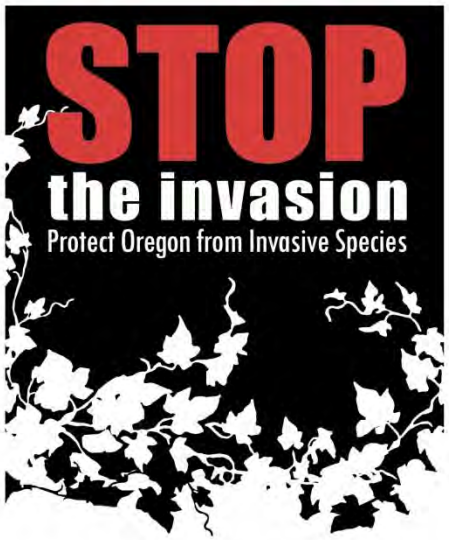
A STATEWIDE MANAGEMENT ASSESSMENT OF INVASIVE SPECIES IN OREGON

February 2010



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EXECUTIVE SUMMARY

The Oregon Invasive Species Council initiated an effort in 2009 to conduct a statewide management assessment of invasive species in Oregon to provide a big picture framework for existing management plans, identify areas where legislation is needed to fill gaps in statutory authority, suggest priority policy issues, identify areas where there is overlap or redundancy in addressing invasive species, enable people to better understand the legal framework, enable financial supporters of invasive species projects to allocate dollars to highest priority areas for combating invasive species and to fill gaps in management, and define roles and responsibilities for managing invasive species.

The Council contracted with Creative Resource Strategies, LLC, to develop and implement the assessment and report to the Council on its findings. The project included a review of existing authorities, role, and responsibilities, development of a survey instrument, and analysis of data, followed by recommendations to enhance Oregon's ability to respond to invasive species issues.

Oregon expended an estimated $26,362,404 on invasive species-related activities in 2008.[1] Analyses were conducted to determine the source of funds for invasive species as well as who ultimately expended those funds, and for what invasive species activities.

Federal agencies are the largest funder for invasive species activities in Oregon ($16,668,890), followed by state agencies ($5,169,971), local governments ($3,494,453), nonprofit organizations ($497,596), industry and out-of-state entities as well as public and private foundations ($327,835), academic institutions ($165,660), and tribal governments ($38,000).[2]

Of the $6,849,756 disbursed from all entities in Oregon for invasive species activities in 2008, federal agencies disburse the most—$4,334,890, followed by state agencies ($1,748,174), industry and private foundations ($408,616), local governments ($320,076), and tribes ($38,000).

Federal agencies spent a total of $17,156,390 on invasive species in 2008 ($3,823,000 on salaries and benefits, $8,998,500 on operations, and $4,334,890, which they disbursed to other entities). They received a total of $487,500 from other federal entities, thus their total investment in invasive species in Oregon in 2008 was $16,668,890.

State agencies spent a total of $8,292,899 on invasive species in 2008 ($3,906,631 for salaries and benefits, $2,638,094 for operations, and $1,748,174, which they disbursed to other entities). They received a total of $3,122,928 from other entities, thus their total investment in invasive species in Oregon in 2008 was $5,169,971.

State agencies received a total of $3,122,928 from other agencies (primarily federal—Bureau of Land Management, USDA Forest Service, and USDA-APHIS Plant Health, Plant Protection and Quarantine) to supplement invasive species activities.

[1] This does not include control by homeowners, timber companies, and others.

[2] These numbers are total operational costs plus salary/benefits, plus disbursements, minus incoming funds—to reflect the true source of funding, not actual expenditures. Actual expenditures were calculated separately (see next two paragraphs).

Local governments spent a total of $4,717,854 on invasive species activities in 2008 ($3,083,160 for salaries and benefits, $1,634,694 for operations, and $320,076, which they disbursed to other entities). They received a total of $1,543,477 from other entities, thus, their total investment in invasive species in Oregon in 2008 was $3,494,453.

Nonprofit organizations spent a total of $1,581,613 on invasive species activities in 2008 ($607,378 for salaries and benefits and $974,235 for operations). They did not report any disbursements. They received a total of $1,084,017 from other entities, thus their total investment in invasive species activities in Oregon in 2008 was $497,596.

Academic institutions spent a total of $1,136,972 on invasive species activities in 2008 ($944,381 for salaries and benefits and $192,591 for operations). They did not report any disbursements. They received a total of $971,313 from other entities, thus their total investment in invasive species activities in Oregon in 2008 was $165,659.

Industry, entities outside the state of Oregon, commissions, and private and public foundations contributed $327,835 to invasive species activities in 2008.

HOW ARE FUNDS BEING SPENT?

Federal agencies spent a total of 45% of their invasive species funds on management and control, followed by 10% on policy work, 9% on prevention, 8% on monitoring/surveillance, coordination, and EDRR, 5% on outreach and education, and 2% on both effectiveness monitoring and research (Table 11, Figure 35). Figure 36 shows the relative amounts of funding spent on operations, salary/benefits and disbursements categories.

State agencies spent a total of 63% of their invasive species funds on management and control, followed by 18% on monitoring and surveillance, 5% on outreach and education, 4% on coordination, 3% on EDRR, 2% on effectiveness monitoring, policy work, and prevention, and 1% on fundraising (Table 14, Figure 40). The two primary state agencies that allocate funds to local governments and organizations are OWEB and ODA.

Local entities spent a total of 64% of their invasive species funds on management and control, followed by 7% on outreach and education, 6% on monitoring and surveillance, 5% each on coordination and EDRR, 4% each on effectiveness monitoring and prevention, 2% each on policy work and other activities, and 1% each on fundraising and research.

Nonprofit organizations spent a total of 49% of their invasive species funds on management and control, followed by 9% on monitoring and surveillance,8% each on outreach and education and coordination, 7% on EDRR, 4% each on fundraising and research, 3% on policy work, effectiveness monitoring and other activities, and 2% on prevention.

Of the $1,136,972 academic institutions spent on invasive species activities in 2008, they spent a total of 44% on research, 21% on outreach and education, 17% on EDRR, 8% on fundraising, 3% each on policy work, coordination, and other activities, 1% on effectiveness monitoring, and less than 1% on management and control, prevention, and monitoring and surveillance (Table 23, 24, 25 and Figure 51).

Entities in Oregon reported spending an estimated $27,012,408 on invasive species activities in 2008 (Table 26). A total of 50% of funding was spent on management and control, followed by 10% on monitoring and surveillance, 6% on outreach and education, prevention, policy work, EDRR, and coordination, 3% each on effectiveness monitoring and research, and 1% on fundraising and other activities (Figure 52).

Outreach and education activities comprised 7% of funds expended in 2008 for invasive species activities. A total of 37% of all funds expended for outreach and education activities in 2008 were expended for nonformal education, followed by printed materials (16%), formal education (13%), training (13%), database management (6%), Internet information (6%), other (5%), audio visual materials (3%), and news (1%).

The majority (51%) of statewide management assessment survey respondents ranked the adequacy of Oregon's invasive species regulations and laws as good, followed by fair, poor, and excellent. A Strengths, Weaknesses, Opportunities, and Threats analysis was conducted to identify critical policy needs. Addressing shortcomings identified in the weaknesses and threats categories should be a high priority for Oregon in the 2011 legislative session.

Two surveys were conducted to determine the needs and wants of invasive species database users as well as the attributes of existing databases. It was determined that there are two potential successful approaches to reduce the ratio of the cost of database management to the benefits users receive from using invasive species databases: short-term, develop minimum standards for the most commonly used databases and develop tools that allow people to query across databases to record and extract information; long-term, analyze the specifics of each of the most commonly used databases, and make recommendations to pool resources and potentially reduce the number of databases while increasing the utility of those in existence. The OISC database subcommittee is pursuing both approaches.

The most common method to evaluate program effectiveness in 2008 was outcome-based performance objectives (27%), followed by effectiveness monitoring (20%) and met the requirements of a contract (20%), compliance monitoring (14%), and conduct opinion surveys (6%).

Survey respondents ranked management methods and prevention methods as the highest priorities for research and development. Biology/ecology, risk assessments, detection methods, and economics were the second tier of priorities, with almost equal rankings achieved when the most important and second most important categories were added. Post-treatment evaluation was ranked the least important.

The greatest obstacle to effective implementation of invasive species programs was funding. A total of 38% of respondents ranked funding as the most important or second most important obstacle, compared to a total of 14% of survey respondents, who ranked public awareness as the most important or second most important obstacle.

A total of 58% of survey respondents indicated they participate in an EDRR network; however, it is unclear what constitutes an EDRR network. Survey respondents identified numerous basin, local, county, regional, and state EDRR networks—many more than those identified by The Nature Conservancy. These results indicate the need for Oregon to develop a set of best management practices and minimum standards for EDRR

networks to ensure consistent use and application of these networks statewide.

There was no evidence found to support the theory that there are conflicting actions promoted by agencies that contribute to invasive species establishment; however, evidence was found that indicates there are opportunities for collaboration among agencies not being realized and that there are significant gaps relative to planning outcomes.

The report concludes with one key recommendation—development of a top-down/bottom-up strategic plan for Oregon that aligns with the Oregon Conservation Strategy and other federal, regional, state, and local plans—and 30 additional recommendations:

1. Expenditures for recommended invasive species activities need to be clearly identified and align with the highest priorities for the State of Oregon so that a commitment can be obtained to carry out these actions.

2. Agencies and entities responsible for development of plans at all levels need to ensure there is alignment and linkages across those plans, and the cost to implement those plans should be clear.

3. Measurable invasive species performance measures need to be developed to assess the state's success in adequately protecting Oregon and effectiveness monitoring should be used, where appropriate, to evaluate the cost-benefits to Oregon's expenditures on invasive species.

PREVENTION

4. Oregon should strongly support the role of the federal government in invasive species prevention efforts. The federal government is uniqely positioned to protect the country from invasive species introduction through the development of biosecurity measures. Regulating all importation, setting ballast water discharge standards, regulating Internet sales, and other measures by the federal government will allow states to then use their limited resources to focus on management and control of existing invasives. Shutting down vectors and pathways will lessen introductions of invasive species to Oregon.

MONITORING/SURVEILLANCE/EDRR

5. Each county needs an established funded weed district and program so that there are adequate monitoring/surveillance activities to detect invasive species introduction early.

6. Move the state toward the development and use of a few shared databases to track and manage invasive species to make efficient use of resources and enhance sharing of information.

7. Oregon needs to fund programs that provide for experienced/trained individuals to survey for invasive species. A comprehensive statewide EDRR network that includes standards and protocols supported by best management

practices will help to detect and eradicate new invasions of invasive species.

COORDINATION

8. Develop one comprehensive invasive species list/plan that spans all taxa and identifies the highest priorities for funding and management activities and identifies the costs associated with plan implementation.

9. Streamline the management agreement process and ensure there are linkages across different levels of policy and planning.

10. The National Invasive Species Council should serve to coordinate national invasive species efforts and assist states in identifying and addressing regional issues.

11. Develop an invasive species strategic plan for the Pacific Northwest to identify high priority regional issues. In addition, encourage the use of the West Coast Governors Agreement on Ocean Health as a vehicle for facilitating regional consistency, coordinating actions, and promoting federal support for invasive species management goals and programs.

OUTREACH AND EDUCATION

12. Better coordinate amongst all natural resource agencies (locally, statewide, regionally, and where appropriate, nationally) programs and messages that address invasive species instead of developing stand-alone campaigns and agency-focused outreach. For example, all advertising and outreach relative to invasive species issues should have similar branding. Dedicated funding toward coordinated, priority messages about high priority invasive species issues (versus agency-specific or taxa-specific) will help to create an informed public that contributes to lessening the spread of invasive species.

13. Take advantage of opportunities to protect Oregon by looking beyond Oregon's borders and partnering with neighboring states (e.g., firewood outreach campaign).

POLICY

14. Review existing authorities every two years to propose proactive legislation to protect Oregon. Policy development should focus on proactive, horizontal, policies that target prevention—recognized as the most cost-efficient and effective way to deal with invasive species.

RESEARCH

15. Focus future research needs on the development of management and control and prevention methods.

EFFECTIVENESS MONITORING

16. More resources need to be directed into effectiveness monitoring, while more cost-

effective methods for management and control need to be implemented. Some of this streamlining can be achieved by replacing the current voluntary grant-based funding process with direct funding aimed at high priority projects and programs.

17. Opportunities exist to examine more closely the requirements of grant programs for invasive species funding to require effectiveness monitoring as a critical adaptive management function to ensure appropriate design and selection of projects.

FUNDING

18. Oregon needs to develop an alternative system for funding invasive species issues. A medium-term expenditure framework, or a similar system that helps decision makers balance what is affordable in the aggregate against the policy decision of the state, would allow for the development of a consistent and realistic resource framework. This type of approach requires consistent strategic coordination among all entities with authority for invasive species activities in Oregon.

19. A long-term sustainable source of funding for base county invasive species programs needs to be established, and current grant-only programs should be reviewed to determine if another method of allocation would best protect intended habitats for these grants programs—watersheds and agricultural areas.

20. Replace the existing patchy network of federal funding from one or more agencies with base federal funding for each state to address high priority invasive species issues.

21. Develop an initiative to add to the existing state gas tax and implement a modest fee on commercial shipping vessels calling up on our ports to create a source of funding to support invasive species management efforts, supplement the Invasive Species Control Account, and support ballast water management, and hull-fouling prevention activities.

22. Explore opportunities to redirect existing funds to fund high priority invasive species programs in the state—not through expensive and time-consuming grant programs, but through direct funding to initiatives designated as the highest priorities.

23. Oregon needs a $5 million emergency fund, and sustainable funding for invasive species. Oregon needs to take a critical next step to statutorily protect the $5 million emergency fund.

24. Oregon needs to better balance its three-legged stool for invasive species funding to ensure contributions of government, industry, and private funding contribute to a shared responsibility and commitment.

25. Many natural resource-related federal programs currently funded by federal agencies are affected by invasive species. Oregon should support expansion of these federal government programs to allow these programs to expend funds for invasive species.

26. States are creating emergency funds to respond to invasive species emergencies, similar to wildfires. Oregon should promote and support this model at the national level so that a national invasive species emergency fund exists.

27. An implementation plan for the Oregon Conservation Strategy should be developed, and natural resource funding should be pooled and funneled to the highest priorities to implement the strategy and its six key conservation areas.

MANAGEMENT/CONTROL

28. Review existing state statues and authorities to determine if there are opportunities for agencies to share responsibilities for invasive species management (i.e., create more horizontal policies).

29. Agencies need adequate ongoing training to ensure staff understands existing authorities and regulations.

30. Proactive horizontal policies need to be developed to share the burden all natural resources agencies must carry to protect native fish and wildlife habitats and water quality. In particular, existing policy shortcomings, identified in the SWOT analysis of this report, should be addressed immediately.

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BACKGROUND

Invasive species pose enormous economic and ecological threats to the State of Oregon. Invasive species—defined by Oregon statute as nonnative organisms that cause economic or environmental harm and are capable of spreading to new areas of the state—cost Oregon taxpayers millions of dollars in lost revenue each year, and threaten the continued survival of native birds, fish, and wildlife.

Numerous agencies, academic institutions, nonprofit organizations, landowners, and other entities play a major role in preventing new invasions and stopping the spread of existing ones. However, lack of strategic coordination and efficient methods to share information, gaps in authority for some areas of invasive species management, poor state and federal budget climates that have reduced funding for many invasive species programs in recent years, and misalignment between policy priorities and sources of funding are creating increasing challenges that threaten Oregon's economy, environment, and the quality of life of its citizenry.

In June of 2008, the Oregon Invasive Species Council hosted the first statewide summit on invasive species in Oregon. One outcome of the summit was an expressed need to conduct a statewide management assessment of invasive species in Oregon to:

- Provide a big picture framework for existing management plans, such as the Noxious Weed Strategic Plan and the Aquatic Nuisance Species Management Plan;
- Identify areas where legislation is needed to fill gaps in statutory authority for the effective management of invasive species;
- Suggest priority policy issues that state agencies should consider when developing new policies and management plans;
- Identify areas where there is overlap or redundancy in addressing invasive species;
- Enable invasive species managers, landowners, and other stakeholders to increase coordination, plan projects strategically, and better understand the legal framework;
- Enable financial supporters of invasive species projects to allocate dollars to highest priority areas for combating invasive species and to fill gaps in management;
- Point out what is working in various parts of Oregon so that successful efforts can be replicated elsewhere;
- Define roles and responsibilities for managing invasive species; and
- Allow the Oregon Invasive Species Council to better focus its efforts, fill regulatory and management gaps, and better fulfill its mission in Oregon.

Specifically, the assessment was designed to summarize existing statewide policies and practices and evaluate the effectiveness of these by assessing the following issues:

a. Authorities, roles and responsibilities related to early detection/rapid response, prevention,

control/management/restoration, information management, public outreach and partnership efforts, interagency efforts/leadership/collaboration;

b. Where are there challenges to policy enforcement?

c. Are there conflicting actions that are being promoted by agencies that can contribute to invasive species establishment or conflict with prevention measures by other agencies?

d. Are there opportunities for collaboration among agencies that are not being realized?

e. Are there between-agency agreements that are in place?

f. Are there plans drafted and funded that address invasives?

g. Are there gaps, redundancies or conflicting plans?

h. What is the status of funding in the state for invasive species?

In addition, the assessment was designed to summarize the roles, responsibilities, authorities and activities of organizations, local agencies, and groups that significantly contribute (or could significantly contribute) to the on-the-ground control of invasive species, and evaluate the effectiveness of local activities by addressing the following issues:

a. How are local groups and agencies addressing early detection/rapid response, prevention, containment, and education/outreach?

b. Are there opportunities for collaboration among groups that are not being realized?

c. Are there between-group agreements that are in place?

d. Are there plans drafted and funded that address invasives?

e. What types of invasive species are addressed (e.g., plants, animals, pathogens, both aquatic (marine and/or fresh water) and terrestrial)?

f. Are there gaps, redundancies or conflicts among the activities of these groups?

g. What data are available and how are they managed: maps, databases?

METHODOLOGY

To answer the questions asked by the Oregon Invasive Species Council relative to management of invasive species in Oregon, the project was subdivided into three phases.

Phase 1 included a literature review of international, national, regional, state, and local laws and regulations pertaining to invasive species.

Phase 2 included the development of a survey instrument to obtain information from federal, state, tribal, and local governments, nonprofit organizations and academic institutions. This survey was followed by numerous one-on-one contacts with individual entities to clarify information provided via the survey and obtain additional information. The survey instrument was designed to:

- Obtain updated contact information for organizations working on invasive species issues in Oregon;
- Determine the invasive species taxa and species entities worked on in 2008;
- Determine the laws and policies that guide invasive species activities in Oregon;
- Understand the perceptions people have of the efficacy of Oregon's invasive species regulations and laws;
- Determine the extent to which entities use management plans to guide their invasive species activities;
- Describe the cooperative partnerships that exist among entities managing invasive species in Oregon;
- Describe how much entities in Oregon expend on different types of invasive species activities;
- Determine the source of funding for invasive species activities in Oregon;
- Characterize the methodologies entities use to assess the effectiveness of invasive species activities;
- Determine the extent to which entities participate in early detection rapid response networks;
- Document the perceptions of barriers to implementing invasive species programs; and
- Document the perceptions for the highest priority areas for invasive species research and development.

Phase 3 included data analysis to answer, to the degree possible, the questions posed by the Oregon Invasive Species Council.

SURVEY RESPONDENTS

A total of 297 individuals representing 234 entities in Oregon were contacted during the summer of 2009 and asked to complete the statewide assessment survey (Appendix A). Numerous entities within each county were asked to complete the survey (e.g., watershed council, cooperative weed management area, weed department, soil and water conservation district, university extension) to assess the extent of invasive species activities. In many instances (e.g., Clatsop County Soil and Water Conservation District), one county program deferred to another to complete the survey on behalf of the county.

A total of 95 individuals completed all of the survey, and an additional 34 individuals provided partial responses to the survey. Table 1 is a listing of those entities that completed the survey.

The geographic representation of survey respondents ranged from sub-basin to the Pacific Northwest. Local entities ranged from watershed councils, municipalities, and counties (Figure 1), to agencies and organizations with responsibilities for larger expanses of land, such as Wallowa Canyonlands Partnership, The Nature Conservancy, and US Forest Service.

Table 1. Organizations that responded to the statewide management assessment.

Organization	Geographic Representation
Federal Agencies	
Bonneville Power Administration	Pacific Northwest
Bureau of Land Management	Oregon and Washington
National Oceanic and Atmospheric Administration Fisheries	Washington and Oregon
Pacific States Marine Fisheries Commission	California, Oregon, Washington, Idaho, Alaska, and Montana
US Department of Agriculture – Forest Service	Oregon and Washington
US Department of Agriculture – Forest Service Aquatic and Riparian Effectiveness Monitoring Program	Oregon, Washington, and northern California
US Department of Agriculture-Animal Plant Health Inspection Service Plant Health Plant Protection and Quarantine (USDA-APHIS PPQ)	Oregon
US Department of Agriculture-Animal Plant Health Inspection Service—Wildlife Services	Oregon
US Fish and Wildlife Service	Oregon, Washington, Idaho, and Hawaii
US Geological Survey – Aquatic	Pacific Northwest
US Geological Survey Forest and Rangeland Ecosystem Science Center	Pacific Northwest
State Agencies	
Oregon Department of Agriculture – Nursery Program	Clackamas County
Oregon Department of Agriculture – Insect Pest Prevention and Management Program	Oregon
Oregon Department of Agriculture – Noxious Weed Control Program	Oregon
Oregon Department of Agriculture – Plant Division	Oregon
Oregon Department of Agriculture – Plant Health Program	Oregon
Oregon Department of Environmental Quality	Oregon
Oregon Department of Fish and Wildlife	Oregon
Oregon Department of Forestry	State-managed forest lands
Oregon Department of Forestry	Oregon, except state-managed forestlands
Oregon Department of Transportation – Geo-Environmental	Oregon
Oregon Department of Transportation – Vegetation Management	Oregon
Oregon State Marine Board	Oregon
Oregon Watershed Enhancement Board	Oregon
Oregon Youth Conservation Corps	Oregon
South Slough National Estuarine Research Reserve	Pacific Northwest Estuaries

Organization	Geographic Representation
Tribal Governments	
Burns Paiute Tribe	Malheur and Grant Counties
Columbia River Inter-Tribal Fish Commission	Columbia River Basin/Member Tribes Ceded Areas
Local Governments	
Benton Soil and Water Conservation District	Willamette Valley
Burnt River Irrigation District/Soil and Water Conservation District/Powder Basin Watershed Council	Burnt River Sub-Basin
City of Eugene Parks and Open Space Division	Ridgeline and dispersed natural areas
City of Portland Bureau of Environmental Services	City of Portland
Clatsop County Soil and Water Conservation District/Sherman Area Watershed Council	Sherman County
Columbia Slough Watershed Council	Columbia Slough Watershed
Columbia Soil and Water Conservation District	Columbia County
Coos Watershed Association	Oregon South Coast
Deschutes County	Deschutes Basin
Deschutes County	Deschutes County and the Deschutes Basin
East Multnomah Soil and Water Conservation District	Multnomah County east of Willamette River
Gilliam County Weed Department	Gilliam County
Harney County Weed Control	Harney County – southeast Oregon
Hood River County Weed and Pest Department	Hood River valleys, mountains, and orchards
Hood River Soil and Water Conservation District	Hood River County
Jefferson County Weed Control	Jefferson County
Jordan Valley Cooperative Weed Management Area	Southern Malheur County
Klamath County Weed Control	Klamath County
Klamath Watershed Partnership	4.77 million acres
Lane County Public Works	Lane County
Lincoln County	Lincoln County
Lincoln County Soil and Water Conservation District	Lincoln County
Lower Columbia River Watershed Council	Columbia and Clatsop Counties
Malheur County Weed Control	Malheur County
Marion County	Marion County
Monument Soil and Water Conservation District	Monument County
Morrow County Weed District	Columbia Basin/Eastern Oregon
Multnomah County Transportation	Multnomah County

Organization	Geographic Representation
Nestucca Neskowin Watershed Council	Northern coast of Oregon – 217,000 acres
Northwest Weed Management Partnership	15 counties in northwest Oregon; 5 counties in southwest Washington
Sandy River Basin Watershed Council	Sandy River Basin
Seven Basins Watershed Council	Jackson County
Sherman County Weed District	Sherman County
Siuslaw Watershed Council	Siuslaw Watershed and Coastal Lakes
Tualatin Hills Parks and Recreation District	City of Beaverton and parts of Washington County
Tualatin River Watershed Council	Gales Creek Valley
Umatilla County	Columbia Basin
Upper Deschutes Watershed Council	Deschutes River
Wasco County Soil and Water Conservation District	Wasco County
West Multnomah County Soil and Water Conservation District	Western Multnomah County and Sauvie Island
Wheeler Soil and Water Conservation District	Wheeler County
Nonprofit organizations	
Audubon Society of Portland	Northwest Portland and unincorporated Multnomah County
CoastWatch/Oregon Shores Conservation Coalition	Oregon coastal region
Institute for Applied Ecology	Oregon
Oregon Council Trout Unlimited	Oregon
The Nature Conservancy	Oregon
Three Rivers Land Conservancy	Portland metro area
Tillamook Estuaries Partnership	North Coast of Oregon
Wallowa Resources	Northeast Oregon
Private organizations	
Oregon Garden	Oregon Garden (Silverton)
Wood Tatum	Pacific Northwest
Academic Institutions	
Maritime Studies - Connecticut	Entire Oregon coast
Oregon Sea Grant	Oregon
Oregon State University – Extension	Eastern Oregon
Oregon State University – Extension	Grant County
Oregon State University – Extension Forestry	Jackson and Josephine Counties
Oregon State University – Hermiston Agricultural Research Center	North Central and Northeast Oregon

Organization	Geographic Representation
OSU – Columbia Basin Agricultural Research Center	Northeast Oregon
OSU – Department of Crop and Soil Science	Oregon
OSU – Department of Fisheries and Wildlife	Pacific Northwest
OSU – Department of Fisheries and Wildlife	Oregon coast and Willamette Valley
OSU – Extension	Douglas County
OSU – Extension	Jefferson, Crook, and Deschutes Counties
OSU – Extension Forestry	Central and Eastern Oregon
OSU – Klamath Basin Research & Extension	Eastern Cascades
OSU – Newport	Northeast Pacific
OSU – Sea Grant Extension	Tillamook and Clatsop Counties
OSU Extension – Yamhill County	Oregon
Portland State University – Center for Lakes and Reservoirs	Oregon/Region
Portland State University – Department of Biology	Oregon, Washington, and California
Reed College	Portland Metropolitan Area
University of Oregon	United States and Europe

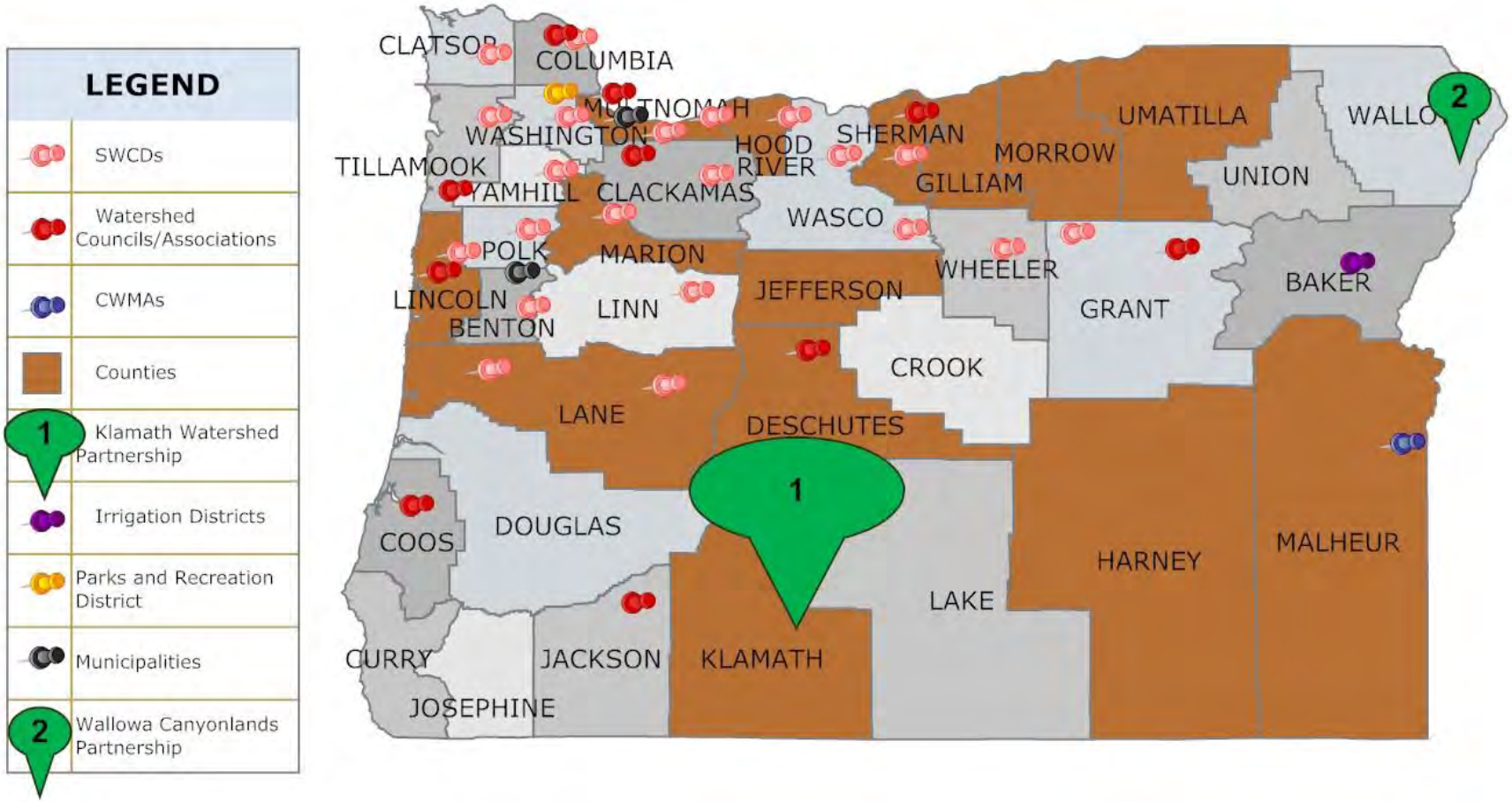


Figure 1. Map of Oregon showing counties (brown), local governments, and local entities that responded to the assessment survey. Many state and federal agencies also participated.

AUTHORITIES, ROLES, AND RESPONSIBILITIES

Authorities, roles, and responsibilities relating to invasive species efforts in Oregon exist at the federal, state, tribal, and local government levels. The ability of Oregon to protect itself from invasive species is directly related to how effectively agencies implement these authorities—individually as well as collectively—at the international, national, regional, state, and local levels. Appendix B is a list of federal, state, tribal, county, city, or local laws/policies that provide authority to engage in or guide invasive species activities.

INTERNATIONAL

There is a global recognition that increased commerce is a key vector or pathway for the movement and introduction of invasive species worldwide. That recognition has spawned numerous international agreements and codes of conduct (Appendix B) to lessen invasive species introductions.

There are at least 12 international codes of conduct or guidelines relating to invasive species, ranging from principles for prevention, introduction, and mitigation of impacts from alien species, to guidelines for introduction of threatened and endangered species.

A total of 10 international conventions exist, ranging from plant protection and international trade in endangered species, to biological diversity, climate change, and migratory species.

Six international organization agreements exist, ranging from protection of marine environments to management and conservation of forests.

FEDERAL[3]

The following federal entities have regulatory responsibility for invasive species in Oregon:

U.S. Department of Agriculture—involved in prevention, detection, control (management), monitoring, restoration, research and development, information management, and education, outreach, partnerships, and cooperative activities.

- Agricultural Research Service—provides scientific and technical support for Agriculture and other federal agencies focusing on detection technology for ports of entry; systematics for rapid identification of invading species; and pesticide application technology. Also develops biologically based controls and helps monitor target pests of integrated pest management programs.

- Animal and Plant Health Inspection Service—through its agriculture quarantine inspection and regulatory enforcement programs at 172 U.S. ports of entry, conducts preclearance activities, risk analysis and permit decisions, treatment efforts, detection surveys, and eradication efforts to prevent the introduction of foreign pests (e.g., insects, plant and animal diseases, mollusks, mites, and invasive plants) that would threaten U.S. agricultural production and natural ecosystems.

[3] The majority of information about federal agencies in this section is excerpted from the following report: U.S. General Accounting Office. 2000. Invasive Species: Federal and Selected State Funding to Address Harmful, Nonnative Species. RCED-00-219. 34 pp. The original source of this information is: Source: GAO's survey of 10 federal departments; Harmful Non-Native Species: Issues for Congress, Congressional Research Service, Sept. 1999; and Harmful Non-Indigenous Species in the United States, Office of Technology Assessment, OTA-F-656, Sept. 1993.

Cooperates with federal and state agencies and nongovernmental organizations to detect, contain, and eradicate infestations of quarantined foreign pests before they become well established and spread.

- Cooperative State Research, Education, and Extension Service—funds integrated projects and competitively based research relevant to improving public understanding of invasive species; funds research on cost-effective management, environmentally safe control of invasive species using biological, chemical, cultural, and mechanical practices and supports invasive species management to maximize effective and economical pest control and exclusion. Also provides linkages to address invasive species problems with local, state, and regional stakeholders.

- Economic Research Service—develops decision-making tools for comparing the consequences of invasive plant species with possible control costs. Considers both direct and indirect human costs of ecosystem disruptions and costs and potential adverse consequences of alternative weed treatments.

- Farm Service Agency—requires all of its program participants to control weeds (including noxious weeds), insects, pests, and other undesirable species on enrolled lands.

- Forest Service—manages 191 million acres of federal lands for many purposes, including protection from invasive weeds, and is Agriculture's lead agency for nuisance weed control. Conducts research on invasive plant species, including ecological studies to support restoration of sites after treatment of exotic weeds and control of invasive plants. Seeks to control and mitigate the impact of invasive species, such as the Asian longhorned beetle, gypsy moth, hemlock woolly, and browntail moth. Conducts disease research. Works closely with state agencies, private landowners, and tribal governments through its regulatory and enforcement programs to prevent and control invasive species and provides funding and technical assistance through its state and private forestry programs.

- Natural Resources Conservation Service—provides technical assistance to cooperating landowners on managing invasive species that inhabit lands used for agricultural production—has a significant program for range management and restoration, which includes an invasive species control element. Maintains a database that includes extensive information on invasive plant species and operates plant materials centers that promote the use of native species for soil erosion control.

U.S. Department of Commerce—involved in prevention, detection, control (management), monitoring, restoration, research and development, information management, and education, outreach, partnerships, and cooperative activities.

- National Oceanic and Atmospheric Administration—funds research, education and outreach, and control activities primarily through the National Sea Grant Program, with some activities funded through the National Ocean Service and National Marine Fisheries Service. Efforts focus on marine systems and the Great Lakes. Research efforts include monitoring the impacts of invasive species on coastal and other ecosystems,

developing control and mitigation options, and preventing new introductions by, among other things, developing new technologies for ballast water management. Performs economic evaluations of the costs of aquatic invasive species and conducts control programs to eradicate and prevent their spread. Has regulatory authority to prevent the introduction of invasive species that may affect marine sanctuaries; endangered or threatened species; coastal areas; and essential fish habitats.

U.S. Department of Defense—involved in prevention, detection, control (management), monitoring, restoration, research and development, information management, and education, outreach, partnerships, and cooperative activities. Engages in management and control of invasive species: (1) prevents the entry of invasive species in the United States, (2) controls invasive species on Defense installations, and (3) restores Defense lands using native plants. Developed and implemented the Navy's ballast water management policy and set discharge standards for vessel ballast water to address the environmental effects of invasive species in ballast water. Other efforts include partnerships to prevent the spread of invasive plants, and maintain a noxious and nuisance plant management information system.

- Army Corps of Engineers—supports aquatic plant control, which primarily involves invasive species in non-Corps waters. Spends several million dollars annually on removal of aquatic growth, predominantly for invasive species, and supports zebra mussel research efforts.

U.S. Department of Homeland Security—involved in guarding against terrorism, securing U.S. border, enforcing immigration laws, improving readiness for , response to, and recovery from disasters, and maturing and unifying the department.

- U.S. Coast Guard—responsible for developing and implementing a ballast water management program to minimize the likelihood that invasive species can be transported to the United States in the ballast water of long-distance ocean vessels.

U.S. Environmental Protection Agency—involved in prevention, detection, control (management), monitoring, restoration, research and development, information management, and education, outreach, partnerships, and cooperative activities. Deals with invasive species in three general areas—(1) reducing the risk of transporting non-native plants, animals and microbial species into the United States via ballast water and biofouling pathways, (2) regulating pesticides that may be used to control invasive species, and (3) conducting research on the ecological impacts of invasive species.

Department of the Interior—involved in prevention, detection, control (management), monitoring, restoration, research and development, information management, and education, outreach, partnerships, and cooperative activities.

- Bureau of Indian Affairs—helps support the management of invasive species on Indian lands through exotic weed eradication and other programs.

- Bureau of Land Management—focuses primarily on controlling invasive plants on the 264 million acres it

manages, primarily in western states and Alaska. Initiated strategy to prevent and control the spread of noxious weeds on public lands by using biological, chemical, and physical treatment for invasive plants.

- Bureau of Reclamation—focuses on invasive species infestation of water systems, including reservoirs, rivers, thousands of miles of distribution canals, rights-of-way, wetlands, and recreational areas. Invasive species of concern include zebra mussels, Chinese mitten crabs, hydrilla, water hyacinth, purple loosestrife, saltcedar and leafy spurge. These species can obstruct water flow, hinder access for maintenance and recreation, cause structural damage, and negatively affect water system operations, water quality, wildlife habitat, and public use.

- Fish and Wildlife Service—protects and conserves fish and wildlife resources; controls invasive plants and animals, such as feral pigs, melaleuca, salt cedar, purple loosestrife, in the 93-million acre National Wildlife Refuge System; works with private landowners to implement on-the-ground restoration projects that eradicate and control and manage invasive species; regulates imports of injurious wildlife; evaluates imported animals to determine injurious status; conducts activities to prevent, control and monitor aquatic nuisance species that threaten native species and the aquatic ecosystems; and provides cost-share grants to implement approved state aquatic nuisance species management plans.

- Geological Survey—focuses on researching factors influencing the invasion by invasive species and the effects of invasive species on ecosystem processes, native species, and landscape dynamics, especially on Department of the Interior land; facilitates documentation, dissemination and integration of invasive species information; focuses on small number of highly invasive species, with emphasis on the Great Lakes and eastern waterways and wetlands, riparian ecosystems, and Hawaii, as well as invasive plants on western rangelands. Also, manages the national Nonindigenous Aquatic Species Database and several regional databases.

- Minerals Management Service—routinely conducts ecological monitoring projects to measure potential or actual impacts of outer continental shelf oil and gas development on marine, coastal, and human lives. Invasive species level taxonomic identifications conducted during these monitoring efforts provide useful information for documenting occurrences and geographic extensions of marine invasive species in near-shore and offshore waters.

- National Park Service—about 190 of the 300 National Park Service units have identified exotic species as a significant resource management concern in their management plans. When managing invasive species, relies on an integrated pest management approach that permits the use of biological and other types of controls. Some parks have programs to address specific invasive species. In addition, a number of parks work collaboratively with neighbors or other groups to manage invasive species.

National Science Foundation—involved in research and development; and education, outreach, partnerships, and cooperative activities. Funds basic and applied research on invasive species, including their roles in population and ecological

processes, their relationship to biological conservation activities, and their role as a disturbance agent in the ecosystem.

Smithsonian Institution—involved in prevention, detection, control (management), monitoring, research and development, information management, and education, outreach, partnerships, and cooperative activities. Research addresses the pattern, impact, and management of invasive species. Smithsonian Environmental Research Center programs measure the pattern of transfer, invasion, and effects of invasive species on coastal marine and estuarine systems. Conducts specific projects to test methods to reduce the risk of species transfer in ship ballast water. In cooperation with Coast Guard, established the National Ballast Water Information Clearinghouse to measure the changing patterns of ballast water delivery, manages vessels arriving in U.S. ports, and synthesizes national data on patterns and impacts of alien species in coastal ecosystems.

U.S. Department of State—involved in the following invasive species activities: information management; and education, outreach, partnerships, and cooperative activities. Engages in negotiations, international treaty activities, and cooperative intergovernmental efforts to address invasive species issues.

U.S. Department of Transportation—involved in prevention, research and development, information management, and education, outreach, partnerships, and cooperative activities.

- Federal Highway Administration—focuses primarily on vegetation management, including developing guidelines for combating roadside invasive species.

U.S. Department of the Treasury—involved in prevention, detection, information management, and education, outreach, partnerships, and cooperative activities. The U.S. Customs Service has a major operational role in preventing or restricting the entry of imported merchandise and its containers that could potentially be or are infested with invasive species. Customs personnel inspect passengers, baggage, and cargo at U.S. ports of entry to enforce or cooperate, as appropriate, in enforcing regulations/procedures of other federal agencies. Customs selectively inspects incoming passengers, baggage, and cargo based on risk management criteria, such as country-of-origin and other factors.

One other federal entity, the Bonneville Power Administration (within the U.S. Department of Energy), operates an electricity transmission system in Oregon, and provides funding to Oregon entities for invasive species activities.

REGIONAL

- Invasive Plant Final Environmental Impact Statement—(2005) Comprehensive U.S. Forest Service document assessing the environmental impacts of invasive plants, with detailed strategies and objectives, implementation and prevention guidelines, management framework, inventory and monitoring procedures, plant maps, and overall standards and guidelines to control and minimize invasive species and their impacts.

- Pacific Northwest Region, Non-Native Invasive Plants Program coordinates guiding policies and procedures for use in preventing and controlling invasive weed infestations, and recovering ecosystems. The PNW Region Noxious Weed Policy and Strategic Plan 1999 and Order to Implement Weed-Free Feed in the Pacific Northwest(2009) provide detailed strategies and

implementation policy geared towards controlling noxious weed invasions.

- Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States—Programmatic Environmental Impact Statement (2007)

Numerous regional organizations exist to provide more comprehensive approaches to significant invasive species issues (Appendix A) and bridge gaps that may exist between federal, regional, state, and local levels. For example, the Pacific Ballast Water Group participates in the development of ballast water management along the West Coast of the United States, and includes federal and state agency representatives, environmental groups, shipping industry representatives, and others. The Western Regional Panel on Aquatic Nuisance Species attempts to span geopolitical lines to limit the introduction, spread, and effects of aquatic nuisance species in the western United States. And the Western Governor's Association Undesirable Aquatic and Terrestrial Species program created Resolution 05-11 to develop and coordinate strategies and support functions to control and prevent the spread and introduction of undesirable species, support the use of Integrated Pest Management concepts, encourage broad-based partnerships, and to seek support for the USDA- Animal and Plant Health Inspection Service.

STATE

Four state agencies are the primary state regulatory authority agencies for invasive species activities in Oregon—the Oregon Department of Agriculture (ODA), the Oregon Department of Fish and Wildlife (ODFW), the Oregon Department of Forestry (ODOF), and the Oregon Department of Environmental Quality (ODEQ).

- The ODEQ, through Chapter 340, protects the waters of the state from aquatic nuisance species by establishing procedures for the proper reporting and management of ballast water discharges, including vessel inspections, compliance verification, and enforcement authorities.

- The ODA, through Chapter 603 and its Plant Division, works to exclude, detect, and control or eradicate serious insect pests and plant diseases; to enhance the agricultural value of nursery stock, Christmas trees, seeds and other agricultural products for export through pest and disease inspection and certification; and to oversee statewide noxious weed control efforts.

- The ODOF, through Chapter 629, allows for planned activities to manage forest insects and diseases on private lands.

