

GAO

Report to the Chairman, Committee on
Resources, House of Representatives

February 2005

INVASIVE SPECIES

Cooperation and Coordination Are Important for Effective Management of Invasive Weeds



GAO

Accountability * Integrity * Reliability



Highlights of [GAO-05-185](#), a report to the Chairman, Committee on Resources, House of Representatives

Why GAO Did This Study

Invasive weeds, native or nonnative plant species, cause harm to natural areas such as rangelands or wildlife habitat and economic impacts due to lost productivity of these areas. While the federal investment in combating invasive species is substantial most has been concentrated on agricultural lands, not on natural areas. In this report, GAO describes (1) the entities that address invasive weeds in natural areas and the funding sources they use; (2) federal, state, and local weed management officials' views on the barriers to weed management; and (3) their opinions about how additional resources for weed management could be distributed. GAO limited this study to entities in the Departments of Agriculture and the Interior, and California, Colorado, Idaho, Maryland, and Mississippi, and gathered information through interviews of over 90 weed management officials.

What GAO Recommends

Because invasive weed control involves many different types of entities, GAO recommends that the Department of Agriculture collaborate with other federal agencies that have experience managing invasive weeds in administering its new weed program. In commenting on a draft of this report, the Department of the Interior agreed with the findings and supports the recommendation; Agriculture did not provide comments.

www.gao.gov/cgi-bin/getrpt?GAO-05-185.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Robin Nazzaro at (202) 512-3841, or nazzaror@gao.gov.

INVASIVE SPECIES

Cooperation and Coordination Are Important for Effective Management of Invasive Weeds

What GAO Found

All types of landowners—government and private—are involved in the battle against invasive weeds in natural areas and include federal agencies such as the Bureau of Land Management, the Fish and Wildlife Service, the Forest Service, and the National Park Service; state and local agencies such as those responsible for agriculture, natural resources, and transportation; and individuals who manage their lands for a variety of purposes, including production or preservation. In some cases, federal or state laws and regulations require that landowners and managers control specific regulated weeds. In other instances, land managers control weeds—including unregulated ones—to meet their larger responsibilities for natural resource conservation. Weed management entities rely on a wide range of funding sources to carry out their activities. The federal government is the largest source of funding through the general budgets of federal land management agencies and numerous grant programs for natural resource management. State and local agencies and nongovernmental entities often rely on a mix of their own funding, grant resources, and collaboration with other entities or volunteers to implement weed management projects.

Not surprisingly, given the magnitude of the invasive weed problem, federal and nonfederal officials we questioned believed that the lack of consistent and adequate funding limits effective management of the problem. Specifically, some officials commented that funding needs to be consistent from year to year to ensure that invasive weeds are eradicated or kept in check, but available resources for weed management often fluctuate. In addition, some officials said that funding is sometimes received late in the year, beyond the point when effective actions can be taken. Other identified barriers to effective weed management included the requirement to comply with National Environmental Policy Act requirements in order to conduct treatments, a lack of cooperation among entities needed to combat invasive weeds, and a general lack of awareness and public education on the issue.

Posed with the prospect of a new program or funds for addressing invasive weeds, a majority of the federal and nonfederal officials who responded to our question preferred that existing programs be used to disburse additional funds. Several officials noted that a key factor for such an approach is to capitalize on existing relationships among current programs and weed management entities, rather than creating a new program. A majority of officials also believed that an agency within the Department of Agriculture should implement any new program or funding source, but that states should play a key role in determining how funds should be distributed. Some officials noted, however, that certain agencies have different expertise with regard to weeds and knowledge of local weed management entities. As we completed our review, a new law required the creation of a new program to provide funding by the Department of Agriculture for weed management. The law requires that the department rely on reviews by regional, state, and local experts when making funding decisions.

Contents

Letter

Results in Brief	1
Background	4
Government Agencies at All Levels and Nongovernmental Entities Manage Invasive Weeds	7
Funding for Weed Management Comes from a Variety of Sources	9
Federal and Nonfederal Officials Identified Funding, Cooperation, and Public Education as Key to Effective Weed Management	22
Clear Consensus Does Not Exist among Weed Management Stakeholders on How Additional Resources for Weed Control Should Be Distributed	34
Conclusions	39
Recommendation for Executive Action	42
Agency Comments and Our Evaluation	43

Appendixes

Appendix I: Objectives, Scope, and Methodology	45
Appendix II: Legal Ramifications of the Terms Used in Federal and State Law for Invasive Weeds	50
Appendix III: Weed Management in the Five States Reviewed	67
California	67
Colorado	70
Idaho	73
Maryland	76
Mississippi	79
Appendix IV: Description of Federal Agency Programs Supporting Invasive Weed Management Work on Nonfederal Lands	83
Appendix V: Comments from the Department of the Interior	90
GAO Comments	92
Appendix VI: GAO Contact and Staff Acknowledgments	93
GAO Contact	93
Staff Acknowledgments	93

Tables

Table 1: Estimates of Infested Federal Acreage and Acreage Treated in Recent Fiscal Years	12
Table 2: Federally Funded Programs Known to Support Weed Control by Other Entities	25

Table 3: Number of organizations, by type, contacted in five states	49
Table 4: Summary of Provisions in 26 States' Statutory Definitions	56
Table 5: States' Definitions of Noxious Weeds	61
Table 6: USDA and Interior Funding Programs Known to Have Provided Support for Invasive Weed Management by Nonfederal Entities, Fiscal Year 2004	83
Table 7: USDA and Interior Funding Sources That Could Potentially Support Invasive Weed Management by Nonfederal Entities	87

Figures

Figure 1: National Park Service Exotic Plant Management Teams	14
Figure 2: Tri-State Weed Management Area's Hells Canyon Project	18
Figure 3: Susan River Tall Whitetop Eradication Project	20
Figure 4: The San Miguel Tamarisk Eradication Project	21
Figure 5: Partnership Success on Cogongrass in Mississippi	38
Figure 6: Giant Hogweed Eradication in Maryland	41

Abbreviations

APHIS	Animal and Plant Health Inspection Service
BLM	Bureau of Land Management
CDFA	California Department of Food and Agriculture
FWS	Fish and Wildlife Service
IUCN	International Union for Conservation of Nature and Natural Resources-World Conservation Union
NPS	National Park Service
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States Government Accountability Office
Washington, D.C. 20548

February 25, 2005

The Honorable Richard Pombo
Chairman
Committee on Resources
House of Representatives

Dear Mr. Chairman:

The infestation of invasive nonnative plants, animals, and microorganisms is a long-standing and growing problem in the United States. As we have reported in the past, these species pose a significant risk to industries such as agriculture, ranching, and fisheries by damaging the environment on which these industries depend. Many scientists believe that invasive species are also a significant threat to biodiversity and are major or contributing causes of population declines for almost half the endangered species in the United States.

The federal government has a substantial stake in the battle against invasive species. Numerous federal agencies spend over a billion dollars annually to prevent, detect, control, or otherwise manage invasive species. To date, however, most efforts have been focused on invasive insects, diseases, and weeds that infest agricultural resources because of the economic impact these species have on crops. But invasive species are not limited to just agricultural lands, and there is a growing awareness that they also cause harm to other types of ecosystems and natural resources such as forests, rangelands, and urban areas by, for example, crowding out native species and affecting the frequency of wildfires. The spread of invasive weeds in these nonagricultural areas is said to resemble an explosion in slow motion, and weeds now cover an estimated 133 million acres in the United States.

Several federal laws and an Executive Order provide direction to agencies for addressing invasive weeds. For example, the Plant Protection Act authorizes the U.S. Department of Agriculture (USDA) to list weeds that it determines can cause certain harms, including damage to agriculture or natural resources. Under the act, these weeds are designated as being “noxious weeds.” The department is authorized to regulate the movement of these noxious weeds in interstate commerce and may order that they be destroyed. The Secretary of Agriculture has delegated this authority to the Animal and Plant Health Inspection Service (APHIS). In addition, under section 15 of the Federal Noxious Weed Act, all federal agencies are

required to undertake a number of control efforts for undesirable plants, which include designated noxious weeds. In 1999, the President issued Executive Order 13112, which established the National Invasive Species Council made up of the heads of certain federal departments and agencies. As directed by the order, the council developed a national management plan that includes recommended actions for addressing all types of invasive species, including weeds.

Various statutes, such as those regarding natural resource protections in our national parks, forests, refuges, and rangelands, also provide authority to the federal land management agencies to control invasive weeds on federal lands. Nonfederal entities and private landowners also play a role in combating invasive weeds under state and local laws or because of their interest in resource protection. Federal agencies are authorized to enter into cooperative agreements to assist nonfederal landowners with those efforts. Since weed control often involves chemical treatments that may have major impacts on the environment, agencies must also comply with the National Environmental Policy Act, which requires them to analyze the impacts of major federal actions.

The 108th Congress continued to recognize the daunting task that managing invasive species poses by enacting laws to provide additional resources for addressing specific invasive species. In 2003, Congress authorized \$6 million per year over a 5-year period for Maryland and Louisiana programs to eradicate nutria—a South American rodent that destroys wetland habitat. In 2004, Congress passed the Noxious Weed Control and Eradication Act, which authorizes \$15 million for each fiscal year over a 5-year period for a new program of grants and cooperative agreements to support state, county, and other weed management entities' efforts to control invasive weeds; the Secretary of Agriculture is responsible for establishing this new program.

In this context, we identified (1) the federal and nonfederal entities that implement projects to address terrestrial invasive weeds on nonagricultural lands, (2) the sources of funding that these entities use, (3) the views of federal and nonfederal officials on the barriers that limit the effectiveness of weed control efforts, and (4) these officials' observations on specific aspects of how to implement a new program—or to infuse new resources into an existing program—to support weed management and control. We also determined the legal ramifications of the use of certain terms—such as invasive, noxious, and nonnative—and their associated definitions on control efforts (see app. II). For purposes of this report, we

use the term “invasive weeds” to refer to terrestrial plants or plant parts that are either native or nonnative to a particular ecosystem and could threaten the environment, economy, or public health. Invasive weeds include those that are identified as “noxious weeds”—terrestrial or aquatic weeds that the federal government or state governments regulate because of the harm they can cause; noxious weeds may be native or nonnative. Our definition for invasive weeds is different from the invasive species definition under Executive Order 13112 in that it includes native species. We define nonagricultural land to include all land that is not actively used for row crop production, orchards, cereal grains, or pastures. On the other hand, for purposes of this report, forests and rangeland are nonagricultural land uses.

To analyze these issues related to terrestrial weeds on nonagricultural lands, we examined weed management entities’ policies and practices at the federal, state, and local levels. We limited our review of federal agencies’ weed management activities to the four major land management agencies: the Department of the Interior’s (Interior) Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), and National Park Service (NPS); and USDA’s Forest Service. We also examined federal programs that these and other agencies within Interior and USDA administer to support weed management by nonfederal entities. In addition, we reviewed agencies within those departments that conduct or support weed-related research. Finally, we reviewed invasive weed management issues in five states—California, Colorado, Idaho, Maryland, and Mississippi—to gain an understanding of the nonfederal entities involved in weed management. We selected these states to provide a range of characteristics, including geography, federal land ownership, and maturity of weed management programs. We used structured interviews to obtain information from 57 federal, state, local, and nongovernmental officials. We conducted unstructured interviews with another 36 officials. All told, we spoke with over 90 federal and nonfederal officials representing 58 agencies and organizations. We did not attempt to evaluate the effectiveness of these federal and nonfederal efforts to address nonagricultural weeds, and were unable to identify with precision the amount of funding these entities devote to weed management. We conducted our review from May 2004 through December 2004 in accordance with generally accepted government auditing standards. For more details on our scope and methodology, see appendix I.

Results in Brief

A wide range of organizations manage terrestrial invasive weeds on nonagricultural lands across the United States, including federal agencies, state and local governments, large and small nongovernmental organizations, and individual landowners. In the federal government, large land management agencies such as the Bureau of Land Management and the Forest Service are among the most visible participants in such weed management, although other federal agencies also control weeds, conduct research, and support the efforts of other weed management entities. The federal land management agencies primarily control weeds as part of their larger responsibilities for natural resource conservation but also in order to comply with federal laws on managing invasive weeds, such as section 15 of the Federal Noxious Weed Act. In the five states we reviewed, state agencies responsible for agriculture, natural resources, and transportation most often manage weeds on state lands and may also work on private lands on a reimbursable basis. In three of these states, county officials are responsible for managing weeds on county lands and for assisting private landowners. Private entities ranging from major land conservation organizations to small neighborhood associations and individual landowners also participate in weed management.

The federal and nonfederal entities working on invasive weeds that we identified draw upon multiple sources of public and private funding. Federal land management agencies typically do not have specific congressional appropriations for invasive weed management but allocate funds out of their general operational budgets. While the agencies are not able to determine expenditures with precision, they estimated that in fiscal year 2004 they collectively spent around \$40 million for weed control activities on their lands. Similarly, states and counties we reviewed typically rely on general operating funds to support their efforts, while some also levy specific taxes or receive grants from private organizations. The five states we reviewed vary widely in geographic size as well as in the size of their weed management programs; rough estimates of their annual funding levels range from hundreds of thousands of dollars to over \$10 million. States and local governments also frequently use funding from the numerous federal grant and cooperative agreement programs that support natural resource and land management activities of nonfederal entities. Most of these federal programs—which are in addition to the programs federal agencies conduct to manage weeds on their own lands—are focused on broader natural resource management issues, such as protecting water quality or reducing soil erosion, but allocate tens of millions of dollars each year to invasive weed projects. To make these

funding decisions, the federal agencies typically select grant applications that best meet the objectives and eligibility criteria of the grant program; the agencies sometimes receive input from other federal officials and state and local experts to aid in decision making. Nongovernmental organizations involved in weed management use grants from a variety of governmental and private sources.

Officials we interviewed overwhelmingly believe that the lack of consistent and adequate funding limits effective weed management (39 of 48 of those who commented on management on nonfederal land and 37 of 41 who commented on management on federal lands). Consistent funding is critical because weed treatment needs to occur regularly, year after year, to keep the weed population under control; progress made in one year can be lost without subsequent treatments. However, funding is not consistent because the availability of grants or general operating funds fluctuate from year to year. Timely funding—at a point in the year when weeds can be most easily treated—also makes eradication efforts more effective. Officials identified other barriers to effective weed management, but not nearly as frequently as funding. For example, more than one-third of the officials (15 of 41) said that requirements under the National Environmental Policy Act to analyze the potential impacts of major federal actions to the environment were overly time consuming and a hindrance to effective and timely weed management on federal land. While officials were generally supportive of the intent of the act, they said that the procedures could make it difficult to respond rapidly to new infestations.

Weed management officials varied in how they believed additional resources for weed control should be delivered, and more than one-third of those we interviewed did not have firm opinions on the matter. In some respects, the opinions expressed were similar to the approach taken in the newly enacted Noxious Weed Control and Eradication Act of 2004. A notable difference, however, is that 33 of the 38 officials who expressed an opinion believed that existing programs should be modified to direct more funding to weed management and that a new program was not necessary. Many officials noted that existing programs have developed relationships with weed management entities that should be maintained. The act, however, requires the Secretary of Agriculture to establish a new program. Under a new program, officials generally agreed that a wide range of activities should be funded, including education, prevention, early detection and rapid response, control, monitoring, and research; the act, in fact, does authorize USDA to fund a broad array of weed management activities and projects. With regard to leadership for a new program, 20 of

31 officials believed that it should be managed by USDA or one of its agencies. The act does require USDA to establish the program, but does not specify which agency within USDA should implement it. Officials pointed out what they believed were strengths and weaknesses of both USDA and Interior agencies with respect to managing support programs for weed management, including geographic coverage and the level of experience in working on weeds, particularly in natural areas. For example, some commented that USDA's Natural Resources Conservation Service has good geographic coverage but little experience managing nonagricultural weeds. Others appreciated the focus that Interior's land management agencies have on protecting natural areas.

Among the 39 officials commenting on how the federal government should allocate additional funds for weed management, 24 stated that the states should play the primary role in determining which projects to fund, while 8 advocated giving this responsibility to a federal agency. To some degree, the act addresses both approaches by giving responsibility for making funding decisions to USDA but requiring the department to rely on technical and merit reviews conducted by regional, state, and local experts, to the maximum extent practicable. Regardless of which USDA agency is chosen to implement the new program, USDA and Interior officials stressed to us that collaboration with other relevant federal agencies within the two departments would be beneficial since it would allow the agencies to share expertise on specific invasive weeds and experience with nonfederal entities. The law, however, does not specifically call for other federal agencies to be involved in setting direction for the program or in making funding decisions.

Federal and state laws use many different terms, such as "noxious" and "exotic," to describe harmful weeds. In federal law, three different terms are used for, or encompass, invasive weeds—"invasive species," "noxious weeds," and "undesirable plants." At the state level, almost all states use the term "noxious weed" but define it differently. Importantly, control efforts by weed management entities are affected by—and in some cases can be restricted by—definitions for these terms, federal and state noxious weed lists, and other federal and state legal provisions. For example, some states limit control efforts to only those weeds on federal or state lists, while other states authorize control efforts for additional weeds. In addition, some states further categorize listed noxious weeds and, in doing so, make distinctions in the types of control efforts that are authorized or required.

To ensure that in administering its new grant funding program USDA considers the broad range of issues related to weed management and the needs of weed management entities across the country, we recommend that it collaborate with other federal agencies experienced in managing invasive weeds and related grant programs to help develop the mechanisms for allocating funds to weed management entities and to serve as technical advisers in determining what entities should receive such funding.

The Department of the Interior provided comments on a draft of this report and generally agreed with the findings and supported the recommendation. With regard to our recommendation for collaboration between USDA and Interior on implementation of the new grant funding program, the department suggested that the issue be approached through the National Invasive Species Council and that council's advisory committee. Four Interior bureaus (the National Park Service, Fish and Wildlife Service, Bureau of Land Management, and the U.S. Geological Survey) also reviewed the report and provided technical comments relating to funding data and the number of acres infested with weeds. We have incorporated these comments where appropriate. The letter from the department is in appendix V.

The Department of Agriculture did not respond to our request to comment on a draft of this report, although the Animal and Plant Health Inspection Service and the Forest Service provided technical comments and clarifications. We have incorporated those where appropriate.

Background

As we have reported in the past, the impact of all types of invasive species in the United States is widespread, and their consequences for the economy and the environment are profound.¹ Invasive species are found on agricultural cropland and in natural and urban areas, and can be either terrestrial or aquatic. Invasive species represent all taxonomic groups—plants, animals, and microorganisms—and cause harm by multiplying rapidly, crowding out native species, damaging agricultural and industrial

¹GAO, *Invasive Species: Clearer Focus and Greater Commitment Needed to Effectively Manage the Problem*, [GAO-03-1](#) (Washington, D.C.: Oct. 22, 2002); *Invasive Species: Federal and Selected State Funding to Address Harmful, Nonnative Species*, [GAO/RCED-00-219](#) (Washington, D.C.: Aug. 24, 2000).

resources, and generally altering natural systems.² For example, they can alter entire ecosystems by disrupting food chains, preying on critical native species such as pollinators, increasing the frequency of fires, or—as in the case of some plants—simply overshadowing and outcompeting native plants. As such, many scientists believe that invasive species are a significant threat to biodiversity and many endangered species in the United States. The cost to control invasive species and the cost of damages they inflict, or could inflict, on property or natural resources are estimated to total billions of dollars annually. Once they have arrived, invasive species are hard to eradicate. As the Fish and Wildlife Service noted, “Invasive species management is a never-ending activity because of the insidious and explosive nature of the species themselves. Elimination of established populations of multiple invasive species has not yet been demonstrated in the 100-year history of the Refuge System.”³

The Plant Conservation Alliance—an organization created in 1994 to protect native plants by ensuring that their populations and communities are maintained, enhanced, and restored—estimates that about 4,000 foreign plant species have been introduced into the United States since European settlement began, and as many as 1,000 of these have been identified as a threat to our native flora and fauna as a result of their aggressive, invasive characteristics.⁴ All 50 states have been affected, although certain states are particularly hard hit. California, Florida, and Hawaii are hosts to an estimated 2,000 nonnative plants, or half of the 4,000 that exist nationwide.

Some of the 4,000 introduced plant species were brought as food crops and do not display invasive or harmful characteristics. Others arrived by accident, perhaps germinated from seeds either contaminating otherwise beneficial commodities such as grain or in the soil once used as ships’ ballast. Other plant species were introduced intentionally to serve some purpose or as an ornamentally desirable plant. Kudzu, for example—a

²Taxonomy is defined as the orderly classification of organisms according to their presumed natural relationships.

³The National Strategy for Management of Invasive Species, National Wildlife Refuge System (April 23, 2003).

⁴The Plant Conservation Alliance is a consortium of 10 federal agencies and over 220 nonfederal cooperators representing various disciplines within the conservation field, including biologists, botanists, habitat preservationists, horticulturists, soil scientists, nonprofit organizations, and concerned citizens.

rapidly growing vine that thrives in the southeastern and mid-Atlantic United States—was intentionally introduced from Japan by USDA in the 1930s to control soil erosion but has now overtaken many natural areas. Similarly, multiflora rose was promoted for use as a living fence, like hedgerows on pastureland, but has spread far beyond its original purpose. Ornamentally pleasing but also invasive plants include English ivy, autumn olive, Japanese honeysuckle, and purple loosestrife. Some species that are considered invasive—autumn olive, for example—are still advertised as beneficial to the environment because they are a food source for wildlife. However, once established, the seeds of invasive plants can spread through wind, water, and animals, and by hitching a ride on people or their vehicles. Invasive weeds may also take hold or spread as a result of disturbances in ecological systems. Disturbances could include deforestation, road building, or changes in water quality or quantity.

