screening system for intentional introductions.
- Development of the NISC website, www.invasivespecies.gov, which provides links to invasive species information across governmental agencies and nongovernmental organizations in partnership with USDA's National Agricultural Library.
- In collaboration with the Aquatic Nuisance Species Task Force (ANSTF) and the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW), the publication of NISC guidance on the formulation and evaluation of Early Detection and Rapid Response systems.
- Publication of guidance on setting priorities for projects to control and manage invasive species.
- Providing technical assistance to States for creating invasive species councils or other coordinating bodies—19 States now have invasive species councils or similar bodies.
- Development of implementation procedures to track NISC progress under the EO.
- Sponsoring workshops and meetings with State and local partners on species and issues of common concern, e.g., the April 2004 "Team Tamarisk: Cooperating for Results" workshop, which involved more than 300 participants.
- Working with the State Department to address global invasive species mechanisms and treaties such as the International Plant Protection Convention, the Commission on Economic Cooperation (under NAFTA), and the Asian Pacific Economic Cooperation.
- Sponsoring international regional workshops to exchange information and build international capacity for invasive species. Partners included USAID, State Department, Transportation Department, and Global Invasive Species Programme (GISP).

In summary, NISC employs a cooperative approach to enhance the Federal Government's response to the threat of invasive species. A forum for coordination and planning, the Council and the Advisory Committee strive to ensure that Federal programs are successful, avoid duplication, and minimize costs. In the last 5 years, NISC has emphasized prevention, early detection and rapid response, and sharing information to create a more proactive and effective invasive species strategy. By providing an overall framework for Federal invasive species policy, coordination, and outreach, Executive Order 13112 enhances efforts to minimize the harm to the economy, the environment, and human health caused by invasive species. Any needed improvements should be addressed through the update and revision of the NISC Plan. This report recommends that the current version of Executive Order 13112 be maintained.

Five-Year Review of Executive Order 13112 on Invasive Species Prepared for the Office of Management and Budget

Executive Order 13112 on Invasive Species (EO) directs the National Invasive Species Council (NISC) to

> ***"… assess the effectiveness of this order no less than once each 5 years after the order is issued and shall report to the Office of Management and Budget (OMB) on whether the order should be revised."* (See Sec. 5(c), App. I).**

NISC has approved the following report for submission to Office of Management and Budget (OMB) on this 13th day of May 2005.

INTRODUCTION

EO 13112 was issued on February 3, 1999 to enhance federal coordination and response to the complex and accelerating problem of invasive species. The EO directs Federal agencies to work together [as stated in the Preamble] to

> ***"… prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause."***

Rather than create a new agency or department to deal with this complex problem, the EO established a mechanism for interdepartmental coordination, joint action, and planning among Federal agencies in cooperation with local, State, and tribal governments, private interests, and international efforts to prevent and mitigate the harmful effects of invasive species (see App. I).

The EO defines an invasive species as: "…*an alien species* (a species that is not native to the region or area) *whose introduction does or is likely to cause economic or environmental harm or harm to human health.*" This definition encompasses all types of invasive species: plants, animals, and microorganisms (see Sec. 1, App. I). The EO was designed to encourage Federal agencies to adopt a comprehensive approach to invasive species problems, instead of a less effective and more reactive species-by-species approach, which was more commonly used in the past.

Invasive species were not a new problem to the United States when the EO was adopted in 1999. Non-native species have been introduced into North America from the first days of exploration and settlement (Todd 2001). Most introduced species are not harmful. In fact, many non-native species—which include most U.S. crops and domesticated animals—are extremely important sources of food, fiber, or recreation (Grosholz 2005). Only a small number of non-native species that are introduced into a new environment become established, and less than 10 percent of those species are estimated to be invasive (Williamson and Fitter 1996).

Invasive species can be found in all major habitat types across the country and around the world (NRC 2002; Mack et al. 2000). For example, localized infestations of New Zealand mud snail (*Potamopyrgus antipodarum*) populations can be extremely dense (e.g., 28,000 individuals per sq. ft.), reducing the productivity of mountain streams in the West (Richards 2004). Cattle, sheep, goats, deer, and other animals are at risk from heartwater disease, which is transmitted by ticks such as the invasive tropical Bont tick, a species native to Africa. It has spread to more than 15 Caribbean islands in the last 50 years (Corn 2001). Residents of the southeastern United States know imported red fire ants cause painful stings, and Formosan subterranean termites destroy irreplaceable historic buildings and century-old trees. Even areas in the open ocean have been invaded by invasive species, such as tunicates or "sea squirts." One tunicate species now blankets 41 square miles of Georges Bank off the northeast coast of the United States (Lambert 2005).

The repercussions of invasions can be seen in declining wildlife and plant populations, loss of economically important resources, and direct and indirect impacts to human health. It is estimated that 42 percent of the species listed as threatened or endangered in the United States under the Endangered Species Act (ESA) are at risk at least in part due to alien invasive species (Wilcove et al. 1998). Our forests are at risk from invasive insects such as emerald ash borer, as well as from plant diseases such as sudden oak death. Zebra mussels and other fouling organisms clog intake pipes for utilities and other industries. Brown treesnakes in Guam cause hundreds of power outages by climbing onto power cables,

and have extirpated 10 of the 12 native bird species from the island (USGS 2005b). Purple nutsedge (*Cyperus rotundus* L.), an invasive plant native to India, spreads rapidly, is difficult to control, and severely reduces yields in crops, such as soybeans and cotton. It has been called the world's worst weed (Holm et al. 1977). Invasive species can directly impact human health. For example, there are more than 500 known arboviruses (viruses transmitted by arthropods) and at least 110 are associated with human disease (Roehrig 2002). West Nile Virus (WNV) is an arbovirus transmitted by mosquitoes to wildlife and livestock populations and humans. By the end of 2002, WNV activity had been identified in 44 States and the District of Columbia, resulting in 4,156 reported human cases of WNV disease (including 2,942 meningoencephalitis cases resulting in 284 deaths), 16,741 dead birds, 6,604 infected mosquito pools, and 14,571 equine cases (Gubler et al. 2003).

Economic estimates of the damage caused by invasive species (other than those dealing with certain specific localized species or damage to crops and livestock) are few. However, there are two frequently cited studies estimating the total cost of invasive species. The first study, entitled *Harmful Non-indigenous Species in the United States*, estimated that the total cumulative costs of damages related to 79 harmful species was $97 billion over the period from 1906 to 1991 (U.S. Congress 1993). A more recent study estimated the associated control costs of the United States due to invasive species to be $137 billion annually (Pimentel et al. 2000). Although there are few comprehensive estimates of the economic impacts of invasive species, there are numerous individual reports (Lovell and Stone 2005). For example, the nationwide economic impacts of aquatic weeds are estimated to range from $1 billion to $10 billion (Rockwell 2003). Much of the cost to control established invasive species populations are borne by State and local governments. For example, the State of Florida spent about $30 million in 2000 to control invasive aquatic weeds alone (Schardt, 2002).

Invasive species have major impacts on the ecosystems into which they are introduced (Mooney and Hobbs 2000; Cox 1999; Schmitz et al. 1997). Examples include nutria, which have contributed to the loss of coastal wetlands (Foote et al. 1996), and melaleuca, which has formed monocultures in southern Florida crowding out native vegetation (Westbrooks 1998). Invasive species can also change trophic dynamics. Zebra mussels in the Great Lakes have altered the food chain, threatening whitefish, one of the last remaining commercial fisheries (Pothoven et al. 2001). The Asian clam (*Potamocorbula amurensis*) has virtually eliminated phytoplankton blooms, which form the base of the food chain in the northern portion of the San Francisco Bay (Cloern 1996). Invasive species can alter water chemistry, e.g., aquatic weeds reduce dissolved oxygen levels in some water bodies (ANSTF 2004); change nitrogen levels in the soil (Corbin and D'Antonio 2004); or add allelochemicals to the soil, which reduce the growth of other plant species (Kelsey and Locken 1987).

Downy brome (*Bromus tectorum*) is an invasive winter annual grass that produces abundant fine fuels that increase wildfire frequency. While downy brome is well adapted to fire, the native plant communities that it invades are not. Successive fires can lead to nearly monotypic stands of downy brome (Rice 2005). Among the many impacts caused by downy brome, it is described as a major factor in the decline of sage grouse, which is considered a "keystone" species indicative of sagebrush-dependent plant and animal communities. Pellant and Hall (1994) reported 16.9 million acres of Bureau of Land Management (BLM) rangeland alone were highly infested with downy brome. In 2003, an estimated 56 million acres were infested with downy brome in 17 western States (Rice 2005).

Many factors complicate the determination of the most appropriate response(s) to invasive species. There is no overall assessment of the full scope and extent of the invasive species problem. Comprehensive data concerning the number of invasive species and their population sizes, ranges, current densities, and associated impacts are often inconsistent, outdated, or incomplete (Lovell and Stone 2005). Work with many species is complicated by a lack of taxonomic expertise, incomplete specimen collections, and the fact many taxonomic records have not yet been placed into computer databases. Accurate assessment of the environmental context of species is critical. A species may be invasive in one region but not in another. For example, smooth cordgrass (*Spartina alterniflora*) is a valuable native component of the Atlantic and Gulf coast estuaries, but invasive in locations such as Willapa Bay, Washington (Civille and Caz

2001). In addition, some invasive species are thought to exhibit an initially slow or "lag phase" population growth pattern. However, data concerning small incipient invasive "early lag phase" populations are mostly anecdotal. Quantification of small populations is often difficult because individuals are hard to locate and measure, even when population growth is rapid (Parker 2004).

The effects of invasive species may be both beneficial and detrimental (Duncan and Clark 2005). Any potential benefits from invasive species must be weighed against potential harm to determine the most appropriate response(s). For example, purple loosestrife (*Lythrum salicaria* L.) was probably introduced for ornamental purposes and to provide nectar and pollen for honey bees (Pellett 1996; Thompson et al. 1987). Also, some species of wildlife utilize purple loosestrife (Kiviat 1978; Rawinski 1982; Rawinski and Malecki 1984; Anderson 1991; Whitt et al. 1999; Lor 2000). However, along with these benefits, purple loosestrife reduces bird diversity (Hill and Prince 2000) and causes other environmental impacts (Blossey et al. 2001). Thompson et al. (1987), compared the value of "benefits" of purple loosestrife to the costs of the harm associated with the plant and estimated that controlling purple loosestrife would save $45.9 million, yet result only in about 10 percent reduction in annual honey sales totaling $1.3 million and 5 percent reduction in ornamental plant sales equaling $0.3 million (Duncan and Clark 2005).

The vast number of ways a species can be introduced and spread also complicates meeting the challenges posed by invasive species. The NISC Pathways Report of 2004 documents that these pathways range from intentional introductions with unintended results (such as an ornamental plant introduced for the horticulture trade that becomes invasive) to the unintentional or accidental introduction (such as an invasive snail "hitchhiking" a ride in a shipment of marble). The potential for species movement is increasing rapidly. U.S. import volume measured in dollars increased from $40 billion in 1991 to approximately $100 billion in 2001 (USDOT 2002). Across geographic regions, the rate of newly detected biological invasions is increasing, and initial populations of certain species growth is exponential (Ruiz et al. 2000). The result of these combined factors is a complex ecological, legal, regulatory, social, and jurisdictional framework further complicating response to invasive species.

