

A Resource Guide for

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# Invasive Plant Management in the Sonoran Desert



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INSTITUTE

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A collaborative project between the Sonoran Institute and The Nature Conservancy



healthy landscapes • vibrant economies • livable communities

The Sonoran Institute, founded in 1990, is a nonprofit organization that works with communities to conserve and restore important natural landscapes in western North America, including the wildlife and cultural values of these lands. The Sonoran Institute's community stewardship work creates lasting benefits, including healthy landscapes and vibrant, livable communities that embrace conservation as an integral element of their economies and quality of life.

Nina Chambers, Project Manager, Sonoran Desert Ecoregion Program



The Nature Conservancy is an international nonprofit conservation organization. Its mission is to preserve the world's best remaining examples of plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

John Hall, Program Manager, Sonoran Desert Ecoregion Program

### **Illustrations**

Illustrations of buffelgrass and fountain grass are original artwork by Kim Duffek, provided by the Arizona-Sonora Desert Museum. All other illustrations are by Lucretia Hamilton from *An Illustrated Guide to Arizona Weeds*, by Kittie Parker. Copyright © 1972 The Arizona Board of Regents. Reprinted by permission of the University of Arizona Press.

### **Acknowledgements**

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Nina Chambers and John Hall  
October 2001

Cover: buffelgrass (*Pennisetum ciliare*)

## How to Use This Guide

This resource guide is designed to be practical and useful in encouraging collaboration in invasive plant management efforts—particularly in the Sonoran Desert region of southern Arizona.

It is organized in four sections: the first section describes organizations that provide technical assistance and education; the second describes invasive plant management activities on specific land management units and rights-of-way in the Sonoran Desert; the third describes weed management areas in Arizona; and the last describes coordinating organizations for invasive plant management. Each section begins with a brief overview to provide context and emphasize relationships or commonalities among the groups presented in the section. Invasive plant common names are used throughout; an appendix provides a list of all common and scientific names referenced. A comprehensive list of resource people mentioned in the guide appears at the end.

### **Purpose**

The purpose of this guide is to describe the various organizations working in invasive plant management, compare existing approaches, and identify opportunities for cooperation and coordination that will lead to effective management of invasive plants in the Sonoran Desert.

Several points deserve emphasis

- A variety of organizations today are working to address the issue of invasive plant management in the state of Arizona, the region, and the nation (as well as across the border with Mexico). Each organization, or group of organizations, can serve specific functions. Organizations are most effective when their role complements, rather than overlaps, that of other organizations.
- Land management entities in the Sonoran Desert face many of the same problems and obstacles and deal with the same invasive plant species. Thus, there are common experiences to be shared and opportunities for cooperation, as well as for diversification to fill niches.
- Organizations that have used an inclusive, cooperative approach to invasive plant management have been successful in achieving their goals and are making an important contribution to the control of invasive plants.

The guide is divided into groups of organizations with the same general function so that groups just forming, as well as those already in existence, can better understand what niches have yet to be filled and with whom to coordinate to avoid duplicating missions. It appears that the most successful and efficient groups are those with clearly defined missions and partnerships with other organizations that can help them achieve their goals.

For example, weed management areas focus on control actions implemented on the ground by its members. These are geographically specific actions or actions directed at the control of specific invasive species. Other groups, such as invasive plant councils or other state-, regional-, or national-level coordinating bodies, often work to influence public policy as a means of increasing the effectiveness of invasive plant management. Specific federal and state agencies provide enforcement and regulatory control. Working together, these groups can complement one another and increase the effectiveness of invasive plant management. No group should feel the need to participate in all roles of invasive plant management; weed management areas do not have to work on policy to be effective, and state coordinating bodies may not be the most effective organization to achieve site-based control. Often organizations try to do too much themselves and become inefficient in their work when stretched too thin or when providing a function that is not well-suited to their membership and strengths.

### **How this guide was compiled**

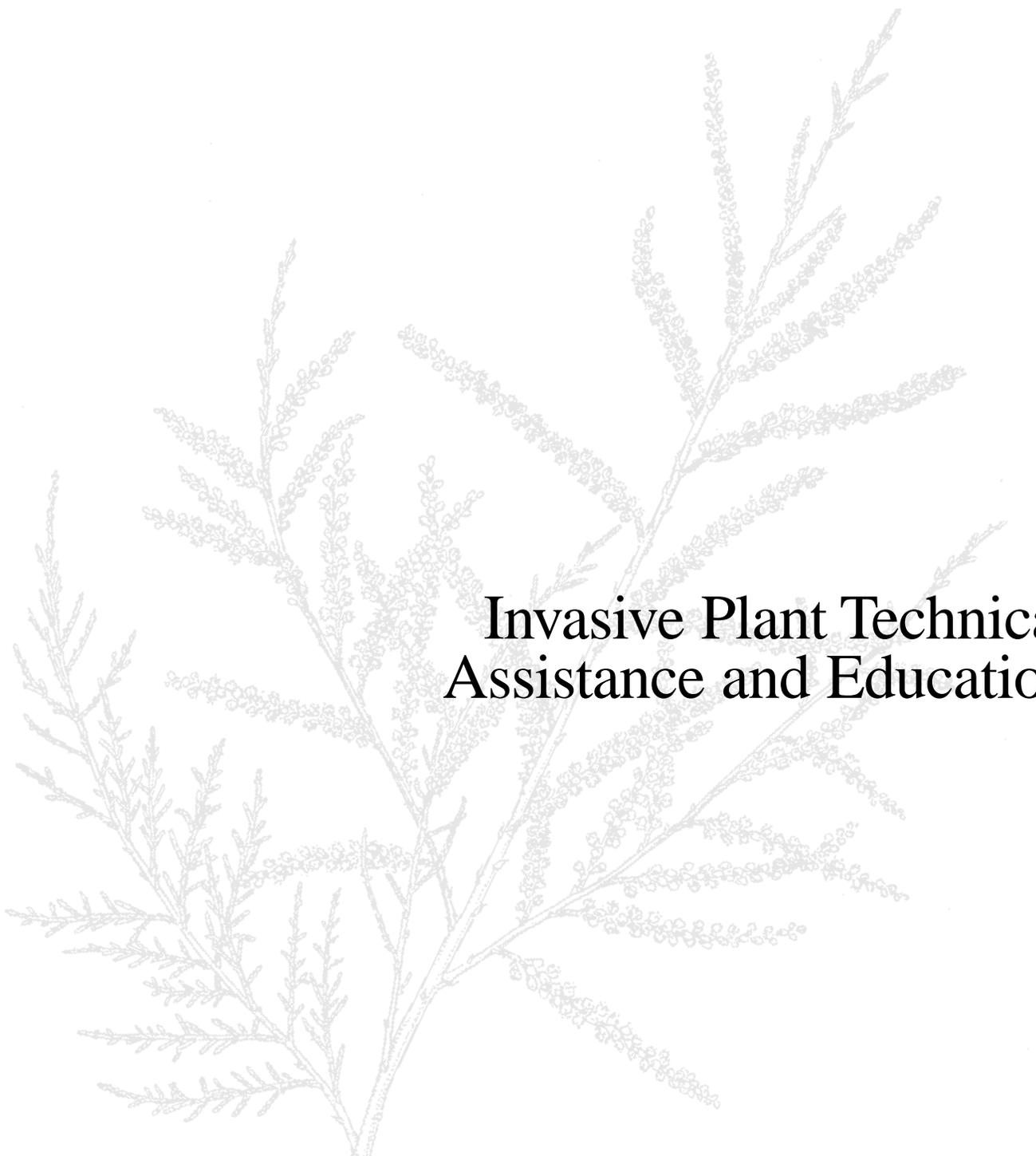
Invasive plants pose a serious threat to native species and ecosystems in the Sonoran Desert. Experts consider invasive species a critical source of stress on the ecoregion's biodiversity. The ability to minimize the adverse effects of invasive species on native biodiversity is key to the long-term health of the Sonoran Desert.

To address this issue, a series of workshops was held in the spring of 2001 to bring together land managers, and others in the region, to discuss cooperative strategies. After workshop participants expressed a need to better understand existing groups and their functions within the Sonoran Desert and the state of Arizona, the Sonoran Institute, in partnership with The Nature Conservancy, developed and conducted a survey to collect this information. This resource guide of invasive plant management organizations comes directly from the organizations surveyed. While not all organizations contacted chose to participate, those that did have provided a wealth of information and a representative picture of the kinds of organizations that exist and the roles they play in invasive plant management.

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# Invasive Plant Technical Assistance and Education

Arizona Department of Agriculture, Plant Services Division  
Natural Resource Conservation Districts  
NRCD Natural Resource Education Center  
Society for Ecological Restoration  
Society for Range Management  
USDA Animal and Plant Health Inspection Service, Pest Plant Quarantine  
USDA Natural Resource Conservation Service, Tucson Plant Materials Center  
USDA Natural Resource Conservation Service, Yuma Field Office  
US Geological Survey, Forest and Rangeland Ecosystem Science Center,  
Colorado Plateau Field Station  
University of Arizona, Cooperative Extension  
Additional Experts and Resources

salt cedar (*Tamarix ramosissima*)

## *Invasive Plant Technical Assistance and Education* Overview

This section describes organizations that provide invasive plant management technical assistance and education. Some agencies, such as the Arizona Department of Agriculture, have specific programs dedicated to invasive plant management; others, such as cooperative extension services, do not have such specific programs, but provide technical assistance in this area as well. The kinds of services these organizations provide include

- plant identification, natural history information, recommended methods of control, and other environmental or habitat information
- educational programs and materials
- specific training opportunities
- research and data sharing

Federal agencies, such as the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), provide information on management and control as well as legislation and enforcement at the national or interstate level. Regional programs such as the U.S. Geological Survey provide context for science-based decision making and links to common issues throughout the region.

The Arizona Department of Agriculture has a state-level Noxious Weed Program. This program provides assistance to private landowners, counties, state agencies, and federal agencies on plant identification, noxious weed control, coordination of information systems, networking among plant management groups, and enforcement and revision of noxious weed regulations.

The USDA Natural Resource Conservation Service (NRCS) works at the county level and addresses land management issues such as soil and water management, erosion control, conservation education; it can also address invasive plant issues. The NRCS field offices respond to priorities identified by the associated Natural Resource Conservation Districts (NRCD), or Soil and Water Conservation Districts, as they are known on tribal lands. The NRCDs are formed by private land owners and land managers, who act as a steering committee for the NRCS field staff in their area. The NRCD receives some funding from the state, and it also supports Natural Resource Education Centers, which often work collaboratively with county cooperative extension offices. These education centers respond to the priorities set by the NRCD. The NRCD and the NRCS often work with county-level cooperative extension agents, who are supported through universities. This combination of federal, state, county, and university collaboration makes for a beneficial partnership that optimizes resources and potential funding opportunities.

Research and inventory data on invasive plants can be accessed through the University of Arizona and the U.S. Geological Survey. The Society for Ecological Restoration and the Society for Range Management provide scientific publications, training, and networking opportunities. Universities and plant societies are also a good source of information and personal contact with experts.

## **Arizona Department of Agriculture Plant Services Division**

### **Contact information**

Dr. Francis E. Northam  
Noxious Weed Program Coordinator  
Arizona Department of Agriculture  
1688 W. Adams Street  
Phoenix, AZ 85007  
602.542.3309 (tel), 602.542.1004 (fax)  
ed.northam@agric.state.az.us

### **Mission or purpose**

- provide information and advice to volunteer weed management/invasive plant organizations in Arizona
- coordinate activities, including information transfer, among various invasive plant management groups
- train Arizona Department of Agriculture inspectors in noxious weed identification and abatement
- conduct public education about invasive plant problems and regulatory rules pertaining to noxious weeds
- enforce Arizona noxious weed regulations

### **Geographic scope**

State of Arizona

### **Main programs and services**

- Arizona Noxious Weed Program
- identification of weeds
- weed control information
- evaluation of new weeds as potential additions to noxious weed lists
- documenting invasive plant distributions
- historical and biological information about invasive species

### **Clients**

Anyone in Arizona who needs noxious weed information

## Natural Resource Conservation Districts

Following is contact information for Natural Resource Conservation Districts (NRCs) and associated Natural Resources Conservation Service (NRCS) in the Sonoran Desert.