Historically, weed control has been practiced primarily in agricultural areas. However, there is a growing recognition that invasive weeds' effects are felt throughout natural areas as well. For example, sagebrush-grassland ecosystems such as those in the Great Basin states, including Idaho, Nevada, Oregon, and Washington, are degraded by cheatgrass, introduced from Eurasia. This grass, along with other nonnative grasses such as medusahead, are now the dominant plant species on tens of millions of acres in the West. Because cheatgrass tolerates wildfire and adds to fuel loads, it has increased the frequency of major fires in these grasslands—ecosystems that cannot handle frequent, intense fires—thereby causing a near extirpation of native flora and fauna. In the Northeast and Midwest, purple loosestrife is rapidly degrading wetlands by filling in open waters with dense stands—some thousands of acres in size. In the Southwest, tamarisk—also known as salt cedar—proliferates along streams in otherwise arid landscapes, ousting native trees and shrubs upon which native animals depend while also lowering water tables. This report focuses on efforts to manage terrestrial invasive weeds in nonagricultural areas, including forests, rangelands, parks, and urban areas.

Government Agencies at All Levels and Nongovernmental Entities Manage Invasive Weeds

A wide range of organizations and individuals manage and control invasive weeds on nonagricultural lands across the United States, including federal, state and local agencies; large and small nongovernmental organizations; and private landowners. The weed management activities of these entities are guided by federal and state laws, agency policies and regulations, executive initiatives, or natural resource management principles.

Four Federal Agencies Are Extensively Involved in Managing Invasive Weeds on Federal Land

The four major land management agencies we examined are responsible for the vast majority of federal lands in the United States—over 630 million acres out of a total of over 700 million acres (BLM, 261 million; Forest Service, 193 million; FWS, 96 million; NPS, 84 million).⁵ As directed by the various statutes that they implement, these agencies are to ensure they manage the lands under their jurisdiction for a variety of important economic, recreation, and conservation purposes. While the laws do not specifically require the agencies to control invasive weeds, they give the agencies broad authority to guard against threats to the resources they are responsible for protecting.⁶ For example, invasive weeds such as leafy spurge and yellow star thistle, which degrade western rangelands, hamper BLM’s ability to ensure adequate forage for grazing; some rangeland weed species are actually toxic or fatal if consumed by livestock, while others displace desirable native grasses. Invasive weeds are also crowding out some native species on national wildlife refuges and other federal lands, harming threatened or endangered species or other protected wildlife. The Fish and Wildlife Service reported that invasive weeds interfere significantly with meeting wildlife objectives on nearly 50 percent of its refuges. In addition, invasive weeds that increase fuels can feed high-intensity fires and crowd out seedlings, thereby hindering the Forest Service’s ability to manage forests for sustainable timber harvests. Three of the four agencies—BLM, the Forest Service, and the Fish and Wildlife Service—are authorized to expend funds to protect resources outside of lands they manage, which is important in battling invasive weeds as the weeds do not respect jurisdictional borders. The National Park Service does not have this authority.

⁵Other major federal land management agencies include the Bureau of Indian Affairs (55.7 million acres), the Bureau of Reclamation (8.7 million acres), and the Department of Defense (24 million acres owned in the United States).

⁶As many as 23 agencies have taken an active role in some aspect of invasive species management. Key departments in addition to USDA and Interior include Commerce, State, and Defense. The State Department coordinates formulation of U.S. positions on invasive species in international conventions and treaties. Commerce has the authority to protect marine sanctuaries and funds research and outreach on aquatic invasive species. Defense controls invasive species on military installations, controls movement of species during military operations, and, through the Corps of Engineers, researches and manages aquatic invasive species. Others involved include the Coast Guard, which regulates ballast water, a source of aquatic invasive species, and the Department of Transportation, which oversees highway projects, including vegetation management.

While the federal agencies may use these broad authorities for natural resource management to control weeds, section 15 of the Federal Noxious Weed Act requires federal agencies to have a management program for the control of some invasive plant species.⁷ As authorized under the Plant Protection Act, USDA's APHIS maintains a list of noxious weeds—plants or plant products that can cause certain harms, including damage to agricultural or natural resources.⁸ The current list contains 96 plant taxa, about one-half of which are known to be in the United States, according to USDA.⁹ This represents a small percentage of the overall number of plants that have invaded the country. USDA's APHIS is authorized to take a number of actions to prevent the introduction or spread of these listed weeds and may cooperate with other federal agencies. In addition, Executive Order 13112 directs federal agencies to take actions against invasive species, including preventing their introduction, providing for their control, and conducting relevant research. The order, issued in 1999, established a National Invasive Species Council, comprising the heads of certain federal departments and agencies, and directed the council to develop a national management plan for invasive species; the resulting plan contains action items for the land management agencies (and others).¹⁰ For example, the plan called upon agencies to request additional funding through the annual appropriation process, to reduce the spread of invasive species from federal lands to neighboring areas, and to lessen the impact of invasive species on natural areas.¹¹

⁷U.S.C. § 2814.

⁸U.S.C. § 7701 et seq. The act repealed and consolidated the authorities in the Plant Quarantine Act, Federal Plant Pest Act, Federal Noxious Weed Act, as well as some other plant-related statutes.

⁹The term taxa, the plural form of taxon, refers to a group of organisms constituting one of the categories or formal units in taxonomic classification, such as genus or species.

¹⁰In 2002, we reported on the plan and the progress agencies had made implementing it. See GAO, *Invasive Species: Clearer Focus and Greater Commitment Needed to Effectively Manage the Problem*, GAO-03-1 (Washington, D.C.: Oct. 22, 2002).

¹¹The National Invasive Species Council, which now comprises the heads of 13 federal departments and agencies, provides national leadership and coordination in federal invasive species activities. Council members include the Secretaries of Agriculture, Commerce, Defense, Health and Human Services, Homeland Security, State, Transportation, the Interior, and the Treasury, as well as the administrators of the Environmental Protection Agency and the National Aeronautics and Space Administration, the Environmental Coordinator of the U.S. Agency for International Development, and the U.S. Trade Representative.

To help carry out their responsibilities, the four land management agencies have either strategic plans or other policy or management guidance for addressing invasive species. In addition, the agencies have done some assessments of the extent of weed infestations on federal lands. All have identified significant infestations and taken actions to treat weeds, although officials noted to us that, because the agencies have only recently used standardized methods of measuring infestations or areas treated, comparisons over time must be done with caution. They also cautioned us that treating an acre of weeds does not necessarily mean controlling the weeds on that acre; subsequent treatments are likely to be necessary. (See table 1 for agency estimates.)

Table 1: Estimates of Infested Federal Acreage and Acreage Treated in Recent Fiscal Years

Agency	Infested acres (fiscal year of estimate)	Estimated acres treated (fiscal year of treatment)^a
Interior		
BLM	36 million (2001)	318,000 (2004)
FWS	1.9 million (2004)	280,000 (2004)
NPS	2.6 million (2004)	132,200 (2004) ^b
USDA		
Forest Service	6 million to 7 million (2002)	157,000 (2003)

Sources: Agriculture and Interior.

^aIn 2002, the four land management agencies endorsed new standards for measuring acres treated for invasive weeds. The new standards call for agencies to measure the actual acreage covered by weed species. In the past, an acre infested with a handful of tamarisk trees, for example, might have been recorded as an infested acre, when the actual acreage infested with the tree was quite a bit less. This approach is likely to show a decline in the number of acres that agencies report they treated.

^bThe National Park Service reports that it controlled weeds on over 95,000 of the 132,200 acres it treated and expects to treat on average approximately 200,000 acres per year.

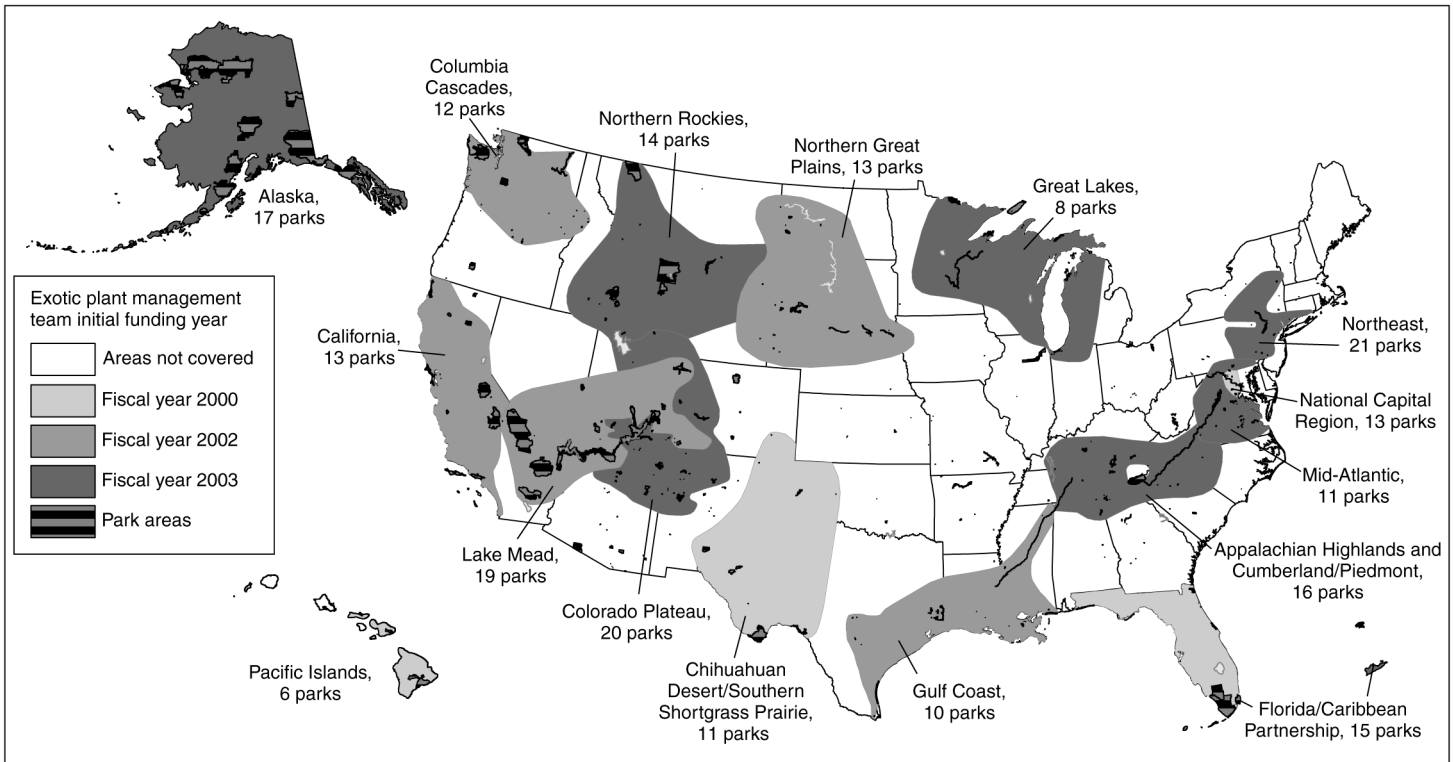
According to most federal officials we spoke with (15 of 18), weed infestations are getting worse. The Forest Service estimated in 1998 that weed infestations were increasing on its lands by approximately 8 percent to 12 percent annually. Recognizing the threat that infestations pose, federal agencies try to control weeds by pulling them out by hand, mowing, applying herbicides, and using biological control agents, among other

methods.¹² For example, in 2002, the National Park Service distributed approximately 5 million flea beetles in three parks in North Dakota, South Dakota, and Wyoming in an attempt to biologically control leafy spurge. In the Washington, D.C., area, National Park Service staff members have manually removed Japanese stiltgrass to protect sensitive native species. Often, a combination of methods, known as integrated pest management, is needed. For example, federal agencies have used a combination of chemical and mechanical methods—including burning and plowing—to manage tamarisk in the West. They are also experimenting with biological control. In Hawaii, USDA and Interior have supported efforts to suppress an invasive tree (miconia) by uprooting it, spraying herbicide from helicopters, and using a fungal biological control agent.

Such actions, though, are resource intensive, and agencies often do not have enough staff to carry out many projects. In 2000, to address the issue of a lack of on-site staff, the National Park Service created Exotic Plant Management Teams, which move among the parks to control harmful plants. The Park Service has found these teams to be an effective tool and expanded the program to 16 teams that cover 209 of the 388 units in the national park system (see fig. 1).

¹²Biological control is the use of an animal, insect, or disease to reduce the population of an invasive species. Ideally, the controlling animal, insect, or disease affects only the target species.

Figure 1: National Park Service Exotic Plant Management Teams



Source: National Park Service.

Note: The National Park Service's Exotic Plant Management Teams treat invasive weeds in one park for a week or two before moving on to a different park. Starting in 2000, the service's Biological Resource Management Division created four teams, each charged with conducting weed management work on parks within a distinct geographic area. In fiscal year 2003, there were 16 teams that were funded at \$5.2 million, or an average of about \$300,000 per team. Each team, with the exception of the one in Florida, consists of a team leader, 4 to 16 members, and a liaison between the team and the nearby parks. The team in Florida is unique in that it contracts out all of its control work through the Florida Department of Environmental Protection, which pays about half the control costs, rather than using service employees. A representative of every park covered by a team serves on a steering committee that sets priorities and selects projects. To select projects, the committee receives requests from parks and ranks them using criteria such as their cost-effectiveness and biological impacts. In addition to weed control work, a team might help a park create a weed management plan or inventory infestations on its land, as did the team that assists park units in the Washington, D.C., area. In 2003, the teams inventoried 627,112 acres across the national park system; treated 10,666 acres of infestations; and restored 191 acres of land with native species. Partnerships are an important component of the teams' work. In 2003, partners contributed \$2.8 million to team efforts across the country. Partners range from nongovernmental organizations such as the Student Conservation Corps (through which students volunteer with a team) to state and local government agencies. For example, the Colorado Plateau team worked with Utah State University in 2003 to conduct inventory surveys at six sites in Utah. The map above shows the areas each team covers as well as the year in which funding for each team began.

The Fish and Wildlife Service also began to use this approach in fiscal year 2004 with three so-called “strike teams” that work at refuges in the Everglades, the Lower Colorado River, and the Columbia-Yellowstone-Missouri River areas. In light of staffing limitations, all four land management agencies also seek volunteers to help control invasive weeds. For example, the Fish and Wildlife Service is using trained volunteers to help with early detection at six refuges. In general, the agency reports that volunteers conduct about 20 percent of all work on refuges, which now includes assisting with noxious weed activities.

Sixteen federal agencies—including the 4 federal land management agencies we reviewed—also work toward better weed control by participating in the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, which was established in 1994 through a memorandum of understanding. According to the committee’s charter, the committee is to coordinate (1) information on the identification and extent of invasive weeds in the United States and (2) federal agency management of these species. Since it began, the committee made recommendations that led federal agencies to create a grant program for managing weeds known as the Pulling Together Initiative, published a nontechnical overview of invasive weeds to increase public awareness, and developed a conceptual design for a national early detection and rapid response system for invasive weeds. The committee has also encouraged the development of state and regional invasive species teams and councils.

State and Local Governments We Reviewed Vary in the Extent to Which They Manage Weeds

We found similarities and differences in the state and local agencies that manage invasive weeds among the five states we examined. These states—California, Colorado, Idaho, Maryland, and Mississippi—all have laws to address the management of noxious weeds. In four states, the laws require a state agency to designate or list noxious weeds, but they define what is considered noxious differently (app. II discusses states’ definitions in detail). The number of listed weeds varied widely across the five states, from a low of 3 in Maryland to a high of 133 in California.

All five states’ weed laws authorize certain management efforts for noxious weeds. For example, states’ laws typically discuss control steps that can be taken, agency responsibilities, provisions regarding sale and transport of listed weeds, and taxes or other steps that can be taken to raise revenue to implement management programs. The weed lists can also limit the specific weeds that state agencies are able to work on; some laws limit agencies’ use of state funds to efforts that address only listed weeds or

stipulate that they must use state funds on listed weeds before addressing other weeds. In addition, four of the five states—Mississippi is the exception—require private landowners to control or eradicate listed weeds on their property. Most of the laws provide for assessing misdemeanor charges or fines for noncompliance.

Each of the five states has infrastructure in place to address noxious weeds, although the infrastructure varies from informal to formal. In all five states, the state agriculture department is responsible for implementing the state weed law. Agencies responsible for parks, natural resources, and transportation were also involved in invasive species management. Some states also have laws or other directives that establish additional organizational responsibilities. For example, in Idaho, state law established a statewide weed coordinator, and a gubernatorial executive order created an invasive species council.¹³ Colorado law created a statewide weed coordinator and a statewide noxious weed advisory committee. Also, in Colorado, the state agency for higher education plays a key role in implementing the state's strategic plan for managing invasive species by providing research, education, and outreach. California law provides for a weed coordinator and a weed mapping specialist. Maryland and Mississippi have much less formal infrastructures. The five states have other mechanisms to help manage invasive weeds. Each has an invasive species or plant pest council or committee, which is primarily intended to share information among the entities involved in weed management. Three of the five states—California, Colorado, and Idaho—also have strategic plans for addressing noxious weeds. Appendix III provides detailed information on weed management in the five states.

Some of the state laws also impose infrastructure requirements on counties. For example, in Colorado and Idaho, state law requires each county to have a weed coordinator and weed advisory council. In California, county agriculture commissioners carry out most of the work on noxious weed eradication and control in the state. In Maryland and Mississippi, weed management programs are at the discretion of the county. In Maryland, almost all counties have some programs addressing invasive weeds that were initiated in cooperation with the state's agriculture agency. We found very little activity at the county level in Mississippi.

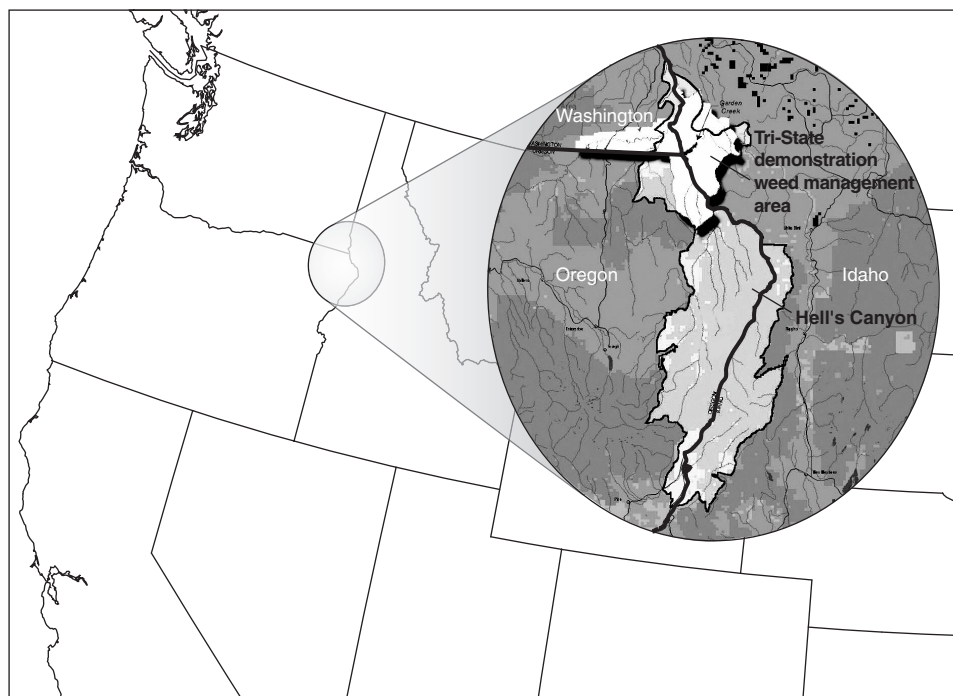
¹³Weed councils generally include federal, state, local, and tribal agencies, and citizens.

Other Types of Entities Play an Important Role in Weed Management

A growing number of areas in the country—particularly in the western states—participate in multijurisdictional organizations known as “weed management areas” or “cooperative weed management areas.” These areas—which typically include federal, state, and local agencies; nongovernmental organizations and businesses; and citizens—coordinate and collaborate on weed management issues among neighboring landowners. The areas are considered important grassroots efforts that garner local support and enthusiasm for controlling noxious weeds. Federal agencies—BLM, Forest Service, Fish and Wildlife Service, Park Service, USDA’s Natural Resources Conservation Service, and others—are often partners in weed management areas. Participating state agencies include departments of transportation, agriculture, fish and game, forestry, and parks. Other typical partners include county weed agencies, soil and water conservation districts, community groups, railroads, irrigation districts, and private landowners.

For the five states we reviewed, California, Colorado, and Idaho had weed management areas while Maryland and Mississippi did not. According to the California Department of Food and Agriculture, the state has 40 weed management areas representing over 50 of the state’s 58 counties. Idaho’s Department of Agriculture lists 30 areas that cover nearly the entire state. In Colorado, weed management areas encompass one-half of the state, according to the state weed coordinator. Officials in these three states have stated that the management areas have had a positive impact on weed control by increasing coordination or leveraging limited resources. Maryland and Mississippi officials, as well as other stakeholders, speculated that weed management areas might not be as common in the East because of differences in typical land ownership patterns. Eastern states are less likely to be dominated by a large landowner, such as the federal government, which often provides needed leadership. Figure 2 describes the activities of one weed management area in the Pacific Northwest.