Invasive species impacts in agricultural ecosystems have been studied extensively for most of the last century. However, during the 1970s and 1980s, there was growing awareness about invasive species problems in aquatic and other "natural" ecosystems and the need for better coordination and response. In 1977, EO 11987 on Exotic Species was issued and directed Federal agencies to avoid the introduction of exotic species into natural areas. Prompted by the problems associated with the introduction of the zebra mussel in the Great Lakes, Congress passed the Non-indigenous Aquatic Nuisance Species Prevention and Control Act (NANPCA) in 1990, establishing the Aquatic Nuisance Species Task Force (ANSTF). ANSTF was created to coordinate federal efforts on aquatic invasive species—defined in NANPCA as aquatic nuisance species (ANS)—and to address the management of ballast water on ships, which is a major pathway for the introduction of aquatic invasives. In 1993, the influential Office of Technology Assessment report on invasive species identified lack of coordination and planning by Federal agencies as a major impediment to better management of the problem (U.S. Congress 1993). In 1994, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) was established through a memorandum of agreement (MOU) among Federal agencies to coordinate work on invasive plants. There were other efforts to coordinate research and encourage regional collaboration. These efforts were significant, but limited in scope. In 1998, 516 scientists, land managers, and others from all 50 States as well as 11 other nations wrote to the Vice President of the United States calling for action to address the overall problem of invasive species (Vice Presidential Correspondence 1998). An inter-agency invasive species task force was formed to draft a short plan. This 1998 task force recommended a permanent and more formal entity be established to provide the significant level of leadership and coordination necessary on invasive species issues. EO 13112 on Invasive Species was signed 10 months later, on February 3, 1999, creating the National Invasive Species Council (NISC).

FIVE-YEAR REVIEW REPORT

EO 13112 created NISC to carry out its goal of providing leadership and coordination for federal efforts "… and to ensure that Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient and effective" (EO 13112, Sec. 4(a), App. I). By providing a structure for federal agencies to work more cooperatively and identify common goals, NISC was established to assist its members in marshalling ideas, resources, and capacity to respond to the complex, growing, and dynamic problem of invasive species. This Review briefly summarizes the operational structure of NISC and what NISC has achieved under the EO, and highlights the significant challenges that remain.

I. Invasive Species Council

"…An Invasive Species Council is hereby established whose members shall include…" the Secretaries of State, Treasury, Defense, the Interior, Agriculture, Commerce, Transportation, and the Administrator of the Environmental Protection Agency. "…The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce." (EO 13112, Sec. 3(a), App. I).

The EO also authorized NISC to add, as needed, other Federal departments or agencies as members. Soon after NISC was formed, the Secretary of Health and Human Services and the U.S. Agency for International Development became members. In February 2003, the Secretary of Homeland Security became a NISC member because of the transfer to the Department of Homeland Security of several agencies and programs with important invasive species responsibilities. These include the U.S. Coast Guard, which plays a major role in ballast water regulation and other issues related to shipping, and the port inspection program formerly under the Animal and Plant Health Inspection Service (APHIS) (EO 2003). In early 2004, the U.S. Trade Representative became a member, recognizing the important relationship between international trade and invasive species. The Administrator of the National Aeronautics and Space Administration (NASA) joined NISC in November 2004, because of the agency's extensive expertise in satellite technologies that may be used for mapping and monitoring of invasive species and their program to prevent cross-contamination of species between Mars and Earth.

NISC is a unique and innovative organization in the Federal Government. The broad and inclusive nature of NISC reflects the EO's mandate to deal with all aspects of the problem in a way that is consistent with existing budgets and authorities, including prevention, early detection and rapid response, control, monitoring, international cooperation, restoration, research, and public education (EO 13112, Sec. 2(a)(2), App. I). Under the EO, NISC was assigned a broad set of responsibilities and duties but not given any additional regulatory authority or responsibility. Nor were NISC staff assigned specific programs to directly operate. Instead, NISC members and their staff were called on to improve the overall federal response to invasive species by coordinating and enhancing existing programs.

Although NISC member agencies vary widely in their level of involvement with invasive species issues, all have an important role in some aspect of solving the problem. For some NISC member agencies, invasive species threaten to undermine or reduce the agencies' ability to accomplish their mission. In 2001, the National Invasive Species Management Team within the U.S. Fish and Wildlife Service (FWS) reported that "…Invasive alien species have become the single greatest threat to the National Wildlife Refuge System and the FWS's wildlife conservation mission; causing widespread habitat degradation, competition with native species, and contributing significantly to the decline of trust species" (USFWS 2001). In addition, the Chief of the USDA Forest Service identified invasive species as one of the four most significant threats to the nation's forests; and the USDA Forest Service issued its *National Strategy and Implementation Plan for Invasive Species Management* in October 2004 (USDA 2004).

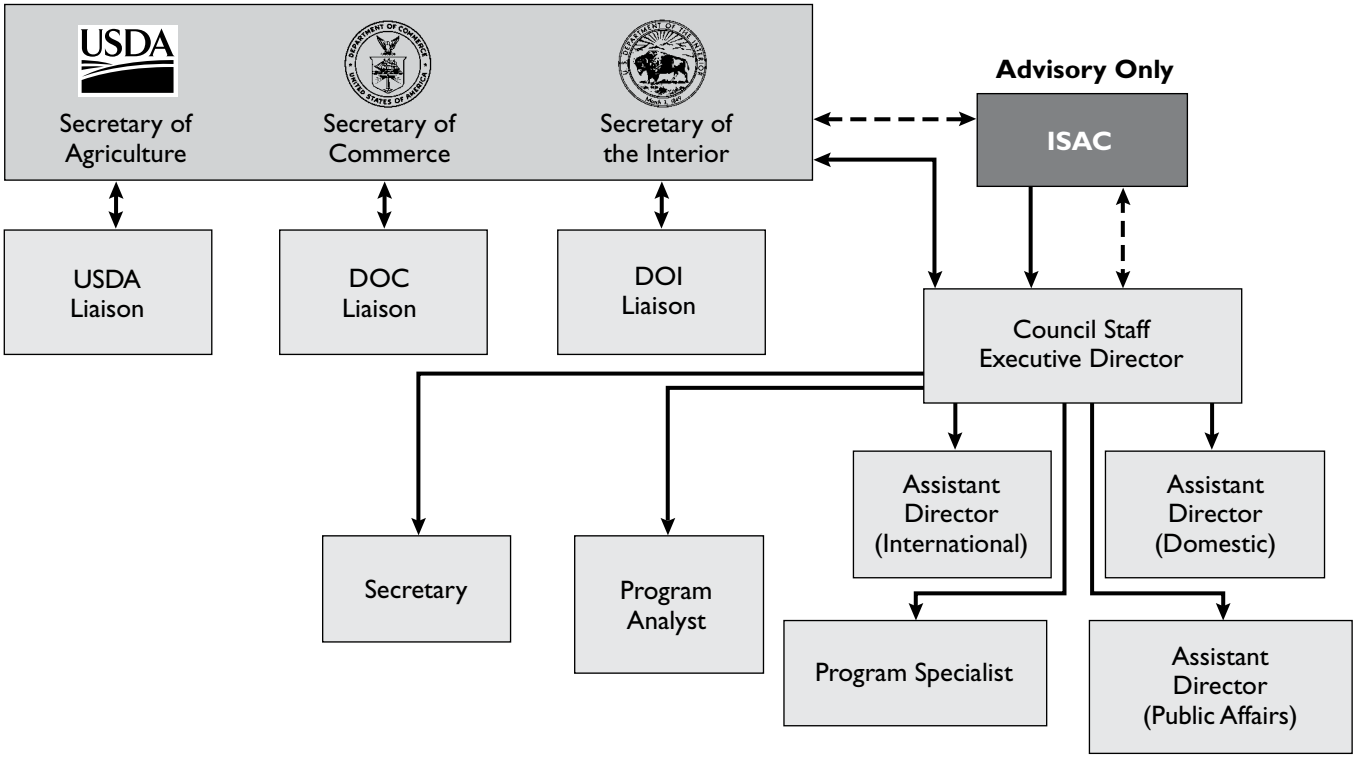
NISC is charged with coordinating the activities of over 35 different agencies—each with very different mandates, authorities, responsibilities, and resources. With its three equal Co-Chairs (the Secretaries of Agriculture, Commerce, and the Interior), NISC's unique structure has provided a diverse platform to reach out to the individual agencies and stakeholders. Each agency brings its individual experiences, authorities, and specialized resources to bear on this multifaceted issue. Together, the

agencies have the capacity to deal with the many taxa, scientific disciplines, resources, and geographic areas encompassed by invasive species issues. Given the diverse programs and authorities of the agencies, solutions agreed to by the members represent broad, comprehensive approaches to invasive species.

The EO directs the Secretary of the Interior to provide staff and administrative support for NISC. The EO also recognizes the important role of the NISC Co-Chairs by requiring that the Executive Director be selected by consensus of all three Co-Chairs. The NISC staff is housed within the Secretary of the Interior's immediate office and consists of six permanent employees. In addition, USDA provided a full-time staff member to serve as Assistant Director for Public Affairs for NISC. Member agencies occasionally provide interns or detailees to NISC for term appointment or special projects. Each of the Co-Chair departments also provides a full-time Policy Liaison who works and is co-located with NISC staff (see table below).

This small and highly diverse staff has the capacity and expertise to deal with issues such as prevention, international affairs, budgetary coordination, legal analyses, and legislation, as well as track and report on invasive species activities in the 13 NISC member departments and agencies. This capacity is critical to carry out the large number of duties described in the EO. However, NISC progress was slowed during the first several years while its staffing plan was implemented. The Executive Director was not hired until August of 1999—6 months after the EO was signed—and staffing shortages continued for the next several years. As a result, NISC was not fully staffed until early in 2004, which has affected the pace of progress under the EO.

NISC Organizational Outline



II. Invasive Species Advisory Committee (ISAC)

"…The Secretary of the Interior shall establish an advisory committee …to provide information and advice for consideration by the Council…"
(EO 13112, Sec 3(b), App. I).

In recognition of the critical role of experts and stakeholders in dealing with invasive species, the EO directs the Secretary of the Interior (in consultation with the other NISC members) to appoint committee members to "represent stakeholders." The EO also directs the Secretary of the Interior to provide financial and administrative support for the committee (EO 13112, Sec. 3 (b), App. I). In many cases, invasive species detection, control and prevention efforts depend upon the actions of State, local or private entities and joint Federal/State/local efforts, which often require cross-jurisdictional coordination of strategic actions. Federal efforts can also greatly benefit from the vast experience of nonfederal scientists, decision makers, business and agricultural representatives, natural resource managers, and many others.

ISAC is chartered under the Federal Advisory Committee Act (FACA) and currently consists of 29 members (ISAC 2005). ISAC includes representatives from State government, private industry, tribes, academia, agriculture, forestry, recreation, and conservation organizations, as well as other stakeholders that have knowledge of the full range of invasive species and other related issues. These individuals come from diverse geographic, taxonomic, environmental, and business areas affected by invasive species (see App. II). ISAC provides advice and recommendations to NISC on most of the invasive species issues it [NISC] considers. ISAC members are often selected in their individual capacities as individual representatives to testify before Congress, speak at conventions, answer press inquiries, and serve on government and privately sponsored panels on invasive species matters. ISAC members also regularly update each other and NISC on issues and activities of their organizations and aid in gauging reaction—both positive and negative—to proposed programs and solutions. This information assists NISC in determining which programs and plans are most likely to be effective and accepted by critical stakeholder groups.

ISAC has improved its effectiveness over the past several years, in part by establishing a steering committee to ensure a functional and focused agenda. It has adopted operating guidelines to streamline operations, and at its last meeting recommended several changes to the ISAC Charter. The ISAC Charter was revised on April 21, 2005, reflecting a number of ISAC's recommendations (ISAC 2005). ISAC and NISC have established eight joint subcommittees that focus on specific tasks related to implementation of the National Management Plan, and report back to the full committee. Each subcommittee has a Federal agency Co-Chair and in most cases an ISAC member who acts as the nonfederal Co-Chair.