- The ODFW, through Chapter 635, regulates specific nonnative wildlife species use. Species listed are classified into one of three groups: prohibited, controlled, or noncontrolled. The Oregon State Police Fish and Wildlife Division ensures compliance with the laws and regulations that protect and enhance the long-term health and equitable utilization of Oregon's fish and wildlife resources.

In addition, numerous other state entities have responsibilities ancillary/supporting roles to the primary agency roles. For example:

- Oregon Watershed Enhancement Board – ORS 541.351 to 541.403 – awards grants for watershed restoration.

- Healthy Streams Partnership – ORS 541.407—integrates private sector energy, resources and knowledge with the public sector to improve the health and function of aquatic systems and enhance beneficial uses of water.

- Independent Multidisciplinary Science Team – ORS 541.409— reviews implementation of the Oregon Plan and other programs and serves as an independent scientific review panel to state agencies;

- Oregon State University – ORS 561.362, ORS 452.625—provides outreach and education on agricultural-related issues and coordinates agricultural extension service activities related to watersheds, and carries out 452.620.

- Soil and Water Conservation Commission – ORS 561.395—provides for coordination between Oregon's Soil and Water Conservation Districts and the Department.

- State Weed Board – ORS 569.600—guides statewide noxious weed control priorities and awards noxious weed control lottery funds.

- State Board of Agriculture – ORS 561.372—advises the State Department of Agriculture regarding the implementation, administration and enforcement of department programs and the development of department policies designed to positively affect the agricultural industry in this state.

- New Crops Development Board – ORS 561.700—identifies, endorses and promotes worthy new and alternative crops for Oregon, and acts as a clearinghouse for new ideas and resources in the development of new crops.

- Oregon Department of Human Services – ORS 452.300 – public health vector control.

- State Board of Higher Education – ORS 567.035—acting through the Oregon agricultural experiment station, takes the action necessary to eradicate and control algae and detrimental weeds and grasses which are found growing in the waters, lakes and streams of this state.

- Oregon Invasive Species Council—ORS 570.750–570.810—conducts a coordinated and comprehensive effort to keep invasive species out of Oregon and to eliminate, reduce, or mitigate the impacts of invasive species already established in Oregon.

- Center for Lakes and Reservoirs at Portland State University—ORS 352.068—assists state and federal agencies in research and mitigation of nonindigenous aquatic species.

LOCAL

Local governments in Oregon use a variety of local laws, policies, and ordinances to conduct invasive species activities in their jurisdictions. The following is a sample of the approaches used:

- The City of Portland Resolution # 36360 describes a 10-year goal to reduce noxious weeds on its lands through

the containment, control, and eradication of invasive plant species and the establishment of native plant communities.

- As part of the City of Portland Integrated Pest Management Strategy, Metro Title 3 notes that all landscaping plans must comply with the native plant requirements outlined in the Willamette Greenway Plan.

- The Port of Portland's Vegetation Management Plan provides information about invasive species control methods used by the Port on mitigation sites and natural areas. This document includes background and purpose, invasive plant species profiles, herbicide profiles, methods and equipment, Best Management Practices, and site maps. Although the focus of the plan is the proper use of herbicides, the Port also uses mechanical and biological means to control invasive species on mitigation sites and natural areas.

- Soil and Water Conservation Districts—The West Multnomah Soil and Water Conservation District has developed a 5-year invasive species strategic work plan. The plan includes inventory, assessment, coordination, education and outreach, funding, and control and restoration components. Many SWCDs have these types of work plans.

- Tualatin Hills Parks & Recreation Department—Weed species management is prioritized through four species lists (active management, opportunistic management, watch list, and wish list).

- City of Eugene—Integrated Pest Management Policy (2009)—document describes the City of Eugene Parks and Open Space Division's program and the operation procedures used.

- City of Salem—The City of Salem Plant List is based on the Portland Plant List. Non-Native Plant List—The invasive non-native plant section is a listing of plants which the City of Salem considers undesirable for use in all landscaping situations within the City limits and plants which are prohibited from use by Oregon State law (OAR 603-52-1200(4)). Salem also provides a noxious weed list and nuisance plant list.

- Wallowa County Weed-Free Forage Inspection Program—a voluntary inspection program is designed to assure that forage and straw sold with proper inspection identification meets minimum standards designed to limit the spread of noxious weeds. Buyers are provided assurance that forage and straw, inspected through this program, meet these minimum standards.

- Baker County Noxious Weed Policy requires landowners and managers within the county to follow state laws regarding noxious weed control.

- Coos County Weed Advisory Board provides oversight and management to the Noxious Weed Control District, including maintenance of a noxious weeds list and management priorities development of weed education and control programs, and identification and monitoring of weed problem areas with support from the Coos County Interim Noxious Weed Advisory Committee and approval by the Coos County Board of Commissioners.

- In 2005 the Columbia Invasive Weed Control Partnership was formed and approved by the County Commissioners. The Columbia Soil and Water Conservation District was named the lead agency in this partnership.

- Deschutes County Weed Board prioritizes and classifies noxious weeds found within the Weed Control District on an extensive Noxious Weed List with detailed photos, characteristics, and growth patterns for easy identification.

- Harney County Weed Advisory Board is governed by a county Ordinance #2008-61 that sets policy and procedure for the control and eradication of noxious weeds within Harney County, including appointment of the Board and Weed Inspector, designation of the Weed Control District, maintenance of a Noxious Weeds List, and regulations for enforcement within the County.

- Hood River County Weed & Pest Division prioritizes noxious weeds found within the Weed Control District as detailed in the Top Noxious Weeds and Plants List.

- Hood River Watershed Action Plan was developed with a coordinated effort of local irrigation and water districts, landowners, businesses, citizens, tribal government and local, state, and federal agencies. The plan outlines strategies and cooperative projects targeted at improving water quality and fish populations in the Hood River sub-basin of the Columbia River.

- Jefferson County Weed Control Enforcement—Ordinance O-37-03—details authority to establish weed control districts, administration and duties, classification of weeds, regulations for enforcement and penalties for non-compliance.

- Klamath County Code 401.500 through 560—details authority to establish weed control districts, administration and duties, and regulations for enforcement and penalties for non-compliance. The Klamath County Weed Control Program also maintains a Noxious Weed List.

- Lane County Noxious Weeds and Invasive Species—Lane County maintains a Noxious Weed List and, as governed by Lane County Code 15.500, the Public Works department uses guiding policies and procedures concerning the use of herbicides for roadside vegetation management found in the Last Resort Policy (Ordinance No. 12-03). The Policy Implementation Final Report details methods for noxious weed control, management, and eradication and comprehensive lists of threatening plant species.

- Malheur County Weed Inspector's Office and the Malheur County Weed Advisory Board advise the court on policy and facilitate in the control and eradication of noxious weeds in Malheur County. A Weed Ordinance specifies the procedures for the control of weeds identified as noxious by the Malheur County Court, establishes the Weed Control District, appointment of the Weed Advisory Board and Weed Inspector, and also specifies the Noxious Weed List.

- Marion County Weed District—County Ordinance 1225 establishes an active Weed Control District and authority to work with private landowners to assist them in controlling noxious weeds on their lands, a Noxious Weeds List, and the Weed District Advisory Committee.

- Sherman County Weed District

- Wallowa County Integrated Weed Management Plan—provides a written strategy to inform and guide weed management activities for the Wallowa County Weed Control District including detailed maps, establishment of the Weed Board and associated procedures, Wallowa County Noxious Weed Policy, Planning Goals, Control Methods, and Noxious Weed Tables.

- Wasco County Soil and Water Conservation District—maintains several watershed assessment and sub-basin plans affecting the Buck Hollow, Pine Hollow, White River, Fifteenmile, Dalles Area, Mosier, and Bakeoven watersheds.

Oregon Counties

Figure 2 is a map of Oregon showing counties with weed districts, counties with weed programs and weed boards, one county with a weed program and weed district, and one county with a weed district.

During the 2009 legislative session, the Oregon Invasive Species Council expressed strong support for legislation that would provide base funding for each county in Oregon, so that adequate resources would be available to effectively implement weed programs across the state. Senate Bill 629 would have mandated that the Oregon Department of Agriculture establish a program for issuing grants to counties for noxious weed control, and would have allocated lottery funds to carry out the grant program. This legislation did not pass because of the current economic environment, delaying Oregon's ability to strategically address noxious weed issues across the state.

Pursuant to ORS 569.360, counties have the ability to create active weed control districts. Creation of a weed control district gives the county the authority to work with private landowners to assist them in controlling noxious weeds on their lands and addressing other high priority weed issues. In addition, creation of a weed control district allows for the hiring of a weed inspector to look for and enforce control within the district and allows a tax to be levied. All of these actions create a vehicle for weed control activities in a district.

Counties, such as Wheeler County, which have no weed district (in an oasis of counties with weed districts), subject adjacent counties and the state to increased risks because an established program does not exist to survey for noxious weeds, nor work with landowners to eradicate infestations immediately upon early detection. Neighboring counties occasionally use their resources to identify and respond to infestations in Wheeler County.

In 2006, the Oregon Department of Agriculture conducted a survey of counties to assess the extent of weed control programs/districts in the state (Appendix C). A total of 20 counties reported they had established weed control districts per ORS570 (Figure 2)—this number remained the same during the development of this report. The following results of this 2006 survey fill gaps in understanding from counties that did not respond to the statewide management assessment survey:

- Of these 20 counties with established weed control districts, 17 hired full-time staff, and three hired part-time staff to supervise their weed control program.

- A total of 21 counties reported having an active weed board, and all acknowledged partnerships with a variety of federal, state, tribal, and local government agencies, nonprofit organizations, and academic institutions (Figure X). The broad distribution of partnerships is directly related to funding sources, policy and laws, and similar strategic noxious weed-related initiatives. All counties reported their cooperative partnerships included education, while 75% included weed treatment and surveys, 71% included finance, and 64% including monitoring.

- Of the 20 counties with weed control districts, almost half (41%) of the districts are managed under the County Road Department. The remaining districts operate through CWMA's, weed control departments, county courts, SWCD's, and other entities.

SUMMARY

The data presented in this section of the report will help people understand the complex legal framework that exists relative to invasive species, and helps to identify gaps that need to be addressed.

Both regulatory and non-regulatory strategic efforts are needed to successfully manage invasive species. Entities throughout Oregon, either through authority, influence, or interest, can contribute to Oregon's fight against invasive species. The following are some suggestions to enhance the regulatory and non-regulatory roles for entities contributing to invasive species activities:

Federal

- Prevention—The most significant role the federal government can play is prevention. Adoption of biosecurity measures— pre-border preparedness, border protection and post-border management and control—to protect the states from the negative effects associated with invasive species, will allow states to then use their limited resources to focus on management and control of existing invasives. The federal government can also play a lead role in preventing the import of harmful species by regulating all importation, including Internet sales. Ballast water discharge standards should set the highest standards for protection of the nation's waters.

- Funding—Many natural resource-related federal programs currently funded by federal agencies are affected by invasive species. The federal government should expand the scope of these programs to allow these programs to expend funds for invasive species.

- Funding—Aquatic Nuisance Species Task Forces and their respective plans should be funded.

- Funding—States are creating emergency funds to respond to invasive species emergencies, similar to wildfires. This model should be replicated at the national level so that a

national invasive species emergency fund exists.

- Coordination—The National Invasive Species Council should serve to coordinate national invasive species efforts and assist states in identifying and addressing regional issues.

Oregon

- Funding—State leadership needs to acknowledge its role in protecting the state from invasive species by creating a sustainable funding mechanism tied to pathways and vectors. The federal government cannot and should not be responsible for funding all or the majority of invasive species programs in the states.

- Funding—The siloed approach to funding state agency programs results in a patchwork of unreliable funding with minimal effectiveness monitoring, jeopardizes sound invasive species programs every two years, and pits one agency against another for diminishing state resources. An implementation plan for the Oregon Conservation Strategy should be developed, and natural resource funds should be pooled and funneled to the highest priorities to implement the strategy and its six key conservation areas.

- Funding—A long-term sustainable source of funding for base county invasive species programs needs to be established, and current grant-only programs should be reviewed to determine if another method of allocation would best protect intended habitats for these grants programs—watersheds and agricultural areas.

- Coordination—Coordination needs to be strategic and at the highest levels of government.

- Outreach and education—State leadership should acknowledge the unique perspectives its citizenry shares relative to healthy native fish and wildlife and their habitats, and better coordinate amongst all natural resource agencies programs that address invasive species that include strong outreach components.

- Legislation—Review existing authorities every two years to propose proactive legislation to protect Oregon.

The Pacific Northwest Region

- Coordination—Opportunities exist to work more closely with neighboring states to share resources and develop a region-based approach to identify and implement actions to address invasive species issues. Development of a strategic plan for the Pacific Northwest would help identify high priority regional issues.

Local governments

- Each county needs an established funded weed district and program so that there are adequate monitoring/surveillance activities to detect invasive species introduction early.

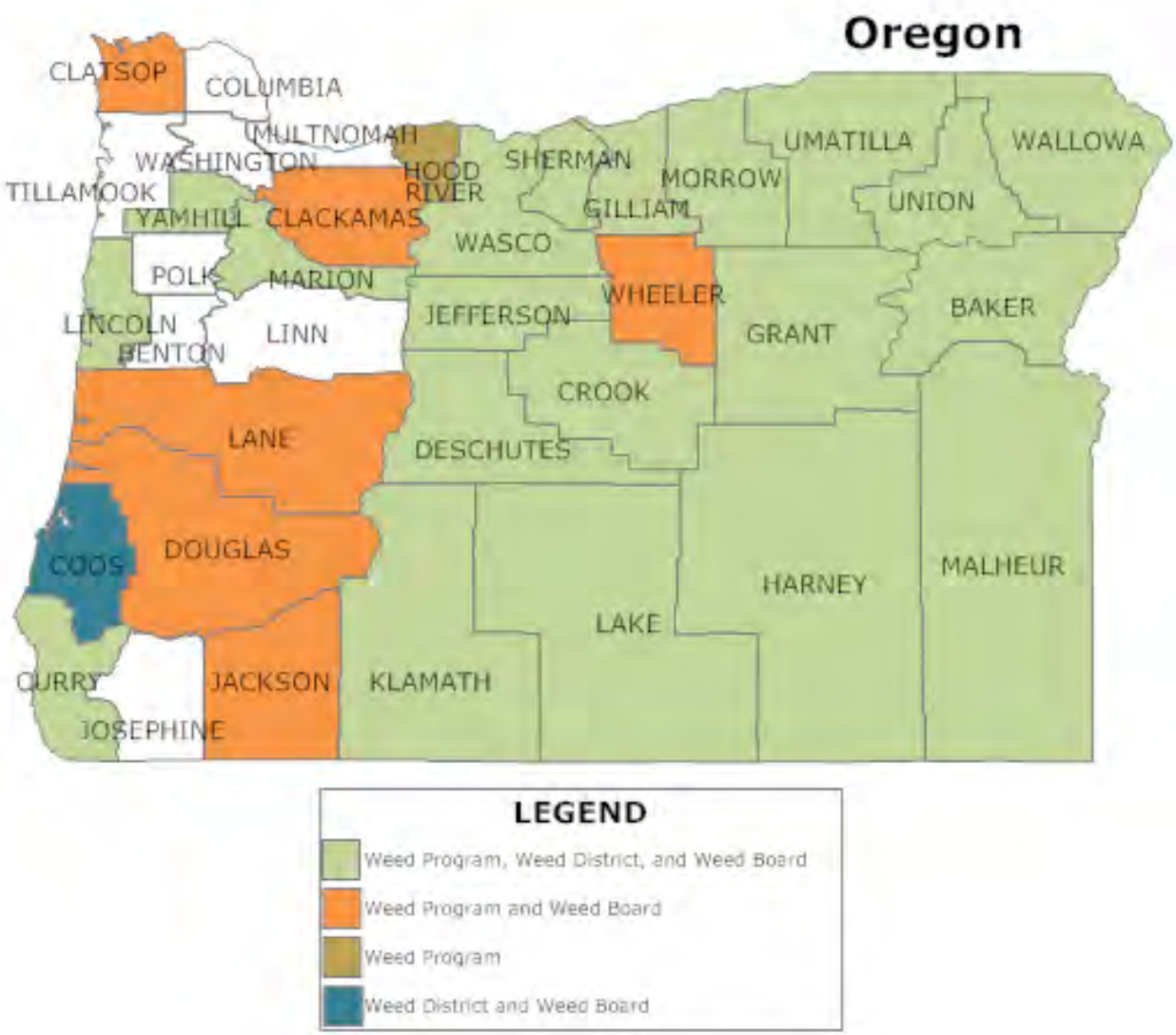


Figure 2. Map of Oregon depicting counties with various levels of weed programs, districts, and boards.

PLANS DRAFTED AND FUNDED THAT ADDRESS INVASIVES

Statutory authorities for invasive species activities cannot be reviewed in a vacuum. In addition to the legal authorities, roles, and responsibilities that exist, entities responsible for or interested in conducting invasive species activities in Oregon have developed a number of plans, reports, and protocols that support their statutory authorities and obligations as well as provide direction to those responsible for on-the-ground implementation.

A total of 59% (Figure 3) of the respondents to the statewide management assessment survey indicated they have a management plan that includes invasive species strategies/action items. The significant percentage that have no management plan, in almost all cases, have partnership agreements with other entities whose management plans are guiding the activities of those without plans.

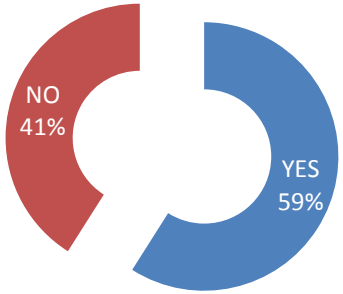


Figure 3. Percent of organizations that responded they have a management plan that includes invasive species strategies/action items.

Federal

- BLM—The National Partners Against Weeds Strategy (PAWS); OR/WA BLM also has a Noxious Weed Strategy for Oregon/Washington; each District has a Resource Management Plan which includes invasive species management where appropriate. There are a number of sub-plans, which also include more site-specific strategies for Areas of Critical Environmental Concern (ACEC), Wilderness Areas, etc. Under the District RMPs there are programmatic District Environmental Assessments (EAs) which describe specific weed management strategies/practices for each district.

- NOAA—2008–2012 National Invasive Species Management Plan (jointly with 13 federal agencies)

- US Forest Service AREMP—Field protocols prevent the spread of aquatic invasive species (e.g., New Zealand mud snails) and terrestrial plant diseases (e.g., sudden oak death syndrome).

- US Forest Service—National Strategy and Implementation Plan for Invasive Species Management 2004, R6 Business Plan 1.4.1 Invasives 2009.

- USDA-APHIS—Safeguarding America report (2000); National Invasive Species Council.

- USFWS—Pacific Region: Fisheries Program Strategic Plan—under revision currently; Multiple national species management plans (e.g., New Zealand mudsnails)

Regional

- Noxious Weed Management Plans For National Forests - Pacific Northwest Region R6
- Noxious Weed Policy & Strategic Plan (1999)
- Pacific Northwest Weed Management Handbook (Idaho, Oregon, Washington)
- Preventing and Managing Invasive Plants - Draft Environmental Impact Statement (DEIS) (2004)
- Columbia River Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenid Species (Idaho, Oregon, Montana, Washington, NOAA, USFWS, CRITFC)

State

- ODOT divides the state into 15 maintenance districts. Each district develops annual IPM plans that include noxious weed control.
- Oregon Conservation Strategy (2/06), Oregon Aquatic Nuisance Species Management Plan (2001), Feral Swine Action Plan for Oregon (2007), Native Fish Conservation Policy (2002).
- Oregon Dept. of Agriculture Plant Health Emergency Response Plan, 2006.
- Oregon Noxious Weed Strategic Plan (2001)
- Oregon *Spartina* Response Plan (2003), Program Project Plans, "A" and "T" Weed Plans.
- South Slough NERR Management Plan.
- Upper Watershed Restoration Action Plan.
- State Emergency Management Plan Annex G, Appendix B, Plant Health Emergency Response Plan Version 1.0, 2006.
- Aquatic Vegetation in Irrigation Canals: A Guide to Integrated Management (1999)
- Guide to Developing Integrated Aquatic Vegetation Management Plans in Oregon (1999)
- Managing Aquatic Invasive Species Risks from Shipping Transport Pathways: A report prepared by The Oregon Task Force on the Shipping Transport of Aquatic Invasive Species for the 2009 Oregon State Legislature (2008)
- Noxious Weed Control Policy and Classification System 2009 (2009)

Local (note: this list is not comprehensive, but represents many different types of plans in existence)

- City of Eugene—Wild Iris Ridge Management Plan (2008), Whilamut Natural Area Management Plan (2005), Gudu-kut Natural Area Management Plan (2003),

Mariposa Woodland Management Plan (2008), numerous wetland mitigation improvement plans (1997–2009), Ridgeline Area Open Space Vision Plan (2007)

- City of Portland—Watershed Management Plan (2005), Invasive Plant Management Strategy (2008), Invasive Species Resolution Urban Forestry Action Plan (2007), Parks Vision 2020 Plan (1999), Bull Run Habitat Conservation Plan (2007)
- Columbia Invasive Weed Management Plan (2008)
- Columbia Slough Sediment Program Watershed Action Plan (2003)
- CWMAs—all six have management plans
- East Multnomah County SWCD Strategic Plan (2008); Fiscal year work plans; Individual work plans; management plans of the 4-County CWMA, Columbia Gorge CWMA, Sandy River Basin Integrated Management Plan
- Jordan Valley CWMA Strategic Plan (2008)
- Lincoln County SWCD—Survey/monitor and treat knotweed (*Fallopia* species) and are surveying and monitoring (early detection) other species to develop a treatment/control plan.
- Natural Resources Management Plan (2002), Tualatin Hills Nature Park Natural Resources Maintenance Management Plan (2005), various other park Natural Resources Maintenance Management Plans (2007–2009).
- NNWC Management & Action Plan (2002)
- North Coast Weed Management Area Plan (2007)
- North Fork John Day Cooperative Weed Management Area Strategic Plan (2009)
- Northwest Weed Management Partnership (2009)
- Seven Basins Strategic Plan (2009), Seven Basins Watershed Action Plan (2006)
- Sherman County SWCD Work Plan (2009), Sherman County Area Watershed Council Action Plan (2008)
- Siuslaw Watershed Council Strategic and Action Plan (2008)
- Tualatin River Watershed Council Strategic Action Plan (2008)
- West Multnomah SWCD Invasive Plant Species Strategic Work Plan (5-Year Plan)
- McDonald-Dunn Forest Plan: Invasive Species Management Plan
- An Integrated Aquatic Vegetation Management Plan for Blue Lake, Fairview, Oregon (2004)

- Noxious Weed Plan: Baker County (2002)
- Oregon Invasive Species Action Plan (2005)

Nonprofit

- Audubon Society of Portland—Portland Watershed Management Plan (2007)
- Oregon Council of Trout Unlimited—2004 5-year plan
- The Nature Conservancy of Oregon—Oregon Strategic Business Implementation Plan (July 1, 2009–June 30, 2011)
- Three Rivers Land Conservancy—Management and/or restoration plans for some properties.
- Wallowa Resources—Wallowa County Integrated Weed Management Plan

University

- Reed Canyon Restoration Strategy, 1998
- National Sea Grant Strategic Plan, 2009-2013 http://seagrant.oregonstate.edu/inhouse/documents/Sea_Grant_National_Strategic_Plan_2009-2013.pdf

Table 2 is a list of national, regional, and state invasive species-related management/strategic plans. The majority of these plans were developed without a cost implementation component. As a result, many are underfunded.

Table 2. National, regional and state invasive species management plans depicting whether costs to implement are included in the plans.

	Cost to Implement Included in Plan	Funding Obtained Toward Plan Objectives
National		
National Partners Against Weeds Strategy	NO	?
National Invasive Species Council Management Plan	NO	?
USFS National Strategy and Implementation Plan for Invasive Species Management 2004	NO	Some
Safeguarding America Report 2000	NO	Some
USFWS Pacific Region Fisheries Program Strategic Plan	NO	Some
Regional		
USFS Noxious Weed Management Plans For National Forests - Pacific Northwest Region R6	NO	Some
USFS Noxious Weed Policy & Strategic Plan (1999)	NO	?
Preventing and Managing Invasive Plants - Draft Environmental Impact Statement (DEIS) (2004)	NO	?
State		
ODOT Integrated Pest Management Plans for 15 maintenance districts	NO	Some
Oregon Conservation Strategy	NO	NO
Oregon Aquatic Nuisance Species Management Plan (2001)	YES	Some
Feral Swine Action Plan for Oregon (2007)	YES	NO
Oregon Department of Agriculture Plant Health Emergency Response Plan (2006)	NO	?
Oregon Noxious Weed Strategic Plan	NO	Some
Oregon *Spartina* Response Plan (2003)	Yes	Some
A & T Weed Management Plans	No	Some
South Slough NERR Management Plan	No	Some
Plant Health Emergency Response Plan	No	?

CHALLENGES TO POLICY DEVELOPMENT, IMPLEMENTATION, AND ENFORCEMENT

To analyze the challenges to invasive species policy development, implementation, and enforcement in Oregon requires an analysis of the different types of policy—substantive and administrative policy, horizontal and vertical policy, and reactive and proactive.[4]

Administrative policy is developed by an agency to make its systems and procedures more efficient.

Substantive invasive species policy, on the other hand, is concerned with legislation, programs, and practices[5] that govern the work conducted on invaders in Oregon, and is usually vertical in nature—it is developed by agencies that have statutory authority for management of a species. The State Weed Board, established by ORS 569.600, has the authority to identify weeds growing in Oregon that represent the greatest public menace and establish those weeds as the top priority for action by weed control programs. This statute is a good example of a vertical substantive policy. It serves as a "step-down policy" from the federal Noxious Weed Control and Eradication Act and the Federal Noxious Weed Act of 1974, both of which address the need to control and eradicate noxious weeds. Establishing the State Weed Board and authorizing it to identify priority weeds for eradication at the local level reinforces the statutory authority for management and control of noxious weeds by both the Oregon Department of Agriculture and the State Weed Board.

Horizontal policy making, on the other hand, is policy developed by two or more organizations, each of which has the ability or mandate to deal with only one dimension of an invasive species problem.[6] An example of horizontal policy making in Oregon is the many laws that govern timber and forest products to protect Oregon's forest resources from disease pests. For example, the Oregon Department of Agriculture's Chapter 603, Division 52 Pest and Disease Control policy regulates imported timber products. The Oregon Department of Forestry's Chapter 629, Division 51 Forest Insect and Disease Management regulates introduced forest pests. Both laws seek to protect the health of Oregon's forests, and each identify the important niche both agencies play to realize the policy goals.

Torjmann also characterized policy as reactive and proactive.[7] Reactive policy is usually in response to a crisis. An example of that is legislation passed in the 2009 Oregon legislative session that makes it illegal to knowingly allow feral swine to roam on private land. The legislation was developed to prevent the spread of feral swine, one of the top 100 global worst invasive species.

Proactive policy, on the other hand, is introduced through deliberate choice.[8] An example of proactive policy is the legislative bill introduced in 2009 to expand Oregon's Adopt-A-Highway program from litter only to invasive weeds. This legislation was introduced by individuals who wanted to expand the awareness of roadside invasive species and receive credit for their manual labor efforts.

[4] Torjmann, Sherri. 2005. What is Policy? Caledon Institute of Social Policy. 20pp.
[5] Ibid.
[6] Ibid.
[7] Ibid.
[8] Ibid.

A key element of any policy process is an analysis of cost. Torjmann noted, "The design of any policy initiative – whether related to income security or other area – must be costed to establish how much is required to support the proposed plan."[9] It is in this arena—articulating the cost of existing management and strategic plans—that Oregon has fallen short (see recommendations).

Policy and planning structures are complex and non-linear. A linear, systematic approach to invasive species policy and planning would ideally be a pyramid approach—one that begins with high level strategic policy and planning at the international level, ultimately cascading through national, regional, and state policy to local ordinances (Figure 4). Although the examples in Figure 4 seem to be linear, they are, in fact, a complex interaction of documents, policies, agreements, plans, and other activities, some of which are intertwined, and some of which are stand-alone in nature. Also, the role that entities play can differ depending on the potential solutions.

For example, a major vector for the spread of non-native, invasive insects and diseases is firewood. The National Association of State Foresters have articulated the cooperative role federal and state agencies can play to minimize the spread of firewood-carrying insects and diseases, using a combination of national and state policy, certifications, guidelines, and outreach.

Traditionally, policy making at the government level has been reflective of the siloed statutory nature of individual government agencies and their respective mandates, thus policy has generally been of a vertical nature.[10] But because of the increasing complexity of natural resource issues and the shared mandates and interests that span federal, state, and local governments, horizontal policy making is becoming increasingly common. One outcome of horizontal policy making is the increasing reliance on interagency agreements to achieve desired outcomes. However, the lack of strategic coordination to define the highest priorities among entities that develop the management plans that ultimately fund the agreements result in lost opportunities to articulate the state's highest priorities.

[9] Ibid.

[10] Ibid.

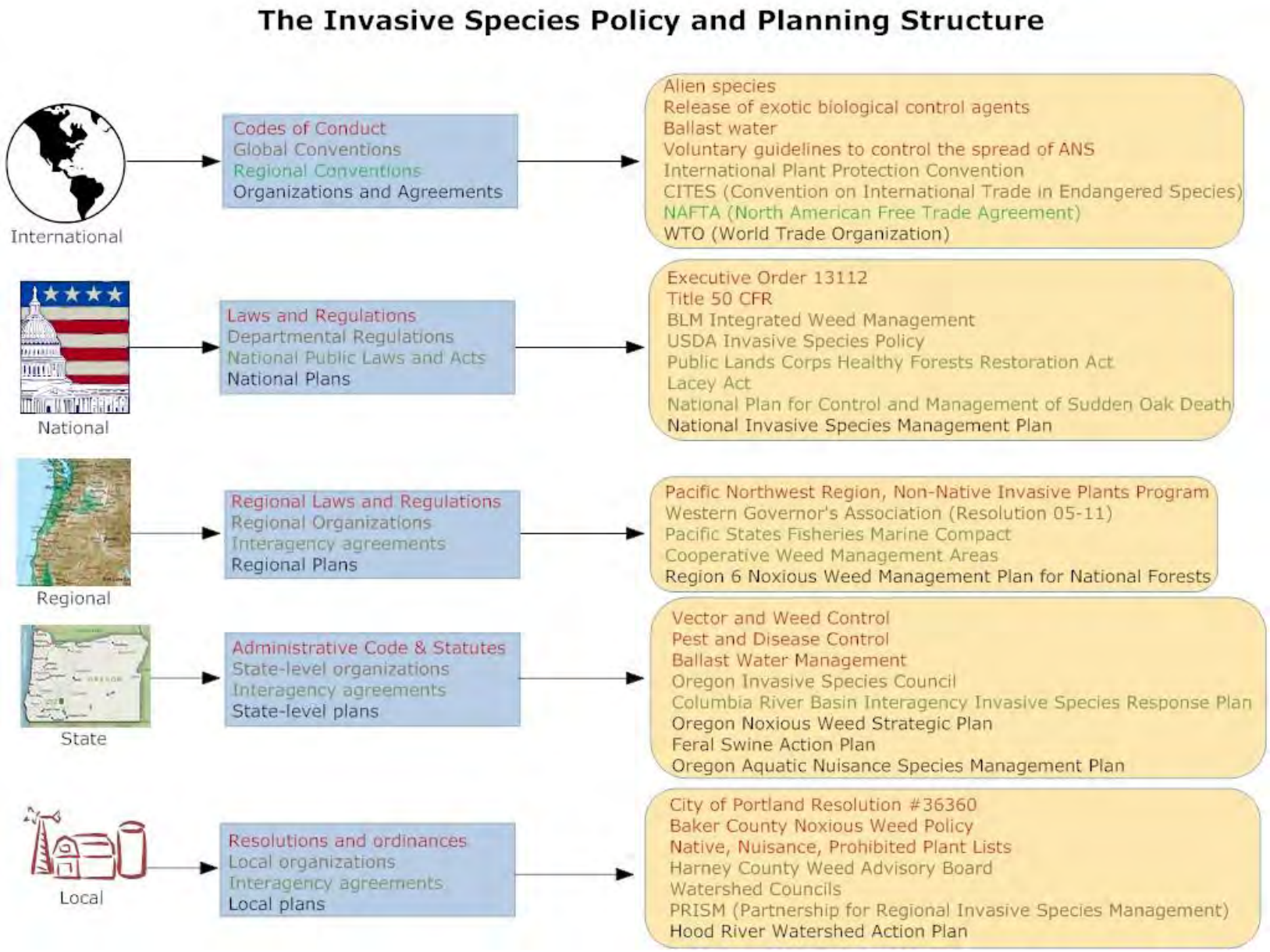


Figure 4. The relationship of international, national, regional, state, and local policies and plans.

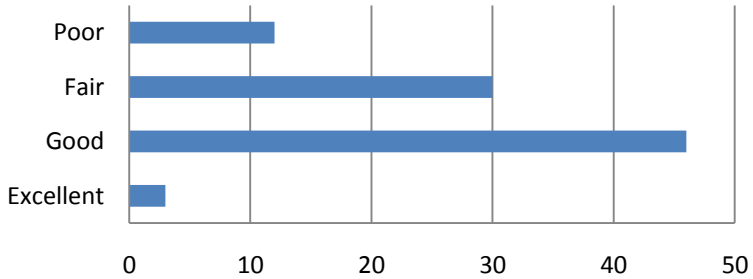
OREGON'S INVASIVE SPECIES POLICIES AND PLANS—ARE THEY EFFECTIVE?

The majority (51%) of statewide management assessment survey respondents ranked the adequacy of Oregon's invasive species regulations and laws (Figure 5) as good, followed by fair (33%), poor (13%) and excellent (3%). Several noted that Oregon would not have received the good or excellent rating it was given had it not been for the 2009 Oregon legislative session. During that session, Oregon adopted 11 new pieces of legislation aimed at protecting the state from invasive species (Appendix D). For example, the state adopted legislation that created a $350,000 Invasive Species Control Account to respond to early detections as well as making it illegal for anyone to purchase a feral swine hunt. Despite these significant advances, there is additional legal and policy work as well as agency protocols to be developed on an ongoing basis to protect Oregon from the ever-changing environment that results in new introductions of invasive species on a regular basis.

For example, in August of 2008, a Hanjin shipping container from China loaded with granite arrived at Terminal 6 at the Port of Portland. Customs and Border Protection staff discovered an amphibian and several spiders and immediately resealed the container. Lack of identification of the amphibian and an inefficient communication structure delayed decisions and actions regarding the container and resulted in hundreds of hours of staff time across numerous agencies and organizations before it was ultimately resolved. The Asian toad incident is an excellent example of sufficient legal authorities, but insufficient use of those authorities because of lack of agency training and understanding of roles and responsibilities.

Another example of an additional need is legislation to protect the Invasive Species Control Account, an emergency fund that will allow the State of Oregon to respond quickly to a new invasive species infestation. Failure to protect this account for its said purpose could jeopardize its existence. In addition, a mechanism is needed to replenish the account as funds are expended.

Figure 6 represents an analysis of Oregon's strengths, weaknesses, opportunities, and threats relative to effective invasive species policy implementation, and is largely a result of information provided by respondents to the statewide management assessment survey (Appendix E).



	Excellent	Good	Fair	Poor
Ratings	3	46	30	12

Figure 5. Ratings of the adequacy of State of Oregon invasive species regulations and laws (N=91).

SWOT Analysis of Oregon Invasive Species Regulations

STRENGTHS

- Have statutorily authorized Invasive Species Council, State Weed Board, and other entities.
- Prohibit, or require a permit for, the import or release of wildlife and aquatic species.
- Authorize quarantines for all taxa.
- Statutorily authorize outreach and education.
- Require a permit to possess non-native species.
- Authorize the use of emergency powers for rapid response.
- Authorize criminal and civil penalties for all taxa.
- Have an Invasive Species Control Account to fund eradication or control of new infestations or infections of invasive species.
- Enacted legislation in 2009 that holds people liable for introducing non-native fish to Oregon's water bodies.
- Lack an adequately vetted/researched list of approved biocides that could be used/applied during a rapid response circumstance.

OPPORTUNITIES

- A stronger federal presence regarding pathways could help Oregon's prevention efforts (e.g., firewood).
- The 2009 legislative session resulted in the passage of 11 invasive species-related pieces of legislation, paving the way for continued discussion and support for invasive species legislation in the 2011 legislative session.
- Model legislation and policy exist in other states to stimulate thinking and action in Oregon to enhance effectiveness (e.g., Wisconsin Lakes Monitoring Program, NY approach to EDRR is state-supported).
- The public is becoming increasingly aware of the threat of invasives to Oregon's economy, environment, and quality of life.
- Recent statewide public awareness campaign has solidified Oregon's commitment to lessening the threat of invasive species.
- More communication with neighboring states is creating opportunities to share resources.
- Regional groups have developed excellent regional plans to address significant aquatic invasives.
- West Coast Governors Agreement on Ocean Health can provide a powerful vehicle for facilitating regional consistency, coordinating actions, and promoting federal support for invasive species management goals and programs.

WEAKNESSES and THREATS

- An adequately funded statutorily authorized Invasive Species Emergency Fund, created in 2009,needs adequate funding to ensure effective rapid response to new infestations.
- Oregon constitution makes mandatory watercraft inspection stations illegal.
- Federal and state statutes may not address the latest threats and associated pathways.
- Some counties have no weed control districts or county weed inspectors. Cities are not included in county weed boards unless all cities in a county sign on.
- Statutes lack adequate enforcement penalties.
- Regulations are often reactive versus proactive.
- State law prevents public employees from treating weeds on private property.
- A unified reporting system for all invasive species taxa does not exist in the state, the region, or nationally.
- Legislation is needed to provide for reimbursement to agencies that respond to and eradicate a new infestation for which the source can be determined.
- Agencies do not provide adequate ongoing training to ensure all employees understand the statutory responsibilities of their organizations and their partner organizations.
- Federal legislation could save states time and money by addressing national issues, such as movement of firewood, instead of each state developing its own firewood regulations.
- There isn't an adequate assessment of the total cost needed to implement the many management plans developed to address Oregon's invasive species issues.
- No monitoring of Internet sales of species invasive to Oregon.
- Do not authorize the study of future threats, except noxious weeds.
- Do not authorize monitoring after release of non-native species.
- Do not hold people responsible fiscally that possess species of risk to the state.
- Do not require owners to notify the state when invasive species are detected on their land, except for certain escaped wildlife.
- Inadequate funding is available to address prevention, control, research, monitoring and surveillance, and outreach and education.
- Inadequate consistent public outreach and education.
- Coordination across agencies is underfunded and lacks strategic coordination.

Figure 6. Strengths, weaknesses, opportunities, and threats to Oregon's invasive species regulations.

INTER-AGENCY PARTNERSHIPS

Survey respondents were asked to characterize the nature of their partnership with other entities—monitoring/surveillance, EDRR, prevention, management/control, outreach/education, research, effectiveness monitoring, coordination, fundraising, and policy—and entity (Appendix F). The most common type of inter-agency partnership was for outreach/education (324) purposes, followed by monitoring/surveillance (315), management/control (306), EDRR (297), coordination (250), prevention (241), research (164), effectiveness monitoring (151), policy (94), and fundraising (86).

The most common types of partnerships were between local governments and all other entities (N=905), followed by partnerships between state governments and all other entities (N=499), nonprofit organizations and all other entities (N=303), federal agencies and all other entities (N=253), academic institutions and all other entities (N=184), and tribal governments and all other entities (N=9) (Table 3).

Table 3. Total number of invasive species-related inter-agency partnerships in Oregon in 2008 by entity type.

	Federal	*Tribal*	*State*	*Local*	*Academic*	*Nonprofit*	
Federal	104	17	59	35	30	8	253
Tribal	7	0	2	0	0	0	9
State	160	53	129	107	34	16	499
Local	284	46	233	275	33	34	905
Nonprofit	86	4	92	91	13	17	303
Academic	77	3	34	49	13	8	184
	718	123	549	557	123	83	2,153

The predominance of partnerships between local governments and other entities (Figure 7) is likely a result of two factors: more survey respondents were associated with local government organizations compared to other entities, and local governments provide a key nexus between national and state invasive species policies and activities and local on-the-ground management activities. Funding from sources other than local governments fuel invasive species activities in local jurisdictions, with the exception of the City of Portland, which provides its own and significant source of funding.

The most common type of monitoring/surveillance, EDRR, prevention, management/control, outreach/education, effectiveness monitoring, coordination, and fundraising partnerships were between local governments and federal, state, and local governments (Figures 8–28).

The most common types of research partnerships were between federal agencies and academic institutions as well as federal agencies and federal and state agencies (Figures 18, 19).

The most common types of policy partnerships were between local governments and state and local governments, and between state governments and federal and state governments (Figures 26, 27), although compared to the number of agreements for other implementation categories, the policy category had the second fewest number of agreements among agencies.

Lack of clear policy direction in agreements may result in lost opportunities to create linkages between policy at national, regional, state, and local levels. This will be discussed more in the Discussion section of this report.

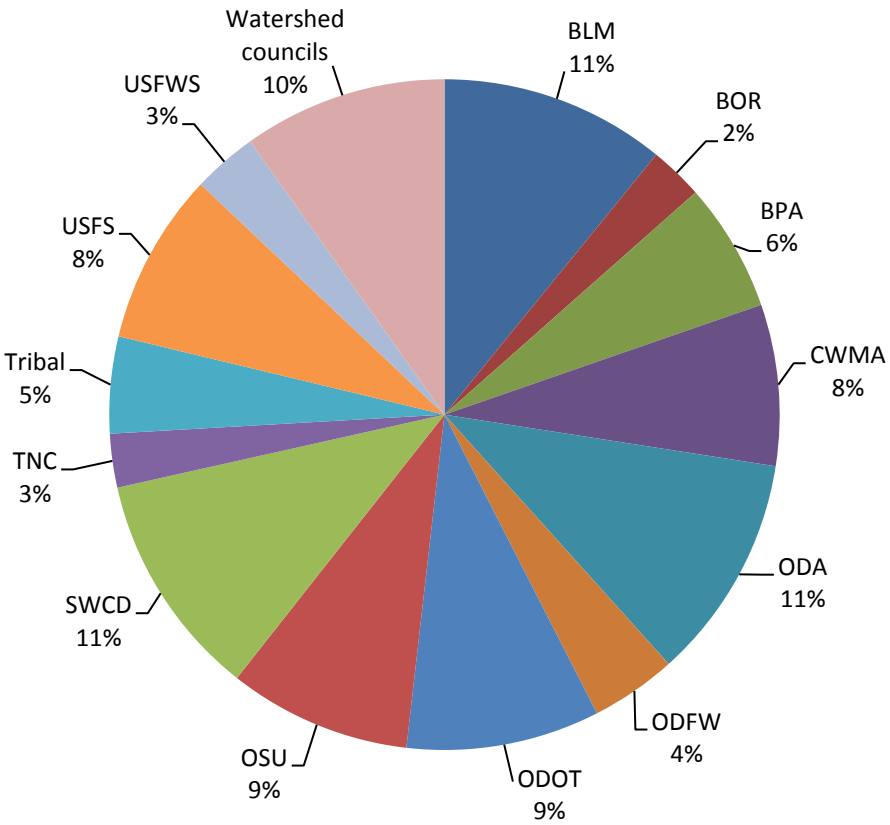


Figure 7. Percentage of entities that have invasive species agreements with counties.