### Maricopa County

Mac Herrera, Executive Director  
*Arizona Association of Conservation Districts*  
3003 N. Central Avenue, Suite 800  
Phoenix, AZ 85012-2946  
602.280.8803  
aacd@az.nrcs.usda.gov

Kristen Graham Chavez  
*NRCS-Phoenix Service Center*  
3150 N. 35<sup>th</sup> Avenue  
Phoenix, AZ 85017  
602.378.3058

Penny Jorgensen  
*Agua Fria-New River NRC*  
3150 N. 35<sup>th</sup> Avenue  
Phoenix, AZ 85017  
602.379.3058, ext. 122  
Penny.Jorgensen@az.usda.gov

Rayanne Leister  
*Buckeye-Roosevelt NRC*  
220 N. 4<sup>th</sup> Street  
Buckeye, AZ 85326-2404  
623.386.4631  
rayannel@yahoo.com

Gerald Tavernaro  
*Gila Bend NRC*  
PO Box 544  
Gila Bend, AZ 85337-0544  
520.683.2324  
nrcd@gilabend.net

Donna Vivona  
*Wickenburg NRC*  
155 N. Tegner Street, Suite A  
Wickenburg, AZ 85390-3427  
520.684.5451, ext. 200

Natural Resource Conservation Districts, 2

**Pima County**

Grace Baker  
*Pima NRCD*  
5814 W. Circle H Place  
Tucson, AZ 85713-4332  
520.887.4505, ext. 4

Ralph Ware  
*NRCS-Tucson Service Center*  
4650 N. Highway Drive  
Tucson, AZ 85705-1914  
520.887.8520  
ralph.ware@az.usda.gov

Virgil Mercer  
*Winkleman NRCD*  
4650 N. Highway Drive  
Tucson, AZ 85705-1914  
520.887.4505, ext. 4  
mercerv@theriver.com

Edward Manuel  
*Tohono O'odham SWCD*  
520.887.4505, ext. 4  
Sells, AZ 85634-0577  
520.383.2851

Gilbert TwoTwo  
*NRCS-Sells Service Center*  
520.887.4505, ext. 4  
Sells, AZ 85634-0577  
520.383.2851

**Pinal County**

Patty Caywood  
*Eloy NRCD*  
*Florence-Coolidge NRCD*  
*West Pinal NRCD*  
115 E. 1<sup>st</sup> Street  
Casa Grande, AZ 85222-5241  
520.836.1960, ext. 3  
pscaywood@yahoo.com

Kevin Stein  
*NRCS-Casa Grande Service Center*  
115 E. 1<sup>st</sup> Street  
Casa Grande, AZ 85222-5241  
520.836.2048, ext. 3

**Yuma County**

Sheryl Christensen  
*Laguna/Yuma NRCD*  
2450 S. 4<sup>th</sup> Avenue, 4<sup>th</sup> Floor  
Yuma, AZ 85364-8573  
928.726.5562, ext. 115

*NRCS-Yuma Service Center*  
2450 S. 4<sup>th</sup> Avenue, 4<sup>th</sup> Floor  
Yuma, AZ 85364-8573  
928.726.4707

Sari McLaurin  
*Welton-Mohawk NRCD*  
PO Box 7185  
Roll, AZ 85347-7185  
928.785.9401

## **NRCD Natural Resource Education Center**

### **Contact information**

Nancy Wade, Director  
nwade@juno.com

### **Mission or purpose**

To educate people of all ages about renewable natural resources (including agriculture) so they can be conserved, managed, and available now and for future generations

### **Geographic scope**

Pinal County, Arizona, with some education programs throughout Arizona

### **Main programs or services**

- education programs on food and fiber sources for elementary school children
- education programs in conservation practices for high school students and adults
- education programs on crops and watershed issues

### **Clients**

- elementary schools
- high schools
- permanent residents and winter visitors

# Society for Ecological Restoration

## Contact information

Steve Gatewood, Executive Director  
1955 W. Grant Road #150  
Tucson AZ 85745  
520.622.5485 (tel), 520.622.5491 (fax)  
steveg@ser.org

## Mission or purpose

To serve the growing field of ecological restoration through

- facilitating dialogue among restorationists
- encouraging research
- promoting awareness of and public support for restoration and restorative management
- contributing to public policy discussions
- recognizing those who have made outstanding contributions to the field of restoration

## Geographic scope

The Society for Ecological Restoration (SER) is international in scope. Its chapters in 31 nations serve regions of North America (Canada, the United States, Mexico), England, Europe (forming), Australia, and India (forming)

## Main programs and services

SER promotes ecological restoration around the globe through

- a newsletter
- a Web site
- training programs
- committees
- regional chapters
- working groups
- two professional journals
- annual conferences

## Clients

SER serves about 2,300 members, consisting of individuals and organizations that are actively engaged in ecologically sensitive repair and management of ecosystems through an unusually broad array of experience, knowledge, and cultural perspectives.

# Society for Range Management

Kristen Egen, President  
SRM (Arizona Section)  
Natural Resources Conservation Service  
4650 N. Highway Drive, Suite 1  
Tucson, AZ 85705  
520.887.8520, ext. 108  
kristen.egen@az.usda.gov

**Contact information**  
Sam Albrecht, Executive Vice President  
SRM (Parent Society)  
445 Union Boulevard., Suite 230  
Lakewood, CO 80228  
303.986.3309 (tel), 303.986.3892 (fax)  
sam\_albrecht@ix.netcom.com

## **Mission or purpose**

The goal of the Society for Range Management (SRM) is productive, sustainable rangelands. Its mission is to promote and enhance the stewardship of rangeland ecosystems and associated renewable resources to meet human needs, assessed on the basis of scientific research and sound policies.

## **Geographic scope**

Established in 1948, the SRM has over 4,000 members in 48 countries, including many developing nations. In North America, the SRM has many state and regional sections in Canada, the United States, and Mexico.

## **Main programs and services**

The SRM promotes proper rangeland management around the globe through

- a bimonthly newsletter
- a Web site
- training programs, symposia, workshops, and education/outreach training sessions
- publications and videos
- student conclaves, scholarships, activities, and competitions for high school, undergraduate, and graduate students
- accreditation of professional programs in range management education
- certification programs and employment opportunities
- committees (such as Rangeland Invasive Species Committee)
- coordinated resource management
- state and regional sections
- biannual international, state, and regional meetings

## **Clients**

Land managers, scientists, educators, students, producers, and conservationists compose a diverse membership guided by a professional code of ethics and unified by a strong land ethic. Membership in the SRM is open to anyone engaged or interested in any aspect of the study, management, or use of rangelands. Please contact Sam Albrecht for details on the parent society or Kristen Egen for information on the Arizona section.

## **USDA Animal and Plant Health Inspection Service Pest Plant Quarantine**

### **Contact information**

R. D. Richard

Robert.D.Richard@aphis.usda.gov

### **Mission or purpose**

Implementation and development of biological control strategies on invasive weeds

### **Geographic scope**

The lower 48 states in the United States

### **Main programs and services**

- information and resource materials on biological control of weeds (including brochures and CDs)
- sources of biological control agents
- source of insect quarantine for pass-through clearance of imported biological control agents (based out of Mission, Texas)
- programs on purple loosestrife, diffuse knapweed, spotted knapweed, Russian knapweed, Dalmation toadflax, and leafy spurge
- future projects on salt cedar and Canada thistle

**USDA Natural Resource Conservation Service  
Tucson Plant Materials Center**

**Contact information**

Bruce Munda, Plant Resource Specialist  
Mark Pater, Operations and Research Coordinator  
Tucson Plant Materials Center  
3241 N. Romero Road  
Tucson, AZ 85705  
520.292.2999  
bruce.munda@az.usda.gov  
mark.pater@az.usda.gov

**Mission or purpose**

To provide quality vegetative solutions to conservation problems

The Tucson Plant Materials Center (PMC) conducts studies and plantings and participates in cooperative efforts to address resource issues on rangelands, mined lands, urban lands, croplands, and riparian areas. It provides technical assistance to the Natural Resource Conservation Service (NRCS) field offices and Resource Conservation and Development (RC&D) groups. Others cooperating in these efforts include conservation districts, federal and state agencies, and private landowners.

**Geographic scope**

All of Arizona, southeastern California, southern Nevada, southwestern New Mexico, and a small portion of southwestern Utah

**Main programs and services**

- assemble, evaluate, and develop plant materials for revegetation for wildlands, mined lands, and croplands
- develop plant-related technology and information for arid land revegetation, cover crops on farmland, and disturbed-area revegetation
- assist NRCS field offices and other cooperators with recommendations, demonstration plantings, and on-site assistance for plant-related resource needs
- provide plant production (seed and plants), seed cleaning, and seeding recommendations (species selection, rates, and timing)

**Clients**

- NRCS field offices
- RC&Ds
- private landowners
- numerous local, state, and federal agencies

## **USDA Natural Resource Conservation Service Yuma Field Office**

### **Contact information**

Bobbi McDermott, District Conservationist  
2450 S. 4<sup>th</sup> Ave., #402  
Yuma, AZ 85364  
928.726.5562, ext. 101

### **Mission or purpose**

To work with private and state land users on improving conservation practices, and maintaining and improving the resource base

### **Geographic scope**

Yuma and La Paz Counties of Arizona through the Yuma, Laguna, and Wellton-Mohawk Valley Natural Resource Conservation Districts (NRCD) and the Bard Resource Conservation District in California

### **Main programs or services**

On-site assistance to land users with

- soils
- engineering
- irrigation water management
- conservation education
- erosion reduction
- urban resource problems

### **Clients**

The Natural Resource Conservation Service (NRCS) works on state lands, private lands, and tribal lands. It works through conservation districts made up of locally elected officials who set NRCS priorities, and services are free to the public.

**U.S. Geological Survey  
Forest and Rangeland Ecosystem Science Center  
Colorado Plateau Field Station**

**Contact information**

Kathryn Thomas  
928.556.7466, ext. 235  
Kathryn\_A\_Thomas@usgs.gov

**Mission or purpose**

To collect contributed data on harmful nonnative weed distribution, compile the data into a standardized regional database, and make maps of the species distribution

The regional database and maps are available on a public Web site, at: [www.usgs.nau.edu/swemp](http://www.usgs.nau.edu/swemp)  
The Web site also provides organized links to biological and ecological information on exotic plant species in the Southwest and the Alien Plant Ranking System developed by the National Park Service for prioritizing management actions for exotic plant control.

**Geographic scope**

New Mexico and Arizona, and adjacent areas in Utah, Colorado, Nevada, and California

**Main programs or services**

- yearly publishing of a regional database (year 2000 database had over 7,500 entries)
- publishing of interactive distribution maps on the Web that can be queried and printed
- facilitating the collection and compilation of collaborator observations into a regional exotic plant distribution database
- providing a web site clearinghouse for access to up-to-date links to biological and ecological information on southwest exotic plant species and to the Alien Plant Ranking System

**Clients**

Numerous agencies, tribes, and interested parties contribute data to the database development; it is useful and accessible to those interested in the issue of exotic plants such as land management agencies, weed management areas, and others.

## University of Arizona Cooperative Extension

### Contact information

Dr. Jim Christenson, Director  
Cooperative Extension  
College of Agriculture and Life Sciences  
University of Arizona  
Forbes 301; PO Box 210036  
Tucson, AZ 85721-0036  
520.621.7205 (tel), 520.621.1314 (fax)  
jimc@ag.arizona.edu

### Mission or purpose

The Cooperative Extension system, the outreach arm of The University of Arizona, is “taking the university to the people.” The system serves as a statewide network of knowledgeable faculty and staff that provides lifelong educational programs for all Arizonans. The program is part of a nationwide educational network of scientists and educators who help people solve problems in their daily lives and put knowledge to use. Arizona Cooperative Extension provides a link between the university and the citizens of this state.

### Geographic scope

Statewide, in fifteen counties and on five Indian reservations

### Main programs and services

- *Animal Systems*

Extension programs address beef, dairy, and horse production, including the health and well-being of these animals. These courses seek to improve productivity and increase the quality, composition, safety, and desirability of animal products. Programs promote the use of integrated and long-term sustainable production systems that are compatible with arid environments.

- *Environment and Natural Resources*

Programs educate decision makers, managers, and the public in the management and use of renewable natural resources including wildlife, fisheries, rangelands, forests, watersheds, and other landscapes in both private and public ownership. These sessions emphasize the sustainable use of natural resources, environmental protection, and public policy issues as well as resource assessment, monitoring and management.

- *Family, Youth and Community*

Programs in this area target diverse youth, family, and community needs including effective parenting, violence prevention, resource management, responsible decision making,

leadership and access to community support systems. County- and campus-based faculty, including members of the School of Family and Consumer Resources, Department of Nutritional Sciences, Department of Agricultural Education, the College of Architecture, and the College of Medicine help Arizona residents become healthy, financially secure, and responsible members of society.

Arizona 4-H Youth Development is a non-formal, educational youth development program aimed at youth ages 5 to 19 years. The 4-H Youth Development program encourages youth, their families, and youth and adult volunteers to become productive and self-directing by developing practical skills and knowledge. Youth are involved in hands-on, experiential learning that fulfills the motto of “learning by doing.” All 4-H Youth Development Programs focus on active involvement and quality experiences that stimulate lifelong learning of values and skills. Professionals and volunteers together provide educational projects and activities in any areas youth want to explore, such as computer training, reading, cooking, and animal care.

- *Human Nutrition, Food Safety, and Health*

This program area focuses on the relationship of nutrition to health including disease prevention and food safety. Programs include the Extension Food and Nutrition Program, osteoporosis education, healthy lifestyles involving physical activity, and successful aging. Participants are educated in the overall safety and quality of food for human consumption through courses in animal and plant health, stored feed and food products, transportation, processing, and consumer handling.

- *Marketing, Trade, and Economics*

Programs address crop budgets, economic impacts of public policy issues, direct farm marketing, and the economic evaluation of the impact of economic development on natural resources and the environment.

- *Plant Systems*

Programs focus on the production of field and forage crops (such as cotton, grains, and alfalfa), vegetable crops, and landscape plants. Optimal and sustained productivity is based on best management practices, the molecular genetics of plants, and an understanding of molecular, plant, microbe, and insect interactions. The program emphasizes pest management and disease, adaptability, and use of plants in arid environments.

## **Clients**

People of all ages throughout Arizona.

