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# Invasive Species: Major Laws and the Role of Selected Federal Agencies

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## Summary

An “invasive” species (alternatively known as an alien, exotic, injurious, introduced or naturalized, non-native, nonindigenous, nuisance, or noxious species) refers to an animal or plant that is introduced into an environment where it is not native. The introduction of invasive species to the United States—whether deliberate or unintentional—from around the globe can pose a significant threat to native animal and plant communities, and may result in extinctions of native animals and plants, species disruptions as native and non-native species compete for limited resources, reduced biodiversity, and altered terrestrial or aquatic habitats. This can result in a range of economic, ecologic, and cultural losses, including reduced agricultural output from U.S. farms and ranches; degradation of U.S. waterways, coastal areas, national parks, and forests; and altered urban, suburban, and rural landscapes.

It is estimated that 50,000 non-native species have been introduced to the United States. The potential economic costs associated with nonindigenous plant and animal species are estimated at more than \$100 billion annually in the United States. A few examples of the types of damages attributed to non-native invasive species in the United States are as follows. Burmese pythons are multiplying in south Florida, becoming a top carnivore and killing large numbers of native species of reptiles, birds, and mammals. Zebra and quagga mussels from Eastern Europe are clogging intakes for urban water supplies and nuclear power plants in the Great Lakes and the Mississippi basin. The light brown apple moth, a native pest of Australia, has been detected in California and is causing damage to a wide range of plant species and commercial fruit and vegetable crops. Leafy spurge is lowering the forage value of western grazing land, and reducing overall land values.

In the United States, numerous federal and interagency efforts share responsibilities regarding invasive species. Among the federal agencies involved are the Departments of Agriculture, Commerce, Defense, Homeland Security, Interior, Transportation, and others, including the Environmental Protection Agency and the Executive Office of the President. Of these, three Departments—Agriculture, Commerce, and Interior—play a major role by co-chairing the National Invasive Species Council (NISC). Created by Executive Order 13112 in 1999, NISC provides high-level interdepartmental coordination of federal invasive species actions and works with other federal and nonfederal groups to address invasive species issues at the national level.

In FY2016, the U.S. government spent an estimated \$2.3 billion across a range of federal agencies and activities in an effort to prevent, control, and eradicate invasive species domestically. Activities at the Department of Agriculture accounted for the bulk of available federal funding, nearly \$1.2 billion (53% of total available funds). Activities at the Department of Homeland Security, comprised of mostly border protection and security activities, accounted for about \$0.8 billion (33% of total funding). The remainder of federal funding, about \$0.3 billion (about 14% of total funding) covers activities across a range of agencies at the Departments of Interior, Commerce, and Defense, and other independent agencies.

Despite efforts to achieve high-level interdepartmental coordination, comprehensive legislation on the treatment of invasive species has never been enacted, and no single law provides coordination among federal agencies. Instead, the current legal framework is largely governed by a patchwork of laws, regulations, policies, and programs. Some laws are tailored to individual species or narrowly focused on what is affected by the species. Other laws have a broader intended purpose and may only peripherally address invasive species. Some laws, although they do not directly address invasive species control or prevention, may limit such introductions.

# Contents

Estimated Economic Costs .....	2
Selected Federal Laws and Directives .....	5
Federal Laws .....	6
Organic Administration Act .....	7
Lacey Act .....	7
Virus-Serum-Toxin Act .....	8
Animal Damage Control Act .....	9
Soil Conservation and Domestic Allotment Act .....	9
Federal Seed Act .....	10
National Environmental Policy Act .....	10
Endangered Species Act .....	11
Federal Noxious Weed Act .....	11
Forest and Rangeland Renewable Resources Planning Act .....	12
Federal Land Policy and Management Act .....	12
Cooperative Forestry Assistance Act .....	12
International Forestry Cooperation Act .....	13
Nonindigenous Aquatic Nuisance Prevention and Control Act .....	13
National Invasive Species Act .....	14
Alien Species Prevention and Enforcement Act .....	14
Wild Bird Conservation Act .....	15
Hawaii Tropical Forest Recovery Act .....	15
Plant Protection Act .....	15
Animal Health Protection Act .....	16
Noxious Weed Control and Eradication Act .....	17
Federal Directive .....	17
Executive Order 13112 on Invasive Species .....	17
Selected Federal Agencies .....	18
Interagency Efforts .....	19
National Invasive Species Council .....	19
Aquatic Nuisance Species Task Force .....	21
Federal Interagency Committee for Management of Noxious and Exotic Weeds .....	21
Invasive Terrestrial Animals and Pathogens .....	22
Department of Agriculture .....	22
Animal and Plant Health Inspection Service .....	22
Farm Service Agency .....	24
Foreign Agricultural Service .....	24
Forest Service .....	24
Research, Education, and Economics Agencies .....	26
Natural Resources Conservation Service .....	27
Department of Commerce .....	28
National Oceanic and Atmospheric Administration .....	28
Department of Defense .....	29
Army Corps of Engineers .....	29
Department of Health and Human Services .....	30
Department of Homeland Security .....	30
Coast Guard .....	30
Customs and Border Protection .....	31

Federal Emergency Management Agency .....	31
Immigration and Customs Enforcement .....	31
Department of the Interior.....	32
Bureau of Indian Affairs .....	32
Bureau of Land Management.....	32
Bureau of Reclamation .....	33
Fish and Wildlife Service.....	33
Geological Survey.....	34
National Park Service .....	34
Office of Surface Mining Reclamation and Enforcement.....	35
Department of State.....	36
Department of Transportation .....	37
Federal Aviation Administration .....	38
Federal Highway Administration.....	38
Federal Railroad Administration.....	38
Department of the Treasury.....	38
Executive Office of the President.....	39
Council on Environmental Quality .....	39
Office of Science and Technology Policy .....	39
Office of the United States Trade Representative .....	39
Independent Agencies .....	39
Agency for International Development.....	39
Environmental Protection Agency .....	40
National Science Foundation .....	40
Smithsonian Institution .....	40

## **Tables**

Table 1. Estimated Annual Costs Associated with Some Non-native Species, Introductions in the United States .....	3
Table 2. Funding for Invasive Species Activities .....	18

## **Appendixes**

Appendix A. Major Federal Agencies and Laws Governing Invasive Species .....	42
Appendix B. List of Acronyms.....	46

## **Contacts**

Author Contact Information .....	47
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An “invasive species” means “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”<sup>1</sup> “Invasive” species (alternatively known as an alien, exotic, injurious, introduced or naturalized, non-native, nonindigenous, nuisance, or noxious species) further refers to an animal or plant that is introduced into an environment where it is not native.<sup>2</sup> The introduction of invasive species to the United States—whether deliberate or unintentional—from around the globe can pose a significant threat to native animal and plant communities, and may result in extinctions of native animals and plants, species disruptions as native species compete for limited resources, reduced biodiversity, and altered terrestrial or aquatic habitats.

It is estimated that 50,000 non-native species have been introduced to the United States, including nonindigenous plant and animal species.<sup>3</sup> Examples of some invasive species found in the United States, and the types of damages they may inflict, include the following:

- Burmese pythons (*Python bivittatus*) have multiplied in south Florida, becoming a top carnivore and killing large numbers of native species of reptiles, birds, and mammals.
- Brown tree snakes (*Boiga irregularis*) from the western Pacific continue to threaten power utilities and communications on Guam and the Northern Marianas, and threaten to invade Hawaii and harm its tourism industry.
- Zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena rostriformis bugensis*) from Eastern Europe have clogged intakes for urban water supplies and nuclear power plants in the Great Lakes and the Mississippi basin.
- The light brown apple moth (*Epiphyas postvittana*), a native pest of Australia, and the diamondback moth (*Plutella xylostella*), a native to the Mediterranean region, have both spread to the United States and are causing damage to a range of commercial fruit and vegetable crops.
- Lionfish (*Pterois volitans*), likely released from private aquaria in Florida, have spread north along the U.S. coast and also within the Caribbean.
- Formosan termites (*Coptotermes formosanus*) have devastated living trees and historic buildings in the French Quarter of New Orleans.
- Leafy spurge (*Euphorbia esula*) has reduced the forage value of western grazing land, resulting in lower overall value to private landowners.

All 50 states and the U.S. territories have at least some invasive plants and animals. A few (e.g., Hawaii, Florida, Louisiana, the Great Lakes states, and California) have so many harmful non-natives as to cause major ecological and economic damage to a variety of locations and industries.

This report provides an overview of the federal laws and directives in the United States that govern invasive species, and the role of selected federal agencies. Much of the agency-level information is from the National Invasive Species Council (NISC), which provides high-level interdepartmental coordination of federal invasive species actions and works with other federal

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<sup>1</sup> Executive Order 13112 on Invasive Species (64 *Federal Register* 6183, February 8, 1999).

<sup>2</sup> Despite differences in emphasis, this report generally uses these terms interchangeably.

<sup>3</sup> D. Pimentel, “Environmental and Economic Costs Associated with Alien Invasive Species in the United States,” in *Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal, and Microbe Species*, CRC Press, 2011. Updates estimates from previous studies in 2000 and 2005, and the first edition of the book.

and nonfederal groups to address invasive species issues at the national level—both from its website and its periodic management plans.<sup>4</sup> A summary of selected laws and agencies is provided in **Appendix A**. The patchwork of laws that currently govern invasive species in the United States also contribute to fundamentally different approaches to regulate invasive species, which is beyond the scope of this report.

In addition to the federal laws discussed in this report, invasive species are regulated and/or managed through a variety of statutes administered by the states, often with the cooperation of federal agencies. This report also does not address the extensive efforts of individual states to deal with invasive species concerns.<sup>5</sup>

Further, this report focuses primarily on invasive plant and animal species that may affect U.S. agriculture, waterways and coastal areas, national parks and forests, and various ecosystems and landscape environments. The potential for non-native species to adversely affect human health and disease is not addressed in this report.

This report also does not address species introductions to the United States that are widely considered beneficial, such as certain crop plants (e.g., wheat, soybeans) and orchard fruit (e.g., apples, pears), as well as honey bees (*Apis mellifera*) and pheasants (*Phasianus colchicus*), among other introduced species.

## Estimated Economic Costs

The introduction of invasive animal and plant species can result in a range of economic, ecologic, and cultural losses, including but not limited to reduced agricultural output from U.S. farms and ranches, degradation of U.S. waterways and coastal areas, as well as national parks and forests, and changed urban, suburban, and rural landscapes.

It is difficult to quantify and further monetize the economic damage due to a non-native invasive species. The most widely cited and available aggregation of the various available cost estimates is by researchers at Cornell University.<sup>6</sup> The most widely reported estimates put the potential aggregate economic costs from selected invasive species at \$127 billion annually in the United States (**Error! Reference source not found.**), excluding estimated costs for human diseases which are not covered in this report).<sup>7</sup> These estimated economic costs include control costs and direct damages and losses to property values, agricultural or natural resource productivity or output, and other costs.

Based on these estimated economic costs, the single largest cost is damage to U.S. agricultural crop and livestock production, totaling nearly \$65 billion annually. This estimate is for losses, damages, and control costs associated with agricultural crop weeds (estimated at \$20.5 billion annually); crop plant pathogens (\$18.4 billion); livestock diseases (\$9 billion); and weeds in pastures (\$6 billion). Plant pathogens and pests in forests account for another \$4.2 billion annually.

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<sup>4</sup> NISC's website is at <https://www.doi.gov/invasivespecies/nisc-resources>.

<sup>5</sup> The University of Florida's Center for Aquatic and Invasive Plants provides a compilation of the available lists, laws, rules, and regulations by state and state agencies addressing non-native plants (<http://plants.ifas.ufl.edu/node/634>).

<sup>6</sup> D. Pimentel, "Environmental and Economic Costs Associated with Alien Invasive Species in the United States," in *Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal, and Microbe Species*, CRC Press, 2011. Updates previous estimates from previous studies in 2000 and 2005, and the first edition of the book.

<sup>7</sup> This report excludes costs associated with certain human diseases, estimated at nearly \$92 billion annually. Human disease costs include reportedly introduced diseases such as AIDS, syphilis, and influenza.

**Table I. Estimated Annual Costs Associated with Some Non-native Species, Introductions in the United States**

Category	Non-Indigenous Species (number)	Estimated Costs, Selected Pests (\$million)
<b>Plants</b>	25,000	—
<b>Selected pests:</b> purple loosestrife; aquatic weeds; melaleuca tree; crop weeds; weeds in pastures; and weeds in lawns, gardens, golf courses		28,155
<b>Mammals</b>	20	—
<b>Selected pests:</b> Wild horses/burros; feral pigs; mongooses; rats; cats; dogs		38,481
<b>Birds</b>	97	—
<b>Selected pests:</b> pigeons; starlings		3,000
<b>Reptiles, Amphibians</b>	53	—
<b>Selected pest:</b> Brown tree snakes		16
<b>Fish</b>	138	5,400
<b>Arthropods</b>	4,500	—
<b>Selected pests:</b> fire ants; Formosan termites; green crabs; gypsy moths; crop pests; pests in lawns; and gardens, golf courses, forest pests		17,555
<b>Mollusks</b>	88	—
<b>Selected pests:</b> Zebra mussels, Asian clams, and shipworms		3,205
<b>Microbes</b>	20,000	—
<b>Selected pests:</b> Crop plant pathogens; plant pathogens in lawns, gardens, golf courses; forest plant pathogens; and Dutch elm disease		22,600
<b>Livestock Diseases</b>	9,000	9,000
<b>TOTAL (excluding human disease)</b>		<b>\$127,418<sup>a</sup></b>

**Source:** D. Pimentel, “Environmental and Economic Costs Associated with Alien Invasive Species in the United States,” in *Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal, and Microbe Species*, CRC Press, 2011. Estimated costs for selected pests include costs for losses and damages and control costs. May not add due to rounding.

**Notes:** Updates previous estimates from the first edition of the book, as well as estimates from previous studies in 2000 and 2005: D. Pimentel et al., “Update on the Environmental and Economic Costs Associated with Alien-Invasive Species in the United States,” *Ecological Economics*, February 2005, Vol. 52(3): 273-288; and D. Pimentel et al., “Environmental and Economic Costs of Nonindigenous Species in the United States,” *BioScience*, January 2000, vol. 50: 53-65.

- a. Excludes human diseases, estimated at nearly \$92 billion annually for reportedly introduced diseases such as AIDS, syphilis, and influenza. This report focuses on invasive plant and animal species that may affect U.S. agriculture, waterways and coastal areas, national parks and forests, and various ecosystems and landscape environments, rather than human health and disease.

The **text box** below highlights available individual estimates of the estimated costs of some selected invasive species and describes their potential impacts. These cost estimates do not account for possible offsetting benefits from some introduced species. Some criticize the estimates for overstating the cost of damages from invasive species or for not considering possible offsetting benefits.<sup>8</sup> The estimates also do not account for some types of indirect losses and costs or certain nonmarket welfare losses. Others note that a full accounting would consider other types of losses and would result in a higher estimate.<sup>9</sup>

#### **Economic Costs of Selected Invasive Species**

The following are individual estimates by various sources of the costs associated with selected invasive species.

Leafy spurge (*Euphorbia esula*): Costs an estimated \$100 million annually in cattle forage losses in North Dakota but spreading throughout the northern Great Plains and Rocky Mountain areas.

Purple loosestrife (*Lythrum salicaria*): Costs an estimated \$45 million annually across nearly all U.S. states, attributable to forage losses and to control costs.

Sea lamprey (*Petromyzon marinus*): Costs an estimated \$680 million annually from recreational fishery losses and control costs in the northern United States and Canada.

Zebra mussel (*Dreissena polymorpha*): Costs an estimated \$1 billion annually in recreational fishery losses, controls, and other costs in the Great Lakes and Pacific Northwest areas, as well as cleaning of water intake pipes, filtration equipment, power generating equipment, and damage to docks and recreational or commercial boats.

Hydrilla (*Hydrilla verticillata*): Costs an estimated \$860 million in Florida in damages to agriculture, flood control, and residential property values.

Formosan termites (*Coptotermes formosanus*): Costs an estimated \$1 billion annually (including several hundred million dollars in New Orleans alone).

Imported fire ants (*Solenopsis invicta* and *S. rickeria*): Costs an estimated \$1 billion annually (including \$300 million in Texas alone).

Brown tree snakes (*Boiga irregularis*): Costs an estimated \$12 million annually. (In Guam alone, management and controls cost \$4 million per year. Other unaccounted for damages include power outages, slowed transportation and shipping, lost agricultural productivity and recreation/tourism, and health care costs from snake bites. Other unaccounted for costs include the loss of bird species attributable to the snake in Guam.)

Weeds, pests, and plant and animal diseases affecting U.S. agricultural crop and livestock production total nearly \$65 billion annually.

**Sources:** Estimates are from D. Pimentel, "Environmental and Economic Costs Associated with Alien Invasive Species in the United States," *Biological Invasions: Economic and Environmental Costs of Alien Plant, Animal, and Microbe Species*, CRC Press, 2011; S. Lovell et al., "The Economic Impacts of Aquatic Invasive Species: A Review of the Literature," *Agricultural and Resource Economics Review*, vol. 35, no. 1 (April 2006), pp. 195-208; L. Sandell and S. Knezevic, "Leafy Spurge," University of Nebraska; and Federal Interagency Committee for the Management of Noxious and Exotic Weeds, *Invasive Plants: Changing the Landscape of America*, 2003.

<sup>8</sup> See, for example, L. Goldstein, "17 Reasons the Economic Impact of the Domestic Cat as a Non-Native Species in the U.S. Does Not Cost \$17 Billion," 2011; and D. Gattuso, "Invasive Species: Animal, Vegetable or Political?," National Center for Public Policy Research, August 2006.