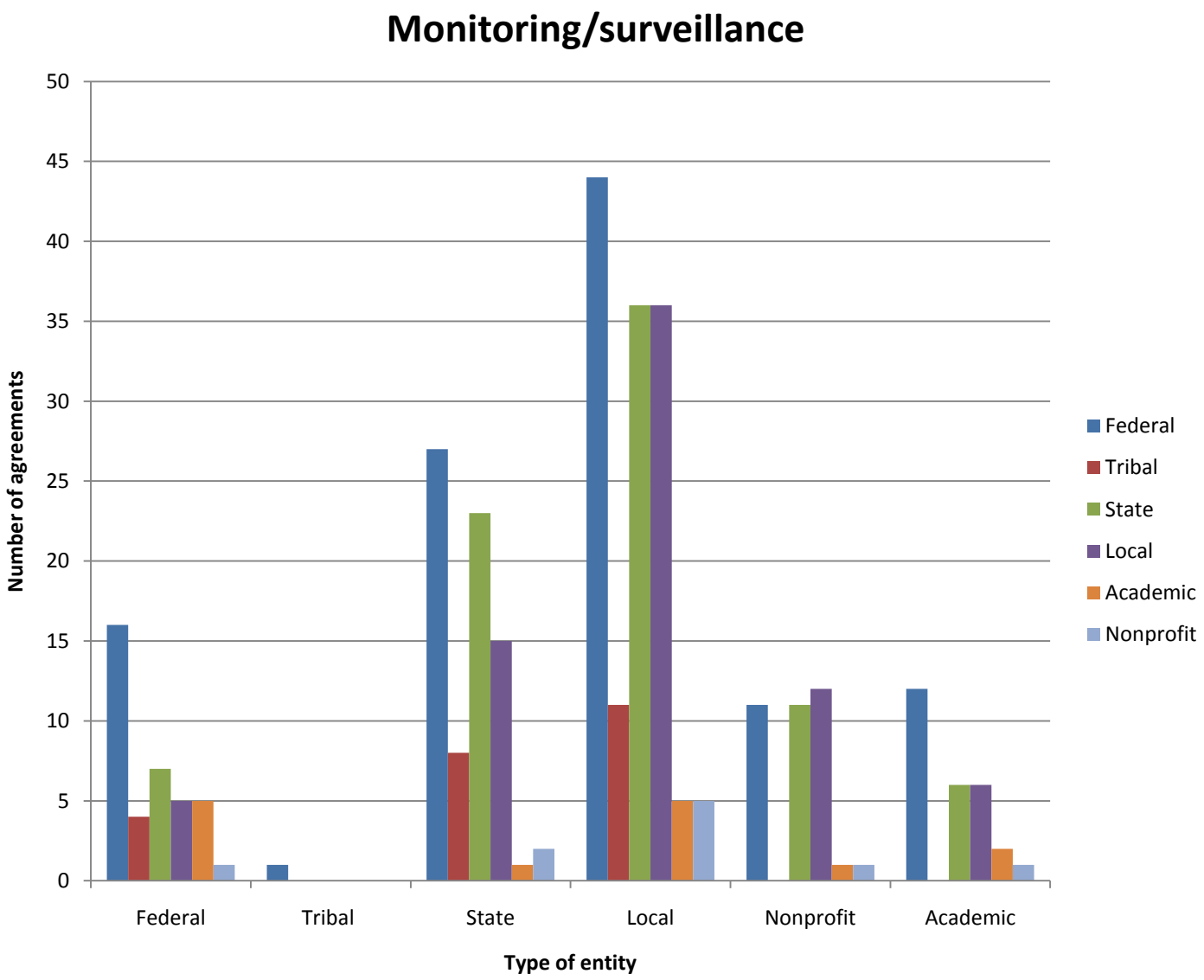


Figure 8. Agreements among entities for invasive species monitoring/surveillance activities in Oregon in 2008.

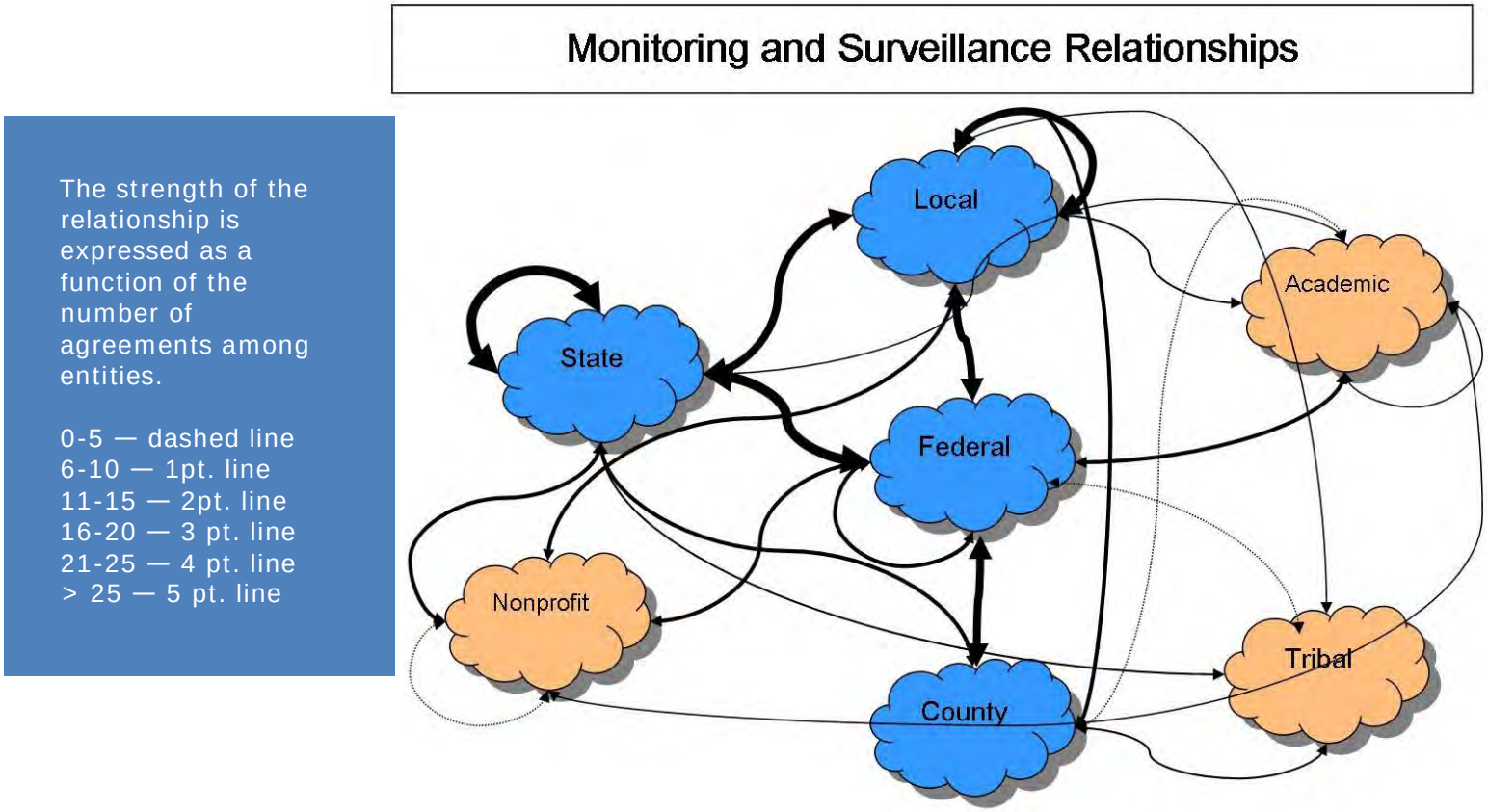


Figure 9. Monitoring and surveillance relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

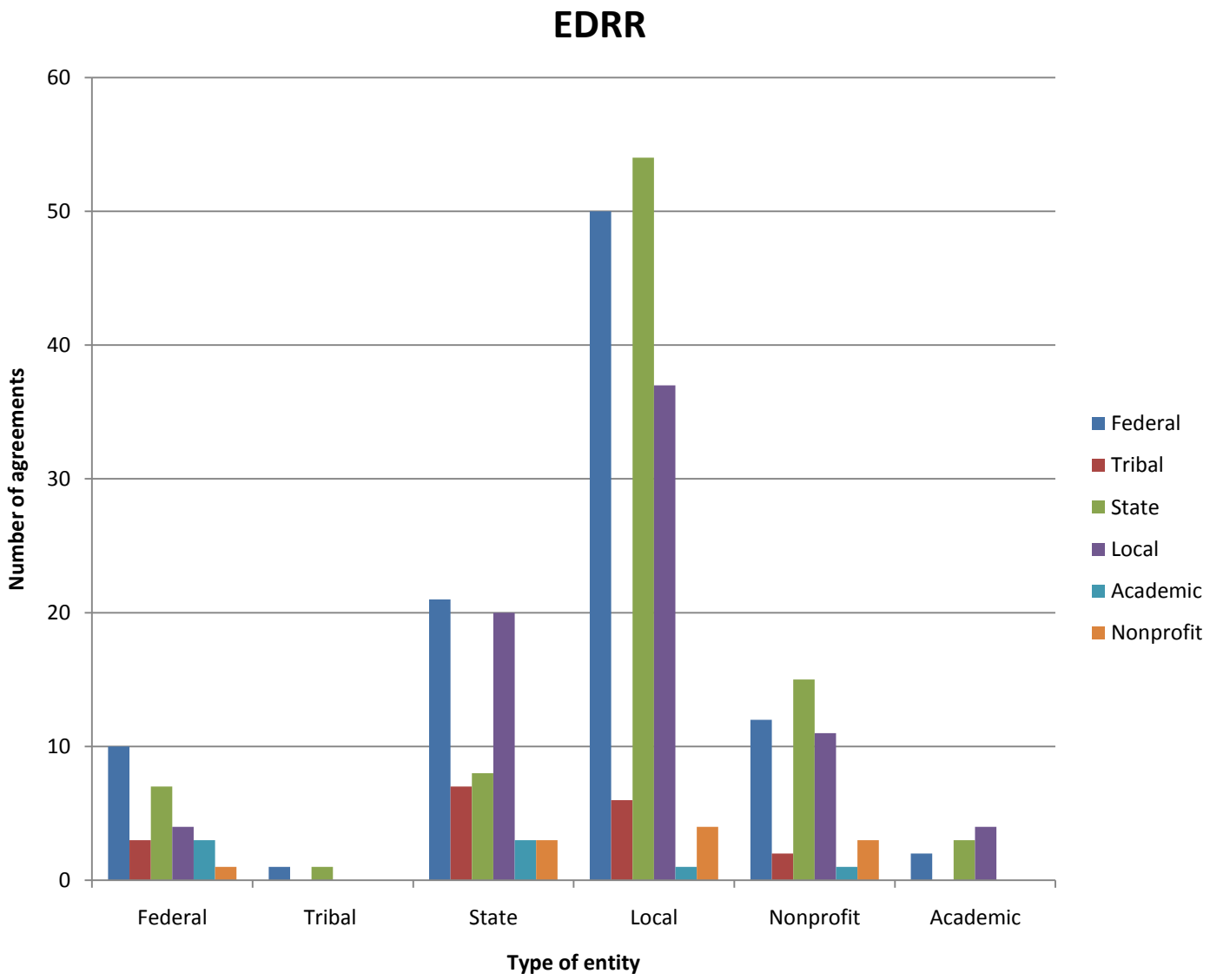


Figure 10. Agreements among entities for invasive species EDRR activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

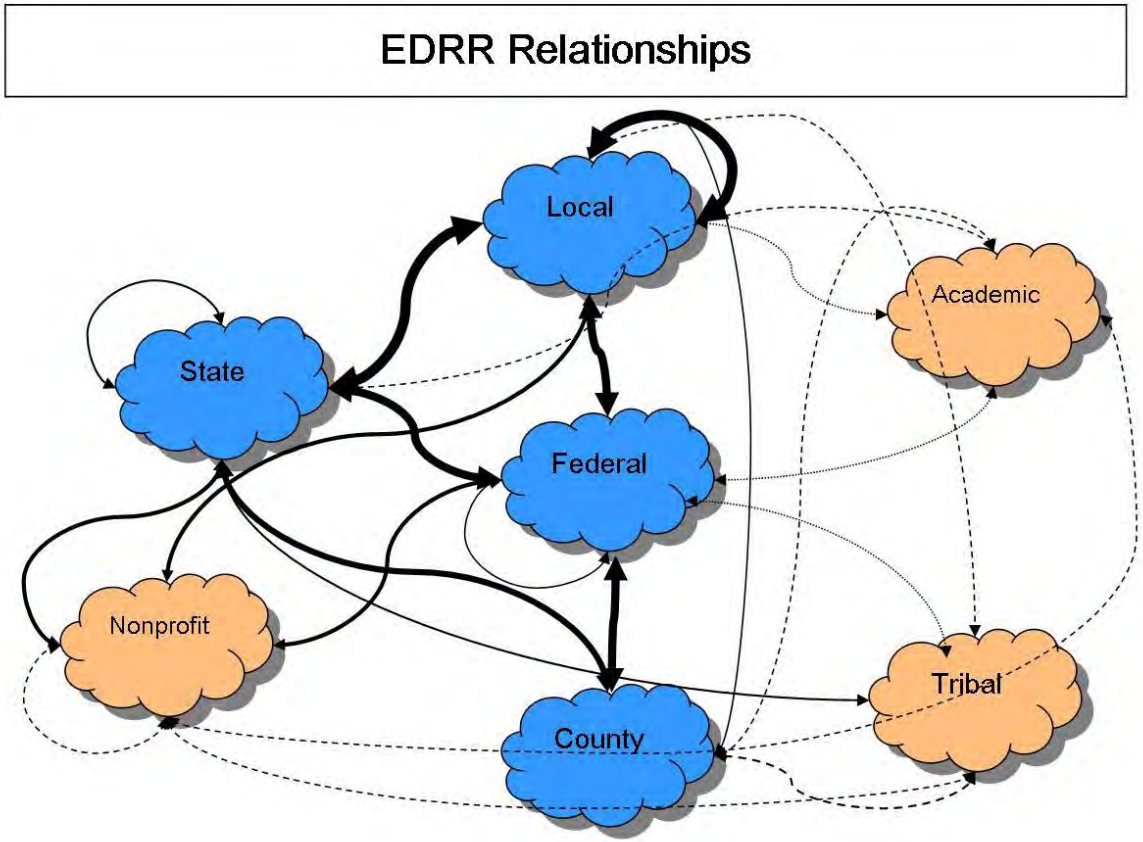


Figure 11. EDRR relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

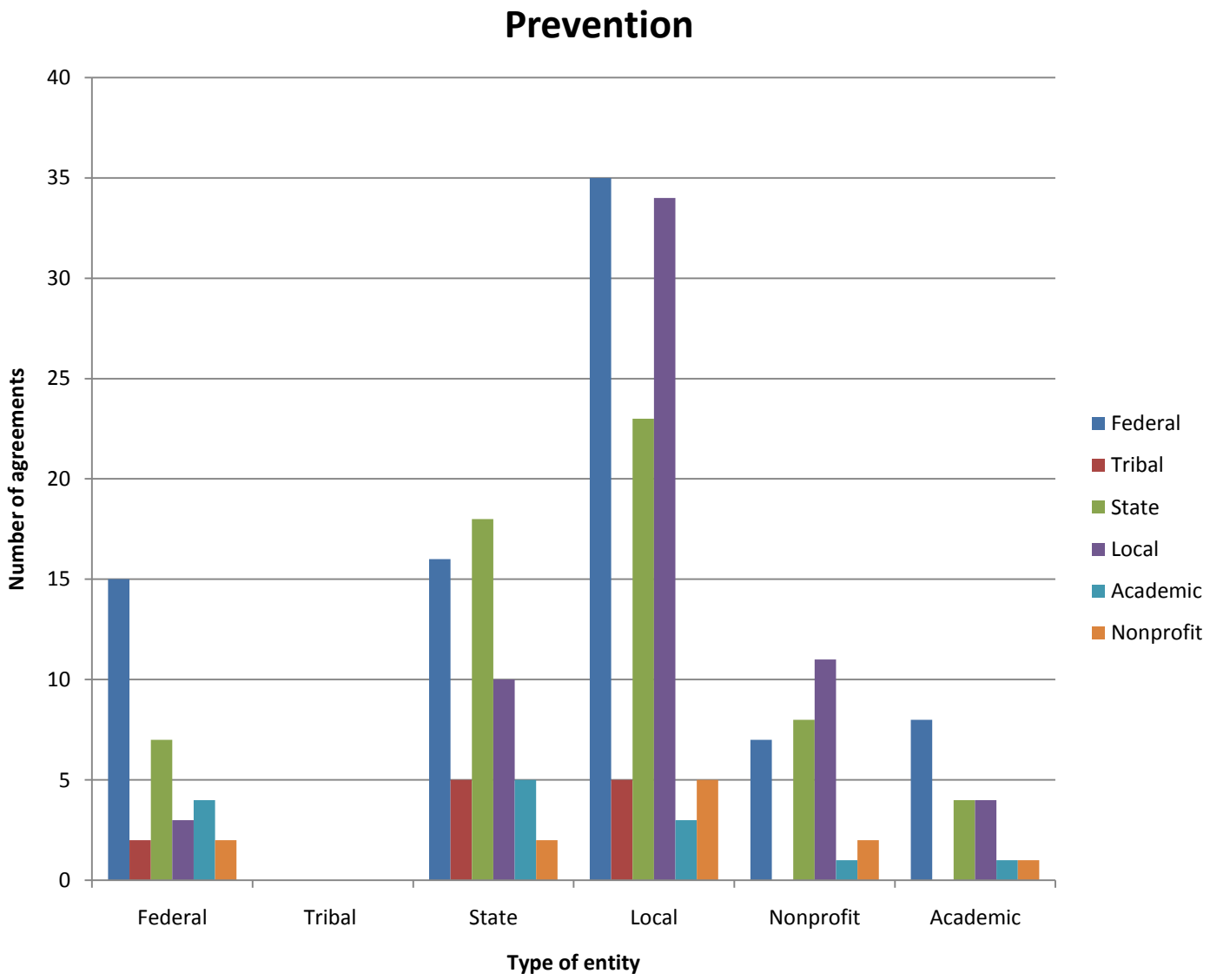


Figure 12. Agreements among entities for invasive species prevention activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

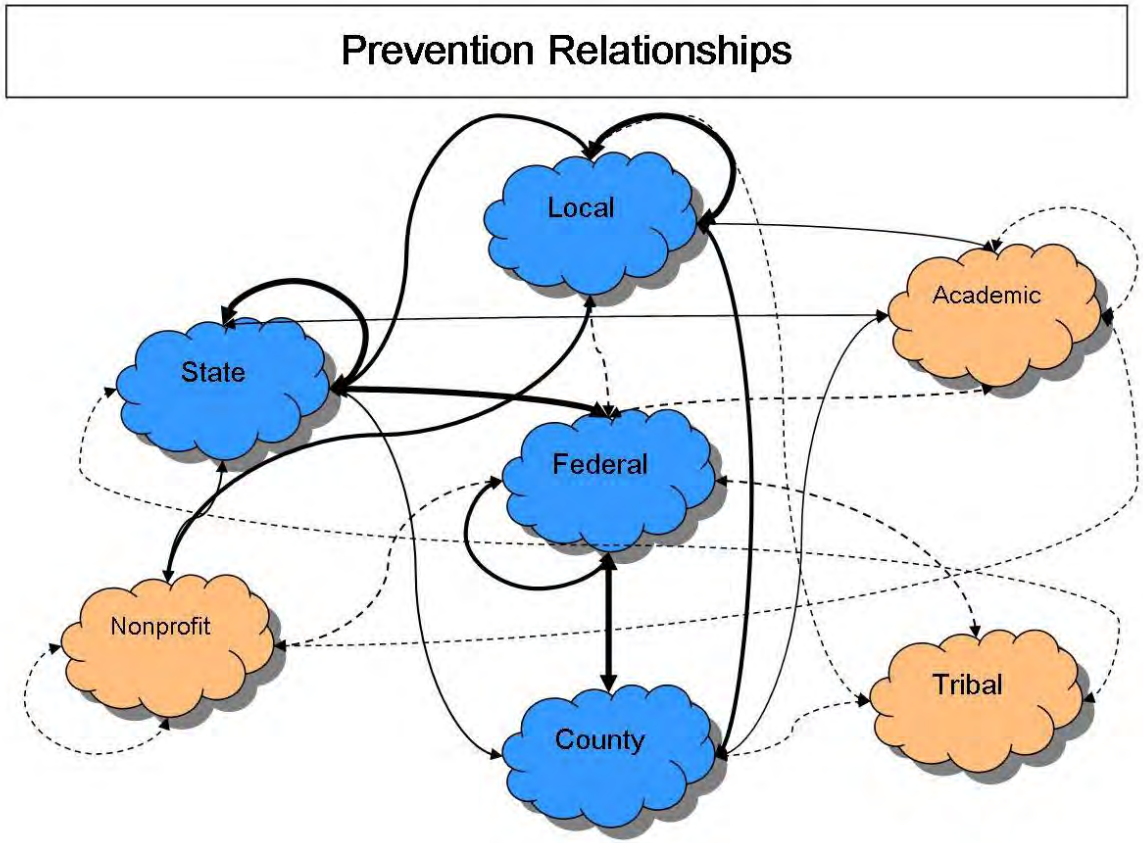


Figure 13. Prevention relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

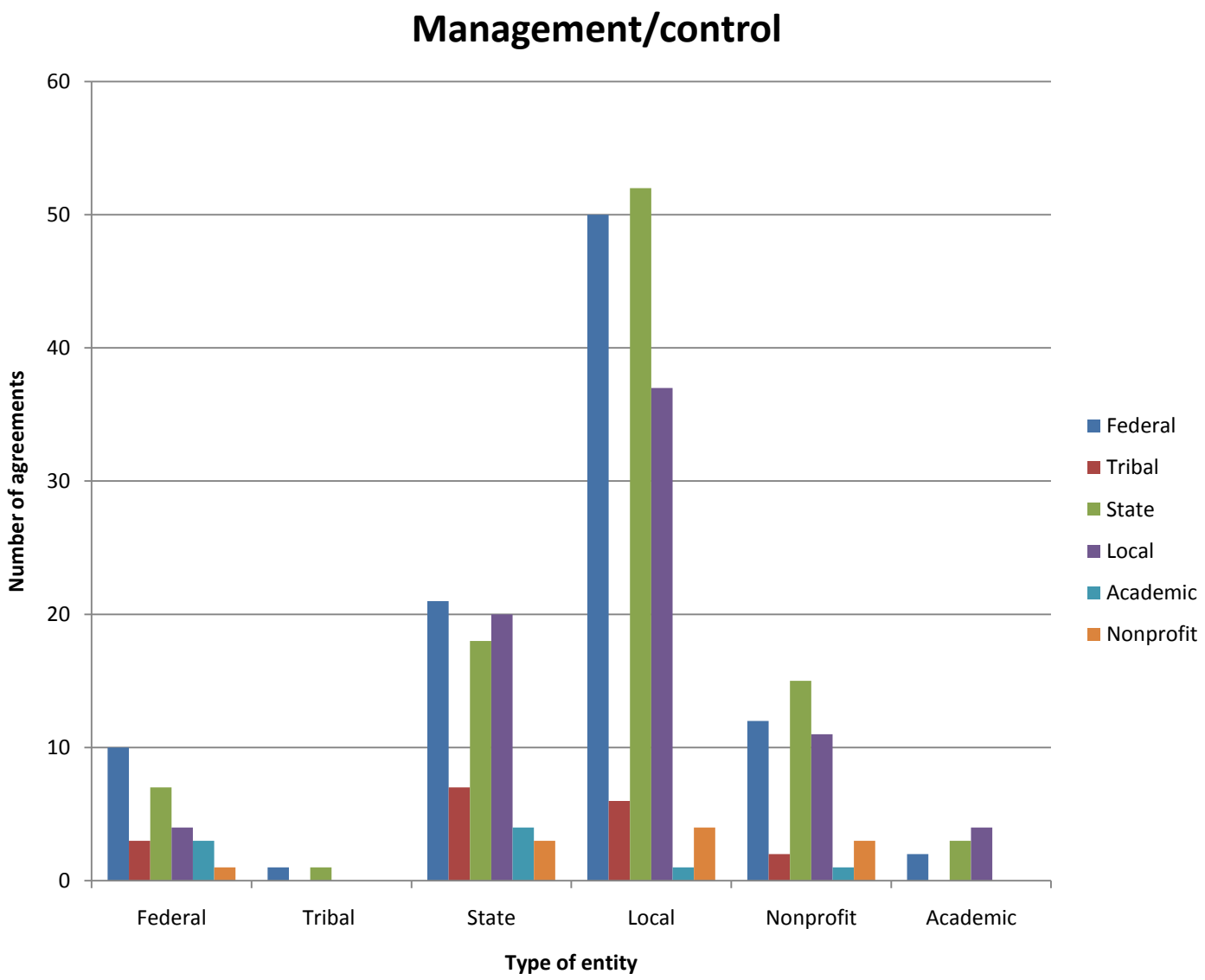


Figure 14. Agreements among entities for invasive species management/control activities in Oregon in 2008.

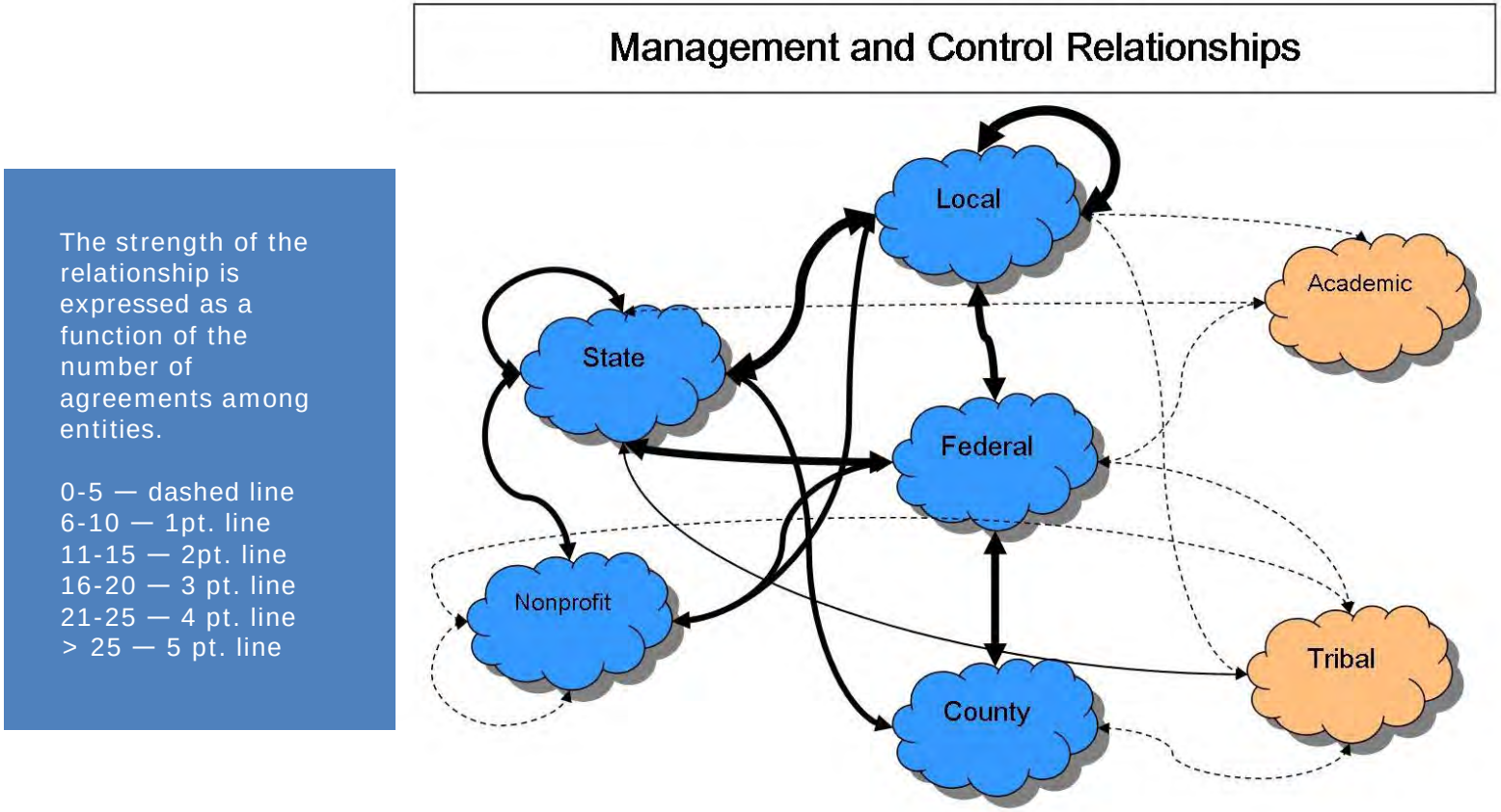


Figure 15. Management/control relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

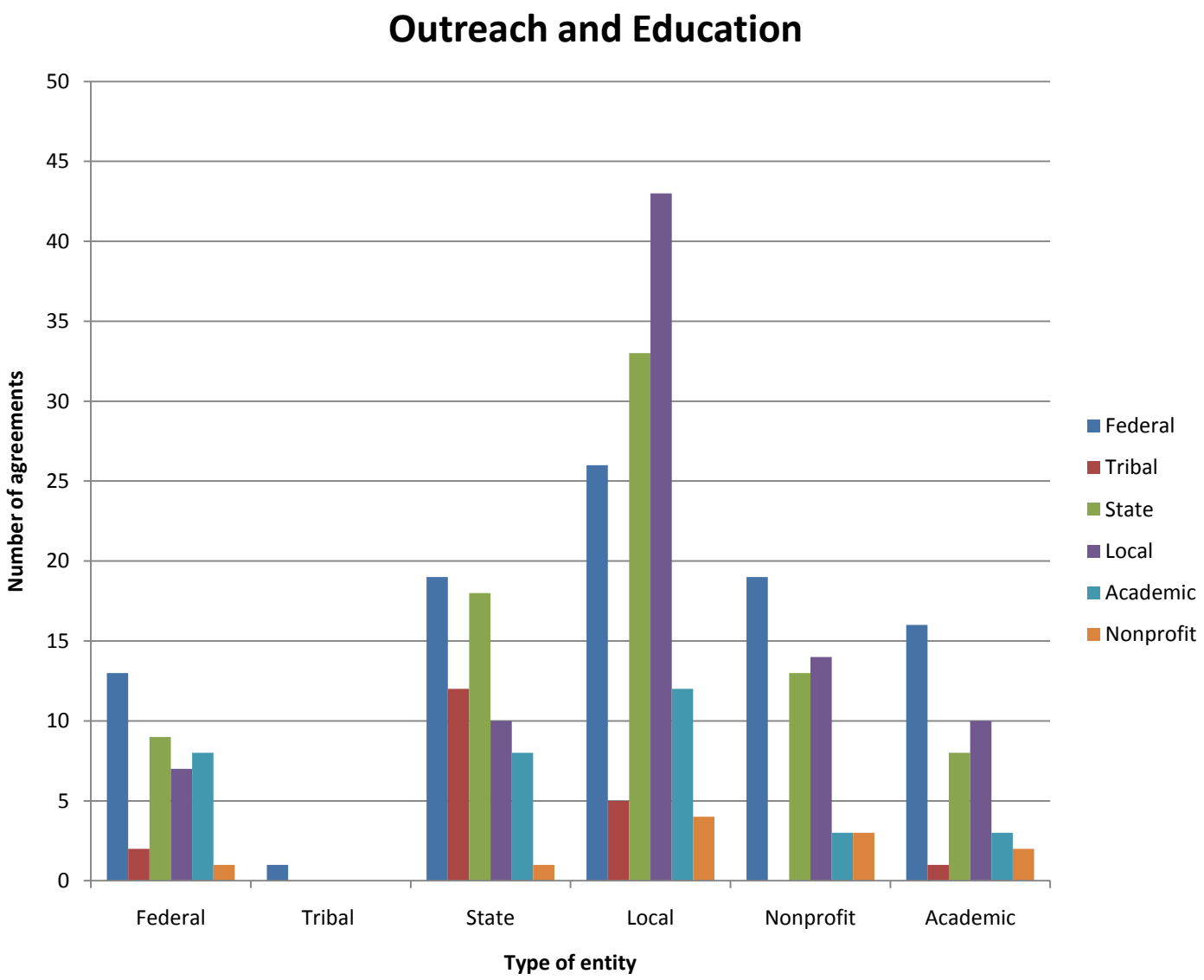


Figure 16. Agreements among entities for invasive species outreach and education activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

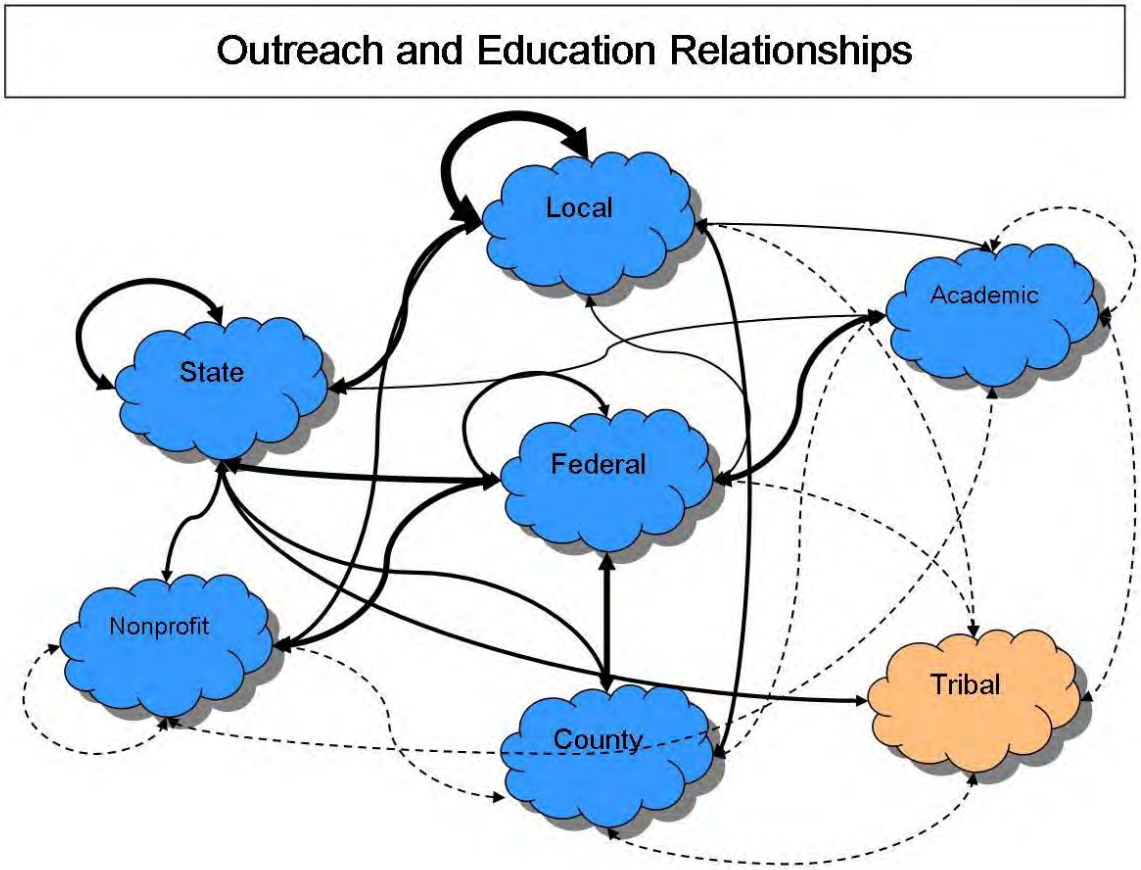


Figure 17. Outreach and education relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

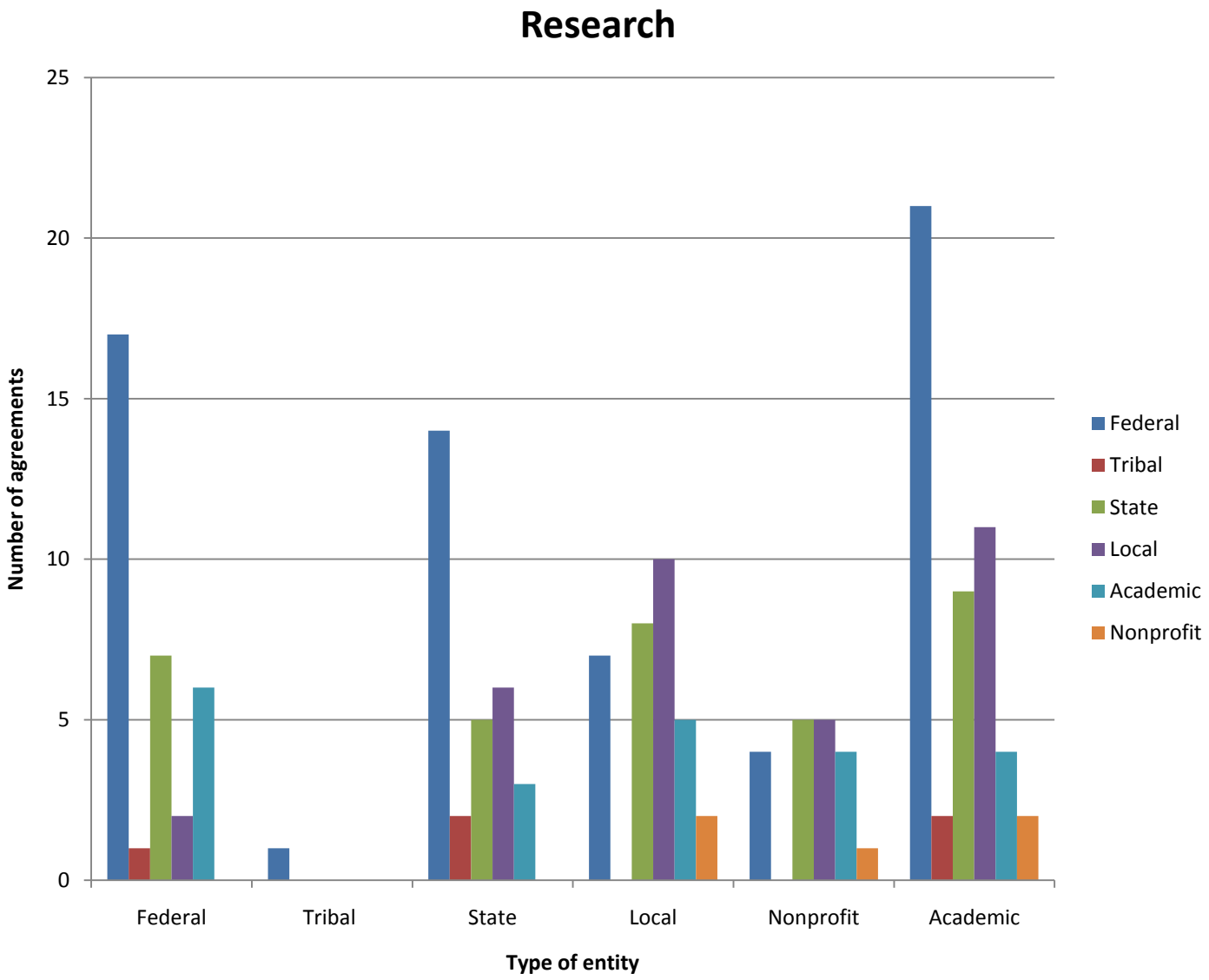


Figure 18. Agreements among entities for invasive species research in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

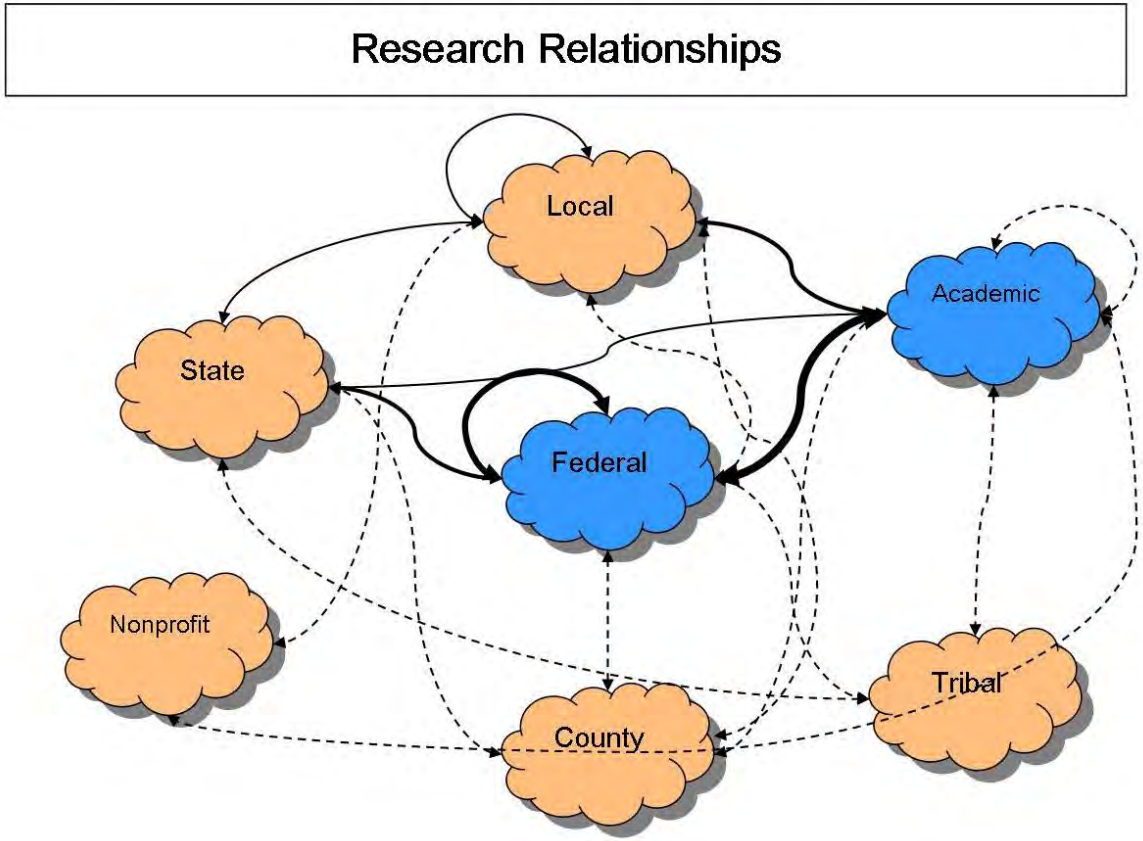


Figure 19. Research relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

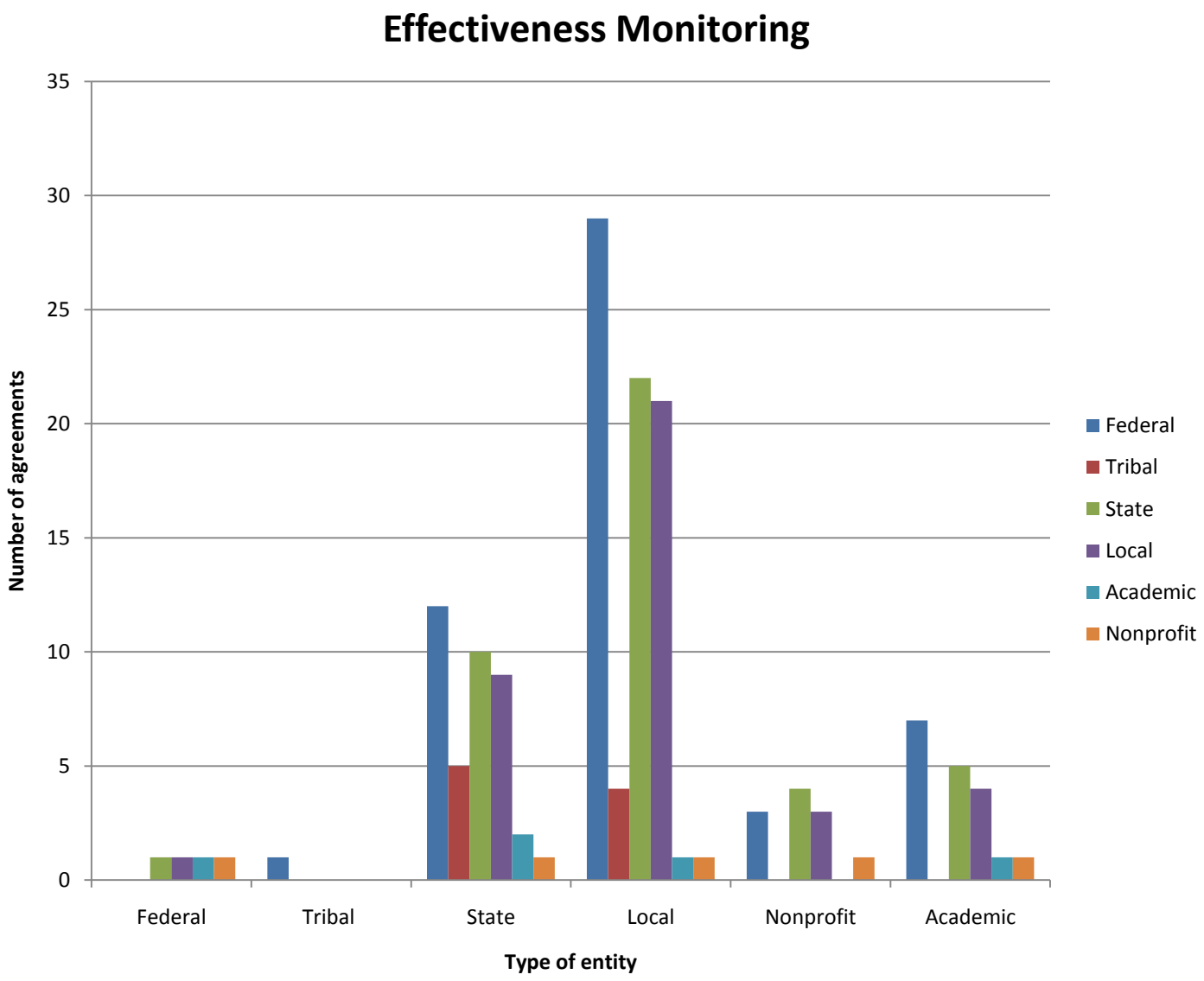


Figure 20. Agreements among entities for invasive species effectiveness monitoring activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

