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INVASIVE SPECIES: A NATIONAL PERSPECTIVE AND THE NEED FOR A COORDINATED RESPONSE

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Abstract: The multiple economic, environmental, and animal and human health impacts of invasive species pose complex challenges in policy formation and governmental coordination. The National Invasive Species Council (NISC) was established by an Executive Order in 1999 to provide coordination, planning and facilitate cooperation among the diverse federal agencies and to take a more comprehensive approach to invasive species. NISC, assisted by the nonfederal Invasive Species Advisory Committee (ISAC) has developed several tools and enhanced capacities to address invasive species. Additionally, NISC has helped place greater emphasis on essential prevention, early detection and rapid response, research, public outreach, and international cooperation efforts. Invasive vertebrates are an increasing concern for NISC and for state, tribal, and local governments and the private sector. The invasive vertebrates further complicate an already complex issue. Invasive vertebrates require an even greater level of coordination and understanding. Important questions such as, best practices for the humane control and removal and effective public outreach messages must be answered. NISC continues to emphasize the critical need for effective multi-sector coordination when addressing invasive vertebrates.

Key Words: federal policy, invasive species, management, National Invasive Species Council, National Invasive Species Management Plan, United States.

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INTRODUCTION

Invasive species affect all the United States (US) and other nations. Society pays a price for invasive species, in dollars, and in increased wildfire frequencies, degraded wildlife habitat, additional stress on endangered species, more extensive water shortages, and wildlife and livestock disease epidemics, and other environmental damage. In some cases, invasive species, such as West Nile Virus, harm human health directly. As global trade, travel, and transport expand to more areas, increase in volume, and become more rapid, the risk of additional invasive species also increases.

People have always moved organisms both intentionally and unintentionally. Many plants animals and microorganism are intentionally imported into the US. Most crops, livestock and pets are non-native species. Their benefits are obvious. Well managed livestock populations are examples of non-native species that are not invasive. Most non-native species are benign or beneficial. In some cases, invasive species are smuggled into the US and others arrive as hitchhikers on goods and conveyances. Even a single invasive species can cause great harm. An

"invasive species" is defined in Executive Order 13112 as a species that is 1) non-native (or alien) to the ecosystem under consideration, and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

It is difficult to estimate the total cost of invasive species. However, one estimate places it in the range of \$100 billion annually (Pimentel et al. 2000). Data for individual species indicate significant costs. Formosan termite (*Coptotermes formosanus shiraki*) costs an estimated \$300 million in property damage annually in New Orleans, Louisiana alone (E. Bordes, personal communication). Substantial efforts are focused on vertebrate invasive species such as: brown treesnakes (*Boiga irregularis*) in Guam, nutria (*Myocastor coypus*) and feral pigs (*Sus scrofa*) in numerous states. Burmese pythons (*Python molurus*) and Gambian giant pouched rats (*Cricetomys gambianus*) in Florida represent more recent vertebrate invasions in the US. Invasive species are a primary impacting factor for about half of the plants and animals currently federally-listed as endangered with extinction (Wilcove et al. 1998).

Executive Order 13112 on Invasive Species established the National Invasive Species Council (NISC). NISC is co-chaired by the Secretaries of Agriculture, Commerce and the Interior; and includes a total of 13 federal agencies and departments that have a role in invasive species. It also established the Non-Federal Invasive Species Advisory Committee (ISAC) to advise NISC. NISC provides national leadership on invasive species and works to increase the coordination and effectiveness of federal efforts. NISC also contributes to the work of local, state, and tribal governments and that of the private sector and makes recommendations for international cooperation. General NISC staff responsibilities include: staying current with the scientific literature; monitoring media coverage; tracking federal and state invasive species legislation and programs; maintaining a comprehensive invasive species meeting calendar; analyzing current and planned efforts; reporting NISC Plan progress; answering media and public inquiries; representing NISC at meetings; hosting interdepartmental meetings; facilitating ISAC; working with the NISC website; publishing the NISC e-mail newsletter; and supporting decision makers.

UPDATING THE NATIONAL PLAN

The 2001 National Invasive Species Management Plan (henceforth Plan, NISC 2001) was the first national plan to focus on invasive species. Many, but not all, of the Plan action items have been accomplished. As called for in Executive Order 13112, the Plan is being revised. The revised 2008 Plan was released for public comment in December of 2007. This document will direct federal efforts to prevent and control invasive species over the next 5 years.

The 2008 Plan is focused on 5 strategic goals: prevention, early detection and rapid response, control and management, restoration, and organizational collaboration. To accomplish these goals, critical support for efforts such as research, data and information management, education and outreach, and international cooperation elements are included in pertinent sections of the 2008 Plan.