## **Contact University of Arizona Cooperative Extension Agents**

### Cochise County

Kim McReynolds  
Agriculture and Natural Resources  
450 S. Haskell Avenue  
Wilcox, AZ 85643-2790  
520.384.3594  
kimm@ag.arizona.edu  
(see also Sweet Resinbush/Karoo Bush WMA)

### Gila County

Christopher Jones  
Agriculture and Natural Resources  
1177 Monroe Street  
Globe, AZ 85501  
928.425.7179  
ckjones@ag.arizona.edu  
(see also Tonto WMA)

Jim Sprinkle  
Animal Science  
714 S. Beeline Highway, Suite 200  
Payson, AZ 85541  
928.474.4160  
sprinkle@ag.arizona.edu

### La Paz and Yuma Counties

Barry Tickes  
Agriculture and Natural Resources  
2200 W. 28<sup>th</sup> Street, Suite 102  
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928.726.3904  
btickes@ag.arizona.edu

### Maricopa County

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4341 E. Broadway Road  
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602.470.8086  
pclay@ag.arizona.edu

Kai Umeda  
Vegetable Crops  
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Phoenix, AZ 85040-8807  
602.470.8086  
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### Mohave County

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### Pinal County

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Agriculture and Natural Resources  
820 E. Cottonwood Lane, Building C  
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520.836.5221  
gibsonrd@ag.arizona.edu

### Santa Cruz County

Dean Fish  
Agriculture and Natural Resources  
3241 N. Grand Avenue, Suite 6  
Nogales, AZ 85621-3917  
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dfish@ag.arizona.edu

### Yavapai County

Jeff Schalaus  
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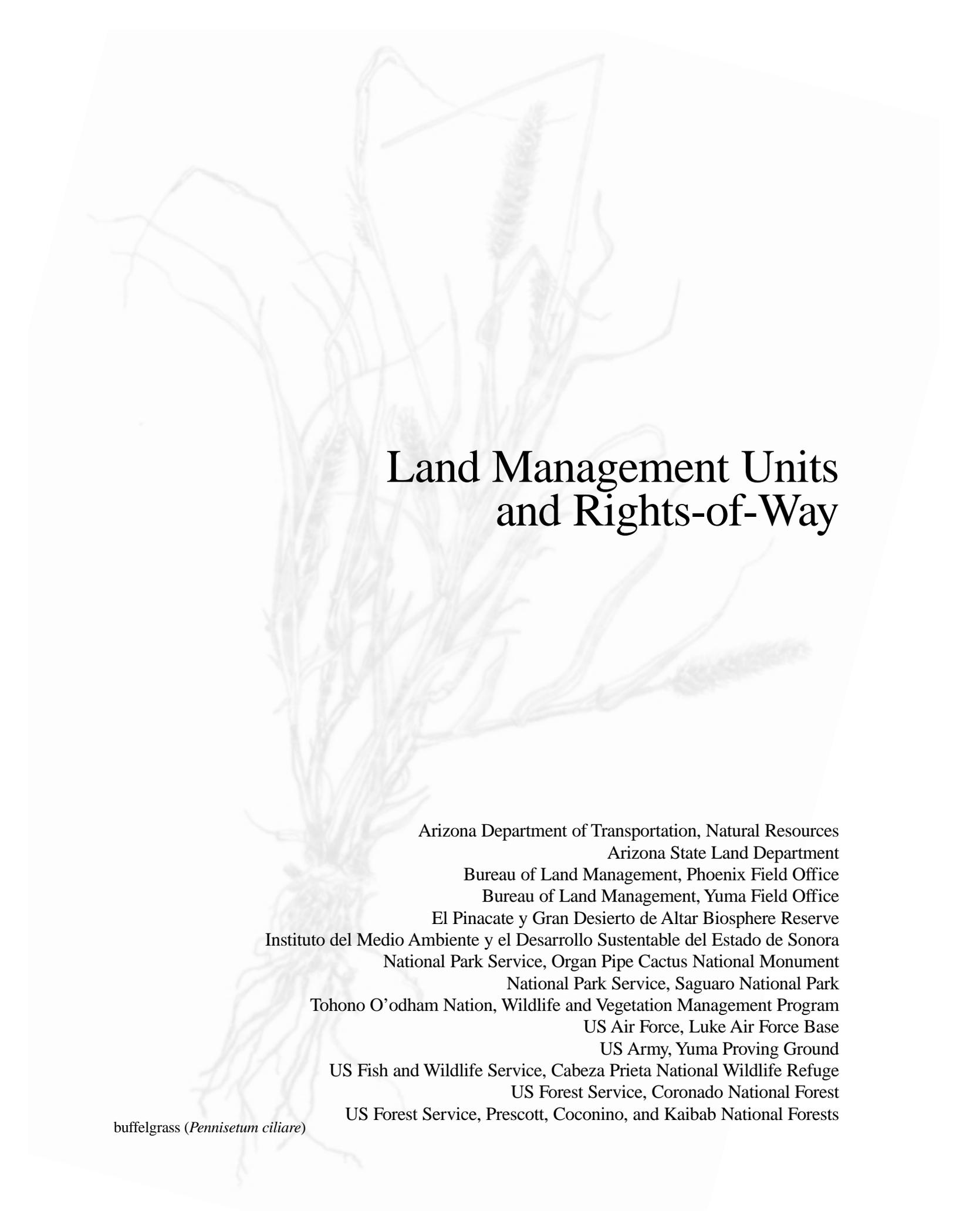
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# Land Management Units and Rights-of-Way

Arizona Department of Transportation, Natural Resources  
Arizona State Land Department  
Bureau of Land Management, Phoenix Field Office  
Bureau of Land Management, Yuma Field Office  
El Pinacate y Gran Desierto de Altar Biosphere Reserve  
Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora  
National Park Service, Organ Pipe Cactus National Monument  
National Park Service, Saguaro National Park  
Tohono O'odham Nation, Wildlife and Vegetation Management Program  
US Air Force, Luke Air Force Base  
US Army, Yuma Proving Ground  
US Fish and Wildlife Service, Cabeza Prieta National Wildlife Refuge  
US Forest Service, Coronado National Forest  
US Forest Service, Prescott, Coconino, and Kaibab National Forests

buffelgrass (*Pennisetum ciliare*)

## *Land Management Units and Rights-of-Way* Overview

This section describes invasive plant management within specific land management units (federal and tribal) and rights-of-way (in the case of the Department of Transportation) within the Sonoran Desert. These land management units range from hundreds of thousands of acres to several million acres in size. Clearly, the management objectives for these lands are diverse, and invasive plant management is only a small part. In addition, the resources available for management of these vast lands are stretched thin. The purpose of this section is to identify common priorities and needs, and to search for opportunities to maximize scarce resources and accomplish common goals.

Among all land management units within the Sonoran Desert

- There is a commonly expressed need to better understand the extent of the invasive plant problem on specific land units, as well as throughout the region.
- There is a need to expand available resources; time, money, and personnel are limited.
- Outreach and education are considered important components of a prevention strategy.
- There is a recognition of the need to expand partnerships, but also a sense that opportunities to do so are limited by a lack of time and resources and by an agency's hesitancy to meet with others before understanding the scope of the problem on its own lands.

Some opportunities exist

- Several land management units have highlighted their efforts to focus on prevention and containment. A set of species of common concern including buffelgrass, fountain grass, starthistles, Sahara mustard, and knapweeds—have encouraged units to share experiences with control methods for these species, and to share information about infested sites and the extent of the infestation at a regional level. These efforts—along with surveys, mapping, and data exchange—will help define the scope of the problem in this region and prioritize actions.
- To maximize limited personnel, time, and funds, units have begun cooperating with other groups that may contribute skills and equipment to achieving tasks or providing information; using existing volunteer corps or encouraging the participation of new volunteers; and educating a wider staff that can help collect information or control invasive plants as part of other duties.
- Partnering to achieve public education and outreach may be beneficial to the region.
- Partnerships are forming; cooperative efforts in the region are expanding.
- Partnerships will need to continue in order to address the problem of invasive plants at a regional level, better understand the scope of the problem, and monitor changes.

## **Arizona Department of Transportation Natural Resources**

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### **Area description**

The transportation corridors and rights-of-way include all the major biotic communities that occur in Arizona. Elevation ranges from the desert floor to high mountain peaks, and topography also varies through the full range.

### **Current activities for invasive plant management**

The Arizona Department of Transportation (ADOT) manages vegetation with an integrated approach using a combination of control methods that are cost effective and efficient. First and foremost, native plants are used for ground cover to compete for space and nutrients with invasive plants and thus preclude them. Species are chosen for the desired characteristics of low height, drought tolerance, and ability to reseed or propagate themselves. Additional control methods include mechanical means, such as mowing or blading (where a grader is used to remove top growth), reseeding to change species composition, and sometimes digging or hand grubbing of individual plants. Herbicides are used in conjunction with both these methods to prevent re-growth or re-invasion. ADOT chooses chemicals that will selectively control broadleaf species and not inhibit grass species. Forbs or flowering plants are then seeded in these areas. Alternate species are reseeded when it is necessary to control grass species. Fire is sometimes used to remove biomass and seed reserves. Biological controls are encouraged, and ADOT has worked with APHIS in researching insects or other natural vectors to control selected species.

### **Main species or areas targeted**

- *The Tucson area* lists buffelgrass, fountain grass, desert broom, palo verde, and mesquite
- *Phoenix and Prescott* list buffelgrass, fountain grass, desert broom, palo verde, mesquite, camelthorn (in Chandler), Russian knapweed, tumbleweed, yellow and Malta starthistle, diffuse knapweed, hoary cress, sweet resinbush, Dalmation toadflax, mullein, sweet clover, Johnson grass, blue panic, and camphor weed
- *Flagstaff* manages outside the Sonoran Desert, but the species found on tribal lands are adapted to and could invade the desert areas; species include diffuse knapweed, Dalmation toadflax, Russian knapweed, Scotch thistle, musk thistle, yellow and Malta starthistle, camelthorn, juniper, and Johnson grass

[Note that ADOT controls native vegetation as well as invasive plants along rights-of-way to protect public safety. The control of invasive plants is just one aspect of their mandate.]

### **Future plans for invasive plant management**

Future plans include partnering with land owners and other agencies to unify control methods that improve the efficiency and better utilize existing resources.

### **Obstacles identified that limit effectiveness of invasive plant management**

Obstacles abound, and chief among them is a lack of a state-wide coordinated effort. Within ADOT itself, there is no cooperation among the divisions dealing with environmental planning, maintenance, new construction, traffic signals, or signing and striping. An obvious solution is involvement and education of upper management at the level of the director, governor, legislature, and so forth. The land ownership issue creates another division between Bureau of Land Management (BLM), the U.S. Forest Service (USFS), the Bureau of Indian Affairs (BIA), various tribes, and private individuals.

### **Current coordination activities to address the issue of invasive plants**

Coordination with other managers follows a piecemeal approach wherever agreement is easily forthcoming. The BLM, USFS, and BIA use Memoranda of Understanding and verbal agreements, but these are not adhered to or enforced in a unified way. There seems to be a fear of making formal written agreements because these can leave a trail of documents that can be used against a manager in a political battle. A number of agreements are actually “don’t ask, don’t tell” arrangements in which ADOT personnel treat problems until someone complains.

#### **In other efforts**

- ADOT Natural Resources managers are encouraged to participate in all weed management areas within their jurisdiction
- all Natural Resource managers are members of the Southwest Vegetation Management Association
- ADOT has been involved in efforts to create an Inter-agency Weed Action Group to coordinate efforts among agencies within Arizona and New Mexico
- all ADOT Natural Resources personnel have attended the New Mexico Noxious Weed Short Course at least once
- ADOT will also send instructors whenever asked to provide training programs on identifying or controlling invasive species

## Arizona State Land Department

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### Area description

State Trust Lands encompass over 9 million acres across the state of Arizona

### Current activities for invasive plant management

The Arizona State Land Department works with various weed management areas and other weed groups across the state. Monitoring studies have been established on several populations of noxious weeds, and the department assists in invasive plant identification.

### Main species or areas targeted

- probably the most critical species to control and eradicate is sweet resinbush
- since 1999, a project has been underway to eradicate Scotch thistle on a riparian area near Flagstaff

### Future plans for invasive plant management

- continue developing monitoring sites on noxious weed populations and taking follow-up actions
- work with weed management areas and other groups involved in local control efforts (for example, the Scotch thistle eradication project on the Río de Flag near Flagstaff)

### Obstacles identified that limit effectiveness of invasive plant management

Lack of a budget for invasive species control and eradication

### Current coordination activities to address the issue of invasive plants

Most of the efforts—including monitoring studies, weed pulls, and control efforts—have been in coordination with other agencies including the Arizona Department of Transportation, the University of Arizona's Cooperative Extension, and others.

**Bureau of Land Management  
Phoenix Field Office**

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**Area description**

The Phoenix Field Office (PFO) manages approximately 2 million acres of public land south of I-10. Included in this area are the Sonoran Desert National Monument and several wilderness areas.

**Current activities for invasive plant management**

There is very little work currently ongoing with invasive species in the PFO. As field work is conducted, some invasive species and locations are recorded on an informal basis as a collateral duty.

**Main species or areas targeted**

Although the PFO has not targeted a main species, species currently listed by state and federal agencies are considered a “higher priority” than invasive species not currently listed. Some species that are not listed, such as buffelgrass, are considered problematic, but it does not seem practical to spend large amounts of time or money on these species at this time. As these species become listed, priorities can, and should, change.

**Future plans for invasive plant management**

The first priority for the PFO is to develop a formal procedure for identifying and recording locations and infestations of invasive species. After better inventory records are established, treatments of problem areas can begin. Although the primary concern of this review is the Sonoran Desert, it is important to realize that the PFO has management responsibility for another 1 million or so acres of public land north of I-10, including the Agua Fria National Monument. Based on inventory results, it may be determined that given the size of the infestation, the potential effectiveness of treatment, the availability of funding, and various political factors, the PFO may need to focus on these areas instead of the Sonoran Desert. Although the PFO has management responsibilities outside the Sonoran Desert, the opportunity to work with other agencies and organizations associated with or concerned about the Sonoran Desert is welcome.

**Obstacles identified that limit effectiveness of invasive plant management**

The main problem is a lack of resources (people and money). The PFO is currently trying to get more field personnel to help with invasive species monitoring as a collateral duty while in the field. However, finding people to help treat invasive species would still be a concern as would money for materials.

In addition, owing to the large area both within and outside of the Sonoran Desert that the PFO manages, and the ever-changing political environment, it may be difficult for the PFO to concentrate strictly on one area, such as the Sonoran Desert.

**Current coordination activities to address the issue of invasive plants**

The PFO is not currently coordinating with any other land managers within respect to invasive species.

**Bureau of Land Management  
Yuma Field Office**

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**Area description**

The Yuma Field Office (YFO) manages a diverse combination of land and resources, encompassing 1.6 million acres of southwestern Arizona and southeastern California. The area includes 155 miles of the Lower Colorado River, a destination for hundreds of thousands of visitors seeking recreation year-round.