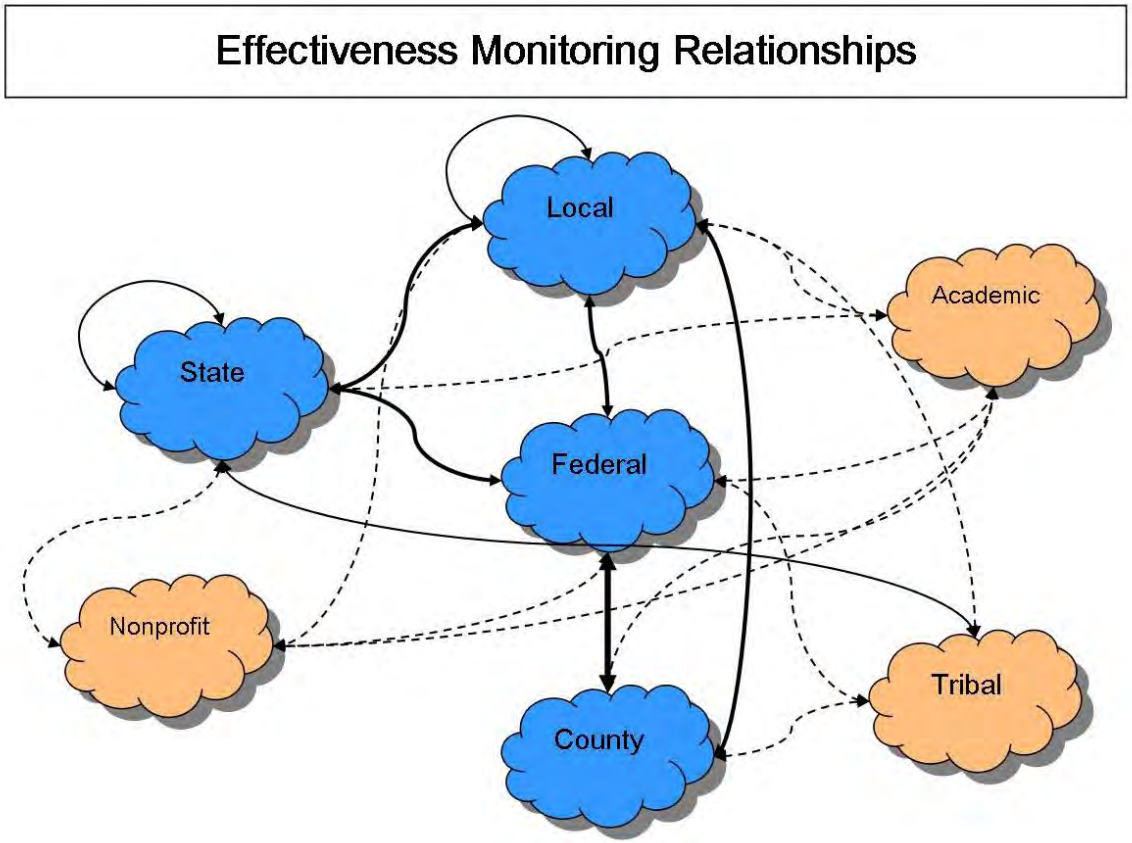


Figure 21. Effectiveness monitoring relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

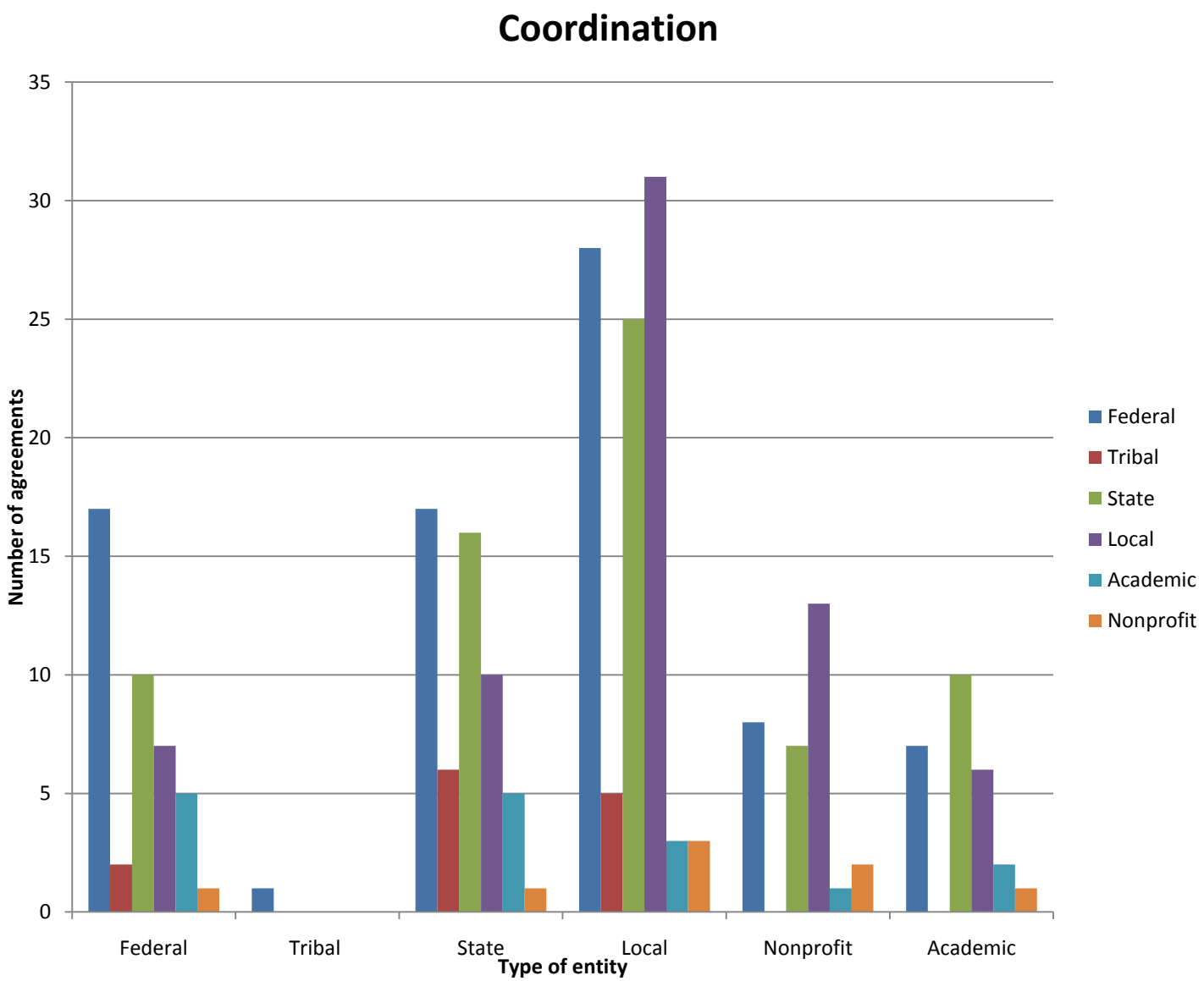


Figure 22. Agreements among entities for invasive species coordination activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

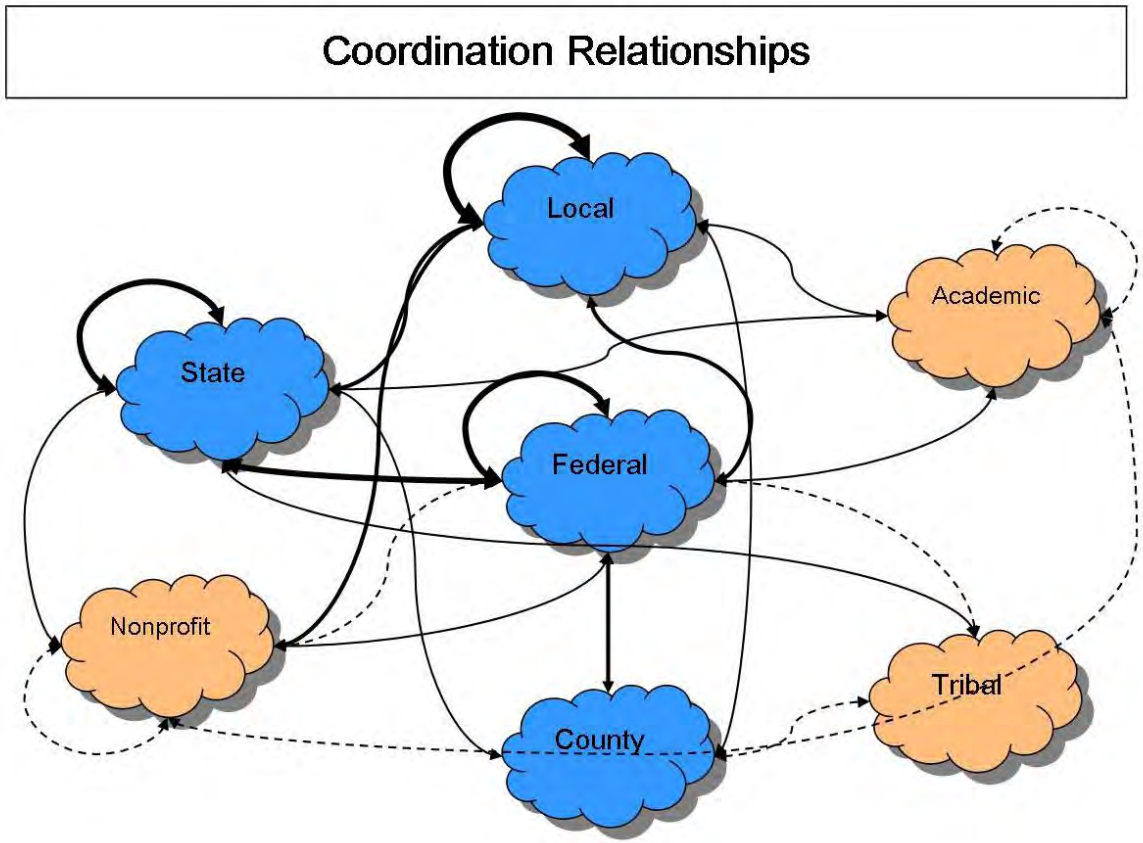


Figure 23. Coordination relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

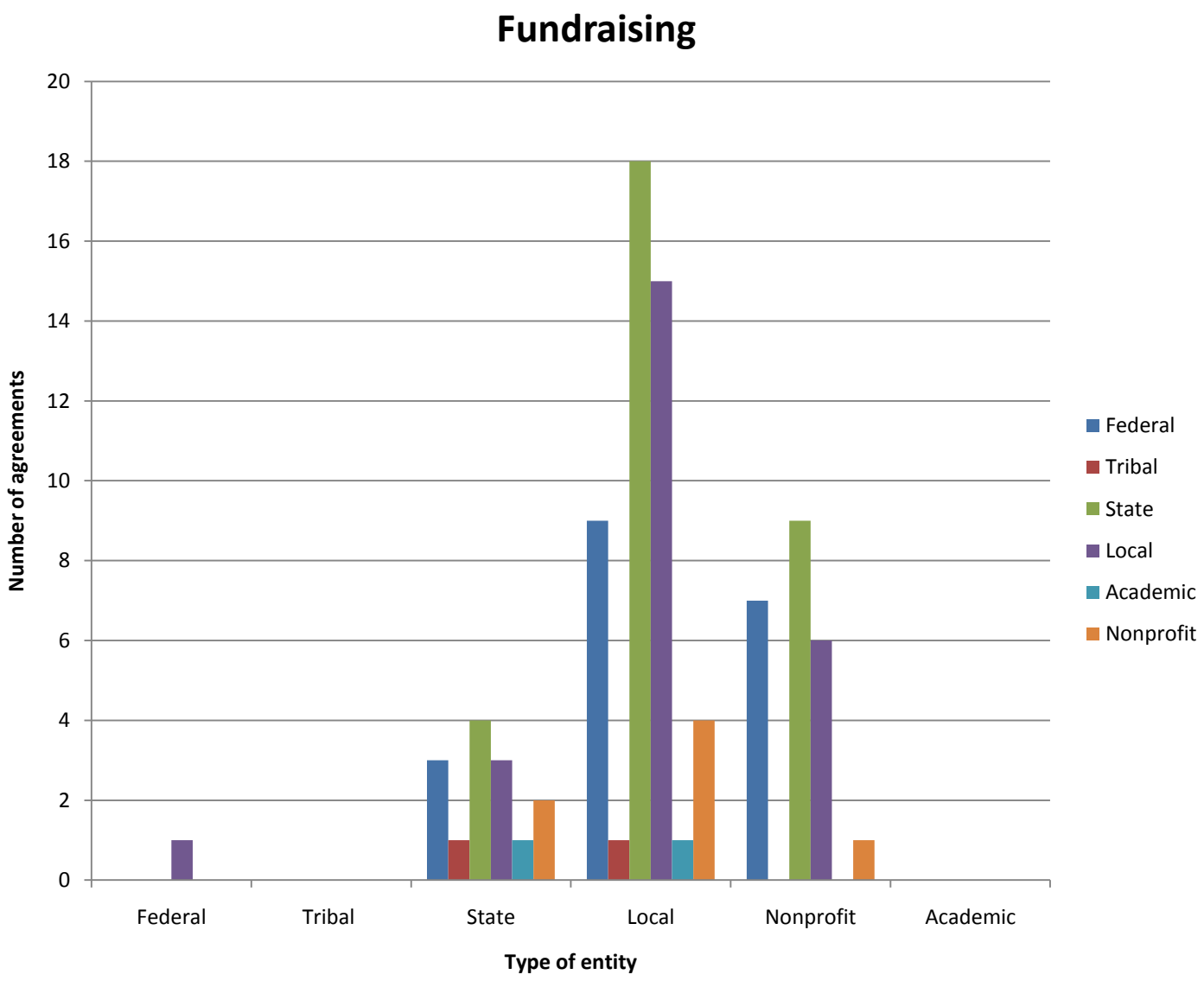


Figure 24. Agreements among entities for invasive species fundraising activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

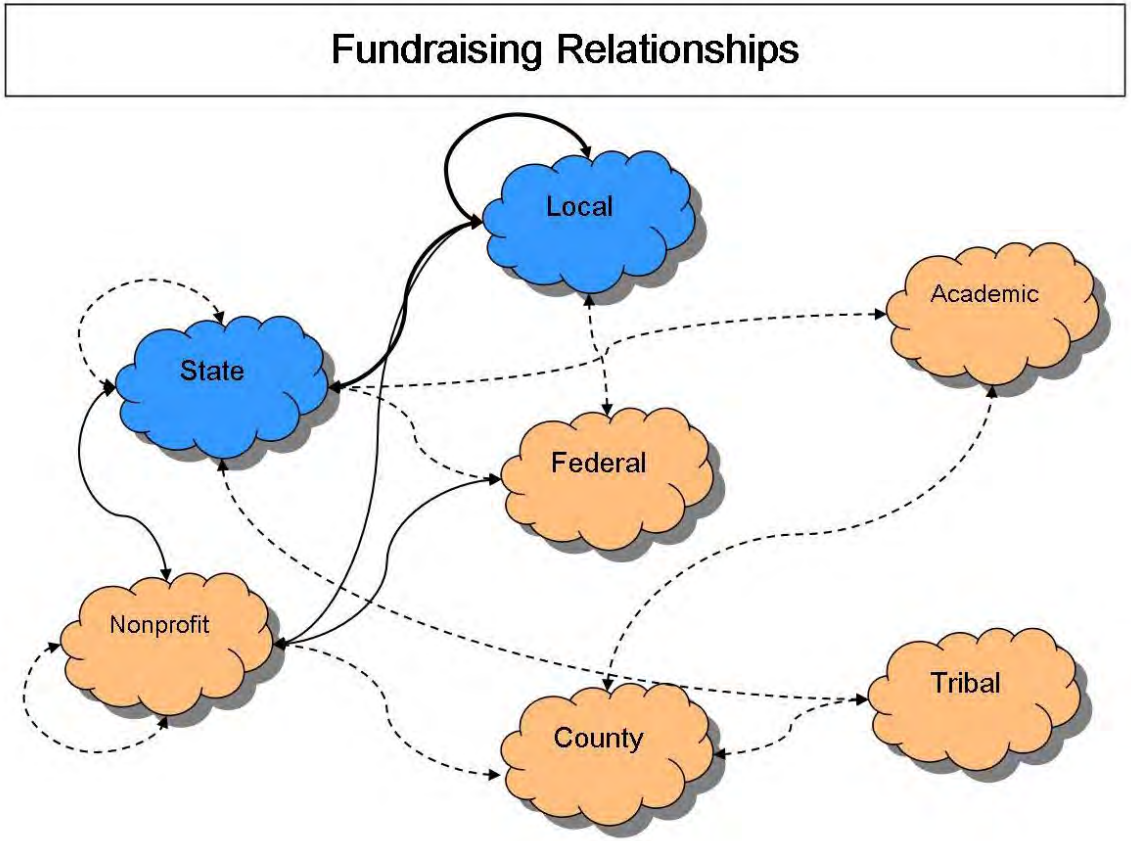


Figure 25. Fundraising relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

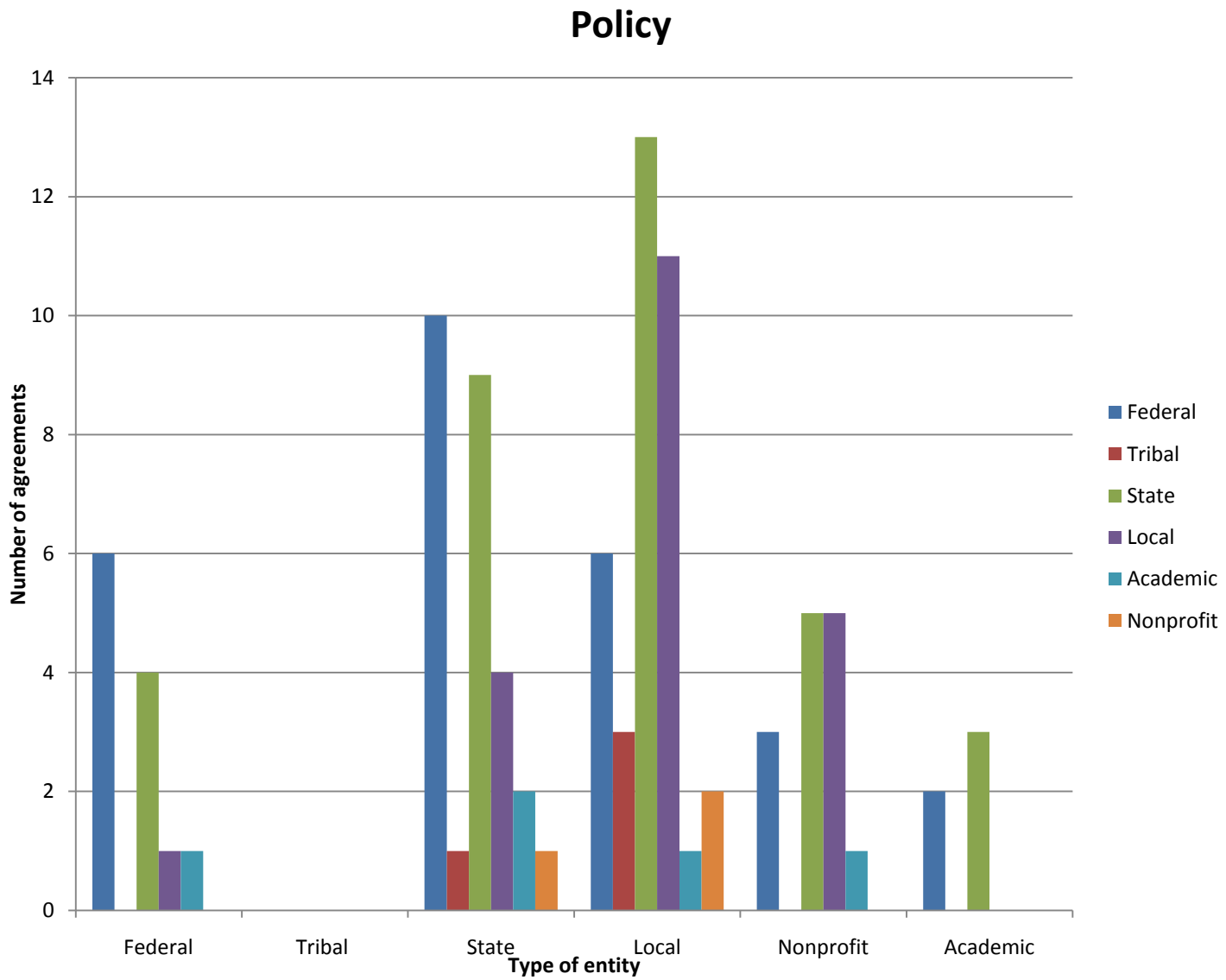


Figure 26. Agreements among entities for invasive species policy activities in Oregon in 2008.

The strength of the relationship is expressed as a function of the number of agreements among entities.

0-5 — dashed line
6-10 — 1pt. line
11-15 — 2pt. line
16-20 — 3 pt. line
21-25 — 4 pt. line
> 25 — 5 pt. line

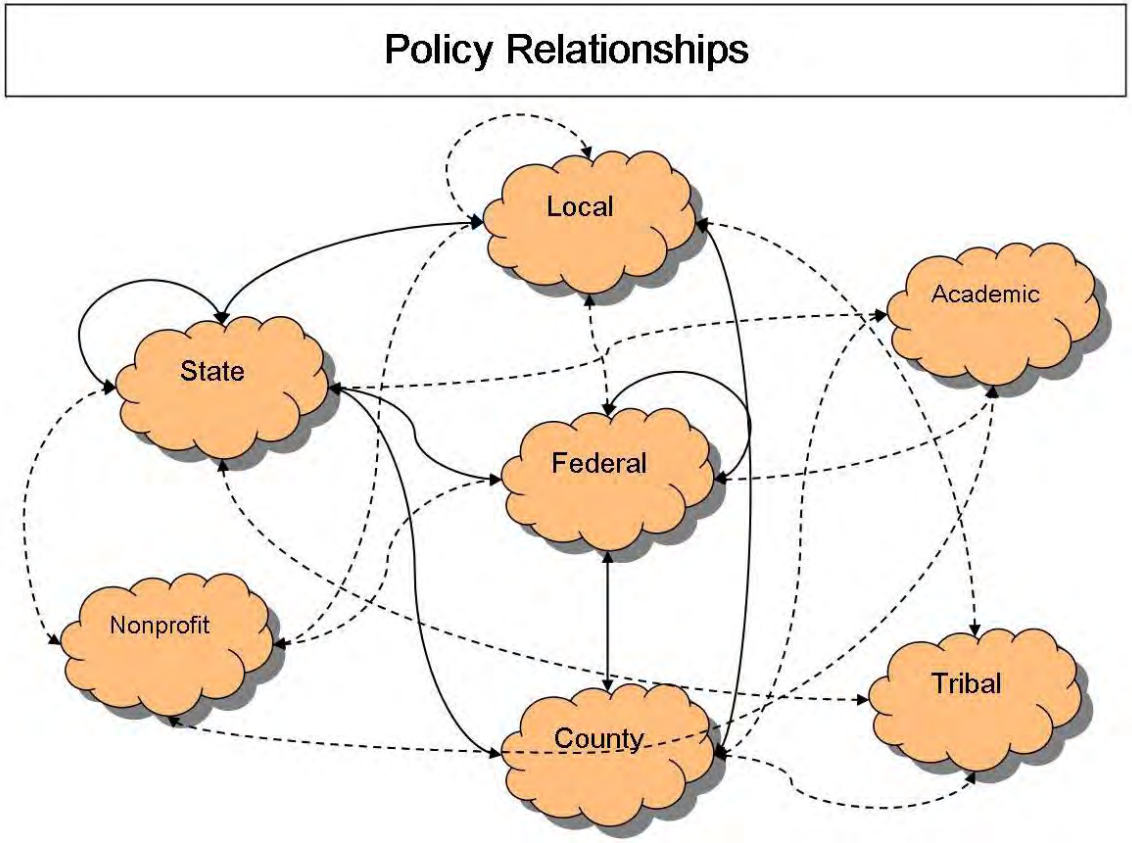


Figure 27. Policy relationships for key invasive species entities in Oregon. The number of agreements is expressed by the thickness of the line.

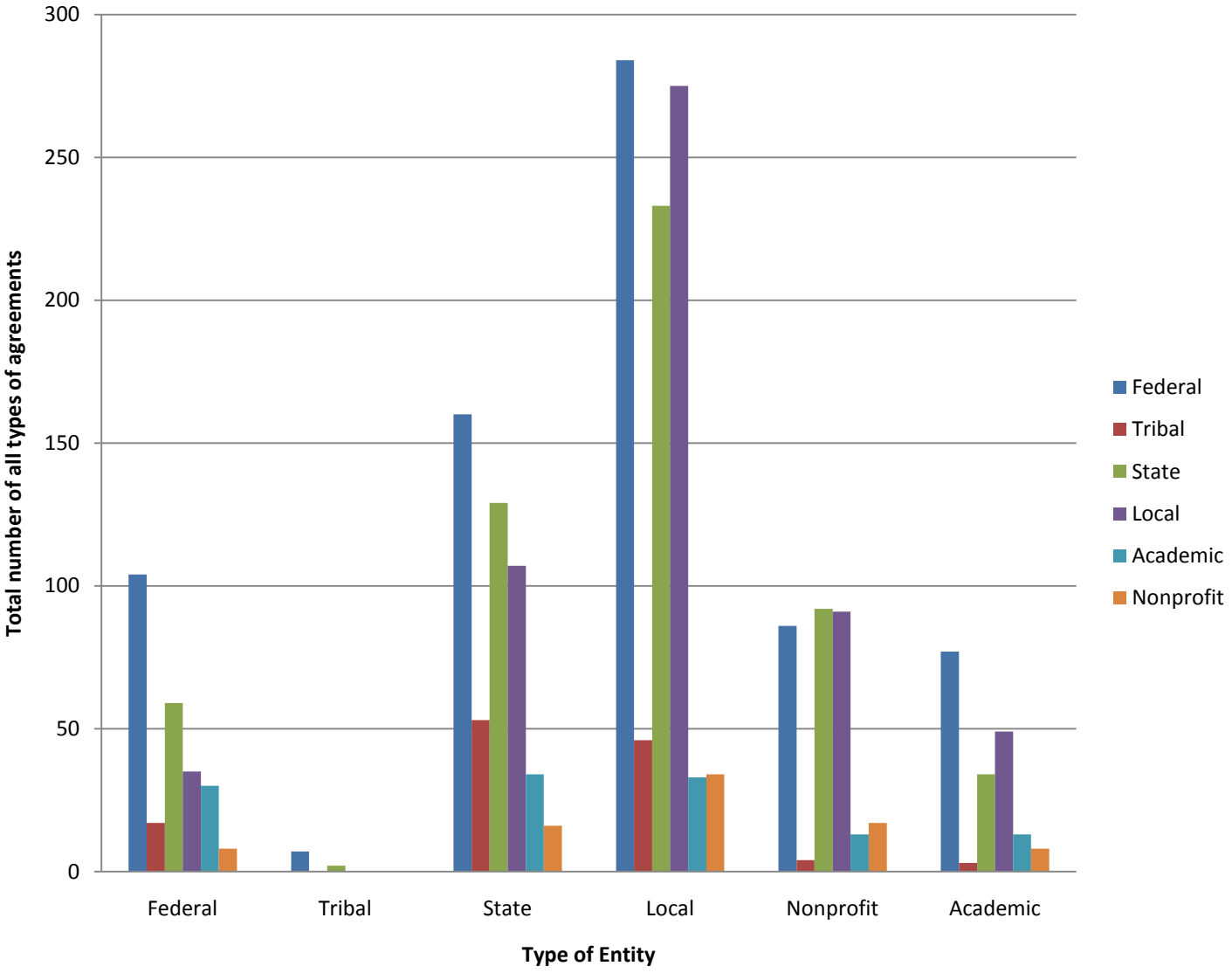


Figure 28. Agreements among entities for all invasive species activities in Oregon in 2008.

INVASIVE SPECIES TAXA

Survey respondents indicated the most common invasive species taxa entities worked on in Oregon in 2008 were land plants, followed by aquatic plants, aquatic invertebrates, fish, mammals, microorganisms, land invertebrates (insects, mites, etc.), reptiles, amphibians, and birds (Table 4). A total of 78 entities (45%) responded they work on invasive land plants, while 29 entities (17%) work on aquatic invasive plants, and 20 entities (11%) work on aquatic invertebrates. Invasive fish (7%), mammals (6%), micro-organisms (5), land invertebrates (4%), amphibians (2%), reptiles (2%), and birds (1%) comprise the remaining categories (Figure 29).

Table 4. The number and types of entities that worked on invasive species taxa in 2008.

	Micro-organisms	Aquatic plants	Land plants	Aquatic invertebrates	Land invertebrates	Fish	Birds	Mammals	Reptiles	Amphibians
Federal	2	5	4	7	3	6	0	2	1	1
State	1	4	9	3	2	1	0	1	1	0
Local	0	11	42	1	0	0	1	2	1	0
Tribal	0	0	2	1	0	0	0	0	0	0
Nonprofit	1	4	8	3	0	1	1	3	1	0
Academia	5	5	13	5	2	4	0	2	0	2
TOTALS	**9**	**29**	**78**	**20**	**7**	**12**	**2**	**10**	**4**	**3**

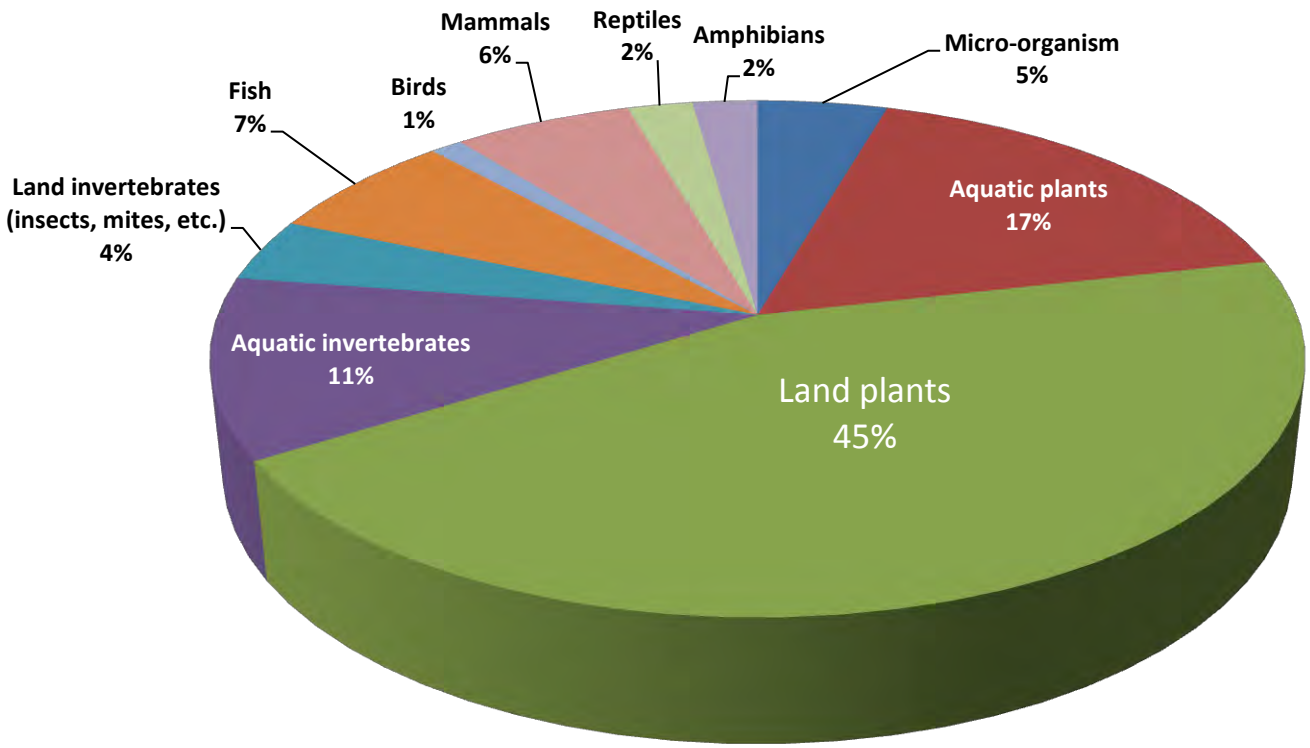


Figure 29. Percentage of invasive species taxa in Oregon for which entities conducted work in 2008.

Survey respondents provided a list of invasive species for which they conducted survey or management work in 2008 (Appendix G). The species lists from each organization were compiled (Table 5) to determine which species received survey or management work in 2008 by the greatest number of organizations.

Table 5. Number of entities that conducted survey and management work on invasive species in Oregon in 2008. Note: List includes species for which five or more organizations conducted work. For the full listing, see Appendix G.

# of entities that conducted survey or management work on this species in 2008	Scientific Name	Common Name	Oregon State Noxious Weed List Designations
40	*Lepidium spp.*	White top/perennial pepperweed	B
27	*Polygonum spp.*	Knotweeds	B,T
20	*Linaria spp.*	Dalmatian/yellow toadflax	B,T
17	*Tribulus terrestris*	Puncture vine	B
16	*Cytisus scoparius*	Scotch broom	B
16	*Onopordum acanthium L*	Scotch/cotton thistle	B
15	*Centaurea solstitialis*	Yellow starthistle	B,T
15	*Cirsium arvense*	Canada thistle	B
14	*Centaurea diffusa*	Diffuse knapweed	B
13	*Rubus armeniacus/discolor*	Armenian blackberry	B
12	*Alliaria petiolata*	Garlic mustard	B
12	*Chondrilla juncea*	Rush skeletonweed	B,T
12	*Euphorbia cyparissias*	Cypress spurge	
12	*Iris pseudacorus*	Yellow flag iris	B
12	*Lythrum salicaria*	Purple loosestrife	B
12	*Taeniatherum caput-medusae*	Medusahead	B
11	*Hedera helix*	English ivy	B
11	*Senecio jacobaea*	Tansy ragwort	B,T
10	*Brachypodium sylvaticum*	False brome	B,T
9	*Cynoglossum officianale*	Houndstongue	B
9	*Ulex europaeus*	Gorse	B,T
7	*Acropitlon repens*	Russian knapweed	B
7	*Conium maculatum*	Poison hemlock	B
7	*Dreissena bugensis*	Quagga mussels	N.A.
7	*Dreissena polymorpha*	Zebra mussels	N.A.
7	*Kochia scoparia*	Kochia	B
7	*Potamopyrgus antipodarum*	New Zealand mudsnail	N.A.

# of entities that conducted survey or management work on this species in 2008	Scientific Name	Common Name	Oregon State Noxious Weed List Designations
6	*Carduus nutans*	Musk thistle	B
6	*Centaurea pratensis*	Meadow knapweed	B
6	*Genista monspessulana*	French broom	B
6	*Hydrilla verticillata*	Hydrilla	A
6	*Myriophyllum spicatum*	Eurasian water milfoil	B
6	*Phalaris arundinacea*	Reed Canary Grass	
6	*Salvia aethiopis*	Mediterranean sage	B
5	*Cirsium vulgare*	Bull thistle	B
5	*Clematis vitalba*	Old man's beard	B
5	*Hieracium aurantiacum*	Orange hawkweed	A,T
5	*Hypericum perforatum*	St. John's wort	B
5	*Isatis tinctoria*	Dyer's woad	B
5	*Potentilla recta*	Sulfur cinquefoil	B
5	*Rana catesbeiana*	American bullfrog	N.A.
5	*Salsola kali*	Russian thistle	

Note: "A" Weeds are economically important, and do not occur in the state or occur in the state in small enough infestations to make eradication/containment possible; or which are not known to occur, but their presence in neighboring states makes future occurrence in Oregon seem imminent. "A" weeds are the highest priority for eradication.
"B" Weeds are economically important and regionally abundant, but may have limited distribution in some counties.
"T" Weeds have been designated as high-priority targets by the State Weed Board.

A total of 42 invasive species received survey or management work from at least 5 entities in 2008. The top 10 invasive species that were surveyed or managed by the greatest number of entities in 2008 were white top/perennial pepperweed (40), knotweeds (27), toadflax species (20), puncture vine (17), scotch broom (16), scotch/cotton thistle (16), yellow starthistle (15), Canada thistle (15), diffuse knapweed (14), and Armenian blackberry (13).

Oregon State Weed Board

The Oregon State Weed Board is a seven-member board broadly representative of weed control interests in the state that guides statewide noxious weed control priorities and awards noxious weed control lottery funds. The board develops and maintains the State Noxious Weed List and provided direction to control efforts at the county and local levels. Priorities are developed, in part, through the state noxious weed control policy and classification system. The OSWB is also responsible for awarding noxious weed control grants to assist cooperators in noxious weed control efforts throughout the state.

"A" Weeds are economically important, and do not occur in the state or occur in the state in small enough infestations to make eradication/containment possible; or which are not known to occur, but their presence in neighboring states makes future occurrence in Oregon seem imminent. "A" weeds are the highest priority for eradication. Survey work for "A" weeds is lacking. These should be our highest priority, but because m ost of them aren't known from the the state, most people are not looking for them.

"B" Weeds are economically important and regionally abundant, but may have limited distribution in some counties.

"T" Weeds have been designated as high-priority targets by the State Weed Board.

Of the 42 invasive species listed in Table 5, a total of 38 are weed species. Of those 38 weed species, only eight (21%) are listed as "T" species on the State Noxious Weed List. Although limited distribution of some plants directly influences the total number of entities needed to survey or manage a noxious weed, this data may indicate that the priorities of the State Weed Board, as articulated through their "T" list species, did not receive a similar level of priority at the local level.

Because local government entities conduct the greatest amount of on-the-ground work relative to invasive land plants (Figure 30), it is especially important the policy decisions and highest priorities established to protect Oregon's economic interests and environmental quality filter down to the entities that actually perform the work.

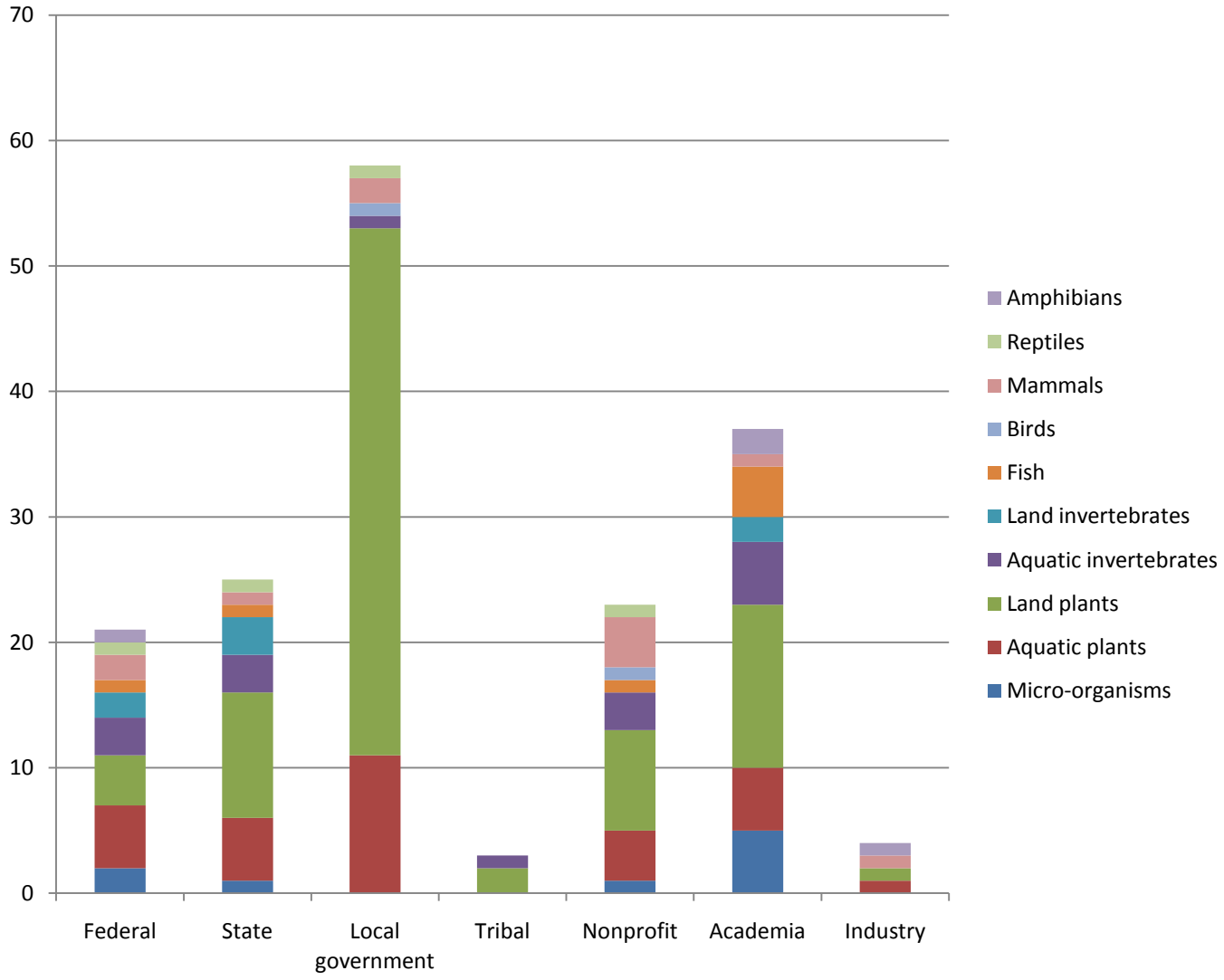


Figure 30. Invasive species taxa for which entities conducted survey or management activities in Oregon in 2008.

INVASIVE SPECIES DATABASES

[Note: The full report on this portion of the management assessment can be located in Appendix H.]