NISC/ISAC TASK TEAMS AND SUBCOMMITTEES

Leadership and Coordination
Communications and Outreach
Control and Management
Early Detection and Rapid Response
Information Management/Research
International Cooperation
Definitions
Prevention
- Pathways
- Screening
- Risk Analysis

ISAC members are limited to no more than two 3-year terms to maintain a continuing influx of new members and some continuity. The third cycle of ISAC members was appointed on October 7, 2004. ISAC has met 13 times (about three times per year) since the EO was signed. The majority of meetings have been in the Washington, DC, area. However, meetings have also been held in locations facing critical invasive species challenges. In June 2002, ISAC met in Montana and learned about the efforts of the Greater Yellowstone Coalition to prevent and control invasive plants, animals and invertebrates through a broad State/Federal/private cooperative effort. ISAC traveled to Chicago in June 2003 to observe invasive species efforts in Great Lakes systems and urban areas. In March 2004, the State of Hawaii hosted an ISAC meeting during which ISAC learned about the Hawaii Invasive Species Council and separate

but affiliated Invasive Species Committees (or ISCs) on five Hawaiian islands (Hawaii, Oahu, Maui, Kauai, and Molokai). During the meeting, ISAC members had the opportunity to visit State, Federal, and local invasive species programs working in concert to deal effectively with one or multiple invasive species. Hawaii State Governor Linda Lingle addressed ISAC and announced a major new initiative to provide up to $5 million per year in matching funds to address invasive species (Lingle 2004; ISC and CGAPS 2004).

ISAC has provided critical input and advice over the past 5 years regarding NISC activities, which include

- Drafting of the National Invasive Species Management Plan of 2001 (Plan) and providing guidance to revise the Plan.
- Recommending initiatives to be considered for the Invasive Species Performance-Based Crosscut Budgets for FY 2004, FY 2005, and FY 2006.
- Developing www.invasivespecies.gov and creation of the Species of the Month outreach program.
- Recommending an emphasis be placed on enhanced outreach and education efforts.
- Helping to identify priority activities for NISC.
- Placing an emphasis on obtaining an enhanced understanding of the economics of invasive species.
- Recommending continued emphasis be placed on the importance of prevention.
- Recommending the establishment of a rapid response fund.
- Commenting on numerous NISC documents and other products (NISC 2003c; NISC 2005e).

Organisms that have been moved from their native habitat to a new location may be referred to as "non-native," "nonindigenous," "exotic," or "alien" to the new location. Most U.S. food crops and domesticated animals are non-native species, and their value is obvious. A small percentage of non-native species cause serious problems in their new environments and are collectively known as "invasive species." However, even a single invasive species may cause significant harm. Numerous terms are used to describe the wide variety (e.g., plants, fish, mammals, insects, plant diseases, zoonotic pathogens, and parasites) of invasive species. As public awareness, press coverage, and Congressional interest (e.g., Corn et al. 1999; Buck 2004) in invasive species increases, so has a certain amount of confusion over the definition(s) of invasive species. Concerns have been expressed that an overly broad or vague definition could result in an undue infringement on private property rights in the name of controlling species that are unclearly defined or inappropriately labeled as invasive. At their October 2004 meeting, ISAC discussed the definition(s) and related terms that are used. To help reduce any confusion over terminology, ISAC formed the Definitions Task Team. It is tasked with preparing a "white paper" to examine the issue of the invasive species definitions and terminology in the EO. The Task Team has met three times and presented a preliminary proposal at the February 2005 ISAC Meeting held in Silver Spring, MD. The Task Team is examining terminology, context, and the appropriate use of terms in order to clearly differentiate between regulatory and non-regulatory issues and to provide a framework for clarifying issues related to definitions. Once completed, ISAC will forward its white paper to NISC members for their consideration. In addition, NISC staff and Policy Liaisons will consider these issues and concerns in the revision of the NISC Plan for 2005 (see App. V).

III. Duties of the National Invasive Species Council

This section enumerates the responsibilities of NISC as set out in the EO, summarizes how NISC has carried out these duties, and highlights some of the challenges NISC has encountered in accomplishing its mission.

***"…The Invasive Species Council shall provide national leadership regarding invasive species…"* (EO 13112, Sec. 4, App. I).**

NISC provides national leadership on invasive species at the broad, policy level in a number of ways. Most importantly, NISC provides a forum and process for coordination, cooperation, and information exchange. NISC members, principal contacts for the Co-Chair departments, and Policy Liaisons representing each member department or agency meet and exchange information on a regular basis about invasive species matters. They are informed (Secretaries or Administrators and leaders within their organizations) about invasive species developments, trends, and opportunities in a comprehensive

manner. NISC provides information to fellow members and invasive species stakeholders through a wide variety of means such as meetings, trip reports, weekly updates, recommendations submitted by ISAC, workshops, conferences, progress reports, legislative updates, crosscutting budgetary information, and oral briefings. NISC sets broad goals and objectives for the coordination of federal invasive species programs and activities utilizing a number of mechanisms, including the National Invasive Species Management Plan (NISC 2001) and the Performance-Based Invasive Species Crosscut Budget process (NISC 2004b; NISC 2005a; NISC 2003b) and by identifying specific projects and objectives for the NISC staff. These mechanisms are described in more detail below.

In providing leadership, NISC must consider the different missions, authorities, capacities and mandates of its 13 member departments and agencies, including invasive species responsibilities or programs in about 35 separate agencies/bureaus/divisions within NISC. NISC has encouraged intradepartmental coordination by calling for consolidated responses from each of its members. A few member departments such as USDA and DOI have multiple agencies with invasive species responsibilities—e.g., seven agencies in USDA and six in DOI. A number of the NISC Policy Liaisons conduct regular meetings with their agency invasive species coordinators in order to discuss priorities and plans for their department. Thus, NISC Policy Liaisons play an important role of maintaining intradepartmental/agency coordination and cooperation, and communicating their department's position to NISC.

It is important to recognize the EO does not provide NISC with any new authorities or specific powers to direct member departments and agencies' specific actions, but it does provide a decision-maker level forum and a process to more effectively address invasive species issues. The capacity of NISC to address invasive species issues comes from the roles, responsibilities and missions of its members and relies upon their willingness to identify a common vision and goals for reducing the harmful impacts of invasive species. Critical to this effort is an interdepartmental ability to identify a common vision, conduct strategic planning, ensure implementation of activities and projects by all partners, and track and report the outcomes of joint projects.

1) "[NISC shall:] Oversee the implementation of this order and see that Federal agency activities … are coordinated, complementary, cost-efficient, and effective … relying to the extent appropriate on existing organizations…." **(EO 13112, Sec. 4(a), App. I).**

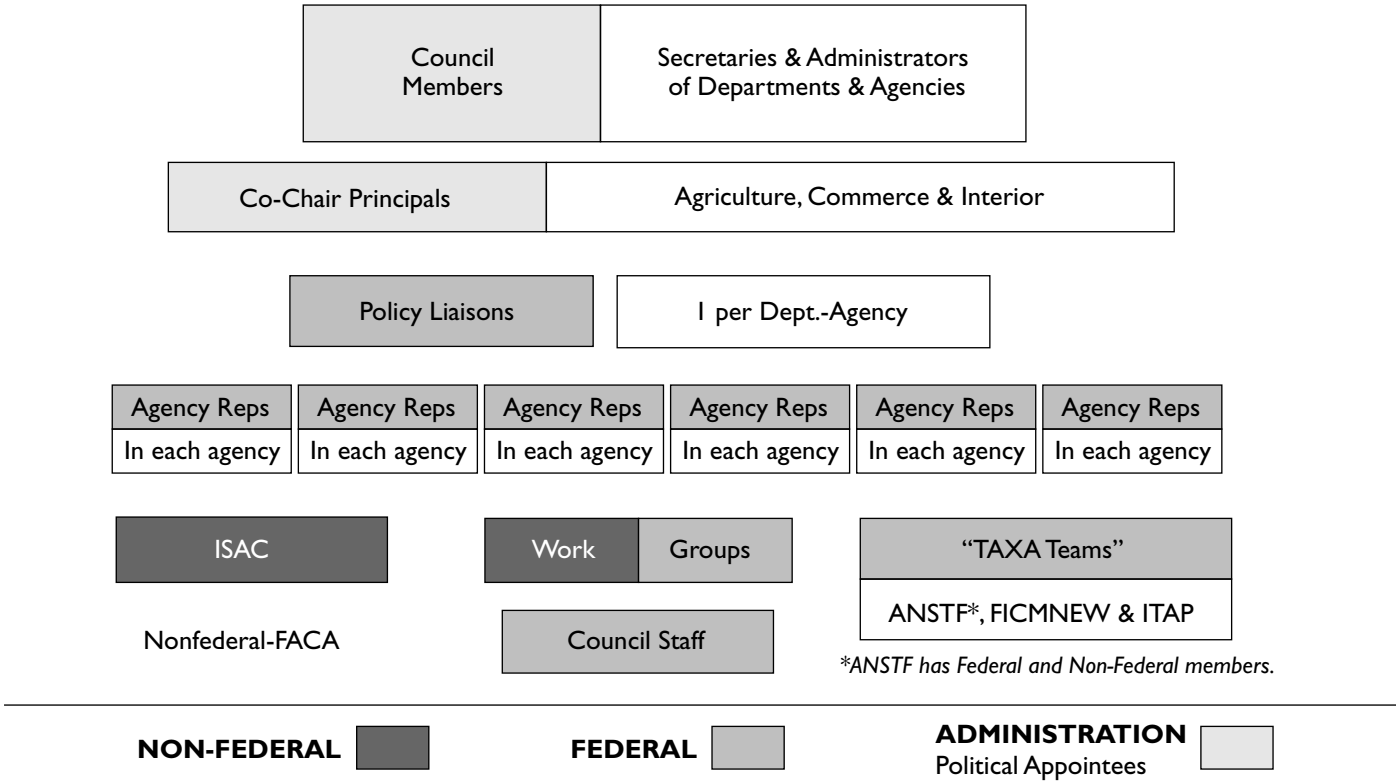
This first charge in the EO is NISC's broadest and most ambitious duty. NISC is responsible not only for providing coordination and leadership, but utilizing that coordination to enhance and improve the Federal Government's response to the threat of invasive species by ensuring Federal programs are effective, avoid duplication, and minimize costs. NISC is also instructed to not duplicate, but rather enhance the efforts of already existing Federal coordinating bodies including ANSTF, FICMNEW, and the Committee on Environment and Natural Resources (CENR), which are focused on specific types of invasive species or specific issues on a technical level (NISC 2001, App. 2, pp. 60-61). By working with these groups, NISC can emphasize broad, high-level, overarching invasive species efforts, identify gaps, and focus on the specific duties assigned to NISC in the EO.

The table below depicts (in general terms) the organizational and operational structure of NISC and how it interacts with ISAC, other Federal coordinating bodies and the NISC/ISAC subcommittees and task teams.

While most of EO 13112 deals with the duties and responsibilities of NISC and ISAC, Section 2 applies to *all* Federal agencies, *"… whose actions may affect the status of invasive species…"* (see Sec. 2(a), App. I). Section 2 of the EO specifically calls on all Federal agencies to identify actions they take which may affect the status of invasive species (to the extent practicable and permitted by law), and subject to the availability of appropriations, use relevant programs and authorities to

1. prevent the introduction of invasive species; detect and respond rapidly to (and control populations of) invasive species;
2. monitor invasive species populations;
3. provide for restoration of native species;

The National Invasive Species Council (NISC)



4. conduct research, develop technologies to prevent introduction, and provide for environmentally sound control of invasive species; and
5. promote public education on invasive species and the means to address them (EO 13112, Sec. 2(a), App. I).

In addition, the EO provides:

> ***"…an agency should not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."***

The EO calls on Federal agencies to pursue these duties "… in consultation with the [National] Invasive Species Council and consistent with the National Invasive Species Management Plan." It does not include a requirement that agencies report to NISC regarding their compliance with the EO (EO 13112, Sec. 2(b), App. I).

NISC has taken a number of steps to determine whether the EO is being implemented. The first action item in the National Invasive Species Management Plan relates to monitoring compliance with the EO. Action Item 1 calls on NISC to draft *"… a transparent oversight mechanism for use by Federal agencies in complying with the Order and reporting on implementation"* (NISC 2001). In May 2003, NISC approved a mechanism developed by NISC staff and Policy Liaisons to monitor implementation of the EO in accordance with the Plan and in consultation with ISAC (see App. IV). This mechanism requires each NISC member to report on its efforts to comply with the EO.