<sup>9</sup> See, for example, S. Lovell et al., "The Economic Impacts of Aquatic Invasive Species: A Review of the Literature," *Agricultural and Resource Economics Review*, vol. 35, no. 1 (April 2006), pp. 195-209; and C. Zhang and K. Boyle, "The Effect of an Aquatic Invasive Species (*Eurasian watermilfoil*) on Lakefront Property Values," *Ecological Economics*, vol. 70 no. 2 (December 2010), pp. 394-404.



## Selected Federal Laws and Directives

Comprehensive legislation on the treatment of invasive species has never been enacted, and no single law directs coordination among federal agencies. No laws focus on the broad problems of invasive species, their interception, prevention, and control across a variety of industries and habitats. Instead, the current legal framework is largely governed by a patchwork of laws, regulations, policies, and programs. Some laws are tailored to individual species or narrowly focused on what is affected by the species, such as agricultural production or certain aquatic or terrestrial ecosystems. Other laws have a broader intended purpose and may only peripherally address invasive species, such as certain environmental laws, resource management laws, and species or wildlife protection laws. Some laws, though they do not directly address invasive non-native species control or prevention, have effects that may limit such introductions. Below is a brief digest of existing laws that affect non-native species introduction, prevention, and control. However, control of invasive species is not often the major purpose of the law in some cases, and agencies have little authority to eradicate invasive species, except where they occur on federally managed lands, thus undermining the effectiveness of these programs. In general, laws addressing threats to agriculture (for centuries a well-developed North American industry whose risks from non-native invasion species are relatively clear) tend to be more developed than laws protecting other industries or ecosystems.

This patchwork contributes to two fundamentally different regulatory approaches to address invasive species: one approach based on a particular listed or known species, and another approach based on certain pathways by which a variety of species may be introduced (see **text box**). Further discussion of these two regulatory approaches is beyond the scope of this report.

## **Approaches to Invasive Species Regulation: Single Species vs. Pathways**

### **Single-Species Approach**

Under a single-species approach, regulation of invasive plants or animals must be placed on a “black list” before they are regulated as harmful. Black list approaches to invasive species are, of necessity, done on a species-by-species basis. Harm can rarely be demonstrated unless the plant or animal is already at pest levels and inflicting damage somewhere—that is, generally after the species is reproducing and spreading. Usually, damage must be readily apparent before protection can begin, at which point prevention could be nearly impossible. A key factor is knowledge of the presence of the species. If the species, its potential damage, or its means of transport are unknown, it will not be regulated under the black list approach. Examples of this approach are demonstrated in the laws described in this report. One such example includes coverage of the brown tree snake under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA; 16 U.S.C. §§4701, *et seq.*), as amended by the National Invasive Species Act (NISA, 16 U.S.C. §§4701 *et seq.*), which otherwise regulates the pathway of ship ballast water. Another example is the requirement that individual weed species be placed on an exclusion list before they can be regulated under the Plant Protection Act of 2000 (PPA; 7 U.S.C. §§7701 *et seq.*).

### **Pathways Approach**

Under a pathways approach, regulation of invasive species tends to be based on the risk of invasion via certain pathways. In such an approach, plants or animals may be removed wholesale, e.g., by sterilizing pallet wood, cleaning a cargo hold, or sterilizing the soil in which horticultural specimens are shipped. There are instances of regulation and prevention by pathway. Examples of this approach are demonstrated in the laws described in this report. One such example is NANPCA’s regulation of ballast water as a risk to saltwater and freshwater ports, bays, and estuaries. Similarly, plant and animal quarantine and inspection requirements under both the PPA and the Animal Health Protection Act of 2002 (AHPA, 7 U.S.C. §§8301-8302) give the U.S. Department of Agriculture (USDA) broad authority to inspect imported agricultural products to detect, control, or eradicate plant and animal pests or diseases. Pathway approaches also exist at the state level. Pathway approaches do not require lists of organisms to be implemented or effective, and may even block the entry of species whose existence is unknown to science.

For background information, see CRS Report R44049, *Invasive Species: Issues in Brief*; CRS Report R44011, *Invasive Species: Control Options and Issues for Congress*; and CRS In Focus IF10217, *Federal Efforts to Control Invasive Plant and Animal Species*.

## **Federal Laws**

The laws described here are listed according to the year the law was enacted. **Appendix A** provides a summary of the laws and statutes governing invasive species, and is based in part on information compiled by NISC.

This report does not provide a comprehensive review of all the U.S. laws and statutes that may contain provisions that address some aspect of invasive or non-native species. Some environmental laws (such as the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act),<sup>10</sup> and certain resource management laws (such as the Fish and Wildlife Act and other laws)<sup>11</sup> are not directly covered in this report, although some provisions in these and other U.S. laws may play a role in addressing invasive species. Also omitted are federal laws referring to single species. This report does, however, cover the National Environmental Policy Act

<sup>10</sup> Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. §§136-136y); Federal Water Pollution Control Act of 1948, also known as Clean Water Act (CWA, 33 U.S.C. §§1251-1376). For example, FIFRA regulations broadly govern pesticide use, including pesticides that may be used to control and/or eradicate invasive plants; CWA broadly aims to protect waters of the United States, and contains provisions regulating ballast water discharges and also protecting U.S. wetlands and waterways from invasive plants and aquatic species.

<sup>11</sup> Fish and Wildlife Act of 1956 (16 U.S.C. §742).

(NEPA), requiring federal agencies to take into consideration potential environmental impacts, including invasive species, from any planned agency actions.<sup>12</sup>

In addition to federal laws, a number of states have laws restricting transport or possession of invasive species. State laws are not described in this report.

## **Organic Administration Act**

The Organic Administration Act of 1897 (16 U.S.C. §551) provides broad authority to the U.S. Forest Service within the U.S. Department of Agriculture (USDA) to protect National Forest System lands from a range of threats, including invasive species. In addition, under the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. §§528-531), USDA manages U.S. national forests for multiple uses—such as outdoor recreation, range, timber, watershed, and wildlife and fish purposes.

## **Lacey Act<sup>13</sup>**

The Lacey Act of 1900 (18 U.S.C. §§42-43; 16 U.S.C. §§3371-3378) addresses illegal wildlife trade to protect species at risk and bars importing species found to be injurious to the United States.<sup>14</sup> The portion of the Lacey Act known as the *injurious species provision* is codified in the criminal code at 18 U.S.C. Section 42.<sup>15</sup> The injurious species provision (18 U.S.C. §42) bans import and shipment of listed living creatures and their eggs.<sup>16</sup>

Under 18 U.S.C. Section 42(a)(1), the Secretary of the Interior and the Secretary of the Treasury are may exclude the importation and shipment of three major categories of non-native animals: vertebrates, crustaceans, and mollusks. The list of just these three taxonomic categories means that other abundant and diverse groups of animals, such as insects and spiders, are not covered in the act's injurious species provisions.<sup>17</sup> Moreover, grounds for excluding such imports or shipments go beyond the traditional harm to agriculture, horticulture, and forestry interests to include harm to “wildlife or the wildlife resources of the United States.” The act's broad definition of harm could mean that nearly any non-native vertebrate, crustacean, or mollusk could be considered for exclusion, because most and perhaps all ecologists would hold that the proliferation of any non-native species in an ecosystem risks harm to the nation's wildlife or wildlife resources.

The list of banned species may be amended either by statute or by regulation issued by FWS. Permits may be issued to import banned species for scientific, zoological, educational, or medical purposes. Under the injurious species provision, it is also illegal to import or ship between states any species listed under the act. A violation is a Class B misdemeanor, punishable by no more than six months in jail and/or up to a \$5,000 fine for an individual and \$10,000 for an

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<sup>12</sup> For more information, see CRS Report RL33152, *The National Environmental Policy Act (NEPA): Background and Implementation*, by (name redacted)

<sup>13</sup> This section was adapted in part from out-of-print CRS Report R43170, *Injurious Species Listings Under the Lacey Act: A Legal Briefing*.

<sup>14</sup> Plants are not covered by the injurious species provision.

<sup>15</sup> The trade provisions are in the conservation title (Title 16) of the U.S. Code. For more information in this aspect of the Lacey Act, see CRS Report RL34395, *International Illegal Trade in Wildlife: Threats and U.S. Policy*; and out-of-print CRS Report R42067, *The Lacey Act: Protecting the Environment by Restricting Trade*.

<sup>16</sup> In addition, the regulations also ban certain dead fish.

<sup>17</sup> Although this provision of Title 18 of U.S. Code makes no mention of insects and spiders, provisions in Title 16 do cover these species. There are many other examples of differences in coverage between the act's major provisions.

organization. The species listed as injurious wildlife under the Lacey Act is available at the Department of Interior's U.S. Fish and Wildlife Service (FWS) website.<sup>18</sup>

Generally, laws that list banned species are known as “black list” laws. “White list” laws ban importing all species *except* those on an approved list.<sup>19</sup> For decades, the Lacey Act was primarily a white list law—prohibiting importing “any foreign wild animal or bird” except under special permit, as well as originally banning all imports of four species: mongoose, fruit bats, sparrows, and starlings.<sup>20</sup> The 1949 amendments of the Lacey Act transformed the injurious species provision into a purely black list law, such that only listed species were banned.<sup>21</sup> As a result of the black list approach, a species that might merit exclusion is not covered under the Lacey Act until a potentially lengthy review process is completed, thus limiting the usefulness of this statute when a new potential invader is first discovered.

Because the Lacey Act relies on a black list, it implicitly focuses on those species which are knowingly moved between states or nations, or at least travel on pathways already known to present a high risk of transporting unwanted plants or animals. If someone enters the United States, or crosses between states, unaware that the plant or animal has stowed away in a hubcap, on a wheel well, or beneath a shoe, and that plant or animal furthermore is not already on a black list, the injurious species provision of the Lacey Act has little or no bearing on the act.

Another provision of the statute is not discussed in detail here but also has implications for invasive species by making it illegal to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any fish, wildlife, or plant taken, possessed, transported, or sold in violation of any federal, tribal, state, or foreign law (16 U.S.C. §3372 (a)(1), (2), and (4)).<sup>22</sup>

## **Virus-Serum-Toxin Act**

The Virus-Serum-Toxin Act, as amended (21 U.S.C. §151 *et seq.*), was originally enacted in 1913 and authorizes USDA to regulate veterinary biological products that are intended for use in the treatment (i.e., prevention, diagnosis, management, or cure) of animal diseases. These include vaccines, bacterins, sera, antisera, antitoxins, toxoids, allergens, diagnostic antigens prepared from, derived from, or prepared with microorganisms, animal tissues, animal fluids, or other substances of natural or synthetic origin. The law prohibits the shipment or delivery for shipment in interstate and intrastate commerce, as well as the importation or exportation of any veterinary biological product that is “worthless, contaminated, dangerous, or harmful,” and also any

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<sup>18</sup> FWS, “Species Listed as Injurious Wildlife under the Lacey Act (50 CFR 16),” <http://www.fws.gov/>.

<sup>19</sup> For more information, see CRS Report R44049, *Invasive Species: Issues in Brief*. Generally, federal laws have tended to focus on exclusion, or “black lists,” i.e., on species that have already been shown to be harmful (anything not on the list is allowed), in contrast to a “white list” (anything not on the list is excluded). See, for example, the Federal Noxious Weed List (<http://plants.usda.gov/>) where the U.S. government has designated certain plants as noxious weeds, in accordance with the Plant Protection Act (7 U.S.C. §§7701 *et seq.*).

<sup>20</sup> 31 Stat. 188. These four were not all accompanied by scientific names in the original statute. Thus, the number of species actually banned in 1900 may have been as high 90. The 1949 amendments also added language prohibiting transport of wild animals and birds “under inhumane and unhealthful conditions.” 63 Stat. 89. While this section remains codified with the injurious species provision in 18 U.S.C. §42(c), it is not part of the ban on injurious species.

<sup>21</sup> The 1949 amendments removed language that barred import of “any foreign wild animal or bird” (63 Stat. 89).

<sup>22</sup> For more information, see out-of-print CRS Report R42067, *The Lacey Act: Protecting the Environment by Restricting Trade*; and CRS Report R42119, *The Lacey Act: Compliance Issues Related to Importing Plants and Plant Products*.

biological product not prepared in compliance with USDA regulations at a USDA-licensed establishment.<sup>23</sup>

Activities under the law are generally administered by USDA's Animal Plant Health Inspection Service (APHIS); however, there is an existing memorandum of understanding between APHIS and the Food and Drug Administration (FDA) at the Department of Health and Human Services (HHS) regarding procedures and responsibilities for resolving jurisdictional issues and questions concerning the regulation of certain animal products as biologicals under the act, or as drugs under the Federal Food, Drug, and Cosmetic Act (21 U.S.C. §321(g)(1)).<sup>24</sup>

### **Animal Damage Control Act**

The Animal Damage Control Act of 1931, as amended (7 U.S.C. §§426 *et seq.*), is the primary statute under which USDA operates its Wildlife Services program.<sup>25</sup> This is the lead USDA program to conduct research and control work on invasive species to agriculture such as the brown tree snake, as well as address damage problems caused by such invasive species as nutria (*Myocastor coypus*), European starlings (*Sturnus vulgaris*), and monk parakeets (*Myiopsitta monachus*). The law gives APHIS wide authority to control damage caused by wildlife to agricultural interests, including livestock, on federal, state, or private land. The program aims to protect field crops, vegetables, fruits, nuts, horticultural crops, and commercial forests; freshwater aquaculture ponds and marine species cultivation areas; livestock on public and private rangeland and in feedlots; public and private buildings and facilities, such as houses, commercial properties, swimming pools, golf courses, reservoirs, levees, and landfills; civilian and military aircraft (against collisions with birds); and public health (against wildlife-borne diseases such as rabies, Lyme disease, West Nile virus, and plague). Control methods include providing advice to individuals and to municipal, state or federal agencies on a wide variety of preventive, nonlethal control methods. Control of predatory animals, native or non-native, is largely carried out by lethal means, including hunting, trapping, and poisoning. The agency publishes annual Program Data Reports to inform the public on its wildlife damage management activities.

APHIS has memoranda of understanding and other cooperative agreements with FWS, the National Park Service, the Bureau of Land Management (BLM), the Forest Service, and state natural resource agencies to help protect natural resources, including wildlife and threatened or endangered species, from loss of life, habitat, or food supply due to the activities of other species, including invasive species.

### **Soil Conservation and Domestic Allotment Act**

The Soil Conservation and Domestic Allotment Act of 1936 (16 U.S.C. §590(a)-590(f)) gives USDA's Natural Resources Conservation Service (NRCS) the authority to operate Plant Materials Centers for the development, testing, and distribution of plants and vegetation management technologies for voluntary use by land owners and users of private or other nonfederal lands for soil erosion control, water conservation, and wildlife habitat. In addition, the NRCS Conservation Technical Assistance Program provides technical assistance to land owners and users of private or other nonfederal lands to plan and install, on a voluntary basis, structures and land management practices for soil erosion control and water conservation. These programs broadly provide for the

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<sup>23</sup> NISC, *2001 Management Plan National Invasive Species Council*, January 2001.

<sup>24</sup> MOU 225-05-7000 (APHIS Agreement 04-9100-0859-MU).

<sup>25</sup> This program was known until 1997 as the Animal Damage Control program.

detection and prevention of invasive species. Other USDA farmland conservation programs<sup>26</sup> also provide technical, educational, and financial assistance to livestock and crop producers to protect against threats to soil, water, and related natural resources, and may also address invasive species concerns. Aspects of each these efforts encompass prevention, control and management, and restoration relating to invasive species.<sup>27</sup>

### **Federal Seed Act**

The Federal Seed Act of 1939, as amended (7 U.S.C. §§1551 *et seq.*), requires accurate labeling and purity standards for seeds in commerce, and prohibits the importation and movement of adulterated or misbranded seeds. The law also authorizes enforcement activities and rulemaking functions. In addition, it regulates interstate and foreign commerce in seeds, and addresses “noxious weed seeds” that may be present in agricultural (e.g., lawn, pasture) or vegetable seed. APHIS administers the foreign commerce provision of this law. USDA’s Agricultural Marketing Service administers the interstate commerce provisions. The law works in conjunction with the Plant Protection Act (7 U.S.C. §§7701 *et seq.*), which authorizes APHIS to regulate imports of agricultural seed when they may contain noxious weed seeds.

### **National Environmental Policy Act<sup>28</sup>**

The National Environmental Policy Act of 1970 (NEPA, 42 U.S.C. §§4321 *et seq.*), as amended, established a national policy to protect the environment.<sup>29</sup> Federal agencies are required to comply with NEPA and consider the environmental impacts, including invasive species, of an agency’s actions. NEPA has two primary aims—to require federal agencies to consider the environmental effects of their actions *before* proceeding with them; and to involve the public in the decision-making process. To ensure that environmental impacts are integrated into that process, federal agencies must prepare an environmental impact statement for actions “significantly” affecting the quality of the human environment.<sup>30</sup>

NEPA applies only to “federal actions,” defined broadly to include projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies.<sup>31</sup> Accordingly, programs or projects intended to control invasive species (e.g., BLM development of its Weed Management and Invasive Species Program), or actions that may result in the spread or introduction of non-native invasive species (among a range of other potential impacts), may be subject to NEPA. Such impacts may occur as a direct result of the action (e.g. state transportation agency landscaping or erosion control projects that receive federal funds) or be incidental to the action (e.g., a federally authorized construction project that opens a corridor that provides an opportunity for the movement of invasive species; or that introduces seeds from noxious weeds on construction equipment).

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<sup>26</sup> These programs were originally authorized in various omnibus farm bills, including provisions in the Food Security Act of 1985 (16 U.S.C. §§3839aa-3839aa-8) and the Federal Agriculture Improvement and Reform Act of 1996 (16 U.S.C. §3836a).

<sup>27</sup> NISC, *2001 Management Plan National Invasive Species Council*, January 2001.

<sup>28</sup> This section was prepared by (name redacted), Analyst in Environmental Policy (redacted@crs.loc.gov-....).

<sup>29</sup> For an overview of NEPA, see CRS Report RL33152, *The National Environmental Policy Act (NEPA): Background and Implementation*.