**Current activities for invasive plant management**

- surveying, treating, and monitoring giant salvinia along the Lower Colorado River and Palo Verde Irrigation Drain (PVID) using Integrative Pest Management (IPM)
- surveying the Lower Colorado for other invasive plants such as spiny naiad, Eurasian watermilfoil, and phragmites
- mapping of Sahara mustard in Sonoran pronghorn habitat
- planning salt cedar removal projects in conjunction with hazardous fuel reduction programs
- revegetation projects in conjunction with salt cedar removal

**Main species or areas targeted**

- giant salvinia: treatment is focused on the PVID originating in Blythe, California, the PVID drains into the Lower Colorado River at Walters Camp
- salt cedar: removal and revegetation by native plants and trees, habitat creation

**Future plans for invasive plant management**

- map spread of buffelgrass along highway corridors coming into the YFO
- establish proactive maintenance program to keep the YFO as weed free as possible

**Obstacles identified that limit effectiveness of invasive plant management**

The current IPM program will be evaluated and expanded. A weed management area will be explored for the local area, and a priority list for the local land managers will be developed.

**Current coordination activities to address the issue of invasive plants**

The BLM YFO has strong partnerships with several land managers; most prominently the coordinated efforts to control giant salvinia on the Lower Colorado River. Partners include the Bureau of Reclamation, Palo Verde Irrigation District, Arizona Department of Agriculture, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, and the University of Arizona.

## **El Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora**

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### **Area description**

The Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora (IMADES) works throughout the state of Sonora, Mexico. IMADES also works closely with the Pinacate y Gran Desierto de Altar Biosphere Reserve.

### **Current activities for invasive plant management**

IMADES is initiating a project that will determine the status of invasive species in the Pinacate Biosphere Reserve and develop strategies for their management and control. The Pinacate Biosphere Reserve is a pilot area and invasive plant management efforts will eventually be expanded to the state of Sonora. This will include

- completing an analysis of the distribution of invasive species by reviewing the literature, contacting experts, and recording locations from herbarium specimens
- completing an analysis of the status of invasive species by corroborating species locations with a field inventory and mapping the distribution and status of the primary species in the reserve following the mapping standards produced by the North American Weed Management Association
- organizing an invasive species workshop for the Pinacate Biosphere Reserve involving expert scientists, other region-wide land management agencies from the United States and Mexico, and conservation organizations to develop coordinated strategies for invasive species management and control
- publishing the results of the workshop, including identification of invasive species, their locations and status, and management recommendations
- participating in the development of a regional Weed Management Area for the Sonoran Desert region, in collaboration with U.S. and Mexican land management agencies and other conservation groups

### **Main species or areas targeted**

All invasive species found in the Pinacate Biosphere Reserve and Sonora

### **Future plans for invasive plant management**

At the end of this analysis phase, an invasive plant management plan will be in place to address the conservation and restoration of the communities in the state of Sonora. This will also include

- creating a database containing information about patterns of invasive and exotic plant species distributions throughout the state of Sonora

- evaluating the impact of these invasive species in identified priority sites for the conservation of biodiversity in Sonora
- determining and implementing strategies for monitoring, conservation, management, and restoration in priority conservation areas

**Obstacles identified that limit effectiveness of invasive plant management**

- financial assistance
- lack of information
- lack of professional experience in invasive species management
- lack of awareness in local communities about the problem of invasive plants

**Current coordination activities to address the issue of invasive plants**

IMADES has an on-going collaborative relationship with The Nature Conservancy, the Sonoran Institute, the Agricultural Research Council, and other U.S. and Mexican organizations and agencies. The invasive plant management program will continue collaborating with these organizations to further the impact and effectiveness of invasive plant management in Sonora.

## El Pinacate y Gran Desierto de Altar Biosphere Reserve

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### Area description

The Pinacate y Gran Desierto de Altar Biosphere Reserve contains over 1.7 million acres within which there are granitic and volcanic mountain ranges, large expanses of sand dunes (considered the largest in North America), and a great diversity of wildlife and plant communities.

### Current activities for invasive plant management

The most important, impacted area for invasive plant management activity is the northern limit of the Río Sonoyta which is infested with salt cedar. This is the only source of permanent water in the reserve; as a result it is the only site where such native desert fish as the desert pupfish, exist. Other endangered species are also found in this habitat.

### Main species or areas targeted

The main species affecting the reserve are salt cedar and Sahara mustard. Eradication of salt cedar is most crucial in the Río Sonoyta and the Elegante Crater. Sahara mustard needs to be controlled primarily around the *tinajas* as well as in disturbed areas, depending on the size of the infestation.

### Future plans for invasive plant management

Future planned activities include the eradication of salt cedar in the Río Sonoyta (an extensive infestation), at the base of the Elegante Crater, and in a small area in the center of the crater. The eradication of Sahara mustard is also planned for various sites, principally, in the *tinajas* and the arroyos linking them. These activities are being planned for the most advantageous time of year when the eradication will be most effective.

### Obstacles identified that limit effectiveness of invasive plant management

The only problem has been estimating the extent of the problem—particularly in the dispersion of seed from last year. It may be that the proliferation of invasive plants is too great for the amount of people available to control it. In this case, a local school will likely assist volunteers in invasive plant eradication projects.

### Current coordination activities to address the issue of invasive plants

The biosphere reserve is working with the U.S. Fish and Wildlife Service to eradicate salt cedar in the Río Sonoyta and to restore the desert pupfish habitat.

**National Park Service**  
**Organ Pipe Cactus National Monument**

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**Area description**

Organ Pipe Cactus National Monument contains 330,689 acres (517 square miles) of Sonoran Desert Scrub.

**Current activities for invasive plant management**

- mechanically removing fountain grass, buffelgrass, and Malta starthistle
- attending meetings

**Main species or areas targeted**

- buffelgrass
- fountain grass
- Malta starthistle

**Future plans for invasive plant management**

- continue to mechanically remove buffelgrass and fountain grass, if task continues to be an NPS priority and is funded
- if time and funding allow, work with neighbors to control invasive plants generally
- investigate ways to control Bermuda grass in Alamo Canyon
- finish report on the status of buffelgrass control if time allows

**Obstacles identified that limit effectiveness of invasive plant management**

- lack of money
- limited staff and time
- policy directives
- illegal migrant traffic

**Current coordination activities to address the issue of invasive plants**

- working with Saguaro National Park to standardize ArcView database fields
- adding contract stipulations to construction and maintenance projects to reduce or prevent invasions

## National Park Service Saguaro National Park

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### Area description

Saguaro National Park is a 90,000-acre national park in two districts, divided by the city of Tucson. The park's east district varies from 2,800 to 8,666 feet in elevation; the west district ranges from 2,200 to 4,400 feet in elevation. Due to the remote nature of the east district, most of the park's non-native plant problems are confined to the lower elevations (Sonoran Upland and Semi-desert Grassland), which are closer to the effects of urban development from Tucson. Nonetheless, the rugged terrain makes most areas difficult to reach for surveying and eradication.

### Current activities for invasive plant management

- *Inventory and monitoring:* using park staff to locate and map populations of invasive non-natives in the park to develop a database geographic information system for mapping non-native plant populations
- *Eradication:* using large volunteer groups to manually eradicate most troublesome species (buffelgrass and fountain grass mainly); some seasonal eradication is also accomplished by park staff
- *Research:* using U.S. Geological Survey grant to compare manual and herbicide eradication on buffelgrass (still in planning stages)
- *Education:* delivering formal and informal talks to the public on the threat of invasive vegetation

### Main species or areas targeted

- buffelgrass
- fountain grass
- thistles and knapweeds
- smaller populations of other species

### Future plans for invasive plant management

Saguaro National Park plans to continue its current activities, while working more cooperatively with adjacent land managers, other community organizations, and the public.

**Obstacles identified that limit effectiveness of invasive plant management**

- not enough funding to work on park lands
- no consensus or coordinated effort throughout the community on non-native plant issues

**Current coordination activities to address the issue of invasive plants**

- working with the Tucson Mountain Weedwackers on survey, eradication, and education efforts as well as coordinated mapping
- coordinating with the Pima Invasive Species Council
- participating in the Interagency Weed Action Group
- perhaps start inputting information into the Southwest Exotics Mapping Project (SWEMP) in Flagstaff

**Tohono O’odham Nation  
Wildlife and Vegetation Management Program**

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**Area description**

The Tohono O’odham Nation encompasses 2.8 million acres. It has variable topography but is predominantly Sonoran Desert Scrub.

**Current activities for invasive plant management**

- noting locations of invasive plant species incidental to other field work
- trying to get a youth worker crew together this summer to hand pull some patches

**Main species or areas targeted**

- buffelgrass
- Malta starthistle

**Future plans for invasive plant management**

No firm plans established at this time

**Obstacles identified that limit effectiveness of invasive plant management**

Lack of staff and funding

**Current coordination activities to address the issue of invasive plants**

None

**U.S. Air Force**  
**Luke Air Force Base**  
(eastern portion of the Barry M. Goldwater Range)

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**Area description**

The Barry M. Goldwater Range encompasses 1.7 million acres of Arizona Upland and Lower Colorado River Valley subdivisions of the Sonoran Desert.

**Current activities for invasive plant management**

The Drylands Institute has been hired to conduct an invasive weed survey. All occurrences will be recorded with modified SWEMP data forms, and all species will be ranked using the Heibert System, (see *Handbook for Ranking Exotic Plants for Management and Control*).

**Main species or areas targeted**

Many species have been targeted: yellow starthistle, Sahara mustard, London rocket, Russian thistle, red brome, Bermuda grass, Lehmann lovegrass, wild barley, buffelgrass, fountain grass, Johnson grass, salt cedar, puncture vine

**Future plans for invasive plant management**

- control manageable infestations by hand
- monitor infestations
- prepare NEPA and Native American consultations
- educate Air Force personnel
- receive recommendations from the Drylands Institute
- prioritize and develop prevention measures
- include a statement of prevention in all new contracts

**Obstacles identified that limit effectiveness of invasive plant management**

Ever since the Air Force was assigned the problem, its efforts have been fairly effective. There are, however, many other projects to manage, and due to possible staff changes, priorities and expertise may change.

**Current coordination activities to address the issue of invasive plants**

The Air Force is in the beginning stages of developing a relationship with ADOT.

## **U.S. Army Yuma Proving Ground**

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### **Area description**

Yuma Proving Ground (YPG) includes approximately 840,000 acres of basin and range topography entirely within the Lower Colorado River subdivision of the Sonoran Desert. It is located in the southwest corner of Arizona 25 miles north of the city of Yuma.

### **Current activities for invasive plant management**

YPG monitors the land use and condition of the installation's terrain and vegetation via the standardized Land Condition-Trend Analysis (LCTA) survey (see *Integrated Training Area Management* for more information). Surveys are conducted every five years following baseline monitoring. The most recent survey year was 1998; the next survey will occur January – May 2003.

Weed control is performed in landscaped and industrial areas using chemical and mechanical control methods. Maintenance practices such as disking and grading are periodically performed on specified mobility test courses and drop zones to remove invasive plants. Infrequent vegetation removal may occur for munitions impact areas and ammunition storage to reduce fire hazard.

### **Main species or areas targeted**

The LCTA survey is nonspecific; it includes all vascular plants. Predominant invasive species of concern are common Mediterranean grass, Sahara mustard, puncture vine, and salt cedar. Many other introduced species, including buffelgrass and crimson fountain grass, have been recorded.

Weed control programs are site-driven—out of concern for landscaping, rights-of-way, ammunition bunkers, and test areas—not species-driven at this time.

### **Future plans for invasive plant management**

- participate in SWEMP and other regional invasive plant management programs
- continue the LCTA surveys
- initiate programming for future species-specific control projects

### **Obstacles identified that limit effectiveness of invasive plant management**

Inadequate funding, partnerships, technology, and programming all limit its current effectiveness.

**Current coordination activities to address the issue of invasive plants**

None have been undertaken other than participation in recent workshops and information exchange forums. Recently published Army policy promotes invasive species management through partnerships.

**U.S. Fish and Wildlife Service  
Cabeza Prieta National Wildlife Refuge**

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**Area description**

The Cabeza Prieta National Wildlife Refuge is 860,010 acres in size, of which 803,418 acres is federally designated as wilderness.

**Current activities for invasive plant management**

Control for Sahara mustard began a few years ago, but turnover of personnel prevented follow up and consistency. Other invasives (buffelgrass and fountain grass) have not been subject to a control plan beyond some removal. At this point, the strategy is to determine the extent of the invasion and map the extent and rate of spread if determinable.

**Main species or areas targeted**

- Sahara mustard
- buffelgrass
- fountain grass

**Future plans for invasive plant management**

A control program is in development that will include coordination with Organ Pipe National Monument and, refuge managers hope, Luke Air Force Base. Once the size of the infestation and the rate and direction of the spread has been determined, feasible control mechanisms will be examined.

**Obstacles identified that limit effectiveness of invasive plant management**

- time constraints
- size of refuge
- insufficient funding
- insufficient additional resources (labor, expertise, equipment)

**Current coordination activities to address the issue of invasive plants**

None

**U.S. Forest Service  
Coronado National Forest**

**Contact information**

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Coronado National Forest  
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**Area description**

The Coronado National Forest consists of twelve blocks of land scattered across southeastern Arizona and a bit of southwestern New Mexico. It includes 1,726,514 acres at the confluence of the Rocky Mountains and the Sierra Madres, as well as the Sonoran and Chihuahuan Deserts. Some sections lie on the international border between the United States and Mexico.

The physiography is representative of Sonoran Desert and Mexican Highlands landscape types. The Sonoran Desert landscape character is an area of short mountain ranges in a desert plain. This type is represented by the Tumacacori Mountains and the western edges of the Patagonia, Santa Rita, Rincon, and Santa Catalina Mountains. The rest of the Forest land is made up of the taller Mexican Highlands landscape type. It is an area of high desert valleys at elevations of 4,000 to 5,000 feet, with the mountaintops reaching up to 10,470 feet.