The Plan further specifies the mechanism should *"employ an interactive process that engages public involvement…"* (NISC 2001, Action Item 1). The NISC Implementation Mechanism allows members of the public to call upon a Federal agency in a specific instance to explain whether their actions may cause the introduction or spread of an invasive species, and if so, why such actions were taken (see App. IV). The agency is strongly encouraged—but not obligated—to respond to the request. Thus far, NISC is not aware of any formal requests for explanation of actions under this mechanism. The invasive species implementation mechanism relies exclusively on reporting requirements and does not create any right or duty with any entity to challenge decisions or actions of the Federal Government.

The mechanism has some limitations. Although it applies to all Federal agencies, NISC does not yet have a process to monitor the compliance of non-NISC members; nor does NISC have a point of contact in all Federal departments and agencies. However, with 13 departments and agencies now members of NISC, most—but not all—Federal invasive species activities may be covered. Thus far, only one NISC member (USDA) has submitted an implementation mechanism report, which was well received by ISAC. NISC staff and Policy Liaisons are working to combine several NISC reporting requirements into one report to enhance compliance. Discussion of this issue is expected to be an important topic in the upcoming revision of the Management Plan. Thus far, NISC has relied primarily on coordination, planning, joint efforts and information exchange to encourage participation in the implementation of the goals outlined in the EO.

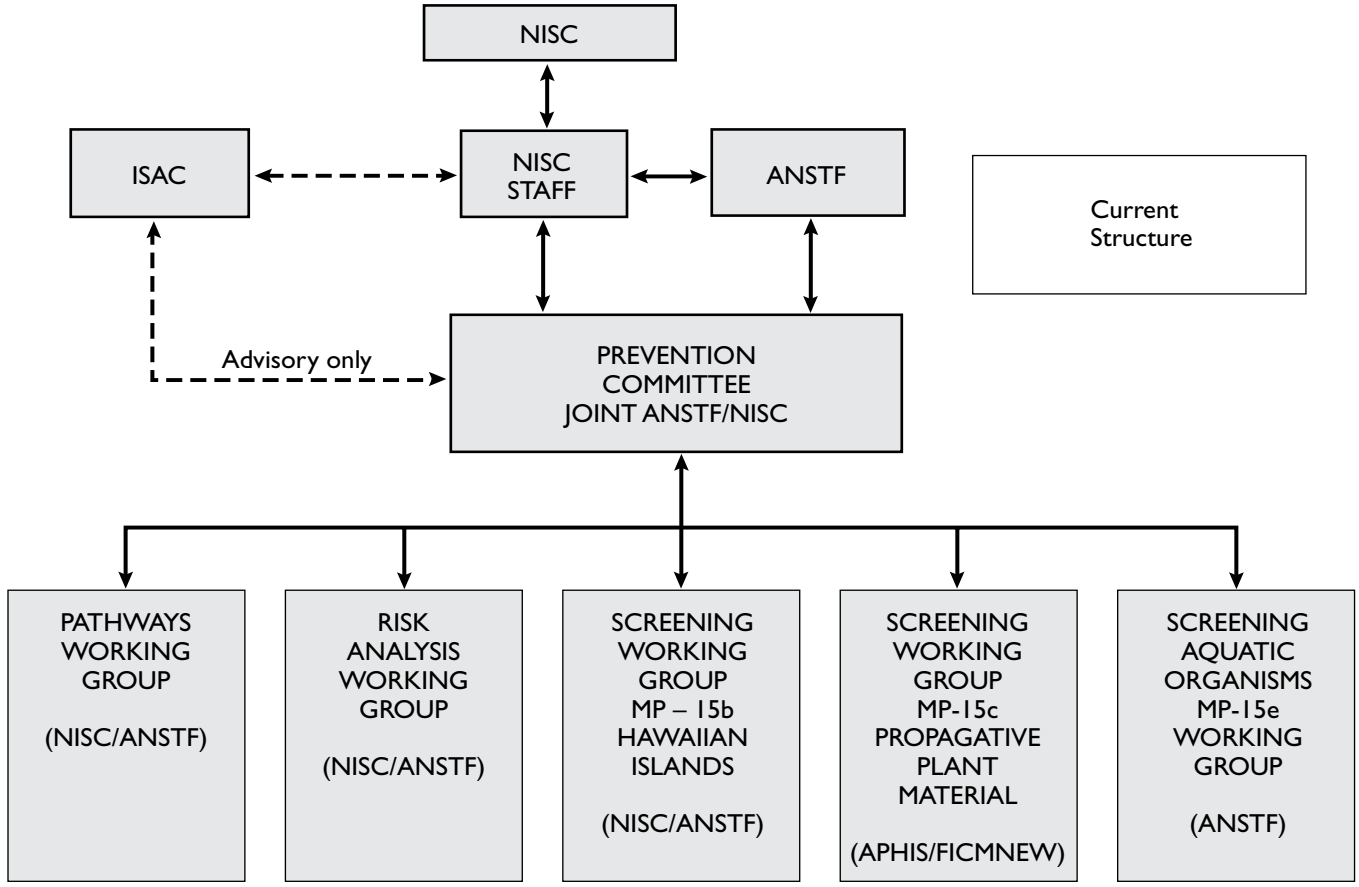
As mentioned above, the EO directs NISC to work with other Federal coordinating bodies to accomplish its mission. NISC is working closely with the ANSTF and FICMNEW. In addition, NISC works with the recently established Federal Interagency Committee on Invasive Terrestrial Animals and Pathogens (ITAP). ITAP focuses on terrestrial animals such as invasive insects and vertebrates, as well as microorganisms that cause plant and animal disease. The Committee on Energy and Natural Resources Research (CENR) is part of the National Science and Technology Council (NISC 2001; see App. 2, p. 61). CENR has had limited activity on invasive species issues in recent years; however, NISC is monitoring recent reports that CENR is once again considering issues relating to invasive species research.

Regarding coordination with ANSTF, the Department of Commerce (DOC) Policy Liaison to NISC also serves as the DOC representative to the ANSTF and keeps NISC informed and up to date about ANSTF activities. NISC staff members regularly attend and make presentations at local as well as regional panel meetings of the ANSTF. Most significantly, NISC and ANSTF have combined their largely parallel committees and working groups dealing with prevention issues, and invited FICMNEW and the newly formed ITAP to participate. These committees (shown in table below) are studying a wide range of prevention issues and addressing implementation of the NISC Management Plan as well as the ANSTF strategic plan goals. These joint efforts avoid duplication and enhance cooperative efforts in this critical area. In addition, ANSTF will make specific recommendations regarding the revision of the NISC Management Plan and will involve their regional panels in the process (ANSTF 2004). Plan action items 23 and 24 focus on the development of guidelines and systems for the coordinated detection and response to incipient invasions.

NISC and FICMNEW are cooperating in a number of ways. NISC members attend and participate in FICMNEW meetings, provide input on the work plan, and assist with FICMNEW efforts in support of National Invasive Weed Awareness Week. The policy liaison for the Department of Defense (DOD) serves as both the NISC Policy Liaison and Co-Chair of FICMNEW. NISC is also working closely with the newly formed interagency group ITAP on issues including enhancing federal capacity in the area of taxonomy to support work on invasive species. FICMNEW and ITAP will also participate in the Plan revision process.

2) ***"[NISC shall:] …encourage planning and action at the local, tribal, State, regional, and ecosystem level to achieve goals of the Management Plan… "* (EO 13112, Sec.4(b), App. I).**

NISC/ANSTF Prevention Committee Structure



Many NISC efforts in this area have been accomplished through working with ISAC. Its members represent State, local, and regional programs and organizations including States, aquatic invasive species organizations, local boards, or county programs, Tribal interests and other nonfederal stakeholders. ISAC was involved in drafting and monitoring implementation of the Plan and providing stakeholder input on a wide range of issues. In addition, NISC staff members have traveled to many States that are creating their own invasive species councils or task forces (including Florida, California, New York, and Oregon) to encourage broad coordination efforts. A number of these States also consulted with NISC on the development of State management plans and strategies. NISC staff has participated in meetings to draft State invasive species plans, and worked with regional entities who are crafting early detection and rapid response plans, such as the ANS Great Lakes Regional Panel. NISC Policy Liaisons and staff address meetings of important State, regional, and local organizations including the Western Weed Society of America, the Entomological Society of America, the National Plant Board, and the North American Wildlife and Natural Resources Conference, among others. In addition, NISC works closely with the National Governors Association and other State coordinating bodies. NISC staff has had some contact with roughly 2,500 individuals engaged on invasive species located in various States. Staff estimates that there are some 300 programs and 170 organizations that have involvement with invasive species issues. Given the large and increasing amount of State, regional, and local activity related to invasive species, NISC involvement with these groups will likely increase. Efforts to cooperate on early detection and rapid response, information exchange, monitoring and promoting dialogue with ANS are all current and future goals for NISC (NISC 2001; NISC 2004b).

In April 2004, Team Tamarisk—which includes over 300 representatives from Federal, State, local, tribal organizations, and the private sector—met to discuss the challenges of controlling and managing the invasive weed tamarisk (saltcedar) and developing sustainable habitats in its place. This conference had representatives from approximately 19 States, with the focus on the southwestern States where the tamarisk problem and its impact on watersheds and wetlands is particularly severe. The conference, *Team Tamarisk: Cooperating for Results,* was sponsored by the U.S. Departments of the Interior (DOI) and Agriculture (USDA), NISC, and 11 other organizations. Land managers and scientists developed a series of guiding principles emphasizing the importance of stakeholder involvement and a performance-based approach to setting priorities for tamarisk (and related riparian invasive plants such as Russian olive and Siberian elm) control and subsequent restoration efforts.

***3) "[NISC shall:] …develop recommendations for international cooperation in addressing invasive species…"* (EO 13112, Sec. 4(c), App. I).**

In keeping with the EO, NISC is emerging as an important participant in global discussions on invasive species issues. NISC staff members canvas international policy experts to obtain updates on the status of international meetings and conferences and share this information in a monthly report. This report is used by the international invasive species community to keep abreast of relevant meetings and activities. A recent version of this report noted 130 meetings in 2005 and 2006 (NISC 2005b). The NISC Assistant Director for International Cooperation and Prevention works closely with the Department of State and the appropriate program agencies to coordinate the U.S. position on invasive species for international meetings, negotiations, and agreements. These include facilitating positions and program recommendations for global agreements and entities including the International Plant Protection Organization (IPPO), the Convention on Biological Diversity (CBD), the Asian Pacific Economic Cooperation (APEC), the Global Invasive Species Programme (GISP), and many others. In the last year NISC staff members have also provided comments on invasive species issues relating to a number of Free Trade Agreements. They have also worked with the Peace Corps to draft a policy to prevent the introduction and spread of invasive species through that agency's development activities.

NISC has also been active in engaging Federal agencies and other organizations that could work together utilizing existing trilateral and bilateral mechanisms to provide enhanced prevention and control of invasive species across North America. This includes work with the North American Plant Protection Organization (NAPPO) to form a trilateral invasive species panel; and discussions with the Commission for Economic Cooperation (CEC) to explore a tri-national venture to address aquatic invasive species, which includes the development of tri-national CEC risk guidelines (CEC 2004).

There are ongoing discussions with the International Joint Commission (IJC) on cross-boundary invasive species issues. In addition, NISC – in collaboration with Environment Canada – has hosted several bilateral meetings with Canada and maintained an active dialogue addressing potential areas for cooperation. NISC staff have also traveled to Canada to discuss development of Canada's invasive species management plan. The Canadian plan has now been approved and funded (MacNeil 2004). Given the ability of invasive species to be transmitted via numerous pathways, North American cooperation greatly enhances critical prevention and control efforts.

***4) [NISC shall:] develop, in consultation with the Council on Environmental Quality, guidance for Federal agencies pursuant to the National Environmental Policy Act on the prevention and control of invasive species…"* (EO 13112, Sec. 4(d), App. I).**

A significant method of addressing invasive species problems is identifying those Federal actions and programs that might lead to the introduction or spread of invasive species and examining ways to minimize the harm they cause. The National Environmental Policy Act (NEPA) is one tool that could be used to identify invasive species issues. The EO directs NISC to work closely with the Council on Environmental Quality (CEQ) to provide guidance on how invasive species issues could be identified during the NEPA process and to provide expertise and potential sources of information for dealing with invasive species issues in the context of NEPA.