<sup>30</sup> 42 U.S.C. §4332(2)(C). Required elements of an EIS are specified in the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508) and broadly apply to all federal agencies.

<sup>31</sup> 40 CFR Part 1508.18; this definition also specifies that new or revised agency rules, regulations, plans, policies, or procedures are subject to NEPA.

NEPA does not prohibit an agency from moving forward with a program or project that may introduce or spread non-native invasive species. Nor does NEPA require an agency to implement measures to control such impacts. Within the framework of completing the NEPA process, an agency would identify any environmental requirements applicable to a proposed action,<sup>32</sup> including any measures that must be taken to assure or demonstrate compliance with those requirements. To demonstrate compliance with those requirements, the NEPA analysis must document any outside agency review or consultation regarding the proposal, and identify any measures necessary to control, minimize, or mitigate regulated impacts.

## **Endangered Species Act**

The Endangered Species Act of 1973, as amended (ESA, 16 U.S.C. §§1531-1543) focuses on the conservation and protection of endangered or threatened species and their habitats, except for species that are common to the point of being weeds or pests.<sup>33</sup> Although ESA has no direct regulation of invasive species, it could limit actions involving an invasive species to the extent the action may harm a listed species. For example, in the Pacific Northwest, the threat to resident Pacific salmon (*Onchorhynchus* sp.) protected under ESA is a major argument being used against the introduction or expansion of aquaculture that might introduce Atlantic salmon (*Salmo salar*), potentially an invasive species. Similarly, introduction of mountain goats (*Oreamnos americanus*) in an area where they are not native could be subject to proposed mitigation if the introduction would threaten listed plants likely to be eaten by the goats. ESA is jointly administered by the Departments of the Interior and Commerce.

ESA could provide protection in two ways. First, if the introduction were to be carried out by a federal agency or to require licensing, financial support, permits, or other support from a federal agency, the agency involved would have to consult with FWS or National Marine Fisheries Service (NMFS) to determine whether the introduction (or action leading to introduction) would tend to jeopardize the continued existence of the listed species or adversely modify its critical habitat.<sup>34</sup> If the agency action would lead to jeopardy or adverse modification, the action agency would need to carry out a reasonable and prudent alternative to avoid such problems, or risk violating the ESA. The alternative might, for example, reject the introduction in favor of a native species.<sup>35</sup> Second, if the action had no federal nexus, but its effects could result in taking (as defined in the act) a listed species, the party carrying out the action would have to obtain an incidental take permit from FWS or NMFS.<sup>36</sup>

## **Federal Noxious Weed Act**

Most provisions in the Federal Noxious Weed Act of 1974 were supplanted by the Plant Protection Act;<sup>37</sup> however, a key section (7 U.S.C. §2814) still requires each federal agency to provide for noxious weed management on lands under its jurisdiction. The provision, introduced

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<sup>32</sup> Depending on an action's impacts and the agency implementing it, an action may be subject to various laws, regulations, executive orders, or agency-specific requirements. In addition to federal requirements, the project also may be subject to local, state, or tribal laws or regulations.

<sup>33</sup> For information about the ESA generally, see CRS Report RL31654, *The Endangered Species Act: A Primer*.

<sup>34</sup> 16 U.S.C. §1536.

<sup>35</sup> For information on ESA's consultation process, see CRS Report RL31654, *The Endangered Species Act: A Primer*.

<sup>36</sup> 16 U.S.C. §1539.

<sup>37</sup> 7 U.S.C. §§7701 *et seq.*

in the 1990 farm bill,<sup>38</sup> amended the Federal Noxious Weed Act to require federal agencies to establish and fund noxious weed management programs. It also allows the agencies to implement cooperative agreements with state agencies regarding the management of undesirable plant species in areas adjacent to federal lands. The law requires joint leadership from the Secretaries of Agriculture and the Interior in coordinating federal agency programs for control, research, and education associated with designated noxious weeds. In 1994, a memorandum of understanding among several federal agencies created the Federal Interagency Committee for Management of Noxious and Exotic Weeds (FICMNEW) as a vehicle to coordinate noxious weed priorities.

### **Forest and Rangeland Renewable Resources Planning Act**

The Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. §§1671 *et seq.*), as amended by the National Forest Management Act (16 U.S.C. §1604), is the U.S. Forest Service's primary authority to conduct research activities, including research relating to invasive species. The law contains broad authority for research and technology regarding U.S. lands related to the protection, conservation, and sustainable use of natural resources. The law also authorizes competitive grants to conduct research, and authorizes cooperative agreements with university, industry, and other private and public partnerships.

### **Federal Land Policy and Management Act**

Provisions under the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. §1701 *et seq.*), provide funds for range betterment within a variety of range rehabilitation and improvement activities, including weed control on certain National Forest System rangelands.<sup>39</sup> In addition, the Public Rangelands Improvement Act of 1978 (43 U.S.C. §§1901-1908) provides funding for on-the-ground rangeland rehabilitation and range improvements on some of the rangelands managed by the Forest Service within USDA.

### **Cooperative Forestry Assistance Act**

Under the Cooperative Forestry Assistance Act of 1978, as amended (16 U.S.C. §§2101-2111), USDA's Forest Service may enter into cooperative agreements to assist other federal, state, and private entities in controlling and managing invasive species on other federal lands and nonfederal lands. The primary cooperative authority for invasive species is Section 8 of the law (16 U.S.C. §2104) and authorizes USDA to conduct activities and provide technical assistance relating to insect infestations and disease conditions affecting trees on National Forest System lands and on other federal lands (in cooperation with other federal agencies).<sup>40</sup> The law also provides support for good forest management practices, including financial assistance to maintain healthy timber ecosystem to prevent incursion of invasive species, on privately owned nonindustrial forestlands.

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<sup>38</sup> P.L. 101-624, Title XIV (amending the original law, P.L. 93-629).

<sup>39</sup> Provisions pertaining to range improvements in the Act of April 24, 1950 (16 U.S.C. §580(h)), also state that of funds received from grazing fees, a portion can be used for the "eradication of poisonous plants and noxious weeds in order to protect or improve the future productivity of the range."

<sup>40</sup> USDA, "Forest Service Authorities for Invasive Species Management," March 2006.



## **International Forestry Cooperation Act**

Provisions under sections of the International Forestry Cooperation Act of 1990 (16 U.S.C. §4501(b)) allow USDA to support international forestry and related natural resource activities and provide assistance to prevent and control insects, diseases, and other damaging agents, including invasive species. USDA's Forest Service delivers research and development to conduct prevention, rapid response, control, and management activities related to invasive species and to restore areas affected by invasive species.

## **Nonindigenous Aquatic Nuisance Prevention and Control Act**

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA; 16 U.S.C. §§4701, *et seq.*) established a federal program to prevent the introduction of, and to control the spread of, unintentionally introduced aquatic nuisance species, including zebra mussels, and also the brown tree snake. NANPCA mandated a Great Lakes ballast water management program to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through the ballast water of vessels and established civil and criminal penalties for violating these requirements.<sup>41</sup> Under the program, all ships entering U.S. waters (after operating outside the U.S. Exclusive Economic Zone) are directed to undertake high seas ballast exchange or alternative measures pre-approved by the Coast Guard as equally or more effective.

NANPCA established the Aquatic Nuisance Species Task Force (ANSTF), co-chaired by FWS and the National Oceanic and Atmospheric Administration (NOAA), which is tasked with implementing NANPCA.<sup>42</sup> NANPCA is the major legal authority for NOAA activities, and also covers some FWS activities.<sup>43</sup> Provisions in NANPCA primarily address prevention, control and management, and research of invasive species, but not rapid response and restoration activities.<sup>44</sup> NANPCA authorizes state governors to submit comprehensive management plans to ANSTF that identify areas or activities that need technical and financial assistance.<sup>45</sup> NANPCA encourages the Secretary of Transportation, through the International Maritime Organization, to negotiate with foreign countries on the prevention and control of the unintentional introduction of aquatic nuisance species. NANPCA further directs the U.S. Army Corps of Engineers to develop a program of research and technology for the environmentally sound control of zebra mussels in and around public facilities, and make information available on these control methods.<sup>46</sup>

NANPCA also reauthorized the National Sea Grant College Program Act.<sup>47</sup> Administered by NOAA, the Sea Grant program conducts research, outreach, and education to address marine and

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<sup>41</sup> NANPCA, §1101 (under U.S. Coast Guard regulations at 33 CFR Part 151).

<sup>42</sup> For more information on ANSTF, see report section "Aquatic Nuisance Species Task Force."

<sup>43</sup> In addition, other NOAA activities fall under other authorities, including control of phragmites under essential fish habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. §§1801-1882) and other activities under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 *et seq.*) and the Interjurisdictional Fisheries Act 1986 (16 U.S.C. §§4101 *et seq.*), as amended.

<sup>44</sup> NISC, *2001 National Invasive Species Management Plan*, January 2001.

<sup>45</sup> Grants were authorized to states for implementing approved management plans, with maximum federal shares of 75% of costs for each comprehensive management plan, and 50% for each public facility management plan. However, despite substantial authorizations, relatively little was appropriated or made available for state grants to implement these management plans.

<sup>46</sup> Subsequently, the Corps established the Zebra Mussel Research Program, including annual technical conferences and a publication series.

<sup>47</sup> 33 U.S.C. §§1121 *et seq.*, as amended.

coastal systems, focusing among other things on aquatic invasive species particularly in the Great Lakes. The program also supports research to demonstrate ballast water technology and marine engineering advances to combat aquatic nuisance species under two efforts—Great Lakes Environmental Research Lab (GLERL) and the Cooperative Institute for Limnology and Ecosystems Research at Michigan State University (NOAA’s Joint Institute partner). Additional information is provided in the section on “National Oceanic and Atmospheric Administration.”

### **National Invasive Species Act**

The National Invasive Species Act of 1996 (NISA, 16 U.S.C. §§4701 *et seq.*) amended NANPCA to create a national ballast management program to prevent the introduction and spread of nonindigenous species into U.S. waters.<sup>48</sup> The program was modeled after the Great Lakes ballast water management program established in NANPCA.<sup>49</sup> NISA cites concerns about several invasive aquatic species, including the zebra mussel as well as the Eurasian ruffe (*Gymnocephalus cernuus*), mitten crab (*Eriocheir sinensis*), green crab (*Carcinus maenas*), brown mussel (*Perna perna*), shellfish pathogens, and also several vegetation species, such as Eurasian watermilfoil (*Myriophyllum spicatum*), hydrilla (*Hydrilla verticillata*), anchored water hyacinth (*Eichhornia azurea*), and water hyacinth (*Eichhornia crassipes*).

In addition, NISA encouraged negotiations with foreign governments to develop and implement an international program for preventing the introduction and spread of invasive species in ballast water. NISA required the Coast Guard to report to Congress on the effectiveness of existing shoreside ballast water facilities used by crude oil tankers in the coastal trade off Alaska, as well as studies of Lake Champlain, the Chesapeake Bay, San Francisco Bay, Honolulu Harbor, the Columbia River system, and other estuaries and waters of national significance. NISA established civil and criminal penalties for certain violations, and also authorized funding for research on aquatic nuisance species prevention and control in the Chesapeake Bay, Gulf of Mexico, Pacific Coast, Atlantic Coast, and San Francisco Bay-Delta Estuary.

### **Alien Species Prevention and Enforcement Act**

The Alien Species Prevention and Enforcement Act of 1992 (ASPEA, 39 U.S.C. §3015) defines certain categories of nonmailable plant pests and injurious animals. ASPEA does not make any new categories of plants or animals illegal to ship, but rather makes it clear that use of the U.S. mail is included among those forms of transport whose use is illegal for shipment of prohibited species. The prohibited species are those injurious animals whose movement is prohibited (under part of 18 U.S.C. §42) and those plants and animals whose shipment is prohibited (under 16 U.S.C. §3372), as well as plants covered under various plant pest and plant quarantine acts. ASPEA is administered by the U.S. Postal Service. Although ASPEA appears to do very little to prevent the introduction of invasive species, especially if the sender is unaware that the shipped items are prohibited under the above laws, it may provide for prosecutors to bring cases involving shipment of various species, including non-native invasive species, to court.

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<sup>48</sup> NANPCA, as amended by P.L. 104-332. For more information, see out-of-print CRS Report RL32344, Ballast Water Management to Combat Invasive Species.

<sup>49</sup> This national program became mandatory in 1999 (64 *Federal Register* 94: 26672-26690, May 17, 1999). The U.S. Coast Guard finalized quantitative standards for ballast water treatment in 2012 (77 *Federal Register* 57: 17254-17320, March 23, 2012). For more information, see the report section “Coast Guard.”

## **Wild Bird Conservation Act**

The Wild Bird Conservation Act of 1992 (16 U.S.C. §§4901, *et seq.*) does not address introductions by non-native species, but rather conservation of birds caught in the wild in foreign countries and imported into this country. By regulating imports of certain wild birds, however, the law may have the incidental effect of reducing imports of non-native parasites and diseases that could affect wild populations of native birds.<sup>50</sup> It also could reduce the chance that an imported wild bird species could escape, breed, and increase to pest levels. Ten families of birds are specifically exempted from the provisions of the law, although their importation could be restricted by other applicable U.S. trade laws. FWS generally administers activities under the law.

## **Hawaii Tropical Forest Recovery Act**

The Hawaii Tropical Forest Recovery Act of 1992 (16 U.S.C. §4503(note)) amended the International Forestry Cooperation Act (16 U.S.C. §4501(b)) to create a variety of measures to address the problems within the native forests of Hawaii. The introduction of non-native invasive species, such as pigs, goats, and mosquitoes has been a major threat to the integrity of native Hawaiian forest ecosystems. The law has several features that address these issues. USDA's Forest Service is authorized to develop a program to assist Hawaii and U.S. territories to protect native species from non-native species, and to establish biological control agents for the non-natives, as well as develop plans for the Institute of Pacific Islands Forestry and for the Hawaiian tropical forests which must, among other things, provide for the study of biological control of non-native invasive species. In addition, the law created a short-term task force of specified federal, state, and other individuals. Among its other responsibilities, the task force developed an action plan, which has become the framework for Forest Service management and research budget requests in this area.

## **Plant Protection Act**

The Plant Protection Act of 2000 (PPA; 7 U.S.C. §§7701 *et seq.*) is the primary federal law governing plant pests in foreign and interstate commerce, covering agricultural commodities, plants, biological control organisms, articles that might be infested, means of transportation, and other pathways for moving pests. PPA consolidated several plant quarantine authorities, some dating back to the 1880s,<sup>51</sup> and authorizes APHIS to cooperate with states, localities and others to prevent the spread of or eradicate invasive pests and diseases. It authorizes APHIS to prohibit or restrict the importation, exportation, and the interstate movement of plants, plant products, certain biological control organisms, noxious weeds, and plant pests. It also authorizes APHIS to inspect foreign plant imports, to quarantine any state or premise infested with a new pest or noxious

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<sup>50</sup> Before passage of this act, the United States was the leading importer of wild birds; after passage, the European Union displaced the U.S. as the leading importer. See "International Trade in Wild Birds, and Related Bird Movements, in Latin America and the Caribbean," Food and Agriculture Organization of the United Nations, 2008.

<sup>51</sup> The PPA became law in June 2000 as part of the Agricultural Risk Protection Act (P.L. 106-224, Title IV), and consolidated and superseded several U.S. plant health laws, including (1) The Act of August 20, 1912 (commonly known as the "Plant Quarantine Act", 7 U.S.C. §§151-164a, 167); (2) The Federal Plant Pest Act (7 U.S.C. §§150aa *et seq.* and 7 U.S.C. §147a); (3) Section 102 (a) - (e) of the Department of Agriculture Organic Act of 1944 (7 U.S.C. §147a); (4) The Federal Noxious Weed Act of 1974 (7 U.S.C. §§2801 *et seq.*), except sections 1-15 of that act (7 U.S.C. §2801 note and 7 U.S.C. §2814); (5) the Joint Resolution of April 6, 1937 (commonly known as the "Insect Control Act") (7 U.S.C. §§148 *et seq.*); (6) The Halogeton Glomeratus Act (7 U.S.C. §§1651 *et seq.*); (7) The Golden Nematode Act (7 U.S.C. §§150 *et seq.*); and (8) Section 1773 of the Food Security Act of 1985 (P.L. 99-198; 7 U.S.C. §148f).

weed, and to cooperate with states in certain control and eradication actions. These authorities have been traditional hallmarks of U.S. plant pest regulations, and are administered by APHIS in collaboration with state departments of agriculture and their plant protection boards.

PPA gives USDA authority to use a wide range of measures to exclude alien pests or prevent the spread of new, but not widespread pests.<sup>52</sup> These measures include inspections, surveillance, quarantines, treatments, or destruction. USDA can develop lists of organisms that can or cannot enter the United States and goods that can be imported from specific countries, and has the authority to certify that U.S. agricultural exports meet the phytosanitary standards of other countries. USDA can require private parties to take remedial actions without cost to the government but must select the least costly, effective measure. The law also clarifies the extent of USDA's authority to regulate biological control agents and encourages the USDA, other federal agencies, and the states to facilitate biological control of pests and other invasive species, whenever feasible. The law imposes civil and criminal penalties.