Each of the 5 strategic goals specifies on-going objectives and the long-term vision for success in that area. Under each goal, objectives describe what is to be accomplished over the next 5 years, and implementation tasks describe what agencies expect to do in order to accomplish that objective. Within the implementation tasks, performance

elements describe how progress towards accomplishing identified tasks will be evaluated. Of course, the accomplishment of specific implementation tasks and performance elements depend upon agency budgets, and in some cases, legal or regulatory changes.

The current draft of the 2008 Plan requires the work of 35 different entities (typically agencies or bureaus with NISC members' departments and agencies) to achieve a total of 79 performance elements. Participating agencies are identified either as a "Lead" or a "Participant" to describe their role in accomplishing a specific performance element. Most (45) performance elements call for a finite accomplishment that once completed will require little continuing effort to coordinate. The remaining 34 performance elements require establishment and on-going coordination.

LEADERSHIP AND COORDINATION

NISC works to provide national leadership and coordinate the efforts of the more than 30 federal agencies within the thirteen NISC members' departments that currently deal with invasive species. When appropriate, NISC also draws on existing organizations for coordination and leadership assistance, such as state invasive species councils (there are about 22 currently), regional organizations, Exotic Plant Pest Councils, Aquatic Nuisance Species Task Force (ANSTF), Federal Interagency Committee on the Management of Noxious and Exotic Weeds (FICMNEW), Federal Interagency Committee on Terrestrial Animals and Pathogens (ITAP), and other groups. States play a key role in the management of invasive species. The 2008 Plan emphasizes assisting states.

PREVENTION

Prevention is the first-line of defense. It can be the most cost-effective approach to protection against invasive species. Once a species becomes widespread, controlling the species may require significant and sustained expenditures. Therefore, public investment in prevention tools, resources and infrastructure are indispensable in protecting human health, agriculture and natural resources. Since the first 2001 Plan, progress on risk analyses, screening processes, evaluation of pathways, and the scientific understanding of the biology and ecology of invasive species has been made. A joint ANSTF/NISC Prevention Committee is currently addressing prevention issues.

EARLY DETECTION AND RAPID RESPONSE

Even the best prevention efforts cannot stop all invasive species. Early detection, rapid assessment and rapid response (EDRR) increases the likelihood that localized invasive populations will be found, contained, and eradicated from areas before they become established. EDRR can slow range expansion, and reduce the need for extensive and costly long-term control efforts. Effective EDRR depends upon the timely ability to answer critical questions including: What is the species of concern, and has it been authoritatively identified? Where is it located and likely to spread? How important is it to respond (i.e., what is the potential harm the species may cause?) How can it be acted upon? Who has the authority and capacity to act upon it? How will the effort be funded? EDRR capacity at the regional, state and federal levels has improved, however, significant gaps remain.

CONTROL AND MANAGEMENT

Eradication of well established, widespread invasive species, however, may not be feasible. Widespread invasive species are subject to long-term management efforts that slow the rate of range expansion and lessen the impacts of invasive populations. Invasive species can span geographic and jurisdictional boundaries. Their management requires regionally coordinated action. Information on the distribution, abundance, rates of spread, and impacts of invasive species is critical. Invasive plants, animals, and pathogens cause different impacts, as do aquatic invaders. Understanding their ecological, economic, and social impacts is important in prioritizing management operations. Differing management tools are needed to assess, remove and contain invasive species populations and guide management decisions. These tools are applied within coordinated and integrated invasive species management strategies that are adjusted, as needed. Financial and human resources limit the capacity to manage invasive species.

RESTORATION

Executive Order 13112 requires federal agencies to "provide for restoration of native species and habitat conditions in ecosystems that have been invaded." Often plant and animal communities can recover following the control of the invasive species. However, the damage may be so extensive in some areas that further actions are required. Without restoration, some areas may become re-

infested by the same or additional invasive species. NISC plans to further develop and issue recommendations, guidelines and monitoring procedures for federal land and water management agencies to use, where feasible, in restoration activities.

INTERNATIONAL COOPERATION

The US cannot succeed in addressing its domestic invasive species problems unless it also works within the international arena and strategies that augment the capacity of other nations to manage invasive species. Once invasive species become established, they can threaten an entire region, trading partners, and countries along trade routes. NISC is working to strengthen and expand US participation in mutually supportive standards and international codes of conduct. It will also develop a strategy and support materials for US representatives that encourage and assist other countries with the development of coordinated policies and programs.

CONCLUSION

Invasive species may at times seem overwhelming. However, considerable success is being achieved in the prevention, detection, eradication, and control of some invasive species. Additional research and information exchange, new detection and eradication techniques, and innovative control methodologies and collaborative models are increasing our capacity to solve invasive species problems. The 2008 National Invasive Species Management Plan takes a strategic approach and builds on existing programs to maximize federal efforts over the next 5 years to prevent and control invasive species in order to protect our environment, economy, and human health.

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