To understand what users of invasive species databases need and want, and to describe the questions that each type of database is capable of answering as well as the formats and protocols in place to produce these data outcomes, two surveys were conducted; one for users of invasive species databases in Oregon, and the other for managers of invasive species databases (Appendix H). An invasive species database committee was formed consisting of representation from the Oregon Natural Heritage Program, Oregon Department of Agriculture, Oregon State University, Oregon Department of Environmental Quality, Northwest Weed Management Partnership, and The Nature Conservancy to assist in the formulation of surveys and determine next steps upon survey completion.

The Database Manager Survey Results

The database manager survey consisted of 43 questions and followed a format similar to invasive species database manager surveys conducted in the Southeast and Midwest. This survey was sent to eight individuals that manage invasive species databases throughout the United States, with a focus on databases that serve individuals interested in tracking invasive species in Oregon. All eight (100% response rate) completed the survey—Early Detection and Distribution Mapping System (EDDMaps), INVADERS, Weedmapper, Oregon Flora Project, USGS Nonindigenous Aquatic Species (NAS), Weed Information Management System (WIMS), Integrated Road Information System (IRIS), and iMapInvasives.

All databases surveyed except for one include mapping as a component of the database, and a variety of mapping platforms are used. The most common type of location data is point and polygon. Each of the databases offers a variety of features associated with its mapping functions, ranging from very basic features to more sophisticated functions that allow users to enter their own information fields, pan/zoom maps, etc. All of the databases surveyed manage aquatic and land plant taxa data. Five of the eight databases have a minimum data standard, and of those five, four provide for "customization" by allowing data to be input into special fields by the data provider.

Seven of the eight database managers indicated there was some quality control in terms of data verification, whether that be by oversight of the people that actually enter or review the data, or the accessibility of the database, which, because of its size and scope, provides for review by the thousands of people that both enter and review data inputs.

The majority of databases offer "extra" features, such as photo galleries, information about invasive species, etc. Seven of the eight respondents indicated their database is available online, however, four of the eight indicated there were restrictions in terms of access to downloading. Three databases allow users to download other people's data. Five of the eight databases have an early detection module that can be customized to a specific region.

Six of the eight databases allow users to enter management information on a specific point/polygon, such as follow-up visits, eradication, and mechanical and chemical methods of control. And a few of the databases have mechanisms to identify eradications.

There is a cost ($2,500 startup fee and annual $5,000) to use one of the databases—iMapInvasives—all others have no cost, to both use the database and receive technical support. iMapInvasives has created a unique method to pay for the cost of the database and its long-term management; one organization in any state pays an initiation fee and annual fee, and all other entities within that state can use the system at no cost.

The Database User Survey Results

The overall goal of the database user survey was to better understand what users of invasive species databases need and want to help assess what data is available and determine data needs. The survey consisted of 20 questions, and was available to anyone interested in completing it. A total of 70 individuals responded to the invasive species database user survey representing federal, state, county, and local governments, watershed councils, soil and water conservation districts, cooperative weed management areas, nonprofit organizations, universities, and industry representatives (59 individuals completed the survey; an additional 11 provided partial responses that were included in the results).

When asked what databases were used to track invasive species information, the majority (60%) used Weedmapper. The remaining percentage used a combination of 29 different databases.

A total of 73% share their data outside of their organization on a regular basis, emphasizing the importance of providing access to invasive species information.

The scope and scale of invasive species database user work was as diverse as the database users and the databases themselves.

Aquatic and land plants are the most commonly tracked invasive species, however, many respondents indicated they tracked several different invasive species taxa.

The most common types of questions database users are trying to answer by reporting and/or using an invasive species database can be summarized as follows:

- What is the location/distribution of a species?
- What management actions have been taken against this species, and which ones have been proven to be the most effective? How do I report the management actions I have taken and their corresponding results?
- What invasive species is most likely to "threaten," i.e., invade, the areas in which I work?
- What is the population status and trend of a particular invasive species?
- Where can I find funding to manage/track invasive species, and how much do I need to budget to be effective?

Data access is very important to database users. Survey respondents indicate that people within their organization (84%), partner organizations (77%), and potential funding organizations (39%) need to access their information.

In addition, database users need to access the information found in other databases.

A total of 89% of the respondents indicated they need to support ArcGIS data.

Time, cost, the inability for databases to "talk" with other databases, and the need to keep some data confidential are the primary barriers that prevent database users from sharing their data with others.

A total of 94% of the respondents indicated that data verification was at least "important."

A total of 99% of the respondents indicated that the database needs to have mapping capabilities.

Only 14% rate the importance of allowing volunteers/citizen scientists/public to submit reports as "not important."

A total of 86% of respondents report the production of summary reports as at least "important."

A total of 89% need to be able to track management/treatment information.

When asked if funds were no object, what would database managers envision to meet all of their data needs, the responses supported a variety of mapping and analysis tools, real-time functions, accessibility, query capabilities across databases, quality control, use of technology interfaces, identification keys, and other functions.

A total of 91% of the respondents indicated that if a large group of stakeholders in Oregon decided by consensus to support one or more database solutions, that they would be willing to use the system and contributing data on a regular basis.

Most of the 70 respondents indicated that they did not have funding; of those that have funding, most have restrictions on that funding. However, a few respondents indicated the potential to tap into federal funds to launch an invasive species database initiative for Oregon.

Recommendations

There is no "one-stop shopping" or clearinghouse nationally or within the state of Oregon, but more importantly, tools have not been created that allow database users to query across existing databases. Long-term reliable funding for database management is largely unknown—the larger, more well-known, robust database systems exhibit a higher degree of confidence in their ability to continue to receive funding to support their systems.

Database users understand their needs and wants relative to invasive species databases. However, if funding, knowledge, tools, or access limits the ability of a database user to use an existing database, many develop their own systems using off-the-shelf software, such as Excel or Access. These "stand-alone" databases add greatly to the overall cost of managing invasive species information in Oregon.

There are two potential approaches to reduce the ratio of the cost of database management to the benefits users receive from using invasive species databases:

- Short-term, develop minimum standards for the most commonly used databases and develop tools that allow people to query across databases to record and extract information.

- Long-term, analyze the specifics of each of the most commonly used databases, and make recommendations to pool resources and potentially reduce the number of databases while increasing the utility of those in existence.

The OISC database subcommittee is pursuing both approaches. In December of 2009, the committee hosted WebEx conferences with EDDMaps, iMapInvasives, and USGS NAS—the three databases that currently offer the best options for managing invasive species data—to assess the potential to query across databases and make recommendations for a system Oregon can use to manage invasive species all-taxa data. As of November 2009, Washington, Idaho, and California Invasive Species Councils are participating in this effort, which could result in a Pacific Northwest solution for use and management of invasive species databases.

WHAT IS THE STATUS OF FUNDING IN THE STATE FOR INVASIVE SPECIES?

Invasive species cause nations throughout the world an estimated $1.4 trillion, equivalent to about five percent of the global economy.[11] The annual cost to the United States from invasive species is estimated at $120 billion—over 100 million acres are affected.[12] Ship-borne invasive species cost the Great Lakes Region at least $200 million annually.[13] The cattle industry on southern U.S. grazing lands suffered a loss of 10% of their pasture value because of African lovegrass (*Eragrostis plana*),[14] and continues to experience annual losses of $30 million per year. Leafy spurge (*Euphorbia esula*) costs ranchers in North Dakota, South Dakota, Montana, and Wyoming more than $144 million a year.[15] Aquatic weeds cause $122 million in losses, damages, and control costs, while the projected control costs to 13 hydropower facilities from zebra mussel infestation is estimated to be $25.5 million.

Oregon experiences economic, environmental, and social threats from invasive species. Assessing the state's ability to manage and control current infestations and prevent new infestations is directly related to the resources available to monitor and survey, implement effective early detection rapid response programs, conduct prevention activities and research, manage and control existing and new infestations, inform and educate the public, coordinate efficiently and effectively across geopolitical lines, and develop proactive policies that lessen the threat of new introductions.

To determine the status of funding for invasive species in the State of Oregon, two questions were asked:

(1) What is the current source of funds for invasive species activities? This question was further analyzed to determine expenditures for salaries/benefits and operational activities as well as funds disbursed to other agencies.

(2) How are these funds being spent, in what categories, and by whom?

RESULTS

Results from the statewide management assessment survey were compiled to determine the source of funds for invasive species activities in 2008. Financial data from 110 survey respondents representing federal, tribal, state, and local governments, nonprofit organizations, and academic institutions were compiled.

[11] Pimentel, D., McNair, S., Janecka, J., Wightman, J., Simmonds, C., O'Connell, C., Wong, E., Russel, L., Zern, J., Aquino, T. and Tsomondo, T. 2001. Economic and environmental threats of alien plant, animal, and microbe invasions. Agriculture, Ecosystems and Environment 84: 1-20.

[12] Pimentel, D., Zuniga, R., and Morrison, D. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. Ecological Economics. 52: 273-288.

[13] Lodge, D., and Finnof, D. 2008. Annual Losses to Great Lakes Region by Ship-borne Invasive Species at least $200 Million. Great Lakes United (www.glu.org).

[14] Rosa, F., Ramos, J.V., and Ziller, S. 2007. Economic impacts of *Eragrostis plana* on the Southern Brazil grasslands. Biological Invasions.

[15] Bangsund, D.A., and Leistritz, F.L. 1991. Economic impacts of leafy spurge on grazing lands in the northern Great Plains. NDSU Agriculture Economic Report No. 275-S.

Oregon's investment in invasive species is best captured by analyzing funds in four categories—total dollars expended for salaries and benefits, total dollars expended for operational expenses, total dollars disbursed to other entities (Table 6), and total of incoming funds (Table 7). Tracking these funds by these categories provided a more accurate assessment of actual base funding available for invasive species work, especially since some funds are passed through more than one agency until they are ultimately expended. Methodology used to capture actual funds invested included adding salary/benefit expenditures, operational expenditures, and disbursements, and then subtracting these three numbers from incoming funds to determine net expenditures.

SALARY/BENEFITS, OPERATIONAL EXPENDITURES, AND DISBURSEMENTS

National Invasive Species Council federal agencies expended about $631.5 million on invasive species in 2000—the US Department of Agriculture expended about 90% of those dollars.[16]

Oregon* expended an estimated $26,362,404 on invasive species-related activities in 2008 (Table 8). Federal agencies were the largest funder for invasive species activities in Oregon ($16,668,890) (63%), followed by state agencies ($5,169,971) (20%), local governments ($3,494,453) (13%), nonprofit organizations ($497,596) (2%), industry and out-of-state entities as well as public and private foundations ($327,835) (1%), academic institutions ($165,660) (1%), and tribal governments (<1%) ($38,000) (Figure 31).

Of the $7,049,756 disbursed from all entities in Oregon for invasive species activities in 2008, federal agencies disbursed the most—$4,334,890 (64%), followed by state agencies ($1,748,174)(26%), industry and private foundations ($408,616)(5%), local governments ($320,076) (5%), and tribes ($38,000) (less than 1%) (Table 6, Figure 32).

Federal agencies

A total of eight federal agencies responded to the statewide assessment.

Information garnered from survey respondents about income they received from federal agencies helped to capture invasive species-related funding information from 14 federal agencies.

Federal agencies spent a total of $17,156,390 on invasive species in 2008 ($3,823,000 on salaries and benefits, $8,998,500 on operations, and $4,334,890, which they disbursed to other entities). They received a total of $487,500 from other federal entities, thus their total investment in invasive species in Oregon in 2008 was $16,668,890 (Table 7).

Federal agencies gave 44% of their disbursements to state agencies, followed by universities (18%), and local governments (15%) (Table 6). About 59% of the funds disbursed to state agencies were from USDA-APHIS to the Oregon Department of Agriculture for monitoring/surveillance, management and control, and outreach and education. A total of 10% ($487,500)

[16] U.S. General Accounting Office. 2000. Invasive Species: Federal and Selected State Funding to Address Harmful, Nonnative Species. RCED-00-219. 34 pp.

*Does not include costs incurred by homeowners, private timber companies, farmers, etc.

of federal agency disbursements were funds transferred among federal agencies for invasive species-related work, and are recorded as incoming funds to the receiving agency.

State agencies

A total of 10 state agencies responded to the statewide assessment.

State agencies spent a total of $8,292,899 on invasive species in 2008 ($3,906,631 for salaries and benefits, $2,638,094 for operations, and $1,748,174, which they disbursed to other entities). They received a total of $3,122,928 from other entities, thus their total investment in invasive species in Oregon in 2008 was $5,169,971 (Table 7).

The majority of the funds they disbursed to other entities were from the $1,200,000 lottery dollars OWEB transfers to the Oregon State Weed Board annually for disbursement to nonprofit organizations and local governments for weed control. The remainder of the $1,748,174 ($548,174) included OWEB grants to local governments as well as $74,000 disbursed to three entities—Deschutes County ($16,400), Tri County CWMA ($31,980), and Northwest Weed Management Partnership ($20,500). [Note: For the purposes of this analysis, the $1,136,450 ODA disbursed to local governments and nonprofit organizations was not counted in Table X because it was already counted under OWEB.]

State agencies received a total of $3,122,928 from other agencies (primarily federal—Bureau of Land Management, USDA Forest Service, and USDA-APHIS Plant Health, Plant Protection and Quarantine) to supplement invasive species activities.

Local governments

A total of 39 local government entities responded to the statewide assessment.

Local governments spent a total of $4,717,854 on invasive species activities in 2008 ($3,083,160 for salaries and benefits, $1,634,694 for operations, and $320,076, which they disbursed to other entities). They received a total of $1,543,477 from other entities, thus, their total investment in invasive species in Oregon in 2008 was $3,494,453 (Table 7).

The City of Portland spent $1,040,000 in 2008 on salaries and benefits and $525,000 on operational activities to control invasive species in its jurisdiction. City of Portland expenditures for invasive species comprised almost 45% of the total amount that local governments invested in invasive species activities in Oregon in 2008.

Counties with staff dedicated to invasive species activities seemed successful in securing funds from a variety of sources. Those with minimal resources were noticeably absent from the survey, despite their location and proximity to adjacent counties with strong weed programs.

Nonprofit organizations

A total of eight nonprofit organizations responded to the statewide assessment.

Nonprofit organizations spent a total of $1,581,613 on invasive species activities in 2008 ($607,378 for salaries and benefits and $974,235 for operations). They did not report any disbursements. They received a total of $1,084,017 from other entities, thus their

Table 6. Invasive species funds dispersed to entities in Oregon in 2008. Source funders are listed on the left side of the table.

FUND SOURCE	FEDERAL	TRIBAL	STATE	LOCAL	NONPROFIT	UNIVERSITY	TOTALS
FEDERAL							
ARMY COE	0	0	$22,000	0	0	0	$22,000
BLM	$5,000	0	$296,500	$343,033	$168,728	0	$813,261
BOR	0	0	$25,000	$28,000	0	0	$53,000
BPA	$150,000	$214,257	$5,000	$57,640	$82,900	$42,987	$552,784
EPA	0	0	0	0	$1,841	$83,850	$85,691
NOAA	$100,000	0	0	0	$5,200	$339,564	$444,764
NPS	$70,000	0	0	0	0	0	$70,000
NRCS	0	0	$0	0	$30,000	0	$30,000
NSF	0	0	0	0	0	$78,913	$78,913
PSMFC	0	0	0	0	0	0	$0
USDA-APHIS	0	0	$1,122,114	0	0	$60,000	$1,182,114
USFS	$10,000	0	$409,000	$193,916	$34,660	$7,643	$655,219
USFWS	$100,000	0	$30,000	$21,500	$16,000	$139,361	$306,861
USGS	$20,000	0	0	0	0	$20,283	$40,283
TOTALS	**$455,000**	**$214,257**	**$1,909,614**	**$644,089**	**$339,329**	**$772,601**	**$4,334,890**
TOTAL				**$4,334,890**			
TRIBES							
TRIBES	0	0	0	$38,000	0	0	
TOTALS	**0**	**0**	**0**	**$38,000**	**0**	**0**	
TOTAL				**$38,000**			
STATE							
ODFW	0	0	0	0	$38,000	0	$38,000
OWEB	0	0	1,200,000	$57,600	$158,708	$50,000	$1,466,308
ODA							$1,136,450
	0	0	$0	$74,000	$0	$0	$74,000
ODOT	0	0	$0	$50,000	5,000	0	$55,000
ODF	0	0	0	0	$8,245	0	$8,245
DEQ	0	0	0	$10,000	0	0	$10,000
OPRD	0	0	0	$37,525	$7,100	0	$44,625
CALIFORNIA STATE LANDS	0	0	0	0	0	$43,744	$43,744
ALASKA DEPT FISH AND GAME	0	0	0	0	0	$8,252	$8,252

TOTALS	**0**	**0**	**$1,200,000**	**$229,125**	**$217,053**	**$101,996**	**$1,748,174**
TOTAL				**$1,748,174**			
LOCAL GOVERNMENT							
LOCAL GOVERNMENT	$16,000	0	0	$160,671	$35,000	$21,405	$233,076
METRO	0	0	0	0	$87,000	0	$87,000
TOTALS	**$16,000**	**0**	**0**	**$160,671**	**$122,000**	**$21,405**	**$320,076**
TOTAL				**$320,076**			
OTHER							
CALIFORNIA OCEAN SCI TRUST	0	0	0	0	0	$32,781	$32,781
INDUSTRY – BASF	0	0	0	$6,200	0	0	$6,200
OR and WA Potato Commissions	0	0	0	0	0	$30,000	$30,000
PUBLIC FOUNDATIONS	0	0	0	$25,000	$25,635	$13,000	$63,635
PRIVATE FOUNDATIONS	0	0	0	$5,000	$196,800	0	$201,800
OTHER	0	0	0	0	$21,200	$5,000	$26,200
TOTALS	**0**	**0**	**0**	**$36,200**	**$243,635**	**$80,781**	**$327,835**
TOTAL				**$408,616**			
GRAND TOTAL				**$6,849,756**			

Table 7. Invasive species salaries/benefits, operational expenses, disbursements, and incoming funds by entity in Oregon in 2008.

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
FEDERAL AGENCIES				
BLM	$1,325,000	$2,100,000	$813,261	0
BOR	0	0	$53,000	0
BPA	0	0	$552,784	0
EPA	0	0	$85,691	0
NOAA	0	0	$444,764	0
NPS	0	0	$70,000	0
NRCS	0	0	$30,000	0
NSF	0	0	$78,913	0
PSFMC	$250,000	$217,500	0	$382,500
US Forest Service	$1,800,000	$5,100,000	$655,219	0
USACE	0	0	$22,000	0
USDA-APHIS (PPQ and Wildlife Services)	$123,000	$1,456,000	$1,182,114	$15,000
USFWS	$200,000	$125,000	$306,861	$20,000
USGS	$125,000	0	$40,283	$70,000
TOTALS	**$3,823,000**	**$8,998,500**	**$4,334,890**	**$487,500**
TOTAL	**$16,668,890***			
STATE AGENCIES				
ODA	$2,060,944	$555,129	$1,136,450 $74,000	$2,856,564
ODEQ	$86,352	$23,244	$10,000	0

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
ODFW	$218,000	$100,000	$38,000	$66,364
ODF	$51,000	$246,000	$8,245	$200,000
ODOT	$1,407,935	$1,498,421	$55,000	0
OSMB	$50,000	$95,300	0	0
OWEB	0	$0	$1,466,308	0
OPRD	$32,400	$120,000	$44,625	0
CALIFORNIA STATE LANDS	0	0	$43,744	0
ALASKA DEPT FISH AND GAME	0	0	$8,252	0
TOTALS	**$3,906,631**	**$2,638,094**	**$1,748,174**	**$3,122,928**
TOTAL	**$5,169,971***			
LOCAL GOVERNMENTS				
City of Eugene Parks and Open Space Division	0	$70,700	0	$60,000
City of Portland BES	$1,040,000	$525,000	0	$14,000
Clatsop SWCD	$22,000	0	0	$22,000
Columbia Slough WC	$2,000	0	0	
Columbia SWCD	$24,100		0	$29,785
Coos Watershed Association	$5,000	$27,170	0	$59,000
Deschutes County	$252,500	$95,099	0	$134,648
East Multnomah SWCD	$75,000	$49,000	0	0
Gilliam County Weed Dept.	$134,170	$212,527	0	$260,217
Harney County Weed	$136,047	$58,399	0	$207,000

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
Control				
Hood River County Weed and Pest Dept.	$71,000	0	0	$17,941
Hood River SWCD	$1,600	0	0	$1,600
Jefferson County Weed Control	$62,000	$98,700	0	$94,000
Jordan Valley CWMA	$35,000	0	0	0
Klamath County Weed Control	$130,000	0	0	$128,500
Lane County Public Works	$118,000	$102,000	0	0
Lincoln County	$120,000	$169,000	0	$71,500
Lincoln SWCD	$69,000	0	0	$64,800
Local governments	0	0	$233,076	0
Malheur County Weed Control	$69,006	$13,500	0	$67,000
Marion County	$50,000	$22,000	0	$24,000
Metro	0	0	$87,000	
Mid-Coast WC	$20,000	0	0	$20,000
Morrow County Weed District	$56,675	$76,400	0	0
Nestucca Neskowin WC	0	$5,000	0	$5,000
North Fork John Day WC	$16,500	$11,000	0	$32,500
NWMP	$60,000	0	0	$60,000
Seven Basins WC	$3,000	0	0	$3,000
Sherman County Weed District	$76,000	0	0	$41,000
Siuslaw WC	$28,000	0	0	$28,000
Tualatin Hills Parks and Recreation District	$153,256	0	0	0

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
Tualatin River WC	$35,000	0	0	0
Umatilla County Weed Department	$90,000	$92,500	0	$47,500
Upper Deschutes WC	$20,000	$97	0	$20,000
West Multnomah SWCD	$62,000	$6,602	0	$5,714
Wheeler SWCD	$46,306	0	0	$24,772
TOTALS	**$3,083,160**	**$1,634,694**	**$320,076**	**$1,543,477**
TOTAL	**$3,494,453***			
NONPROFIT ORGANIZATIONS				
Audubon Society of Portland	$35,000	$105,000	0	$70,000
CoastWatch Oregon	0	$500	0	$500
Institute for Applied Ecology	$115,000	0	0	$115,000
Oregon Council Trout Unlimited	$5,500	$5,200	0	$5,200
The Nature Conservancy	$338,193	$356,550	0	$380,343
Three Rivers Land Conservancy	$20,000	$90,000	0	$90,000
Tillamook Estuaries Partnership	$23,485	$16,985	0	$41,314
Wallowa Resources	$70,200	$400,000	0	$381,660
TOTALS	**$607,378**	**$974,235**	**$0**	**$1,084,017**
TOTAL	**$497,596***			
ACADEMIC INSTITUTIONS				
Maritime Studies	0	0	0	$10,000
OSU Extension	$6,500	0	0	$0
OSU Newport	$20,000	0	0	$0
OSU Dept. Crop/Soil Sci.	0	$13,000	0	$13,000

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
OSU - Fisheries and Wildlife	$100,000	$5,000	0	$60,000
OSU Klamath Basin Research and Extension	0	$850	0	$850
PSU Biology Dept.	$5,000	$3,000	0	$5,000
OSU Extension	$20,000	0	0	0
OSU Extension	$3,600	0	0	0
OSU Extension	$2,500	0	0	0
OSU Hermiston Ag. Res. Ctr.	0	$30,000	0	$30,000
OSU Sea Grant	$138,000	$47,000	0	$170,000
University of Oregon	$48,781	$38,741	0	$78,912
PSU Center for Lakes and Reservoirs	$600,000	$55,000	0	$603,550
TOTALS	**$944,381**	**$192,591**	**0**	**$971,312**
TOTAL	**$165,659***			
TRIBAL GOVERNMENTS				
Burns Paiute Tribe	$214,257	$0	$38,000	$214,257
TOTALS	**$214,257**	**$0**	**$38,000**	**$214,257**
TOTAL	**$38,000***			
OTHER				
California Ocean Science Trust	0	0	$32,781	0
INDUSTRY – BASF	0	0	$6,200	0
OR and WA Potato Commissions	0	0	$30,000	0
PUBLIC FOUNDATIONS	0	0	$63,635	0
PRIVATE FOUNDATIONS	0	0	$201,800	0
OTHER	0	0	$26,200	0
TOTALS	**0**	**0**	**$327,835**	**0**

	COLUMN A	COLUMN B	COLUMN C	COLUMN D
	EXPENDITURES			INCOMING FUNDS
	TOTAL SALARIES AND BENEFITS	TOTAL OPERATIONAL EXPENSES	DISBURSEMENTS	
TOTAL	$327,835*			

*Total contribution of each entity for 2008=A+B+C–D

Table 8. Invasive species summary of expenditures by entity in Oregon in 2008 (includes expenditures of incoming funds).

	TOTAL
FEDERAL	$16,668,890
STATE	$5,169,971
LOCAL GOVERNMENT	$3,494,453
NONPROFIT ORGANIZATION	$497,596
ACADEMIC INSTITUTION	$165,659
TRIBAL GOVERNMENT	$38,000
OTHER	$327,835
TOTAL	**$26,362,404**

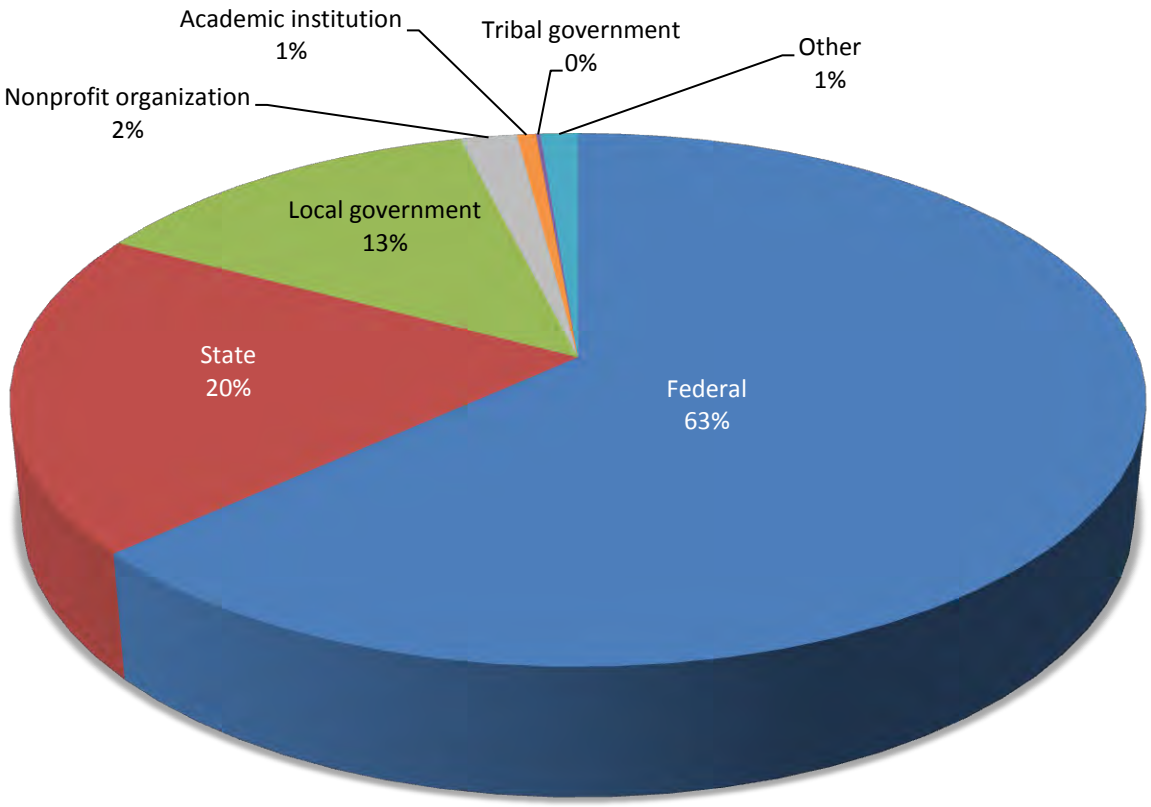


Figure 31. Amount expended on invasive species activities in Oregon in 2008 by different entities.

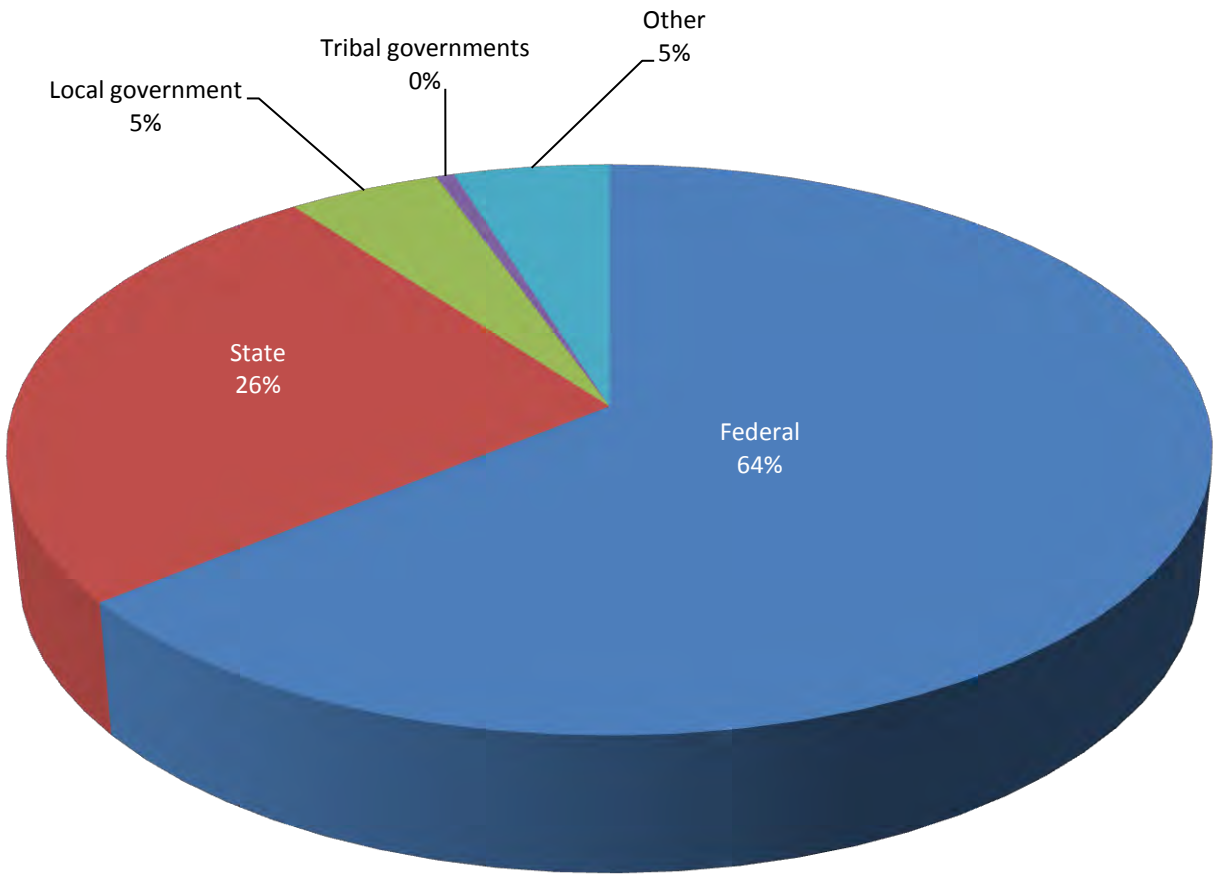


Figure 32. Percentage by entity of funds disbursed for invasive species activities in Oregon in 2008.

agencies for invasive species-related work, and are recorded as incoming funds to the receiving agency.

State agencies

A total of 10 state agencies responded to the statewide assessment.

State agencies spent a total of $8,285,928 on invasive species in 2008 ($3,895,834 for salaries and benefits, $2,641,920 for operations, and $1,748,174, which they disbursed to other entities). They received a total of $3,122,928 from other entities, thus their total investment in invasive species in Oregon in 2008 was $5,153,000 (Table 7).

The majority of the funds they disbursed to other entities were from the $1,200,000 lottery dollars OWEB transfers to the Oregon State Weed Board annually for disbursement to nonprofit organizations and local governments for weed control. The remainder of the $1,748,174 ($548,174) included OWEB grants to local governments as well as $74,000 disbursed to three entities—Deschutes County ($16,400), Tri County CWMA ($31,980), and Northwest Weed Management Partnership ($20,500). [Note: For the purposes of this analysis, the $1,136,450 ODA disbursed to local governments and nonprofit organizations was not counted in Table X because it was already counted under OWEB.]

State agencies received a total of $3,122,928 from other agencies (primarily federal—Bureau of Land Management, USDA Forest Service, and USDA-APHIS Plant Health, Plant Protection and Quarantine) to supplement invasive species activities.

Local governments

A total of 39 local government entities responded to the statewide assessment.

Local governments spent a total of $4,717,854 on invasive species activities in 2008 ($3,083,160 for salaries and benefits, $1,634,694 for operations, and $320,076, which they disbursed to other entities). They received a total of $1,543,477 from other entities, thus, their total investment in invasive species in Oregon in 2008 was $3,494,453 (Table 7).

The City of Portland spent $1,040,000 in 2008 on salaries and benefits and $525,000 on operational activities to control invasive species in its jurisdiction. City of Portland expenditures for invasive species comprised almost 45% of the total amount that local governments invested in invasive species activities in Oregon in 2008.

Counties with staff dedicated to invasive species activities seemed successful in securing funds from a variety of sources. Those with minimal resources were noticeably absent from the survey, despite their location and proximity to adjacent counties with strong weed programs.

Nonprofit organizations

A total of eight nonprofit organizations responded to the statewide assessment.

Nonprofit organizations spent a total of $1,581,613 on invasive species activities in 2008 ($607,378 for salaries and benefits and $974,235 for operations). They did not report any disbursements. They received a total of $1,084,017 from other entities, thus their

total investment in invasive species activities in Oregon in 2008 was $497,596.

The Nature Conservancy, Wallowa Resources, and Audubon Society of Portland expended 43%, 29%, and 8% of the total amount that nonprofits contributed to invasive species activities in 2008.

Academic institutions

A total of five academic institutions responded to the statewide assessment.

Academic institutions spent a total of $1,136,972 on invasive species activities in 2008 ($944,381 for salaries and benefits and $192,591 for operations). They did not report any disbursements. They received a total of $971,313 from other entities, thus their total investment in invasive species activities in Oregon in 2008 was $165,659 (Table 7).

Portland State University's Center for Lakes and Reservoirs documented the greatest contribution to academic institution funding, accounting for 58% of all academic funding for invasives.

Others

Industry, entities outside the state of Oregon, commissions, and private and public foundations contributed $327,835 to invasive species activities in 2008 (Table 7).

Private and public foundations play an integral role in granting funding to nonprofit organizations for invasive species-related activities in Oregon. Although the total dollar contribution from funds in 2008 amount to less than $300,000, these funds were significant to the nonprofit organizations that rely on donations and need matching funds to achieve their natural resource goals.

HOW ARE FUNDS BEING SPENT?

To answer the second question, "How are these funds being spent, in what categories, and by whom?," data were analyzed by entity, by expenditure type (operational dollars and salary/benefit dollars) as well as category—monitoring and surveillance, early detection and rapid response, prevention, management and control, outreach and education, research, effectiveness monitoring, coordination, fundraising, policy work, and other activities—and by operational versus salary/benefit expenditures (Tables 9–26).

The data used for this analysis was the raw data submitted by each survey respondent; it was not changed or re-calculated to reflect source of funds or disbursements to other entities. The focus, then, is on the percentages of categories in which entities expend funds, as these values will align across the entities as funds move through the system.

Federal

Operational dollars

Of the $8,998,500 operational dollars expended by federal agencies, 52% were spent on management and control, followed by 12% on policy work, 8% on both prevention and monitoring/surveillance, 7% on coordination, 6% on EDRR, 3% on outreach and education, 2% on effectiveness monitoring, and 1% on research (Table 9, Figure 33).

Table 9. Invasive species operational dollars* expended by federal agencies in Oregon during each agencies' fiscal year 2008 by implementation category.

	BLM	PSFMC	US Forest Service	USDA-APHIS PPQ	USFWS	**TOTALS**
Monitoring & surveillance	$100,000	0	$300,000	$325,000	$5,000	**$730,000**
EDRR	$100,000	$50,000	$350,000	$50,000	$20,000	**$570,000**
Prevention	$100,000	$12,500	$600,000	$65,000	$20,000	**$797,500**
Management/control	$1,200,000	0	$2,600,000	$875,000	$50,000	**$4,725,000**
Outreach and education	$60,000	$50,000	$100,000	$40,000	$10,000	**$260,000**
Research	$40,000	$10,000	0	0	$10,000	**$60,000**
Effectiveness monitoring	$50,000	0	$100,000	0	0	**$150,000**
Coordination	$50,000	$50,000	$400,000	$76,000	$10,000	**$586,000**
Fundraising	0	$10,000	0	0	0	**$10,000**
Policy work	$400,000 (includes NEPA)	$15,000	$650,000 (includes NEPA)	$25,000	0	**$1,090,000**
Other activities	0	$20,000	0	0	0	**$20,000**
TOTAL OPERATIONAL EXPENSES	$2,100,000	$217,500	$5,100,000	$1,456,000	$125,000	**$8,998,500**

*Includes incoming funds

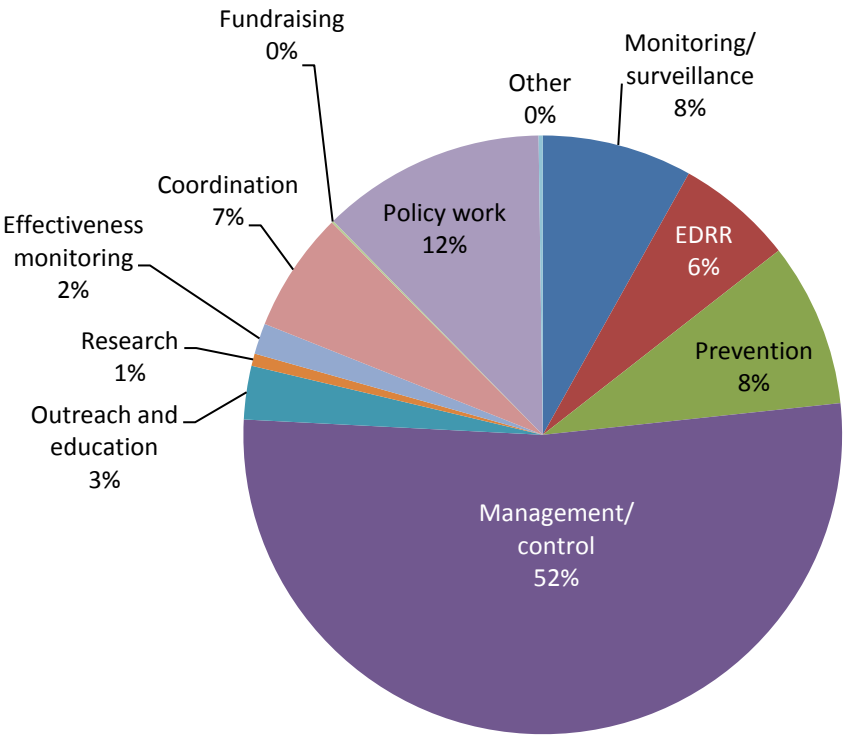


Figure 33. Percent of operational expenditures in invasive species activities by federal agencies in 2008 (federal fiscal year) by implementation category.

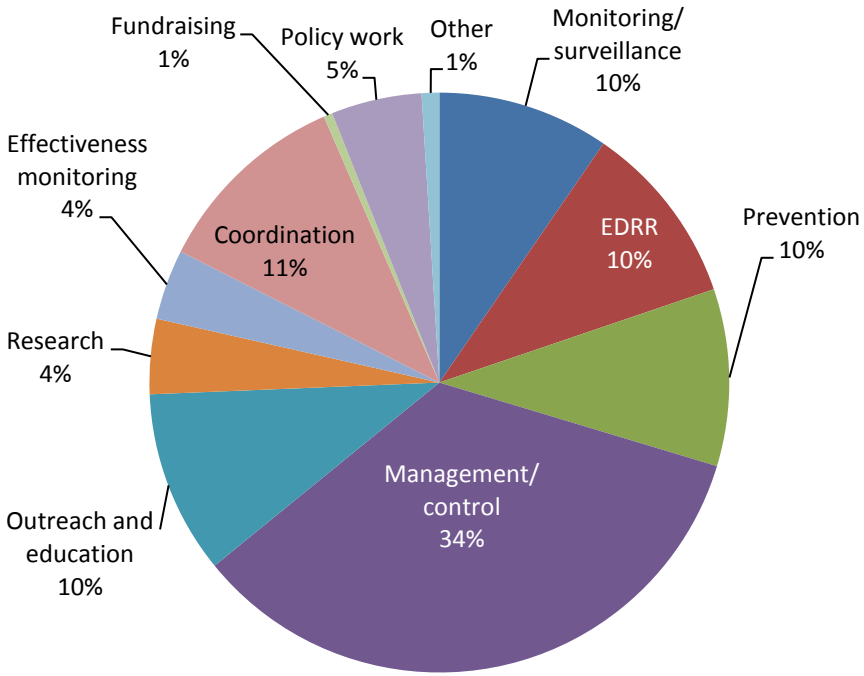


Figure 34. Percent of salary/benefit expenditures in invasive species activities by federal agencies in 2008 (federal fiscal year) by implementation category.

Salary/benefits

Of the $3,823,000 salary/benefit dollars expended by federal agencies, 34% were spent on management and control, followed by 11% on coordination, 10% each on prevention, EDRR, monitoring/surveillance, and outreach and education, 5% on policy work, 4% on both research and effectiveness monitoring, and 1% on other activities (Table 10, Figure 34).

Total

Federal agencies spent a total of 45% of their invasive species funds on management and control, followed by 10% on policy work, 9% on prevention, 8% on monitoring/surveillance, coordination, and EDRR, 5% on outreach and education, and 2% on both effectiveness monitoring and research (Table 11, Figure 35). Figure 36 shows the relative amounts of funding spent on operations, salary/benefits and disbursements categories.

The primary federal agencies that disperse funds to state agencies are BLM, USFS, and USDA-APHIS PPQ (Figure 37).

<u>State</u>

Operational dollars

Of the $2,635,092 operational dollars expended by state agencies, 77% were spent on management and control, followed by 8% on monitoring and surveillance,6% on outreach and education, 3% on fundraising, 2% on EDRR, and 1% on effectiveness monitoring, coordination, and policy work (Table 12, Figure 38).

Salary/benefits

Of the $3,904,629 salary/benefit dollars expended by state agencies, 54% were spent on management and control, followed by 25% on monitoring/surveillance, 6% on coordination, 4% on outreach and education, 3% on EDRR, effectiveness monitoring, and prevention, 2% on policy work, and 1% on research (Table 13, Figure 39).

Total

State agencies spent a total of 63% of their invasive species funds on management and control, followed by 18% on monitoring and surveillance, 5% on outreach and education, 4% on coordination, 3% on EDRR, 2% on effectiveness monitoring, policy work, and prevention, and 1% on fundraising (Table 14, Figure 40). The two primary state agencies that allocate funds to local governments and organizations are OWEB and ODA (via the funding ODA receives from OWEB and the US Forest Service) (Figures 41, 42).

The Oregon Department of Transportation contributes the greatest amount of state dollars (56%)—funds derived from the gas tax—to invasive species activities. This is an appropriate use of gas tax dollars given that the distribution of noxious weeds in Oregon is closely aligned with major highway routes (Figure 43).

Table 10. Invasive species salary/benefit expenditures* by federal agencies in Oregon during each agencies' fiscal year 2008 by implementation category.