PPA authorizes USDA to transfer funds from the Commodity Credit Corporation (CCC)<sup>53</sup> or other USDA programs to implement an emergency program to control specific plant pests of concern, subject to Office of Management of Budget (OMB) review.<sup>54</sup> Under some circumstances, USDA may also declare extraordinary emergencies, under which USDA can take action to control intrastate outbreaks of new pests, and has discretion to compensate growers for losses caused by the control program.<sup>55</sup> All states have some type of domestic quarantine laws; however, federal regulations preempt state actions in interstate commerce. States also may petition the Secretary for a "special need" exception to federal rules to request permission to impose restrictions beyond what is required by APHIS.<sup>56</sup> In addition, PPA provides that "any person" (or state) may petition USDA to add or remove plant pests from federal regulation.<sup>57</sup>

## **Animal Health Protection Act**

The Animal Health Protection Act of 2002 (AHPA, 7 U.S.C. §§8301-8302) is the primary federal law governing the protection of animal health, and gives USDA's APHIS broad authority to detect, control, or eradicate pests or diseases of livestock or poultry. APHA consolidates all of the animal quarantine and related laws, some dating back to the late 1800s, and replaces them with one statutory framework.<sup>58</sup> Most of the authorities contained in the consolidated AHPA were taken from existing laws, while some new provisions were added to help fully protect U.S. animal agriculture due to gaps in legal authority.

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<sup>52</sup> In fact, USDA has less regulatory authority to address established and widespread pests (i.e., already introduced and established pests) under PPA.

<sup>53</sup> USDA's CCC is a government-owned corporation that is authorized to borrow up to \$30 billion at any one time from the U.S. Treasury. The CCC mainly is a financing mechanism for farm bill programs such as commodity price and income supports, agricultural conservation, export assistance, and other mandated authorizations. For more information, see CRS Report R44606, *The Commodity Credit Corporation: In Brief*.

<sup>54</sup> 7 U.S.C. §§7751 and 7772. Such cases often occur in response to larger-scale plant and animal pest and disease outbreaks where the costs are too large to cover within existing appropriations or to new and emerging agricultural issues that warrant a federal role. For other background information, see CRS Report RL32504, *Funding Plant and Animal Health Emergencies: Transfers from the Commodity Credit Corporation*.

<sup>55</sup> 7 U.S.C. §7715.

<sup>56</sup> 7 U.S.C. §7756.

<sup>57</sup> 7 U.S.C. §7711.

<sup>58</sup> Incorporated laws include USDA's animal quarantine laws across several previous statutes (21 U.S.C. §§101 through 135b and 19 U.S.C. §1306), among others.

AHPA authorizes USDA to prohibit or restrict import or export of any animal or related material if necessary to prevent the spread of any livestock or poultry pest or disease, including quarantine of animals. USDA has the authority to hold, seize, treat, or destroy any animal, as well as to limit movement in interstate movement of invasive animal species. Like the Plant Protection Act, AHPA provides for emergency fund transfers and the determination of extraordinary emergencies, so that USDA can, under some circumstances, take actions within a state, and gives USDA the authority to enter into agreements with foreign governments, state governments, or other organizations. AHPA also requires compensation to farm owners based on fair market value of destroyed animals and related material. The law authorizes USDA to transfer funds from the CCC or other USDA programs to implement an emergency control program, subject to OMB review.<sup>59</sup>

### **Noxious Weed Control and Eradication Act**

The Noxious Weed Control and Eradication Act of 2004 (7 U.S.C. §§7781-7786) amended the Plant Protection Act to direct USDA to establish a grant program to provide financial and technical assistance to weed management entities to control or eradicate harmful, invasive weeds on public and private lands. The law also authorizes USDA to enter into cooperative agreements with weed management entities to fund weed eradication activities, and enable rapid response to outbreaks of noxious weeds. The law is administered by USDA's APHIS.<sup>60</sup>

## **Federal Directive**

### **Executive Order 13112 on Invasive Species**

In response to rising concern, especially in southern and western states and Hawaii, then-President Clinton signed Executive Order 13112 on Invasive Species in 1999 to prevent the introduction of invasive species, provide for their control, and minimize their impacts through better coordination of federal agency efforts.<sup>61</sup> Under the order, the federal government may:

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 U.S. 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 order directs all federal agencies to address invasive species concerns, as well as to refrain from actions likely to increase invasive species problems. Interagency goals under NISC were directed to provide leadership, coordination, and oversight of federal agency activities; to encourage work with nonfederal partners; and to aid public participation. NISC, supported by an advisory committee, was directed to develop recommendations for international cooperation, promote a network to document and monitor invasive species impacts, and encourage development of an information-sharing system on invasive species. For more information, see the section on “National Invasive Species Council.”

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<sup>59</sup> This provision is in accordance with the Animal Health Protection Act (7 U.S.C. §§8310 and 8316) and the Plant Protection Act (7 U.S.C. §§7751 and 7772).

<sup>60</sup> 70 *Federal Register* 192:57993-57994. October 5, 2005.

<sup>61</sup> 64 *Federal Register* 6183, February 8, 1999. Executive Order 13112 revoked former President Carter's 1977 Executive Order 11987 on exotic species. For more information on the legal status of Executive Orders, see CRS Report RS20846, *Executive Orders: Issuance, Modification, and Revocation*.

## Selected Federal Agencies

Numerous federal and interagency efforts share responsibilities for preventing, eradicating, and controlling invasive species. Following are descriptions of how federal agencies and interagency efforts address invasive species concerns. Most of these programs also address problems of native pest species or other domestic issues. No agency devotes the majority of its resources to invasive species issues. Even so, in some cases (e.g., APHIS), efforts to address invasive species account for a substantial portion of the workload; in others (e.g., Coast Guard), invasive species are a minor share of the total program. Outside of some activities in the agricultural sector, no evidence was found of focused efforts by any agency to control the exports of U.S. species which could become harmful or invasive in the countries receiving them. A summary of the federal agencies and laws that govern invasive species is in **Appendix A**, based on information from NISC.<sup>62</sup>

**Table 2** provides a summary of federal funding for invasive species activities for FY2012, as reported by NISC. These data are self-reported by the federal agencies engaged in invasive species activities, and are not independently compiled. Further, the criteria used by agencies to compile the data are unclear and may be inconsistent across different agencies, particularly given the difficulty in separating spending related to invasive species concerns from other activities within an agency. Much of this summary is based in part on information compiled by NISC.

In FY2016, the U.S. government spent an estimated \$2.3 billion across a range of federal agencies and activities in an effort to prevent, control, and eradicate invasive species domestically. Activities at the Department of Agriculture accounted for the bulk of available federal funding, nearly \$1.2 billion (53% of total available funds). Activities at the Department of Homeland Security, comprised of mostly border protection and security activities, accounted for about \$0.8 billion (33% of total funding). The remainder of federal funding, about \$0.3 billion (about 14% of total funding), covers activities across a range of agencies at the Departments of Interior, Commerce, and Defense, and other independent agencies.

The budget data are compiled by NISC as part of the Invasive Species Interagency Performance-Based Budget (Crosscut) called for in the first National Invasive Species Management Plan. NISC developed the first Invasive Species Crosscut Budget for FY2004, followed by FY2005, FY2006, and FY2007, followed by annual submissions (FY2011-FY2016).

**Table 2. Funding for Invasive Species Activities**

(FY2016 enacted, \$ in thousands)

	DHS	DOC (NOAA)	DOD (USACE)	DOI	DOS	DOT	EPA	USDA	Total
<b>Prevention</b>	776,300	8	31,850	11,184	565	810	57,000	100,064	<b>977,781 (42%)</b>
<b>Early Detection/ Rapid Response</b>	0	289	15,254	15,604	772	0	—	277,572	<b>309,491 (13%)</b>
<b>Control and Management</b>	0	126	61,066	46,643	12,002	0	—	526,498	<b>646,335 (28%)</b>
<b>Research</b>	0	925	6,029	19,970	2,194	1,585	110	237,692	<b>268,505 (11%)</b>

<sup>62</sup> See, for example, NISC periodic management plans (<https://www.doi.gov/invasivespecies/management-plan>).

	DHS	DOC (NOAA)	DOD (USACE)	DOI	DOS	DOT	EPA	USDA	Total
<b>Restoration</b>	0	54	18,638	4,332	0	0	0	25,145	<b>48,169 (2%)</b>
<b>Education and Public Awareness</b>	0	1,102	7,334	613	219	0	—	78,427	<b>87,695 (4%)</b>
<b>Leadership / Internat'l Coop.</b>	0	5	2,377	673	2,021	40	0	2,926	<b>8,042 (&lt;1%)</b>
<b>Total</b>	<b>776,300</b>	<b>2,509</b>	<b>142,548</b>	<b>99,019</b>	<b>17,773</b>	<b>2,435</b>	<b>57,110</b>	<b>1,248,324</b>	<b>2,346,018</b>
<b>% of Federal Spending</b>	<b>33%</b>	<b>&lt;1%</b>	<b>6%</b>	<b>4%</b>	<b>1%</b>	<b>&lt;1%</b>	<b>2%</b>	<b>53%</b>	<b>100%</b>

**Source:** NISC, “Invasive Species Interagency Crosscut Budget,” December 2016, [https://www.doi.gov/sites/doi.gov/files/uploads/nisc\\_2016\\_crosscut\\_budget\\_summary.pdf](https://www.doi.gov/sites/doi.gov/files/uploads/nisc_2016_crosscut_budget_summary.pdf). Excludes USAID.

**Notes:** Abbreviations are as follows: DHS (U.S. Department of Homeland Security); DOC (U.S. Department of Commerce); NOAA (National Oceanic and Atmospheric Administration); DOD (U.S. Department of Defense); USACE (U.S. Army Corps of Engineers); DOI (U.S. Department of the Interior); DOS (U.S. Department of State); DOT (U.S. Department of Transportation); U.S. Environmental Protection Agency (EPA); USAID (U.S. Agency for International Development); USDA (U.S. Department of Agriculture)

## Interagency Efforts

In an effort to improve coordination across federal agencies and to promote interagency cooperation on invasive species activities, various committees have been established over the years. Some are broadly tasked with addressing a range of invasive species concerns; others are more narrowly focused on specific types of ecosystems, whether aquatic or terrestrial systems, or on specific species groups such as animals or vegetation and weeds. Although the stated missions of the various interagency committees may complement each other by specializing in a particular area, this could result in duplicative efforts and redundancies across some committee jurisdictions. Also, unlike many of the federal agencies that are engaged in invasive species activities under an explicit legal or statutory authority and, in some cases, authorized funding to implement certain programs, the interagency committees established to coordinate activities across the federal agencies often lack the authority and available funding to be able to implement certain policies and actions.

## National Invasive Species Council

NISC provides high-level interdepartmental coordination of federal invasive species actions and works with other federal and nonfederal groups to address invasive species issues at the national level. NISC was created by Executive Order 13112 in 1999. NISC is co-chaired by the Secretaries of the Interior, Agriculture, and Commerce. The membership of the council also consists of the Secretaries of Defense, Health and Human Services, State, Transportation, and Treasury as well as the Administrators of the Agency for International Development (USAID) and the Environmental Protection Agency (EPA).

NISC and its member agencies, supported by its advisory committee (Invasive Species Advisory Committee, ISAC),<sup>63</sup> are tasked with developing recommendations for international cooperation,

<sup>63</sup> ISAC is a group of nonfederal experts and stakeholders established and mandated by Executive Order 13112 to (continued...)

promoting a network to document and monitor invasive species impacts, and encouraging development of an information-sharing system on invasive species. Among NISC's other duties and activities are to:

- prepare, revise, and issue a national invasive species management plan;
- draft the interdepartmental invasive species performance budget;
- oversee implementation of Executive Order 13112, and review progress under the NISC Management Plan and Executive Order 13112 (as part of a five year review);
- encourage planning and action at local, tribal, state, regional, and ecosystem based level to achieve strategic goals;
- work with the Council on Environmental Quality (CEQ) to develop guidance for federal agencies pursuant to NEPA;
- work with the Department of State to provide input for international invasive species standards and cooperation; and
- facilitate development of a coordinated network among federal agencies to document, evaluate, and monitor invasive species impacts.

In 2001, NISC released its first national invasive species management plan. The 2001 plan recommended nine goals for invasive species management and, with the help of ISAC, recommended research needs and measures to minimize the risk of species introductions. The 2001 plan constituted the first federal attempt to coordinate invasive species actions over a broad range of species and habitats; across federal, state, and local governments; and with private industry, interest groups, and private individuals.<sup>64</sup> Among the major features in the plan were the three key areas of prevention, early detection and rapid response, and control and management, which account for the majority of overall federal funding (see **Table 2**).

NISC completed a five year review of Executive Order 13112 in 2005.<sup>65</sup> Also in 2005, the National Invasive Species Information Center (NISIC) was established.<sup>66</sup> The NISIC website serves as a reference gateway to information, organizations, and services about invasive species, and is maintained by USDA's National Agricultural Library. The website posts the national invasive species management plan and provides extensive links to major data bases.

NISC released its second management plan in 2008, revising the 2001 plan. The revised plan directed federal efforts from 2008 through 2012.<sup>67</sup> The 2008 plan focused on five strategic goals: prevention; early detection and rapid response; control and management; restoration; and organizational collaboration. These goals are supported through efforts such as research, data and information management, education and outreach, and international cooperation.<sup>68</sup>

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(...continued)

provide advice to NISC on invasive species-related issues. The advisory committee includes academics, representatives of state and local governments; port authorities; the pet, nursery, and pesticide industries; several environmental groups; a commercial fisherman; and a rancher.

<sup>64</sup> NISC, *2001 National Invasive Species Management Plan*, January 2001.

<sup>65</sup> A five year review is required by Executive Order 13112. NISC, *Five-Year Review of Executive Order 13112 on Invasive Species*, 2005. Prepared for and submitted to the Office of Management and Budget.

<sup>66</sup> NISIC develops and manages the <http://www.invasivespeciesinfo.gov> website.

<sup>67</sup> NISC, *2008 – 2012 National Invasive Species Management Plan*, August 2008.

<sup>68</sup> NISC's management plan, while discussing improvements in international cooperation in general terms, does not (continued...)



NISC released its most recent management plan in 2016, which will direct federal efforts from 2016 through 2018.<sup>69</sup> The revised plan established certain priority action items, including providing institutional leadership and setting priorities, facilitating effective coordination and cost-efficiencies, raising awareness and motivating high-impact actions, removing institutional barriers, assessing and strengthening federal capacities, and fostering innovation.

### **Aquatic Nuisance Species Task Force**

The Aquatic Nuisance Species Task Force (ANSTF) is an intergovernmental organization, established in 1991 to implement NANPCA.<sup>70</sup> The ANSTF is co-chaired by FWS and NOAA, which coordinate government efforts related to nonindigenous aquatic species in the United States with those of the private sector and other North American interests.

Overall, ANSTF consists of 25 members. Of these, 13 are federal agency representatives: EPA, Coast Guard, U.S. Army Corps of Engineers, Forest Service, National Park Service, Bureau of Reclamation, Bureau of Land Management, Maritime Administration, USDA APHIS, U.S. Geological Survey, and the Department of State (along with co-chairs FWS and NOAA). The other 12 *ex officio* members include mostly regional representatives.<sup>71</sup> Six regional panels for the Great Lakes, Western (19 western states and Guam), Mid-Atlantic, Gulf and South Atlantic, Mississippi River Basin, and Northeast regions serve as advocates and advisory committees to ANSTF, coordinating interagency efforts to address regional priorities.

ANSTF approves comprehensive state and interstate plans for managing nonindigenous aquatic species. There were 41 approved state and interstate plans.<sup>72</sup> ANSTF manages a public awareness campaign targeted toward aquatic recreation users entitled “Stop Aquatic Hitchhikers.” The campaign builds on voluntary guidelines for recreational activities to highlight measures that can be taken to minimize the spread of aquatic invasive species.<sup>73</sup> ANSTF also has conducted studies and reports to Congress addressing ballast water exchange, controls on vessels, and aquatic nuisance species, among other issues.

### **Federal Interagency Committee for Management of Noxious and Exotic Weeds**

The Federal Interagency Committee for Management of Noxious and Exotic Weeds (FICMNEW) was created in 1994 through a memorandum of understanding among key federal agencies. It is composed of representatives from 16 federal agencies with invasive plant management and regulatory responsibilities. These include the Departments of Agriculture, the Interior, Transportation, Defense, and Energy as well as EPA.<sup>74</sup> FICMNEW fosters cooperative work on management of noxious and exotic weeds on federal lands and provides technical assistance on private lands. The committee has released several publications and issue papers.<sup>75</sup> FICMNEW

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describe any specific agency tasks which the United States itself might identify to prevent the spread of U.S. species that might cause harm in other countries.

<sup>69</sup> NISC, *2016-2018 National Invasive Species Council (NISC) Management Plan*, July 2016.

<sup>70</sup> 16 U.S.C. §§4701, *et seq.*, as amended by the National Invasive Species Act of 1996.

<sup>71</sup> A list of ANSTF members is at <http://anstaskforce.gov/members.php>.

<sup>72</sup> State and interstate plans are available at <http://anstaskforce.gov/stateplans.php>

<sup>73</sup> See “Protect Your Waters” website at <http://www.protectyourwaters.net/>.

<sup>74</sup> For more information, see FICMNEW’s website: <http://www.fs.fed.us/ficmnew/index.shtml>.

<sup>75</sup> Publications are available at <http://www.fs.fed.us/ficmnew/guidance.shtml>.

works with NISC to implement Executive Order 13122 and to coordinate federal agency activities that prevent and control invasive plants.

## **Invasive Terrestrial Animals and Pathogens**

The Invasive Terrestrial Animals and Pathogens (ITAP) is a federal scientific and technical interagency group housed at USDA to coordinate sharing of technical information for program planning and for managing invasive species.<sup>76</sup> It was established in 2004 by a memorandum of understanding between USDA, the Department of the Interior and the Smithsonian Institution. Other partners include the Departments of Defense, Health and Human Services, Homeland Security, State, and Transportation, as well as EPA and National Aeronautics and Space Administration. ITAP's mission is to "support and facilitate more efficient networking and sharing of technical information for program planning and coordination" among federal agencies involved with invasive species research and management. ITAP focuses on several major taxonomic groups of invasive species, and its mission parallels and complements the missions of FICMNEW and ANSTF.

## **Department of Agriculture**

USDA has a variety of programs affecting invasive species spanning several USDA agencies,<sup>77</sup> and also is a statutory co-chair of NISC.