NISC staff, Policy Liaisons, and agency NEPA experts (working with CEQ) are near completion of an initial draft of this guidance. Limited staff at NISC (from 1999 to 2004) and CEQ as well as the complexity of dealing with the wide variety of invasive species and federal actions has complicated this task. However, significant progress has been made. Completion of this guidance is a high priority for NISC during 2006.

5) *"[NISC shall] …facilitate the development of a coordinated network among agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health…"* (EO 13112, Sec. 4(e)).

NISC member departments and agencies have taken a number of steps toward improving information and analysis of the varied and complex impacts of invasive species; both in carrying out their own missions and implementing the Management Plan. However, no coordinated network cataloguing all types of invasive species impacts exists and no resources have been identified for creating such a network. Current and recent efforts have focused on enhancing the quantity and quality of information and analysis on invasive species impacts. The first study to estimate the total cost of invasive species to the U.S. economy (Pimentel et al. 2000) estimated the total cost at $137 billion. ISAC has recommended additional research and reporting on invasive species impacts to raise awareness about the scope and importance of the issue. Increasingly, NISC member agencies have responded in this area through their grant support of invasive species programs as well as through information management and sharing efforts. For example, in 2004 the Economic Research Service in USDA established the Program of Research on the Economics of Invasive Species Management (PRESIM) to support economic research; and the U.S. Geological Survey (USGS) is developing enhanced monitoring, mapping and inventory tools to assist with estimating the impact of widespread species. In addition, NASA and the USDA have formed a collaborative partnership focusing on earth science applications and decision support, including a Focus Area Working Group on Invasive Species. NASA technology will be used to map the geographic distribution of invasive plants such as saltcedar, and evaluate the impacts of management strategies including biological control. Furthermore, NISC is facilitating a model economic analysis led by the Forest Service and the Bureau of Reclamation working with EPA, FWS, and nonfederal experts to estimate the impact of tamarisk (saltcedar) in two watersheds in the Southwest. This project is being designed to serve as a model for other efforts.

NISC Co-Chairs collaborated with the Charles Valentine Riley Memorial Foundation to sponsor three workshops on invasive species: (1) invasive species databases (November, 1998, proceedings published in 1999); (2) invasive species stakeholders—collecting, sharing and using information (April 26, 2000); and (3) western rangeland noxious weeds—collecting, sharing and using information (September 6-7, 2000). Proceedings are available on the NISC website (www.invasivespecies.gov). The workshops brought together diverse stakeholders from government, academia, and nongovernmental organizations to share multiple approaches for information management. State and private interests in production, agriculture and conservation practice were invited to discuss the sharing of information: standards, risk analysis, and policy implications for aquatic nuisance species and terrestrial invasive plants and animals.

There have also been a number of efforts to document and examine the impact of invasive species on human health. A recent comprehensive literature review indicated there were 1,415 species of infectious organisms known to be pathogenic to humans; of these, 868 (61 percent) are zoonotic (diseases communicable between animals and humans) and an especially high proportion (75 percent) of emerging pathogens are zoonotic. Overall, emerging diseases are twice as likely to be zoonotic as non-zoonotic (Taylor et al. 2001). The Institute of Medicine of the National Academy of Science published a compilation of reports concerning emerging zoonotic diseases (Burroughs et al. 2002). In addition, the potential human, livestock, and wildlife implications of zoonotic and animal disease in the National Park system has been recognized (Gillin et al. 2002). NISC efforts in this area focus on invasive species affecting both animals and humans (i.e., zoonotic pathogens and their vectors), and their impacts on the environment and the economy. The direct human health aspects of invasive zoonotic diseases are addressed by Departments such as Health and Human Services (HHS), USDA, and in some cases, DHS. Examples of progress in this area include efforts

to monitor and track WNV (USGS 2005a; Gubler et al. 2003), State Department interagency working group to discuss zoonotic disease issues, an interagency coordinated response led by the Food and Drug Administration (FDA) and the Centers for Disease Control (CDC) working in cooperation with States to respond to the outbreak of monkeypox (68 FR 62353-62369, Nov. 4, 2003).

***6) "[NISC shall:] Facilitate the development of a coordinated information-sharing system utilizing as much as possible the Internet…"* (see Sec. 4(f), App. I).**

One of the EO's central goals is improved invasive species information management sharing and accessibility. NISC has worked with key partners, including USDA's National Agriculture Library (as the current lead), and USGS, as well as others, to establish and maintain a government Internet portal site on invasive species: www.invasivespecies.gov. It serves as the World Wide Web address for NISC, and it is used frequently by the public as a gateway to information and also to direct information to key target audiences. The site features an educational program requested by ISAC called "Invasive Species of the Month." The goal is to illustrate the depth and complexity of invasive species issues and provide an opportunity to highlight the invasive species work of many Federal agencies. Together NISC and ISAC want to engage people to meet the invasive species challenge. The NISC message, "Know the NISC Plan, help manage the problem," focuses on the idea of working together to prepare, prevent, and protect natural and managed ecosystems from threats posed by invasive species (NISC website: www.invasivespecies.gov).

In addition, NISC has also participated in a number of workshops and encouraged interagency efforts to increase information sharing and development of database networks. These networks would allow scientists, managers and the public to access and utilize multiple information sources critical to identifying and solving invasive species issues. NISC staff, ISAC members, and others participated in the non-native Species Task Group sponsored by the H. John Heinz III Center for Science, Economics, and the Environment. This group developed a suite of non-native species indicators to report on non-native species plants, vertebrates, invertebrates, and pathogens. It also formed a hierarchy of preference for the indicators, stressing the importance of collecting and reporting information on the impacts of non-native species on a national scale. NISC staff members have also contributed to efforts to develop the Global Invasive Species Information Network (GISIN 2005). In addition, the Smithsonian Institute, USGS, and the National Oceanic and Atmospheric Administration (NOAA) collaborated to develop a joint/coordinated database on aquatic invasive species (NISBASE website, 2005).

***7) "[NISC shall] … prepare and issue a National Invasive Species Management Plan …"* (See Sec. 4(g), App. I).**

Among the most critical accomplishments of NISC are the development, drafting, publishing, and distribution of the first version of the National Invasive Species Management Plan, *Meeting the Invasive Species Challenge*, issued in January of 2001. It provides the first national comprehensive blueprint for coordinated federal action on invasive species. The EO called for NISC to develop the Plan "through a public process and in consultation with Federal agencies and stakeholders." (EO 13112, Sec. 5(a), App. I.) The NISC Plan was developed in conjunction with all relevant Federal entities. Its action items were derived working with ISAC, Federal, and State officials, and other interested parties, including extensive input received from the public. Under the auspices of ISAC, over 100 Federal and nonfederal invasive species experts and agency officials participated in ISAC/NISC working groups tasked with developing initial recommendations for the Plan. The NISC Plan was also approved through the normal interagency process, reviewed by OMB, and submitted for public comment. This extensive public process resulted in a blueprint reflecting comment from a broad range of experts, stakeholders, and Federal agencies in addition to NISC.

The Plan is structured around nine specific areas that experts and agency officials identified as critical in addressing invasive species within the United States and around the world. These areas include leadership and coordination; prevention; early detection and rapid response; control and management; restoration; international cooperation; research; information management; and education and public awareness. The Plan sets out a detailed series of action items with specific deadlines,

many of which include specific agency or departmental leads. The Action Items apply to all types (all taxa) of invasive species. Perhaps most significant, the Plan action items highlight the importance of seeking a more proactive, prevention-oriented approach to the problem. A large number of the actions called for in the Plan encourage preparation, early detection, and information exchange. All of these steps can lead to the prevention and/or minimization of the damage caused by invasive species, increasing the chance of eradicating, containing, or managing invasive species successfully. These steps demonstrate that addressing invasive species before they become well established and spread is critical to eradication or containment at a reasonable cost (Rejmanek and Pitcairn 2002). The Plan also stresses the importance of research, international cooperation, and education and outreach as critical tools to prevent and minimize the impact of invasive species (NISC 2001).

Section 5(b) of the EO called for the first version of the Plan to include a number of specific topics and sections (EO 13112, Sec 5(b), App. I). Thus, the Plan begins with a review or survey of roles and responsibilities (NISC 2001, see Survey of Federal Roles and Responsibilities, Plan pp. 18-26). The Plan's section on prevention includes *"… recommended measures to minimize the risk that introductions will occur…"* as well as recommendations regarding *"… a science-based process to evaluate risks associated with introductions …"* (EO 13112, Sec. 5(b), App. I). The Plan also includes an analysis of Federal invasive species programs (NISC 2001, see App. 2) and legal authorities (NISC 2001, see App. 3).

The Order also required the Plan to *"… detail and recommend performance-oriented goals and objectives and specific measures of success for federal agency efforts concerning invasive species…"* (EO 13112, Sec 5(a), App. I). The Plan does not provide these types of performance goals, although in some cases closely related goals are established under the NISC Invasive Species Performance-Based Crosscut Budget (NISC 2004b). An important objective for the next version of the Plan is to include more specific performance goals and information. Issues involving the lack of critical baseline data and measures appropriate for the areas of prevention and research will need to be addressed in some areas (see App. V).

During the past 2 years, NISC and ISAC have been primarily focused on efforts to implement the NISC Management Plan at the federal level and improve efforts to reach out to State and other nonfederal partners. There are a total of 57 Plan action items, including 86 action item sub-parts. Fifty-one are characterized as "ongoing," meaning they require continuing coordination, and 35 are considered "discrete," i.e., requiring little coordination once completed. There has been significant progress on, or completion of, approximately three fourths of the action items detailed in the Plan. Work on the remaining action items has not yet started. As called for in the EO, NISC has completed a detailed review of Plan implementation, Progress Report on the National Invasive Species Management Plan, October 2003 and updated in June 2005 (NISC 2003c; NISC 2005e). This five-year review includes only a few highlights of NISC actions under the first three sections of the Plan (not already been mentioned above) including Leadership and Coordination, Prevention, and Early Detection and Rapid Response. Detailed examples of what has been accomplished under the other areas of the Plan are included in the Plan Progress Reports.

Leadership and Coordination

As called for by Action Item 7 of the Plan, NISC has prepared performance-based crosscut budgets for fiscal years 2004 through 2006; based on the active involvement and hard work of many (but not all) NISC member departments. In 2003, former Office of Management and Budget (OMB) Director Mitchell Daniels wrote NISC agency heads encouraging them to conduct a crosscut budget, but no Budget Data Request or other formal guidance had been issued. The crosscut budget represents remarkable voluntary cooperation and effort among member agencies. NISC will continue to encourage voluntary participation from all agencies and departments, including those not currently involved in the crosscut. The invasive species crosscut budget is one of NISC's most important achievements under the Plan. In addition to valuable budgetary information, the crosscut provides a tool for the coordination and planning of invasive species efforts regarding support for activities relating to invasive species involving multiple departments or agencies. The FY 2004 Crosscut was the first example of an interdepartmental performance-based budget proposal focusing on three components of invasive species (prevention, early detection, and rapid re-

sponse, and control) and included participation from 15 different agencies in 5 different departments. Building on the successful first effort, the FY 2005 and FY 2006 Crosscuts catalog overall Federal spending on invasive species beginning with FY 2002 in each of the major areas identified in the Plan, as general category spending. They also provide details of specific crosscutting initiatives including common strategic goals and performance measures. Sixteen agencies in six departments collaborated to develop the FY 2006 Crosscut.

As noted above, NISC has completed or made progress on a number of items related to leadership. One example is the development of an implementation mechanism calling for detailed reporting by member agencies. Plan Action Item 3 calls on NISC to conduct an evaluation of current legal authorities related to invasive species. With the assistance of USDA, NISC has contracted with the Environmental Law Institute to conduct *"… an analysis of whether and how current invasive species legal and regulatory authorities could be better utilized"* and a determination of their adequacy (NISC 2001, see Action Item 4). An outline of this analysis has been prepared and is under review. Other completed items include a detailed report on Plan implementation progress as noted above (NISC 2001, see Action Item 8; NISC 2005e), and convening of a group of agency leads on international agreements related to invasive species (NISC 2001, see Action Item 10).