	BLM	PSFMC	US Forest Service	USDA-APHIS PPQ	USFWS	USGS	**TOTALS**
Monitoring & surveillance	$125,000	0	$180,000	$35,000	$20,000	$6,250	**$366,250**
EDRR	$125,000	$50,000	$180,000	$5,000	$30,000	0	**$390,000**
Prevention	$125,000	$12,500	$180,000	$20,000	40,000	0	**$377,500**
Management/control	$550,000	0	$720,000	$5,000	$30,000	$12,500	**$1,317,500**
Outreach and education	$120,000	$50,000	$180,000	$15,000	$20,000	$6,250	**$391,250**
Research	$50,000	$12,500	0	0	$10,000	$87,500	**$160,000**
Effectiveness monitoring	$60,000	0	$90,000	0		0	**$150,000**
Coordination	$120,000	$50,000	$180,000	$35,000	$30,000	$6,250	**$421,250**
Fundraising	0	$12,500	0	0		$6,250	**$18,750**
Policy work	$50,000	$25,000	$90,000	$8,000	$20,000	0	**$193,000**
Other activities	0	$37,500	0	0		0	**$37,500**
TOTAL SALARIES AND BENEFITS	$1,325,000	$250,000	$1,800,000	$123,000	$200,000	$125,000	**$3,823,000**

*Includes incoming funds

Table 11. Total invasive species federal expenditures* in Oregon in 2008 by implementation category.

	TOTAL OPS	TOTAL SALARIES	GRAND TOTAL
Monitoring & surveillance	$730,000	$366,250	**$1,096,250**
EDRR	$570,000	$390,000	**$960,000**
Prevention	$797,500	$377,500	**$1,175,000**
Management/control	$4,725,000	$1,317,500	**$6,042,500**
Outreach and education	$260,000	$391,250	**$651,250**
Research	$60,000	$160,000	**$220,000**
Effectiveness monitoring	$150,000	$150,000	**$300,000**
Coordination	$586,000	$421,250	**$1,007,250**
Fundraising	$10,000	$18,750	**$28,750**
Policy Work	$1,090,000	$193,000	**$1,283,000**
Other	$20,000	$37,500	**$57,500**
TOTALS	**$8,998,500**	**$3,823,000**	**$12,821,500**

*Includes incoming funds

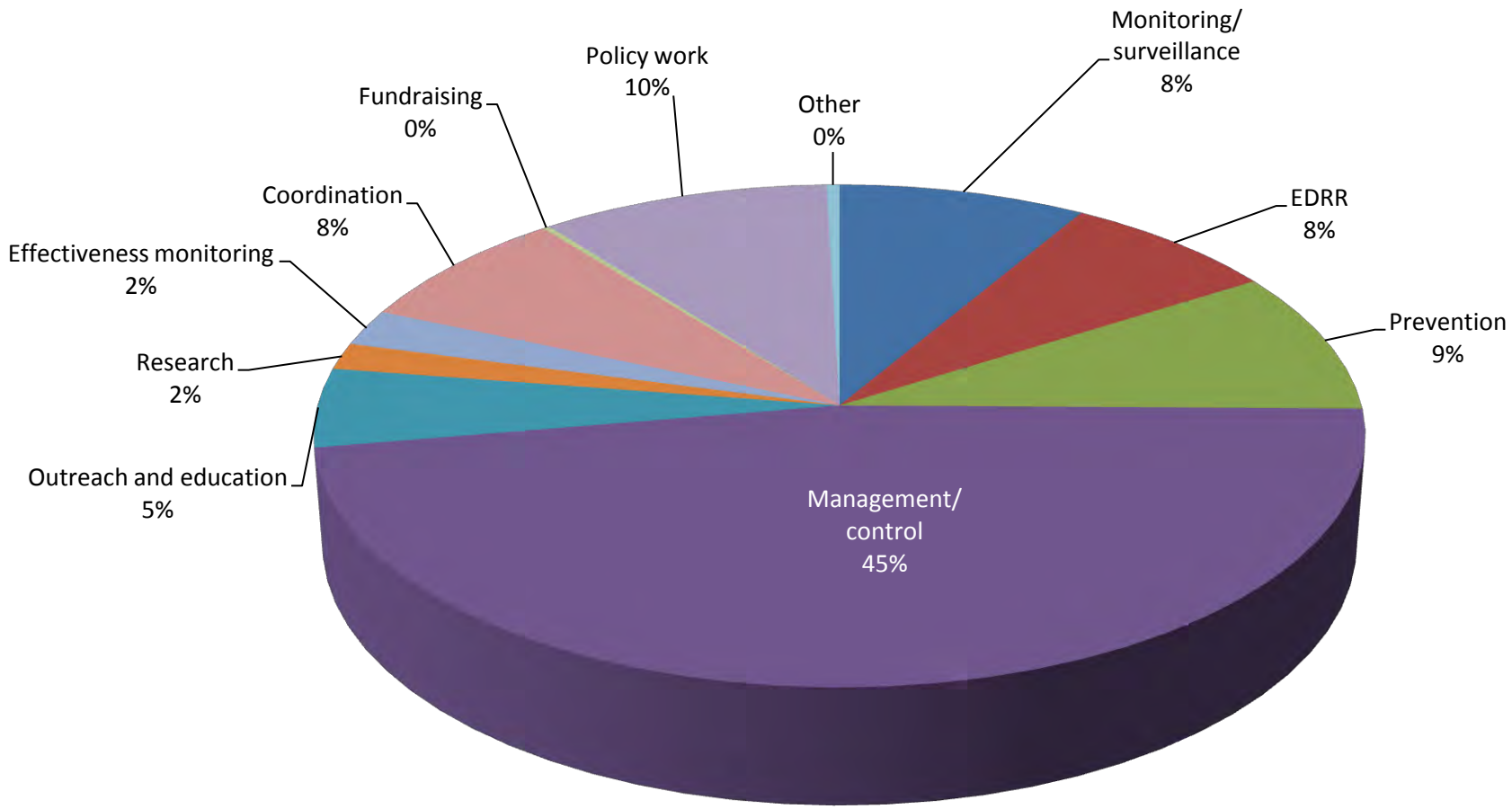


Figure 35. Percent of total expenditures in invasive species activities by federal agencies in federal fiscal year 2008 by implementation category.

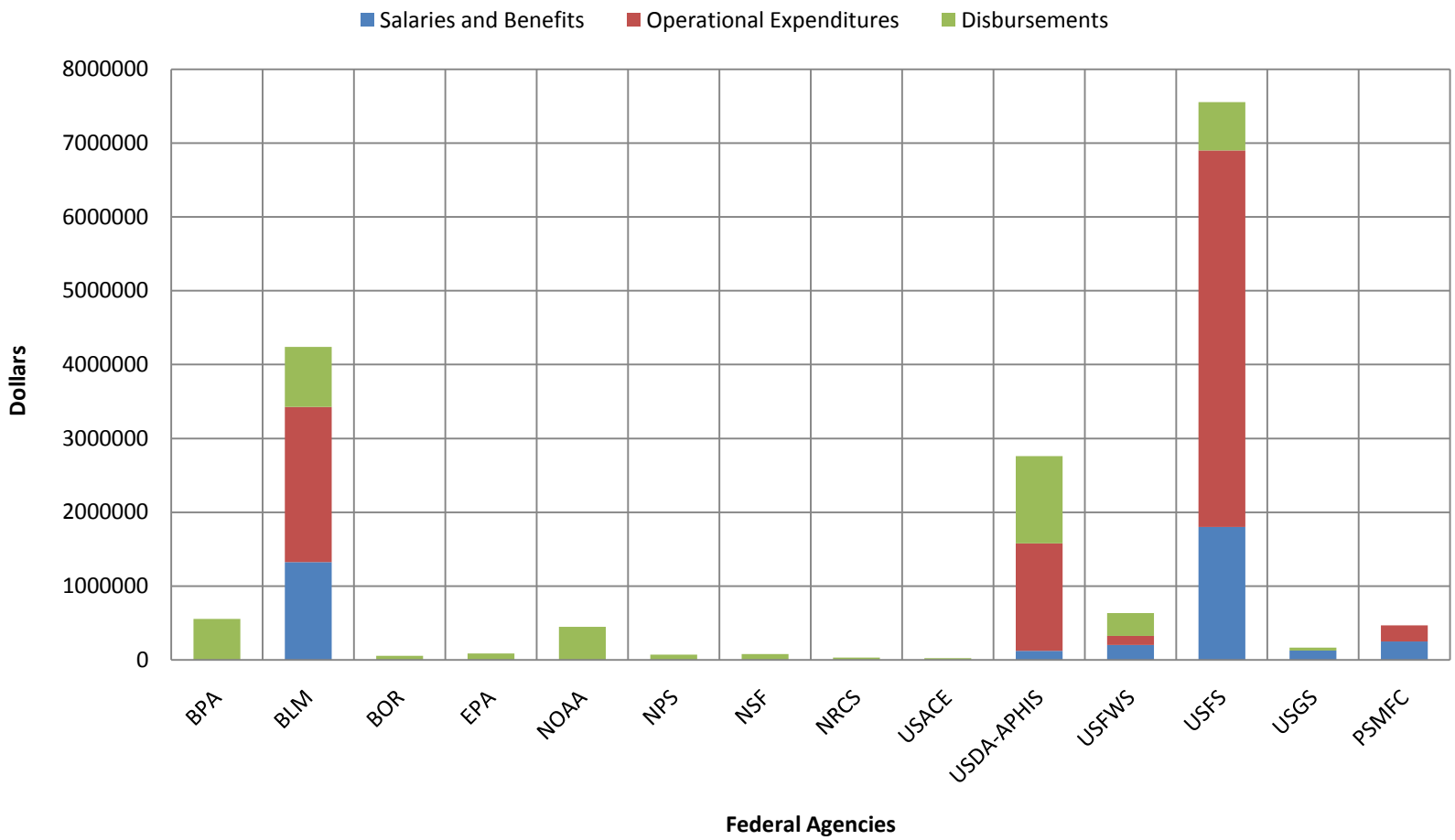


Figure 36. Total expenditures from federal agencies for invasive species activities in Oregon in 2008 (federal fiscal year).

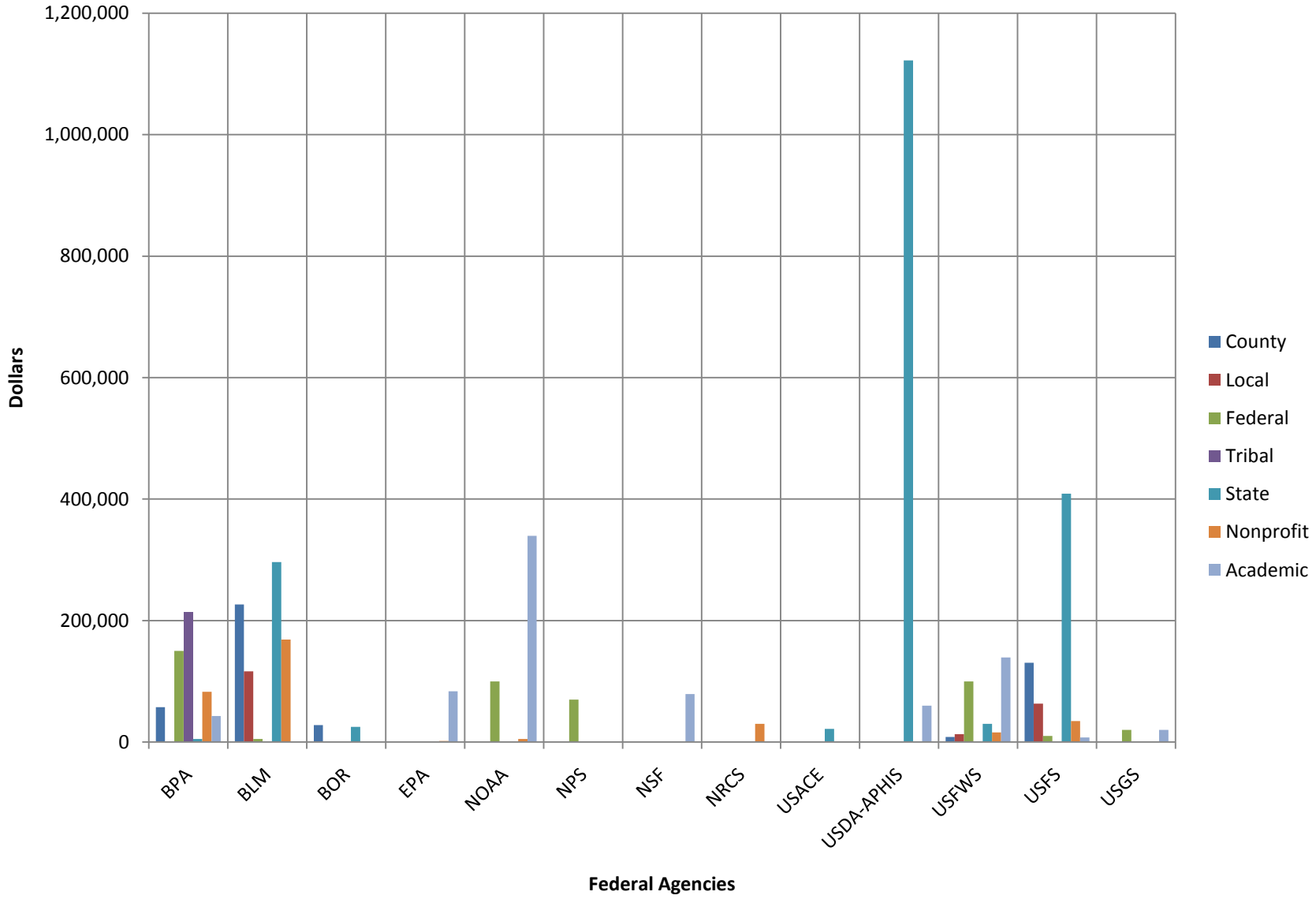


Figure 37. Total disbursements from federal agencies for invasive species activities in Oregon in 2008 (federal fiscal year).

Table 12. Invasive species operational expenditures** by state agencies in Oregon during each agencies' fiscal year 2008 by implementation category.

	ODA	ODEQ	ODFW	ODF	ODOT	OSMB	OPRD	TOTALS
Monitoring & surveillance	$201,560	$1,750	0	0	0	0	0	**$203,310**
EDRR	$34,000		0	0	0	$10,000	0	**$44,000**
Prevention	$17,000	$12,896	0	0	0	0	0	**$29,896**
Management/control	$169,713 and $1,136,450*	0	$94,000	$200,000	$1,453,178		$120,000	**$2,036,891**
Outreach and education	$43,856	$2,149	$6,000	$20,000	0	$80,300	0	**$152,305**
Research	$1,000	$1,074	0	0	0	$5,000	0	**$7,074**
Effectiveness monitoring	$34,000	0	0	0	0	0	0	**$34,000**
Coordination	$34,000	$2,149	0	0	0	0	0	**$36,149**
Fundraising	0	0	0	$26,000	$45,243	0	0	**$71,243**
Policy Work	$17,000	$3,224	0	0	0	0	0	**$20,224**
TOTAL OPERATIONAL EXPENSES	$552,129	$23,242	$100,000	$246,000	$1,498,421	$95,300	$120,000	**$2,635,092**

*State Weed Board Grants were not counted in this chart because these funds are included in OWEB disbursements.
**Includes incoming funds

Table 13. Invasive species salary/benefit expenditures by state agencies in Oregon during each agency's fiscal year 2008 by implementation category.

	ODA	ODEQ	ODFW	ODF	ODOT	OSMB	OPRD	**TOTALS**
Monitoring & surveillance	$925,102	$7,800	$6,540	$7,650	0	0	$1,620	**$948,712**
EDRR	$110,000	0	$2,180	$7,650	0	0	$1,620	**$121,450**
Prevention	$55,000	$46,007	0	$7,650	0	$10,000	0	**$118,657**
Management/control	$561,841	0	$98,100	$7,650	$1,407,935	0	$25,920	**$2,101,446**
Outreach and education	$110,000	7,676	$10,900	$7,650	0	$30,000	$1,620	**$167,846**
Research	$22,000	$3,763	0	0	0	0	0	**$25,763**
Effectiveness monitoring	$110,000	0	0	0	0	0	0	**$110,000**
Coordination	$110,000	$8,426	$74,120	$12,750	0	$5,000	$1,620	**$211,916**
Fundraising	0	0	$6,540	0	0	0	0	**$6,540**
Policy Work	$55,000	$12,679	$19,620	0	0	$5,000	0	**$92,299**
TOTAL SALARY AND BENEFIT EXPENSES	$2,058,943	$86,351	$218,000	$51,000	$1,407,935	$50,000	$32,400	**$3,904,629**

*Includes incoming funds

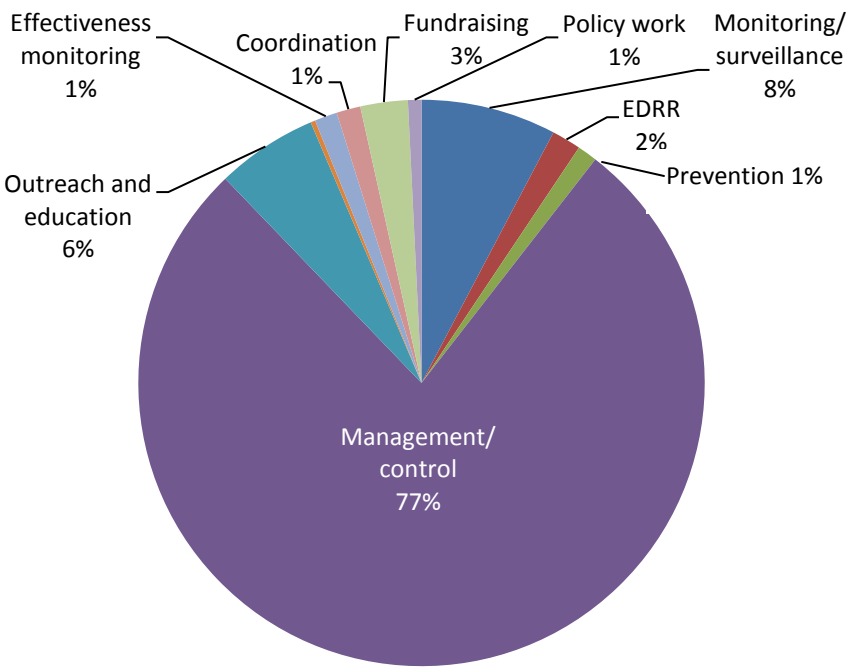


Figure 38. Percent of operational expenditures in invasive species actvities by the State of Oregon in 2008 by implementation category.

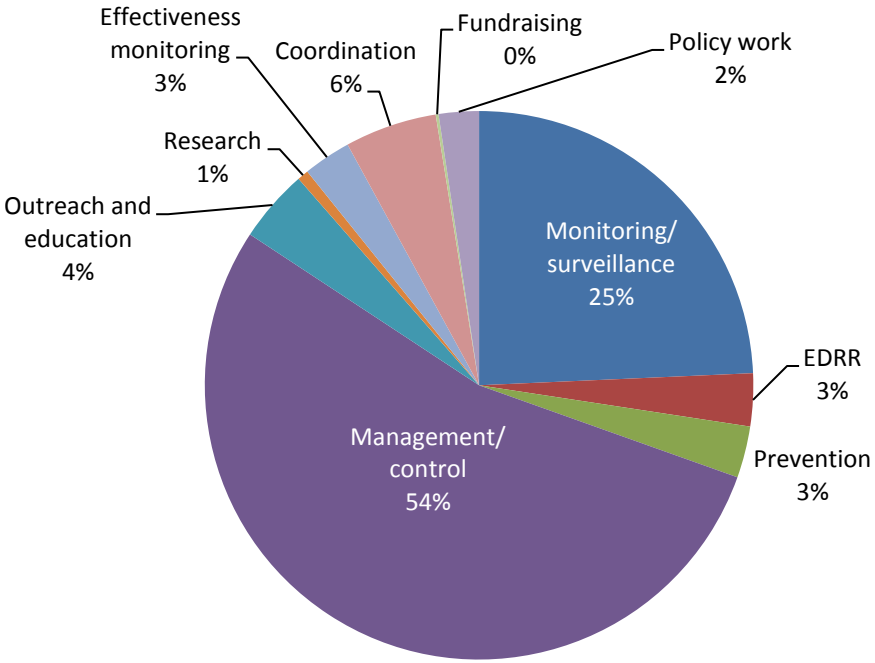


Figure 39. Percent of salary/benefit expenditures in invasive species activities by the State of Oregon in 2008 by implementation category.

Table 14. Invasive species total state expenditures* in Oregon in 2008 by implementation category.

	Total Ops	Total Salaries	GRAND TOTAL
Monitoring & surveillance	$203,310	$948,712	**$1,152,022**
EDRR	$44,000	$121,450	**$165,450**
Prevention	$29,896	$118,657	**$148,553**
Management/control	$2,036,891	$2,101,446	**$4,138,337**
Outreach and education	$152,305	$167,846	**$320,151**
Research	$7,074	$25,763	**$32,837**
Effectiveness monitoring	$34,000	$110,000	**$144,000**
Coordination	$36,149	$211,916	**$248,065**
Fundraising	$71,243	$6,540	**$77,783**
Policy Work	$20,224	$92,299	**$112,523**
TOTALS	**$2,635,092**	**$3,904,629**	**$6,539,721**

*Includes incoming funds

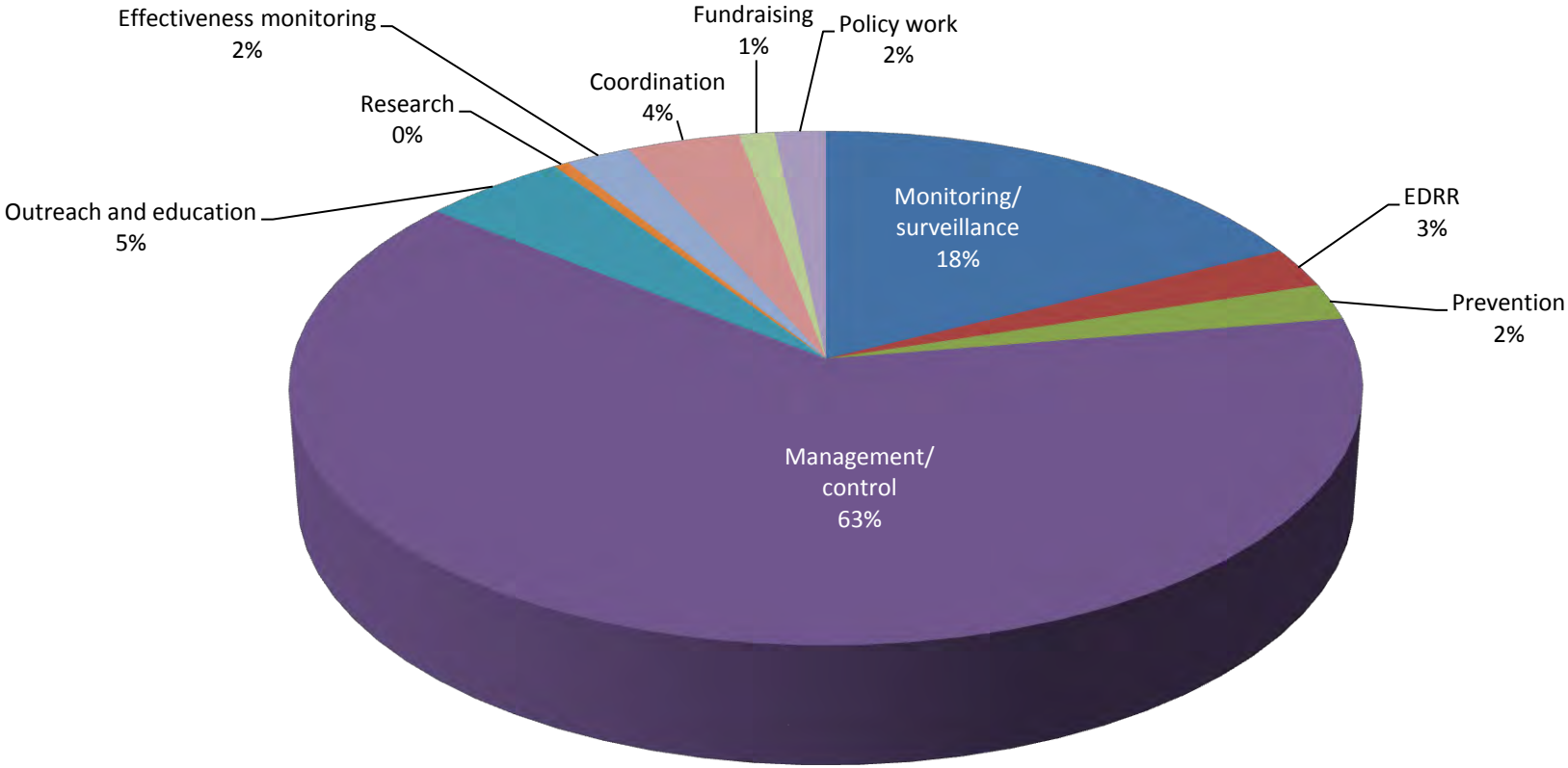


Figure 40. Percent of total expenditures in invasive species activities by the State of Oregon in 2008 by implementation category.

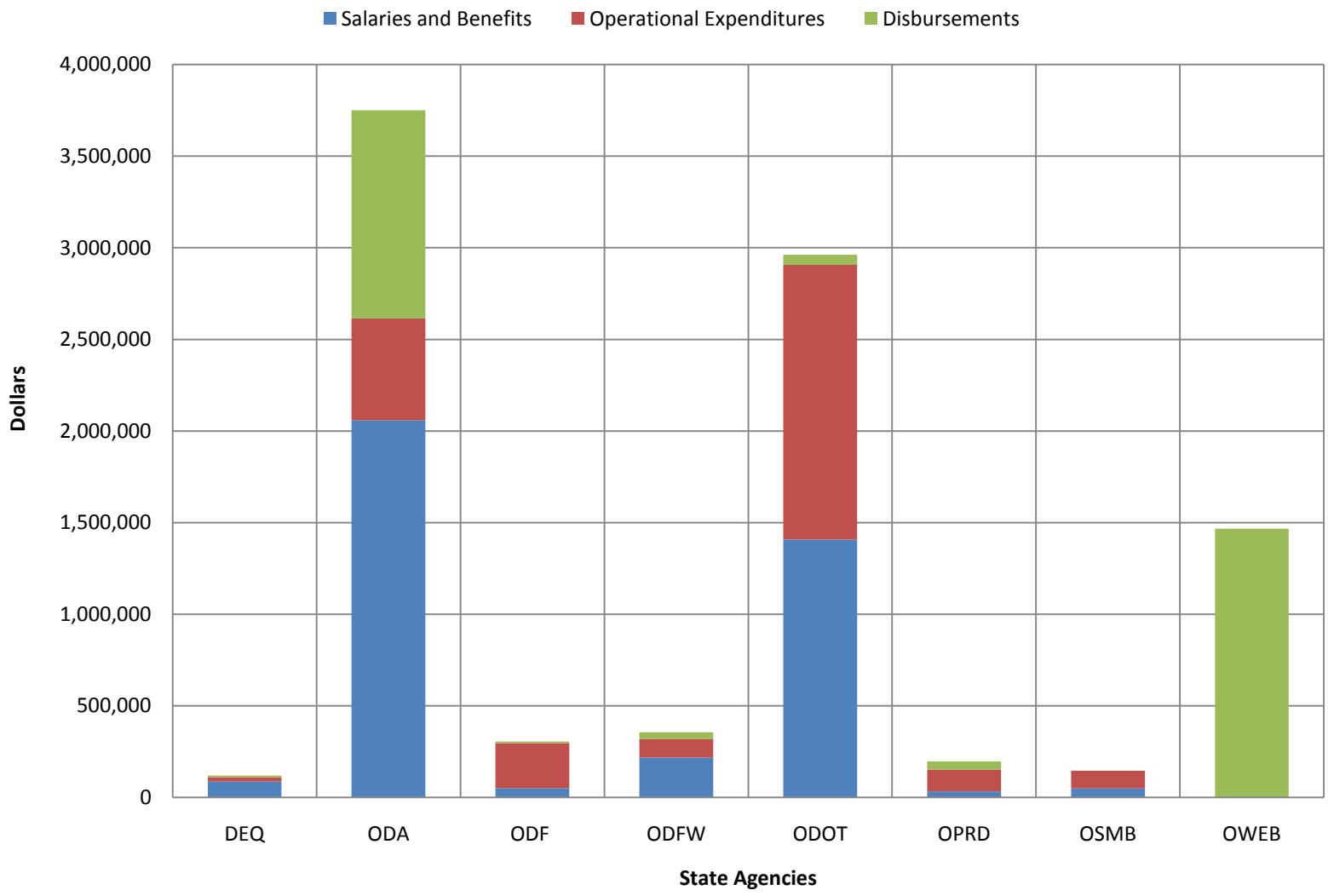


Figure 41. Total state expenditures in invasive species activities in Oregon in 2008 (includes expenditures of incoming funds).

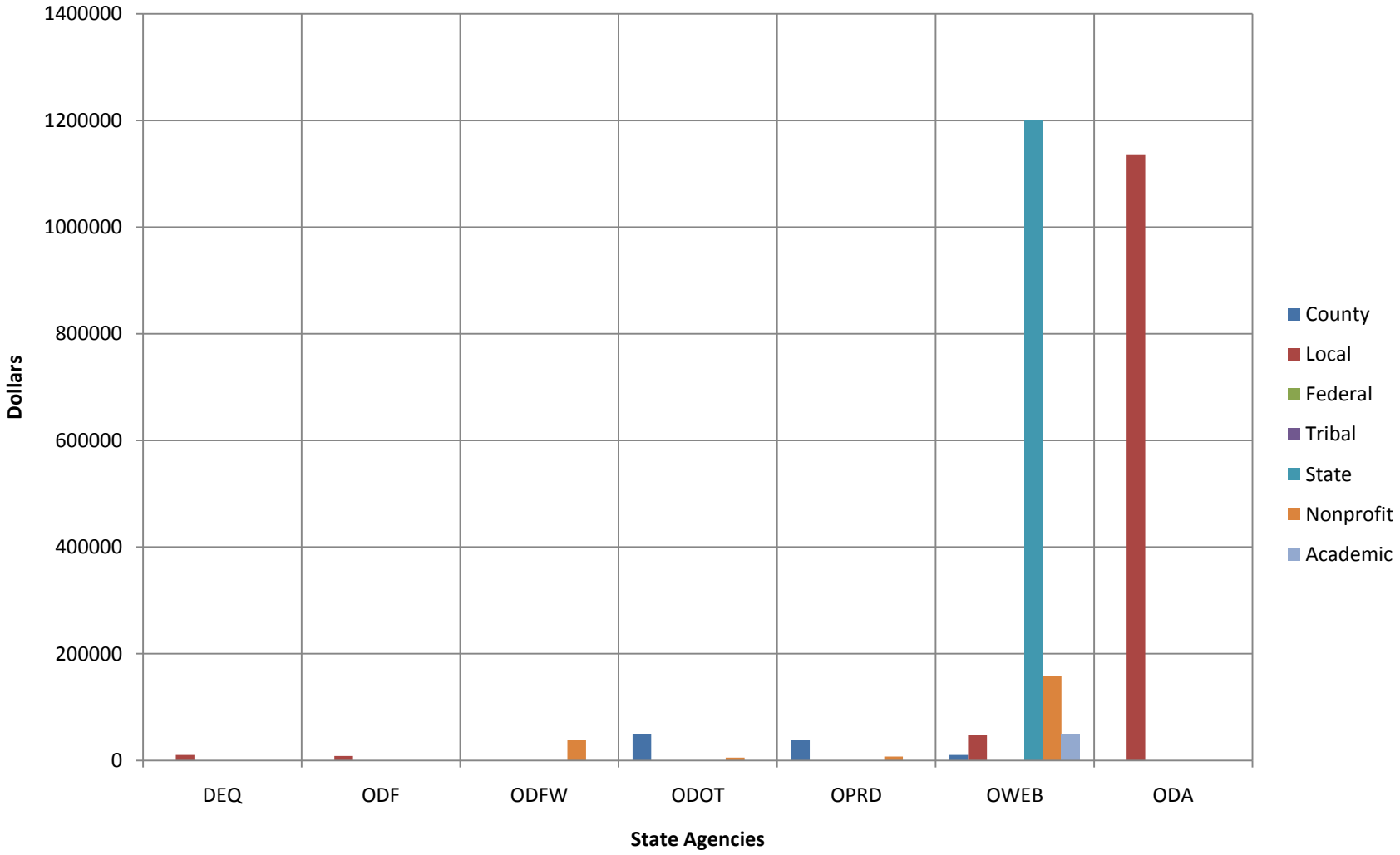


Figure 42. Entities receiving disbursements from state agencies for invasive species activities in Oregon in 2008.

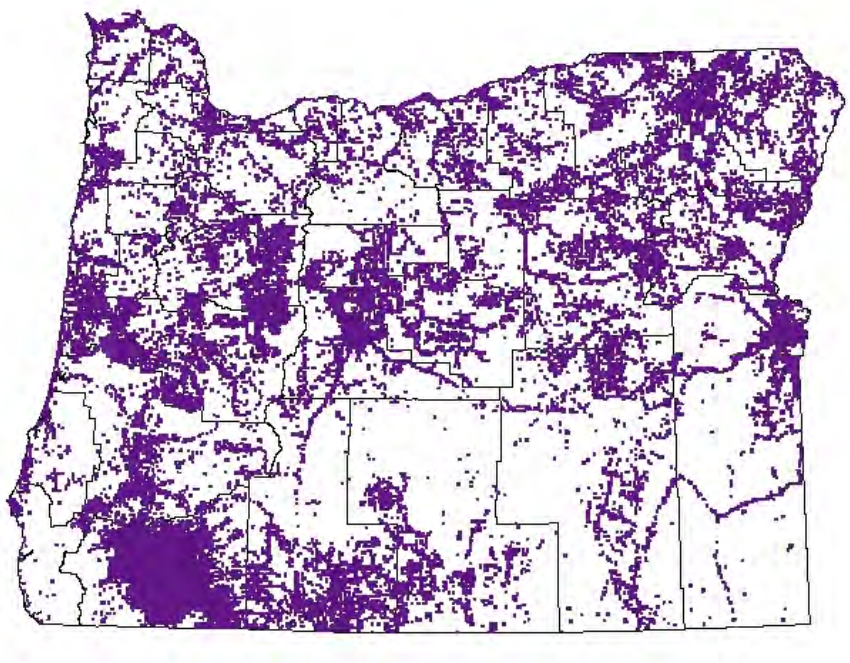


Figure 43. Map of Oregon showing locations of noxious weeds (Source: Oregon Department of Agriculture).

Local

Operational dollars

Of the $1,634,634 operational dollars expended by local entities, 67% was spent on management and control, followed by 8% on monitoring and surveillance, 5% on effectiveness monitoring, 4% on EDRR and outreach and education, 3% on prevention, policy work, coordination, and other activities (Table 15, Figure 44).

Salary/benefits

Of the $3,083,721 salary/benefit dollars expended by local entities, 61% was spent on management and control, followed by 10% on outreach and education, 6% on EDRR, 5% on monitoring and surveillance and coordination, 4% on prevention, 3% on effectiveness monitoring, 2% on fundraising and policy work, and 1% of other activities and research (Table 16, Figure 45).

Total

Local entities spent a total of 64% of their invasive species funds on management and control, followed by 7% on outreach and education, 6% on monitoring and surveillance, 5% each on coordination and EDRR, 4% each on effectiveness monitoring and prevention, 2% each on policy work and other activities, and 1% each on fundraising and research (Table 17, Figure 46).

Local entities play an important role educating and working with landowners to identify and treat invasive species, particularly noxious weeds, on their properties.

Table 18 shows a listing of all organizations that receive funding from ODA in 2008 via grants from the State Weed Board. Many of these entities did not participate in the assessment survey. Future assessments should seek to capture the activities of all organizations that receive grant funding from the State Weed Board, and consideration should be given to mandate participation in future assessments by entities that receive state funding of any kind.

Table 15. Invasive species operational expenditures* by local entities in Oregon during their fiscal year 2008 by implementation category.

	Monitoring & surveillance	EDRR	Prevention	Management /control	Outreach and education	Research	Effectiveness monitoring	Coordination	Fundraising	Policy Work	Other Activities	TOTAL OPERATIONAL EXPENSES
City of Eugene Parks and Open Space Division	$4,200	0	$3,500	$49,000	$700	$1,400	$4,200	$3,500	$700	$3,500	0	$70,000
City of Portland BES	0	$35,000	0	$480,000	$10,000	0	0	0	0	0	0	$525,000
Coos Watershed Association	$2,500	0	0	$22,000	$170	0	$2,500	0	0	0	0	$27,170
Deschutes County	0	0	0	$47,599	0	0	0	0	0	0	$47,500	$95,099
East Multnomah SWCD	0	$2,000	0	$46,000	$1,000	0	0	0	0	0	0	$49,000
Gilliam County Weed Dept.	$53,132	$10,626	$10,626	$53,132	$10,626	0	$31,879	$21,253	0	$21,253	0	$212,527
Harney County Weed Control	0	0	0	$47,599	$10,740	0	0	0	0	0	0	$58,339
Jefferson County Weed Control	$2,500	$2,500	$5,000	$85,700	$3,000	0	0	0	0	0	0	$98,700
Lane County Public Works	$10,000	0	$20,000	$42,000	$5,000	$5,000	$10,000	0	0	$10,000	0	$102,000
Lincoln County	$30,000	$12,000	$5,000	$90,000	$5,000	0	$10,000	$10,000	$2,000	$5,000	0	$169,000
Malheur County Weed Control	$3,000	$1,000	$500	$2,000	$1,000	0	$3,000	$2,500	0	$500	0	$13,500
Marion County	0	0	0	$20,000	$2,000	0	0	0	0	0	0	$22,000
Morrow County Weed District	0	0	0	$76,400	0	0	0	0	0	0	0	$76,400
Nestucca Neskowin WC	0	0	0	$5,000	0	0	0	0	0	0	0	$5,000
North Fork John Day WC	$650	0	$300	$8,000	$250	0	$700	$500	$500	$100	0	$11,000

	Monitoring & surveillance	EDRR	Prevention	Management /control	Outreach and education	Research	Effectiveness monitoring	Coordination	Fundraising	Policy Work	Other Activities	TOTAL OPERATIONAL EXPENSES
Umatilla County Weed Department	$27,000	$4,500	$9,000	$22,500	$13,500	0	$13,500	$2,500	0	0	0	$92,500
Upper Deschutes WC	0	0	0	$97	0	0	0	0	0	0	0	$97
West Multnomah SWCD	0	0	0	$5,497	$1,105	0	0	0	0	0	0	$6,602
TOTALS	**$132,982**	**$67,626**	**$53,926**	**$1,102,524**	**$64,091**	**$6,400**	**$75,779**	**$40,253**	**$3,200**	**$40,353**	**$47,500**	**$1,634,634**

Note: The following organizations participated in the survey, but did not provide financial information: Benton SWCD, Burnt River Irrigation District/SWCD/PBWC, Klamath Watershed Partnership, Lower Columbia River Watershed Council, Monument SWCD, Multnomah County Transportation, Sherman County SWCD/Sherman Area WC, and Wasco County SWCD.

*Includes incoming funds

Table 16. Invasive species salary/benefit expenditures* by local entities in Oregon during their fiscal year 2008 by implementation category.

	Monitoring & surveillance	EDRR	Prevention	Management/ control	Outreach and education	Research	Effectiveness monitoring	Coordination	Fundraising	Policy Work	Other Activities	TOTAL SALAIRES AND BENEFITS
City of Portland BES	0	$72,800	0	$946,400	$20,800	0	0	0	0	0	0	$1,040,000
Clatsop SWCD	0	0	0	$21,500	$500	0	0	0	0	0	0	$22,000
Columbia Slough WC	$400	$1,000	0	0	$400	$200	0	0	0	0	0	$2,000
Columbia SWCD	0	0	0	$18,652	$3,750	0	0	0	0	0	0	$22,402
Coos Watershed Association	$500	$250	0	$3,000	$750	0	$500	0	0	0	0	$5,000
Deschutes County	$2,525	$2,525	$32,825	$118,675	$83,325	0	$2,525	0	$10,100	0	0	$252,500
East Multnomah SWCD	$15,000	$7,500	0	$18,750	$18,750	$3,750	$3,750	$3,750	0	0	$3,750	$75,000
Gilliam County Weed Dept.	$33,543	$6,709	$6,709	$33,543	$6,709	0	$20,126	$13,417	0	$13,417	0	$134,173
Harney County Weed Control	0	$17,686	$17,686	$17,686	$10,884	$13,605	$10,884	$17,686	$10,884	$20,407	0	$137,408
Hood River County Weed and Pest Dept.	$7,100	0	$28,400	$10,650	0	0	$3,550	0	$3,550	0	$17,750	$71,000
Hood River SWCD	0	$160	0	0	$1,280	0	0	0	0	0	0	$1,440
Jefferson County Weed Control	$3,100	$3,100	$3,100	$49,600	$3,100	0	0	0	0	0	0	$62,000
Jordan Valley CWMA	$5,250	$1,750	$5,250	$5,250	$3,500	0	$1,750	$7,000	$1,750	$3,500	$0	$35,000
Klamath County Weed Control	$5,200	$6,500	0	$110,500	$2,600	0	$2,600	0	0	$2,600	0	$130,000

	Monitoring & surveillance	EDRR	Prevention	Management/ control	Outreach and education	Research	Effectiveness monitoring	Coordination	Fundraising	Policy Work	Other Activities	TOTAL SALAIRES AND BENEFITS
Lane County Public Works	0	0	$5,900	$94,400	$5,900	0	$5,900	$5,900	0	0	0	$118,000
Lincoln County	$14,400	$6,000	$4,800	$54,000	$6,000	0	$12,000	$8,400	$7,200	$7,200	0	$120,000
Lincoln SWCD	$6900	0	0	$58,650	0	0	0	0	$3450	0	0	$69,000
Malheur County Weed Control	$13,801	$6,901	$3,450	$6,901	$10,351	0	$10,351	$10,351	0	$6,901	0	$69,007
Marion County	0	0	0	$40,000	$10,000	0	0	0	0	0	0	$50,000
Mid-Coast WC	$2,000	0	0	$12,000	$4,000	0	$2,000	0	0	0	0	$20,000
Morrow County Weed District	$5,667	0	$8,502	$31,172	$5,667	0	0	$5,667	0	0		$56,675
North Fork John Day WC	$1,650	0	$825	$3,300	$1,650	0	$1,650	$4,950	$1,650	$825	0	$18,150
NWMP	0	$6,000	0	0	$12,000	$3,000	0	$33,000	$3,000	$3,000	0	$60,000
Seven Basins WC	$400	$300	0	$900	$350	0	$350	$300	$400	0	0	$3,0 00
Sherman County Weed District	$7,600	$3,800	0	$38,000	$3,800	$3,800	$11,400	$3,800	0	$3,800	0	$76,000
Siuslaw WC	0	$5,600	$5,600	$16,800	0	0	0	0	0	0	0	$28,000
Tualatin Hills Parks and Rec District	0	0	0	104,250	47,750	0	0	0	0	0	0	$152,000
Tualatin River WC	0	0	0	0	0	0	0	$35,000	0	0	0	$35,000
Umatilla County Weed Department	$27,000	$4,500	$9,000	$22,500	$13,500	0	$13,500	0	0	0	0	$90,000
Upper Deschutes WC	0	0	0	$20,000	0	0	0	0	0	0	0	$20,000
West Multnomah SWCD	$3,100	$21,700	0	$9,300	$9,300	0	$3,100	$9,300	$6,200	0	0	$62,000
Wheeler SWCD	$4,630	0	0	$4,630	$9,260	0	$2,315	$6,945	$6,945	0	$13,891	$20,372

	Monitoring & surveillance	EDRR	Prevention	Management/ control	Outreach and education	Research	Effectiveness monitoring	Coordination	Fundraising	Policy Work	Other Activities	TOTAL SALAIRES AND BENEFITS
TOTALS	**$159,766**	**$174,781**	**$132,047**	**$1,871,009**	**$295,876**	**$24,355**	**$108,251**	**$165,466**	**$55,129**	**$61,650**	**$35,391**	**$3,083,721**

*Includes incoming funds

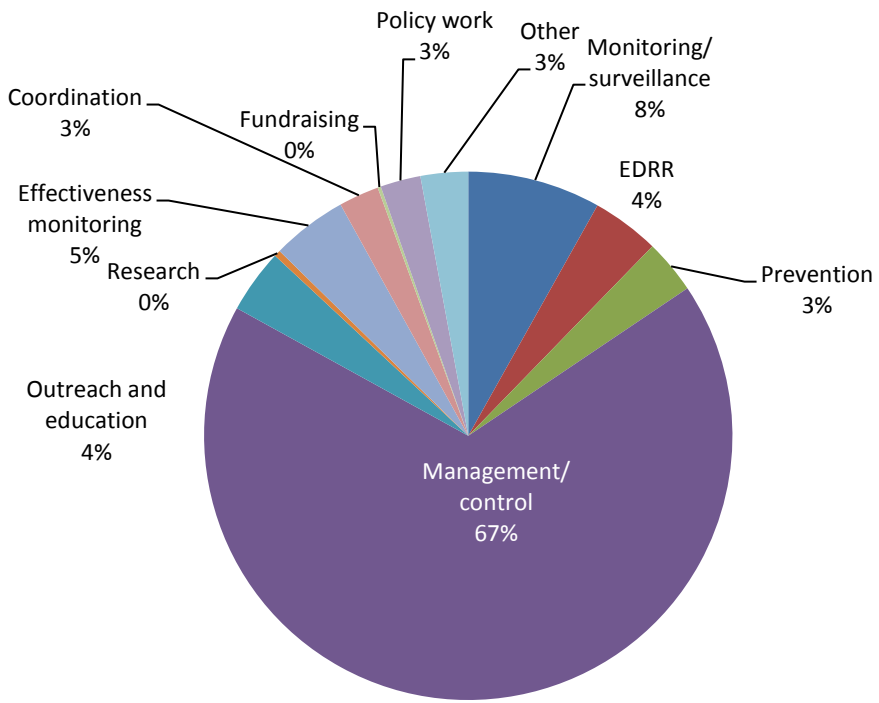


Figure 44. Percent of operational expenditures by local entities for invasive species activities in Oregon in 2008 by implementation category.