Figure 2: Tri-State Weed Management Area's Hells Canyon Project



Source: The Nature Conservancy.

Note: Noxious weeds are the largest biodiversity threat to Hells Canyon, which covers 1.15 million acres in Idaho, Washington, and Oregon. The canyon is a refuge for some of the best remaining native plant communities, with over 1,000 native plant species—many found nowhere else on Earth—and about 380 wildlife species. The Tri-State Weed Management Area's project includes 340,000 acres within and around the canyon, including public and private lands. The weeds posing the greatest harm are yellow star thistle, hoary cress, leafy spurge, and rush skeletonweed. Yellow star thistle alone covers more than 100,000 acres. It can spread at the rate of 60 percent annually, and its seeds can lie dormant for 10 years. It causes chewing disease and death in horses, and chokes out wildlife habitat, rangelands, and recreational areas. Hoary cress is a serious problem because its deep and creeping rootstalk makes it difficult to control—cultivation spreads root pieces that start new plants. Leafy spurge can produce blisters and dermatitis in humans, cattle, and horses and can cause permanent blindness if rubbed into the eyes. This weed spreads both by seed and creeping roots and can throw its seeds as far as 15 feet. Rush skeletonweed is difficult to control because each plant can produce up to 15,000 seeds annually and has an extensive, deep root system.

The Tri-State Weed Management Area began the Hells Canyon project in January 2002. At least 16 federal and state land management agencies, county weed programs, private landowners, nonprofit organizations, and the Nez Perce Tribe are involved. While the project benefits from shared leadership and implementation responsibilities among all entities, the principal entities are BLM, the Idaho Fish and Game Department, The Nature Conservancy of Idaho and Oregon, and the county weed superintendents in participating Idaho, Oregon, and Washington counties. Over the last 3 years, the weed management area has treated 13,000 acres and revegetated 1,200 acres in Hell's Canyon. Weed management includes an early detection and rapid response system guided by satellite technology to eradicate new invasions, including in remote areas; consistent monitoring and evaluation; and a publicly accessible geographic information system and weed database.

Another type of multijurisdictional organization—exotic plant pest councils—allows government and nongovernmental organizations and academic experts to collaborate and share information on weed management. The councils—typically nonprofit organizations formed voluntarily by interested parties—obtain funding from membership dues, grants, donations, and other sources. Three regional councils cover portions of the United States in the Mid-Atlantic, Southeast, and New England. Similarly, the Western Weed Coordinating Committee is a voluntary organization designed to help coordinate noxious weed management programs and efforts among state and federal agencies.

Many nongovernmental organizations—often voluntary “friends” groups—also provide services at national wildlife refuges and national parks or for state or local governments.¹⁴ For example, in 2003, the Fish and Wildlife Service and the National Wildlife Refuge Association began an initiative involving “friends” groups and volunteers to assist in combating invasive species.¹⁵ Similarly, the National Park Service has entered into an agreement with the Student Conservation Association to collaborate on weed control in national parks. In California, chapters of the California Native Plant Society organize members to volunteer for weed removal, sometimes in collaboration with government agencies and other nongovernmental organizations. In Montgomery County, Maryland, volunteers through the “weed warrior” program donated nearly 3,000 hours of labor in 2004. In addition, BLM’s volunteer services program reports many instances of weed control done by volunteers brought together through other nongovernmental organizations or as individuals. Weed management areas also engage volunteers in the war on weeds (see fig. 3).

¹⁴To promote and facilitate these volunteer efforts, Interior and USDA are partners with other agencies in maintaining a Web site that links the public to a variety of volunteer opportunities, including weed and invasive species control, offered by federal agencies. As of December 2004, the Web site database contained 161 links related to weed and invasive species control. See <http://www.volunteer.gov/gov/index.cfm>.

¹⁵The National Wildlife Refuge Association is a nonprofit organization whose mission is to provide support to, and advocate on behalf of, national wildlife refuges.

Figure 3: Susan River Tall Whitetop Eradication Project



Source: BLM.

Note: According to BLM's California State Weed Coordinator, tall whitetop—also known as perennial pepperweed—is one of the six most widespread invaders in California, with Lassen County one of the most infested areas in the state. Located in northeastern California—about 80 miles northwest of Reno, Nevada—Lassen County encompasses about 4 million acres, with approximately 64,000 of those acres being infested. Tall whitetop is difficult to treat and control because it can grow in both wet and dry locations, including in ditches, roadsides, cropland, and along waterways, and mechanical removal such as dicing helps the species spread to new areas. Through its robust and deep-spreading root system and production of numerous seeds, it chokes out native vegetation and crops to form a monoculture.

The Susan River Tall Whitetop Project is a Lassen County Weed Management Area five-year effort that benefits greatly from the efforts of many volunteers and funding sources. BLM has provided significant leadership to the management area, which includes city, county, and federal entities; private sector companies; and other nongovernmental entities and individuals. For example, students have participated in weed surveys, research, and weed removal, and a private company—Sierra Pacific Industries—has partnered with a 4-H group to maintain an area they “adopted.” Project participants have also developed a K-12 school curriculum and adult education courses at a local community college. In addition, the California Department of Corrections allowed inmates from the local minimum-security correction facility to volunteer for mechanical weed removal. In 2000, the project began treating about 17 miles of river corridor located in and around the city of Susanville. By using an integrated weed management approach that was researched by the University of California at Davis, the project has been very successful in eliminating whitetop in designated areas and has moved to work on additional infestations on both public and private lands through the Natural Resource Conservation Service and the Honey Lake Valley Resource Conservation District. The removal success is due, in part, to mowing at the prebud stage and applying herbicide after the plants resprout. Numerous funding sources have made this project possible. A Pulling Together Initiative grant was initially matched by Pheasants Forever, the California Department of Food and Agriculture, the city of Susanville, Lassen County Department of Agriculture, Sierra Pacific Industries, and the Lassen Union

High School. Subsequent annual funding sources have included the state, Lassen National Forest, and BLM's Cooperative Conservation Initiative.

With regard to national nongovernmental organizations, we found The Nature Conservancy was active in weed management—both as a landowner and as a partner with other landowners—in all five states we reviewed. In these states, the Conservancy owns lands on which it conducts weed management activities, and it assists government agencies on weed management projects on public lands. For example, in Mississippi, the Conservancy is under contract to the Department of Defense to help it protect threatened and endangered species by controlling invasive weeds at Camp Shelby, a National Guard training facility. Because the camp is partly within national forest boundaries, the Conservancy also coordinates weed control work with the Forest Service. Figure 4 provides detailed information on a weed management project The Nature Conservancy led in Colorado.

Figure 4: The San Miguel Tamarisk Eradication Project



Source: Steve Dewey, Utah State University, www.forestryimages.org.

Note: Tamarisk, or salt cedar, is a tenacious shrub or small tree with a root system up to 100 feet deep. When its leaves fall to the ground, they deposit a salt residue on surrounding surface soils. Tamarisk's roots and high salt content enable it to quickly replace native cottonwoods, willows, grasses, and other herbaceous plants, degrading the habitat for native wildlife, especially birds; decreasing forage for livestock; and increasing fire hazards. In 2003, the Colorado Water Conservation Board estimated that

tamarisk occupied 55,000 acres and consumed 170,000 acre-feet of water more per year than the native vegetation it replaces. Such consumption can lower water tables and dry up springs, wetlands, and riparian areas. While tamarisk threatens many riparian areas in Colorado, it has not established as strong a foothold in the San Miguel River Watershed, located in southwestern Colorado. Therefore, the San Miguel project provided a unique opportunity to control, if not completely eradicate, tamarisk along this river. As of October 2004, the project had received approximately \$600,000 from at least eight government agencies and nongovernmental entities. These funds have been used to map the area, develop educational materials, and control and monitor the weed population. At the end of calendar year 2004, the project spent a total of \$380,000 to remove tamarisk, at an average cost of \$5,750 per mile.

The project's partners include The Nature Conservancy, the San Miguel Weed Board, the Bureau of Land Management, the Terra Foundation, the San Miguel Watershed Coalition, the San Miguel Basin Soil Conservation District, the Monsanto Corporation, the Bureau of Reclamation Central Utah Project, the National Fish and Wildlife Foundation, the Colorado Wetlands Initiative, and volunteer groups. The effort, launched in 2001, mapped the weed population (Russian olive and Siberian elm were also included) over 150 river miles of the San Miguel and its tributaries, which identified over 100 miles infested with tamarisk, and then removed these weeds from 40 miles of river. The partners expect to continue removing tamarisk and to establish the San Miguel as the only naturally functioning, tamarisk-free river in the Southwest by 2006. They also expect to offer continuing landowner education, monitoring, and maintenance.

Funding for Weed Management Comes from a Variety of Sources

Efforts to manage invasive weeds rely on a web of federal, state, and local government funding as well as nongovernmental funding sources. Some entities use general operating funds, while others rely on grant programs administered by numerous federal agencies. Often, funding from one source is used to leverage funding from other sources.

Federal Agencies Often Use General Resource Management Funds to Address Invasive Weeds on Federal Lands

Federal land management agencies generally do not receive specific appropriations for weed management but typically fund weed and other invasive species management out of appropriations for broad budget line items, such as vegetation management or refuge operations and maintenance. However, the agencies do not all track expenditures on weed management activities and therefore cannot comprehensively describe the amount of funding devoted to weed management or the sources of that funding.¹⁶ Overall, as can be seen in the following examples, agencies fund a mix of activities to help them determine the extent of their weed

¹⁶As recommended by the National Invasive Species Council and with encouragement from the Office of Management and Budget, the land management agencies—along with the other member agencies within the council—prepared what is known as the interagency invasive species performance budget, or cross-cut budget, beginning in fiscal year 2004. The budget, however, includes activities related to all types of invasive species, not just weeds. In addition, the cross-cut budget has not included all funding that agencies direct to invasive species control through grant programs. Therefore, this budget document cannot be used to identify an agency's total expenditures on invasive weeds specifically.

problems, control particularly bad infestations and eradicate them where possible, and conduct research and education:

- The Forest Service’s rangeland management program—with an estimated budget of about \$15.7 million for invasive weeds in fiscal year 2004—uses resources from its vegetation and watershed management appropriation. Its most significant expenditures are for prevention, early detection and eradication, and control of terrestrial weeds; its 2004 plan called for treating weeds on over 67,000 acres. Forest Service officials told us that the agency also manages invasive weeds through fire management and other programs, but that it cannot easily quantify those expenditures.
- The National Park Service funds its weed management activities from its resource stewardship account. While individual park units draw from this appropriation, the Park Service also uses it to fund its exotic plant management teams. The agency spends about \$5.2 million annually out of its natural resource stewardship budget on 16 teams that serve many park units.
- According to the Fish and Wildlife Service, it funds invasive weed work out of its refuge operations and maintenance budget. From this budget, the agency estimates that it spent \$4.7 million in fiscal year 2004 to prevent, manage, and control invasive weeds.¹⁷ Included in this total are the Fish and Wildlife Service’s three invasive species “strike teams” that are similar to the National Park Service’s exotic plant management teams.
- BLM funds weed management activities primarily through its range management program, which in fiscal year 2004 provided about \$7.2 million for weed control. However, other BLM activities, such as fire or wildlife management, can also be used to fund weed management.

On occasion, Congress uses appropriations legislation to direct activities on weed management or invasive species. For example, the conference committee for Interior’s fiscal year 2004 appropriations directed the Forest Service to spend \$300,000 from its vegetation and watershed management

¹⁷The Fish and Wildlife Service started to gather data on invasive weed activity costs midway through fiscal year 2004. Agency officials caution that the data collection system is not mature.

account on leafy spurge control. It also directed the Secretary of the Interior to transfer \$5 million to the Fish and Wildlife Service's resource management account to fund, among other things, water quality monitoring and eradication of invasive plants at the A.R.M. Loxahatchee National Wildlife Refuge in Florida.

Federal Programs Provide Funding for Weed Control Work by Other Entities

Interior and USDA manage at least eight programs that provide hundreds of millions of dollars through grants and cooperative agreements to other federal agencies, state and local governments, nongovernmental organizations, and private landowners to support resource conservation efforts, including weed control.¹⁸

Most of these programs award grants to support a variety of conservation activities, and agencies do not consistently track how much these programs spend directly on weed control. Table 2 shows the major programs that have been used to support weed control, the estimated amount of funding provided for weed control, and the total funding that the programs provided for conservation. More information on these and other programs is in appendix IV.

¹⁸Agencies distribute the funds in a variety of forms, including grants, cost-share agreements, easements, and rental payments. In some instances, an agreement between the agency and recipient is short-lived (a year or two), while in other instances the recipient enters into a long-term agreement (five years or more) to carry out certain conservation measures.

Table 2: Federally Funded Programs Known to Support Weed Control by Other Entities

Entity	Program name	Fiscal year 2004	
		Weed funding	Total program funding
National Fish and Wildlife Foundation	Pulling Together Initiative ^a	\$1.3 million	\$1.3 million
Montana State University	Center for Invasive Plant Management Cooperative Weed Management Area Grants ^b	\$121,660	\$121,660
Interior			
Departmentwide (BLM, NPS, FWS)	Cooperative Conservation Initiative Conservation Challenge Cost Share	\$7.7 million	\$21.2 million
Fish and Wildlife Service	Partners for Fish and Wildlife	\$7.3 million ^c	\$42.4 million
	Private Stewardship Grants	\$2.4 million	\$7.4 million
USDA			
Forest Service	Cooperative Forest Health Management Program	\$5.2 million	\$44.7 million
Natural Resources Conservation Service	Wildlife Habitat Incentives Program	\$4 million in 2003 ^d	\$21.2 million in 2003^e
	Environmental Quality Incentives Program	\$8.2 million in 2003 ^d	\$627 million in 2003^f
Total		\$36.2 million	\$765.3 million

Sources: USDA, Interior, National Fish and Wildlife Foundation, the Center for Invasive Plant Management.

^aThis program is funded by Interior's Fish and Wildlife Service, and BLM; USDA's Forest Service and Animal and Plant Health Inspection Service; and the Department of Defense.

^bThis program is managed by Montana State University. The Center has received federal funds through BLM's land resources appropriation account at the direction of House and Senate Appropriations Committees.

^cThese funds include grants to partners as well as Fish and Wildlife Service staff who work with partners to implement projects.

^dThis number is estimated for 2003; the conservation service did not have an estimate for 2004.

^eFunding for this program increased to \$29.9 million in 2004.

^fFunding for this program increased to \$908.3 million in 2004.

The federal programs have specific purposes and eligibility criteria that guide what type of projects will receive funds or cooperative agreements (see app. IV for program descriptions). The programs vary in how funding decisions are made, although most of them receive input from other agencies and stakeholders. For example, USDA makes funding decisions at the state level for relevant farm bill conservation programs, such as the Environmental Quality Incentives Program. While USDA issues a national announcement about funding availability and describes the types of conservation activities that are eligible for funding, a state technical committee—made up of a variety of public and private sector stakeholders—determines which of those activities will receive the highest priority. This may mean that some state committees may emphasize funding weed control projects while others may not. Funding decisions for grants provided under the Pulling Together Initiative are made at a national level by a steering committee of weed management experts from government, industry, professional societies, and nonprofit organizations. The committee reviews all applications together and makes award decisions once a year. The Fish and Wildlife Service’s Private Stewardship grant program also draws upon a diverse panel of representatives from federal and state governments and other organizations to assess proposals.

Among the programs listed in table 2, two are dedicated solely to weed management—the Pulling Together Initiative and the Center for Invasive Plant Management’s grant program. Under the Pulling Together Initiative, the National Fish and Wildlife Foundation distributes federal grant funds to state, county, and local agencies, and private nonprofit organizations, among others. The grants are designed to build capacity at the local level to manage invasive weeds by supporting the creation of weed management areas. According to the foundation, local partners will match the grants in 2004 with over \$3.3 million in nonfederal contributions.¹⁹ Among the states we reviewed, in 2004 the Pulling Together Initiative awarded five grants to Colorado, four California, two each to Idaho and Maryland, and one to

¹⁹The foundation reports that to date, the Pulling Together Initiative has awarded \$9.7 million to 301 projects nationwide. Leveraged by an additional \$19.9 million in partner contributions, these grants have resulted in a total of \$29.6 million for local communities fighting invasive weeds.

Mississippi, for a total of \$396,300.²⁰ Two of those grants include the following:

- Larimer County Weed District in Colorado received \$25,000 to coordinate a cooperative effort to manage and, where possible, eradicate leafy spurge from the riparian areas of the Poudre River and its tributaries using chemical, biological, and mechanical weed control methods. The local matching contribution was about \$60,000.
- The California Department of Food and Agriculture received a \$20,000 grant to continue to survey, map, and implement integrated pest management practices to control and eradicate purple loosestrife in Humboldt, Kern, Mendocino, San Mateo, Siskiyou, and Sonoma counties. The local matching contribution was \$40,000.

The other program devoted solely to weed management is administered by the Center for Invasive Plant Management at Montana State University. The university created the center following discussions among public and private stakeholders. From fiscal years 2000 through 2004, the center received about \$3.3 million in federal funds specifically for weed management.²¹ The center supports the efforts of weed management areas in the West by offering them small, competitive grants. From fiscal years 2002 through 2004, the center made 58 grants to weed management areas in 14 states, for a total of about \$282,000. For instance, the center awarded \$4,937 in 2003 to the Mojave Weed Management Area in San Bernardino County, California, to develop a comprehensive weed management plan for the Mojave River; tamarisk is the primary target species of this project. The center has also used funding from BLM to create an online course in ecological land management, provide grants for weed management research and for synthesizing research libraries, establish restoration projects for weed-dominated lands, and publish numerous public education and outreach documents, among other things.

²⁰Two grants to Colorado and one grant to California also cover work to be done in neighboring states. In addition, a grant awarded to a county in Oregon will support work in California.

²¹Montana State University uses 10 percent of these funds for overhead expenses. The Senate Committee on Appropriations has directed \$750,000 of BLM's fiscal year 2005 land resources appropriation to go to the center.

The Forest Service's cooperative forest health management program is also heavily focused on weed management. This program supports cooperation among state, private, and tribal land jurisdictions and develops weed management programs using integrated pest strategies. Since fiscal year 2002, the program has provided funding to Forest Service regions for invasive plant activities on state and private forested lands. In fiscal year 2004, the program distributed \$5.2 million—an increase of \$2 million compared with 2003—to its regions.

APHIS enters into cooperative agreements with state agencies and universities and others to conduct surveys, develop biological control methods, and implement weed management. Data from APHIS show that in fiscal year 2004, the agency provided at least \$3.2 million through cooperative agreements for agricultural and nonagricultural weed projects. APHIS's total budget for pest and disease management in fiscal year 2004 was \$331 million, most of which is devoted to agricultural pests and diseases.

In addition to the federal natural resource conservation programs in table 2 that are known to provide support for weed management, others have the potential to be used for that purpose. For example, USDA reports that the Natural Resource Conservation Service's Grassland Reserve Program could be used to address tamarisk, an invasive tree species, or other invasive plants. These programs that agencies could potentially use to support weed control provide billions of dollars for conservation efforts in general (see app. IV for more detail on these programs).

After we completed our interviews of weed management officials, Congress enacted the Noxious Weed Control and Eradication Act of 2004, calling for the establishment of a new source of funds for weed management. This law amends the Plant Protection Act and requires the Secretary of Agriculture to establish a program to support weed control efforts by weed management entities on BLM, Forest Service, and nonfederal lands. The law authorizes USDA to provide grants to and enter into cooperative agreements with weed management entities. Eligible activities include education, inventories and mapping, management, monitoring, methods development, and other activities to control or eradicate noxious weeds. In addition, USDA may enter into cooperative agreements at the request of a state's governor for rapid response to outbreaks of noxious weeds. The law authorizes appropriations of \$7.5 million for grants and \$7.5 million for cooperative agreements for each of 5

years beginning in fiscal year 2005. It is not yet clear what agency within USDA will administer this new program.

If the law were fully funded, it would represent a significant source of funds for weed management. The authorized amount is about 40 percent of all federal grant funding identified by our review as devoted to nonagricultural invasive weed management in fiscal year 2004. However, it is not yet clear what portion of the new program's funds will be used to address noxious weeds in nonagricultural settings. The law authorizes that funds may be used on natural area lands that BLM, the Forest Service, and nonfederal entities manage—but not on national parks or refuges—but it does not limit weed control support to nonagricultural lands. In the 108th Congress, Members of Congress introduced two other legislative proposals calling for additional resources for weed management—one addressed invasive species in general, while the other was limited to two western weed species.²²

Federal Agencies Conduct or Support Weed Management Research

Much of the federal funding already discussed deals with the management of invasive weed infestations; however, federal agencies also conduct or support weed management research. We identified four federal agencies within Agriculture and Interior that provide funding and other support to federal and nonfederal researchers. The types of research range from studies of the natural history of weeds (such as their life cycles and methods of spread) to evaluations of the effectiveness of control techniques. This research, however, primarily addresses weeds in agricultural settings.