### **Animal and Plant Health Inspection Service**

APHIS is the primary USDA agency charged with preventing plant and animal pests and diseases, including non-native invasive species, from entering the United States. Accordingly, APHIS can prohibit, inspect, treat, quarantine, or require mitigation measures prior to allowing entry of plant species, plant pests, biological control organisms, animals, animal products and by-products, or their host commodities or conveyances. APHIS is also involved with overseas control and eradication of some invasive pest species and regulates the importation/exportation of veterinary biological products intended to treat animal disease.

APHIS is responsible for protecting U.S. agriculture from domestic and foreign pests and diseases, responding to domestic animal and plant health problems, and facilitating agricultural trade. As part of APHIS' regulatory framework, the agency regulates certain animals and animal products to guard against the introduction of animal diseases into the United States,<sup>78</sup> and regulates certain plants and plant products prohibiting or restricting the importation of plants, plant parts, and plant products into the United States.<sup>79</sup> APHIS also lists noxious weeds that may be a concern involving the importation and interstate movement of plants and plant products.<sup>80</sup> The **text box** below provides a partial listing of some of the plant and wildlife programs and

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<sup>76</sup> R. M. Nowerierski and H. J. Meyer, "Establishing Inter-agency Multidisciplinary Areawide Pest Management Programmes," *Areawide Pest Management: Theory and Implementation*, ed. O. Koul et al., 2008.

<sup>77</sup> Information provided here of the activities at each USDA agency is excerpted from "Avoiding Harm From Invasive Species" report (also known as "USDA Do No Harm Report"), particularly its 2011 report.

<sup>78</sup> AHPA (7 U.S.C. §§8301-8302); regulations are at 9 CFR Parts 91 through 99.

<sup>79</sup> PPA (7 U.S.C. §§7701 *et seq.*); regulations are at 7 CFR Part 319. The requirements apply to many commodities, including nursery stock.

<sup>80</sup> 7 U.S.C. §2814; regulations are at 7 CFR Parts 360 and 361. Refers to plants that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources, public health, or the environment.

ongoing efforts at USDA—primarily addressing concerns to U.S. agriculture. Many of these plant and animal species are invasive.

APHIS conducts program delivery, research, and other activities through its regional and state offices, the National Wildlife Research Center and its field stations, as well as through its national programs. It has a number of ongoing efforts targeting certain plant pest concerns for key invasive species that are known to harm agricultural production.<sup>81</sup> APHIS also administers the Plant Epidemiology and Risk Analysis Laboratory (PERAL), whose scientists and professionals conduct Plant Protection and Quarantine (PPQ) analyses for pest risks. PERAL is responsible for providing essential scientific support to risk-based policy-making across a broad range of phytosanitary issues.

APHIS's Wildlife Services activities target introduced and invasive animal species of concern, including brown tree snakes, Gambian rats, nutria, coqui frogs, pigeons, starlings, house sparrows, feral pigs, and Burmese pythons. APHIS's Veterinary Services activities include the National Animal Health Laboratory Network, which is a state-federal cooperative effort including the APHIS National Veterinary Services Laboratories, and provide reference and confirmatory laboratory services including training, proficiency testing, and prototypes for diagnostic tests. For example, more than 40 laboratories have been trained and proficiency-tested to perform foot and mouth disease, avian influenza, and exotic Newcastle surveillance diagnostics, among other animal-related diseases.

Control methods used by the agency include providing advice to individuals and to municipal, state or federal agencies on a wide variety of preventative, nonlethal control methods.<sup>82</sup> Control of predatory animals, native or non-native, is largely carried out by lethal means, including hunting, trapping, and poisoning. The agency publishes annual Program Data Reports to inform the public about its wildlife damage management activities.

The agency has memoranda of understanding and other cooperative agreements with FWS, the National Park Service, the Bureau of Land Management, the Forest Service, and state natural resource agencies to help protect natural resources, including wildlife and threatened or endangered species, from loss of life, habitat, or food supply due to the activities of other species. The agency also addresses damage problems caused by such non-native species as nutria (*Myocastor coypus*), European starlings (*Sturnus vulgaris*), and monk parakeets (*Myiopsitta monachus*) and is also charged with monitoring and controlling the brown tree snake.

The two primary laws administered by APHIS are the Plant Health Protection Act (7 U.S.C. §§7701-7721) and the Animal Health Protection Act (7 U.S.C. §§8301-8322). Other laws and statutes governing APHIS activities relating to invasive species also include the Agricultural Bioterrorism Act (7 U.S.C. §8401); the Animal Damage Control Act (7 U.S.C. §§426 *et seq.*); the Federal Seed Act (7 U.S.C. §§1551 *et seq.*); the Federal Noxious Weed Act (7 U.S.C. §2814); and the Noxious Weed Control and Eradication Act of 2004 (7 U.S.C. §§7781-7786).

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<sup>81</sup> APHIS, Plant Pest Program Information, [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/](http://www.aphis.usda.gov/plant_health/plant_pest_info/). Also see “Federal Noxious Weeds List” ([http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/weeds/downloads/weedlist.pdf](http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf)).

<sup>82</sup> For more information, see CRS Report R44011, *Invasive Species: Control Options and Issues for Congress*.

### **Selected APHIS Plant and Wildlife Pest Programs/Efforts**

Following is a partial listing of some ongoing USDA plant and wildlife programs, most of which address species primarily regarded as a concern to U.S. agricultural production, including fisheries and aquaculture. Many of these plant and animal species are invasive.

- **Plant Diseases:** Black stem rust/barberry; chrysanthemum white rust; citrus diseases (including citrus canker, citrus greening, and Asian citrus psyllid); European larch canker; gladiolus rust; karnal bunt; sudden oak death; plum pox; potato diseases (such as potato virus Y strains, potato wart, and ralstonia); soybean rust; and thousand cankers disease.
- **Weeds:** Anchored waterhyacinth; giant salvinia; giant hogweed; hydrilla; melaleuca (or broadleaf paper bark tree); *Mikania micrantha*; onionweed; old world climbing fern; maidenhair creeper; tropical soda apple; tropical spiderwort (also known as Benghal dayflower); and witchweed (among many other aquatic and parasitic noxious weeds).
- **Nematodes:** Golden Nematodes and pale cyst nematode.
- **Mollusks:** Giant African land snail; temperate terrestrial gastropod; and zebra and quagga mussel (latter mostly addressed by NOAA and state department of fish and game).
- **Insects and Mites:** Asian longhorned beetle; brown marmorated stink bug; elm seed bug; cotton pests (such as boll weevil and pink bollworm); spotted wing drosophila; emerald ash borer; European grapevine moth; false codling moth; fruit flies (especially within the genera *Anastrepha*, *Bactrocera*, and *Ceratitis*); grasshopper/Mormon cricket; gypsy moth; imported fire ant; Japanese beetle; Khapra beetle (or cabinet beetle); light brown apple moth; panicle rice mite; pine shoot beetle; and palm weevils. (European honey bees, introduced to the United States, are also considered non-native.)
- **Other Wildlife:** Brown tree snake; European starling; feral swine; nutria; and Gambian pouch rat.

**Sources:** Compiled by CRS from various USDA sources.

## **Farm Service Agency**

The Farm Service Agency (FSA) administers USDA's Conservation Reserve Program (CRP).<sup>83</sup> CRP is a voluntary program that helps agricultural producers and landowners use environmentally sensitive lands (such as lands that are highly erodible) for conservation benefits, including weed control (including noxious weeds) and invasive species, insects, pests, and other undesirable species on enrolled lands. Accordingly, the primary statute governing FSA relating to invasive species are provisions regarding CRP (16 U.S.C. §§3838a, 3832).

## **Foreign Agricultural Service**

The Foreign Agricultural Service (FAS), working with APHIS, helps provide invasive species technical assistance to foreign countries seeking to import raw agricultural commodities and food products into the United States to ensure they do not also inadvertently introduce plant and animal pest and disease concerns, including invasive species.

## **Forest Service**

The Forest Service manages invasive activities on 193 million acres of National Forests and grasslands. As part of its forest and resource management activities, it has numerous programs intended to prevent invasive species introduction and spread, controlling the most threatening invasive species, monitoring to detect newly introduced species, and restoring ecosystems damaged by invasive plants, insects or pathogens. The agency's activities in the National Forest

<sup>83</sup> 16 U.S.C. §3831. Also see CRS Report R42783, *Conservation Reserve Program (CRP): Status and Issues*.

System (NFS) are intended to improve forest management by preventing, controlling, and eradicating aquatic and terrestrial invasive species (including invasive plants, pathogens, vertebrates, and invertebrates), as well as monitoring to detect newly introduced species, and restoring ecosystems damaged by invasive plants, insects or pathogens.<sup>84</sup> Some Forest Service activities regarding invasive species are:<sup>85</sup>

- respond to nationwide threats to forest ecosystems from non-native invasive species: insects, pathogens and plants;
- support the establishment of Cooperative Weed Management Areas and also Cooperative Invasive Species Management Areas;
- develop a Forest Service Manual (FSM 2900) for invasive species management on the NFS, and also a NFS Invasive Species Management Handbook;
- establish an Early Detection and Rapid Response (EDRR) initiative and also an Invasive Insects Early Detection Program;
- conduct training, and provide funding and technology for invasive species work;
- develop policies regarding both native and invasive species management in national forests; and
- conduct data management, recordkeeping and reporting, and research.

To support these efforts, the FS conducts research focused on invasive plant species, including ecological studies to support restoration of sites after treatment of exotic weeds, as well as control *Miconia* sp. and other invasive plants in Hawaii; kudzu (*Pueraria montana* var. *lobata*) in the southern United States; yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea maculosa*), and leafy spurge (*Euphorbia esula*) in Idaho; among other non-native invasive species. In addition, the Forest Service seeks to control and mitigate the impacts from harmful non-native invasive insects, such as the Asian longhorned beetle (*Anoplophera glabripennis*), gypsy moth (*Lymantria dispar*), hemlock woolly adelgid (*Adelges tsugae*), and browntail moth (*Euproctis chrysorrhoea*). The agency conducts research on such tree diseases as butternut canker and sudden oak death syndrome, and works to find and develop trees genetically resistant to Dutch elm disease, pitch canker, chestnut blight, and white pine blister rust.

The Forest Service works closely with state agencies, private landowners, and tribal governments on prevention and control activities, and provides funding and technical assistance through its state and private forestry programs.

Primary laws governing Forest Service programs relating to invasive species include the Organic Administration Act (16 U.S.C. §551), Multiple-Use Sustained-Yield Act (16 U.S.C. §§528-531), Forest and Rangeland Renewable Resources Planning Act (16 U.S.C. §§1671 et seq.), Federal Noxious Weed Act (7 U.S.C. §2814), Public Rangelands Improvement Act (43 U.S.C. §§1901-1908), Federal Land Policy and Management Act (43 U.S.C. §1701), Cooperative Forestry Assistance Act (16 U.S.C. §§2101-2111), among others. Many of these authorities do not focus strictly on invasive species management, but also apply to other Forest Service activities including rangeland management, research, or public use activities.

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<sup>84</sup> NFS regularly treats thousands of acres of lands and waters infested with invasive species, including targeted non-plant invasive species.

<sup>85</sup> USDA, “Avoiding Harm From Invasive Species,” various years.

## **Research, Education, and Economics Agencies**

USDA's Research, Education, and Economics agencies are responsible for research, analysis, and data collection within USDA. Three agencies support research on invasive species: Agricultural Research Service (ARS), Economic Research Service (ERS), and National Institute of Food and Agriculture (NIFA).<sup>86</sup>

### *Agricultural Research Service*

ARS is USDA's chief in-house research agency, and provides scientific and technical support for its regulatory agencies, including APHIS. ARS has significant involvement in pest management, including invasive species, through its research infrastructure. Its personnel and facilities in domestic and foreign laboratories provide support to other agencies, organizations, and state governments. Some of the agency's activities regarding invasive species are:<sup>87</sup>

- maintain overseas biological control laboratories and quarantine facilities, and develop procedures relating to conducting tests for the release of biological control agents in accordance with the requirements of NEPA;<sup>88</sup>
- maintain and manage e-Government and public communication initiatives, such as the website, <http://www.invasivespeciesinfo.gov>, through the agency's National Invasive Species Information Center at the National Agricultural Library within ARS, among other public outreach and educational activities;
- conduct biological control host-specificity testing to support research efforts in Integrated Pest Management (IPM);<sup>89</sup>
- conduct area-wide pest management programs, including demonstrations of IPM and other systems that employ biologically-based or pest-specific methods to reduce use of certain chemical pesticides;
- develop technologies and approaches to reduce nontarget effects associated with conventional pesticides; and
- provide support for the NISC and ITAP.

Research activities of ARS include the detection, identification, characterization, prevention, monitoring, and control of plant diseases, insects, weeds, and animal diseases.

### *Economic Research Service*

ERS, the USDA's in-house economic research agency, contributes to USDA's invasive species efforts through its Program of Research on the Economics of Invasive Species Management (PREISM), as well as its programs on pesticide use and pest management economic research and

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<sup>86</sup> Another USDA data and research agency, the National Agricultural Statistics Service (NASS) is not discussed here.

<sup>87</sup> USDA, "Avoiding Harm From Invasive Species," various years, including USDA, "Avoiding Harm From Invasive Species In FY2011" February 27, 2012.

<sup>88</sup> 42 U.S.C. §§4321 *et seq.*

<sup>89</sup> Section 15 of the Federal Noxious Weed Act, and Executive Order 13112 direct Federal agencies to use an IPM approach for the management of undesirable plants on federal lands, including education; preventive measures; cultural, mechanical, physical, biological and chemical control; and general land management practices (such as revegetation, manipulation of livestock or wildlife grazing, and improvement of livestock and wildlife habitat). For more information, see University of California, Statewide Integrated Pest management Program, "Definition of Integrated Pest Management," <http://www.ipm.ucdavis.edu/GENERAL/ipmdefinition.html>.

analysis program. PREISM was initiated in 2003 to examine the economics of managing invasive pests in increasingly global agricultural markets. Through PREISM, ERS has funded a competitive awards program that focuses on national decision-making concerning invasive species of agricultural significance or affecting, or affected by, USDA programs. In addition, ERS research on pesticide use provides information used to administer the integrated pest management program, Food Quality Protection Act<sup>90</sup> implementation, and invasive species programs.<sup>91</sup>

### ***National Institute of Food and Agriculture***

NIFA distributes federal funds to support research and extension programs at the land grant colleges of agriculture in every state.<sup>92</sup> NIFA supports research, education, and extension programs in the land grant university system and other partner organizations; it does not perform actual research, education, or extension but instead helps fund programs at the state and local level. NIFA allocates some funds to each state according to formulas spelled out in authorizing laws, and distributes the rest through various competitive grant programs.

NIFA maintains two national plant and animal diagnostic laboratory networks to detect and report pathogens of national interest, and to provide timely information and training to state university diagnostic laboratories. These include the National Plant Diagnostic Network<sup>93</sup> and the National Animal Health Laboratory Network.<sup>94</sup> NIFA also supports ongoing IPM work, pesticide use and pest management, training, and other extension and education programs. NIFA supports activities in the Technical Advisory Group for the Biological Control of Weeds. NIFA also supports state-level research on invasive species, and extension programs to help farmers, ranchers, and private landowners to adopt cost-effective, environmentally safe controls for invasive species.

### **Natural Resources Conservation Service**

The Natural Resources Conservation Service (NRCS) provides technical assistance to cooperating landowners and federal agencies (such as the Forest Service and Bureau of Land Management) on adopting conservation practices on agricultural land, including rangeland. The agency also promotes conservation planning through many of its farmland conservation programs that provide both technical and financial assistance to farmers and landowners. Some NRCS activities regarding invasive species are as follows:<sup>95</sup>

- Provide U.S. private landowners with financial and technical assistance to control and/or eradicate invasive plants through USDA farmland conservation programs<sup>96</sup> in an effort to maintain the desired vegetation (e.g., food crops and forage), to maintain the desired characteristics of the land (e.g., wetland open water), and to diminish invasive plants spreading to neighboring lands.

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<sup>90</sup> FQPA, enacted in 1996 (P.L. 104-170), amended Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA). For more information see CRS Report RL31921, *Pesticide Law: A Summary of the Statutes*.

<sup>91</sup> ERS, Program of Research on the Economics of Invasive Species Management FY 2003-2011 Activities, May 2011.

<sup>92</sup> Formerly Cooperative State Research, Education, and Extension Service or CSREES.

<sup>93</sup> Led by five regional laboratories (Cornell University, University of Florida, Michigan State University, Kansas State University, and University of California-Davis) and one support laboratory (Texas Tech University).

<sup>94</sup> For more information, see USDA's websites: [http://www.aphis.usda.gov/animal\\_health/nahln/downloads/NAHLNBriefingCurrent.pdf](http://www.aphis.usda.gov/animal_health/nahln/downloads/NAHLNBriefingCurrent.pdf) and [http://www.nifa.usda.gov/nea/ag\\_biosecurity/in\\_focus/apb\\_if\\_healthlab.html](http://www.nifa.usda.gov/nea/ag_biosecurity/in_focus/apb_if_healthlab.html).

<sup>95</sup> USDA, "Avoiding Harm From Invasive Species," various years.

<sup>96</sup> For more information, see CRS Report R40763, *Agricultural Conservation: A Guide to Programs*.

- Develop NRCS Conservation Practice Standards, consisting of 170 practice standards to guide applying conservation technology on the land and minimum levels for application of the technology.
- Operate NRCS Plant Materials Centers nationwide to cultivate and provide seed stock of plants that are used for vegetative conservation practices within various geographical regions. These centers encourage use of native plants for restoration, reclamation, and conservation practice uses, and support studies nationwide to control or suppress weeds and find suitable replacements for invasive species once control is achieved.<sup>97</sup> In addition to the National Plant Materials Center (located in Beltsville, Maryland), other materials centers serve several major land resource areas.
- Support the PLANTS Database (<http://plants.usda.gov>) to determine beneficial plants that do well within a particular geographical location, as well as to list plants that should not be planted within a particular environment (e.g., federal and state noxious weed lists).