Due to the wide variation in elevation, soils, and climate, the vegetation is highly diverse. Plant communities range from Sonoran Desert scrubland, grassland, and oak woodland on the dryer, lower altitudes through ponderosa pine and Engelmann spruce on the high mountain peaks. In lower elevations, dryer ecosystems predominate.

**Current activities for invasive plant management**

- participation in the Sweet Resinbush and Karoo Bush Weed Management Area
- weed survey conducted in 1999 concentrating on primary roads, recreation sites and administrative sites resulting in mapped locations entered into the forest GIS
- use of volunteer groups (Eagle Scouts, Girl Scouts, church groups, school groups) to grub sweet resinbush, Karoo bush, buffelgrass, and fountain grass in the Sabino Canyon area and on the Safford Ranger District
- use of prison crews to grub bull thistle on the Douglas Ranger District
- educational activities including an interactive display of alien species (“Aliens!”), as well as a display describing the role of invasive plants in desert fires, located in the Sabino Canyon Visitor Center, and informal programs presented to the volunteer groups that participate in eradication activities
- preparation of an Environmental Assessment for a forest-wide Invasive Exotic Plant Management Program

**Main species or areas targeted**

- sweet resinbush
- Karoo bush
- tree of heaven
- bull thistle
- Texas blueweed
- yellow starthistle
- Canada thistle
- buffelgrass
- fountain grass
- giant reed
- salt cedar
- Johnson grass
- Lehmann lovegrass

**Future plans for invasive plant management**

The forest plans to implement a forest-wide Invasive Exotic Plant Management Program as soon as it has been approved through the NEPA process and funding is available.

**Obstacles identified that limit effectiveness of invasive plant management**

Public resistance to the use of herbicides on forest land may prove to be a problem in successfully implementing an invasive plant management plan.

**Current coordination activities to address the issue of invasive plants**

- participation in the Sweet Resin Bush and Karoo Bush Weed Management Area
- coordination with NRCS to enlist an SCA crew for a week of grubbing work in Sabino Canyon during the summer of 2001

**U.S. Forest Service**  
**Prescott, Coconino, and Kaibab National Forests**

**Contact information**

Dave Brewer  
Kaibab National Forest  
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**Area description**

The area includes Prescott, Coconino, and Kaibab National Forests, which contain the following vegetation types: grasslands, chaparral, juniper, pinyon, and ponderosa. The scope of weed management activities is limited to specific control measures on known or projected invasive plant populations within this three-forest area.

**Current activities for invasive plant management**

The forests are mapping invasive plant locations and hand-pulling or grazing certain controllable populations. The forests are also incorporating prevention practices into ground-disturbing projects (for example, pre-spraying for weeds).

**Main species or areas targeted**

The main areas of concern are riparian and wilderness areas and road corridors. The main species of concern are: Russian knapweed, camelthorn, whitetop, musk thistle, diffuse knapweed, spotted knapweed, yellow starthistle, leafy spurge, Eurasian watermilfoil, Scotch thistle, Mediterranean sage, tamarisk, Himalayan blackberry, water primrose, houndstongue, Dalmation toadflax, bull thistle, tree of heaven, giant reed, Malta starthistle, Russian olive, Siberian elm, teasel, cheatgrass, and jointed goatgrass

**Future plans for invasive plant management**

The forests are preparing an environmental impact statement to address this issue for the next five to ten years. An integrated vegetation management approach is being proposed, it will include manual, cultural, biological, and herbicidal treatments. Additional information can be found at <http://www.fs.fed.us/r3/kai/projects>

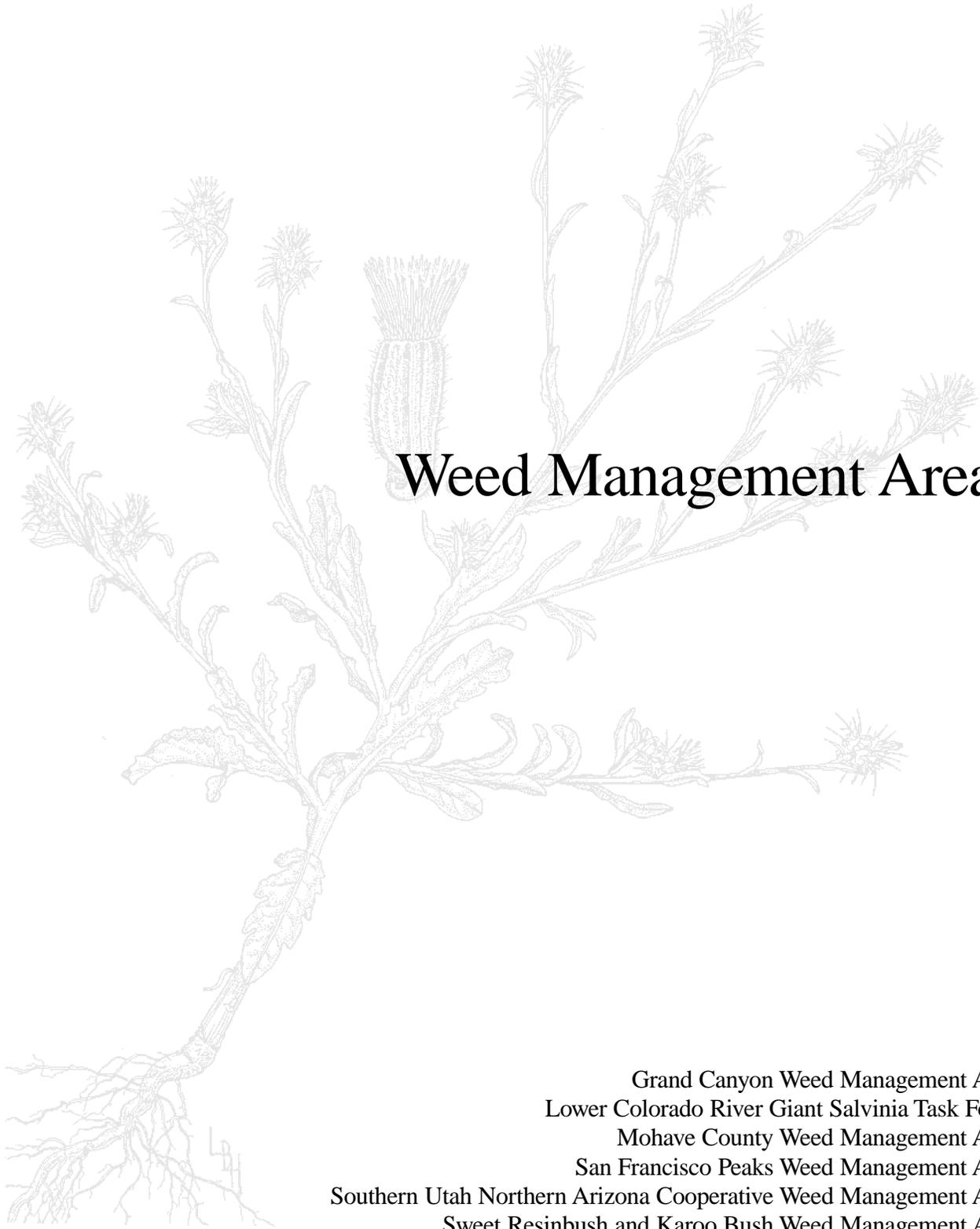
**Obstacles identified that limit effectiveness of invasive plant management**

Funding is one of the major obstacles. Since funding comes from the U.S. Congress, there is no guarantee that whatever decision is made locally will be supported financially in the long term. This uncertainty affects the availability of personnel as well as other resources used to control invasive plants.

**Current coordination activities to address the issue of invasive plants**

The Coconino and Prescott National Forests are active in the San Francisco Peaks, Verde Valley, and West Yavapai Weed Management Areas. Coordination also takes place with the State Department of Agriculture, the State Land Department, and UA Cooperative Extension.





# Weed Management Areas

Grand Canyon Weed Management Area  
Lower Colorado River Giant Salvinia Task Force  
Mohave County Weed Management Area  
San Francisco Peaks Weed Management Area  
Southern Utah Northern Arizona Cooperative Weed Management Area  
Sweet Resinbush and Karoo Bush Weed Management Area  
Tonto Weed Management Association  
Tucson Mountain Weedwackers  
Verde Valley Weed Management Area  
West Yavapai Weed Management Area

Malta starthistle (*Centaurea melitensis*)

## *Weed Management Areas* Overview

This section describes the efforts of weed management areas in the state of Arizona. Weed management areas (WMAs) are formed in a geographic area or for the control of specific species. Both kinds of WMAs are represented in this section. The purpose of reviewing these groups is to learn how they are structured and how they function, what obstacles they have faced, and what advantages might result from creating one or more WMAs for the Sonoran Desert in southern Arizona.

The main functions of WMAs include local control of invasive plants, education and outreach, research and documentation of the problem, and partnership with a wide variety of agencies, organizations, and individuals. A successful combination for membership in a WMA seems to include a mix of federal agencies, non-governmental organizations, universities, private landowners, and the Natural Resource Conservation Districts and Natural Resource Conservation Service, among others. The greater the mix of participants, the more opportunities exist for accessing additional resources.

Common obstacles faced by WMAs, and some possible solutions to those obstacles

- *Funding.* Experiences from these WMAs show that their organization allowed them to access more funding after they became organized. Searching for funding, writing proposals, and managing grants take time and resources, and the most successful groups have been those with a diverse (and committed) membership. Donations are also an opportunity to increase funding or physical resources, and some groups have been quite successful in leveraging those resources as well.
- *Participation.* Encouraging participation by members and accommodating the limited amount of time people have to contribute are common challenges. These groups have used a variety of strategies to overcome this obstacle
  - creating a corps of volunteers
  - organizing field trips that are active and fun and attract more participation
  - rewarding and encouraging committed people to continue, while not overtaxing them
  - hiring a coordinator to keep up with on-going organizational tasks
  - building partnerships with other groups to increase effectiveness
  - simply coming to the realization that the scale of expectations for the group need to fit the amount of time people can put into it—that is, setting achievable priorities and goals

Additional opportunities exist for greater coordination among the WMAs to share lessons learned, compile and share data, and optimize resources and funding opportunities. The concept of a weed management area is a useful one for building cooperative, cross-boundary efforts for invasive plant management. A coordinator, an effective information management system, and outreach and education components are noted as important to the success of the group.

## **Grand Canyon Weed Management Area**

### **Contact information**

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Grand Canyon, AZ 86023-0129  
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### **Mission and geographic scope**

The Grand Canyon Weed Management Area is presently in the early planning stages. Once established, it will cover the area from the Grand Canyon south to Williams and west to the Seligman area. Its eastern boundary will join the San Francisco Peaks WMA.

### **Main species targeted**

Weedy plant species of concern will include

- salt cedar
- Russian olive
- camelthorn
- Mediterranean sage
- Dalmation toadflax
- Scotch thistle
- Russian knapweed
- spotted knapweed
- diffuse knapweed

### **Membership**

Potential partners may include

Arizona Department of Agriculture  
Arizona State Lands Department  
city and county agencies  
National Park Service  
Natural Resource Conservation Districts  
Natural Resource Conservation Service  
University of Arizona, Cooperative Extension  
U.S. Forest Service

## Lower Colorado River Giant Salvinia Task Force

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<http://southwest.fws.gov/fishery/salvinia.htm>

### **Mission or purpose**

The task force seeks to control giant salvinia.

### **Geographic scope**

Lower Colorado River Basin

### **Main species targeted**

Aquatic nuisance species

### **Activities and projects**

- survey locations of giant salvinia
- prevent its spread
- provide education
- clean giant salvinia out of Palo Verde Irrigation District (PVID) drainage ditch
- collect and document water quality data in concert with treatments to eradicate giant salvinia
- conduct regular meetings to coordinate task force actions and provide a consistent message

### **Accomplishments to date**

- produced multi-layered environmental documents for recommended controls
- began drafting an Action Plan describing specific efforts which will be added to the Web page for public review
- received a National Fish and Wildlife Foundation (NFWF) to assist in eradication efforts in the PVID

### **Obstacles faced and overcome**

Multiple agencies, organizations, and partners need to be incorporated into actions. Open meetings to build the task force helped overcome this problem. Funding was a primary problem; everyone had a little money, but these tasks needed more funds than any one agency was able to provide. The grant from NFWF helped cover this shortfall.

### **Future plans**

The task force will continue clearing the PVID drain and concentrate on preventing spread upriver

**Membership**

Arizona Department of Food and Agriculture  
Arizona Game and Fish Department  
Bureau of Land Management  
California Department of Fish and Game  
California Department of Food and Agriculture  
California Water Districts  
Colorado River Indian Tribes  
Government of Mexico  
Imperial Valley Irrigation District  
International Boundary Waters Commission  
Palo Verde Irrigation District  
U.S. Bureau of Reclamation  
U.S. Fish and Wildlife Service  
and others

## **Mohave County Weed Management Area**

### **Contact information**

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### **Mission and geographic scope**

The Mohave County Weed Management Area has only recently been proposed and is still just in the early planning and discussion stages. It potentially will cover Mohave County, south of the Grand Canyon. Once established, this WMA may have a different name than the one listed above.

### **Main species targeted**

Presently known weed problems include

- camelthorn (Mohave Valley)
- yellow starthistle (Wikieup area)
- Malta starthistle (Nothing area)
- Scotch thistle (Mohave County)
- jointed goatgrass (Kingman area)

Other noxious weed problems have been identified on the Hualapai Indian Reservation. None of the knapweeds have been reported, so far, in this portion of Mohave County.