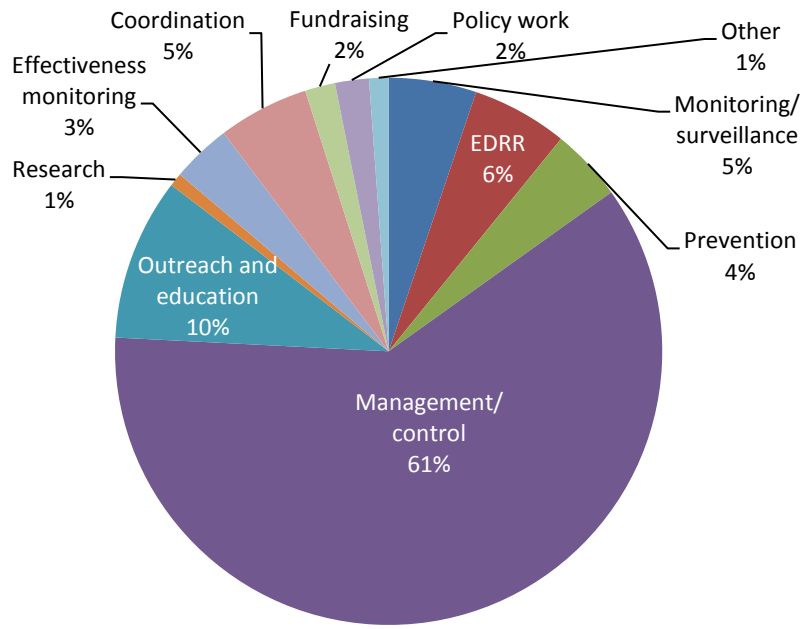


Figure 45. Percent of salary/benefit expenditures by local entities for invasive species activities in Oregon in 2008 by implementation category.

Table 17. Invasive species total expenditures by local entities in Oregon in 2008 by implementation category.

	Total Ops	Total Salaries	GRAND TOTALS
Monitoring & surveillance	$132,982	$159,766	**$292,748**
EDRR	$67,626	$174,781	**$242,407**
Prevention	$53,926	$132,047	**$185,973**
Management/control	$1,102,524	$1,871,009	**$2,973,533**
Outreach and education	$64,091	$295,876	**$359,967**
Research	$6,400	$24,355	**$30,755**
Effectiveness monitoring	$75,779	$108,251	**$184,030**
Coordination	$40,253	$165,466	**$205,719**
Fundraising	$3,200	$55,129	**$58,329**
Policy Work	$40,353	$61,650	**$102,003**
Other	$47,500	$35,391	**$82,891**
TOTALS	$1,634,634	$3,083,721	**$4,718,355**

*Includes incoming funds

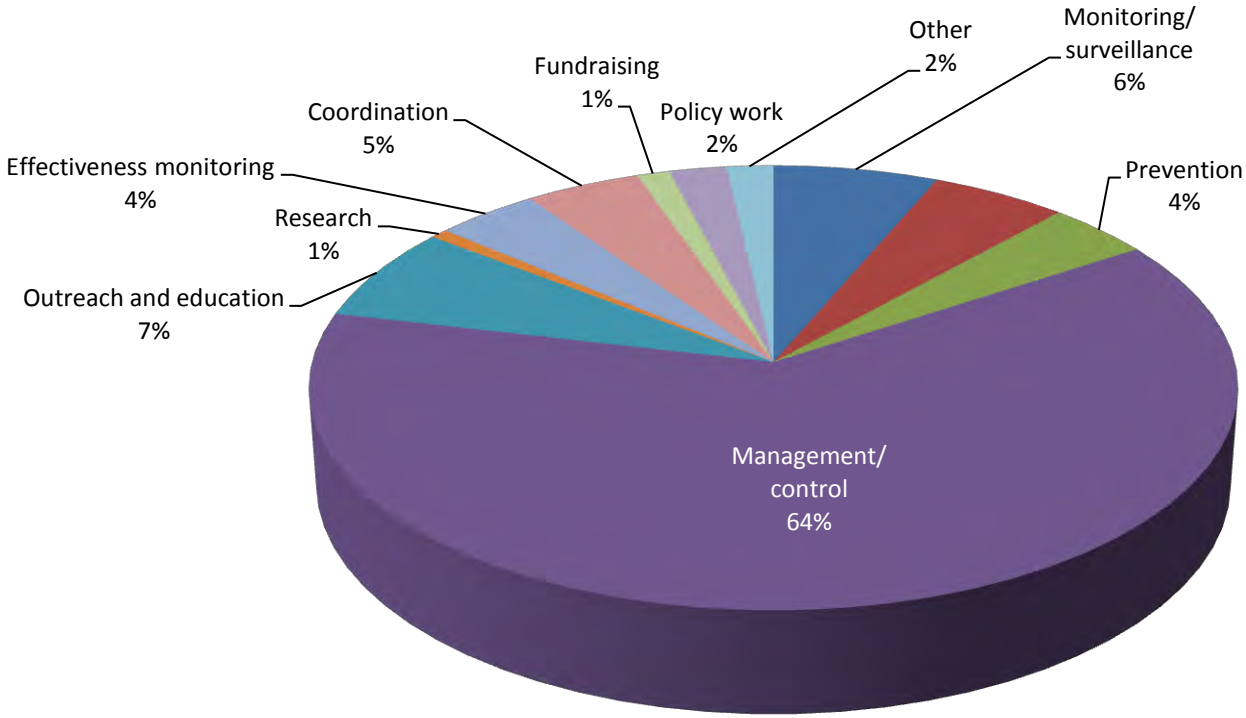


Figure 46. Total invasive species expenditures by local entities in Oregon in 2008 by implementation category.

Table 18. Invasive species grants funded by the Oregon State Weed Board through the Oregon Department of Agriculture in 2008.

Oregon State Weed Board 2008 Grant Recipients	Amount Funded
Baker County Weed Control	$29,300
Clatsop SWCD	$20,422
Columbia Soil and Water Conservation District	$11,192
Crooked River Weed Management Area	$38,923
Curry SWCD	$33,206
Deschutes Land Trust	$7,729
Douglas SWCD	$103,148
East Lane SWCD	$13,250
East Multnomah SWCD	$18,900
Exotic Species Control Project	$22,150
Foundation of N. American Wild Sheep - OR Chapter	$10,000
Friends of the Metolius	$6,300
Gilliam County Weed Department	$56,771
Grant SWCD	$14,166
Harney County CWMA	$9,900
Ivy Hills Homeowners Association	$3,988
Jacksonville Woodlands Association	$2,500
Jefferson County Weed Control	$28,330
Johnson Creek Watershed Council	$7,466
Juntura CWMA	$16,635
Lake County CWMA	$57,776
Langell Valley Irrigation District	$9,350
Lincoln County Road Department	$45,974
Lower Columbia River WC	$9,075
Malheur CWMA	$45,515
North Fork John Day WC	$9,785
OSU College of Forestry	$24,277
Owyhee WC/Jordan Valley CWMA	$66,442

Oregon State Weed Board 2008 Grant Recipients	Amount Funded
Seven Basins Watershed Council	$5,786
Sherman County SWCD	$4,587
South Santiam WC	$20,542
The Nature Conservancy	$50,520
Three Rivers Land Conservancy	$28,030
Tri-County CWMA	$78,500
Umatilla County Weed Department	$12,036
Union County Noxious Weed Control	$13,900
Union County Weed Control	$5,000
Upper Burnt River Invasive Plant Control	$47,748
Wallowa Resources	$85,211
Wasco County Weed Department	$7,500
Wheeler SWCD	$26,650
Willamalane Park & Recreation District	$5,000
Yamhill SWCD	$20,000
Young Life's Washington Family Ranch	$3,000
GRAND TOTAL	$1,136,450

Tribal governments

Tribal governments are underrepresented in this survey because of lack of participation. Each of the recognized tribal governments in Oregon as well as the Bureau of Indian Affairs (BIA) was asked on several occasions throughout 2009 to participate in the survey, however, only the Burns Paiute Tribe and the Columbia InterTribal Fish Commission responded. Because of information provided by other respondents and general knowledge that invasive species work is taking place on tribal lands throughout Oregon, the information in this report does not reflect the level of participation and funding in invasive species activities in Oregon. The Burns Paiute Tribe indicted they expended $214,257 on salary/benefits for invasive species activities in 2008 (Table 19).

The Burns Paiute Tribe indicated that 60% of their invasive species funds were spent on management and control, followed by 15% on prevention, 10% on monitoring and surveillance, 5% on both outreach and education and EDRR, 3% on research, and 2% on effectiveness monitoring (Figure 47).

To capture the invasive species activities on tribal government lands and better assessment the investment being made in Oregon to management invasive species, future assessments should focus on working with tribal governments and BIA to obtain information.

Nonprofit organizations

Operational dollars

Of the $974,235 operational dollars expended by nonprofit organizations, 32% was spent on management and control, followed by 11% on monitoring and surveillance, 10% each on EDRR and coordination, 9% each on outreach and education and research, 6% on policy work, 5% on effectiveness monitoring, 4% on fundraising, 3% on prevention, and 1% on other activities (Table 20, Figure 48).

Salary/benefits

Of the $607,372 salary/benefit dollars expended by nonprofit organizations, 60% was spent on management and control, followed by 7% each on monitoring and surveillance, outreach and education, and coordination, 5% on EDRR, 4% each on fundraising and other activities, 2% each on effectiveness monitoring and prevention, and 1% each on policy work and research (Table 21, Figure 49).

Total

Nonprofit organizations spent a total of 49% of their invasive species funds on management and control, followed by 9% on monitoring and surveillance,8% each on outreach and education and coordination, 7% on EDRR, 4% each on fundraising and research, 3% on policy work, effectiveness monitoring and other activities, and 2% on prevention (Table 22, Figure 50).

Nonprofit organizations play an important role in Oregon's fight against invasive species, because they spend a great deal of time (8% of their total efforts) bringing other entities

Table 19. Invasive species salary/benefit expenditures** by tribal governments in Oregon during their fiscal year 2008 by implementation category.

	SALARIES AND BENEFITS	TOTALS
Monitoring & surveillance	$21,425	**$21,425**
EDRR	$10,712	**$10,712**
Prevention	$32,138	**$32,138**
Management/control	$128,554	**$128,554**
Outreach and education	$10,712	**$10,712**
Research	$5,356	**$5,356**
Effectiveness monitoring	$5,356	**$5,356**
Coordination	0	**0**
Fundraising	0	**0**
Policy Work	0	**0**
Other Activities	0	**0**
TOTALS	$214,257	**$214,257**

*Note: Tribal governments also granted the following in 2008:
$500 —Lincoln County – Siletz
$12,500 — Harney County – Burns Paiute
$25,000 —Jefferson County – Unknown tribal government
**Includes incoming funds

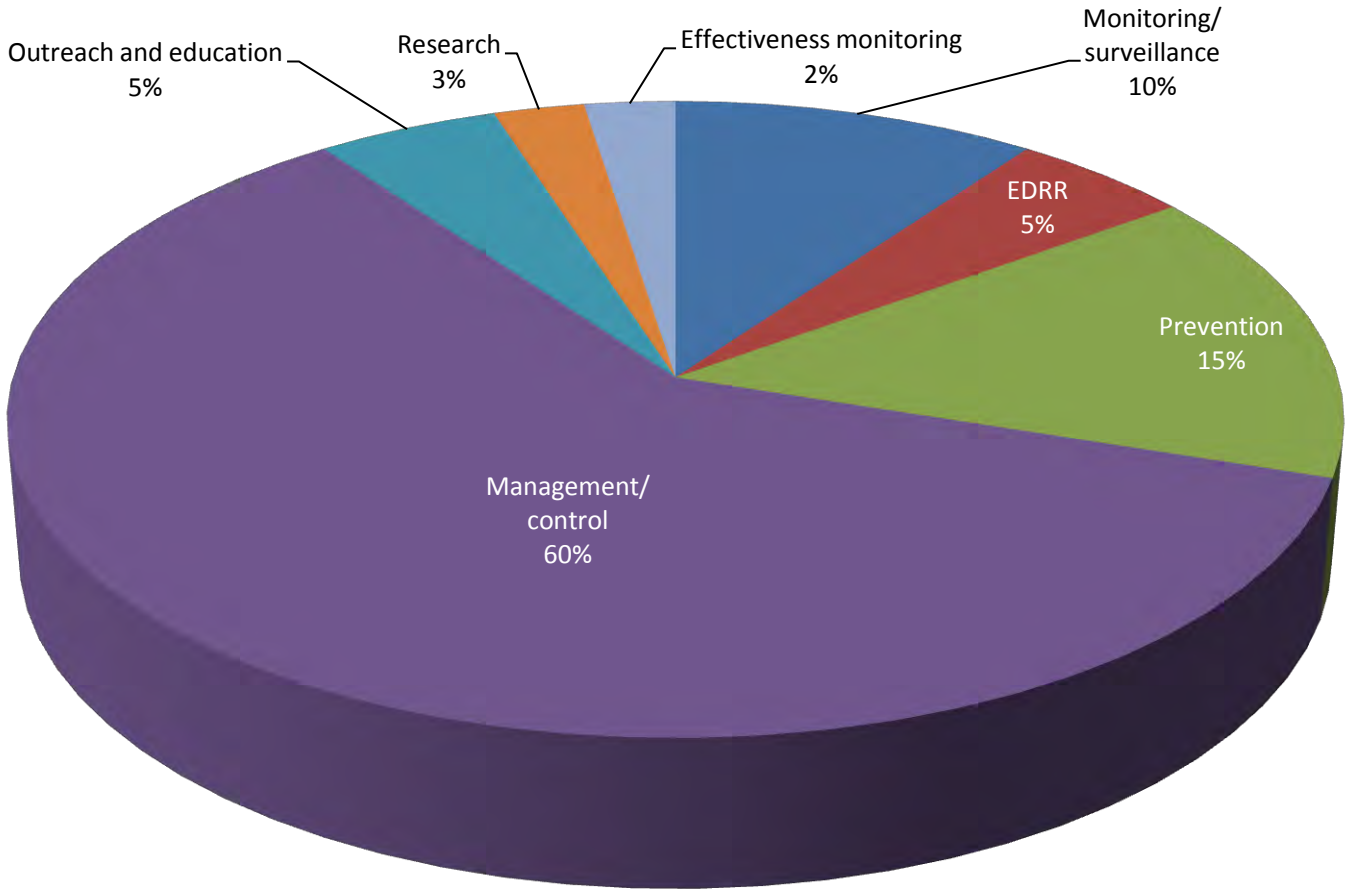


Figure 47. Invasive species expenditures by tribal governments in Oregon in 2008 by implementation category.

Table 20. Invasive species operational expenditures* by nonprofit organizations in Oregon during their fiscal year 2008 by implementation category.

	Audubon Society of Portland	CoastWatch Oregon	Oregon Council Trout Unlimited	The Nature Conservancy	Three Rivers Land Conservancy	Tillamook Estuaries Partnership	Wallowa Resources	**TOTALS**
Monitoring & surveillance	$5,000			$45,919			$19,000	**$69,919**
EDRR	$5,000			$6,729			$40,000	**$51,729**
Prevention	$5,000		$1,000	$5,182			$8,000	**$19,182**
Management/control	$50,000			$254,336	$90,000	$16,985	$170,000	**$581,321**
Outreach and education	$30,000	$500	$1,000	$11,972			$24,000	**$67,472**
Research				$1,512			$8,000	**$9,512**
Effectiveness monitoring				$6,685			$10,000	**$16,685**
Coordination			$1,000	$12,972			$50,000	**$63,972**
Fundraising	$10,000			$8,243			$26,000	**$44,243**
Policy Work			$2,200	$3,000			$5,000	**$10,200**
Other Activities							$40,000	**$40,000**
TOTAL OPERATIONAL EXPENSES	$105,000	$500	$5,200	$356,550	$90,000	$16,985	$400,000	**$974,235**

*Includes incoming funds

Table 21. Invasive species salary/benefit expenditures by nonprofit organizations in Oregon during their fiscal year 2008 by implementation category.

	Audubon Society of Portland	Institute for Applied Ecology	Oregon Council Trout Unlimited	The Nature Conservancy	Three Rivers Land Conservancy	Tillamook Estuaries Partnership	Wallowa Resources	**TOTALS**
Monitoring & surveillance	$4,375			$50,728	$5,000	$4,697	$3,510	**$68,310**
EDRR	$4,375	$2,300		$43,965			$7,020	**$57,660**
Prevention	$4,375		$1,100	$10,145			$1,404	**$17,024**
Management/control	$3,500	$46,000		$125,131	$10,000	$4,697	$7,020	**$196,348**
Outreach and education	$10,000	$11,500	$1,100	$20,291		$4,697	$4,212	**$51,800**
Research		$46,000		$6,763			$1,404	**$54,167**
Effectiveness monitoring				$27,055			$3,510	**$30,565**
Coordination		$2,300	$1,100	$30,437	$5,000	$4,697	$17,550	**$61,084**
Fundraising	$8,375	$2,300		$13,527				**$24,202**
Policy Work		$4,600	$2,200	$10,145			$21,060	**$38,005**
Other Activities						$4,697	$3,510	**$8,207**
TOTAL SALARIES AND BENEFITS	$35,000	$115,000	$5,500	$338,187	$20,000	$23,485	$70,200	**$607,372**

*Includes incoming funds

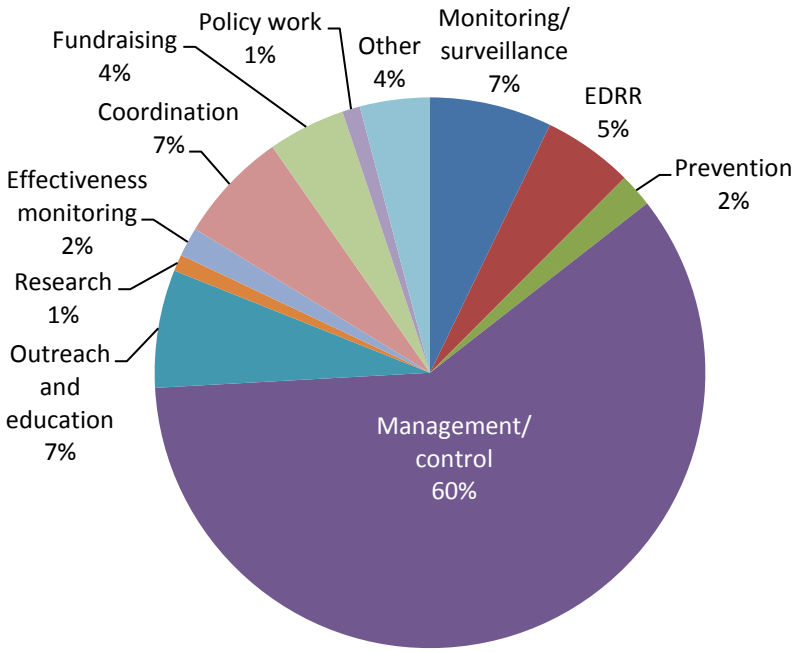


Figure 48. Percent of operational expenditures in invasive species activities by nonprofit organizations in Oregon in 2008 by implementation category.

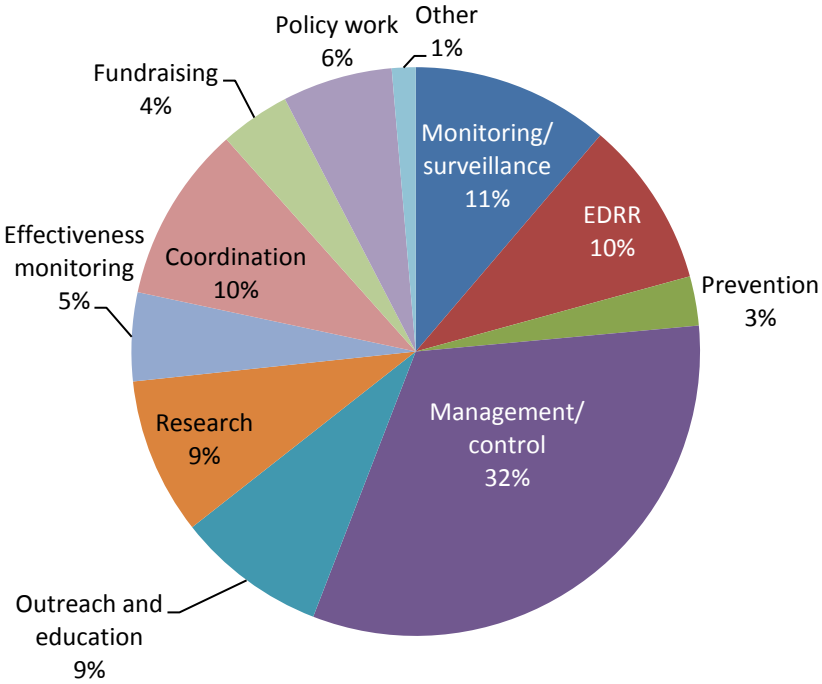


Figure 49. Percent of salary/benefit expenditures in invasive species activities by nonprofit organizations in Oregon in 2008 by implementation category.

Table 22. Invasive species summary of nonprofit expenditures* in Oregon in 2008 by implementation category.

	Total Ops	Total Salaries and Benefits	GRAND TOTALS
Monitoring & surveillance	$69,919	$68,310	**$138,229**
EDRR	$51,729	$57,660	**$109,389**
Prevention	$19,182	$17,024	**$36,206**
Management/control	$581,321	$196,348	**$777,669**
Outreach and education	$67,472	$51,800	**$119,272**
Research	$9,512	$54,167	**$63,679**
Effectiveness monitoring	$16,685	$30,565	**$47,250**
Coordination	$63,972	$61,084	**$125,056**
Fundraising	$44,243	$24,202	**$68,445**
Policy Work	$10,200	$38,005	**$48,205**
Other	$40,000	$8,207	**$48,207**
TOTALS	$974,235	$607,372	**$1,581,607**

*Includes incoming funds

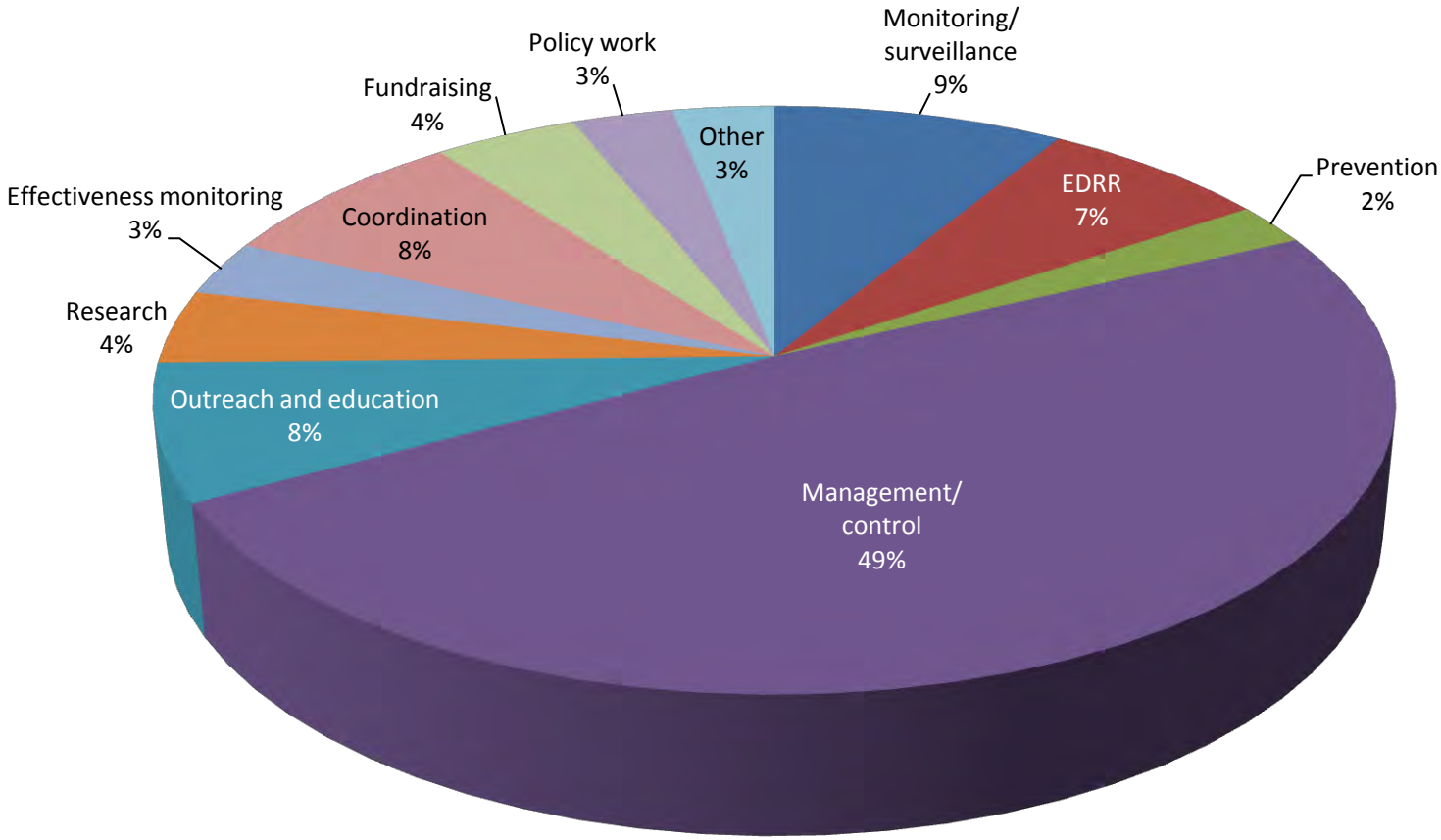


Figure 50. Expenditures in invasive species activities by nonprofit organizations in Oregon in 2008 by implementation category.

together to achieve common natural resource goals. In addition, they serve an important role in the outreach and education arena, dedicating 8% of their total efforts in this area.

Academic Institutions

Of the $1,136,972 academic institutions spent on invasive species activities in 2008, they spent a total of 44% on research, 21% on outreach and education, 17% on EDRR, 8% on fundraising, 3% each on policy work, coordination, and other activities, 1% on effectiveness monitoring, and less than 1% on management and control, prevention, and monitoring and surveillance (Table 23, 24, 25 and Figure 51).

All entities

Entities in Oregon reported spending an estimated $27,012,408 on invasive species activities in 2008 (Table 26). A total of 50% of funding was spent on management and control, followed by 10% on monitoring and surveillance, 6% on outreach and education, prevention, policy work, EDRR, and coordination, 3% each on effectiveness monitoring and research, and 1% on fundraising and other activities (Figure 52).

Table 23. Invasive species operational expenditures* by academic institutions in Oregon during their fiscal year 2008 by implementation categories.

	OSU Dept. Crop/Soil Sci.	OSU - Fisheries and Wildlife	OSU Klamath Basin Research and Extension	PSU Biology Dept.	OSU Hermiston Ag. Res. Ctr.	OSU Sea Grant	University of Oregon	PSU Center for Lakes and Reservoirs	TOTALS
Monitoring & surveillance	0	0	0	0	0	0	0	0	**0**
EDRR	0	0	0	0	0	$1,000	0	$10,000	**$11,000**
Prevention	0	0	0	0	0	0	0	0	**0**
Management/control	0	0	0	0	0	0	0	0	**0**
Outreach and education	0	0	$850	0	$5,000	$35,000	$1,000	$25,000	**$66,850**
Research	$13,000	$5,000	0	$3,000	$25,000	$7,000	$11,160	$20,000	**$84,160**
Effectiveness monitoring	0	0	0	0	0	$4,000	0	0	**$4,000**
Coordination	0	0	0	0	0	$0	0	0	**$0**
Fundraising	0	0	0	0	0	0	0	0	**0**
Policy Work	0	0	0	0	0	0	0	0	**0**
Other Activities	0	0	0	0	0	0	$26,581	0	**$26,581**
TOTAL OPERATIONAL EXPENSES	$13,000	$5,000	$850	$3,000	$30,000	$47,000	$38,741	$55,000	**$192,591**

*Includes incoming funds

Table 24. Invasive species salary/benefit expenditures* by academic institutions in Oregon during their fiscal year 2008 by implementation category.

	OSU Extension	OSU Newport	Fisheries and Wildlife	PSU Biology Dept.	OSU Extension	OSU Extension	OSU Extension	OSU Sea Grant	University of Oregon	PSU Center for Lakes and Reservoirs	TOTALS
Monitoring & surveillance				$2,500		$720					**$3,220**
EDRR						$720				$180,000	**$180,720**
Prevention		$3,000									**$3,000**
Management/control		$3,000									**$3,000**
Outreach and education	$6,500	$8,000			$2,000	$1,080	$125	$82,800	$4,878	$60,000	**$165,383**
Research		$6,000	$100,000	$2,500	$18,000	$1,080	$2,375	$27,600	$43,903	$210,000	**$411,458**
Effectiveness monitoring								$13,800			**$13,800**
Coordination								$6,900		$30,000	**$36,900**
Fundraising										$90,000	**$90,000**
Policy Work								$6,900		$30,000	**$36,900**
TOTAL SALARIES AND BENEFITS	$6,500	$20,000	$100,000	$5,000	$20,000	$3,600	$2,500	$138,000	$48,781	$600,000	**$944,381**

*Includes incoming funds

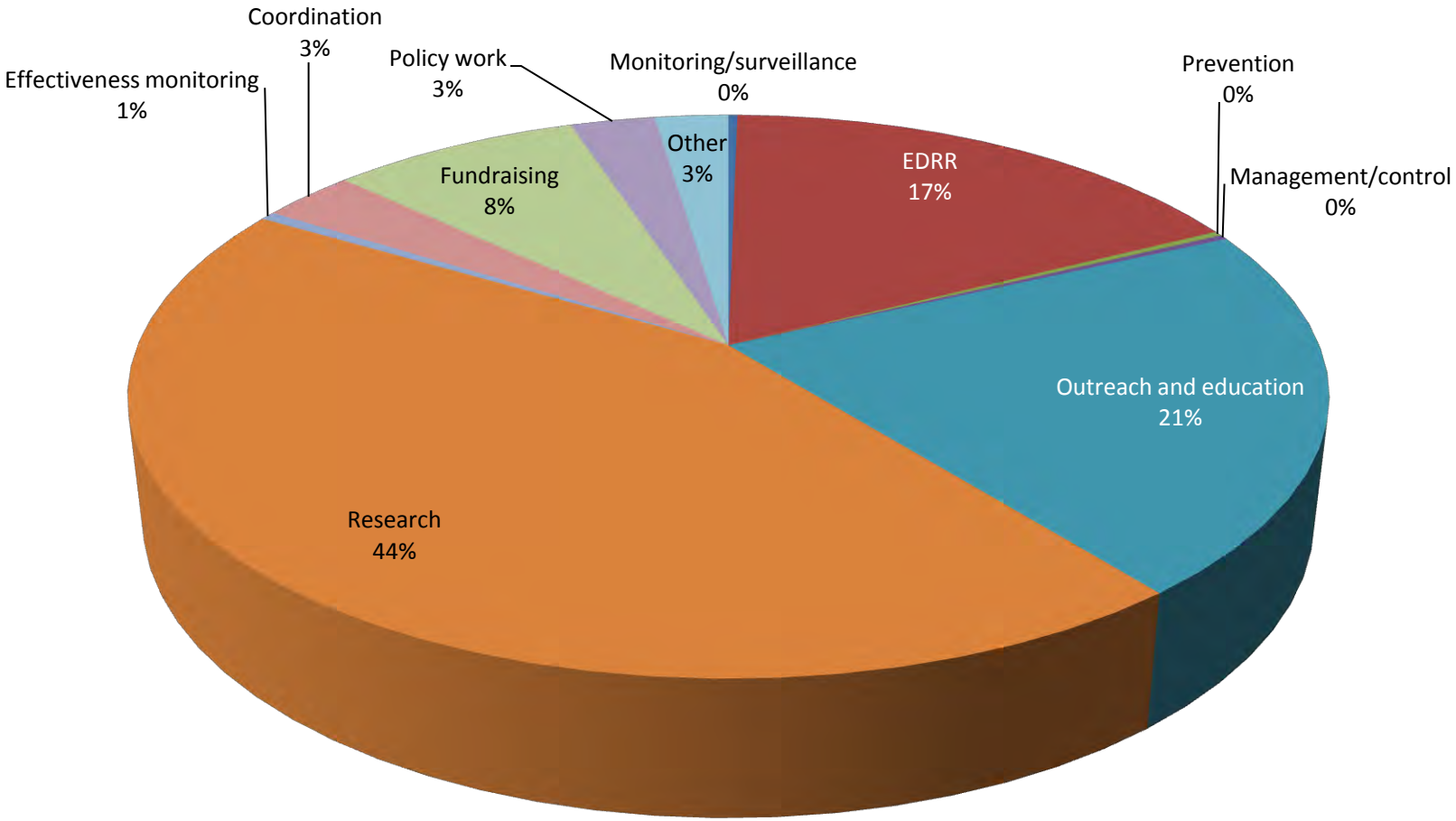


Figure 51. Invasive species expenditures by academic institutions in Oregon in 2008 by implementation category.

Table 25. Invasive species summary of academic expenditures* for invasive species activities in Oregon in 2008 by implementation category.

	Total Ops	Total Salaries and Benefits	GRAND TOTALS
Monitoring & surveillance	0	$3,220	**$3,220**
EDRR	$11,000	$180,720	**$191,720**
Prevention	0	$3,000	**$3,000**
Management/control	0	$3,000	**$3,000**
Outreach and education	$66,850	$165,383	**$232,233**
Research	$84,160	$411,458	**$495,618**
Effectiveness monitoring	$4,000	$13,800	**$17,800**
Coordination	$0	$36,900	**$36,900**
Fundraising	0	$90,000	**$90,000**
Policy Work	0	$36,900	**$36,900**
Other	$26,581	0	**$26,581**
TOTALS	$192,591	$944,381	**$1,136,972**

*Includes incoming funds

Table 26. Summary table of expenditures* for invasive species activities by category in Oregon in 2008.

	Federal	State	Local	Nonprofit	Academic	Tribal	GRAND TOTALS
Monitoring & surveillance	$1,096,250	$1,152,022	$292,748	$138,229	$3,220	$21,425	**$2,703,894**
EDRR	$960,000	$165,450	$242,407	$109,389	$191,720	$10,712	**$1,679,678**
Prevention	$1,175,000	$148,553	$185,973	$36,206	$3,000	$32,138	**$1,580,870**
Management/control	$6,042,500	$4,138,337	$2,973,533	$777,669	$3,000	$128,554	**$14,063,593**
Outreach and education	$651,250	$320,151	$359,967	$119,272	$232,233	$10,712	**$1,693,585**
Research	$220,000	$32,837	$30,755	$63,679	$495,618	$5,356	**$848,245**
Effectiveness monitoring	$300,000	$144,000	$184,030	$47,250	$17,800	$5,356	**$698,436**
Coordination	$1,007,250	$248,065	$205,719	$125,056	$36,900	0	**$1,622,990**
Fundraising	$28,750	$77,783	$58,329	$68,445	$90,000	0	**$323,307**
Policy Work	$1,283,000	$112,523	$102,003	$48,205	$36,900	0	**$1,582,631**
Other	$57,500	0	$82,891	$48,207	$26,581	0	**$215,179**
TOTALS	**$12,821,500**	**$6,539,721**	**$4,718,355**	**$1,581,607**	**$1,136,972**	**$214,253**	**$27,012,408**

*Includes incoming funds

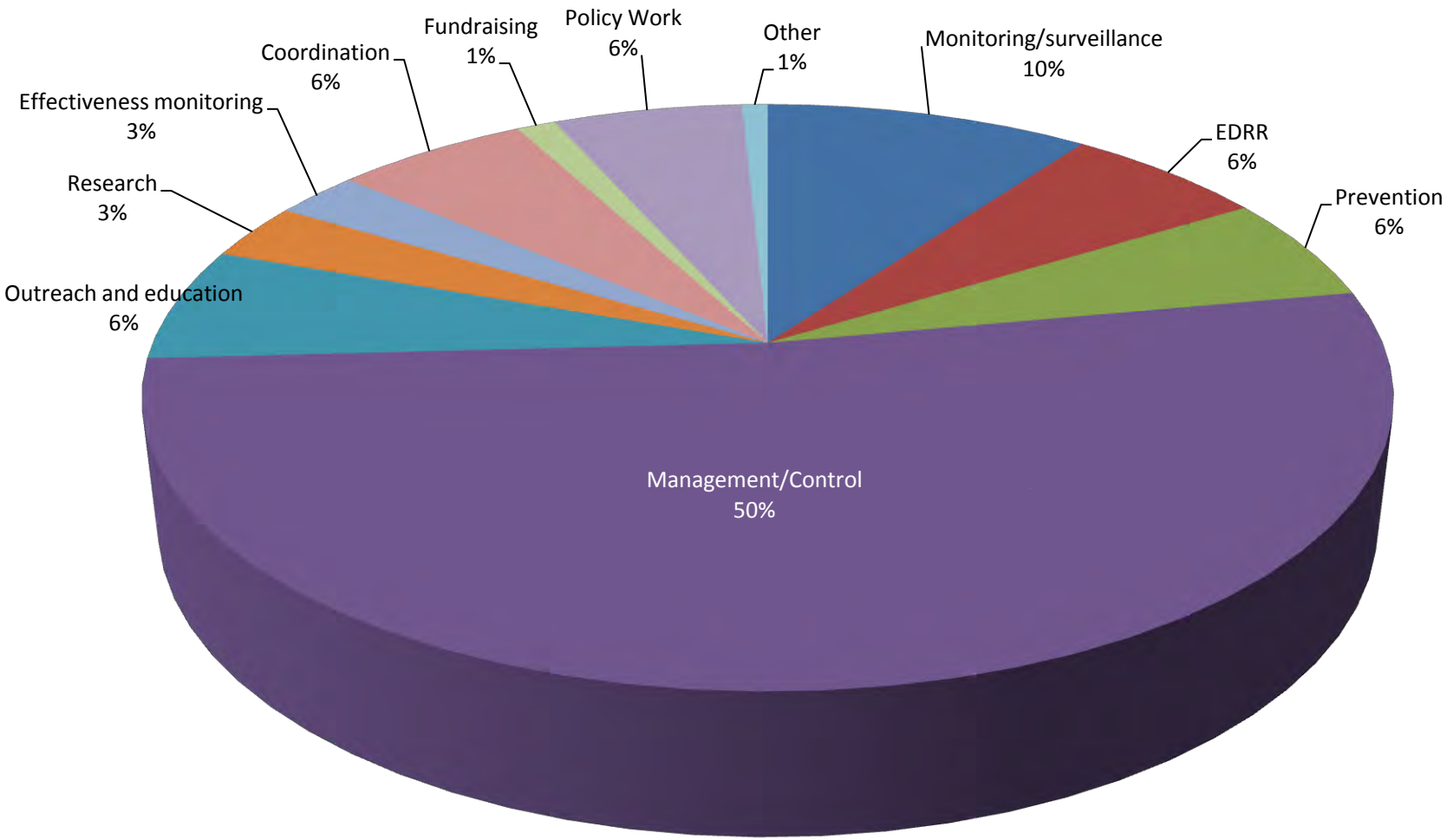


Figure 52. Percent expenditures in invasive species activities by all entities in Oregon in 2008 by implementation category.

OUTREACH AND EDUCATION

The following information is a more detailed analysis of the 7% expended in invasive species activities by all entities in Oregon in 2008 (Figure 52).

Survey respondents indicated they spent $1.9 million on outreach and education, but when asked to break down those costs, only 42 survey respondents provided detailed information about how they expended $660,347 for invasive species outreach and education activities in 2008. The dollar amounts excluded salary and benefits.

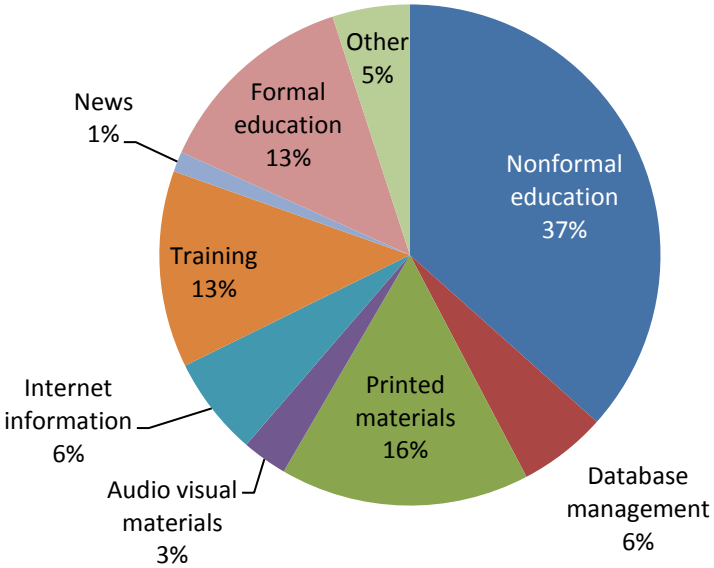


Figure 53. Percentage expended on invasive species outreach and education activities in Oregon in 2008 by category.

A total of 37% of all funds expended for outreach and education activities in 2008 were expended for nonformal education, followed by printed materials (16%), formal education (13%), training (13%), database management (6%), Internet information (6%), other (5%), audio visual materials (3%), and news (1%).

Table 27. Amount of outreach and education dollars expended on invasive species in Oregon in 2008 by category.

Category	Amount
Nonformal education	$241,662
Printed materials	$106,345
Formal education	$87,660
Training	$83,900
Database management	$37,650
Internet information	$42,230
Other	$33,000
Audio visual materials	$19,300
News	$8,600
TOTAL	**$660,347**

Outreach and education activities help to create an informed public equipped with facts and information to support sound policy decisions as well as contribute to activities, such as EDRR networks, that help to protect Oregon for the spread of and new introductions of invasive species. One of the greatest challenges the state faces is allocating adequate resources for outreach and education, and then determining, given changes in technology and new ways people are acquiring information, the best methods to reach audiences of all kinds.