USDA agencies fund several research efforts. The Agricultural Research Service has funded research on several key weeds in natural areas, including tamarisk, leafy spurge, and melaleuca, as part of its overall weed and invasive species program. The Cooperative State Research, Education, and Extension Service is making an estimated \$3.6 million available in fiscal year 2005 through its National Research Initiative to a wide range of educational institutions, local governments, nonprofit organizations,

²²S. 2598, The Public Land Protection and Conservation Act of 2004; and H.R. 2707, The Salt Cedar and Russian Olive Control Assessment and Demonstration Act.

individuals, and others to study the biology of weedy and invasive plants.²³ For example, the initiative has funded research on the causes and consequences of weed plant invasions in forestlands and on the effects of nitrogen supply on Japanese barberry and Japanese stiltgrass. The Forest Service also supports research related to invasive weeds such as in developing new guides for identifying and controlling for invasive plants using mechanical and biological control methods. According to the Forest Service, in fiscal year 2004 it allocated more than \$3.5 million for weed research.

In fiscal year 2004, Interior's U.S. Geological Survey (USGS) budgeted \$9.3 million for invasive species research. USGS reports that it spends about half of its invasive species research funds on weeds—about \$4.7 million. It develops its research agenda in consultation with its client agencies in Interior (Fish and Wildlife Service, National Park Service, and Bureau of Land Management), which determine their research needs, in part, based on the National Invasive Species Council's National Management Plan for Invasive Species, departmental priorities, and congressional interests. For example, the survey has been researching nutria, ballast water, and tamarisk because of recent congressional actions on these issues.

States Rely on Various Sources of Funding for Weed Management

The states we reviewed primarily use funds from a variety of state agencies' general appropriations to undertake weed management. Typically, state agencies responsible for agriculture, natural resources, and transportation are most active in weed management and have either dedicated weed funding or utilize funds from general maintenance accounts. State agencies also rely on federal grant programs to assist in their weed management efforts. For example, as discussed previously, all five states received funds through the Pulling Together Initiative for weed management activities.

The five states we reviewed differed in the level of resources devoted to controlling weeds. The disparity in resources no doubt reflects differences in the size and geography of the states and the nature and extent of the invasive species problem. We believe that it also reflects differences in the priority that certain states have assigned to the problem and their capacity for allocating resources. For this report, while we obtained information on

²³The agency's appropriation for research and education is about \$661 million for fiscal year 2005, including \$181 million for competitive research grants, which goes to the National Research Initiative.

expenditures, we did not attempt to precisely determine how much the five states are spending on weed management on nonagricultural lands. As with the federal agencies, it is often difficult to distinguish state agency expenditures on agricultural weeds from those on nonagricultural weeds, and between general maintenance work and weed control. In 2000, we reported on similar issues with regard to state expenditures on all types of invasive species (not just weeds), including three of the states we reviewed for this report.²⁴

California: Several state agencies spend funds on weed management. The Department of Food and Agriculture, the lead agency for weed management in California, receives approximately \$2 million and the Department of Transportation about \$1 million annually for weed control from state appropriations. The Department of Parks and Recreation's funding fluctuates based on available funds, including general appropriations, ongoing maintenance funds, and specially funded projects. The Coastal Conservancy (a state agency focused on protecting coastal resources) has spent approximately \$800,000 per year of grant money and \$300,000 per year for in-kind, staff, and direct expenses over the last 3 years on management of a specific invasive weed (*Spartina alternifolia*, a wetlands grass).

Colorado: The state weed coordinator estimated that state funding for invasive weeds was approximately \$3.6 million for fiscal year 2002. This amount included the Colorado Department of Agriculture's noxious weed program, the Department of Natural Resources' program for controlling weeds on state lands, and the Department of Transportation's work along roadsides. In the past, the state provided additional resources for addressing invasive weeds. From fiscal years 1998 through 2002, the Colorado legislature provided about \$1.3 million through the Colorado Noxious Weed Management Fund to support communities, weed control districts, or other entities engaged in cooperative noxious weed management efforts. On average, private, local, other state, and federal entities matched every dollar of the state's investment with more than a 5-to-1 ratio. However, the state legislature discontinued funding for the

²⁴The seven states were California, Florida, Hawaii, Idaho, Maryland, Michigan, and New York. The range of expenditures on all invasive species for these states in fiscal year 2000 was \$1.8 million to \$127.6 million. Expenditures in Maryland and Idaho were among the lowest, at \$1.8 million and \$3.8 million, respectively. California had the second-largest expenditure among the seven at \$87.2 million in fiscal year 2000. See [GAO/RCED-00-219](#).

program in 2003 because of concerns about the state's overall financial situation.

Idaho: Congressional appropriation committees have directed land resource appropriation funds for noxious weed control in Idaho. Since 2000, the state has received a total of about \$5.6 million in federal funds through BLM and the Forest Service. Over that same period, the state's general fund has provided about \$2.2 million. The Idaho Department of Agriculture manages these funds. Other state departments, including Fish and Game, Lands, Transportation, and Parks and Recreation, are also responsible for weed management on the lands they oversee and for determining what portion of their general operating budgets will be devoted to weed management on a yearly basis.

Maryland: The Maryland Department of Agriculture had a 2004 budget of \$310,000 for weed management for salaries, equipment, enforcement, and other expenses; also included was \$80,000 in grants to 20 county weed programs. The state's highway administration spent about \$2 million on vegetation management in 2004, of which less than \$50,000 was for control of two state-listed noxious weeds (Canada thistle and Johnsongrass) and phragmites. The Maryland Department of Natural Resource's associate director for habitat conservation told us that funding for weed control efforts on departmental lands, including state parks, comes from general operating budgets and is difficult to estimate.

Mississippi: The lead agency for weed management, the Mississippi Department of Agriculture and Commerce, spent about \$100,000 from its general budget for weed management in fiscal year 2004. It also received funding from other sources, including a \$25,000 Pulling Together Initiative grant and \$250,000 from USDA's Animal and Plant Health Inspection Service in fiscal year 2004. Those funds have been used to support landowners' weed control efforts through a cost-share program. The Mississippi Department of Transportation spent about \$2.5 million from its general operating budget in fiscal year 2003 for chemical weed control on over 27,000 miles of state-owned roadways. Private landowners also reimbursed the Mississippi Forestry Commission about \$177,000 for weed management work it did that year on private lands. The conference committee for the Department of the Interior and Related Agencies Appropriations Act of 2004 directed \$1 million of the U.S. Geological Survey's water resources appropriation to go to the GeoResources Institute of Mississippi State University to develop remote sensing techniques and monitoring strategies for early detection of invasive weeds in the

Southeast, control techniques for invasive aquatic plants, and an assessment of new invaders.

Local Governments Rely on a Range of Funding Sources for Weed Management

Counties that we reviewed receive funding for weed management from the federal government, state agencies, their own general operating funds, and special tax levies. County agriculture departments or weed management districts are the primary recipients of this funding but other departments may include those responsible for roads, parks, or public works. The counties we contacted illustrated a wide range of funding available for weed control, from a few thousand dollars per county to more than \$1 million.

For example, in Idaho, we identified two counties with significantly different funding levels. Ada County, Idaho, provided almost \$1 million for weed management in fiscal year 2004 and budgeted over \$1.3 million for fiscal year 2005. In 2004, the funding sources were a weed management mill levy, weed control fees charged to residents when the county treats their weeds, and the reimbursements from government agencies for weed treatment on federal lands (BLM, Bureau of Reclamation, and the National Guard). Ada County's weed superintendent told us that because the county has these sources of funding, and because it recognizes that other counties have fewer resources, he does not apply for grants and funding from other sources that may be the primary source of funding for some counties. In contrast to Ada County's situation, Idaho's Adams County spent about \$67,000 for weed management in 2003, including a \$49,085 Resource Advisory Council grant, \$12,356 from the state, and \$6,000 from the county. However, according to a county official, because the funding is not sufficient to meet existing needs, the county recently established a weed levy to help fund its limited program. In total, the county agriculture departments in California devoted an estimated \$4 million from their general operating funds to weed control in fiscal year 2004. In Maryland, the Department of Agriculture provided a total of \$80,000 in grants in 2004 to 20 counties that the counties matched or exceeded. We did not identify Mississippi counties engaged in weed control.

Federal and Nonfederal Officials Identified Funding, Cooperation, and Public Education as Key to Effective Weed Management

The majority of the officials we interviewed cited insufficient funding as the primary barrier to dealing effectively with invasive weeds (39 of 48 and 37 of 41 officials responding to questions about managing weeds on nonfederal land and federal land, respectively). Many of these officials highlighted the magnitude of the task at hand to control invasive weeds in discussing their funding situations. For example, Fish and Wildlife Service refuge managers have identified invasive plant management projects estimated to cost approximately \$70 million, compared with estimated agency expenditures of \$4.7 million on weed control in fiscal year 2004. The California Department of Food and Agriculture's annual weed management budget is approximately \$2 million, but it has identified about \$5 million in necessary management projects per year. Similarly, the Forest Service region responsible for California had a weed management budget of about \$600,000 in fiscal year 2004 but estimated that it needed about \$1.8 million to control weeds.

Officials we interviewed also identified specific issues related to funding. First, federal and nonfederal officials said that project funding needs to be consistent and predictable from year to year, because, to be effective, weed eradication actions need to be done regularly until the weed population is under control—which in some cases may take several years. Currently, officials submit new funding requests each year with no guarantee that projects started will be funded through to completion—potentially losing the investment made in weed reduction in prior years. The Fish and Wildlife Service's national strategy recognized the difficulty of addressing invasive species and its funding implications commenting, "Like an out-of-control wildfire, the cost of fighting invasive species increases each year." The agency also noted that, according to experts, the cost to control invasive species increases two- to threefold each year that control efforts are delayed. The National Park Service noted that, in some cases, parks do not have funds for routine maintenance to ensure that treated areas do not become reinfested. Second, some officials responsible for both federal and nonfederal lands noted that funding often arrives late in the year, which may limit their ability to begin weed control in the spring, when many types of weeds can be attacked most effectively. In addition, in many northern communities, the window of opportunity for weed treatment is small because of weather conditions. Third, some officials identified what they described as an often burdensome grant application process as a disincentive to pursuing needed funds for work on nonfederal lands. For example, one large nongovernmental organization said it would not apply for grants of less than \$25,000 because the benefits would not outweigh the

costs associated with applying. In addition, county and municipal governments often do not have the time or the expertise to identify and apply for grants. One county parks department official commented that she was reluctant to apply for grants because the likelihood of receiving one did not warrant the time and effort required to apply. And lastly, some of our respondents said that local communities sometimes have difficulty meeting requirements to provide matching funds for federal grants to work on nonfederal lands.²⁵

Officials identified additional barriers to addressing invasive weeds on federal lands, although not nearly as frequently as funding. More than one-third of the officials (15 of 41), including 6 federal and 9 nonfederal officials, cited compliance with the National Environmental Policy Act as an impediment, although they were generally supportive of the goals of the act.²⁶ Officials said that the time it takes to conduct required analyses of the potential impacts of treatment, such as applying herbicides, could make it difficult to respond rapidly to new infestations. The Forest Service director of rangeland management told us that she believes that agency personnel should be able to routinely use registered herbicides—without going through an impact analysis—as long as they follow label directions. Similarly, one Fish and Wildlife official told us he does not believe the agency should need to extensively analyze the potential impacts of using certain herbicides that any homeowner could legally purchase and use. Some agencies seek to or have tried to streamline the process for complying with the act, including the following:

- The Forest Service’s National Strategy and Implementation Plan for Invasive Species Management calls for pursuing use of National Environmental Policy Act regulations’ categorical exclusions and the agency’s emergency authorities to ensure environmental analysis does

²⁵Requirements for matching funds vary by grant program. For example, the Fish and Wildlife Service’s Partners for Fish and Wildlife grant program is flexible but seeks a 50 percent match, while USDA’s Wildlife Habitat Improvement Program requires a 25 percent match.

²⁶The National Environmental Policy Act requires federal agencies to assess and report on the likely environmental impacts of any major actions they propose that significantly impact environmental quality. If a proposed activity is expected to significantly impact the environment, the agency is required to prepare an environmental impact statement. If, however, a proposed activity is unlikely to have a significant effect on the environment, the agency is not required to prepare an environmental impact statement—such activities are classified as categorical exclusions.

not inhibit environmentally sound rapid response or control efforts. Under a categorical exclusion, certain activities that are deemed not to have a significant effect on the environment can be conducted without the need for an environmental assessment or environmental impact statement.

- In Mississippi, the Forest Service has completed a programmatic environmental assessment of cogongrass control using herbicides. According to the Forest Service, the programmatic assessment enables the service to use an environmental impact analysis of herbicide use at one location to satisfy the requirements of the act at other locations, if certain circumstances are met. This enables forest managers to act more quickly to invasive weed outbreaks, in some cases.
- BLM prepared a series of environmental impact statements on vegetation management—including noxious weeds—for the entire western United States in the 1980s and early 1990s that has helped to streamline analytical processes by providing an overview of the possible impacts of different treatment methods based on the broad regional characteristics of the 13 western states. The agency still has to conduct site-specific analysis of the potential impacts of treatment methods, but the extent of that analysis is reduced. BLM is in the process of developing an updated programmatic environmental impact statement to address pesticide use and general vegetation management on its lands.

In terms of nonfederal lands, in addition to funding barriers, more than one-third of officials responding (19 of 48) identified a lack of cooperation as problematic for effective weed management. State and county officials told us that successful weed control depends on the efforts of neighboring landowners to do their part, since weeds pay no attention to property lines. However, officials said that some landowners are uncooperative with weed control efforts. In addition, because some people do not understand the long-lasting damage that can be caused by invasive weeds, they often oppose the use of herbicides, which may have more intense short-term effects on the environment but are needed to eradicate invasive weeds. National Park Service officials noted that, in contrast with other land management agencies, the park service is not authorized to conduct work outside its boundaries and this has hampered them in cooperating with adjacent landowners. Also for nonfederal lands, about one-third of officials (14 of 48) identified a lack of awareness or education as a barrier. Some officials said that because people are unaware of the harmful effects of

invasive weeds, they sometimes neglect weeds on their property, thereby reducing the effectiveness of other control efforts. In addition, some officials noted that greater public awareness could lead to higher government priority for the issue and could help prevent the introduction and spread of invasive species by making the public aware of the risks of such activities as spreading seeds through recreational activities.

We also asked officials to identify the factors contributing to effective management of invasive weeds. About 83 percent (44 of 53 officials responding) identified cooperation and coordination as important for successful management on both federal and nonfederal lands. Officials noted that cooperation among numerous landowners and government agencies allows for the sharing of resources that are often in short supply and an ability to address weeds over a larger geographic area than if tackled alone. This sentiment is most evident in the strong support and momentum that has been building for the creation of weed management areas. Officials routinely highlighted such major benefits of these areas as improved coordination among the participating entities and the resulting collaboration on weed management projects. (Fig. 5 discusses a successful collaborative project in Mississippi addressing invasive cogongrass.)

Figure 5: Partnership Success on Cogongrass in Mississippi



Source: James R. Meeker, USDA Forest Service, www.forestryimages.org.

Note: Cogongrass was introduced into the United States in the early 1910s in packaging materials brought into Alabama. The weed, originally from Southeast Asia, had been found in 47 of Mississippi's 82 counties by 2003. It has been named the seventh worst weed in the world because it is highly flammable and can crowd out native vegetation, infest agricultural and natural lands, and have a negative economic impact by hindering timber production. Some agencies have lacked adequate resources to conduct cogongrass control. For example, the De Soto National Forest Ranger District reported in 2003 that it had the resources to treat about 25 acres of cogongrass annually, although forest staff estimated that they needed to treat 200 to 300 acres annually to control the infestation. Historically, the numerous agencies working on cogongrass were not coordinated and therefore duplicated efforts. The public was also not generally aware of the problems cogongrass posed for the state.

In 2002, after complaints from numerous landowners over many years, the Mississippi Department of Agriculture and Commerce recruited 17 other state and federal agencies to create a cogongrass task force. The task force's goal is to "facilitate a voluntary and cooperative effort in educating the public, researching this pest species, and providing a means of control, suppression or eradication of cogongrass in Mississippi." The task force drafted an action plan in 2004 that lays out its goal of reducing infestations as well as the expected tasks of 23 state and federal agencies and nongovernmental organizations. For example, under the plan, the Mississippi Forestry Commission is charged with surveying lands for infestations and enforcing sanitation requirements on its employees to stop the spread of the weed. Task force participation is voluntary, however, and agencies are not legally required to devote financial resources. Nevertheless, agencies have received and devoted funds for cogongrass control. For example, the Department of Agriculture and Commerce has received \$250,000 from USDA, which it has used to provide herbicides to landowners.

Clear Consensus Does Not Exist among Weed Management Stakeholders on How Additional Resources for Weed Control Should Be Distributed

The officials we interviewed offered wide-ranging views on how the federal government could best provide additional resources to weed management entities. In some instances, these views were consistent with the approach called for in the newly enacted Noxious Weed Control and Eradication Act of 2004; in others they were not.²⁷ (We conducted our interviews before this law was passed.)

Most officials responding to the issue (33 of 38) stated that the federal government should expand an existing program or programs rather than create a new one to distribute additional weed management funds.²⁸ Some officials told us that they preferred using existing programs because they know the application procedures, the types of projects the programs typically fund, and the agency officials that run the programs. The creation of a new program—which the newly passed law requires—will add another set of application procedures to learn and a new set of officials who may or may not be familiar with state and local weed management entities and their respective needs. One official noted that there was no need to “reinvent the wheel.”

The act requires the Secretary of Agriculture to implement the new program, but does not designate a responsible agency within USDA. The act amended the Plant Protection Act, which USDA has delegated to APHIS for implementation. About two-thirds of officials responding to our question (20 of 31) also identified USDA or one of its agencies as the best fit to lead a new program.²⁹ Officials we interviewed did not agree on which agency within USDA should lead a new program, but the Forest Service was identified most often (by 13 officials). Four officials named APHIS as an appropriate agency to manage the program. Officials noted that the various USDA agencies have different focuses that could affect how they would implement the program. For example, while the Forest Service was cited as having knowledgeable staff, established relationships with local land managers, and experience in delivering funding, one official expressed

²⁷However, more than one-third of officials we asked did not respond to our questions regarding a new funding program; some said they did not have well-formed opinions on the matter.

²⁸Additionally, 7 of 9 other officials we interviewed without an interview guide favored expanding an existing program.

²⁹Nine of 14 other officials we interviewed without an interview guide said that USDA or one of its agencies should manage the program.

concern that the service might fund weed management projects on forested lands only, and not in other nonagricultural settings. Similarly, while some officials said that USDA's Natural Resources Conservation Service would be a good fit because of its extensive contacts at the local level and funding expertise, others were concerned that it does not have much experience with weed management on nonagricultural lands.

Officials' views on the types of activities that should be eligible for funding are consistent with the activities and projects eligible for funding under the act. The act includes a broad range of activities and projects that can be funded, including education, methods development, control, and monitoring. Eighteen officials (of 40) said that all of these activities should be eligible and everyone agreed that at least a subset of these should be eligible. As noted earlier, public education is important because citizens and businesses may be the unintentional carriers of invasive weeds, and improved awareness can help garner additional support for addressing the problem. Research and monitoring are essential to identifying ways to prevent invasive weed introductions and cost-effectively control or eradicate them, and to ensure that treated areas do not become reinfested. Some officials also identified inventorying and mapping, and early detection and rapid response as important activities that should be funded. Inventorying and mapping of weed infestations is important so that the extent of the problem can be determined and tracked over time, while early detection and rapid response help avoid future costs by addressing weed infestations before they become unmanageable. (See fig. 6 for an example of the value of early detection and rapid response in Maryland.)

Figure 6: Giant Hogweed Eradication in Maryland



Source: USDA APHIS-Oxford, North Carolina Archives, www.forestryimages.org.

Note: Giant hogweed is on the federal noxious weed list and is a public health concern because its sap can cause serious burns and blisters. Native to Asia, the plant likely entered North America as early as 1917 as an ornamental garden plant. It most often infests roadsides. Giant hogweed was detected in Pennsylvania and Washington, D.C., before it was detected in Maryland. In Pennsylvania, the number of infestations grew from 6 in 1997 to 550 in 2003. Those sightings worried Maryland officials about the possible presence of the weed in their state.

Maryland's Department of Agriculture began to survey for giant hogweed in 2003, before the state had any known infestations. This survey was done in conjunction with a public awareness and education campaign, which included the Maryland Invasive Species Council naming the weed as the "Invader of the Month" in April 2003. The department also held workshops to increase public awareness and encouraged landowners and citizens to report possible giant hogweed infestations. The department received and surveyed 101 reports of infestations in 2003. While some of those reports were incorrect, the department found and treated 29 infested sites that year. The department has also monitored those sites to address regrowth of the weed. In addition, Maryland's Department of Natural Resources treated infestations on its lands in 2003. Total project costs across the state were about \$25,000—\$5,000 of which came from a USDA grant. The department hopes to ultimately eradicate the plant from the state. This eradication program shows the importance of early detection and rapid response—acting to identify and control the weed before it becomes widespread and less manageable. The public education campaign was a key factor in the eradication program's success because it helped the public become aware of the importance of detecting and reporting invasive species.