### **Membership**

Potential partners and members may include

Arizona Department of Agriculture  
Arizona State Land Department  
Bureau of Land Management  
city and county agencies  
Hualapai Indian Reservation  
Natural Resource Conservation Districts  
Natural Resource Conservation Service  
University of Arizona, Cooperative Extension

## San Francisco Peaks Weed Management Area

### Contact information

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bgphillips@fs.fed.us	lmoser@fs.fed.us

### Mission or purpose

The San Francisco Peaks Weed Management Area (SFPWMA) is a cooperative movement of Flagstaff-based land management agencies funded, in part, through a grant from the National Fish and Wildlife Foundation's Pulling Together Initiative. Its mission is to protect our natural resources through the management of invasive weeds.

### Geographic scope

1,215,300 acres above the Mogollon rim surrounding the San Francisco Mountains:

- 107,000 acres of private land
- 965,700 acres of National Forest System land
- 98,000 acres of State land
- 2,600 acres of City land
- 42,000 acres of National Park Service land

### Main species targeted

The species of concern are knapweeds, starthistles, biennial thistles, leafy spurge, Mediterranean sage, camelthorn, whitetop, Dalmatian toadflax, jointed goatgrass, and cheatgrass.

### Activities and projects

The SFPWMA has received enough grants to fund a coordinator devoted to: prioritizing species, coordinating control efforts between agencies, assisting agencies in building noxious weed management programs, securing funding for the WMA, and organizing volunteer groups.

With sufficient staff and funding, the SFPWMA has been able to publish a color brochure for public education purposes entitled, "Noxious Weeds, A Growing Concern in Northern Arizona;" prepare species information sheets and action plans with sections on life history, impacts, and control methods (cultural, mechanical, biological, and chemical); and enter distribution maps of invasive weeds within the SFPWMA in the Southwest Exotics Mapping Project database.

At the same time, an integrated approach is being used to control Scotch thistle and yellow starthistle along a reach of the Río de Flag, east of Flagstaff. An Arizona State Land Department (ASLD) employee in Flagstaff received a grant for the project which includes the application of herbicide and hand grubbing. The Coconino National Forest, through the WMA grant, provided a six-person range crew for a week to complete much of the mechanical control. The city of Flagstaff also provided fire crews for mechanical control, burning yellow starthistle, and they contract out herbicide treatments when appropriate. The ASLD has established a monitoring transect and numerous photo points in the treatment area to monitor effectiveness.

The SFPWMA, under the Pulling Together Initiative, accomplished the specific project objectives in 2000-2001

- expanded the weed management area from 300,000 acres to 1,200,000 acres
- maintained the WMA coordinator part time
- hired additional range crew on the Coconino National Forest to inventory and control weeds throughout the WMA
- treated invasive weeds over 15,640 acres (largely due to ADOT's right-of-way treatments)
- encouraged and developed invasive species research projects
- expanded educational projects and resources with new partners

The SFPWMA continues to work toward its long-term goals of eradicating recently introduced invasive weeds and restoring native vegetation to protect wildlife, national parks, forest service lands, and private lands from being overrun by invasive exotic plants. In one year, the project partners have spent more than \$150,000 on invasive plant education, surveys, mapping, control actions, monitoring, and revegetation. The WMA has been able to establish baseline surveys over 1,000 acres never surveyed before, revisit 4,000 acres, and treat many high-risk populations before seed dispersal.

#### **Obstacles faced and overcome**

- *funding*: entered into a matching partnership grant
- *participation*: made presentations to city council, city manager, county board of supervisors, and county manager

#### **Future plans**

- explore possible Memoranda of Understanding
- encourage expansion of partners for weed management programs
- establish permanent funding

**Membership**

Arboretum at Flagstaff  
Arizona Department of Agriculture  
Arizona Department of Transportation  
Arizona State Lands Department  
City of Flagstaff (Parks and Street, Wildcat Sewage Plant, Fire Department)  
Coconino County  
cooperative volunteers  
Deaver Herbarium  
Diablo Trust  
Flagstaff Unified School District  
Grand Canyon Trust  
Lowell Observatory  
Museum of Northern Arizona  
National Park Service, Sunset Crater, Walnut Canyon, Wupatki National Monuments  
Northern Arizona University, College of Ecosystem Science and Management,  
Facilities Management  
Restored Landscapes, Native Plant and Seed Nursery  
The Nature Conservancy  
U.S. Forest Service, Coconino National Forest, Rocky Mountain Research Station  
U.S. Geological Survey, Biological Resources Division

## **Southern Utah-Northern Arizona Cooperative Weed Management Area**

L. D. Walker  
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Rob Grumbles  
Mohave County Extension Office  
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grumbles@ag.arizona.edu

### **Mission or purpose**

To bring together those responsible for weed management, in order to establish common objectives and facilitate effective treatment and management of weeds.

### **Geographic scope**

Southwest Utah and northwest Arizona

### **Main species you targeted**

State listed noxious weeds for both states

### **Activities and projects**

- treatment
- education and outreach

### **Accomplishments to date**

Effective outreach programs were completed and have treated weed infestations

### **Obstacles faced and overcome**

How to treat weeds north of the river when there are no state-licensed contractors

### **Future plans**

To keep on fighting the fight with all tools available

### **Membership**

Arizona Department of Transportation  
Bureau of Land Management  
counties  
Indian Tribes  
National Park Service  
Natural Resource Conservation Districts  
State of Arizona  
State of Utah  
University of Arizona, Cooperative Extension  
U.S. Forest Service  
Utah Wildlife Resources Department

## Sweet Resinbush and Karoo Bush Weed Management Area

### Contact information

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Kim McReynolds  
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### Mission or purpose

The Sweet Resinbush and Karoo Bush Weed Management Area is intended to bring together those with concerns for weed management within southern and central Arizona, to develop common management objectives, facilitate effective treatment and coordinate efforts with regard to sweet resinbush and Karoo bush in particular, and other noxious weeds as they occur.

Cooperators will jointly

- establish control priorities
- establish specific weed management objectives
- create treatment zones within the weed management area
- treat individual weed species and infestations
- coordinate the use of resources and manpower
- develop common inventory techniques and mapping
- manage designated noxious weeds in an integrated approach
- cooperate with other weed management areas
- add discussion items for yearly coordinated resource management meetings

### Geographic scope

This weed management area is not based geographically, but by species.

### Main species targeted

- Sweet resinbush
- Karoo bush

### Activities and projects

#### *Control*

- Helped efforts to add sweet resinbush to the Arizona Noxious Weed List as a restricted species
- coordinated and implemented eradication efforts with volunteer organizations at four sites
- developed a weed management plan

### *Education*

- developed and printed an informational brochure
- led workshops and field tours to increase awareness of noxious weed problem among the general public, land management agencies, scientific community, and state legislators
- supported an Arizona State legislator's drafting of a funding bill for control efforts
- developed an eight-page color newspaper insert that was distributed in 45,000 newspapers in Cochise, Graham, and Greenlee Counties and two papers in the Globe area
- currently developing a Web site; several pages about sweet resinbush are on the Coronado National Forest Web site

### *Research*

- conducted research on the effects of chemical, mechanical, and burning treatments
- conducted germination trials to determine seed bank viability

### **Obstacles faced and overcome**

The momentum has continued with this group. The largest obstacle is finding the time to work together, and coordinate activities, and this has not yet been overcome. The group wants to hire a coordinator to keep on top of all the activities, write progress reports, and take care of some administrative duties. The other obstacle is securing funding for actual on-the-ground control.

### **Future plans**

To apply for grants to do the on-the-ground control

### **Membership**

Arizona Department of Agriculture  
Arizona Game and Fish Department  
Arizona State Land Department  
Bureau of Land Management-Safford Field Office  
Bureau of Reclamation  
cities of Safford and Thatcher  
Coronado RC&D  
Desert Botanical Garden  
Gila Monster Watershed Council  
Gila Valley NRCD  
Graham County  
Greenlee County  
local ranchers and farmers  
University of Arizona, Cooperative Extension  
USDA Natural Resources Conservation Service  
U.S. Fish and Wildlife Service  
U.S. Forest Service, Coronado National Forest

## Tonto Weed Management Association

### Contact information

Chris Jones	Shawn Evans	Lufkin Hunt
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Globe, AZ 85501	Young, AZ 85554	Payson, AZ 85547
928.425.7179 (tel), 928.425.0265 (fax)	928.462.3131	928.468.8385
ckjones@ag.arizona.edu	tontowma@msn.com	

### Mission or purpose

To cooperatively develop common management objectives, facilitate effective treatment, and coordinate efforts to control or prevent the spread of weeds within the area through an informally organized team of individuals and organizations responsible for weed management

### Geographic scope

Gila County, some educational programs were given on the San Carlos Apache Reservation, but they were encouraged to form a separate WMA

### Main species targeted

- yellow starthistle
- diffuse knapweed
- Dalmation toadflax
- Malta starthistle
- jointed goatgrass

### Activities and projects

- regular planning meetings
- educational programs
- grant writing
- continuing education for members
- trial plots
- some literature and poster development

### Accomplishments to date

- mapped approximately 2,500 acres of weed infestation
- acquired a National Fish and Wildlife Foundation *Pulling Together* grant matching \$25,000
- treated over 500 acres of infested land
- trained approximately 20 volunteers to be certified pesticide applicators
- directed educational contact with over 300 county residents
- expanded from a primarily Young-based program to include the communities of Payson and recently, the Tonto Basin

**Obstacles faced and overcome**

- limited funding to operate: pursuing grants
- poor response from local public land agency: not yet resolved
- poor response from infested landowners: persisting with outreach efforts

**Future plans**

Continue searching for grant funding to maintain program efforts

**Membership**

Arizona Department of Agriculture  
Arizona Department of Transportation  
Arizona Game and Fish Department  
Arizona State Committee on Trails  
Arizona State Lands Department  
concerned public citizens and local ranchers  
Ducks Unlimited  
Gila County Cattle Growers Association  
High Country Gardeners  
Hohokam R&CD  
Payson Packers  
Rim Area Gardeners  
Rocky Mountain Elk Foundation  
Tonto Cattle Growers Association  
Tonto NRCD  
Tonto Travelers  
University of Arizona, Cooperative Extension  
USDA Natural Resource Conservation Service  
U.S. Forest Service  
Wildlife Foundation  
Young Town Council

## Tucson Mountain Weedwackers

### Contact information

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Doug Siegel  
Pima County  
Natural Resources, Parks and Recreation Division  
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520.883.8245

### Mission or purpose

To eradicate invasive exotics in the Tucson Mountains, and to educate people in the region about invasive species

### Geographic scope

Tucson Mountain Park and Saguaro National Park-West (eradication), Sonoran Desert (education)

### Main species targeted

- buffelgrass
- fountain grass

### Activities and projects

*Recon*: mapping and scouting out infestations and determining the extent of invasive populations

*“Rad”*: eradication efforts, pulling weeds

*Southwest Weed Attack Team (SWAT)*: enlisting volunteers with knowledge of plant identification are on call to evaluate and eradicate invasive infestations in Tucson Mountain Park and Saguaro National Park-West

### Accomplishments to date

- weeds have been eradicated in over 400 acres of park land, little re-infestation has occurred on those sites
- over 350 volunteers have participated since January 2000 and a “core” group of 90 volunteers regularly attend events

### Obstacles faced and overcome

- *Volunteers*: Volunteer recruitment and retention has been a major focus. To retain (and gain) volunteers: weed-pulling activities are kept to a short, enjoyable amount of time—not to exceed a few hours; food is always provided at the events; events are well-planned so volunteers get a sense of accomplishment and see their activities as effective; “big picture” information about accomplishments is shared with volunteers to build and

maintain morale and commitment to the group; and “rewards” such as free entrance to the Arizona-Sonora Desert Museum and free camping in Tucson Mountain Park are given to regular and committed volunteers.

- *Resources:* Resources are always short. To make resources go farther: volunteers bring food to events on a pot-luck basis and donations of tools, gloves, and bags are accepted from the county, parks, and the volunteers themselves. Collaboration has helped make resources stretch farther.

### **Future plans**

- search for grants for developing and printing education and outreach materials
- do more community outreach and expand activities to local neighborhoods
- work more on policy issues, such as getting buffelgrass listed on the State Noxious Weed List

### **Membership**

There is no official membership; all members are volunteers, and many are members of the Arizona-Sonora Desert Museum, the Native Plant Society, or live in local neighborhoods.

## Verde Valley Weed Management Area

### Contact information

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Clare Hydock  
U.S. Forest Service, Verde Ranger Station  
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Camp Verde, AZ 86022-0670  
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chydock@fs.fed.us

### Mission or purpose

To prevent the adverse economic effects and environmental degradation that results from the presence and spread of noxious weeds.

### Geographic scope

Mogollon Rim to the north; south to Cordes Junction; east to Fossil Creek; and west to Highway 69, bordering the San Francisco Peaks WMA on the north and the West Yavapai WMA to the west

### Main species targeted

Yellow starthistle and Russian knapweed are the main focus, but the WMA is concerned with all weeds in the region, including Dalmatian toadflax, hoary cress, and salt cedar.

### Activities and projects

Notices are sent to local papers to enlist volunteers to come pull weeds. Newspaper articles generally raise public awareness, and meeting in the field educate people about specific plants. A cooperative agreement among all agencies in the Verde Valley is being explored, so that weeds can be controlled collaboratively regardless of what property they are found on.

### Accomplishments to date

- getting newspaper articles published
- doing a 30 minute segment on the local cable access show
- bringing in new members
- expanding the mailing list
- meeting folks from other WMAs and taking advantage of their expertise

### Obstacles faced and overcome

- lack of interest and involvement from local community leaders: keeping them on the mailing list
- too many meetings or inconsistent meeting dates: the group decided to meet on a set day (3<sup>rd</sup> Thursday) of every other month and rotate locations in Camp Verde, Cottonwood, and Sedona; the group also meets in the field and does something proactive to learn about new plants.