While there has been much progress on Plan implementation, items calling for NISC to develop and implement

FY 2006 INTERAGENCY PERFORMANCE BUDGET SUMMARY

INITIATIVE	Funding for FY 2006 ($1000)
Brown Treesnake	4,745
Tamarisk	9,831
Emerald Ash Borer	35,235
Leafy Spurge/Yellow Star Thistle	6,031
Sudden Oak Death	5,109
Asian Carp	2,972
Ballast Water	920
Prevention Through Education	949
Aquatic Area Monitoring	2,832
Early Detection/Rapid Response	49,573
Innovative Control Technologies	18,919
TOTAL	**137,116**

Fiscal Year 2006 President's Budget
General Category Summary by Department ($1,000)

	DOT	USDA	USACE	DOI	STATE	EPA	DOC	DHS	TOTAL
Prevention	0	128,373	700	3,775	0	0	300	4,000	137,148
EDRR	0	247,259	700	8,065	0	0	1,000	0	257,024
Control	0	365,836	59,000	27,606	12,119	345	1,000	0	465,906
Research	500	208,611	3,750	10,012	0	1,230	3,000	0	227,103
Restoration	0	22,326	10,000	10,642	0	0	0	0	42,968
Education and Public Awareness	0	59,227	300	12	0	0	700	0	60,239
Leadership/ International Coordination	0	63,920	0	511	88	0	500	0	65,019
TOTAL	**500**	**1,095,552**	**74,450**	**60,623**	**12,207**	**1,575**	**6,500**	**4,000**	**1,255,407**

a dispute resolution mechanism to solve invasive species issues (Action Item 2), select and solve two specific invasive species problems or issues (Action Item 6), and prepare a detailed analysis of barriers to coordination (Action Item 5) have not been significantly addressed. Many of these items require substantial time to address, or are controversial or complex in nature. These items will be carefully evaluated during the Plan revision process when it will be determined whether they warrant priority attention or need to be amended.

Prevention

Prevention is the "first line of defense" against invasive species and is emphasized as a critical priority in the Plan. Highlights under this section include progress by the Joint NISC/ANSTF Prevention Subcommittee toward development of a risk-based screening system for intentional introductions. Three screening working groups have been created in response to Action Items 14 and 15, which deal with screening of intentional introductions of species. Progress is being made within the propagative plant screening working group. In December 2004, APHIS published an "Advance Notice of Proposed Rulemaking" to consider changes to its nursery stock regulations. The Aquatic Screening Working Group completed a workshop that focused on screening of aquatic organisms in February 2005. The Hawaiian Screening Group focused their efforts on the State of Hawaii, where a number of screening regulations are in effect (NISC 2001, see Action Items 14 and 15 [a-e]).

Unintentional introductions through pathways are addressed by Action Items 16-20. Action Item 16 calls for three separate actions, two of which have been completed and one making significant progress. First, significant progress has been made in developing ballast water treatment technologies. NOAA, USFWS and the Maritime Administration have submitted a joint request for proposals and sponsored over 40 different research projects. Several technologies that could serve as alternatives to ballast water exchange are well beyond the proof of concept stage and are undergoing full-scale tests (NISC 2003c). Second, the Coast Guard has published procedures for approving experimental shipboard testing of new technologies (69 FR 1078-1081, Jan. 7, 2004), an "Advance Notice of Proposed Rulemaking" on the setting of a standard for technology alternatives to ballast water exchange (68 FR 55559-55563, Sept. 26, 2003). The International Maritime Convention approved the International Convention for the Control and Management of Ships' Ballast Water and Sediments, and it is currently being considered for ratification by member countries (summary available at www.imo.org). Third, USDA has issued regulations (a final rule) to reduce the risk of introductions from solid wood packing material in 2004, as called for in the Plan (69 FR 55719-55733, Sept. 16, 2004).

After consultation with ISAC, NISC issued a report describing the most important invasive species pathways and drafted criteria for ranking their importance as directed in Plan Action Item 20. The pathway ranking criteria and assessment tools are now under review by the joint NISC/ANSTF Pathways task team (NISC 2004a).

Despite significant progress, much remains to be done to complete the development and testing of a screening process for intentional introductions and to address the major pathways for introduction at the national and international level. The addition of USTR to NISC strengthens its ability to deal with the complex international trade issues that need to be addressed in the context of prevention efforts.

Early Detection and Rapid Response (EDRR)

NISC, along with the other taxa-specific coordinating bodies (e.g., ANSTF, FICMNEW and ITAP), States, regions, and others has been active in EDRR planning to prevent the establishment of invasive populations. For example, ANSTF identified EDRR as a priority of their Strategic Plan (ANSTF 2002). FICMNEW has begun testing a conceptual design for an EDRR system issued for invasive plants (FICMNEW 2003). In 2003, NISC provided guidance on the formation and evaluation of EDRR systems (NISC 2003a) that are based in part on work including but not limited to the FICMNEW conceptual design (FICMNEW 2003), a report by Jim Worrall of the U.S. Forest Service, the work of the Western Regional Panel of the ANSTF, the definition of "rapid response" developed by NISC, and information on EDRR systems from New Zealand and Australia (NISC 2003a).

There are several examples of area and species specific EDRR activities. The Cooperative State Research, Education, and Extension Service (CSREES) of USDA has established two national networks of existing diagnostic

laboratories to rapidly and accurately detect and report plant and animal pathogens of national interest, and provide timely information and training to State university diagnostic labs. The National Plant Diagnostic Network (NPDN) is led by five regional labs and one support lab. It is anticipated that the future role of these NPDN labs will broaden to include invasive arthropods, invasive plants, and other organisms, allowing pest managers to take advantage of NPDN for the EDRR of invasive species. In addition, a number of agencies have organized programs utilizing volunteers trained in early detection. Through the NPDN System and the Regional IPM Centers, CSREES has developed a successful system for monitoring and EDRR for sudden oak death and soybean rust, which utilizes master gardeners and other trained volunteers. FWS is working with the National Wildlife Refuge Association and National Wildlife Refuge Friends' groups in early detection pilot programs (NISC 2005e).

Several EDRR action items within the Plan have not been fully addressed, such as Action Item 24. It calls for the creation of an emergency rapid response fund to be available for newly introduced/established organisms that require eradication to avoid the extremely high costs of control and management if the species are permitted to spread. The need for a rapid response fund has been a consistent recommendation from stakeholders such as the National Plant Board, the Weed Science Society of America (WSSA), a number of States, and many other organizations. Costs of addressing pests and disease are significant. The pest and disease management support from the USDA Commodity Credit Corporation rose from $31 million in FY 1998 to a high of $378 million in FY 2003 (Monke 2004). It is estimated that the resources required for an EDRR fund would be significant, but have not yet been fully addressed (NISC 2001). The negative impacts of many of the invasive species, now widely established, could have been mitigated or avoided had an emergency rapid response fund and other mechanisms been available at the critical early invasion stages. A few examples of species that have (or have the potential to) spread rapidly are

Emerald Ash Borer (EAB)—EAB (*Agrilus planipennis* Fairmaire) was discovered in six southeastern Michigan counties in 2002. This year, EAB has been found in 5 States and over 25 counties, and is in 2 locations in Canada. The FY 2006 Crosscut budget contains ca. $35 million (a $27 million increase from FY 2005) for EAB efforts (NISC 2005a).

Asian Long-Horned Beetle (ALB)—ALB (*Anoplophora glabripennis*) eradication appears to be successful in the Chicago area. However, a great deal of work remains in the New York City and New Jersey area. If this species is not contained, it could impact hardwood forests throughout the Eastern United States.

Giant Salvinia—(*Salvinia molesta)* is a rapidly growing floating invasive fern native to southeast Brazil. It forms dense mats that impede water transport of larger vessels, clogs irrigation and drainage canals, reduces fisheries, and causes other economic and environmental impacts. Giant salvinia was first reported in the United States in 1995 in a single South Carolina pond. As of 2004, the USGS reports that *S. molesta* has been found at over 90 locations within 41 freshwater drainages in 11 States: Texas, Louisiana, Mississippi, Alabama, South Carolina, North Carolina, Georgia, Florida, Arizona, California, Virginia, and Hawaii (for the current distribution of *S. molesta* see http://salvinia.er.usgs.gov/html/sm_progression.html).

Cactus Moth—(*Cactoblastis cactorum*) is an invasive insect that could significantly impact the indigenous prickly pear cactus and other species in the United States. This species is a highly effective biological control agent that has been used successfully in Australia for controlling unwanted populations of exotic prickly pear cactus. However, it has become an invasive pest threatening native landscapes and agricultural industries in the Southwestern United States and Mexico. First discovered in the Florida Keys in 1989, the moth has since moved up the eastern seaboard to Bull Island, South Carolina and over to Alabama. Moving at a rate of approximately 100 miles annually since 2000, this moth could reach Texas by 2007. USDA estimates the prickly pear cactus has a U.S. trade, nursery, landscape, crop, and forage value of up to $70 million a year. In Mexico, the prickly pear cactus is estimated to have an annual value between $50 and $100 million (see www.cphst.org/newsletter/jan-05newsletter.pdf).

There have been many important accomplishments in each area of the Plan, as documented in the Plan Progress Report (NISC 2003c; NISC 2005e). However, a great deal of work remains. NISC members and staff have noted the Plan contains some overly optimistic deadlines and objectives. It often calls for simultaneous development of mechanisms for all types (taxa) of invasive species, which has proven unrealistic. The difference between actions that can be completed with existing resources from those requiring enhanced staffing or funding is not clearly defined within the Plan; nor does it prioritize the large and complex set of action items included. The EO calls for the Plan to be revised every two years. In 2003, ISAC recommended that progress in Plan implementation be emphasized for an additional year before its revision. ISAC, as well as NISC member agencies, GAO and OMB, have made preliminary recommendations for revision. A roadmap reflecting these recommendations for the Plan's revision has been drafted and approved (see App. V; USGAO 2002).

In summary, the roadmap calls for the Plan to be updated and revised rather than extensively rewritten. It recommends further that the current Plan remain the base or "reference Plan", while the revision should be a more strategic document—less detailed and more focused on NISC members' projects to be accomplished or initiated in the next 3 years. The revision period will be 3 years in length; and linked to federal budget cycles. To the extent practicable, it will include performance goals and measures. These recommendations were derived from the analysis and experience gained from implementing the current Plan (see App. V).

Conclusion

Executive Order 13112 mandates a more coordinated and effective government-wide response to invasive species. However, invasive species coordination is complex and dynamic, encompassing 25 Federal laws that address invasive species issues, which govern the activities of over 40 agencies and many more programs. In addition, NISC staff members estimate about 300 nonfederal programs, 175 organizations, and 140 groups have at least some involvement with invasive species issues.

The EO created NISC as a coordinating body, but not as a regulatory agency with assigned specific programmatic responsibilities. NISC has developed an operating process and structure encompassing many levels of government and numerous nongovernmental organizations. In addition to coordination and fostering communication among agencies, NISC has developed many tools that facilitate cooperative invasive species efforts among Federal agencies and with nonfederal partners.

The National Management Plan provides a comprehensive blueprint for action organized by thematic areas of focus. ISAC helps NISC reach out effectively to many stakeholders and interest groups. Joint Federal/nonfederal (NISC/ISAC) subcommittees and working groups collaborate to implement the Plan's recommendations. The NISC website (www.invasivespecies.gov) provides links to invasive species information across governmental agencies and nongovernmental organizations. The annual NISC invasive species performance-based crosscut budget coordinates interagency budget efforts to implement NISC plan actions. Weekly reports of NISC activities for NISC Principals and Policy Liaisons and a bi-monthly NISC update regarding its activities and invasive species developments for agency officials and stakeholders provide up-to-date information to our partners. These ongoing efforts provide tools for NISC to accomplish its goals and overall mission under the EO.