With regard to the method of awarding grant funds to weed management entities, the act specifies some selection considerations and states that the grants should be awarded competitively, but leaves the development of the program to the Secretary. The act states that the Secretary shall, to the maximum extent practicable, rely on technical and merit reviews provided

by regional, state, or local weed management experts in making funding decisions. However, 24 of 39 officials stated that funding should be provided directly to the states, which would then distribute the funds to local weed management entities. Officials supportive of this approach said that states best know their weed problems and therefore would make better-informed funding decisions. This approach is similar to the way in which Idaho currently receives federal funding and then distributes it to state and local weed management entities. Until USDA's new program is developed, however, it is not clear how much influence these nonfederal experts will have in the funding decisions. It is also unclear how the Secretary will delegate implementation authority and which other federal officials will be involved in the decision making. About one-quarter of those who commented on this issue (8 of 39) expressed a preference for federal officials deciding about project-specific grants to state and local entities based on a review of proposals. A few officials cited the Pulling Together Initiative as a model that could be followed, in which representatives from relevant federal agencies and nonfederal stakeholders consider the merits of grant applications and jointly make funding decisions. Such an approach could provide a balance in federal and nonfederal influence in deciding how to allocate funds for weed management.

Conclusions

Clearly the attack on invasive weeds in the United States is a massive effort that will continue far into the future. This effort involving a multitude of entities is needed, however, because invasive weeds pervade the landscape and affect virtually every type of ecosystem. Certainly, an additional source of funds to address invasive weeds, as authorized in recent legislation, will be welcomed by those involved in the battle. However, given the magnitude of the problem in relation to the resources devoted to it, identifying priorities and deciding how those resources should be allocated is important. As officials pointed out to us during our work, many types of weed management activities are needed, and different areas of the country are plagued by different weed problems and have varying levels of infrastructure in place to deal with them. In addition, when it comes to providing federal assistance to deal with invasive weeds, federal agencies have specific strengths and weaknesses with regard to their connection to, and understanding the needs of, weed management entities. While the newly enacted Noxious Weed Control and Eradication Act recognizes the importance of drawing upon the expertise of others by requiring reliance on information provided by regional, state, or local weed management experts, it does not specifically require consultation with other federal entities. Nonetheless, we believe it is important for the Secretary of

Agriculture to direct the implementing agency of the new program to collaborate with other federal entities with relevant weed management experience to (1) benefit from lessons learned in administering grant programs and cooperative agreements and (2) identify priorities that should receive funding from this new source so as to complement other federal assistance to on-the-ground weed management activities.

Recommendation for Executive Action

To help ensure that the new program under the Noxious Weed Control and Eradication Act is implemented effectively, we recommend that the Secretary of Agriculture direct the implementing agency to collaborate with other USDA and Interior agencies that have experience managing invasive weeds (1) in developing the mechanisms for allocating funds to weed management entities, and (2) in determining what entities should receive such funding, using the agencies—along with other regional, state, and local experts—as technical advisers, as appropriate.

Agency Comments and Our Evaluation

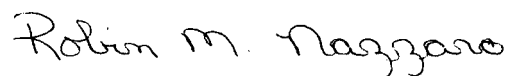
We provided copies of our draft report to the Departments of the Interior and Agriculture. The Department of the Interior provided written comments (see app. V). The Department of Agriculture did not provide comments, although the Animal and Plant Health Inspection Service and Forest Service provided technical comments and clarifications. We have incorporated those where appropriate.

The Department of the Interior concurred with our findings. Specifically, the department stated that the report contributes to the call for cooperation and collaboration across all government levels to control and eradicate invasive plants, and agrees with the attention it places on natural or nonproduction areas as significant contributors to our nation's biological and natural resources heritage. The department supported our recommendation regarding implementation of the Noxious Weed Control and Eradication Act of 2004. In addition, the department suggested that the issue be approached through the National Invasive Species Council and that council's advisory committee. Four Interior bureaus (the National Park Service, Fish and Wildlife Service, Bureau of Land Management, and the U.S. Geological Survey) also reviewed the report and provided technical comments relating to funding data, the number of acres infested with weeds, and other issues. We have incorporated those comments where appropriate.

As agreed with your office, unless you publicly announce the contents of this report earlier, we will plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to other interested congressional committees and the Secretaries of Agriculture and the Interior. We also will make copies available to others upon request. In addition, the report will be available at no charge on GAO's Web site at <http://www.gao.gov>.

If you or your staff have any questions, please call me at (202) 512-3841. Key contributors to this report are listed in appendix VI.

Sincerely yours,



Robin M. Nazzaro
Director, Natural Resources
and Environment

Objectives, Scope, and Methodology

The objectives of this report are to determine (1) the federal and nonfederal entities that implement projects to address harmful nonagricultural weeds, (2) the sources of funding that these entities use, (3) the views of federal and nonfederal officials on the barriers that limit the effectiveness of weed control efforts, (4) these officials' observations on specific aspects of how to implement a new program—or to infuse new resources into an existing program—to support weed management and control, and (5) the legal ramifications, if any, of the use of certain terms—such as invasive, noxious, and nonnative—and their associated definitions on control efforts. As called for in the objectives, we focused on weed control programs that address problems in nonagricultural areas, such as parks, forests, rangeland, and other types of land. As agreed with the requester, we focused on terrestrial weeds.

While a large number of departments and agencies are in some way responsible for weed management, as agreed with the requester, we limited our focus on the federal entities engaged in weed management to the Department of the Interior and the Department of Agriculture (USDA). (We therefore excluded other federal departments engaged in weed management, such as the Department of Defense and the Department of Transportation.)

To determine what federal entities implement projects to address harmful nonagricultural weeds and what sources of funding these entities use, we interviewed relevant officials at Interior, USDA, and the National Invasive Species Council, and reviewed weed management literature and Web sites. Within Interior and USDA, we limited our scope to the four agencies that manage the most public land—Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), and Forest Service; other agencies administering programs that can provide funding to landowners and other partners (Animal and Plant Health Inspection Service, Natural Resources Conservation Service, and Farm Services Agency); and agencies engaged in research into the use of weed control methods (Agricultural Research Service; Cooperative State Research, Education, and Extension Service; and U.S. Geological Survey). This scope excluded several Interior and USDA agencies that are less involved in weed management or research, including Interior's Bureau of Reclamation and Bureau of Indian Affairs and USDA's Economic Research Service.

To learn more about the role of state and local governments and other nonfederal entities in weed management, we interviewed officials from several national organizations, including the National Association of

Counties, the National Association of Conservation Districts, the Weed Science Society of America, and the Environmental Law Institute. On the basis of these interviews, we determined that the number of state and local agencies engaged in weed management was large. We also decided that it was not feasible or necessary to attempt to identify all such entities. Therefore, we selected a nonprobability sample of states to review in detail to provide illustrations of the types of weed management structures and entities that are at work across the country.¹ The states we selected were California, Colorado, Idaho, Maryland, and Mississippi. We selected them to provide a range of characteristics, using criteria that included geography, federal land ownership, and maturity of weed management programs. While these states are not representative of all states, they illustrate some of the types of weed management entities and activities that exist within states. For these five states, we determined whether there was a lead official—such as a state weed coordinator or invasive species coordinator—who would be able to direct us to other officials working on weed control in the state on behalf of federal, state, local, and nongovernmental organizations. We used those recommendations and other means to generate a list of entities to contact.

To gather information on the activities of federal and nonfederal weed control entities, determine what factors could improve the effectiveness of weed control efforts, and obtain opinions on specific aspects of how to implement a new federal weed control support program, we administered two structured interview guides. We designed the first interview guide to gather information from officials connected with weed control efforts at federal, state, and local government agencies and nongovernmental organizations. We administered that guide to 52 officials. We designed the second interview guide to gather information from officials connected with federal grant and cooperative agreement programs that can be used to fund the weed control work of a variety of entities and stakeholders. We administered that interview guide to 5 federal officials.

The interview guides contained common questions regarding the officials' opinions about the top three barriers to effective weed management, the top three factors contributing to success, and their views on certain aspects related to providing additional financial support to weed

¹Results from nonprobability samples cannot be used to make inferences about a population, because in a nonprobability sample, some elements of the population being studied have no chance or an unknown chance of being selected as part of the sample.

management entities. The guides also contained unique questions tailored to the different types of respondents. For example, the interview guide for weed managers contained questions about the sources of funding the entities use, while the interview guide for federal grant program managers contained questions about the extent to which those programs support weed control.

We gathered information about weed control expenditures by federal and nonfederal entities from a variety of sources. These include the structured interview guides, agency budget documents, and other agency reports and databases. In the instances where officials provided us with information through the interview guide, we asked if their answer was an estimate. We sought other documentation where practicable. We independently corroborated the data the officials provided in answer to our questions, to the extent possible, using other documentation. In some instances, we verified that expenditures agencies reported to have made for weed control were consistent with expenditures reported for recent years. We determined that the data were sufficiently reliable for the purposes of this report.

Similarly, we obtained information on federal and other grant resources directed to weed control from a variety of sources, including structured interviews, and agency or organizational documents. In some instances, agency officials were only able to provide estimates of the resources directed to weed control, while in other cases the data were more definitive. We independently corroborated the funding estimates provided by federal officials in response to our questions, to the extent possible, by comparing it with overall agency budgets for those programs. With respect to federally funded programs that are administered by other organizations (the Pulling Together Initiative and Center for Invasive Plant Management), we compared reported expenditures on weed projects with prior years' expenditures. We determined that the data were sufficiently reliable for the purposes of this report.

Some of the questions in the guides asked for open-ended opinions regarding how to provide new federal funding for weed control. At times, in answering one question, a respondent would also provide an answer to a subsequent question. In our analysis, we assigned their answers to the appropriate question. In some instances, respondents did not give clear answers to specific questions. For example, in response to a question about which federal agency should be responsible for administering a new program to support weed management agencies, one official said "any land

management agency.” In a situation like that, we classified the response as “unclear” rather than adding to the tallies of each land management agency. We analyzed the responses to these questions in light of the provisions of the newly enacted Noxious Weed Control and Eradication Act of 2004.

Within the five states we reviewed, we contacted officials at federal, state, and local government agencies, as well as at nongovernmental organizations. We did not attempt to identify or contact all federal, state, and local agencies engaged in weed management in each state. For the five states, we set as a target contacting representatives from the federal land management agencies’ regional or state offices, as well as representatives from one federal land management unit—such as a national park or wildlife refuge—within each state. We also sought to contact representatives from at least four counties, municipalities, or nongovernmental organizations in each state. To accomplish this, we asked state weed coordinators or other knowledgeable officials to recommend appropriate entities, and we conducted Internet research.

In addition to using the interview guides, we also interviewed 36 officials in a less formal way. We conducted some of these interviews prior to preparing the interview guides. In other instances, we used an informal interview method because we did not believe that either of the guides was appropriate for the interviewee. In our report, we present information obtained from the informal interviews, but do so separately from our presentation of information we obtained through the interview guides. In all, we spoke with over 90 officials representing 58 federal and nonfederal organizations.

Table 3 shows the number of organizations from different levels of government we contacted within each state. We did not contact representatives from all of the categories in each state; for example, in Mississippi we learned that county and municipal agencies are not actively involved in weed management.

Table 3: Number of organizations, by type, contacted in five states

Organizations	California	Colorado	Idaho	Maryland	Mississippi
Federal agencies	2	3	3	3	3
State agencies	3	1	3	3	3
Counties/municipalities	5	3	8	2	0
Nongovernmental organizations/individuals	1	1	3	1	2

Source: GAO.

We made site visits in Maryland, Idaho, and Colorado to observe weed control entities in action. For example, in Maryland we observed National Park Service staff hand pulling and mechanically removing Japanese stilt grass to protect native plant species, and in Idaho we observed the use of goats to graze leafy spurge.

To provide information on issues related to the terminology of invasive weeds, we researched the use and definitions of relevant terms in federal and state laws. This included analysis of the Plant Protection Act and section 15 of the Federal Noxious Weed Act, Executive Order 13112, and relevant statutes and regulations concerning invasive weeds in all 50 states. We also reviewed testimony provided to Congress by stakeholders to gain a better understanding of some of the concerns associated with the use a certain terminology.

We conducted our review from May 2004 through December 2004 in accordance with generally accepted government auditing standards.

Legal Ramifications of the Terms Used in Federal and State Law for Invasive Weeds

Based on our review of the statutes and regulations of the federal government and the fifty states, federal and state laws use many different terms to describe harmful weeds, including invasive, noxious, and exotic. In federal law, three different terms are used for, or encompass, invasive weeds—invasive species, noxious weeds, and undesirable plants. At the state level, almost all states use the term noxious weed, but define it differently. The states' lists of noxious weeds and the manner in which states determine whether to categorize a weed as noxious, also differ among the states. The noxious weed definitions, noxious weed lists, and other legal provisions affect control efforts by federal and state officials.

Terms Used in Federal Law for Invasive Weeds

In the United States, three terms are used at the federal level for invasive weeds: invasive species, noxious weeds, and undesirable plants. The common element of all of these different terms is the concept of harm.¹ However, the definitions and scope of these different terms vary.

- Executive Order 13112 uses the term invasive species and defines such species broadly as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.² Alien species are defined as a species (including its seeds, eggs, spores, or other biological material capable of propagating that species) that is not native to a particular ecosystem.

¹See Clare Shine, Nattley Williams, and Lothar Gundling; *A Guide to Designing Legal and Institutional Frameworks on Invasive Species* (Gland, Switzerland: IUCN Environmental Law Centre, 2000), 2: "The common denominator of such terms is often the concept of adverse impact, in the form of damage inflicted on the receiving species, site, or ecosystem."

²Exec. Order No. 13112, Invasive Species, § 1, 64 Fed. Reg. 6183 (Feb. 3, 1999).

- The Plant Protection Act uses the term noxious weed, which it defines as “any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.”³ This definition expanded upon an earlier definition of noxious weed that only included plants of a foreign origin posing a threat to agricultural interests that were new to or not widely spread in the United States.⁴
- Section 15 of the Federal Noxious Weed Act of 1974, as amended, uses the term undesirable plants and defines them as “plant species that are classified as undesirable, noxious, harmful, exotic, injurious, or poisonous, pursuant to State or Federal law.”⁵ This provision prohibits the designation of endangered species or plants indigenous to the area where control measures are taken as undesirable plants.

There are several important distinctions in these definitions. One distinction is whether a species is native or nonnative. The Executive Order defines invasive species as those that are not native to any particular identifiable ecosystem within the United States. Section 15 of the Federal Noxious Weed Act limits control activity to those undesirable plants that are not indigenous to the area where control efforts are to be taken. The Plant Protection Act’s definition of a noxious weed, however, does not limit work on invasive weeds to those that are not native, authorizing control efforts to address native species that may be harmful. Another distinction relates to a definitional issue that the International Union for Conservation of Nature and Natural Resources-World Conservation Union (IUCN) has identified as important with regard to management of invasive species. Specifically, because lower taxonomic units of species can be harmful, the IUCN has recommended that the term “species” include subspecies, lower taxa, and any part, gametes, seeds, eggs, or propagule of the species that

³Plant Protection Act, Pub. L. No. 106-224, § 403 (2000) (codified at 7 U.S.C. § 7702(10)).

⁴The previous definition of a noxious weed was contained in the Federal Noxious Weed Act of 1974, which, as discussed in footnote 5, was repealed in the Plant Protection Act.

⁵Federal Noxious Weed Act of 1974, Pub. L. No. 93-629, § 15, as added by the Food, Agriculture, Conservation and Trade Act of 1990, Pub. L. No. 101-624, § 1453 (1990) (codified at 7 U.S.C. § 2814). The Plant Protection Act repealed the Federal Noxious Weed Act of 1974 but left this provision intact.

could survive and reproduce.⁶ Both the Plant Protection Act's definition of noxious weed and the Executive Order's definition of invasive species include plant products or parts.⁷ However, the definition of an undesirable plant, while including species identified as noxious by state or federal law, does not specifically indicate that subspecies or plant parts are included.

In addition to these definitional distinctions, some plant species have both beneficial uses for some purposes but also demonstrate harmful characteristics—spurring debate over how these species should be characterized and managed. For example, a number of invasive plants have been intentionally introduced into the United States because of their beneficial uses, but later turned out to be harmful. Crownvetch has been useful in slope stabilization, beautification and erosion control on highways, and as a living mulch for no-till corn. Some officials in the agriculture industry have testified that it should not be considered an invasive species.⁸ However, the Wisconsin Department of Natural Resources and others have found crownvetch to be a serious management threat to natural areas and native plants because of its rapid spread by creeping roots and seeds. Similarly, kudzu and salt cedar were promoted for erosion control, but these weeds have overgrown native vegetation and are now the subject of significant eradication efforts. A somewhat similar debate has arisen with respect to genetically modified organisms and crops, which may provide benefits to humans but may also pose a threat to natural systems or other crops by introducing certain genetic characteristics.

⁶A Guide to Designing Legal and Institutional Frameworks on Invasive Species, 1-2.

⁷The Plant Protection Act's definition of a noxious weed includes both plants and plant products. The act defines a "plant" as "any plant (including any plant part) for or capable of propagation, including a tree, a tissue culture, a plantlet culture, pollen, a shrub, a vine, a cutting, a graft, a scion, a bud, a bulb, a root, and a seed." A "plant product" is defined as "any flower, fruit, vegetable, root, bulb, seed, or other plant part that is not included in the definition of plant; or . . . any manufactured or processed plant or plant part." In defining an invasive species, the Executive Order includes the seeds, eggs, spores, or other biological material capable of propagating the species.

⁸*Parks and Noxious Weed Legislation: Hearing Before the Nat'l Parks, Recreation and Pub. Lands Subcomm., Comm. on House Res.* (2004) (statement of Fred V. Grau, Jr., President, Grasslyn, Inc.); *Problem of Invasive Species: Hearing on H.R. 1080 and H.R. 119 Before the Subcomm. on Fisheries Conservation, Wildlife and Oceans Comm. on House Res.* (2003) (statement of Bill Pauli, President, California Farm Bureau Federation).

Federal agencies have various authorities under which they can control invasive weeds. Under the Plant Protection Act, USDA's APHIS has listed 96 noxious weeds that are prohibited or restricted from entering the United States or that are subject to restrictions on interstate movement within the United States. While the Plant Protection Act's definition of a noxious weed no longer requires a plant to be new to or not widely spread in the United States, USDA continues to state that candidates for the federal noxious weed list should be either not yet present in the United States or of limited distribution.⁹ According to an APHIS official, the rule of thumb APHIS uses for determining whether a plant is new is whether it has been in the United States for three years or less. Since the enactment of the Plant Protection Act in 2000, no additional weeds have been added to the federal noxious weed list.¹⁰ For those noxious weeds that are listed, the Secretary of Agriculture has authority to control these noxious weeds, including their parts, moving into or through the United States or interstate. If the Secretary considers it necessary in order to prevent the spread of a noxious weed that is new to or not known to be widely prevalent or distributed in the United States, the Secretary may take certain control actions, including destroying or quarantining the noxious weed and ordering an owner of one of these noxious weeds to take control actions.

All federal agencies are required, under section 15 of the Federal Noxious Weed Act, to undertake a number of control efforts for undesirable plants. Every federal agency must

- designate an office or person adequately trained in the management of undesirable plant species to develop and coordinate an undesirable

⁹This practice stems from USDA's interpretation of the International Plant Protection Convention. See APHIS, Guide to the Listing Process for Federal Noxious Weeds, available at <http://www.aphis.usda.gov/ppq/weeds/listingguide.pdf>. See also 69 Fed. Reg. 62419, 62420 (Oct. 26, 2004). While USDA only has authority to take remedial action against noxious weeds that are "new to or not known to be widely prevalent or distributed within and throughout the United States," it is not similarly restricted by the Plant Protection Act in what weeds it lists as noxious. This is an important distinction because, as discussed earlier, the noxious weed list is incorporated into the undesirable plants definition and affects the authority of other federal agencies to take control actions.

¹⁰However, APHIS recently asked for public comment on its receipt of two petitions requesting the addition of either the entire *Caulerpa* genus or all strains of *Caulerpa taxifolia* to the list of noxious weeds. Currently, only the Mediterranean strain is regulated, although USDA noted in its proposed rulemaking that the way in which it is listed as a noxious weed could be confusing. See 69 Fed. Reg. 62419 (Oct. 26, 2004).

plants management program for control of undesirable plants on federal lands under the agency's jurisdiction;

- establish and adequately fund an undesirable plants management program through the agency's budgetary process;
- complete and implement cooperative agreements with state agencies regarding the management of undesirable plant species on federal lands under the agency's jurisdiction; and
- establish integrated management systems to control or contain undesirable plant species targeted under cooperative agreements.¹¹

However, as discussed above, undesirable plants are not defined by section 15 beyond the species level to include plant parts; rather, undesirable plants are defined as "plant species that are classified as undesirable, noxious, harmful, exotic, injurious, or poisonous, pursuant to State or Federal law." Thus—even though the definition of an undesirable plant would include a weed designated as noxious either under the Plant Protection Act or under state law and even though these other laws may extend to subspecies, lower taxa, or plant parts—the control requirements under section 15 could technically be limited to just noxious weeds and other designated plants that are at the species level. While this is a potential definitional issue, we have not found any evidence, from federal agencies or others, identifying this issue as a barrier to control efforts.