**Future plans**

- work on a cooperative agreement
- get community representatives involved
- raise awareness

**Membership**

This is a loose organization with a core group of people, with additional people on the mailing list who never come to a meeting. Members include

Arizona Department of Agriculture

Arizona Department of Transportation

Arizona State Land Department

Arizona State Parks

private individuals

The Nature Conservancy

U.S. Forest Service, Coconino and Prescott National Forests

University of Arizona, Cooperative Extension

## West Yavapai Weed Management Area

### Contact information

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### Mission or purpose

To coordinate information and teach others about methods of control, monitoring, and planning

The West Yavapai Weed Management Area is composed of concerned citizens, agency personnel (state and federal), cities and towns, utility companies, and educational institutions. Educational workshops are conducted to teach the public about noxious weeds and their control.

### Geographic scope

Western half of Yavapai County, Arizona, excluding the Verde Valley

### Main species targeted

- hoary cress (whitetop)
- Russian knapweed
- spotted knapweed
- diffuse knapweed
- yellow starthistle
- Dalmatian toadflax
- Scotch thistle
- jointed goatgrass
- leafy spurge
- sweet resinbush
- Mediterranean sage

### Activities and projects

- field trips
- control effort coordination
- educational workshops

### Accomplishments to date

- a full-color brochure
- 3 all-day workshops
- several newspaper articles

**Obstacles faced and overcome**

Lack of funding: working on the missions stated above to achieve a common goal

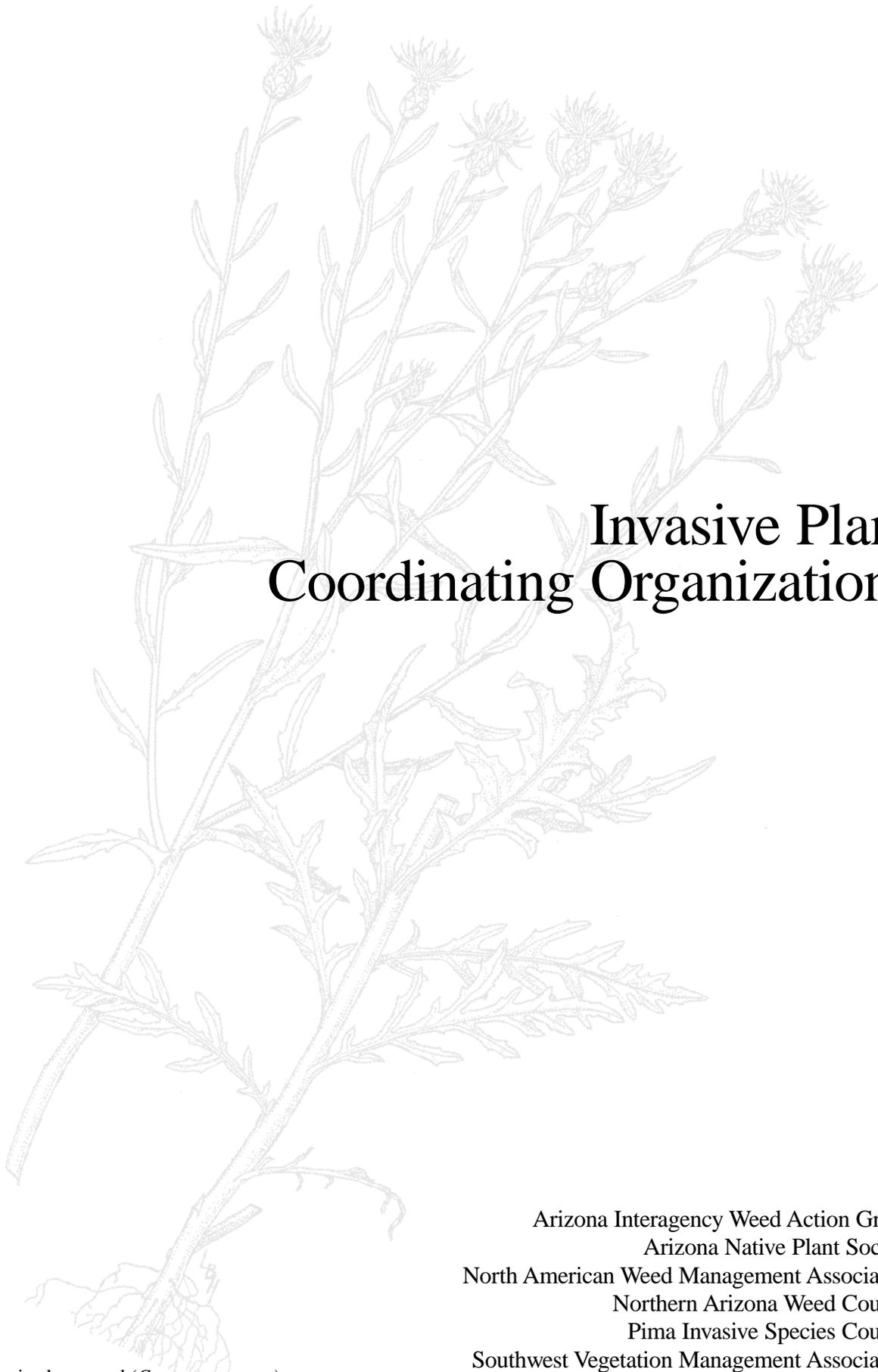
**Future plans**

To secure funding, if possible, to hire a coordinator and continue to fight weeds at the grassroots level

**Membership**

Arizona Department of Agriculture  
Arizona Department of Transportation  
Arizona Public Service  
Arizona State Land Department  
Chino Winds NRCD  
City of Prescott  
private citizens  
Town of Chino Valley  
Triangle Conservation District  
USDA Natural Resources Conservation Service  
U.S. Forest Service, Prescott National Forest  
University of Arizona, Cooperative Extension  
Western Yavapai Conservation Education Center  
Yavapai County Government





# Invasive Plant Coordinating Organizations

Arizona Interagency Weed Action Group  
Arizona Native Plant Society  
North American Weed Management Association  
Northern Arizona Weed Council  
Pima Invasive Species Council  
Southwest Vegetation Management Association

Russian knapweed (*Centaurea repens*)

## *Invasive Plant Coordinating Organizations* Overview

This section presents coordinating organizations that address invasive plant management. These organizations differ from weed management areas in that they generally function at a larger geographic scale, often have a more formal organizational structure, and work on overarching issues—such as promoting legislation affecting the regulation of invasive species, stimulating political will, and providing education and outreach to a wider area—rather than the on the grassroots work of weed management areas (WMAs).

The missions of these coordinating organizations include

- education and outreach
- publication of research findings
- conservation projects
- field trips
- information sharing and networking
- prevention measures
- advocacy
- policy, legislative, and regulatory influence

The scope of the following organizations detailed range from state and regional to national and international. The structure of the group varies. Many have a board of directors, some have formal non-governmental organization status, some have a single paid staff person, and some are strictly volunteer or rely heavily on volunteers.

The obstacles commonly cited among these groups are the same as those identified by WMAs: funding and member involvement. Many of these groups are too new to have experienced additional obstacles yet.

A few opportunities stand out. One is the need to coordinate to ensure that groups fill specific niches and not overlap. Another is the chance for these coordinating groups to provide greater support to the WMAs and land managers who are either a part of the larger organization or could benefit from their experience and programs.

## Arizona Interagency Weed Action Group

### Contact information

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### Mission or purpose

The purpose of the Arizona Interagency Weed Action Group (IWAG) is to identify and accomplish projects of interest and concern to all or most of the IWAG members; to facilitate actions of state and federal agencies to address invasive plant issues in Arizona; and to provide a vehicle by which these agencies can avoid duplicating efforts. The group is *project-oriented* rather than *process-oriented*.

### Organizational structure

IWAG is a loosely structured *ad hoc* group consisting of state and federal agency representatives who are involved with some aspect of invasive species management. The group decides together what activities to undertake. Coordination and communication is currently provided by Ed Northam and April Fletcher.

### Geographic scope

At this time, the group plans to emphasize activities in the southern part of Arizona, although there may be projects undertaken with state-wide, multi-agency application.

### Main species targeted

Primary emphasis is on invasive plants

### Activities and programs

The group plans to undertake projects that will further invasive weed control in the southern part of the state of Arizona.

### Accomplishments to date

Since the group is new, to date the primary accomplishment has been to identify and prioritize issues of mutual concern.

### Obstacles faced and overcome

To date, no particular obstacles—too new for that

### Membership

State and federal employees: weed management personnel, and others concerned with invasive species

# Arizona Native Plant Society

## Contact information

Barbara Skye, State President  
PO Box 41206  
Sun Station, AZ 85717  
bskye@desertmuseum.org

## Mission or purpose

The Arizona Native Plant Society (ANPS) is engaged in many activities from education about Arizona's native plants, to field trips, lectures, publications, and conservation.

## Organizational structure

The ANPS is a state-wide, registered, non-profit group with a board of directors and officers. Currently there is only one paid staff member who works as an administrator. The ANPS is run almost entirely by volunteers.

## Geographic scope

Arizona, with periodic activities and efforts with out-of-state organizations

## Main species targeted

Arizona's native plants, and efforts to monitor the spread of non-native invasive species

## Activities and programs

- regular chapter meetings
- field trips
- workshops
- volunteer programs
- educational publications
- state and chapter newsletters including *Plant Press*
- conservation

## Accomplishments to date

ANPS has been a major contributor to the establishment of the Ironwood Alliance, Tucson Mountain Weedwackers, Pima Invasive Species Council, and Sonoran Desert Conservation Plan.

## Obstacles faced and overcome

As with all volunteer groups, leadership varies with time. At this point, ANPS enjoys dynamic leadership.

## Membership

The Tucson chapter has about 800 members. Members include native plant enthusiasts and professional botanists and biologists.

## North American Weed Management Association

### Contact information

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### Mission or purpose

- represent “on-the-ground” weed managers and weed management issues
- educate Congress and federal agencies in Washington, D.C., about weed issues on the ground, making them more aware of the impacts of noxious weeds and challenges that weed managers face
- educate members on the many aspects of integrated weed management, new species, reclamation, and related issues.

### Organizational structure

There is a 10-member board of directors, a paid executive director, and several working committees. The North American Weed Management Association (NAWMA) produces a Web page and a newsletter. All board members and committee chairs are volunteers.

### Geographic scope

North America

### Main species targeted

All non-native plant species

### Activities and programs

- facilitating the Regional Weed Free Forage Program
- actively participating in the development of the National Mapping Standards and Guidelines
- helping to develop and implement the National Invasive Species Management Plan and continue to participate in the implementation of that plan
- the board travels to Washington each year to represent members in meetings with congressional representatives, federal agencies, and other national organizations that deal with land issues, such as The Nature Conservancy, National Beef Cattle Association, National Farm Bureau, Wool Growers Association, American Seed Trade Association, and others.

### Accomplishments to date

- increased funding for federal land management agencies for noxious weed control
- National Mapping Standards and Guidelines
- Regional Weed Free Forage Program

- several laws passed by Congress for weed management and another in committee at this time, “The Harmful Non-native Weed Management Act of 2001”

**Obstacles faced and overcome**

To increase membership and funding the association keeps talking to people and asking them to participate at the Annual Conference and become active members. NAWMA attends state and federal meetings and other association meetings.

**Membership**

Members are weed managers from across the United States, Canada, and (soon) Mexico. Members are county, state, and federal weed managers, private landowners, and special interest groups.

## Northern Arizona Weed Council

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### Mission or purpose

The Northern Arizona Weed Council (NAWC) works to protect biological diversity and promote healthy ecosystems by preventing the introduction and spread of invasive, non-native plants in northern Arizona. The council is a partnership to promote cooperation and coordination among public and private organizations and interested individuals.

### Organizational structure

The role of coordinator/facilitator rotates among participants, and there is no board of directors as the organizational structure is informal and handled under an MOU among organizations. A steering committee is composed of volunteers from a variety of agencies and organizations (see below). There is no paid staff, but representatives are covered by their agencies, organizations, or grants. There are currently three weed management areas that look to NAWC for direction, while operating semi-independently (San Francisco Peaks WMA, Verde Valley WMA, Western Yavapai WMA).

NAWC normally meets the first Wednesday of every month in Flagstaff. In early December 2000, the monthly meeting included pulling up yellow starthistle plants on state and city lands east of Flagstaff near the Río de Flag. In May 2001, NAWC members met in Oak Creek Canyon on U.S. Forest Service land to dig up a small population of Dalmation toadflax and to look at infestations of tree of heaven and Himalayan blackberry.

### Geographic scope

North-central Arizona, approximately from the south rim of the Grand Canyon to the Verde River

### Main species targeted

Invasive exotic plant species, categorized by priority of extent, the ability to control them, and how invasive they are; species on the state and federal regulated plant species lists.

### Activities and programs

Partners contribute entries to the SWEMP. Species action plans have been developed for over twenty species of local weeds. Posters and presentations have been made to city and county government officials, the general public, participants at technical conferences, elementary and high schools, and neighborhood groups. In conjunction with the SFPWMA, brochures on local weed problems have been made available.

Weed control efforts by volunteers and local business owners have been coordinated.

**Accomplishments to date**

NAWC provides a monthly forum for exchange of ideas and accomplishments in various invasive weed projects in northern Arizona. It also provides educational opportunities for individuals and local agencies. NAWC has helped form three local WMAs and two more are in the development stage. The major role of NAWC has been to coordinate efforts of a wide variety of organizations, identify priority species, institute control measures, and provide outreach and education materials to a wider audience on noxious weeds.

**Obstacles faced and overcome**

Getting a paid, part-time coordinator for the SFPWMA helped to gain a continuity of efforts and purpose since other partners have other responsibilities. Grants last only for one year, and maintaining funding has been a challenge. Administering grants has taken a significant portion of the WMA coordinator's time, so permanent funding would really help. For the most part, Arizona is experiencing the early entrée of many weed species. As a result, awareness of the gravity of the problem is low and needs to be increased among politicians, land managers, and the public.