NISC has made significant progress addressing the central goals and responsibilities outlined in Section 4 of EO 13112, and has significantly improved the quality and degree of coordinated, comprehensive, and more targeted actions to address invasive species issues. Federal agencies are more aware of and focused on invasive species issues and how those issues affect their ability to accomplish their missions, especially in the areas of prevention and early detection and rapid response. Many of the lessons learned by NISC over the last 5 years on how to more effectively address invasive species can be addressed through the revision of the National Management Plan.

Now fully staffed, NISC provides a forum for innovative collaboration. The staff, Principals and ISAC members testify at Congressional hearings, develop agency and Administration positions on prospective invasive species legislation, serve on grant proposal committees dealing with invasive species research and management issues, address meetings across the nation and around the world, and provide information and background for in-

vasive species press reports. NISC records indicate that 19 States have established State-level invasive species coordinating councils or similar bodies, many of which are modeled after NISC.

NISC faces many challenges. However, it is not certain that these challenges could be addressed by revision of the EO. NISC is only as strong as the commitment and contributions of its members. The three Co-Chair departments support full-time staff located at the NISC offices and thus remain consistently and actively engaged with NISC. Recently, other members have stepped forward to provide leadership on particular issues. For example, the State Department has taken the lead on international invasive species issues such as convening international meetings to promote capacity building, and the Army Corps of Engineers is the lead agency on electrical fish barriers in Illinois and modeling of tamarisk spread in the middle Rio Grande using new GIS technologies. Some invasive species duties have been reassigned to new departments, making it difficult to reestablish the appropriate level of contact. Specifically, the Department of Homeland Security has yet to officially name a Policy Liaison, although several points of contact provide ongoing liaison support. NISC needs to explore innovative ways to better engage a number of the non-Co-Chair NISC members.

NISC has had some difficulty collecting needed information and reports on invasive species activities in the agencies. Further efforts to consolidate reporting requirements should give agency staff a consistent annual schedule for updating budget and program activities. Successful NISC efforts require agency investments, primarily in additional staff time and support. Frequently, agency and departmental officials take on NISC responsibilities as one of many other collateral duties but do not receive recognition commensurate to their efforts. Interdepartmental coordination and planning is time consuming and complex. NISC needs to explore how these coordination efforts can be supported and rewarded as well as ways to streamline coordination activities.

Under the umbrella of EO 13112, NISC provides a framework for the Federal Government to mount a comprehensive response to the complex problems and issues raised by invasive species and to coordinate with critical nonfederal partners. As the Government and stakeholders move toward a more coherent national policy and approach, NISC has and will continue to provide leadership and coordination. In the last 5 years, NISC has emphasized prevention, early detection and rapid response, and sharing of information to create a more proactive and effective invasive species strategy. By providing an overall framework for federal invasive species policy and coordination, Executive Order 13112 enhances federal efforts to minimize the harm to the economy, the environment, and human health caused by invasive species.

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Appendix I: Executive Order 13112

Presidential Documents

Executive Order 13112 of February 3, 1999

Invasive Species

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 *et seq.*), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa *et seq.*), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 *et seq.*), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), and other pertinent statutes, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause, it is ordered as follows:

Section 1. *Definitions.*

(a) "Alien species" means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

(b) "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions.

(c) "Ecosystem" means the complex of a community of organisms and its environment.

(d) "Federal agency" means an executive department or agency, but does not include independent establishments as defined by 5 U.S.C. 104.

(e) "Introduction" means the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

(f) "Invasive species" means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

(g) "Native species" means, with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

(h) "Species" means a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

(i) "Stakeholders" means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, non-governmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

(j) "United States" means the 50 States, the District of Columbia, Puerto Rico, Guam, and all possessions, territories, and the territorial sea of the United States.

Sec. 2. *Federal Agency Duties.* (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,

(1) identify such actions;

(2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and

(3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

(b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Sec. 3. *Invasive Species Council.* (a) An Invasive Species Council (Council) is hereby established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council may invite additional Federal agency representatives to be members, including representatives from subcabinet bureaus or offices with significant responsibilities concerning invasive species, and may prescribe special procedures for their participation. The Secretary of the Interior shall, with concurrence of the Co-Chairs, appoint an Executive Director of the Council and shall provide the staff and administrative support for the Council.

(b) The Secretary of the Interior shall establish an advisory committee under the Federal Advisory Committee Act, 5 U.S.C. App., to provide information and advice for consideration by the Council, and shall, after consultation with other members of the Council, appoint members of the advisory committee representing stakeholders. Among other things, the advisory committee shall recommend plans and actions at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order. The advisory committee shall act in cooperation with stakeholders and existing organizations addressing invasive species. The Department of the Interior shall provide the administrative and financial support for the advisory committee.

Sec. 4. *Duties of the Invasive Species Council.* The Invasive Species Council shall provide national leadership regarding invasive species, and shall:

(a) oversee the implementation of this order and see that the Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species, such as the Aquatic Nuisance Species Task Force, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, and the Committee on Environment and Natural Resources;

(b) encourage planning and action at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order, in cooperation with stakeholders and existing organizations addressing invasive species;

(c) develop recommendations for international cooperation in addressing invasive species;

(d) develop, in consultation with the Council on Environmental Quality, guidance to Federal agencies pursuant to the National Environmental Policy Act on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species;

(e) facilitate development of a coordinated network among Federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health;

(f) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, to the greatest extent practicable, the Internet; this system shall facilitate access to and exchange of information concerning invasive species, including, but not limited to, information on distribution and abundance of invasive species; life histories of such species and invasive characteristics; economic, environmental, and human health impacts; management techniques, and laws and programs for management, research, and public education; and

(g) prepare and issue a national Invasive Species Management Plan as set forth in section 5 of this order.

Sec. 5. *Invasive Species Management Plan*. (a) Within 18 months after issuance of this order, the Council shall prepare and issue the first edition of a National Invasive Species Management Plan (Management Plan), which shall detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species. The Management Plan shall recommend specific objectives and measures for carrying out each of the Federal agency duties established in section 2(a) of this order and shall set forth steps to be taken by the Council to carry out the duties assigned to it under section 4 of this order. The Management Plan shall be developed through a public process and in consultation with Federal agencies and stakeholders.

(b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, including those for identifying pathways by which invasive species are introduced and for minimizing the risk of introductions via those pathways, and shall identify research needs and recommend measures to minimize the risk that introductions will occur. Such recommended measures shall provide for a science-based process to evaluate risks associated with introduction and spread of invasive species and a coordinated and systematic risk-based process to identify, monitor, and interdict pathways that may be involved in the introduction of invasive species. If recommended measures are not authorized by current law, the Council shall develop and recommend to the President through its Co-Chairs legislative proposals for necessary changes in authority.

(c) The Council shall update the Management Plan biennially and shall concurrently evaluate and report on success in achieving the goals and objectives set forth in the Management Plan. The Management Plan shall identify the personnel, other resources, and additional levels of coordination needed to achieve the Management Plan's identified goals and objectives, and the Council shall provide each edition of the Management Plan and each report on it to the Office of Management and Budget. Within 18 months after measures have been recommended by the Council in any edition of the Management Plan, each Federal agency whose action is required to implement such measures shall either take the action recommended or shall provide the Council with an explanation of why the action is not feasible. The Council shall assess the effectiveness of this order no

less than once each 5 years after the order is issued and shall report to the Office of Management and Budget on whether the order should be revised.

Sec. 6. *Judicial Review and Administration.* (a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person.

(b) Executive Order 11987 of May 24, 1977, is hereby revoked.

(c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.

(d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.

William J. Clinton

THE WHITE HOUSE,
February 3, 1999.

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Billing code 3195–01–P

Appendix II: List of ISAC Members (2004-2006)

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Appendix III: List of NISC Policy Liaisons

Departmental & Agency Policy Liaisons

Agriculture	Hilda Diaz-Soltero USDA Senior Invasive Species Coordinator National Invasive Species Council 1201 Eye Street, NW., 5th Floor Washington, DC 20005	(202) 720-0857 fax: (202) 720-8984 hdiazsoltero@fs.fed.us
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Interior	A. Gordon Brown DOI Invasive Species Coordinator National Invasive Species Council 1201 Eye Street, NW., 5th Floor Washington, DC 20005	(202) 354-1878 fax: (202) 371-1751 a_gordon_brown@ios.doi.gov
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EPA	Michael Slimak Associate Director for Ecology National Center for Environmental Assessment US EPA ARIEL RIOS BUILDING 1200 Pennsylvania Avenue, NW. Mail Stop 8601N Washington, DC 20460	(202) 564-3324 fax: (202) 564-2018 slimak.michael@epa.gov
HHS	Sandra Howard Senior Policy Analyst Office of the Assistant Secretary for Planning and Evaluation U.S. Department of Health and Human Services 200 Independence Avenue, SW. Washington, DC 20201	(202) 690-5874 fax: (202) 205-8835 sandra.howard@hhs.gov

Continued on next page

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Transportation	Arnold Konheim Senior Policy Analyst Office of the Secretary U.S. Department of Transportation 400 7th Street SW., Room 10309G Washington, DC 20590	(202) 366-4849 fax: (202) 366-7618 arnold.konheim@ost.dot.gov
Treasury	**NO LIAISON APPOINTED**	
US Agency for Int'l Development	Jim Hester Agency Environmental Coordinator Global Environment Center, USAID/G/ENV 1300 Pennsylvania Avenue, NW., Room 6.08-072 Washington, DC 20523-3800	(202) 712-5176 fax: (202) 216-3174 jhester@usaid.gov
DHS	**NO LIAISON APPOINTED**	
USTR	Mark Linscott Assistant U.S. Trade Representative for Environment and Natural Resources 600 17th Street, NW. Washington, DC 20508	(202) 395-7320 fax: (202) 395-6865 mlinscott@ustr.gov
NASA	Edwin Sheffner Program Manager for Invasive Species within The Applied Sciences Program 300 E Street, SW. Washington, DC 20546-0001	(202) 358-0239 fax: (202) 358-3098 edwin.j.sheffner@nasa.gov

Appendix IV: NISC Implementation (Oversight) Mechanism

Oversight of Agency Actions Affecting Invasive Species

Executive Order 13112 on Invasive Species (63 Fed. Reg. 6183-6186, February 8, 1999, as amended; hereinafter "Order") established the Invasive Species Council ("Council"). The Order establishes general Federal agency duties and exceptions and directs the Council to oversee implementation of these and other requirements of the Order (section 4(a)). This document provides guidance for oversight of these requirements and will be reviewed and revised on a yearly basis, as appropriate. This guidance fulfills the first recommendation (action item) under Leadership and Coordination in the first edition of the National Invasive Species Management Plan (Plan). It also partially fulfills the recommendations included in action items 2, 4 and 8 that deal with conflict resolution and reporting requirements. All efforts will be made to ensure that the reports required under this guidance are consolidated with other reporting requirements called for by the Plan or the Order.

Federal Agency Duties under E.O. 13112
Section 2 of the Order establishes Federal agency duties and exceptions as follows:

> **Sec. 2. Federal Agency Duties**. (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,
> (1) identify such actions;
> (2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and
> (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.
> (b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Sections 6(c) and (d) of the Order state:

> (c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.
> (d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.
>
> It is likely that amendment of the Executive Order will also include an exclusion for the Secretary of the Department of Homeland Security if the Secretary finds that exemption is necessary for homeland security reasons.

Oversight Procedures

Questions will be raised whether certain specific Federal agency actions are consistent with the requirements of section 2 and section 6 ("Federal agency duties"). The Council in turn has considered how it should respond in light of its policy oversight responsibilities. The Council believes that oversight should be accomplished by monitoring Federal agency implementation and by providing a means for exchanging information on this. In furtherance of these objectives the Council has agreed to the following:

1. **Invasive Species Reports**. By July 30, 2003, each member of the Council ("Member") should provide the Council Co-Chairs with a copy of the Member's Invasive Species Report (Report). The first edition of each Report will:

> a. Include a description of how the agency will address the Federal agency duties of the Order.
> b. Specify the name, title and address of the Member's designated contact for inquiries concerning invasive species and for the Member's participation in the Council.
> c. Be posted on the Internet at http://www.invasivespecies.gov.