In addition to these required control efforts, the heads of federal departments or agencies are authorized and directed to permit officials from any state in which there is in effect a control program for noxious plants to enter upon any federal lands under their control or jurisdiction and destroy noxious plants if certain conditions are met.¹² Federal agencies also have a number of other statutory authorities under which they can undertake control efforts for invasive weeds. For example, under the

¹¹There is an exception to these requirements if similar programs are not being implemented generally on state or private lands in the same area.

¹²These conditions are that (1) such entry is in accordance with a program submitted to and approved by the federal department or agency, (2) the means by which noxious plants are destroyed are acceptable to the head of the federal department or agency, and (3) the same procedure required by the state program with respect to privately owned land has been followed. 43 U.S.C. § 1241.

Endangered Species Act, federal agencies are required to establish and implement a program to conserve fish, wildlife, and plants. Conservation can include habitat maintenance and thus invasive weed control efforts.¹³ Finally, the Executive Order directs agencies, as permitted by law, to detect, respond rapidly to, and control invasive species in a cost-effective and environmentally sound manner.

Terms Used by States for Invasive Weeds

All of the states but Alaska use the term “noxious weed,” but the states vary in the manner in which they define a noxious weed (see table 5 at the end of this appendix for a complete listing of the states’ noxious weed definitions). Twenty-nine states define noxious weeds either in statute or in regulation (26 and 3 states, respectively). Thirteen states do not have a general definition of what a noxious weed is, but rather list particular weeds as noxious in statute (11 states) or in regulation (2 states). Eight states use the term noxious weed, but only with regard to their weed seed laws.¹⁴

For the 26 states that statutorily define a “noxious weed,” the specificity and scope of their definitions, and thus, the regulatory authority delegated to state agencies in designating noxious weeds varies (see table 4). Some states’ noxious weed definitions are so focused on agricultural harm that invasive weeds that cause harm to the natural environment could be statutorily excluded from being regulated as a noxious weed. Although definitions that include harm to land or other property could potentially cover weeds that cause harm to natural resources or the environment, it is only clear that such weeds would be covered under the states’ definitions that specifically include the concept of harm caused to natural resources or the environment.

¹³For a more detailed list of statutory authorities under which agencies may undertake invasive species control efforts, see National Invasive Species Council, *National Management Plan*, app. 3 (Washington, D.C., 2001).

¹⁴While weed seed laws are important in preventing the spread of invasive weeds, this appendix focuses on noxious weed laws and does not discuss the definitions of noxious weeds for seed law purposes. Some states use different definitions or have different lists of noxious weeds for weed seed laws.

**Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds**

Table 4: Summary of Provisions in 26 States' Statutory Definitions

State	Definition specifically includes plants that cause harm to agriculture, crops, livestock, or poultry	Definition only defines plants that cause harm to agriculture as noxious weeds	Definition specifically includes harm to the environment or natural ecosystems within their definition of noxious weeds	Definition includes harm to public health	Definition includes harm to the economy	Definition includes harm to land in general or to other property	Definition requires a plant to be difficult to control
Ala.	✓	✓					
Ariz.							✓
Ark. ^a							
Calif.	✓						✓
Colo.	✓		✓				
Del.	✓	✓					
Fla.	✓						
Hawaii	✓						
Idaho	✓			✓		✓	
Ill.	✓			✓		✓	
Minn.	✓		✓	✓		✓	
Miss.	✓		✓				
Mont.	✓					✓	
Nebr. ^a							
Nev.							✓
N. Mex.			✓		✓		✓
N. Dak.	✓			✓		✓	
N.Y.	✓						
Pa.	✓			✓		✓	
S.C.	✓			✓			
Tex. ^a							
Utah	✓			✓		✓	
Va.	✓			✓	✓	✓	
Wash.	✓		✓				✓
W.Va.	✓			✓	✓	✓	
Wyo.	✓	✓					

Source: GAO analysis of state statutes.

Note: By way of comparison, the federal definition of a noxious weed specifically includes plants that cause harm to agriculture, crops, livestock or poultry; environment and natural ecosystems; and public health.

Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds

^aStatutory definitions in Arkansas, Nebraska, and Texas do not specifically include any of the items noted in the table. For these definitions, see table 5.

The 24 states that do not have statutory definitions define or identify noxious weeds in a variety of ways:

- *Regulatory definitions.* Three states provide general definitions for noxious weeds in regulations. South Dakota defines a noxious weed in regulation as “a weed which the [weed control] commission has designated as sufficiently detrimental to the state to warrant enforcement of control measures” and possesses some specific invasive characteristics. A North Carolina regulation defines a noxious weed as “any plant in any stage of development, including parasitic plants whose presence whether direct or indirect, is detrimental to crops or other desirable plants, livestock, land, or other property, or is injurious to the public health.” Vermont defines a “noxious weed” in regulation almost identically to North Carolina, but also includes plants that are detrimental to the environment.
- *Statutory lists.* Eleven states (Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Missouri, Oklahoma, Tennessee, and Wisconsin) do not provide a definition for a noxious weed in either statute or regulation, but instead have statutes that list specific plants considered to be noxious weeds. Kentucky uses the term “noxious weed” but does not provide a definition for the term, stating only that it includes Johnsongrass and pests.
- *Regulatory lists.* Ohio and Oregon do not define noxious weeds in statute or regulation, but instead list specific noxious weeds in regulations.
- *Weed seed laws.* Eight states (Alaska, Connecticut, Georgia, Maine, Massachusetts, New Hampshire, New Jersey, and Rhode Island) only use the term noxious weed with respect to their noxious weed seed laws. Noxious weed seed laws generally restrict or prohibit the sale of the seeds of noxious weeds, either as a product in their own right or as contaminants of other seeds or agricultural products.¹⁵ Alaska has a law

¹⁵As indicated earlier, this appendix focuses on noxious weed laws and does not discuss the definitions of noxious weeds for seed law purposes. Some states use different definitions or have different lists of noxious weeds for weed seed laws.

providing for the eradication of “obnoxious weeds” in addition to its weed seed law, but has no statutory or regulatory list of such weeds.

In addition to the states identified above as having statutory or regulatory lists rather than definitions of noxious weeds, most of the other states also have noxious weed lists. As detailed in state statutes or regulations, the states’ noxious weed lists differ greatly in length, from one noxious weed in Louisiana and Kentucky to 133 noxious weeds in California (see table 5). It is important to note, however, that the number of noxious weeds listed may not portray the complete picture of a state’s efforts to control invasive weeds for several reasons. First, one state may list an entire genus as a noxious weed (which could include numerous individual species or taxa of weeds), while another state may list only particular species or varieties of plants within that genus but list them as separate entries on a noxious weed list. For example, Iowa lists all species within the *Carduus* genus as a single entry on its noxious weed list, while California lists certain *Carduus* species separately. Second, some states take control actions against invasive weeds in addition to those identified as noxious weeds in their statutes and regulations.¹⁶ For example, in addition to its list of noxious weeds, Illinois lists 10 exotic weeds that are subject to control efforts. Department of Natural Resources officials in Maryland also told us that they have authority to manage any weed species that threaten the lands they manage, regardless of whether it is listed as noxious. Lastly, localities may have their own noxious weed lists or undertake control efforts for weeds that do not appear on the states’ lists.

In addition, the states may categorize or use their noxious weed lists in various ways that can affect state control efforts. Ten states’ statutes and regulations categorize listed noxious weeds into particular definitional classifications.¹⁷ In further classifying noxious weeds, the states may make a distinction in the types of control efforts that are authorized. For example, Colorado has three classes of noxious weeds—List A, List B, and List C—defined as follows:

¹⁶See http://plants.usda.gov/cgi_bin/noxious_all.cgi for a federal and state composite list of noxious weeds.

¹⁷See table 5. California, as discussed in the report, also classifies its noxious weeds, but it does not do so in either statute or regulation.

- List A noxious weeds are rare noxious weed species that are subject to eradication wherever detected statewide in order to protect neighboring lands and the state as a whole.
- List B noxious weeds are species with discrete statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the commissioner in order to stop the continued spread of these species.
- List C noxious weeds are widespread and well-established noxious weed species for which control is recommended but not required by the state, although local governing bodies may require management.¹⁸

Thus, in Colorado, List C noxious weeds are not subject to the same control requirements as List A and B noxious weeds. States also use their noxious weed lists and implement the noxious weed definitions in a variety of ways. For example, noxious weed lists can represent weeds under quarantine, weeds subject to import or sale restrictions, weeds for which control is required, or weeds for which control is authorized.

Aside from the definitions or lists that stipulate what a noxious weed is, other legal provisions may detail how, where, and by whom control efforts can be carried out.

Some states have laws that specifically restrict control efforts to certain noxious weeds. For example:

- In Hawaii, a number of regulatory criteria must be met. To be designated as a noxious weed for eradication and control projects, a plant species must be one that (1) is not effectively controlled by present day technology or by available herbicides currently registered for use under Hawaii law; (2) is effectively controlled only by extraordinary efforts such as repeated herbicidal applications at high dosage rates; or (3) is effectively controlled only by additional effort over and beyond the normal weed maintenance effort required for the production or management of certain crops and pasturelands, recreation areas, forest lands, or conservation areas.¹⁹ In addition, the plant species must meet

¹⁸COLO. REV. STAT. § 35-5.5-108.

¹⁹HAW. ADMIN. CODE § 4-68-7.

certain criteria regarding distribution and spread, growth characteristics, reproduction, and detrimental effects.²⁰

- Nevada is divided into weed control districts, and the weeds subject to control vary by these districts. For example, all state-designated noxious weeds are subject to control in Nevada’s Ruby Weed Control District, but only four weeds are subject to control in the Lovelock Valley Weed Control District.²¹ While in some cases the control districts restrict which weeds on the noxious weed list can be controlled, in other cases some weeds that are not listed on the Nevada designated noxious weed list are nonetheless subject to control in Nevada’s control districts.

Some states must take particular actions before undertaking control or eradication projects on noxious or invasive weeds. For example, the Maryland Secretary of Agriculture may declare a quarantine to control or eradicate exotic plants, but a public hearing must first be held.²² In Illinois, governing bodies of each county are required to establish coordinated programs and to publish notices for the control and eradication of noxious weeds.

Moreover, some state laws define “control,” providing for the scope of control or eradication efforts authorized in the state. For example, Nebraska defines “control” in a fairly broad manner as “the prevention, suppression, or limitation of the growth, spread, propagation, or development or the eradication of weeds.”²³ Controlling a noxious weed in Hawaii, however, is defined in a more limited manner as “limit[ing] the spread of a specific noxious weed and . . . reduc[ing] its density to a degree where its injurious, harmful, or deleterious effect is reduced to a tolerable level.”²⁴

²⁰HAW. ADMIN. CODE §§ 4-68-4, -5, -6, -8.

²¹NEV. ADMIN. CODE §§ 555.040, 555.080.

²²MD. CODE ANN., AGRIC. § 9-402.

²³NEB. REV. STAT. § 2-953.

²⁴HAW. STAT. § 152-1.

**Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds**

Table 5: States' Definitions of Noxious Weeds

State	Manner in which state defines noxious weed	Definition of noxious weed	Further categorizations of noxious weeds^a	Number of listed noxious weeds
Ala.	Statute	Any living stage, including, but not limited to, seeds and productive parts of a parasitic or other plant of a kind, or subdivision of a kind, which may be a serious agricultural threat in Alabama. Evidence of noxious weed shall be considered a public nuisance.	Yes	28 plus federal list
Alaska	N/A ^b	N/A	No	N/A
Ariz.	Statute	Any species of plant that is, or is liable to be, detrimental or destructive and difficult to control or eradicate and shall include any species that the director [of the Department of Agriculture], after investigation and hearing, shall determine to be a noxious weed.	Yes	54
Ark.	Statute	The board in its rules and regulations . . . shall list the insect pests, diseases, and noxious weeds, of which it shall find that the introduction into or the dissemination within the state should be prevented in order to safeguard the plants and plant products of this state, and the list shall include the plants and plant products or other substances on or in which these pests may be carried.	No	35
Calif.	Statute	Any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the director, by regulation, designates to be a noxious weed. In determining whether or not a species shall be designated a noxious weed for the purposes of protecting silviculture or important native plant species, the director shall not make that designation if the designation will be detrimental to agriculture.	No	133
Colo.	Statute	An alien plant or parts of an alien plant that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board, and meets one or more of the following criteria: a. aggressively invades or is detrimental to economic crops or native plant communities; b. is poisonous to livestock; c. is a carrier of detrimental insects, diseases, or parasites; d. the direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.	Yes	84
Conn.	N/A ^{c, d}	N/A	No	N/A

**Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds**

(Continued From Previous Page)

State	Manner in which state defines noxious weed	Definition of noxious weed	Further categorizations of noxious weeds^a	Number of listed noxious weeds
Del.	Statute	The Department [of Agriculture] shall designate species of weeds which adversely affect or threaten agriculture production as noxious weeds, and may promulgate such rules and regulations as in its judgment are necessary to carry into effect the provisions of this chapter and may alter or suspend such rules when necessary.	No	4
Fla.	Statute	Any living stage, including, but not limited to, seeds and productive parts, of a parasitic or other plant of a kind, or subdivision of a kind, which may be a serious agricultural threat in Florida or have a negative impact on the plant species protected under [a certain provision of Florida law].	No	67
Ga.	N/A ^c	N/A	No	N/A
Hawaii	Statute	Any plant species which is, or which may be likely to become, injurious, harmful, or deleterious to the agricultural, horticultural, aquacultural, or livestock industry of the state and to forest and recreational areas and conservation districts of the state, as determined and designated by the department from time to time.	No	79 ^e
Idaho	Statute	Any plant having the potential to cause injury to public health, crops, livestock, land or other property; and which is designated as noxious by the director.	No	36
Ill.	Statute	Any plant which is determined by the Director [of the Department of Agriculture], the Dean of the College of Agriculture of the University of Illinois and the Director of the Agricultural Experiment Station at the University of Illinois, to be injurious to public health, crops, livestock, land or other property.	No	8 ^f
Ind.	Statutory list		No	4 ^g
Iowa	Statutory list		Yes	25
Kans.	Statutory list		No	12 ^h
Ky.	Statutory list		No	1 ⁱ
La.	Statutory list		No	1 ^j
Maine	N/A ^c	N/A	No	N/A
Md.	Statutory list		No	3
Mass.	N/A ^c	N/A	No	N/A
Mich.	Statutory list		No	10 ^k
Minn.	Statute	An annual, biennial, or perennial plant that the commissioner designates to be injurious to public health, the environment, public roads, crops, livestock, or other property.	Yes	13 plus federal list ^l

**Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds**

(Continued From Previous Page)

State	Manner in which state defines noxious weed	Definition of noxious weed	Further categorizations of noxious weeds^a	Number of listed noxious weeds
Miss.	Statute	A plant species or classified group of plants declared by the Bureau of Plant Industry to be a public nuisance or to be especially injurious to the environment, to agricultural and horticultural production, or to wildlife and which should be controlled and the dissemination of which prevented.	No	8
Mo.	Statutory list		No	8 ^m
Mont.	Statute	Any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses or that may harm native plant communities and that is designated: 1. as a statewide noxious weed by rule of the department; or 2. as a district noxious weed by a board, following public notice of intent and a public hearing. A weed designated by rule of the department as a statewide noxious weed must be considered noxious in every district of the state.	Yes	27
Nebr.	Statute	Any weeds designated and listed as noxious in rules and regulations adopted and promulgated by the director [of agriculture].	No	5
Nev.	Statute	Any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate.	No	45 ⁿ
N.H.	N/A ^c	N/A	No	N/A
N.J.	N/A ^c	N/A	No	N/A
N. Mex.	Statute	New Mexico has two statutory definitions of a noxious weed: 1. Any weed or plant which the board of county commissioners acting as the governing body of the district, and with the advice of the county agent, declares to be harmful or to possess noxious characteristics. 2. A plant species that is not indigenous to New Mexico and that has been targeted pursuant to the Noxious Weed Management Act for management or control because of its negative impact on the economy or the environment.	No	N/A
N.Y.	Statute	Any living stage (including, but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in this state, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation.	No	4 ^o

Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds

(Continued From Previous Page)

State	Manner in which state defines noxious weed	Definition of noxious weed	Further categorizations of noxious weeds ^a	Number of listed noxious weeds
N.C.	Regulation	Any plant in any stage of development, including parasitic plants whose presence whether direct or indirect, is detrimental to crops or other desirable plants, livestock, land, or other property, or is injurious to the public health.	Yes	15 plus federal list
N. Dak.	Statute	Any plant propagated by either seed or vegetative parts which is determined by the commissioner after consulting with the North Dakota state university extension service, or a county weed board after consulting with the county extension agent, to be injurious to public health, crops, livestock, land, or other property.	No	12
Ohio	Regulatory list		No	14
Okla.	Statutory list		No	3
Oreg.	Regulatory list		Yes	97 ^p
Pa.	Statute	A plant that is determined to be injurious, to public health, crops, livestock, agricultural land or other property. The noxious weed control list shall include but not be limited to [four certain weeds].	No	13
R.I.	N/A ^c	N/A	No	N/A
S.C.	Statute	Any living stage of any plant including seed or reproductive parts thereof or parasitic plants or parts thereof which is determined by the Commissioner of Agriculture to be directly or indirectly injurious to public health, crops, livestock, or agriculture, including but not limited to waterways and irrigation canals.	No	9
S. Dak.	Regulation	A weed which the [Weed Control] commission has designated as sufficiently detrimental to the state to warrant enforcement of control measures. The weed must possess the following characteristics: (1) the weed is a perennial; (2) the weed is capable of unique and rapid spreading and growth under adverse conditions; (3) the weed is not controllable without special preventative chemical, mechanical, biological, and cultural practices; (4) the weed is capable of materially reducing the production of crops or livestock; (5) the weed is capable of decreasing the value of the land; and (6) the weed is not native to the state.	No	7 ^q
Tenn.	Statutory list		No	2 ^r
Tex.	Statute	A weed or plant is considered to be a noxious weed if declared to be a noxious weed by: 1. a law of this state; or 2. the department acting under the authority of [state law].	No	N/A
Utah	Statute	Any plant the commissioner [of agriculture] determines to be especially injurious to public health, crops, livestock, land, or other property.	No	18

Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds

(Continued From Previous Page)

State	Manner in which state defines noxious weed	Definition of noxious weed	Further categorizations of noxious weeds ^a	Number of listed noxious weeds
Vt.	Regulation	Any plant in any stage of development, including parasitic plants whose presence whether direct or indirect, is detrimental to the environment, crops or other desirable plants, livestock, land, or other property, or is injurious to the public health.	Yes	32 plus federal list
Va.	Statute	Any living plant, not widely disseminated, or part thereof, declared by the Board [of Agriculture and Consumer Services] through rules and regulations under this chapter, to be detrimental to crops, surface waters, including lakes, or other desirable plants, livestock, land, or other property, or to be injurious to public health or the economy.	No	N/A
Wash.	Statute	Washington has two statutory definitions for a noxious weed: 1. A plant that when established is highly destructive, competitive, or difficult to control by cultural or chemical practices. 2. A living stage, including, but not limited to, seeds and reproductive parts, of a parasitic or other plant of a kind that presents a threat to Washington agriculture or environment.	Yes	124 ^s
W.VA	Statute	Any living plant, or part thereof, declared by the commissioner [of Agriculture], after public hearing, to be detrimental to crops, other desirable plants, waterways, livestock, land or other property, or to be injurious to public health or the economy.	No	7 ^t
Wis.	Statutory list		No	3 ^o
Wyo.	Statute	Weeds, seeds, or other plant parts that are considered detrimental, destructive, injurious, or poisonous, either by virtue of their direct effect or as carriers of diseases or parasites that exist within this state, and are on the designated list.	No	N/A

Source: GAO analysis of state laws and regulations.

Note: N/A = not applicable.

^aIndicates whether a state has a statutory or regulatory provision further classifying its noxious weeds—such as by designating them as Class A, Class B, and Class C noxious weeds.

^bAlaska uses the term “obnoxious weed” instead, only using the term “noxious weed” in relation to its weed seed law.

^cThese states only use the term noxious weed in conjunction with their noxious weed seed laws.

^dConnecticut uses the term invasive plant. The Commissioner of Environmental Protection is to prepare and maintain a list of nonnative plant species and distribute it on an annual basis.

^eSome of these weeds are listed only for control on certain islands.

^fTwo of these noxious weeds are only declared noxious within the corporate limits of cities, villages, and incorporated towns. Illinois also lists kudzu—which is a state noxious weed—and 9 other plants as exotic weeds.

Appendix II
Legal Ramifications of the Terms Used in
Federal and State Law for Invasive Weeds

⁹Indiana lists these same 4 noxious weeds as detrimental plants. Indiana also controls kudzu separately as a pest or pathogen.

^hThe board of county commissioners may also declare 2 other plants to be noxious weeds within county borders.

ⁱKentucky lists another plant as a noxious weed that the Department of Transportation must control, as well as 5 other plants it does not designate as noxious weeds.

^jThis plant is actually listed as a noxious plant.

^kThe Michigan statute lists 10 noxious weeds, but also includes any other plant that in the opinion of the governing body of any county, city, or village, coming under the provisions of the act is regarded as a common nuisance.

^lMinnesota only includes the terrestrial and parasitic weeds from the federal list.

^mThe Missouri statute also states that the term noxious weed includes any other weed designated as noxious by the rules and regulations of the Department of Agriculture.

ⁿSome of these weeds are designated for control only in certain counties.

^oLists these as included among noxious weeds in the state sanitary code.