Among the laws that govern NRCS activities relating to invasive species are the Soil Conservation and Domestic Allotment Act (16 U.S.C. §590(a)-590(f)) and various farmland conservation provisions in various omnibus farm bill laws.

## **Department of Commerce**

### **National Oceanic and Atmospheric Administration**

The National Oceanic and Atmospheric Administration (NOAA) is a statutory co-chair of both the interagency NISC and ANSTF, and administers a variety of programs aimed at expanding and coordinating prevention, early detection, rapid response, control, and monitoring programs nationwide. NOAA is responsible for supporting research and monitoring efforts on the effects of aquatic invasive species on ecosystems and socioeconomic factors. It also assists regions and states by providing technical support and best management practices to prevent and contain invasive species. NOAA sub-agencies, including the National Ocean Service and the National Marine Fisheries Service, are involved in both prevention and control activities. In addition, the National Ocean Service monitors coastal areas for the presence of nonindigenous species.

NOAA's Sea Grant programs on invasive species focus on marine systems and the Great Lakes, through funding of research, education, and outreach to address threats from invasive species. Through this program, NOAA has supported research on ballast water technology and marine engineering advances to combat aquatic nuisance species under two efforts—NOAA's Great Lakes Environmental Research Lab (GLERL) and at the Cooperative Institute for Limnology and Ecosystems Research at Michigan State University (NOAA's Joint Institute partner). Regarding invasive species, GLERL targets both the prevention and control to stop the inflow and spread of new aquatic organisms, with particular emphasis on ship ballast, and also understanding and minimizing the ecological and economic impacts of recent species invasions, especially the on-going secondary effects of zebra mussels. GLERL also leads investigations of invasive species impacts on the Great Lakes ecosystem, focusing on zebra mussels and other recent invaders. Other program efforts support research on the biology of non-native invasive species; impacts of invasive species on ecosystems, including socioeconomic analysis of costs and benefits; control

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<sup>97</sup> Some of the target weeds in this effort are yellow starthistle, cheatgrass, knapweed, Canada thistle, and cogongrass.



and mitigation options; prevention of new introductions; and reduction in the spread of established populations of harmful non-native species. The program also funded a Nationwide Zebra Mussel Training Initiative to provide technical services outside the coastal and Great Lakes areas and provide inland states with a knowledge base for creating state and regional programs.

The primary law governing NOAA's role in addressing invasive species is the Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §4701, *et seq.*), as amended.

## **Department of Defense**

The Department of Defense (DOD) manages over 25 million acres of lands within military installations and engages in management and control of invasive non-native species. DOD controls and manages invasive species in accordance with individual plans governing each installation or base. The goals of DOD's Invasive Species Management Program are prevention, control of invasive species on military installations, and restoration using native plants. The Armed Forces Pest Management Board coordinates DOD activities to prevent and control the spread of invasive species, including the brown tree snake and noxious weeds, on, to, or from military bases. DOD is also promulgating joint regulations with EPA to set national performance standards that will require the use of marine pollution control devices to control discharges incidental to the normal operation of armed forces vessels.<sup>98</sup>

### **Army Corps of Engineers<sup>99</sup>**

The U.S. Army Corps of Engineers (USACE) supports a range of invasive species efforts. The Corps generally undertakes efforts to prevent or reduce the establishment of invasive species at its projects pursuant to its national USACE Invasive Species Policy.<sup>100</sup> Invasive species work within individual projects is typically funded through Operations and Maintenance (O&M) funding for each project; the nature of the work at the project level is addressed in project planning documents. Other USACE activities (e.g., regulatory activities) must also take invasive species into consideration.

USACE also has specific programs that address subcategories of invasive species. The Aquatic Plant Control Program provides cost-shared assistance to states for aquatic plant management that is not a part of routine federal project maintenance.<sup>101</sup> At full federal costs, USACE administers an Aquatic Nuisance Species Research Program, which develops methods and provides general guidance and research assistance on invasive species control strategies.<sup>102</sup> Finally, USACE fully funds control of aquatic plants, predominantly invasive species, in waterways in certain southeastern states through its Removal of Aquatic Growth Program.<sup>103</sup>

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<sup>98</sup> §312(n) of the Clean Water Act (33 U.S.C. §§1251-1376. Regulations are at 40 CFR Part 1700. These standards are referred to as Uniform National Discharge Standards (UNDS).

<sup>99</sup> This section was prepared by Charles Stern, Specialist in Natural Resources Policy (fadedacted@crs.loc.gov-....).

<sup>100</sup> U.S. Army Corps of Engineers, Memorandum, *U.S. Army Corps of Engineers Invasive Species Policy*, June 2, 2009.

<sup>101</sup> 33 U.S.C. §610. Nonfederal entities must provide for 50% of these costs. Corps implementation guidance specifies that maintenance of aquatic plant control at Corps or federally owned projects should be funded through the normal project operations and maintenance budget process.

<sup>102</sup> This program is fully federally funded and was authorized under NANPCA (16 U.S.C. §§4701, *et seq.*). The laboratory also administers a zebra mussel research effort to develop control measures.

<sup>103</sup> This program was authorized in the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. §403), as amended.

In some cases, Congress has authorized Corps invasive species control efforts at specific federal water resource projects administered by USACE in the form of physical construction and other project-level authorities. The most notable example is control of Asian river carp (*Hypophthalmichthys* sp.) in the Chicago area.<sup>104</sup> In that case Congress authorized and funded USACE's construction and operation of underwater electric barriers to help prevent the encroachment of Asian river carp into the Great Lakes.<sup>105</sup> Congress also authorized USACE to study and carry out other means to control Asian river carp in the same area, as well as a larger study of potential methods to prevent the transfer of aquatic nuisance species between the Great Lakes and Mississippi River basin.<sup>106</sup>

## Department of Health and Human Services

Although not the focus of this report, certain invasive species can harm both ecosystems and human health. Some invasive pathogens and parasites infect humans exclusively.

The Centers for Disease Control and Prevention (CDC) within the Department of Health and Human Services (HHS) addresses zoonotic diseases,<sup>107</sup> emerging diseases and those with unknown causes.<sup>108</sup> The National Institute of Health (NIH) provides research support for zoonotic diseases and bioterrorism preparedness. In addition, NISC coordinates actions on animal diseases and human diseases, including diseases that are transmitted between human and animals. The work of various NISC agencies (such as NPS, NOAA, USDA, EPA, and DoD) includes zoonotic disease surveillance and prevention.

## Department of Homeland Security

### Coast Guard

The Coast Guard, an agency of DHS, works with other federal agencies to develop and implement a national ballast water management program aimed at preventing the unintentional introduction and dispersal of nonindigenous aquatic species into waters of the United States from ship ballast water. As mandated by NISA (16 U.S.C. §§4701 *et seq.*, amending NANPCA), this national program became mandatory in 1999.<sup>109</sup> Under the program, the Coast Guard has established quantitative performance standards for ballast water treatment; protocols for testing, verifying, and reporting on treatment technologies; and a program to facilitate experimental shipboard installation and operation of promising technologies.<sup>110</sup> The final rule to implement NISA/NANPCA was promulgated in March 2012 and requires the Coast Guard to ensure to the

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<sup>104</sup> For more information, see CRS Report R41082, *Asian Carp and the Great Lakes Region*.

<sup>105</sup> Water Resources Development Act (WRDA), as reauthorized in 2007 (P.L. 110-114, §3061), consolidated the multiple authorizations for barrier construction and authorized the Corps to permanently operate both barriers at full federal cost.

<sup>106</sup> The study is authorized in 121 Stat. 586 and is expected to focus on options including the permanent hydrological separation of the basins.

<sup>107</sup> Refers to a disease that may be transmitted from animals to humans under natural conditions (e.g., rabies).

<sup>108</sup> A listing of selected authorities pertaining to CDC and public health is at CDC, "Selected Federal Legal Authorities Pertinent to Public Health Emergencies," September 2009.

<sup>109</sup> 64 *Federal Register* 94: 26672-26690, May 17, 1999. These regulations became effective July 1, 1999.

<sup>110</sup> Prior to the release of the final rule, the Coast Guard, in a Memorandum of Understanding with EPA, published a report describing generic procedures for evaluating the performance of ballast water treatment systems. EPA, *Generic Protocol for the Verification of Ballast Water Treatment Technology*, EPA/600/R-10/146, September 2010.

maximum extent practicable that aquatic nuisance species are not discharged into waters of the United States from vessels. It also requires vessels to carry out management practices necessary to reduce the probability of unintentional discharges of invasive species resulting from ship operations other than ballast water discharge, and allows for the approval of certain alternative ballast water management methods, in some cases.<sup>111</sup>

### **Customs and Border Protection**

Customs and Border Protection (CBP) is responsible for securing the border and facilitating lawful international trade and travel while enforcing hundreds of U.S. laws and regulations. According to the agency, CBP guards nearly 7,000 miles of land border the United States shares with Canada and Mexico and 2,000 miles of coastal waters surrounding the Florida peninsula and off the coast of Southern California, and it protects 95,000 miles of maritime border in partnership with the U.S. Coast Guard. Among its many border protection responsibilities, CBP works with USDA and the Department of Interior to enforce laws prohibiting or limiting the entry of invasive species. CBP also works with wildlife inspectors at FWS, USDA, and other federal trade inspection agencies to facilitate the detection and disruption of wildlife trafficking.<sup>112</sup> CBP agriculture specialists prevent the entry of harmful plant pests and exotic foreign animal diseases and confront emerging threats in agro- and bioterrorism. As part of its role in enforcing plant and animal regulations, CBP will detain, where necessary, imported or exported products pending their clearance by agency inspectors. CBP also supports the removal of invasive plants that interfere with border area surveillance. CBP states they regularly discover pests at U.S. ports of entry, many that are potentially harmful to agricultural and natural resources; they also hold materials—plant, meat, animal byproduct, and soil—for quarantine.

### **Federal Emergency Management Agency**

As part of the Federal Emergency Management Agency's (FEMA) "Emergency Support Function" (ESF #11), the agency works with other federal agencies and also supports state, tribal, and local authorities to, among other things, "control and eradicate outbreaks of animal/zoonotic disease, exotic plant pests, or invasive plant pest infestations."

### **Immigration and Customs Enforcement**

Immigration and Customs Enforcement (ICE) is DHS's principal investigative arm and was created in 2003 through a merger of the investigative and interior enforcement elements of the former U.S. Customs Service and the Immigration and Naturalization Service. ICE's stated mission is to "promote homeland security and public safety through the criminal and civil enforcement of federal laws governing border control, customs, trade, and immigration." As part of its overall border protection responsibilities, ICE works with other federal agencies such as FWS, NOAA, and CBP to enforce U.S. trade laws, including laws that prohibit illegal wildlife trafficking.<sup>113</sup>

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<sup>111</sup> 77 *Federal Register* 57: 17254-17320, March 23, 2012. As required under NANPCA, 16 U.S.C. 4711(c)(2)(A), 16 U.S.C. 4711(c)(2)(E); and 16 U.S.C. 4711(c)(2)(D)(iii). Regulations are at 33 CFR Part 151, Subparts C and D. For more information, see out-of-print CRS Report RL32344, *Ballast Water Management to Combat Invasive Species*.

<sup>112</sup> U.S. Fish and Wildlife Service (FWS), Office of Law Enforcement, "Strategic Plan 2011 – 2015: Protecting Our Wildlife and Plant Resources," p. 28.

<sup>113</sup> *Ibid.*, p. 17.

## Department of the Interior

The Department of the Interior (DOI) is the largest land and water manager in the United States, and invasive species are an aspect of most of its programmatic responsibilities and missions. DOI is also a statutory co-chair to both NISC and ANSTF. The federal staff of NISC and the nonfederal staff of ISAC are both housed and administered within DOI.

### Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA) is responsible for protecting and improving the trust assets of Indian tribes while maintaining a relationship within the spirit of self-governance. The BIA, through exotic weed eradication and other programs, helps support the management of non-native invasive species on Indian lands (e.g., reservations, pueblos, rancherias, communities). In addition, BIA's Noxious Weed Control program supports resource protection on trust lands in compliance with various laws<sup>114</sup> and also provides education, direction and technical guidance to individual Indians, non-Indian farmers and ranchers, Indian tribes and Alaska natives involved in controlling noxious weeds.

BIA also cooperates in DOI's Invasive Species Crosscut Initiative and participates in three of the Area Invasive Plant Initiatives: Rio Grande (tamarisk or salt cedar (*Tamarix* sp.)); Northern Great Plains (leafy spurge, yellow star thistle); and Florida (melaleuca, tropical soda apple (*Solanum viarum*), and Brazilian pepper (*Schinus terebinthifolius*). The BIA funds tribal projects in all three of these initiatives.

### Bureau of Land Management

The Bureau of Land Management (BLM) focuses its invasive species efforts primarily on controlling non-native plants on the 250 million acres it manages, primarily in western states and Alaska.<sup>115</sup> BLM works with state, federal and local partners to reduce the spread of invasive species, and focuses on early detection of and rapid response to new invasions and to reduce the need for larger, more expensive treatments. BLM's action plan details its strategy to prevent and control the spread of noxious weeds on public lands; the goals of the plan roughly parallel those of NISC.

BLM also provides for education and cooperative efforts with various states to control exotic weeds. It maintains a cooperative research relationship with most USDA agencies (APHIS, Forest Service, and USDA's research agencies). BLM also is responsible for protecting, controlling, and managing populations of wild horses and burros which, although not native, have a legally protected status.<sup>116</sup> APHIS, through its Wildlife Services program, helps to regulate animal pests (primarily predator control), whether native (such as coyotes (*Canis latrans*)) or non-native (such as Eurasian collared doves (*Streptopelia decaocto*)), on BLM land. On its grazing lands, BLM requires that non-native plant species be used only when native species are not available in sufficient quantities or are incapable of maintaining or achieving properly functioning conditions and biological health.

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<sup>114</sup> Including American Indian Agricultural Resource Management Act (AIARM, P.L. 103-177, codified at 25 U.S.C. §3701), Federal Noxious Weed Act (7 U.S.C. §2814), and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA, 7 U.S.C. §§136 *et seq.*).

<sup>115</sup> BLM, *Pulling Together: National Strategy of Invasive Plant Management*, 1998.

<sup>116</sup> For more on management of wild horses and burros generally, see CRS Report RL34690, *Wild Horses and Burros: Issues and Proposals*.

## **Bureau of Reclamation<sup>117</sup>**

The Bureau of Reclamation's research, prevention, detection, and control programs address primarily the pests of aquatic systems such as reservoirs, canals, pipelines, and rivers. Such pests include both plants and animals, including tamarisk (salt-cedar), hydrilla, Eurasian watermilfoil, giant salvinia (*Salvinia molesta*), quagga and zebra mussels, and Asian river clams (*Corbicula fluminea*). Their presence results in loss of irrigation water, blocked waterways, impediments to navigation, and lost recreational opportunities. To control these pests, the agency uses biological control agents and pesticide application. Ongoing projects include research and development for eradicating or controlling invasive mussels, insect control for weed species; grass carp (itself a non-native species) for control of certain aquatic weeds, and use of herbicide meters to match herbicide flow to fluctuating water levels. The agency also maps the movement of certain invasive species (e.g., giant salvinia, hydrilla, and quagga and zebra mussels), and works with partners in Cooperative Weed Management Areas in western states to identify and control weeds. It works to improve control methods and basic knowledge of non-native invasive species, and to develop methods to restore areas with tamarisk infestation. Mitigating the effects of zebra and quagga mussels is among its top research and development priorities.<sup>118</sup> BLM also works with federal agencies, state and local governments, and others including Mexican officials on cross-border weed infestations. It also supports the work of NISC.

## **Fish and Wildlife Service**

The U.S. Fish and Wildlife Service (FWS) is authorized to help prevent the introduction and spread of invasive species in general and, on its own lands, to control established non-native invasive species. FWS maintains numerous programs covering fisheries, endangered species, habitat conservation, refuge operations and maintenance, and international affairs. FWS also enforces laws and regulations concerning the importation of injurious wildlife species.

FWS wildlife inspectors also help prevent the entry of invasive species, working with other federal agencies (USDA, NOAA, and CBP) and state and local governments. Several other programs providing grants to states, territories, and tribes may be used for prevention, control, or eradication of invasive species. Annual spending on invasive species under these programs will vary depending on the applications received. FWS also allocates available funds nationally for wildlife and habitat management within the 150-million-acre National Wildlife Refuge System (NWRS). Many refuges spend substantial portions of their budgets on the control of such non-native invasive species such as feral pigs (*Sus scrofa domesticus*), Burmese pythons (*Python bivittatus*), melaleuca, tamarisk (or salt cedar), and purple loosestrife. The agency attempts to minimize the use of pesticides and herbicides in these efforts. FWS also has five Invasive Species Strike Teams available to respond rapidly to new infestations of invasive species before they become established.

Under wildlife protection statutes, such as ESA, the agency's authority to protect domestic ecosystems is indirect or general, meaning the agency sometimes finds itself at odds with other interests, particularly those wishing to introduce various species for sport fishing or hunting. Its broad authority under ESA allows the agency to act if a proposed introduction or other activity seems likely to harm a protected species.<sup>119</sup> Its spending on harmful non-native species occurs in

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<sup>117</sup> This section was prepared by (name redacted) Specialist in Natural Resources Policy ([redacted]@crs.loc.gov-....).

<sup>118</sup> Based on previous budget requests for its science and technology program.

<sup>119</sup> 16 U.S.C. §§1531 *et seq.*

a number of its programs, including fisheries (e.g., Aquatic Nuisance Species and brown tree snake programs), endangered species, Partners for Fish and Wildlife (e.g., some funding earmarked by Congress for special projects), habitat conservation (coastal program), refuge operations and maintenance (e.g., inventory, mapping, and monitoring of invasive species), and also international affairs.