The Council will advise Federal agencies that are not Council Members on implementation of the Order, and will encourage them to prepare Reports and annual updates as described below.

2. **Annual Updates to Invasive Species Reports.** At the end of each Fiscal Year, Members should provide an update to the Invasive Species Report to the Council that includes:

> a. a description of any significant changes to the Invasive Species Report prepared under section 1 above;
> b. a summary of accomplishments relating to addressing invasive species issues;
> c. a summary of significant issues and any issues raised about compliance with Federal agency duties under the Order and how they were treated;

d. a summary of any instances in which the agency found it necessary to rely on any of the exceptions in section 2 or section 6 of the Order, and the terms prescribed for invoking the exceptions; and
e. any other information that the agency wishes to share with the Council and the public.

Members will provide written materials addressing (a) through (e) to the Council for inclusion in the minutes of the next Council meeting. The materials provided will be posted on the Internet, at http://www.invasivespecies.gov, as a part of the posting of the minutes

3. **Public issue identification and response**.

a. Any person who believes that an agency has taken or is planning to take an action inconsistent with Federal agency duties of the Order may apprise the Council of this opinion by submitting a written statement to that agency and by providing copies of the statement to the Council Co-Chairs. Such written statements shall describe (i) the action of concern, (ii) any damage the action is believed to cause, and (iii) any earlier communications about the action made to the agency concerned. Any person who contacts the Council Co-Chairs or any Member about the actions of another Member will be referred to the procedure above.

b. Council Member agencies whose actions have been questioned under paragraph a. should respond to the commenter in writing and provide a copy of the response to the Council.

i. If the matter of concern is subject to a formal administrative process, the agency should provide a written response referring the originator to the appropriate public comment process, and direct the written statement received into that process.

ii. Communications with the Council will not substitute for public comment through Member agency provisions for public comment or public hearing on actions, nor will communications with the Council offer an additional opportunity for consideration of comments on actions, or a substantive right of action, except to the extent consistent with all applicable law.

c. The Council may offer advice and recommendations to facilitate resolution of issues under this section.

4. **Judicial Administration**. This oversight procedure does not create any right or benefit, substantive or procedural, enforceable in law or equity by a party against the United States, its agencies, its officers, or any person or Council Member.

Appendix V: NISC Plan Revision Roadmap

Purpose of Roadmap. Under Executive Order 13112, the National Invasive Species Council is directed to revise and update the National Invasive Species Management Plan (Plan) approved in 2001 every two years. Based on the recommendation of the Invasive Species Advisory Committee (ISAC) the revision of the Plan was delayed one year to allow more time for implementation of the first Plan. NISC has received recommendations and had a number of discussions about the revision as set forth in the section on 'Starting Point' below. The purpose of this document is to outline the process that will be used to revise the Plan in accordance with those recommendations and provide timelines and direction for the NISC staff, Policy Liaisons, and Principals to ensure that the revised Plan provides clear, quality direction for Federal invasive species programs and policies in a timely manner with public input and involvement.

I. Starting Point and Direction from NISC, ISAC, GAO, and OMB

- The initial Plan is a good document that provides a comprehensive summary of what needs to be done on invasive species and should be retained as a base or core document and starting place for the revision.
- A brief discussion, clarification, or explanation of issues regarding the definition of invasive species and the use of other invasive species terms should be included.
- There is a need for the Plan to be more focused, streamlined, and prioritized. The first step should be an intensive analysis of the current Plan identifying priority items for the next 3 years and revising unrealistic deadlines.
- The revision should be based on extensive Federal and nonfederal input but should be a less time-consuming and complex process than the process used to write the original Plan.
- The revision (3-year action plan) should set out attainable goals that would then be reflected in the Invasive Species Performance-Based Crosscut Budget (Crosscut).
- Where practicable the revised plan should include performance-based elements and measurable goals or refer to those goals contained in the Invasive Species Performance-Based Crosscut Budget (OMB, GAO recommendations).
- The revision should cover 3 years (rather than 2) in order to plan for Federal budget cycle.
- The revision should more clearly set out a game plan for action over the next 3 years (to better match the budget cycle) than the first Plan (which is the more comprehensive blueprint).
- Critical leadership and coordination issues should receive priority attention (ISAC—see Action Items 1-9 in the Plan).
- Development of additional economic impact data should also be stressed.
- Education efforts should be emphasized.
- Barriers to implementation should be identified as a specific task in the 3-year action plan.
- The entire drafting process (not counting public comment and clearance) should take no longer than 6 months.

Essential Tasks identified in discussions with NISC staff and Liaisons

- Complete thorough analysis of existing Plan.
- Identify small steering/writing team for first draft of the 3-year action plan.
- Identify structure (categories and organization) and overall mission statement for the 3-year action plan.
- Identify broader review team to complete short initial review of detailed outline.
- Ensure schedule for review includes NISC agency review, ISAC input, OMB, CEQ, and public comment and documents all comments (only rough schedule included in this draft of Roadmap).
- Identify resources for design, layout, and publishing the 3-year action plan. (This item can be delayed and is not included in this draft of Roadmap.)

II. Critical tasks and recommended process. **Complete thorough analysis of existing Plan**
This analysis should examine

- Whether current Plan categories should be maintained or certain categories should be combined (i.e., should Control & Restoration be dealt with together as closely related issues).
- Status of action items (see draft update of Plan

Progress Report).

- Whether action item includes subparts and multiple actions and how to track these separate subparts.
- Whether the item is listed or should be cross-referenced in other categories.
- Linkage of action items to other elements of Plan.
- What additional resources or authorities (if any) are needed to complete item?
- Capacity to complete action items.
- Is the item identified as a budget priority by the lead agencies involved?
- Has the item been included in past Invasive Species Performance-Based Crosscut Budget initiatives?
- How many NISC member departments and agencies are involved?
- Whether there is clear departmental, agency, or program lead for action item.
- Whether item is closely related to mission of one or more NISC departments/agencies.
- How crosscutting is action item.
- Whether action item is prerequisite or condition precedent for other items.
- Whether nonfederal partners are essential to item.
- Whether there is stakeholder support or outside (i.e., nonfederal) interest in the item.
- Whether NISC agency member(s) plan to complete item in next 3 years.
- Whether NISC agency members (expect to) have base funds or need additional funding to complete the item in the next 3 years.
- Whether item affects all types/taxa of invasive species.
- How broad is the impact (in terms of species, area, or agencies) of the item?
- Using information in questions assign a priority (1-5) based on the relative priority of the item related to the other items in the NISC Management Plan within the relevant category (i.e., prevention). Please also factor in the priorities expressed in the *Starting Point Guidance* above.
- What additional action items or elements are identified in each category as critical gaps that need to be addressed in the next 3 years? Identify lead departments, agencies, or programs as appropriate and rank the item (1-5).

Results of this analysis in terms of the priority areas of the current Plan, any gaps, and identified priorities in each category will inform—but not dictate—what is included in the 3-year action plan.

Existing active ISAC/NISC subcommittees would be asked to complete the analysis, coordinated by a NISC staff member or Co-Chair Policy Liaison as coordination lead for each area of the Plan Revision. Each subcommittee will be asked to complete the same list of questions (including those listed above) and rank the action items within their categories. (Prevention, Early Detection Rapid Response, International Issues, Control and Management, Information Management, Research). All the members of the Revision Steering Team (see below) would become part of the existing Leadership and Coordination Committee. The Restoration issues would be considered by the Control Subcommittee. Leads are proposed on the timetable in Section III of the Roadmap.

This initial work analyzing the existing Plan could occur by e-mail and during one to three conference call meetings to speed the initial phase of the project. This analysis is meant to inform and not determine elements of the revision and NISC and ISAC members will have further opportunities to comment and have input on the 3-year action plan.

1. **Identify Revision Steering Team and draft detailed outline of Revision.**
   This team will be responsible for
   - Devising an overall structure for the 3-year action plan.
   - Drafting a mission statement for the action plan (reflecting prior Plan, EO, and guidance).
   - Ensuring adequate review and input from all groups.
   - Analyzing and reflecting input from NISC/ISAC subcommittees and task teams (and dealing with varied or contrasting input).
   - Drafting an initial detailed outline of the 3-year action plan and providing it for review and comment.
   - Initial ground truthing of the draft 3-year action plan (especially checking any identified leads, participants and major changes from current Plan).

Steering Team would include

- Lead: NISC Executive Director.
- Three Co-Chair Policy Liaisons or designees for USDA, DOI, and DOC.
- Policy Liaison or representative of NISC member with international expertise (USAID, State, or USTR).
- Representatives of two other Policy Liaisons (DOD, DOT, EPA, or others?).

2. **Initial Review Team:** Initial review team would include one representative from all key agencies and Co-Chairs of all NISC/ISAC committees as well as three representatives from ISAC and the Principals. Three ISAC representatives (suggest members of Leadership and Steering committee or ISAC Co-Chairs of committees). Purpose of short (2 week) review would be to raise major issues and catch mistakes or critical problems before Outline was converted to full written draft for full NISC, OMB, and subsequent public review and comment. Results of review would go to Steering Committee, which would incorporate changes into outline and communicate to writer.

3. **Convert detailed outline to draft 3-year action plan** (goal 20 pages or less). Steering committee would supervise with help from one writer (professional writer or NISC Outreach Director depending upon available funds).

4. **Review of draft by full NISC.** Goal would be for NISC agencies to review Plan and compare identified priorities to their own agency planning, strategic and (to the extent possible) budgetary documents. Review should answer whether —for items naming specific agency leads—those lead agencies are committed to items in 3-year action plan and has (or will) the lead agency include the item in their planning, strategic, and (if possible) budget documents. Also share with CEQ and brief OMB.

5. **Approval of draft by NISC (full Council meeting).**

6. **Clearance, as draft to OMB, to put out for public comment.**

7. **Public comment period/ incorporation of public comments (NISC staff and Liaisons).**

8. **Final 3-year action plan is cleared by OMB and approved by full NISC.**

9. **Final published and distributed.**

III. Leads, timelines and milestones in Roadmap (RM). Timing set out in initial roadmap for 1-4 only. Year is 2004 unless otherwise noted (most dates below have changed to reflect new starting time).

Set up Excel chart that includes:

Task	Lead	Participants	Next Steps
Roadmap and Planning			
Discuss Draft RM	NISC Staff		ISAC/NISC comments
Approval of RM	NISC Staff	Policy Liasion Principals	Incorporate comments Approval final draft
Edit Plan survey	NISC Staff		Send survey to subcommittee
Plan Prog. Update	NISC Staff		Complete
Draft Plan through NISC approval			
Steering Comm. Formed	NISC		1st meeting: July 15-30
Update to Subcom.	Sub. Chairs		Subcommittee complete survey by October 2005
Mission and Structure	Steering		2nd meeting: August 1-15 September 2005
Strategic Goals	Steering		3rd meeting: Sept. 2005
Input from subcomm.	Co-Chairs		Give to Steering
Subcommittee Meetings			
— Leadership	NISC Staff		Report to Steering **October 2005**
— Prevention	NISC Staff		"
— EDRR	NISC Staff		"
— International	NISC Staff		"
— Control and Rest.	NISC Staff		"
— Research	NISC Staff		"
— Information	NISC Staff		"
— Outreach/Comm.	NISC Staff		"

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Task	Lead	Participants	Next Steps
Detailed Analysis of Plan Priorities	NISC staff		Report to Steering August 8
Review Plan Analysis	Steering		Identify priority items
Drafting of Detailed Outline	Steering		Send to review team (and writer)
Review of Outline	Review Team		Edits to Steering to writer
Write Rough Draft	Writer/Steer.		Draft to NISC
Edits From NISC Agencies	Steering Agencies		Redraft back out to NISC
Council Meets to Approve	NISC		Send DRAFT to OMB

Task	Next Steps
Final Draft	
OMB Clear for Public Comm.	
Public Review and Comment	ISAC considers
Incorporate Comments	Send to OMB
OMB Final Clearance	NISC final approval