^pOregon excludes Japanese blood grass, which is on the federal list. Oregon also lists 5 weeds, 2 of which are not on the quarantine list of 97 weeds, as noxious when found in nursery stock.

^qSouth Dakota regulations also specifically authorize 19 weeds to be designated as locally noxious weeds or pests.

^rThese weeds are subject to eradication and control when growing on state highway rights-of-way.

^sSixty-five of these weeds are designated as Class B noxious weeds and are subject to control only in certain regions of the state.

^tOne of these noxious weeds is only designated as such for certain counties.

Weed Management in the Five States Reviewed

This appendix provides detailed information on the weed management in the five states we reviewed: California, Colorado, Idaho, Maryland, and Mississippi. It describes the weed species posing serious threats in the states; the legal framework for invasive weeds; federal agencies' activities on lands they manage in the states; state, county, and municipal governments' responsibilities; and cooperative and private entities' activities.

California

California has a state weed coordinator, an invasive plant council, and a strategic plan that addresses weeds.

Weed species posing serious threats in the state. According to the state's weed action plan, noxious and invasive weeds infest over 20 million acres in California and result in hundreds of millions of dollars in control costs and lost productivity. California's noxious weed list includes 133 species. According to the state weed coordinator, the weeds that pose the biggest problems in the state include yellow star thistle, *Arundo donax* (also known as giant reed), perennial pepperweed, and several species of broom. Perennial pepperweed (also known as tall white top) has infested about 10 million acres in central California. Several species of broom—French, Spanish, Portuguese, and Scotch—invaded California more than 70 years ago. Broom crowds out other habitat and damages agriculture, timber, livestock, and other industries. It also increases fire susceptibility because it contains volatile organic compounds that allow it to burn when either green or dry.

Legal framework relevant to invasive and noxious weeds. California administers a pest prevention system designed to protect agriculture from damaging agricultural pests—including weeds—and protect natural environments. Key implementers of the system include the California Department of Food and Agriculture (CDFA), county departments of agriculture, and USDA. State law defines noxious weeds and gives the Department of Food and Agriculture primary responsibility for their control. CDFA has established through regulation a noxious weed list that includes over 130 plant species. In addition, CDFA policy is to classify

those weeds on the basis of how widespread they are.¹ The classification determines the extent to which the department undertakes control or other action on the weeds. The California Seed Law also gives the CDFA authority to regulate noxious weed seeds found in agricultural or vegetable seed.

In 1999, the Noxious Weed Subcommittee of the state's California Range Management Advisory Committee published the *Strategic Plan for the Coordinated Management of Noxious Weeds in California*. This plan was focused on cooperative weed management areas; following the plan, the state legislature enacted Assembly Bill 1168 in 1999 and Senate Bill 1740 in 2000, to provide funding for development of such areas. In 2002, the California Invasive Weed Awareness Coalition, a consortium of businesses and nongovernmental organizations that works to increase awareness of noxious and invasive weeds and resources for weed prevention and control, asked the CDFA to take the lead in developing a statewide plan that would be focused more broadly on invasive weed management. In 2004, the department published the California Noxious and Invasive Weed Action Plan. The ultimate goal of this plan is to protect and enhance the economy, natural environment, and safety of the citizens of California through greater awareness, cooperation, and action in the prevention and control of noxious and invasive weeds.

Federal weed management infrastructure in the state. Three of the federal land management agencies we reviewed are active in weed management. The Forest Service manages approximately 20 million acres in California and estimates that approximately 300,000 acres are infested with weeds. The regional office in California and each forest unit have a designated weed coordinator. Forest Service budgeted about \$600,000 in fiscal year 2004 to treat invasive weeds. The Bureau of Land Management (BLM) is responsible for 17 million acres of land and estimates that about 1.8 million acres are infested with noxious or priority weeds (priority weeds are not on the state's list of noxious weeds but are of concern). BLM has a management plan for weeds and an agency weed coordinator for California. Its current weed budget is about \$625,000. The National Park

¹The ratings include A, B, C, D, and Q weeds. A, B, and C designations reflect how widespread a species is; the level of regulation and control applied is inversely related to how widespread they are. Q rated weeds are those undergoing review to determine an appropriate rating. D rated weeds are not considered significant weeds. The ratings can be modified on the basis of the severity of the threat the weed poses.

Service deploys the California Exotic Plant Management Team to control weeds on 12 parks encompassing almost 2.4 million acres.

State, county, and municipal governments' weed management infrastructure. The California Department of Food and Agriculture is the state's lead agency in noxious weed control. It is responsible for maintaining the list of officially designated noxious weeds and regulating their movement in commerce. It also implements the state's pest prevention system, which it coordinates with county departments of agriculture and USDA. Furthermore, the CDFA coordinates with counties' eradication efforts for high-priority noxious weeds and provides partial funding, oversight, and guidance to county-based weed management areas. The current CDFA expenditure for targeted noxious and invasive weed management in California is approximately \$2 million annually. At least five other state agencies also control for invasive weeds. The Department of Parks and Recreation manages 1.4 million acres. According to a 2004 inventory, approximately 100,000 acres of these are infested with invasive weeds. In addition, the Department of Fish and Game manages almost 970,000 acres of fish and wildlife habitat. In 2003, state department personnel worked to control 68 invasive weed species on their lands. The California Bay-Delta Authority distributed over \$2.6 million for weed control, management and research activities during fiscal year 2004. Species addressed included *Arundo donax*, purple loosestrife, Brazilian elodea, and perennial pepperweed. Since 1999, the state's Wildlife Conservation Board has also provided over \$5 million to restore riparian areas in 11 counties, particularly by removing invasive weeds. The state is spending about \$10 million annually to treat *Arundo donax* in Orange County and \$100,000 to study the agricultural productivity lost because of yellow star thistle.

Many county agricultural commissioners carry out regulatory and other weed eradication and control programs, generally in coordination with CDFA and the local weed management area. County programs typically focus on high priority weeds (those rated "A"), such as musk thistle and spotted knapweed. Lower priority weeds (those rated "B" and "C" because they are more widespread) may also be subject to local control, especially when they are just beginning to invade a county. Counties have increased their efforts in recent years to detect and inventory using electronic systems, which has led to the discovery of new populations of listed weeds. Counties also manage biological control programs in cooperation with CDFA, and some counties participate in weed management areas, roadside weed control, and weed control for fire abatement purposes. Estimated

funding for weed programs in county agriculture departments was about \$4 million last year, putting the statewide expenditure at about \$6 million.

According to the state's 2004 weed action plan, not many cities have weed control programs that can be thought of as dealing with targeted noxious or invasive weeds. The plan does note that some municipalities do have strict mandatory abatement programs to control weeds, but they are designed to alleviate fire risk and unsightliness.

Cooperative and private entities. At least 50 of the 58 counties in California are involved in weed management areas. These areas focus on education and local outreach, including workshops and demonstration projects; detecting, surveying and mapping weeds; setting priorities for weed management and conducting strategic planning; fostering cooperative weed control projects; and writing grants. Personnel from county agricultural departments most commonly lead weed management areas, although resource conservation districts and state or federal agency employees also take the primary leadership role in many counties. Each weed management area received approximately \$80,000 in state funding from 1999 through 2004, for a total of about \$4.5 million. However, the state funding for the program ended in June 2004. The weed management areas raised over \$5 million in grants, local matches, and in-kind donations.

In 1998, Mendocino County officials helped found the International Broom Initiative, which includes California, Hawaii, Oregon, Washington, Australia, New Zealand, and France. In California, both public and private sectors have joined to fund this initiative. Additionally, the initiative has recently obtained federal funds because of the problems broom is causing, especially along the coasts.

Colorado

Colorado has a state weed coordinator, a noxious weed advisory committee, and a state strategic plan for weeds.

Weed species posing serious threats. Regulations under Colorado's Noxious Weed Act designate 71 weed species as state noxious weeds. For example, yellow star thistle is listed because it causes chewing disease and death in horses. Purple loosestrife is listed because it rapidly displaces habitat and feed for wildlife; spawning fish, ducks, cranes, and turtles leave when loosestrife invades an area. Whitetop, also known as hoary cress, is another major noxious weed threat. Its deep and creeping rootstalks make

it difficult to control because cultivation tends to spread root pieces that start new plants.

Legal framework for invasive and noxious weeds. Until the enactment of the 1990 Colorado Weed Management Act, weed management focused almost entirely on controlling weeds in agricultural areas. This act, however, broadly addresses the effect of nonnative plants on the economy and environment. The state law classifies weeds depending upon how widespread they are, among other things, and tailors its management of them accordingly. It also required each county to have a weed advisory board. A 1996 amendment to the act created a statewide weed coordinator and established the Colorado Noxious Weed Management Fund to provide financial resources to communities, weed control districts, or other entities engaged in cooperative noxious weed management efforts. An amendment to the act in 2003 created a statewide noxious weed advisory committee.

The Department of Agriculture, in coordination with over 40 other state, local, and federal agencies, as well as private entities, formulated a strategic plan to address the spread of noxious weeds. According to the plan, during the 21st century, the state seeks to stop the spread of noxious weed species and restore degraded lands that have exceptional agricultural and environmental value.

Federal weed control infrastructure within the state. BLM and the Forest Service manage 94 percent of all the federal land in Colorado. These lands are generally not used for agriculture but are often used for grazing livestock. The Fish and Wildlife Service also manages six refuges throughout the state. All three agencies have active weed management programs to control weeds on their own lands and to support the weed control efforts of nonfederal agencies and organizations. They plan and implement weed control projects on public lands in a decentralized manner; most units conduct weed management as part of another program, such as range or vegetation management. In fiscal year 2004, BLM, Forest Service, and the Fish and Wildlife Service provided an estimated \$537,000, \$500,000, and \$564,000, respectively, to weed control on federal lands within Colorado.

State, county, and municipal governments' weed control infrastructure. The Departments of Agriculture and of Natural Resources are the states' primary weed control agencies. They work on state-owned lands and help coordinate the activities of other state entities involved in weed management. Between fiscal years 1998 and 2002, the state's Noxious Weed

Management Fund provided approximately \$1.3 million for noxious weed management, education, and mapping. On average, every dollar of the state's investment was matched more than 5 to 1 with private, local, other state, and federal resources. Because requests for funding always exceeded the resources available, the Department of Agriculture, which administers the fund, made awards on a competitive basis, following the recommendations of a committee of weed management professionals. The applications were scored on such factors as the nature of partnerships formed, urgency of the problem, projected impact of the project, and use of sensible and integrated pest management strategies. However, in 2003, the state discontinued its contributions to the fund because of state budget shortfalls.

The Department of Natural Resources is responsible for weed management on some state lands and is also the lead state agency for controlling tamarisk—a state executive order establishes tamarisk eradication as a priority. The department recently published the state's strategic plan for the eradication of tamarisk by 2013. In addition, the department oversees weed management on state lands managed by the Division of Parks and Outdoor Recreation and the Division of Wildlife.

In addition to the Departments of Agriculture and Natural Resources, the state's Department of Higher Education plays a major role in the implementation of the state's strategic weed management plans by supporting education, research, and outreach. Colorado State University's agricultural research station and cooperative extension service play a major role in research and outreach. Also, the state Department of Transportation incorporates weed management principles into the construction, operation, and maintenance programs on the state highways. For fiscal year 2002, the Colorado Department of Transportation's weed control funding was estimated to be \$3 million.

Other weed management activities are organized along county lines. Most of Colorado's counties have a weed board and weed supervisor. The counties maintain most of the state's transportation corridors and also work with private landowners to manage their own weeds. We did not attempt to obtain information on funding in all of the state's counties.

Few municipal governments have dedicated weed control programs, according to the state weed coordinator. To the extent that cities own and manage parks and other public lands, weed control is part of general

maintenance. For example, the city of Steamboat Springs employs an open space supervisor who manages weeds part time.

Cooperative and private entities. Cooperative weed management areas now cover about half the state; state funding has supported these areas. For example, in 1998, the Colorado Noxious Weed Management Fund provided a \$5,000 grant to organizations in the Upper Arkansas River Valley, located in the south central part of the state, as an incentive to create a watershedwide partnership to coordinate weed management planning. As a result, a weed management area representing eight counties was formed. The area received about \$92,000 between 1999 and 2002 to, among other things, purchase equipment and supplies to control such weeds as leafy spurge and knapweed.

Idaho

Idaho has a state weed coordinator, an invasive species council, and a strategic plan that addresses weeds.

Weed species posing serious threats in the state. Idaho lists 36 noxious weeds, and the state is in the process of ranking them in order of priority for treatment. Some of the most serious threats are yellow star thistle, which is now found throughout the state, and several species of hawkweeds, knapweeds, and knotweeds, all of which diminish the health of rangeland. Recent invaders that could have a serious impact on Idaho lands are Japanese knotweed and tamarisk, both aggressive weeds capable of crowding out other vegetation and animal habitat. Neither is on the state's noxious weed list.

Legal framework relevant for invasive and noxious weeds. The state's noxious weed law gives the Idaho Department of Agriculture the authority to designate noxious weeds and devise rules and regulations to carry out the provisions of the law.² The law also establishes a state weed coordinator to carry out these duties and responsibilities for the director of the Department of Agriculture. The law places the responsibility for controlling weeds upon all landowners, and requires county weed superintendents to inspect lands for weeds and take enforcement actions, when necessary. Idaho also has a seed law that authorizes the Department of Agriculture to regulate and control the spread of noxious weed seeds

²IDAHO CODE § 22-2403.

through inspection, testing, and stopping the sale of contaminated agricultural seeds.

In 1996, the Department of Agriculture sponsored a workshop that resulted in an agreement between the public and private sector to develop a statewide strategic plan and noxious weed list, and to cooperate in identifying problems and better ways to use resources. In February 1999, Idaho published its strategic plan to heighten the general public's awareness about the damage nonnative weeds were causing to state lands and to establish statewide cooperation to halt their spread and restore infested lands and waters. The plan also recommended the statewide formation of cooperative weed management areas. Through a 2001 gubernatorial executive order, Idaho established an invasive species council to provide statewide policy direction and planning.

Federal weed management infrastructure within the state. The Forest Service and BLM own 20.5 million and 11.8 million acres, respectively, of noncultivated forest and rangeland. In addition to conducting work on their own lands, both agencies distribute federal funds to state agencies and cooperative weed management areas in Idaho. Since 1999, Idaho has received about \$500,000 per year in federal funds through BLM's land resources appropriation account at the direction of House and Senate appropriations committees. Beginning in fiscal year 2001, the Forest Service's State and Private Forestry Program also started providing funds to the state Department of Agriculture for weed management, including \$812,578 in fiscal year 2004. Over the past 5 years, federal funds have constituted about 72 percent of the total funds state agencies have used for weed management. Forest Service and BLM staff also assist state weed officials in designing their yearly weed management programs. Additionally, federal staff make in-kind contributions by donating equipment, volunteer labor, and other services. For example, federal employees volunteer during weed workdays conducted on both federal and nonfederal lands.

State, county, and municipal governments' weed management infrastructure. The director of the Department of Agriculture is responsible for enforcing the state's noxious weed law and distributing federal funds. In fiscal year 2004, the department spent about \$388,000 on weed management. The director has a state noxious weed advisory committee to assist in developing, modifying, and directing a statewide noxious weed management strategy, and in helping evaluate cost-share projects and research proposals. The director also can call for annual weed

plans and end-of-year reports from each county, cooperative weed management area, and other state departments. In addition to working with weed management areas and counties, state agencies participate in other multijurisdictional efforts. For example, state agencies belong to the Hawkweed Biological Control Consortium, along with BLM, Forest Service, and government agencies in Montana, Washington, and British Columbia, Canada.

At the county level, weed management usually consists of a board of county commissioners and weed management area volunteers. The commissioners allot county departments their general budget, and the departments in turn determine the amount of funds they will use to treat weeds as part of their general property maintenance. The commissioners also contribute to local weed management areas and work with them to obtain federal weed management cost-share funds. Additionally, counties usually support weed management by providing herbicides during “weed workdays,” when volunteers from public and private entities come together to treat infested areas across jurisdictional boundaries.

In the three counties we reviewed, infrastructure and funding for weeds varied depending on the tax base. For example, Ada County’s tax base is large enough to support seven full-time employees. Since the county does not require external funds, it does not belong to a cooperative weed management area. In contrast, Adams County has found it difficult to establish and maintain a weed management infrastructure because it has fewer tax dollars. (Adams’s tax base is smaller because the federal government owns about 65 percent of the county and it has a smaller population.) It hired a weed superintendent in 2003, when it obtained federal and state dollars to fund the position. Washington County has three full-time employees devoted to weed control. One project the county has managed with federal funds uses goats to graze on leafy spurge, although officials commented to us that the county had to provide all initial funding because the federal funds arrived about 8 months after they were committed.

Idaho municipalities do not have active weed management programs or full-time weed managers. Instead, municipalities generally have agreements with either counties or weed management areas to treat noxious weeds on municipal property not covered by their own departments as part of general maintenance. Municipalities have nuisance ordinances that restrict the height of weeds and require weed cleanup to avoid fire hazards on private property. Additionally, they sponsor

community cleanup days in which federal, county, and local government employees and volunteers participate.

Cooperative and private entities. Cooperative weed management areas are the key component of Idaho's strategic weed plan. The Department of Agriculture uses the areas to distribute federal and state weed funds based on the quality of their grant proposals. Each weed management area has its own steering committee to advise members on developing and implementing integrated weed management plans and strategies. A few Idaho counties are not part of a weed management area either because they do not require external funds or because they do not have the grassroots support to form one. According to officials, a few counties have refused to participate because the federal government will not commit to a partnership and provide consistent financial assistance.

The Nature Conservancy is a nongovernmental organization active in weed management in Idaho. It has worked with weed managers from all sectors on both private and public lands and has emerged as a principal in providing leadership and resources in the state. Conservancy staff chair the Idaho Weed Awareness Campaign and the Idaho Weed Coordinating Committee. On the ground, The Nature Conservancy is using new technologies such as the Global Positioning System and geographic information systems, as well as partnerships and public awareness campaigns, to detect, prevent, and control weeds.

Maryland

Maryland has an invasive species council but not a state weed coordinator or a strategic plan that addresses weeds.

Weed species posing serious threats. The invasive species council names 34 invasive plant species of concern in Maryland. Several of these species stand out as being particularly harmful. For example, according to state estimates, thistles (five species), Johnsongrass and shattercane cause \$15 million in agricultural losses annually. Other weeds, such as garlic mustard, kudzu, and mile-a-minute, are problems in forests and other natural areas.

Legal framework for invasive and noxious weeds. Maryland has had a noxious weed law since 1969, which lists Johnsongrass, shattercane, and thistles (including musk, nodding, Canada, bull, and plumeless thistle) as noxious weeds that are regulated by the Department of Agriculture. The law emphasizes protecting agricultural lands from harmful weeds. It requires landowners to control or eradicate any infestations of listed weeds

and prohibits the transport of noxious weeds in any form capable of growth. In 2004, owing to control costs, the Departments of Agriculture and Natural Resources opposed an attempt in the state legislature to add mile-a-minute weed to the noxious weed list. According to an analysis of the proposal, adding the weed to the list—it grows in every county—would cost the state government an estimated \$1.5 million per year to assist counties and private landowners with control efforts.

Federal weed control infrastructure in the state. Of the four land management agencies we reviewed, the National Park Service and the Fish and Wildlife Service have the most significant land holdings in Maryland. The National Park Service's National Capital Region Exotic Plant Management Team carries out weed control on five national parks that total about 42,000 acres. In addition to scheduling activities based on the needs of individual parks, the team can quickly respond to infestations, thus filling a rapid response role. Individual park units, however, are responsible for general maintenance on invasive weeds on a routine basis. To do so, these units use funding from their vegetation management fund.

The Fish and Wildlife Service manages five national wildlife refuges in Maryland totaling about 44,000 acres. The refuges are responsible for managing weed infestations found on their lands. For example, the Patuxent Research Refuge uses its biological resources staff and its facilities management staff to conduct weed control activities on its more than 12,000 acres. Because weed efforts are part of general refuge maintenance, refuge officials were unable to estimate how much they spend on weed management.

State, county, and municipal governments' weed control infrastructure. Three departments engage in weed control. The Department of Agriculture has a staff of six weed supervisors who work with 20 of the state's 23 counties to manage weeds—primarily those on the noxious weed list—on agricultural and nonagricultural lands. The department provides grants that the counties match or exceed—about \$80,000 in fiscal year 2004, with counties contributing about \$200,000. For example, the department granted \$3,500 in 2004 to Carroll County, while the county contributed \$18,000 for weed management. The county weed coordinators look for infestations in their counties and work with landowners to remove them. Some of the 20 counties also have a spraying program to conduct weed control for private or public landowners in return for a fee, as well as to treat weeds on county lands. The Department of Agriculture's fiscal year 2004 budget for weed control, including the county grant programs, was \$310,000.

In the Department of Natural Resources, individual natural resource land units—including forests, wildlife areas, and state parks—conduct weed management as part of general operations. Funding for these efforts comes from general operating budgets; the department was not able to estimate how much it spends. The department is currently exploring the creation of “weed teams” similar to ones used by the National Park Service.