**Membership**

- Arizona Department of Agriculture
- Arizona Department of Transportation
- Arizona State Land Department
- City of Flagstaff
- Coconino County
- National Park Service
- Northern Arizona University
- The Nature Conservancy
- U.S. Forest Service, Coconino, Kaibab, and Prescott National Forests
- U.S. Geological Survey, Biological Research Division, Colorado Plateau Field Station

## **Pima Invasive Species Council**

### **Contact information**

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Water Resources Research Council  
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### **Mission or purpose**

The Pima Invasive Species Council (PISC) is a newly formed group whose purpose is to promote education about all non-native invasive species, form working alliances, promote invasive species management programs, and meet regularly to share information about exotics.

### **Organizational structure**

At this point, PISC is an unofficial alliance of volunteers. The group is examining the possibility of non-profit status. Current members want the group to be very pro-active in education and establishing invasive management programs throughout the county.

### **Geographic scope**

Mainly southern Arizona, Pima County

### **Main species targeted**

All problematic, and potentially problematic, non-native invasive species; current efforts focus on invasive plants and aquatic vertebrates

### **Activities and programs**

PISC is just getting started, but wants to be a major force for exotics management in Pima County.

### **Accomplishments to date**

PISC has made major efforts to get buffelgrass and fountain grass listed on the State Noxious Weed List and to create cooperative management alliances.

### **Obstacles faced and overcome**

None yet

## **Membership**

PISC has approximately 45 members, with several other people interested in joining. Members include

- Arizona Department of Agriculture
- Arizona Game and Fish Department
- Arizona Native Plant Society
- Arizona-Sonora Desert Museum
- Arizona State Land Department
- Desert Watch
- Pima County Flood Control
- Pima County Parks Department
- Sonoran Arthropod Studies Institute
- Sonoran Institute
- SWCA Environmental Consultants
- The Nature Conservancy
- Tohono O'odham Nation
- Tucson Audubon Society
- University of Arizona, Cooperative Extension

## Southwest Vegetation Management Association

### Contact information

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### Mission or purpose

To conserve and protect natural resources by providing leadership, education, regulatory direction, and professional and environmental awareness and by promoting integrated vegetation management.

### Organizational structure

The Southwest Vegetation Management Association (SWVMA) is made up of unpaid volunteers that have elected officers and advisory board members. The president and board assume a leadership role and meet monthly. SWVMA has working committees that are involved in addressing problems or issues confronting the members as land managers. These include:

- The *Education Committee* is currently establishing a newsletter, a web page, and creating a weed identification presentation. One of the members conducts a noxious weed awareness presentation for school children in Young, Arizona. The SWVMA is currently attempting to expand this statewide and to create similar ones for other public access.
- The *Legislative Committee* acts in an educational role to the state legislature in providing biological information. SWVMA is also trying to convince the legislature to add species to the current state noxious weed list. Members have called for support in placing sweet resinbush and Karoo bush on bills with the legislature. Dr. Ed Northam has called upon the membership for support in adding 3 species including Malta starthistle, Sahara mustard, and buffelgrass to the current state list.
- The *Agenda Committee* is responsible for setting up the annual conference with speakers and items for the field trip. This group locates experts and professionals to help educate members on problem-solving techniques and current developments in managing invasive species.
- The *Special Projects/Issues Committee* is currently looking at a state certified weed free seed and hay program. There is an interest in developing a certification program in rangeland noxious weed management.

The SWVMA is also active in supporting weed management areas. The board has been involved in providing input on management techniques, locating suppliers of equipment and herbicides, and in helping to identify funding.

**Current board members**

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**Current advisory board members**

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### **Geographic scope**

The group concentrates its efforts on a state-wide basis in Arizona, but has members from New Mexico, Utah, and California. Since weeds respect no boundaries, the SWVMA realizes it must cooperate with other states in the border areas. Neighboring states can share their knowledge about other invading species they are confronted with that will soon appear in Arizona.

### **Species targeted**

The emphasis is invasive plant species with listed noxious weeds being of primary importance, but there are a number of native plants that also pose problems because of their invasive nature.

### **Activities and programs**

The main focus is the annual conference. The SWVMA provides testing and certification in pesticide application. The conference also provides credits for the annual license requirements. Speakers and presenters are provided to educate and share their experience in methods and management techniques of noxious weeds and invasive plants.

The board helped write a grant proposal this spring for creation of, and seed money for, WMAs in Arizona and New Mexico. One of the more important goals is to foster cooperation and sharing resources between state and federal agencies and private individuals or companies for the management and control of invasive species.

### **Accomplishments to date**

- this year will be the fourth annual conference
- publication of a noxious weed handbook for the state of Arizona, available to anyone
- a state noxious weed calendar, available at the conference
- a state noxious weed plan to be submitted to the state legislature
- an electronic newsletter, which will become a quarterly publication
- a web page should be up in July, that includes a question/answer page or chat room for members to share problems and solutions or gather information from other members
- a focus group is being formed to help advise the state legislature on the noxious weed issues, attempts to date have been impromptu mail in responses
- the board helped write a grant this spring for creation of WMAs in New Mexico and Arizona to control invasive species

### **Obstacles faced and overcome**

The major obstacle has been member involvement, or a lack thereof. The driving force has been the past treasurer and secretary and is changing now with strong leadership of the president and creation of a more committed board with a leadership role. The newsletter has helped to keep members involved and updated. The web page is hoped to further this contact and to help members share their experiences and expertise.

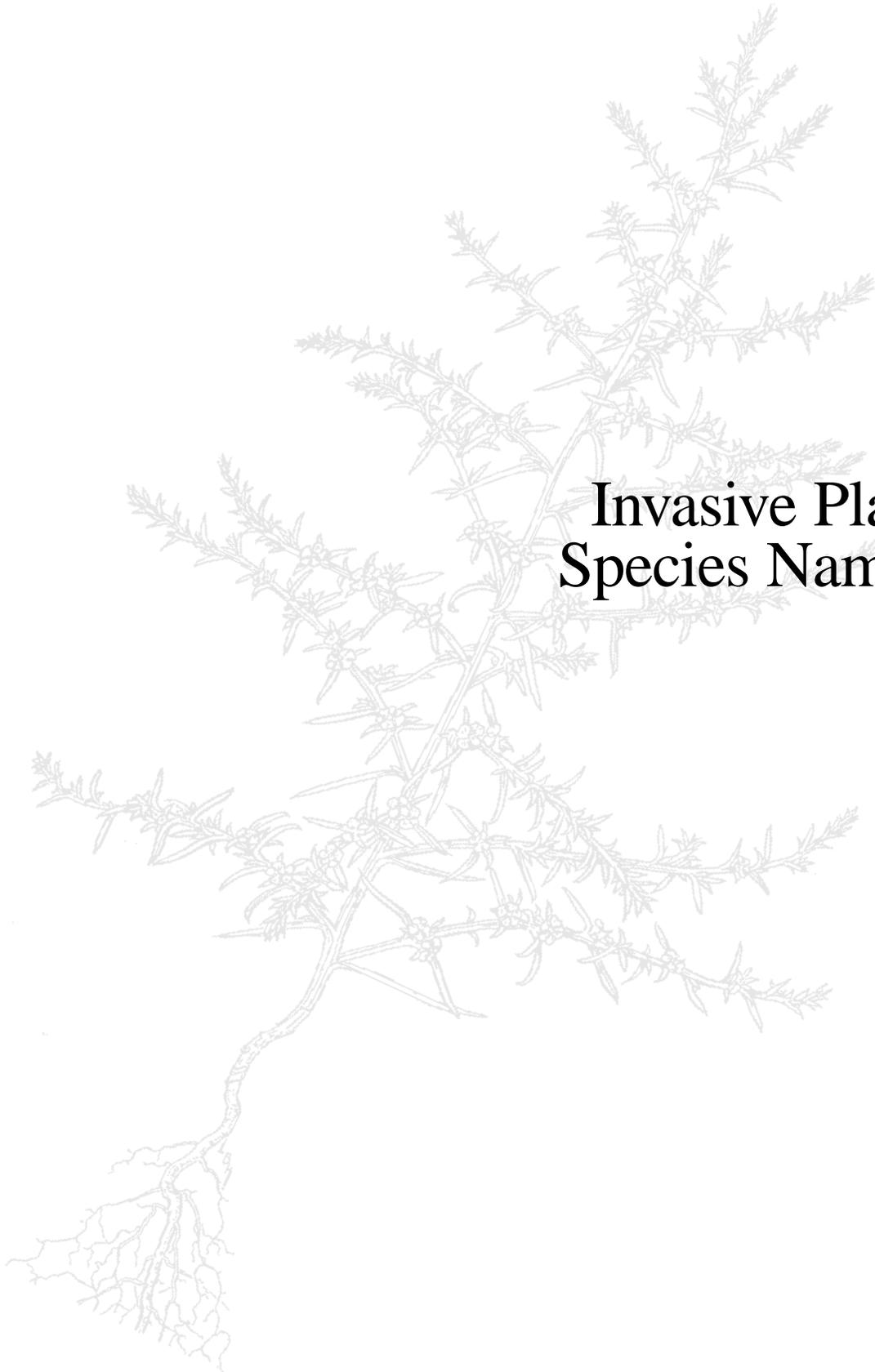
## **Membership**

SWVMA was created to fill the role of providing information to those on the ground. There is information available for researchers, or from chemical company representatives, but that information does not reach the managerial level or below. Members were recruited at all levels of knowledge and experience, and an effort was made to share that information on a working level through a conference format. Those efforts have now been expanded. Membership has been a problem, as the founders set the SWVMA up with membership status dependant on attendance of the annual conference. This confusion will be eliminated this year with changes to the by-laws, and a membership fee separate from registration fees.

### Members include

- Arizona Department of Transportation
- Arizona Game and Fish Department
- Arizona State Land Department
- Arizona State University professors
- Bureau of Indian Affairs and Indian Tribes
- Bureau of Land Management
- chemical company representatives and vendors
- National Park Service
- Natural Resources Conservation Districts
- Natural Resources Conservation Service
- private individuals (landowners)
- University of Arizona professors
- U.S. Fish and Wildlife Service
- U.S. Forest Service





# Invasive Plant Species Names

Russian thistle (*Salsola tragus*)

## Appendix A: Invasive Plant Species Common and Scientific Names

<u>Common Name</u>	<u>Scientific Name(s)</u>
Arabian grass (Arabian schismus)	<i>Schismus arabicus</i>
Bermuda grass	<i>Cynodon dactylon</i>
blue panic (blue panicum)	<i>Panicum antidotale</i>
buffelgrass	<i>Pennisetum ciliare</i> (= <i>Cenchrus ciliaris</i> )
bull thistle	<i>Cirsium vulgare</i>
camelthorn	<i>Alhagi maurorum</i> (= <i>A. pseudalhagi</i> )
camphor weed	<i>Heterotheca subaxillaris</i>
Canada thistle	<i>Cirsium arvense</i>
cheatgrass	<i>Bromus tectorum</i>
Dalmation toadflax	<i>Linaria dalmatica dalmatica</i> (= <i>L. genistifolia dalmatica</i> )
desert broom	<i>Baccharis sarothroides</i>
diffuse knapweed	<i>Centaurea diffusa</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
fountain grass (crimson fountain grass)	<i>Pennisetum setaceum</i>
giant reed	<i>Arundo donax</i>
giant salvinia	<i>Salvinia molesta</i>
Himalayan blackberry	<i>Rubus discolor</i>
hoary cress (whiteweed)	<i>Cardaria draba</i>
houndstongue	<i>Hieracium cynoglossoides</i>
Johnson grass	<i>Sorghum halepense</i>
jointed goatgrass	<i>Aegilops cylindrical</i>
Karoo bush	<i>Pentzia incana</i>
leafy spurge	<i>Euphorbia esula</i>
Lehmann lovegrass	<i>Eragrostis lehmanniana</i>
London rocket	<i>Sisymbrium irio</i>
Malta starthistle	<i>Centaurea melitensis</i>
Mediterranean grass	<i>Schismus barbatus</i>
Mediterranean sage	<i>Salvia aethiopsis</i>
mullein	<i>Verbascum</i> spp.
musk thistle	<i>Carduus nutans</i>
phragmites	<i>Phragmites communis</i>
puncture vine	<i>Tribulus terrestris</i>
purple loosestrife	<i>Lythrum salicaria</i>
red brome	<i>Bromus rubens</i> (= <i>B. madritensis rubens</i> )
Russian knapweed	<i>Acroptilon repens</i> (= <i>Centaurea repens</i> )
Russian olive	<i>Elaeagnus angustifolia</i>
Russian thistle (tumbleweed)	<i>Salsola tragus</i> (= <i>S. australis</i> , <i>S. iberica</i> )
Sahara mustard (African mustard)	<i>Brassica tournefortii</i>
salt cedar (tamarisk)	<i>Tamarix ramosissima</i>
Scotch thistle	<i>Onopordum acanthium</i>
Siberian elm	<i>Ulmus pumila</i>
spiny naiad	<i>Najas marina</i>

## Appendix A: *Continued*

<u>Common Name</u>	<u>Scientific Name(s)</u>
spotted knapweed	<i>Centaurea biebersteinii</i> (= <i>Acosta maculosa</i> , <i>C. maculosa</i> )
sweet clover	<i>Melilotus</i> spp.
sweet resinbush	<i>Euryops subcarnosus vulgaris</i>
teasel	<i>Dipsacus</i> spp.
Texas blueweed	<i>Helianthus ciliaris</i>
tree of heaven	<i>Ailanthus altissima</i>
water primrose	<i>Ludwigia peploides</i>
wild barley	<i>Hordeum marinum gussonianum</i> (= <i>H. hystrix</i> )
yellow starthistle	<i>Centaurea solstitialis</i>



# Resource Directory

Fountain grass (*Pennisetum setaceum*)

## Appendix B: Resource Directory

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## Appendix B: *Continued*

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