EVALUATING PROGRAM EFFECTIVENESS

A total of 88 individuals responded to the survey question regarding how they evaluate their effectiveness of invasive species activities.

The most common method to evaluate program effectiveness in 2008 was outcome-based performance objectives (27%), followed by effectiveness monitoring (20%) and met the requirements of a contract (20%), compliance monitoring (14%), and conduct opinion surveys (6%) (Figure 54). Seven percent of the respondents did not evaluate program effectiveness.

The two most common methods federal agencies used to evaluate program effectiveness were outcome-based performance objectives (41%) and met the requirements of a contract (24%).

State agencies evaluated program effectiveness by meeting the requirements of a contract (25%), followed by both outcome-based performance objectives (21%) and compliance monitoring (21%). Effectiveness monitoring was used 18% of the time.

Local governments primarily used outcome-based performance objectives (28%) to evaluate success, followed by both effectiveness monitoring (18%) and compliance monitoring (18%), and meeting the requirements of a contract (16%).

The most common methods nonprofit organizations used to evaluate program effectiveness were effectiveness monitoring (28%) and met the requirements of a contract (28%).

Academic institutions used three primary methods to evaluate effectiveness: outcome-based performance objectives (28%) and effectiveness monitoring (28%), followed by met the requirements of a contract (17%).

Of the 10 entities that did not evaluate program effectiveness, four were academic institutions, three were local governments, two were nonprofit organizations, and one was a state agency.

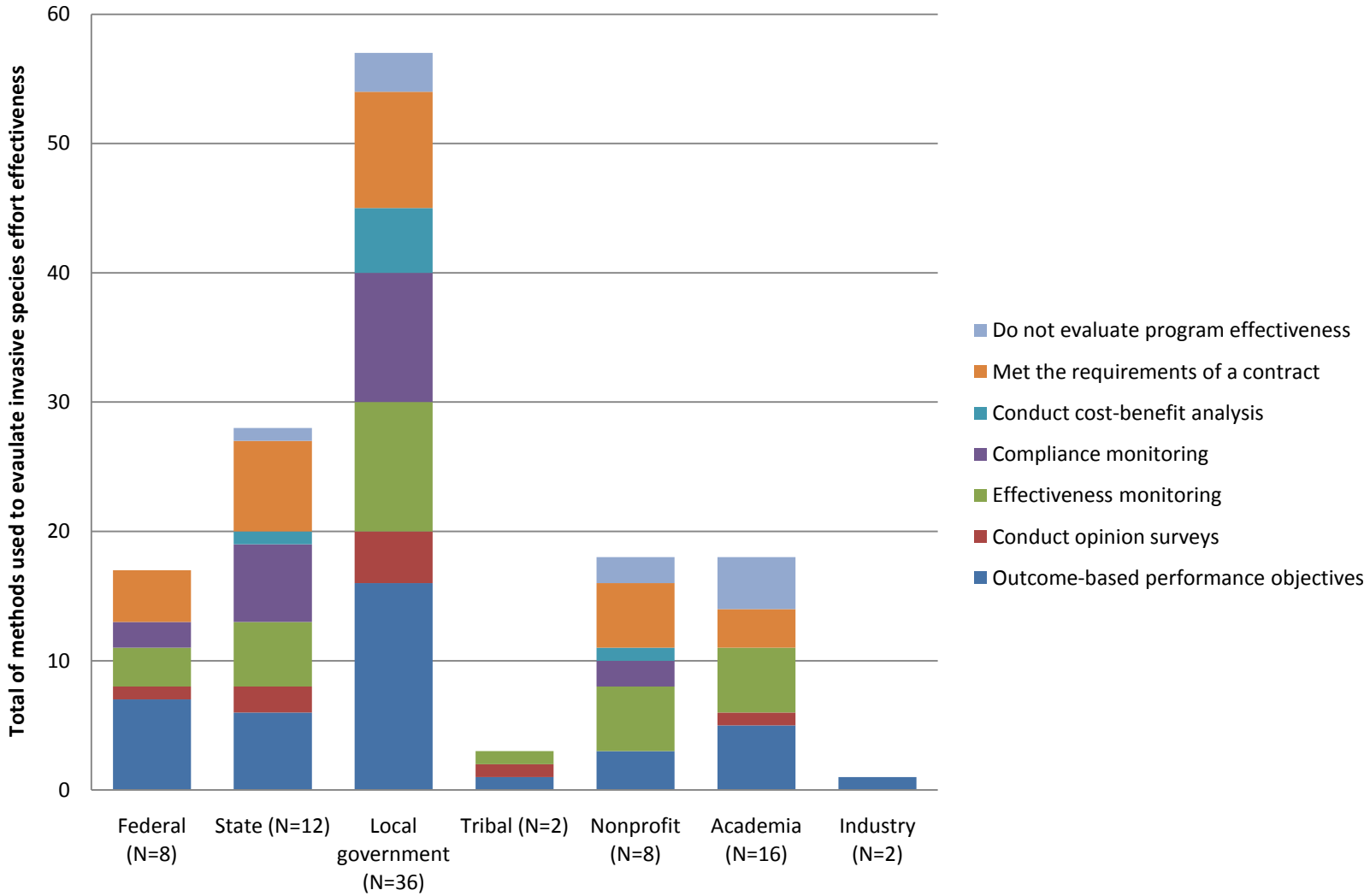


Figure 55. Methods used to evaluate the effectiveness of invasive species efforts in the State of Oregon in 2008.
Note: Survey respondents indicated several other methods they used to evaluate effectiveness: field crew detections, public comments, monitoring landowner reports, research publications, and workshop participants.

RESEARCH AND DEVELOPMENT

Survey respondents were asked to identify the highest priority areas for invasive species research and development in the future. A total of 81 respondents answered this question.

The colored figure below (Figure 55) includes a scale that ranks the importance of research and development areas from the highest priority (light-colored bars) to the lowest priority (dark-colored bars).

Survey respondents ranked management methods and prevention methods as the highest priorities. Biology/ecology, risk assessments, detection methods, and economics were the second tier of priorities, with almost equal rankings achieved when the most important and second most important categories were added. Post-treatment evaluation was ranked the least important.

Individuals responsible for control and management of invasives clearly see a need for more research to develop more cost-effective ways to treat invasives as well as prevent their introduction.

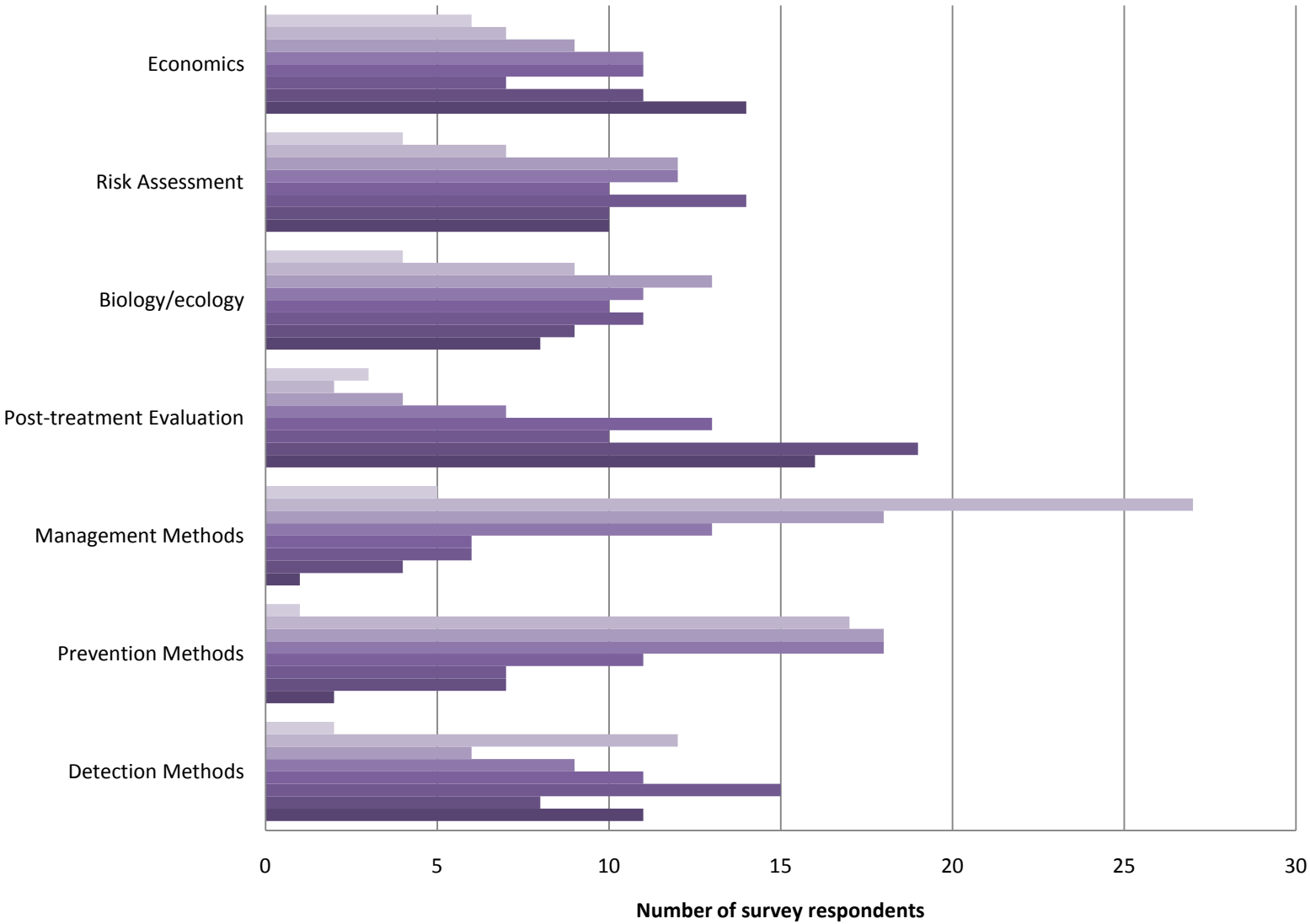


Figure 56. Rankings of the highest priority areas for invasive species research and development; scale ranges from least important (darkest colors) to most important (lightest colors), excluding the first light category ("Don't know").

OBSTACLES TO EFFECTIVE IMPLEMENTATION OF INVASIVE SPECIES PROGRAMS

Survey respondents were asked to rank the obstacles they face in effectively implementing their invasive species programs. The colored figure below (Figure 56) includes a scale that ranks the importance of obstacles from the highest priority (light-colored bars) to the lowest priority (dark-colored bars).

The greatest obstacle to effective implementation of invasive species programs was funding. A total of 38% of respondents ranked funding as the most important or second most important obstacle, compared to a total of 14% of survey respondents, who ranked public awareness as the most important or second most important obstacle.

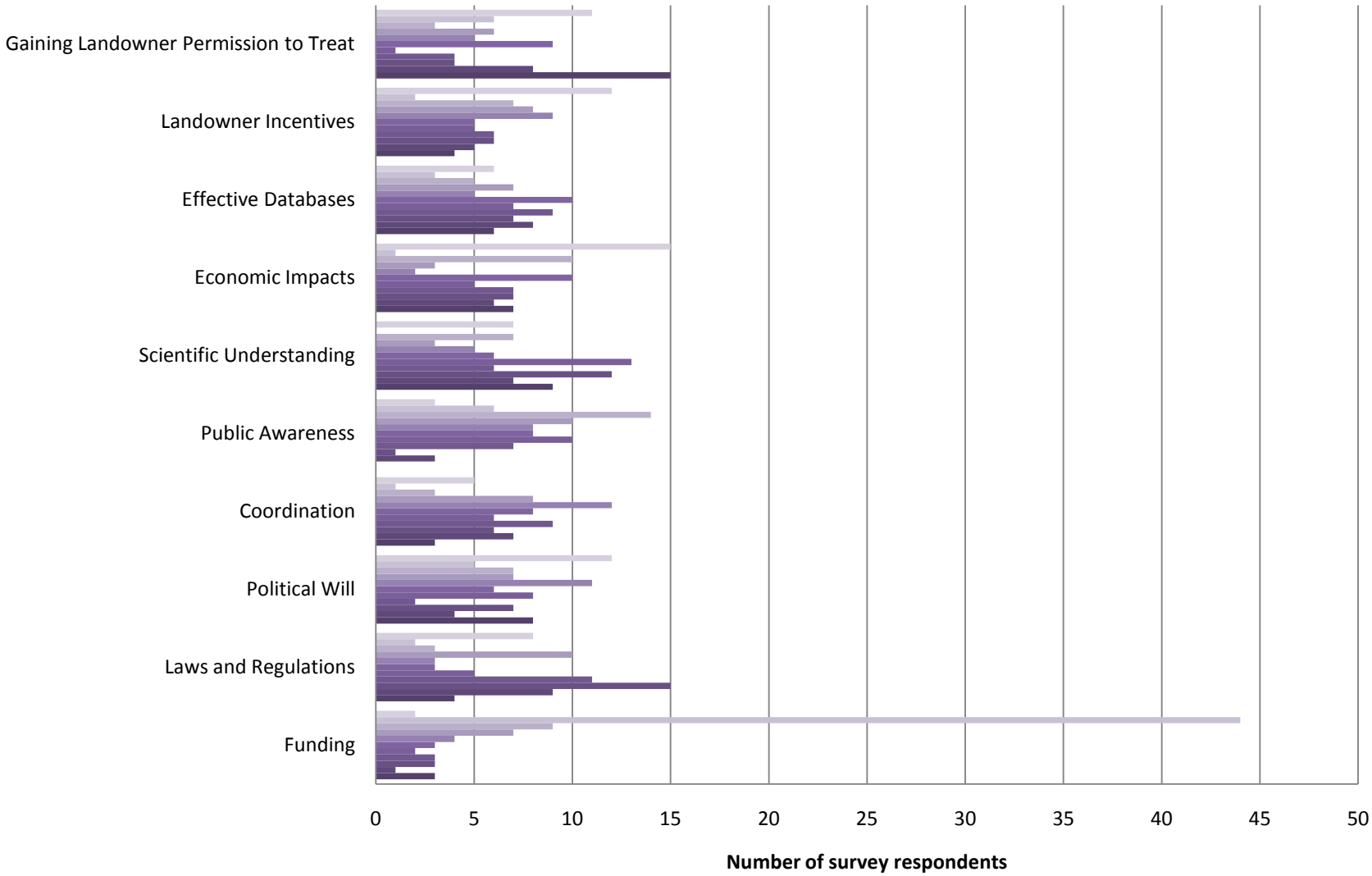


Figure 57. Rankings of the obstacles people face in being able to effectively implement their invasive species programs; scale ranges from least important (darkest colors) to most important (lightest colors), excluding the first light category ("Don't know").

EARLY DETECTION AND RAPID RESPONSE (EDRR)

Federal, state, local, and tribal governments, non-governmental organizations, and private natural resources agencies embrace early detection and rapid response (EDRR) as the primary strategy to abate the threat of invasive species. Throughout the Pacific Northwest, statewide conservation strategy plans reference the severe threat of invasive species to biodiversity, ecosystem services, and society. EDRR programs are becoming established as the primary mechanism to prevent the establishment and spread of invasive species in Oregon (Figure X). The Nature Conservancy listed the EDRR networks on their map if they met the following minimum standards:

1) Multiple partners
2) Agreement on a list of priority species
3) Agreement to respond to priority species
4) Public educational component
5) Priority areas or boundaries identified
6) Monitoring by either staff or volunteers
7) Mapping and tracking species and reports

A total of 58% of survey respondents indicated they participate in an EDRR network (Figure 57); however, it is unclear what constitutes an EDRR network. Survey respondents identified numerous basin, local, county, regional, and state EDRR networks—many more than those identified by The Nature Conservancy. Networks identified by survey respondents included:

Local—Seven Basins Watershed, Jordan Valley area of Malheur County from Nevada, Sandy River Basin, City of Beaverton and environs, City of Portland, Lower Grande Ronde and Imnaha Watersheds, Willow Creek CWMA, Cascade Head, West Eugene, Portland, Metro, BPA mitigation lands.

County— Crook, Deschutes, Douglas, Gilliam, Harney, Hood River, Jackson, Jefferson, Josephine, Klamath, Lane, Lincoln, Multnomah County, Owyhee, Tillamook, Umatilla, Wallowa, Washington, and 15 Oregon counties and five SW Washington counties.

Regional—Southeast Oregon, Eastern Oregon, Deschutes Basin, Western Invasives Network, Pacific Northwest, Western U.S., western Washington, western Oregon, Columbia River Basin, southwest Oregon, Columbia Gorge CWMA, four million acres in Oregon, one million acres in Idaho, Wallowa Canyonlands Partnership, CWMAs, North Coast Weed Management Partnership, Oregon closed based—high desert, and statewide.

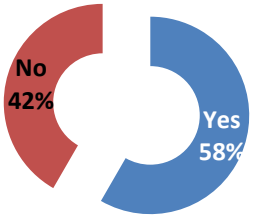


Figure 58. Survey respondents who indicated they participate in an Early Detection Rapid Response Network (N=87).

These results indicate the need for Oregon to develop a set of best management practices and minimum standards for EDRR networks to ensure consistent use and application of these networks statewide.

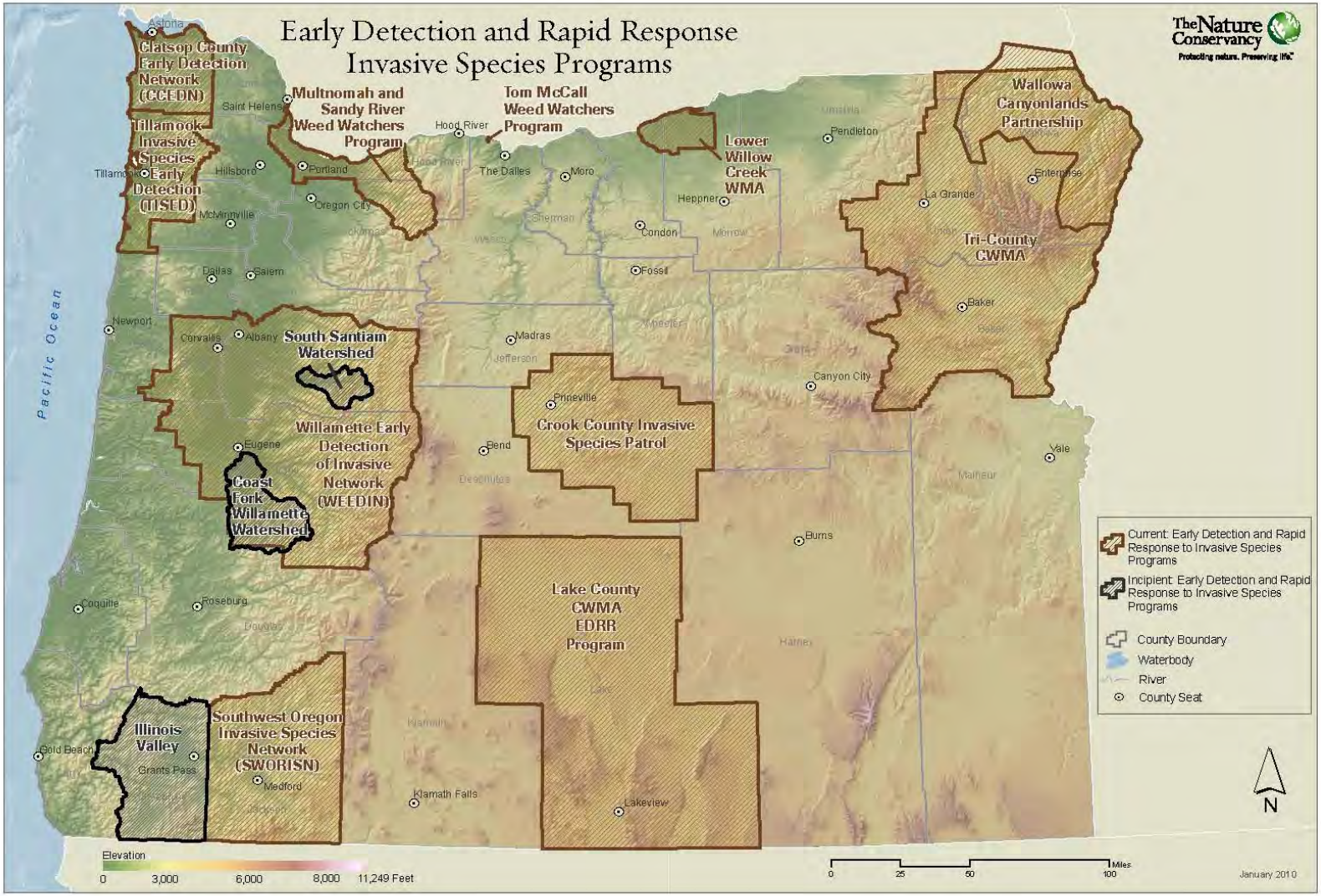


Figure 59. Early Detection Rapid Response invasive species networks in Oregon, as identified by The Nature Conservancy.

DISCUSSION

The Oregon Invasive Species Council sought to answer numerous questions as it articulated the need for a statewide management assessment of invasive species. Sections in this document provided data and information to answer some of the basic questions, such as "Are there between-agency agreements that are in place?" and "What is the status of funding in the state for invasive species?"

The purpose of this section is to answer the remainder of the questions the Council believed important, and to make recommendations to better address invasive species issues in Oregon.

Are there conflicting actions that are being promoted by agencies that can contribute to invasive species establishment or conflict with prevention measures by other agencies? Are there opportunities for collaboration among agencies that are not being realized? Are there gaps, redundancies, or conflicting plans?

There answer to the first question is "No," there does not seem to be conflicting actions by agencies that ultimately contribute to invasive species establishment or conflict with prevention measures by other agencies. However, gaps at the strategic and operational levels within and among agencies create inefficiencies and result in resources being expended on activities that may not be the highest priority for Oregon. Thus the answers to the next two questions are "Yes," and until these issues are addressed, Oregon will continue to expend valuable finite resources on invasive species activities that are not the highest priority for the state.

There are two primary issues associated with most of the existing strategic and management plans that address invasive species issues in Oregon.

The first is that the majority of the plans are missing an important component—an estimate of cost to implement the plan. Without a clear understanding of the cost to address the highest priority invasive species activities in the state, decision makers will be unable to make informed actions—and entities with a vested interest in dealing with invasive species will compete for resources to fund their programs.

Second, most of the plans are not linked, either within categorical entities (i.e., federal agencies or state agencies), or among categorical entities (i.e., federal agencies, state agencies, tribal governments, etc.). Some are targeted toward an individual species (e.g., feral swine), while others are targeted toward specific taxa (e.g., noxious weeds or aquatic nuisance species).

The problem is that once these plans are developed, because they are developed as stand-alone plans and are never part of an overall invasive species strategic plan for the State of Oregon, they often are never funded (e.g., feral swine action plan) or are underfunded (e.g., Aquatic Nuisance Species Action Plan).

This problem is compounded by the development of additional plans, many of which demonstrate ongoing shortcomings over time. For example, several of the deficiencies of the currently underfunded Aquatic Nuisance Species Action Plan for Oregon continue to this day:

- Limited authority and funding to quarantine species and points of origin
- Limited funding to enforce laws relating to ANS
- New plant species are not reviewed before importation
- No regulation of mail order or internet sales of organisms
- Limited inspection programs

Thus, the opportunities for collaboration lie primarily at the policy and planning level—and can be improved by development of an overall prioritized strategic plan for Oregon, with supporting taxa and species-specific plans providing finer levels of detail and action items to achieve statewide invasive species goals.

To illustrate other gaps that may exist in Oregon relative to invasive species activities, implementation categories were analyzed (note: there are overlaps within these categories).

PREVENTION

The most effective way to manage invasive species and reduce costs long term is via prevention efforts (Figure 54). Less than 10% of the estimated resources expended on invasive species programs in Oregon in 2008 was targeted at prevention. Failure to adequately fund prevention will result in increasing funds dedicated toward management and control, resulting in a lost battle against invasive species.

Federal agencies play a siginificant role in prevention (see Authorities, Roles and Responsibilities section). The most significant role the federal government can play is prevention. Adoption of biosecurity measures— pre-border preparedness, border protection and post-border management and control—to protect the states from the negative effects associated with invasive species, will allow states to then use their limited resources to focus on management and control of existing invasives. The federal government can also play a lead role in preventing the import of harmful species by regulating all importation, including Internet sales. Ballast water discharge standards is another area in which the federal government could set the highest standards of protection for the nation's waters.

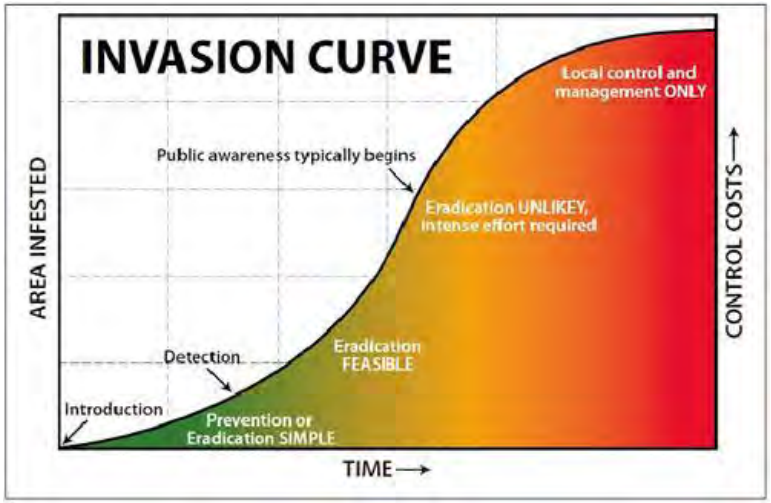


Figure 54. Prevention is the first defense for invasive species. After prevention, EDRR is the most successful, cost-effective, and least damaging means of invasive species control.

MONITORING/SURVEILLANCE/EDRR

Oregon expended 10% of its invasive species funding resources on monitoring/surveillance in 2008. Monitoring and surveillance are the second line of defense after prevention, because invasive species that are detected early cost less to manage, control, and eradicate. From 2007 to 2008, 20 new insects and snails invaded Oregon.[17] A total of 19 of these were discovered as a result of formal surveys by trained individuals versus incidental sightings by the general public. This emphasizes the need for adequate resources to monitor and detect new introductions.

Numerous survey respondents indicated they participated in an EDRR network for invasive species in 2008, yet the term is not clearly defined. The Nature Conservancy EDRR networks in Oregon are using the www.oregoninvasiveshotline.org website to track information on invasives, but other entities are using different or no databases. Failure to clearly establish and manage a comprehensive statewide network of EDRR programs that share information across one or connected databases will lessen Oregon's ability to prioritize on-the-ground invasive species activities. Failure to develop best management practices for the establishment and management of EDRR networks may produce gaps in Oregon's ability to protect ecosystems/basins/watersheds in Oregon.

COORDINATION

The state spent a total of 6% of its invasive species resources on coordination. A closer analysis of the type of coordination occurring among entities in Oregon may reveal gaps and lapses in policy implementation.

There are numerous plant lists that identify priority species—the State Weed Board Noxious Weed List, regional lists, cooperative weed management area lists, watershed council lists, and so on. Yet the state has not developed one comprehensive invasive species list/plan that spans all taxa and identifies the highest priorities for funding and management activities and identifies the costs associated with plan implementation. Without this clear direction, funds are being expended on species of lesser importance, or perhaps on repeated management and control efforts (if, for example, a watershed receives a treatment, and each year, invasive species infiltrate the same watershed because of infestations upstream), while organizations compete for a finite amount of funds. In addition, it becomes difficult for legislators and decision makers to determine the importance of invasive species issues because there is lack of a comprehensive statewide set of priorities. This is a critically important issue for Oregon, and although it ultimately affects funding, it is a strategic coordination issue.

The need and opportunity exist to ensure there is alignment with federal, state, regional, and local invasive species initiatives through streamlined, transparent agreements that create a shared understanding of Oregon's priorities, the source of funds, and the ultimate disposition of funds. The sheer number of the agreements that exist among entities in Oregon to implement invasive species initiatives cost the people and programs responsible for implementation a great deal of time and money—to track and report on the agreements, etc. There is a strong need for streamlining the agreement process and ensure there are linkages across different levels of policy and planning.

[17] Oregon Department of Agriculture, pers. comm.

Opportunities exist to streamline existing efforts and link strategic initiatives locally, regionally, and nationally. For example, development and use of a few shared databases to track and manage invasive species would help make efficient use of resources and enhance sharing of information. Use of the National Invasive Species Council to coordinate national invasive species efforts and assist states in identifying and addressing regional issues will create efficiencies.

OUTREACH AND EDUCATION

Public awareness was ranked the second highest barrier to successful implementation of invasive species programs in Oregon in 2008, yet outreach and education comprises 7% of all invasive species expenditures. Monitoring the amount expended on outreach and education activities over time can help to highlight the importance of informing the public and ensuring an adequate percentage of resources is dedicated to this issue.

State leadership should acknowledge the unique perspectives its citizenry shares relative to healthy native fish and wildlife and their habitats, and better coordinate amongst all natural resource agencies programs and messages that address invasive species instead of developing stand-alone campaigns and agency-focused outreach.

POLICY

Failure to develop proactive, horizontal, policies that focus on prevention—recognized as the most cost-efficient and effective way to deal with invasive species—ultimately results in the greatest portion of dollars being expended on invasive species in Oregon on management and control, versus monitoring/surveillance, research, and other important activities.

There is a role for federal, state, tribal, and local governments to play relative to policy development. However, unnecessary resources are expended when an issue of national importance is not addressed at the national level, and the states are resigned to use increasingly fewer resources to develop and implement policy that could more effectively be addressed by the federal government. Or, for example, local jurisdictions use local resources to address an issue that could best be managed at the state level. An opportunity exists for the National Invasive Species Council, in concert with state invasive species councils (which include federal, state, tribal, and local government, nonprofit organization, and academic institution representation) to have a dialogue with policy makers and take decisive action on issues of national, state, and local importance.

A SWOT analysis of Oregon's invasive species regulations revealed shortcoming's, despite successful efforts in 2009 to pass 11 pieces of invasive species-related legislation. The current list of weaknesses and threats should be analyzed every two years to create an environment in Oregon in which invasive species legislation development is proactive versus reactive. Discussions should include Governor's natural resource policy cabinet.

RESEARCH

Management and prevention methods were recognized in the assessment survey as the most important areas for future invasive species research needs. More effective methods to control and eradicate as well as prevent introductions of invasive species are needed. Stable funding to support invasive species research as

well as a shared database to share management information on treatment of invasives will make more efficient use of existing resources.

EFFECTIVENESS MONITORING

Effectiveness monitoring is essential for adaptive management, as well as demonstrating the value of habitat restoration investments.[18] Despite the fiscal importance and accountability of effectiveness monitoring, it comprised only 3% of the state's expenditures on invasive species in 2008. One state agency specifically states that "effectiveness monitoring is not a requirement of [this grant program], and is monitoring above and beyond compliance monitoring, to determine if the project is effective at meeting its biological and ecological objectives." Opportunities exist to examine more closely the requirements of grant programs for invasive species funding to require effectiveness monitoring as a critical adaptive management function to ensure appropriate design and selection of projects.

FUNDING

Oregon would be well served by considering adopting a system for invasive species funding similar to a framework developed in Australia—a medium-term expenditure framework (MTEF).[19] This type of approach institutionalizes mechanisms that help decision makers balance what is affordable in aggregate against the policy decisions of, in this case, the state.[20] An MTEF allows for the development of a consistent and realistic resource framework, along with strategic allocation of resources and better prediction of both policy and funding (ensuring program sustainability).[21] A more efficient approach to aligning natural resource policy with expenditures will better protect Oregon from invasive species. This type of approach requires consistent strategic coordination among all entities with authority for invasive species activities in Oregon.

Som programs, in particular, lack financial resources to effectively protect Oregon. For example, ballast water program activities, including vessel inspection and compliance verification efforts, are resource limited. As a result of these limitation, agencies often respond to local populations instead of the broader distribution of the species.

A minimum expectation for the development of any strategic/management plan for invasive species in Oregon should be a funding plan.

Failure to adequately fund invasive species activities in the State of Oregon subjects the state to increasing risks from invasive species introductions and infestations. Failure to provide base funding for every county in Oregon so that it can establish and operate a weed district creates risk for adjacent counties and forces counties with weed programs to divert resources from their counties to support unfunded counties. Lack of county program staff dedicated to developing a prioritized approach to weed management results in more expensive responses to larger

[18] Fraser Salmon and Watersheds Program—http://www.thinksalmon.com/fswp_project/item/restoration_effectiveness_monitoring/

[19] World Bank. 1998. Public Expenditure Management Handbook. 177pp. ISBN 0-8213-4297-5.

[20] Ibid.

[21] Ibid.

infestations versus quick responses to small infestations and may result in state-priority species taking a backburner to species emphasized at the local level.

Managing invasive species through grant-funded approaches as the primary or a significant mechanism for weed control is ineffective, especially for counties in the state that do not have adequate resources to apply for grants, develop weed district control plans, etc.

Federal agencies are the key economic driver funding invasive species activities in Oregon. Collaborative agreements with state and local governments and nonprofit organizations emphasize federal policy initiatives. Because of the lack of sufficient state and local funding (and the fact that much of the state funding is grant-based), Oregon is, for the most part, using state and local resources to implement federal policy. Oregon needs to ensure there is strategic collaboration in addition to the operational collaboration, so that Oregon's priorities for invasive species activities are adequately represented.

Federal funding is needed to support state efforts to manage invasive species. The current delivery of these funds should be directed through an entity that represents federal, regional, state, tribal, and local governments, nonprofit organizations, and academic institutions to ensure the funding is directed toward the state's highest priorities. Funding through individual government agencies ultimately results in a patchy network of activities related to invasive species funding, and may not target, on a consistent basis, the highest priorities.

Because transportation systems are a primary vector of invasive species, an initiative to add to the existing state gas tax as well as a modest fee on commercial shipping vessels calling upon our ports may be an appropritate source of funding to support ballast water management, hull-fouling prevention activities, and general invasive species efforts. In addition, opportunities should be explored to redirect existing funds to fund high priority invasive species programs in the state—not through expensive and time-consuming grant programs, but through direct funding to initiatives designated as the highest priorities.

Rapid response is the state's second best defense against invasive species. Some funding to initiate an emergency fund in 2009 ($350,000 was transferred from Oregon Parks and Recreation Department's ATV fund to the Invasive Species Control Account in the Oregon Department of Agriculture) were successful. Oregon needs a $5 million emergency fund, and sustainable funding for invasive species. Oregon needs to take a critical next step to statutorily protect the $5 million emergency fund.

Lack of adequate personnel and funding are significant barriers to implementing effective invasive species programs in Oregon, particularly relative to pathways and vectors for introduction (e.g., ballast water).

Oregon's three-legged stool for invasive species funding is not balanced. Although this statewide management assessment did not include industry's contribution toward invasive species control efforts, future analyses should analyze the contributions of government, industry, and private funding to create shared responsibility in Oregon's commitment of this issue.

Many natural resource-related federal programs currently funded by federal agencies are affected by invasive species. The federal government should expand the scope of these programs to allow these programs to expend funds for invasive species.

Aquatic Nuisance Species Task Forces and their respective plans should be funded as part of an overall national, regional, and strategic effort to protect water quality.

States are creating emergency funds to respond to invasive species emergencies, similar to wildfires. This model should be replicated at the national level so that a national invasive species emergency fund exists.

State leadership needs to acknowledge its role in protecting the state from invasive species by creating a sustainable funding mechanism tied to pathways and vectors. The federal government cannot and should not be responsible for funding all or the majority of invasive species programs in the states.

The siloed approach to funding state agency programs results in a patchwork of unreliable funding with minimal effectiveness monitoring, jeopardizes sound invasive species programs every two years, and pits one agency against another for diminishing state resources. An implementation plan for the Oregon Conservation Strategy should be developed, and natural resource funding should be pooled and funneled to the highest priorities to implement the strategy and its six key conservation areas.

A long-term sustainable source of funding for base county invasive species programs needs to be established, and current grant-only programs should be reviewed to determine if another method of allocation would best protect intended habitats for these grants programs—watersheds and agricultural areas.

MANAGEMENT/CONTROL

The patchwork of weed districts, weed boards, and weed programs across the state makes Oregon vulnerable to both new infestations as well as expansions of existing infestations. Coordination is more difficult because of the different structures that exist—and don't exist—among the counties (e.g., weed board, weed districts, etc.).

Review existing state statues and authorities to determine if there are opportunities for agencies to share responsibilities for invasive species management (i.e., create more horizontal policies).

Individual state agencies have responsibility for managing/controlling some invasive species taxa (ODA and noxious weeds, for example); however, there are gaps in management authority for some taxa, such as aquatic nuisance species. In addition, although some agencies have clear authority, agencies have occasionally failed to exercise that authority (e.g., Asian toad incident). Agencies need adequate ongoing training to ensure staff understands existing authorities and regulations.

SUMMARY AND RECOMMENDATIONS

In summary, Oregon's formula for success to deal with invasive species is, first and foremost, to be strategic at the highest levels of government by creating a top-down/bottom-up strategic plan that links federal initiatives to state priorities to local entities that conduct the majority of on-the-ground activities. The plan should incorporate the highest priorities identified in the Oregon Conservation Strategy, Oregon Aquatic Nuisance Species Management Plan, and other plans to ensure the highest priorities are funded to demonstrate Oregon's commitment and accountability to this important economic, environmental and social issue. This plan should be developed by and have the buy-in of all entities that work on, or have an interest in, invasive species activities in Oregon. The statewide strategic plan and all other supporting invasive species-related plans (e.g., Feral Swine management plan) for Oregon should include, as a minimum, the following components:

1. Expenditures for recommended invasive species activities need to be clearly identified and align with the highest priorities for the State of Oregon so that a commitment can be obtained to carry out these actions.

2. Agencies and entities responsible for development of plans at all levels need to ensure there is alignment and linkages across those plans, and the cost to implement those plans should be clear.

3. Measurable invasive species performance measures need to be developed to assess the state's success in adequately protecting Oregon and effectiveness monitoring should be used, where appropriate, to evaluate the cost-benefits to Oregon's expenditures on invasive species.

PREVENTION

4. Oregon should strongly support the role of the federal government in invasive species prevention efforts. The federal government is uniqely positioned to protect the country from invasive species introduction through the development of biosecurity measures. Regulating all importation, setting ballast water discharge standards, regulating Internet sales, and other measures by the federal government will allow states to then use their limited resources to focus on management and control of existing invasives. Shutting down vectors and pathways will lessen introductions of invasive species to Oregon.

MONITORING/SURVEILLANCE/EDRR

5. Each county needs an established funded weed district and program so that there are adequate monitoring/surveillance activities to detect invasive species introduction early.

6. Move the state toward the development and use of a few shared databases to track and manage invasive species to make efficient use of resources and enhance sharing of information.

7. Oregon needs to fund programs that provide for experienced/trained individuals to survey for invasive species. A comprehensive statewide EDRR network that includes standards and protocols supported by best management practices will help to detect and eradicate new invasions of invasive species.

COORDINATION

8. Develop one comprehensive invasive species list/plan that spans all taxa and identifies the highest priorities for funding and management activities and identifies the costs associated with plan implementation.

9. Streamline the management agreement process and ensure there are linkages across different levels of policy and planning.

10. The National Invasive Species Council should serve to coordinate national invasive species efforts and assist states in identifying and addressing regional issues.

11. Develop an invasive species strategic plan for the Pacific Northwest to identify high priority regional issues. In addition, encourage the use of the West Coast Governors Agreement on Ocean Health as a vehicle for facilitating regional consistency, coordinating actions, and promoting federal support for invasive species management goals and programs.

OUTREACH AND EDUCATION

12. Better coordinate amongst all natural resource agencies (locally, statewide, regionally, and where appropriate, nationally) programs and messages that address invasive species instead of developing stand-alone campaigns and agency-focused outreach. For example, all advertising and outreach relative to invasive species issues should have similar branding. Dedicated funding toward coordinated, priority messages about high priority invasive species issues (versus agency-specific or taxa-specific) will help to create an informed public that contributes to lessening the spread of invasive species.

13. Take advantage of opportunities to protect Oregon by looking beyond Oregon's borders and partnering with neighboring states (e.g., firewood outreach campaign).

POLICY

14. Review existing authorities every two years to propose proactive legislation to protect Oregon. Policy development should focus on proactive, horizontal, policies that target prevention—recognized as the most cost-efficient and effective way to deal with invasive species.

RESEARCH

15. Focus future research needs on the development of management and control and prevention methods.

EFFECTIVENESS MONITORING

16. More resources need to be directed into effectiveness monitoring, while more cost-effective methods for management and control need to be implemented. Some of this streamlining can be achieved by replacing the current voluntary grant-based funding process with direct funding aimed at high priority projects and programs.

17. Opportunities exist to examine more closely the requirements of grant programs for invasive species funding to require effectiveness monitoring as a critical adaptive management function to ensure appropriate design and selection of projects.

FUNDING

18. Oregon needs to develop an alternative system for funding invasive species issues. A medium-term expenditure framework, or a similar system that helps decision makers balance what is affordable in the aggregate against the policy decision of the state, would allow for the development of a consistent and realistic resource framework. This type of approach requires consistent strategic coordination among all entities with authority for invasive species activities in Oregon.

19. A long-term sustainable source of funding for base county invasive species programs needs to be established, and current grant-only programs should be reviewed to determine if another method of allocation would best protect intended habitats for these grants programs—watersheds and agricultural areas.

20. Replace the existing patchy network of federal funding from one or more agencies with base federal funding for each state to address high priority invasive species issues.

21. Develop an initiative to add to the existing state gas tax and implement a modest fee on commercial shipping vessels calling up on our ports to create a source of funding to support invasive species management efforts, supplement the Invasive Species Control Account, and support ballast water management, and hull-fouling prevention activities.

22. Explore opportunities to redirect existing funds to fund high priority invasive species programs in the state—not through expensive and time-consuming grant programs, but through direct funding to initiatives designated as the highest priorities.

23. Oregon needs a $5 million emergency fund, and sustainable funding for invasive species. Oregon

needs to take a critical next step to statutorily protect the $5 million emergency fund.

24. Oregon needs to better balance its three-legged stool for invasive species funding to ensure contributions of government, industry, and private funding contribute to a shared responsibility and commitment.

25. Many natural resource-related federal programs currently funded by federal agencies are affected by invasive species. Oregon should support expansion of these federal government programs to allow these programs to expend funds for invasive species.

26. States are creating emergency funds to respond to invasive species emergencies, similar to wildfires. Oregon should promote and support this model at the national level so that a national invasive species emergency fund exists.

27. An implementation plan for the Oregon Conservation Strategy should be developed, and natural resource funding should be pooled and funneled to the highest priorities to implement the strategy and its six key conservation areas.

MANAGEMENT/CONTROL

28. Review existing state statues and authorities to determine if there are opportunities for agencies to share responsibilities for invasive species management (i.e., create more horizontal policies).

29. Agencies need adequate ongoing training to ensure staff understands existing authorities and regulations.

30. Proactive horizontal policies need to be developed to share the burden all natural resources agencies must carry to protect native fish and wildlife habitats and water quality. In particular, existing policy shortcomings, identified in the SWOT analysis of this report, should be addressed immediately.

APPENDICES

Appendix A. Oregon Statewide Management Assessment of Invasive Species survey.
Appendix B. Listing of federal, state, tribal, county, city, or local laws/policies that provide authority to engage in or guide invasive species activities.
Appendix C. International, national, regional, state, and local regulations pertaining to invasive species.
Appendix D. 2006 Oregon Department of Agriculture survey of counties to assess extent of weed control programs/districts.
Appendix E. Invasive species legislation adopted in the 2009 Oregon legislative session.
Appendix F. Statewide assessment survey respondents' list of invasive species legislation needs.
Appendix G. List of entities and their agreements/partnerships with other entities.
Appendix H. List of invasive species for which entities conducted survey or management work in 2008.
Appendix I. Invasive Species Database Management in Oregon.