At the Department of Transportation, the highway administration is responsible for weed control on 5,700 miles of state-managed roads. According to an administration official responsible for vegetation management, an estimated 40 percent of those roads are infested with state-listed noxious weeds. In addition, the administration conducts control efforts for weeds that are not on the state list. In fiscal year 2004, the administration spent \$2 million on vegetation management, of which less than \$50,000 was for control of thistles, Johnsongrass, and phragmites (the latter of which is not on the state’s noxious weed list).

In addition to joint efforts with the Department of Agriculture, some counties have their own weed management programs. For example, Montgomery County has a voluntary “Weed Warriors” program to control weeds on about 32,500 acres of county parklands. The park system has a few natural resources staff who work part time on weeds, as well as maintenance crews, but it does not set aside any funding specifically for weed management.

According to state officials we spoke with, municipalities in Maryland are generally not active in weed management. In Baltimore, however, the city’s Department of Recreation and Parks recently began work to control weeds in city parks, and in 2004 received a Pulling Together Initiative grant for \$39,500. The city will, as a result of that grant, conduct weed control on six different sites. Weed efforts in the city are otherwise few in number. The city of Frederick requires landowners to cut down weeds that the city determines to be a nuisance. If the owner does not comply with such an order, the city can perform that work and charge the landowner for it.

Cooperative and private entities. The Maryland Invasive Species Council, begun in 2000, includes members representing state, federal and private interests. The council shares ideas and knowledge and helps increase public awareness of invasive species issues, but is not statutorily established. According to state officials, however, Maryland does not have any cooperative weed management areas and the high degree of

urbanization and fragmented land ownership makes the creation of these types of collaborative entities difficult.

Private landowners can receive support for weed management from various sources. For example, the USDA's Natural Resources Conservation Service and the state's Department of Natural Resources provide cost-share funds to landowners for phragmites control. Nongovernmental landowner organizations such as The Nature Conservancy manage noxious and other weeds on their lands. The conservancy owns 31 preserves in the state totaling 62,000 acres; it uses its own resources, as well as volunteer labor, to control weeds. Other groups, such as the Maryland Native Plant Society, run volunteer efforts to control weeds on public lands throughout the state.

Mississippi

Mississippi does not have a state weed coordinator, an invasive species council, or a strategic plan for addressing weeds.

Weed species posing serious threats. The state lists eight species of noxious weeds: Brazilian satintail, Chinese tallow tree, cogongrass, giant salvinia, hydrilla, itchgrass, kudzu, and tropical soda apple. Six of these weeds are also on the federal noxious weed list (Chinese tallow tree and kudzu are not). Cogongrass, which has been named the seventh worst weed in the world, is found in more than half of Mississippi's counties, and kudzu is a major problem primarily in the northern part of the state. Other weeds of concern harm agricultural and natural areas in Mississippi, such as Chinese tallow tree, smutgrass, and tropical soda apple, but most of the weed control work concerns either cogongrass or kudzu.

Legal framework for invasive and noxious weeds. In 2004, Mississippi amended its Plant Pest Act regulations to list the eight noxious weeds. The Department of Agriculture and Commerce regulates the transportation of the listed weeds and inspects for them at nurseries. However, the law does not require Mississippi landowners to manage any infestations of listed noxious weeds on their property.

Federal weed control infrastructure within the state. Mississippi is host to federal lands managed by three of the land management agencies we reviewed. The Forest Service manages about 1.1 million acres in six national forests. Its Southeastern regional office provides advice and guidance to individual forests and districts. The Forest Service funds weed management out of general vegetation management funds. For example, the Holly Springs National Forest's major weed problem is kudzu, which

infests about 22,500 of its 150,000 acres. Holly Springs used about \$42,000 from its overall vegetation management budget to treat 185 acres of kudzu in fiscal year 2004. According to forest officials, they are limited in their ability to treat kudzu because they have not analyzed the potential impact of treating the kudzu with herbicides, as the National Environmental Policy Act requires.

In contrast to the efforts on kudzu, the national forests in Mississippi have worked together to create a “programmatic” environmental assessment to use herbicides on cogongrass. While the forests still have to conduct site-specific assessments in certain areas, the programmatic assessment streamlines the process for cogongrass treatment in many areas of the Mississippi National Forest. According to the Forest Service, this means that infestations, when found, can be controlled in a timely manner. According to the environmental assessment, it can take up to three years to conduct the analysis and public notification to comply with the environmental requirements of the National Environmental Policy Act, during which time an infestation is likely to spread further.

The National Park Service’s Gulf Coast Exotic Plant Management Team is responsible for conducting weed control on three national park units in Mississippi covering about 88,000 acres. The team has targeted kudzu infestations for control along the Natchez Trace Parkway and in Vicksburg National Military Park. Additionally, the team has targeted Chinese tallow tree, Chinese privet, and Japanese honeysuckle for control on Gulf Islands National Seashore.

The Fish and Wildlife Service manages 14 national wildlife refuges in Mississippi. Individual refuges are responsible for managing weeds on their own land and use funds from refuge operations and invasive species funds. The regional office assists refuges in developing long-term comprehensive conservation plans and provides other guidance to refuges. As an example of a conservation plan, the plan for the Noxubee National Wildlife Refuge discusses efforts to control exotic and invasive plants, including its use of monitoring and integrated pest management.

State, county, and municipal governments’ weed control infrastructure. Three state entities engage in weed control. The Department of Agriculture and Commerce is in charge of implementing the state’s noxious weed law and is the lead agency in the state’s cogongrass task force. Its regulatory activities include restricting the transportation of listed weeds and conducting nursery inspections to look for seeds of the listed weeds. While

the department provided close to \$100,000 from its own budget in fiscal year 2004 for weed management efforts, it has also relied on federal grants to help control cogongrass. For example, it received a \$25,000 grant from the Pulling Together Initiative in 2004 to supply private landowners with herbicides for spraying cogongrass. The department also has received about \$220,000 from USDA's Animal and Plant Health Inspection Service to control cogongrass. With this funding, it provided cost-share funds to a total of 218 landowners in 2004 (the department received applications from 600 landowners).

The Department of Transportation controls weeds along state-owned roadways—of which there are 27,270 miles—and spent about \$2.5 million on chemical weed control in fiscal year 2003 out of its general operating budget.

The Forestry Commission in Mississippi conducts weed control on about 500,000 acres of state-managed forests, as well as on privately owned nonindustrial forests in exchange for fees. Since the commission is mostly concerned about timber production, it focuses on controlling weeds that affect timber harvests. The Forest Service's State and Private Forestry program provides much of the commission's funding for weed management, including about \$25,000 in fiscal year 2004. Private landowners reimbursed the commission about \$177,000 for weed management work its crews did in fiscal year 2004.

State officials said that neither counties nor municipalities are active in weed management in Mississippi.

Cooperative and private entities. The Mississippi Exotic Plant Pest Council, which consists of over 30 organizations, was formed to raise awareness about invasive weeds and share knowledge. While the state does not have weed management areas, it does have species-specific groups. For example, a group of 17 federal, state, and local entities formed a cogongrass task force in 2002 to cooperatively fight the weed. In addition, the district ranger at Holly Springs National Forest took the initiative to form a kudzu-specific group. Though this group is not formal, members are interested in educating the public and sharing knowledge about kudzu control. In addition, some federal, state, and nongovernmental entities have formed an alliance to more effectively share information and coordinate invasive species management activities in Mississippi.

Private landowners, including nongovernmental organizations, are also involved in weed management. The Nature Conservancy, for example, manages weeds on about 10,000 acres of land it owns. Its wetland mitigation program, in which developers pay a fee for wetland restoration to offset wetland losses due to development, is a source for some of its weed management funding, according to a Conservancy official in Mississippi. Some private landowners have also received funding from government sources. For example, USDA's Natural Resources Conservation Service's Environmental Quality Incentives Program provided \$165,000 in cost-share funds to 82 Mississippi landowners in fiscal year 2003 and, as noted earlier, the state Department of Agriculture and Commerce offered a \$220,000 cost-share program for cogongrass. Additionally, the Forestry Commission provides cost-share funds, through its Forest Resource Development Program, to forest owners for weed management. In fiscal year 2004, this program provided about \$900,000 for forest regeneration and improvement activities, including weed management.

Description of Federal Agency Programs Supporting Invasive Weed Management Work on Nonfederal Lands

Table 6 identifies major programs at the U.S. Department of Agriculture (USDA) and the Department of the Interior that directly support weed control, the objectives of those programs, the estimated amount of funding provided, and the overall amount of funding available through the program.

Table 6: USDA and Interior Funding Programs Known to Have Provided Support for Invasive Weed Management by Nonfederal Entities, Fiscal Year 2004

Entity	Program and objectives	Recipients	Fiscal year 2004	
			Weed funding	Total program funding
National Fish and Wildlife Foundation	<p>Pulling Together Initiative^a</p> <p>Objective: to build capacity at the local level to manage invasive weeds by supporting the creation of weed management areas.</p>	Private nonprofit organizations, local, county, and state government agencies, and field staff of federal agencies	\$1.3 million	\$1.3 million
Montana State University ^b	<p>Center for Invasive Plant Management CWMA Grants^c</p> <p>Objective: support the establishment or enhancement of weed management areas.</p>	Must be actively involved in establishing or enhancing a weed management area in the western United States	\$121,660	\$121,660

Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands

(Continued From Previous Page)

Entity	Program and objectives	Recipients	Fiscal year 2004	
			Weed funding	Total program funding
Interior				
Departmentwide	<p>Cooperative Conservation Initiative Conservation Challenge Cost Share (managed by BLM, NPS, and FWS)</p> <p>Objectives:</p> <p>BLM—to leverage federal dollars with private and state funding for conservation efforts, benefiting resources on BLM lands.</p> <p>NPS—to increase the participation of neighboring communities and qualified partners in preserving and improving the cultural, natural, and recreation resources for which the service is responsible.</p> <p>FWS—to foster innovative and creative cooperative efforts to restore natural resources and establish or expand wildlife habitat, with an emphasis on federal lands and resources.</p>	Private and public organizations, tribal interests, and individuals	\$7.7 million	\$21.2 million
Fish and Wildlife Service	<p>Partners for Fish and Wildlife</p> <p>Objective: This voluntary habitat restoration program provides financial assistance and restoration expertise to private landowners, tribes, and others who desire to improve the condition of fish and wildlife habitat on their land.</p>	All private lands, including tribal, Hawaiian homelands, and other nonfederal and nonstate entities	\$7.3 million	\$42.4 million
	<p>Tribal Wildlife Grants</p> <p>Objective: to develop wildlife conservation plans and on-the-ground conservation projects benefiting at-risk species. Invasive species control is not the main purpose.</p>	Federally recognized tribes	\$478,000	\$5.9 million

**Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands**

(Continued From Previous Page)

Entity	Program and objectives	Recipients	Fiscal year 2004	
			Weed funding	Total program funding
	<p>Private Stewardship Grants</p> <p>Objective: to provide financial assistance for on-the-ground conservation projects on private lands to benefit at-risk species. Projects that benefit at-risk species through invasive species control may be eligible.</p>	Groups and individuals engaged in conservation activities on private lands	\$2.4 million	\$7.4 million
USDA				
Forest Service	<p>Cooperative Forest Health Management Program</p> <p>Objective: to support and maintain forest health, which includes developing weed management programs on state and private land.</p>	Cooperative weed management areas, states, and nonprofit organizations	\$5.2 million	\$44.7 million
Natural Resources Conservation Service	<p>Wildlife Habitat Incentives Program</p> <p>Objective: This voluntary program helps people develop and improve wildlife habitat primarily on private land.</p>	Private landowners, owners of federal land when the primary benefit is on private or tribal lands, state land, local government land on a limited basis, owners of tribal land	No estimate available (\$4 million estimated for 2003)	No estimate available (\$21.2 million in 2003)
	<p>Environmental Quality Incentives Program</p> <p>Objective: to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. The program offers financial and technical help to assist participants install or implement structural and management practices on eligible agricultural land.</p>	Persons who are engaged in livestock or agricultural production on eligible land	No estimate available (\$8.2 million for 2003)	No estimate available (\$627 million in 2003)

**Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands**

(Continued From Previous Page)

Entity	Program and objectives	Recipients	Fiscal year 2004	
			Weed funding	Total program funding
	<p>Agricultural Management Assistance Program</p> <p>Objective: to provide cost-share assistance to agricultural producers to address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations. Producers may construct or improve water management structures or irrigation structures; plant trees for windbreaks or to improve water quality; and mitigate risk through production diversification or resource conservation practices, including soil erosion control, integrated pest management, or organic farming.</p>	Agricultural producers	No estimate available (\$7,000 estimated for 2003)	No estimate available (\$9.9 million in 2003)
	<p>Conservation Innovation Grants</p> <p>Objective: to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection in conjunction with agricultural production.</p>	Nonfederal governmental or nongovernmental organizations, tribes, or individuals	\$93,750	\$14.3 million
	<p>Wetlands Reserve Program</p> <p>Objective: to offer landowners the opportunity to protect, restore, and enhance wetlands on their property.</p>	Landowners of nonfederal lands and tribes	Unknown: NRCS reported that the program supported weed management, but could not estimate expenditures	\$274.8 million

Sources: USDA and Interior.

^aFunded by Interior's Fish and Wildlife Service, BLM, and National Park Service; USDA's Forest Service and Animal and Plant Health Inspection Service; and the Department of Defense.

^bThe Senate and House Appropriations Committees have directed funds from BLM's land resources appropriations account to go to the center.

^cGrant program created by Montana State University and the Center for Invasive Plant Management, not by BLM or Congress.

In addition to the federal natural resource conservation programs known to provide support for weed management, others could potentially be used for

Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands

that purpose. The programs listed in table 7 are those that USDA and Interior have identified as being potential sources of funding.

Table 7: USDA and Interior Funding Sources That Could Potentially Support Invasive Weed Management by Nonfederal Entities

Entity	Program and objectives	Recipients	Fiscal year 2004 total program funding
Interior			
Departmentwide	<p>Hazardous Fuels Reduction Program</p> <p>Objective: to reduce hazardous fuels to reduce the threat of catastrophic wildfire.</p>	State and local governments and nongovernmental organizations	\$183.9 million
National Park Service	<p>Rivers, Trails, and Conservation Assistance Program</p> <p>Objective: to work with community groups and local and state governments to conserve rivers, preserve open space, and develop trails and greenways. Invasive species control is not the main purpose.</p>	Local government agencies and nonprofit organizations	\$8.2 million
Fish and Wildlife Service	<p>Landowner Incentive Program</p> <p>Objective: to establish or supplement existing landowner incentive programs that provide technical or financial assistance, including habitat protection and restoration, to private landowners to benefit species at risk. Projects that achieve this through invasive species control may be eligible.</p>	States	\$25.9 million
	<p>Tribal Landowner Incentive Program</p> <p>Objective: to develop on-the-ground conservation projects benefiting species at risk. Projects that achieve this through invasive species control may be eligible.</p>	Federally recognized tribes	\$2.9 million
	<p>Wildlife Restoration Program</p> <p>Objective: to provide funding for the selection, restoration, rehabilitation, and improvement of wildlife habitat, wildlife management research, and the distribution of information produced by the projects. Invasive species control is not the main purpose.</p>	States	\$194.9 million

**Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands**

(Continued From Previous Page)

Entity	Program and objectives	Recipients	Fiscal year 2004 total program funding
	<p>State Wildlife Grants</p> <p>Objective: to develop wildlife conservation plans and on-the-ground conservation projects. Invasive species control is not the main purpose.</p>	States	\$61.1 million
	<p>North American Wetlands Conservation Act</p> <p>Objective: to provide funding assistance to promote conservation of wetlands and associated habitats for migratory birds and other wildlife. Invasive species control is not the main purpose.</p>	Private and public organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico	\$37.5 million
USDA			
Natural Resources Conservation Service	<p>Grassland Reserve Program</p> <p>Objective: to help landowners restore and protect grassland, rangeland, pastureland, shrubland, and certain other lands and provide assistance for rehabilitating grasslands.</p>	Private and tribal landowners	\$69.4 million
	<p>Conservation Technical Assistance</p> <p>Objective: to provide technical assistance for planning and implementing natural resource solutions to reduce erosion, improve soil health, improve water quantity and quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and range health, reduce upstream flooding, improve woodlands, and address other natural resource issues.</p>	Private land users, communities, units of state and local government, and other federal agencies	No estimate available
Farm Service Agency/Natural Resources Conservation Service	<p>Conservation Reserve Program</p> <p>Objective: to reduce soil erosion, protect the nation's ability to produce food and fiber, improve water quality, establish wildlife habitat, and enhance forest and wetland resources. It encourages farmers to convert environmentally sensitive acreage to vegetative cover, including native grasses.</p>	Individuals or groups who have owned certain types of cropland or pastureland	\$1.7 billion

Appendix IV
Description of Federal Agency Programs
Supporting Invasive Weed Management Work
on Nonfederal Lands

(Continued From Previous Page)

Entity	Program and objectives	Recipients	Fiscal year 2004 total program funding
	<p>Conservation Reserve Enhancement Program</p> <p>Objective: This voluntary land retirement program helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water.</p>	<p>A partnership among farm producers; tribal, state, and federal governments; and, in some cases, private groups</p>	<p>Funded out of the Conservation Reserve Program</p>

Sources: USDA and Interior.

Comments from the Department of the Interior

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



United States Department of the Interior

OFFICE OF THE ASSISTANT SECRETARY
POLICY, MANAGEMENT AND BUDGET
Washington, DC 20240



FEB - 9 2005

Ms. Robin M. Nazzaro
Director, Natural Resources and Environment
United States Government Accountability Office
441 G Street, NW
Washington, D.C. 20548-0001

Dear Ms. Nazzaro:

The Department of the Interior (Department) is pleased to provide comments in support of the February, 2005 draft report entitled, "Invasive Species: Cooperation and Coordination are Important for Effective Management of Invasive Weeds." This report adds to the body of substantial information calling for expanded cooperative and collaborative efforts at all levels of government to control and eradicate invasive plants – all with the goal to restore natural and agricultural areas adversely impacted across our great nation.

The Department plays an expanding role in invasive species management within a broader conservation agenda including collaboration, consultation, and cooperation with partners. We are pleased to see the report emphasize these approaches. One such, notable example is an inclusive alliance of cooperating agencies, Tribes, Federal and State organizations, and individuals across the West who have banded together to form Team Tamarisk a group devoted to controlling tamarisk and associated non-native invasive plants. Tamarisk is an especially tenacious, undesirable invasive shrub that can cause a wide variety of economic, environmental, and public health and safety problems. It annually consumes an extra 2-3 million acre-feet of water out of western rivers in comparison to the consumption of native vegetation, stealing this precious resource from fish, wildlife, farmers, and faucets in western cities. It also burns even when it is green, making it a year-round fire hazard. Team Tamarisk is fighting the tamarisk wars head-on, developing a strategic approach to eliminate this nuisance. At a landmark conference sponsored in March 2004 by the Departments of the Interior and Agriculture, the National Invasive Species Council, the National Association of Counties, and numerous other organizations and agencies, more than 400 individuals came together to develop a set of principles to help guide tamarisk control work. By working together, we can make progress in addressing this invasive species challenges.

We further commend the attention paid to natural or non-production areas as significant contributors to our nation's biological and natural resources heritage. Historically, these areas have not received as much attention as areas raising commodities.

The Department supports the recommendation of the report: that the Secretary of Agriculture assure collaboration within and among the several USDA and DOI agencies and bureaus having

Appendix V
Comments from the Department of the
Interior

2

experience with invasive weeds for (1) developing funding allocation models informed by lessons learned in previous efforts, and (2) determining in consultation with other technical advisor experts which entities should receive additional funding under the Noxious Weed Control and Eradication Act of 2004.

The Secretary, as co-chair of the National Invasive Species Council (NISC) along with the Secretaries of Commerce and Agriculture, supports approaching this issue through NISC and its Invasive Species Advisory Committee.

We note that the report states “we use the term “invasive weeds” to refer to all native and nonnative terrestrial plants that could threaten the environment.” This definition of invasive plant used in the GAO report is different from the definition of invasive species established by EO 13112 which defines an “invasive species”... as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.” EO 13112 defines “alien species”... with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.”

Four Interior bureaus – the Bureau of Land Management, the National Park Service, the U.S. Fish and Wildlife Service and the U.S. Geological Survey – have reviewed the report, provided comments and some technical corrections relating to funding data and the number of acres infested by weeds. I trust that you will incorporate them as you see fit in the final report either by addendum or by updating certain tables in the body of the text.

If you have further questions, please contact Dr. James Tate, Science Advisor to the Secretary, at (202) 208-7351.

Sincerely,



P. Lynn Scarlett
Assistant Secretary for Policy,
Management and Budget

Enclosure

See comment 1.

The following are GAO's comments on the Department of the Interior's letter dated February 9, 2005.

GAO Comments

1. We recognize that the definition of invasive weeds we use in the report is inconsistent with the definition of invasive species in Executive Order 13112. The primary difference is that our definition includes species that are native to a particular ecosystem whereas the Executive Order includes only those that are nonnative. We chose to use the broader definition because we were gathering information on entities that manage weeds in general, and not just those that are nonnative. This distinction has been added to the report.

GAO Contact and Staff Acknowledgments

GAO Contact

Trish McClure, (202) 512-6318

**Staff
Acknowledgments**

In addition to the individual named above, Ross Campbell, Judy Pagano, Matt Rosenberg, Dawn Shorey, Carol Shulman, Maria Vargas, and Amy Webbink made key contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Paul Anderson, Managing Director, AndersonP1@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548