The primary laws governing FWS's role in addressing invasive species are: Lacey Act (18 U.S.C. §§42-43; 16 U.S.C. §§3371-3378); Endangered Species Act (16 U.S.C. §1531-1543); Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701, *et seq.*); and Wild Bird Conservation Act (16 U.S.C. §§4901, *et seq.*); among other authorities.

## **Geological Survey**

The U.S. Geological Survey (USGS) conducts and supports research that assists resource managers in the control of invasive species and restoration of affected areas. Its invasive species program focuses on “early detection and assessment of newly established invaders, monitoring of invading populations; improving understanding of the ecology of invaders and factors in the resistance of habitats to invasion; and development and testing of prevention, management, and control methods.”<sup>120</sup> USGS has focused its research in recent years on a number of highly invasive species in the Great Lakes and eastern waterways and wetlands; in riparian ecosystems; invasive species in Hawaii and Florida; large constrictor snakes; and invasive plants on western rangelands. USGS also manages the national Nonindigenous Aquatic Species Database, as well as several regional databases (e.g., Hawaii, Colorado plateau, and northern prairie) and manages a nonindigenous aquatic species website.

USGS had also begun efforts to compile a central database, called the National Biological Information Infrastructure (NBII) to identify, document, disseminate, and integrate information about the nation's biological resources generally, including its invasive species. The NBII's purpose was to facilitate access to data and information on U.S. biological resources, as well as early detection and predictive modeling efforts for invasive species in each refuge. However, due to FY2012 budgetary concerns, the program was terminated in January 2012, along with many other federal programs identified for termination or reduction.

## **National Park Service<sup>121</sup>**

Over 6,500 non-native invasive species have been found on National Park Service (NPS) lands and waters. Of these, about 650 are in marine environments.<sup>122</sup> NPS uses an IPM approach to control exotic species, and has a number of programs targeted to specific sites or species. For example, in Hawaii, NPS has designated Special Ecological Areas that best represent native Hawaiian systems, and these areas are managed for the removal of exotic species. Elsewhere, NPS's Lionfish Response Plan is a species-specific program that addresses problems with invasive lionfish (*Pterois volitans*) at several units on the Atlantic seaboard and in the Gulf of Mexico, through public education, monitoring, and removal.<sup>123</sup>

The agency targets quagga and zebra mussels in at least 54 park units, taking actions such as inspecting and cleaning boats at ramps and mooring locations. Some units have special

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<sup>120</sup> USGS, “Invasive Species Program,” [http://www.usgs.gov/ecosystems/invasive\\_species/index.html](http://www.usgs.gov/ecosystems/invasive_species/index.html).

<sup>121</sup> This section was prepared by (name redacted), Analyst in Natural Resources Policy ( [redacted]@crs.loc.gov 7-....).

<sup>122</sup> NPS, “Invasive Species.....What are they and why are they a problem?”

<sup>123</sup> NPS, “Water Resources,” <http://www.nature.nps.gov/water/marineinvasives/lionfish.cfm>.

regulations to minimize the potential for spreading zebra mussels and other aquatic nuisance species. For example, regulations for the St. Croix (WI) National Scenic Riverway address zebra mussels, purple loosestrife, and Eurasian watermilfoil as aquatic nuisance species.<sup>124</sup> In the western United States, some of the non-native invasive species of concern are leafy spurge, knapweed (*Centaurea* sp.), Japanese brome (*Bromus japonica*), and cheatgrass (*B. tectorum*).

NPS is authorized to regulate fishing on its lands and prohibits the possession or use of live or dead minnows or other bait fish, amphibians, nonpreserved fish eggs or fish roe as bait for fishing, except in designated waters.<sup>125</sup> Waters which may be so designated are limited to those where invasive species are already established, where scientific data indicate that the introduction of additional numbers or types of non-native species would not hurt populations of native species, and where park management plans do not call for elimination of non-native species.

NPS uses Exotic Plant Management Teams (EPMTs) for rapid response to invasive plants on units of the National Park System. The teams are explicitly modeled on teams used to fight fires. The team approach provides quick response and consistent application of techniques. The EPMTs provide a personnel resource not otherwise available to these parks, and reduces the need for individual parks to procure and maintain expensive equipment.<sup>126</sup> In an FY2011 report, the EPMTs reported that they inventoried 2,164,232 acres for exotic plants, uncovering 9,589 acres of infestation, of which 8,453 acres were treated (or re-treated) for exotic plant infestations.<sup>127</sup> The EPMTs have claimed elimination of two invasive plant species at Haleakala National Park (HI) and of all exotic plants at Loggerhead Key at Dry Tortugas National Park (FL), among other accomplishments. Lake Mead National Recreation Area is the focal point for an EPMT whose tasks include controlling salt cedar. EPMTs train personnel from other federal agencies with these methods. Their list of partners has included such disparate entities as National Wildlife Refuges, the Navajo Nation, Florida Power and Light, state departments of transportation, and the Nature Conservancy.

The primary laws governing NPS's role in addressing invasive species are the National Park System Organic Act (16 U.S.C. §§1 *et seq.*; 16 U.S.C. §594), Endangered Species Act (16 U.S.C. §1531 *et seq.*), Noxious Weed Control and Eradication Act (7 U.S.C. §§7781-7786), Plant Protection Act (7 U.S.C. §7701 *et seq.*), National Invasive Species Act (16 U.S.C. 4701), Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701), and Animal Damage Control Act (7 U.S.C. §§426-426c), among other authorities.

### **Office of Surface Mining Reclamation and Enforcement<sup>128</sup>**

The Office of Surface Mining Reclamation and Enforcement (OSM) is responsible for regulating coal mining in the United States under the Surface Mining Control and Reclamation Act (SMCRA).<sup>129</sup> OSM regulations govern the permitting of coal mining operations, including the

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<sup>124</sup> 36 CFR Part 7.9.

<sup>125</sup> 36 CFR Part 2.3(d)(2).

<sup>126</sup> For more on the teams, see [http://www.nature.nps.gov/biology/invasivespecies/EPMT\\_teams.cfm](http://www.nature.nps.gov/biology/invasivespecies/EPMT_teams.cfm). It appears that no similar teams function to control invasion of exotic animals, such as lake trout (*Salvelinus namaycush*) at Yellowstone Lake; animal invasions continue to be handled on an *ad hoc* basis. However, in its FY2014 budget request, the agency requested increased funding for management of exotic invasive animals, which would “support applied research for development of a science-based service-wide framework that cohesively and effectively addresses invasive terrestrial and aquatic animal issues.” See NPS, *Budget Justifications and Performance Information*, Fiscal Year 2014.

<sup>127</sup> NPS, “Exotic Plant Management Team Program: 2011 Annual Report,” June 2012, p. 2.

<sup>128</sup> This section was prepared by David Bearden, Specialist in Environmental Policy (fedacted@crs.loc.gov, 7-....) .

<sup>129</sup> 30 U.S.C. §§1201 *et seq.*

reclamation of lands disturbed by surface coal mining and surface impacts incident to underground coal mining. As part of this responsibility, OSM addresses invasive species in mine reclamation areas. These regulations allow the use of introduced species in the revegetation of disturbed or impacted lands, within certain limitations. The substitution of introduced species for native species is subject to approval by OSM, or by the state if it has regulatory primacy under SMCRA.

To reclaim disturbed or impacted surface lands affected by coal mining, OSM regulations require permittees subject to SMCRA to establish a diverse, effective, and permanent vegetative cover comprised of native species, or introduced species where desirable and necessary to achieve the approved post-mining land use. Introduced species also may be used to provide a quick-growing, temporary, stabilizing cover while measures utilizing native species are established. Furthermore, introduced species used in either instance must be compatible with the plant and animal species of the area, and must meet the requirements of other applicable federal and state laws and regulations, including those that apply to poisonous and noxious plants.<sup>130</sup> OSM also has issued an internal policy directive to promote the use of native species in the reforestation of surface lands disturbed or impacted by coal mining, rather than introduced species.<sup>131</sup>

## Department of State

The State Department helps develop U.S. foreign policy on invasive species, and presents the U.S. position and policies within an international context, including conventions, regional initiatives, and bilateral agreements. Some of these agreements and treaties (see **text box** below). The Department of State participates in projects, initiatives, and workshops on invasive species to raise awareness, to share data and information, and also to build regional and global capacity to address invasive species prevention and management. The State Department works with other federal agencies, states, tribes, nongovernmental organizations and the private sector.

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<sup>130</sup> 30 C.F.R. 816.111 specifies these requirements for the reclamation of lands disturbed by surface coal mining, and 30 C.F.R. 817.111 specifies these requirements for the reclamation of surface impacts incident to underground coal mining. 30 C.F.R. 715.20 and 717.20 outline similar requirements for surface and underground coal mining in states without primacy, prior to OSM approval of a state regulatory program at least as stringent as the federal regulations.

<sup>131</sup> OSM, Directive 931, *Reforestation of Title IV and Title V Mined Lands*, June 10, 2008.



### **Selected International Efforts Addressing Invasive Species**

Executive Order 13112 is the primary authority for the broad coordination of international invasive species activity carried out by most U.S. federal agencies as part of their participation in NISC. In addition, there are a number of international organizations cooperating on matters concerning invasive species. However, the United States is a party to only a very limited number of international treaties or conventions in this area. Some selected U.S. efforts in the international arena include:

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973.** A multilateral treaty that regulates the intentional trade in certain species of wildlife and plants worldwide and calls for the consideration of invasive species when developing national legislation and regulations that deal with the trade in live animals or plants. The United States is a signatory of CITES.
- **South Pacific Regional Environment Program (SPREP) Convention, 1990.** A multilateral treaty that calls on its signatory nations to take measures to protect rare or threatened ecosystems and species within the region. The United States is a member of SPREP.
- **Convention on Biological Diversity (CBD), 1993.** A multilateral treaty that calls upon its signatory nations to prevent the introduction of, control, or eradicate those alien species that threaten ecosystems, habitats, or species, to the extent practicable. The United States is an observer but is not a signatory of the treaty.
- **World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures, 1995.** The SPS Agreement provides a uniform framework for measures to protect the health and lives of humans, plants, and animals. The agreement recognizes the international standards, guidelines, and recommendations of three organizations—Codex Alimentarius Commission (Codex); International Plant Protection Convention (IPPC), and Office International des Epizooties (OIE). Accordingly, Codex aims to protect the health of consumers and has formulated safety standards for specific food products, as well as standards regarding pesticide and drug residues, food contaminants and additives, labeling, and other food safety concerns. IPPC provisions and standards apply to quarantine pests in international trade, while OIE standards are aimed preventing the spread of animal diseases. The United States is a member and active participant within each of the three organizations and the WTO and a signatory of the SPS Agreement.
- **North American Free Trade Agreement, 1995.** The free trade agreement between the United States, Canada, and Mexico and the side agreement to NAFTA—the North American Agreement for Environmental Cooperation (NAAEC)—plays a role in protecting native biota within the three countries. The Commission for Environmental Co-Operation (CEC) under the agreement may consider and develop recommendations regarding non-native species that may be harmful.
- **Code of Conduct for Responsible Fisheries, 1995.** As part of the Food and Agriculture Organization of the United Nations provides for guidelines and recommendations for the responsible use of non-native species in fisheries and aquaculture.
- **International Maritime Organization (IMO) Resolutions, 1991 and 1997.** IMO is a specialized agency of the United Nations and encourages its members apply two sets of guidelines—Resolution A.868 (20) and Resolution A.74 (18)—regarding ballast water exchange that provide guidance and strategies to minimize the risk of invasive species and other unwanted organisms from ballast water and sediment discharge.
- **International Civil Aviation Organization (ICAO), Assembly Resolution, 1998.** ICAO is a specialized agency of the United Nations and encourages the aviation authorities of its member nations to assist in the prevention and control of invasive species.
- **International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004.** A multilateral treaty would require the ships of its signatory nations to implement a Ballast Water and Sediments Management Plan and to carry a Ballast Water Record Book and be required to conduct certain procedures. Though not yet a signatory, the United States was one of the major proponents of this convention.

**Sources:** Prepared by CRS from various sources including NISC periodic management plans (<https://www.doi.gov/invasivespecies/management-plan>).

## **Department of Transportation**

The Department of Transportation has a policy on invasive species, focusing on coordination and cooperation with other federal agencies as well as with international organizations, such as the

International Maritime Organization, the International Civil Aviation Organization (ICAO), and the International Organization for Standardization to prevent and control the spread of invasives.

### **Federal Aviation Administration**

The Federal Aviation Administration (FAA) cooperates with other federal and state agencies to reduce the risk of introducing invasive species at airports, particularly regarding arrivals in Hawaii. For example, FAA works with USDA to enforce the Animal Damage Control Act (7 U.S.C. §§426 *et seq.*) to control for wildlife hazards on or near airports. FAA also cooperates in federal research for screening baggage, cargo, and passengers; and protects native species in the management of its facilities and FAA-funded and licensed facilities throughout the country. In addition, FAA was instrumental in promoting involvement by ICAO relative to invasive species. According to ICAO, civil aviation is a significant pathway for the introduction of invasive species, and it now urges all member states to use national civil aviation authorities to assist in reducing the risk of introducing invasive species to areas outside their natural range.

### **Federal Highway Administration**

The Federal Highway Administration (FHWA) has an oversight role in federally funded highway projects, including both interstate and state highways, and works with other federal agencies and state governments to prevent the introduction and spread of invasive species. Its vegetation management guides help state departments of transportation prevent the introduction and spread of invasive species.<sup>132</sup> After Executive Order 13112 was issued, FHWA provided guidance to the states, encouraging inventory and integrated management of roadside weeds before-and-after projects. The guidance requires invasive species assessment during the NEPA process. The agency continues to provide technical support to all states on this vegetation issue.

### **Federal Railroad Administration**

Historically, railroads were a source of invasive species, as livestock were transported around the country and the seeds riding in or on the animals were shed from livestock cars. Now, the Federal Railroad Administration (FRA) works with other federal agencies to support invasive species control efforts on rail corridors. For example, FRA has worked to reduce the risk from invasive species through cooperation with USDA in implementing regulations to lessen the opportunity for spreading karnal bunt, a fungal disease infecting wheat and triticale, across international borders.

### **Department of the Treasury**

The Department of the Treasury advises and assists in the formulation and execution of U.S. international economic and financial policy, including the development of policies with respect to international trade, investment, bilateral aid, environment, and development programs. Previously, multilateral development banks have funded invasive species projects.

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<sup>132</sup> FHWA, “Plants and Invasive Species,” [http://environment.fhwa.dot.gov/ecosystems/vegmgmt\\_row.asp](http://environment.fhwa.dot.gov/ecosystems/vegmgmt_row.asp). Also see FHWA’s *Guide for Local Highway and Street Maintenance Personnel*, August 2008.

## **Executive Office of the President**

### **Council on Environmental Quality**

The Council on Environmental Quality (CEQ) coordinated and led the Clinton Administration's efforts on developing Executive Order 13112 and assisted with formulating agency guidance to implement NEPA. CEQ also chairs the Asian Carp Regional Coordinating Committee in an effort to better protect the Great Lakes from Asian carp (*Hypophthalmichthys* sp.).<sup>133</sup> Several agencies serve on this committee, including FWS, NOAA, EPA, among other agencies.

### **Office of Science and Technology Policy**

The Office of Science and Technology Policy (OSTP) developed a white paper on Executive Order 13112. The Committee on Environment, Natural Resources, and Sustainability (CENRS) of the President's National Science and Technology Council, which is administered through OSTP. CENRS provides for interagency coordination on environment, natural resources, and sustainability policy, and research and development both domestically and internationally. Invasive species are among CENRS research priorities. Representatives from several federal agencies serve on CENRS, including Defense, EPA, Interior, NOAA, National Science Foundation, USDA, the Smithsonian Institution, State, Transportation, and the Council on Environmental Quality. Executive Order 13112 specifically directs NISC to work with CENRS.

### **Office of the United States Trade Representative**

The Office of the United States Trade Representative (USTR) has lead responsibility for developing and coordinating U.S. international trade, commodity and direct investment policy. USTR also leads interagency processes to review the potential environmental effects of trade negotiations. It also is the lead trade negotiator for U.S. bilateral, regional and multilateral trade and investment agreements. USTR leads or directs U.S. negotiations with other countries as part of the U.S. membership with the World Trade Organization (WTO) and on multilateral agreements that address certain human, plant, and animal health concerns, such as the Agreement on Sanitary and Phytosanitary (SPS) Measures.<sup>134</sup>

## **Independent Agencies**

### **Agency for International Development**

The U.S. Agency for International Development (USAID) provides economic, development, and humanitarian assistance to developing countries in support of the foreign policy goals of the United States. USAID has responsibility for ensuring that U.S. development assistance programs do not lead to the introduction of invasive species in other nations. Its programs support projects to eradicate and control invasive species where they are already established in developing countries, especially when food, water, and health security are at risk.

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<sup>133</sup> Other members of this committee include FWS, NOAA, EPA, the Department of Transportation Army Corps of Engineers, Coast Guard, and U.S. Geological Survey, as well as the Great Lakes states and the Great Lakes Fishery Commission, the Metropolitan Water Reclamation District of Greater Chicago, and the city of Chicago.

<sup>134</sup> See CRS Report R43450, *Sanitary and Phytosanitary (SPS) and Related Non-Tariff Barriers to Agricultural Trade*.

## **Environmental Protection Agency**

The Environmental Protection Agency (EPA) is a member of NISC and actively participates in implementing its invasive species management plan. EPA conducts and supports research on the prevention, early detection, control, and management of invasive species. EPA is involved internationally in cooperative efforts focusing on developing policies for early detection and rapid response to potential invasive species. These efforts are mainly coordinated from EPA's regional offices surrounding the Great Lakes and regional offices in the Northeast and involve considerable collaboration and cooperation with Canadian environmental resource managers. As part of these international efforts, EPA is designing public awareness programs on the risks and impacts of invasive species. Invasive species public awareness programs are also sponsored by various estuarine management groups, administered by EPA.

EPA administers a number of environmental laws that have some aspects relating to invasive species, although invasive species may not be the primary focus of these laws. For example, under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. §§136-136y) EPA oversees the federal registration process for pesticides, including pesticides that may be used to control and/or eradicate invasive species, and may place limits on the conditions under which such compounds may be used. EPA implements the Clean Water Act (CWA, 33 U.S.C. §§1251-1376), which broadly aims to protect waters of the United States. CWA permit programs regulate ballast water discharges and also protect U.S. wetlands and waterways from invasive plants and aquatic species. Under CWA, EPA is promulgating joint regulations with DoD to set uniform national discharge standards and requiring the use of marine pollution control devices to control incidental discharges from armed forces vessels.<sup>135</sup>

EPA also conducts research to develop methodologies for the early detection of non-native invasive species and approaches for applying those methodologies in existing environmental monitoring programs. EPA's research activities include evaluation of ecological indicators (including non-native species) for surface waters, the effects of non-native species on wetland restoration, and studies on non-native submerged aquatic vegetation, as well as model development to estimate the area and spreading rates for potentially invasive species. EPA scientists are also working with regional staff to develop guidance for including evaluations of the potential impacts of invasive species in NEPA assessments.

## **National Science Foundation**

The National Science Foundation (NSF) funds basic and applied research on invasive species, including their roles in population and ecological processes, their relationship to biological conservation activities, and their role as a disturbance agent in ecosystems.<sup>136</sup>

## **Smithsonian Institution**

As part of the broader Smithsonian Institution, the Smithsonian Environmental Research Center (SERC) performs research on invasive species in coastal ecosystems, and collects and analyses data and reports.<sup>137</sup> Specific projects have, for example, examined patterns of ballast-water

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<sup>135</sup> §312(n) of the Clean Water Act. Regulations are at 40 CFR Part 1700. For more information, see EPA's website (<http://water.epa.gov/lawsregs/lawsguidance/cwa/vessel/unds/FAQs.cfm>).

<sup>136</sup> See, for example, NSF Press Release 09-173, "Invasive Species on the March: Variable Rates of Spread Set Current Limits to Predictability," September 17, 2009, [http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=115597](http://www.nsf.gov/news/news_summ.jsp?cntn_id=115597).

<sup>137</sup> For more information, see SERC's website: [http://www.serc.si.edu/labs/marine\\_invasions/index.aspx](http://www.serc.si.edu/labs/marine_invasions/index.aspx).

delivery, tested the susceptibility of marine communities to invasive species, and measured species transfer associated with shipping. In addition, in cooperation with the U.S. Coast Guard, SERC has established the National Ballast Water Information Clearinghouse to measure the changing patterns of ballast water delivery and management for vessels arriving in U.S. ports and to synthesize national data on patterns and impacts of alien species in coastal ecosystems.<sup>138</sup> SERC has also documented the history of alien species invasions for Chesapeake Bay, among other projects. Aquatic and terrestrial invasive species research is also conducted by the Smithsonian Institution's National Zoological Park, the Smithsonian Tropical Research Institute, and the National Museum of Natural History.

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<sup>138</sup> For more information, see NBIC's website: <http://invasions.si.edu/nbic/>.

# Appendix A. Major Federal Agencies and Laws Governing Invasive Species

Agency	Major Responsibilities and Activities	Selected Authorities, as amended
<b>Department of Agriculture</b>		
Animal and Plant Health Inspection Service (APHIS)	Protects U.S. agriculture from domestic and foreign pests and diseases, responds to domestic animal and plant health problems, and facilitates agricultural trade. As part of its regulatory framework, APHIS has oversight of animal and plant health, including the prevention of foreign diseases and pests, eradication and containment of such problems domestically.	As amended: Animal Health Protection Act (7 U.S.C. §§8301-8322); Plant Health Protection Act (7 U.S.C. §§7701-7721); Agricultural Bioterrorism Act (7 U.S.C. §8401); Animal Damage Control Act (7 U.S.C. §§426 et seq.); Federal Seed Act (7 U.S.C. §§1551 et seq.); Federal Noxious Weed Act (7 U.S.C. §2814); Noxious Weed Control and Eradication Act of 2004 (7 U.S.C. §§7781-7786); National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other authorities,
USDA's Research, Education, and Economics agencies: Agricultural Research Service (ARS), Economic Research Service (ERS), and National Institute of Food and Agriculture (NIFA).	ARS is USDA's chief scientific in-house research agency. Provides scientific and technical support for its regulatory agencies. ERS is USDA's economic research agency, and supports invasive species efforts through its various research programs. NIFA coordinates and administers federal funding of land grant and other institutions to conduct agricultural and food research, and education activities, including research on invasive species.	Numerous laws dating to the Department of Agriculture Organic Act of 1862 (7 U.S.C. §2201 note), up through and including various omnibus farm bill laws.
Farm Service Agency (FSA)	In managing the Conservation Reserve Program (CRP), requires all participants to control weeds (including noxious weeds), insects, pests, and other undesirable species on enrolled lands.	Provisions governing CRP (16 U.S.C. §§3838a, 3832), as amended; National Environmental Policy Act (42 U.S.C. §§4321 et seq.).
Foreign Agricultural Service (FAS)	Works with APHIS, helps provide invasive species technical assistance to foreign countries.	See laws and statutes under APHIS.
Forest Service (FS)	Manages invasive activities on 193 million acres of national forests and grasslands, as well as supports activities outside the United States.	As amended: Organic Administration Act of 1897 (16 U.S.C. §551); Multiple-Use Sustained-Yield Act (16 U.S.C. §§528-531); Forest and Rangeland Renewable Resources Planning Act (16 U.S.C. §§1671 et seq.), as amended by the National Forest Management Act (16 U.S.C. §1604); Federal Noxious Weed Act (7 U.S.C. §2814); Public Rangelands Improvement Act (43 U.S.C. §§1901 et seq.); Federal Land Policy and Management Act (43 U.S.C. §1701 et seq.); Hawaii Tropical Forest Recovery Act (16 U.S.C. §4503(note)); Cooperative Forestry Assistance Act (16 U.S.C. §§2101-2111); sections of the International Forestry Cooperation Act (16 U.S.C. §4501(b)); National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other laws.

<b>Agency</b>	<b>Major Responsibilities and Activities</b>	<b>Selected Authorities, as amended</b>
Natural Resources Conservation Service (NRCS)	Provides technical assistance to cooperating landowners and federal agencies (such as the Forest Service and Bureau of Land Management) to adopt conservation practices on agricultural land, including rangeland, and promotes conservation planning through many of its farmland conservation programs.	As amended: Soil Conservation and Domestic Allotment Act (16 U.S.C. §590(a)-590(f)); also farmland conservation provisions in various omnibus farm bill laws (e.g., Food Security Act (16 U.S.C. §3839aa-3839aa-8); Federal Agriculture Improvement and Reform Act of 1996 (16 U.S.C. §3836a); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ).
<b>Department of Commerce</b>		
National Oceanic and Atmospheric Administration (NOAA)	Administers a variety of programs aimed at expanding and coordinating prevention, early detection, rapid response, control, and monitoring programs nationwide, among other roles and responsibilities. NOAA is also the statutory co-chair of both the interagency Aquatic Nuisance Species (ANS) Task Force and National Invasive Species Council (NISC).	As amended: Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §4701, <i>et seq.</i> ); Endangered Species Act (16 U.S.C. §§1531-1543); Fishery Conservation and Management Act (16 U.S.C. §§1801-1882); Coastal Zone Management Act (16 U.S.C. §§1451 <i>et seq.</i> ); Interjurisdictional Fisheries Act 1986 (16 U.S.C. §§4101 <i>et seq.</i> ); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ).
<b>Department of Defense</b>		
U.S. Army Corps of Engineers (USACE)	Maintains programs that address subcategories of invasive species, and provides guidance and research assistance on invasive species control strategies. Provides support to states for aquatic plant management and funds control of invasive aquatic plants in certain southeastern states.	As amended: Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701, <i>et seq.</i> ), Rivers and Harbors Appropriation Act, as amended (33 U.S.C. §403); Water Resources Development Act (§3061); and National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ).
<b>Department of Health and Human Service (HHS)</b>		
	Within HHS, the Centers for Disease Control and Prevention (CDC) address zoonotic and emerging diseases. In addition, the National Institute of Health (NIH) supports zoonotic and bioterrorism preparedness research.	Homeland Security Act of 2002 (6 U.S.C. §§101 <i>et seq.</i> ); sections of the Public Health Service Act (42 U.S.C. §201 <i>et seq.</i> ) and other public health authorities.
<b>Department of Homeland Security</b>		
U.S. Coast Guard	Responsible for developing and implementing a ballast water management program to prevent the unintentional introduction/dispersal of nonindigenous aquatic species from ship ballast water	As amended: Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701, <i>et seq.</i> ); Federal Water Pollution Control Act of 1948 (also known as Clean Water Act, 33 U.S.C. §§1251-1376); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ).
Customs and Border Protection (CBP)	Responsible for border protection and facilitating lawful international trade and travel. Works with other federal agencies to enforce laws prohibiting or limiting the entry of invasive species.	Homeland Security Act of 2002 (6 U.S.C. §§101 <i>et seq.</i> ); Tariff Act (19 U.S.C. §§1202-1654).
Federal Emergency Management Agency's (FEMA)	Works with other federal, state, tribal, and local authorities to control and eradicate outbreaks of animal/zoonotic disease, exotic plant pests, or invasive plant pest infestations; also contributes to the protection of natural and cultural resources.	Homeland Security Act of 2002 (6 U.S.C. §§101 <i>et seq.</i> ); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ); among other authorities.

<b>Agency</b>	<b>Major Responsibilities and Activities</b>	<b>Selected Authorities, as amended</b>
Immigration & Customs Enforcement (ICE)	DHS' principal investigative arm, responsible for border control, customs, trade and immigration.	Homeland Security Act of 2002 (6 U.S.C. §§101 et seq.).
<b><i>Department of the Interior</i></b>		
Bureau of Indian Affairs (BIA)	Helps support the management of non-native species on Indian lands through its exotic weed eradication and other programs.	As amended: Federal Noxious Weed Act (7 U.S.C. §2814); National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other authorities.
Bureau of Land Management (BLM)	Controls for non-native and invasive plants on land it manages, primarily in western states and Alaska.	Federal Land Policy and Management Act of 1976 (43 U.S.C. §§1701 et seq.); National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other authorities.
Bureau of Reclamation (BOR)	Conducts research, prevention, detection, and controls to address pests of aquatic systems such as reservoirs, canals, pipelines, and rivers.	Reclamation Act of 1902 (43 U.S.C. §391h), Fish and Wildlife Coordination Act, as amended (16 U.S.C. §§661-667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401); National Environmental Policy Act (42 U.S.C. §§4321 et seq.).
Fish and Wildlife Service (FWS)	Works to conserve, protect, and enhance fish, wildlife, plants and their habitats. Works to prevent the introduction and spread of invasive species, and on controlling established non-native species, often working with other agencies (USDA, NOAA, and CBP). Maintains programs covering fisheries, endangered species, habitat conservation, refuge operations and maintenance, and international affairs.	As amended: Lacey Act (18 U.S.C. §§42-43; 16 U.S.C. §§3371-3378); Endangered Species Act (16 U.S.C. §1531-1543); Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701, et seq.); Wild Bird Conservation Act (16 U.S.C. §§4901, et seq.); Hawaii Tropical Forest Recovery Act (16 U.S.C. §4503(note)); National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other authorities.
Geological Survey (USGS)	Supports efforts to identify, document, disseminate, and integrate information about the nation's biological resource, including nonindigenous species.	Organic Act of March 3, 1879 (43 U.S.C. 31); Fish and Wildlife Resources Cooperative Agreements (16 U.S.C. §753 a); Agreements to Implement the Convention on Great Lakes Fisheries between the United States and Canada (16 U.S.C. §§931-939); Clean Water Act (33 U.S.C. §§1251-1387); among other authorities.
National Park Service (NPS)	Uses an integrated pest management approach to manage exotic species, and targets specific sites or species. Regulates fishing on its lands and prohibits the possession or use of certain bait for fishing.	As amended: National Park System (16 U.S.C. §§1 et seq.; 16 U.S.C. §594); Endangered Species Act (16 U.S.C. §1531 et seq.); Noxious Weed Control and Eradication Act (7 U.S.C. §§7781-7786); Plant Protection Act (7 U.S.C. §7701 et seq.); National Invasive Species Act (16 U.S.C. 4701); Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. §§4701); Animal Damage Control Act (7 U.S.C. §§426-426c); and National Environmental Policy Act (42 U.S.C. §§4321 et seq.); among other authorities.



<b>Agency</b>	<b>Major Responsibilities and Activities</b>	<b>Selected Authorities, as amended</b>
Office of Surface Mining Reclamation and Enforcement (OSM)	Addresses the use of introduced species in mine reclamation areas for revegetation of impacted lands through regulations governing coal mining operations.	Regulations implementing the Surface Mining Control and Reclamation Act (30 U.S.C. §§1201 <i>et seq.</i> ).
<b>Department of State</b>	Works with other federal agencies, states, tribes, nongovernmental organizations and industry to develop U.S. foreign policy on invasive species.	State Department Basic Authorities Act (22 U.S.C. §2651a), as well as 1 U.S.C. §§U.S.C. 112a, 1 U.S.C. 112b, 1 U.S.C. 113 112b(c), among other domestic and international legal authorities.
<b>Department of Transportation</b>		
Federal Aviation Administration (FAA)	Cooperates with other federal and state agencies to develop a strategy to reduce the risk of introducing invasive species at airports. Protects native species at its facilities and in FAA-funded and licensed facilities.	Various environmental laws such as Endangered Species Act of 1973 (16 U.S.C. §1531 <i>et seq.</i> ); Clean Water Act (33 U.S.C. §§1251-1387); Animal Damage Control Act (7 U.S.C. §§426 <i>et seq.</i> ); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> );
Federal Highway Administration (FHWA)	Works with other federal agencies and state governments to combat the introduction and spread of invasive species.	Various environmental laws such as Endangered Species Act of 1973 (16 U.S.C. §1531 <i>et seq.</i> ); Clean Water Act (33 U.S.C. §§1251-1387); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> )
Federal Railroad Administration (FRA)	Works with other federal agencies to support invasive species control efforts on rail corridors.	Various environmental laws such as Endangered Species Act of 1973 (16 U.S.C. §1531 <i>et seq.</i> ); Clean Water Act (33 U.S.C. §§1251-1387); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> )
<b>U.S. Agency for International Development (USAID)</b>	Responsible for ensuring that U.S. development of assistance programs do not lead to the introduction of invasive species in other nations, and supports eradication and control of invasive species in developing countries.	Foreign Assistance Act of 1961, as amended (22 U.S.C. §§2347 <i>et seq.</i> ), among other legal authorities.
<b>U.S. Environmental Protection Agency (EPA)</b>	Assists with cooperative efforts regarding early detection and rapid response to potential invasive species. Conducts and supports research on the prevention, early detection, control, and management of invasive species. Responsible for establishing numeric limits on organisms in ballast water discharges, as well as additional monitoring and reporting of vessel discharges.	Clean Water Act (33 U.S.C. §§1251-1387); National Environmental Policy Act (42 U.S.C. §§4321 <i>et seq.</i> ), among other environmental laws and authorities.

**Source:** Prepared by CRS from various sources including National Invasive Species Information Center (NISIC), “National Management Plan: Survey of Federal Roles and Responsibilities,” August 2009, <http://www.invasivespeciesinfo.gov/council/survey.shtml>; and NISC periodic management plans (<https://www.doi.gov/invasivespecies/management-plan>). Other source information is from individual agency websites.

## Appendix B. List of Acronyms

<b>AHPA</b>	Animal Health Protection Act
<b>APHIS</b>	Animal and Plant Health Inspection Service
<b>ARS</b>	Agricultural Research Service
<b>ASPEA</b>	Alien Species Prevention and Enforcement Act
<b>BIA</b>	Bureau of Indian Affairs
<b>BLM</b>	Bureau of Land Management
<b>BOR</b>	Bureau of Reclamation
<b>BWM</b>	Ballast water management
<b>CEQ</b>	Council on Environmental Quality
<b>CENRS</b>	Committee on Environment, Natural Resources, and Sustainability
<b>DOD</b>	Department of Defense
<b>DOI</b>	Department of the Interior
<b>EPA</b>	Environmental Protection Agency
<b>ERS</b>	Economic Research Service
<b>FAA</b>	Federal Aviation Administration
<b>FHWA</b>	Federal Highway Administration
<b>FICMNEW</b>	Federal Interagency Committee for Management of Noxious and Exotic Weeds
<b>FSA</b>	Farm Service Agency
<b>FWS</b>	Fish and Wildlife Service
<b>GLERL</b>	Great Lakes Environmental Research Lab
<b>NANPCA</b>	Non-indigenous Aquatic Nuisance Prevention and Control Act
<b>NEPA</b>	National Environmental Policy Act
<b>NIFA</b>	National Institute of Food and Agriculture
<b>NISA</b>	National Invasive Species Act
<b>NISC</b>	National Invasive Species Council
<b>NMFS</b>	National Marine Fisheries Service
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NPS</b>	National Park Service
<b>NRCS</b>	Natural Resources Conservation Service
<b>NWRS</b>	National Wildlife Refuge System
<b>OSM</b>	Office of Surface Mining Reclamation and Enforcement
<b>OSTP</b>	Office of Science and Technology Policy
<b>PPA</b>	Plant Protection Act
<b>USACE</b>	U.S. Army Corp of Engineers
<b>USGS</b>	U.S. Geological Survey
<b>USTR</b>	United States Trade Representative
<b>WBCA</b>	Wild Bird Conservation Act

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