



# STEMMING THE INVASIVE TIDE

**Forest Service Strategy for Noxious and Nonnative  
Invasive Plant Management**





United States  
Department  
of Agriculture

Forest  
Service

Washington Office

14th & Independence SW  
P.O. Box 96090  
Washington, DC 20090-6090

SEP 25 1998

The Forest Service Mission is to caring for the land and serving people. To implement this mission, we have developed a Natural Resource Agenda which has clearly articulated what our natural resource priorities are, including maintaining and restoring watershed health, and sustaining forest and rangeland ecosystems. The problem of noxious weeds and nonnative invasive species threatens every aspect of ecosystem health and productivity, in forests and on rangelands, on public and on private lands. The increasingly devastating effects include reducing biological diversity, impacting threatened and endangered species and wildlife habitat, modifying vegetative seral stages, changing fire and nutrient cycles, and degrading soil structure.

I am pleased to introduce the USDA Forest Service Strategy for Noxious Weed and Nonnative Invasive Plants. This strategy provides a roadmap into the future for preventing and controlling the spread of noxious weeds and nonnative invasive plants. By crossing disciplines and deputy areas, we can bring our considerable resources and expertise to bear on this problem. By institutionalizing the noxious weed issues in all of our program and policy decisions, we can provide a consistent and cooperative direction within the Forest Service.

I consider one of our greatest assets to be our employees in the field. I know you are ready and willing to put your expertise and experience to work in tackling this devastating problem. Whether conducting research, providing advice and expertise, or doing on-the-ground control, I want to assure you of my support for their continuing efforts. Our employees and partners, more than anyone, are on the front lines and realize daily what is at stake if we lose this battle. You have already begun implementing the concepts and objectives of this strategy. In recognizing their outstanding work, we have highlighted on-the-ground case studies of cooperative efforts already underway. In the future, I know we will be hearing of many more excellent examples of imaginative partnerships and innovative approaches which will help us steadily win this battle.

Sincerely,

A handwritten signature in black ink that reads "Mike Dombek". The signature is written in a cursive, flowing style.

MIKE DOMBECK  
Chief

# CONTENTS

<b>INTRODUCTION</b> .....	1
<b>CURRENT DIRECTION</b> .....	2
<i>Feature: The Sheyenne National Grassland</i> .....	2
<i>Feature: Hawaii</i> .....	5
<i>Feature: Noxious Weed-Free Forage</i> .....	7
<b>PROGRAM DIRECTION</b> .....	8
<i>Feature: Caribou and Sawtooth National Forests</i> .....	9
<b>I. PREVENTION AND EDUCATION</b> .....	10
<i>Feature: Siuslaw National Forest</i> .....	10
<i>Feature: Nez Perce National Forest</i> .....	13
<b>II. CONTROL</b> .....	14
<i>Feature: Medicine Bow-Routt National Forest</i> .....	15
<b>III. INVENTORY, MAPPING, AND MONITORING</b> .....	16
<i>Feature: Midewin National Tallgrass Prairie</i> .....	17
<i>Feature: Los Padres and Stanislaus National Forests</i> .....	18
<b>IV. RESEARCH</b> .....	20
<i>Feature: Biological Control</i> .....	20
<b>V. ADMINISTRATION AND PLANNING</b> .....	22
<i>Feature: Ocala National Forest</i> .....	23
<i>Feature: Lincoln National Forest</i> .....	25
Interdepartmental USDA Activities .....	26
Cooperation With Other Federal Agencies .....	26
Non-Federal Partners and Cooperators .....	27
Forest Service Noxious Weed Coordinators .....	28
Forest Service Research Contacts .....	30
Acknowledgments .....	31



# INTRODUCTION

Noxious weeds and invasive plant species pose an increasing threat to native ecosystems, croplands, and other plant communities throughout the United States. While weeds have long been recognized as a problem for agriculture, the potential impact to other plant communities, including wildlands, is receiving greater attention.

There are an estimated 2,000 invasive and noxious weed species already established in the United States. Escalating worldwide trade and travel will only increase the risk of further invasions. All ecosystems—urban, suburban and rural, including wildlands, rangelands, forests, riparian areas, and wetlands—are vulnerable to invasion.

Experience and research have shown that invasive and noxious weeds can no longer be considered a problem only on disturbed sites. Noxious and invasive plant species have become established within relatively undisturbed ecosystems, including entire ecosystems such as the Florida Everglades. Noxious weeds pose an increasing threat to the integrity of wildland ecosystems, including specially designated areas such as wilderness and research natural areas.

On Federal lands in the Western United States, it is estimated that weeds occur on more than 17 million acres, with similar infestations occurring in Canada and Mexico. Good estimates are not available for the Eastern United States. On National Forest System (NFS) lands, an estimated 6–7 million acres are currently infested and potentially increasing at a rate of 8 to 12 percent per year. The noxious weed situation in the United States has been described by many as a biological disaster, “an explosion in slow motion” (Wyoming Department of Agriculture).



## NOXIOUS WEED STRATEGY

# CURRENT DIRECTION

The Forest Service (FS) is the largest land-management agency within the United States Department of Agriculture (USDA), managing 191 million acres of national forests and grasslands. The FS has the lead responsibility for noxious weed coordination for the Department under the authority contained in the Noxious Weed Act of 1974, the Hawaii Tropical Forest Recovery Act, and the USDA Policy 9500-10. Under this authority, the FS developed the USDA Policy in 1990 and policy direction for the FS in 1991.

FS policy was revised in 1995 (FSM 2080) to include new standards and refined direction for integrated pest management (IPM). The revised policy emphasizes the importance of integrating noxious weed management in ecosystem analysis, assessment, and forest planning. The policy further emphasizes the importance of coordinated noxious weed management through cooperation with other agencies, State and local governments, and private landowners.

Because the FS policy definition encompasses invasive, aggressive, or harmful nonindigenous or exotic plant species, this report hereafter uses the term “noxious weeds” to include all variations included in the definition. The FS policy defines noxious weeds as—

those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease and being native or new to or not common to the United States or parts thereof. (FSM 2080)

Three Deputy Chief areas of the FS have responsibilities for different aspects of noxious weeds: Research, State and Private Forestry (S&PF), and the NFS. The NFS has responsibility to prevent, control, and eradicate noxious weeds in 156 national forests and 20 national grasslands. To achieve this goal, the administrative units of NFS work in conjunction with State and local governments and private landowners for the common purpose of noxious weed management across jurisdictional boundaries.

## NOXIOUS WEED CONTROL...

# THE SHEYENNE NATIONAL GRASSLAND

Approximately 11,000 acres of leafy spurge on the 70,000-acre Sheyenne National Grassland in North Dakota caused grassland managers to turn to an IPM strategy to deal with the infestation. While a full complement of management tools has been employed—including biocontrol, herbicides, and burning—the grazing of long-haired Angora goats provides a unique twist to the successful leafy spurge control program. Grassland managers’ observations and North Dakota State University research findings indicate that it is the combination of treatments that has proven most effective in combating leafy spurge in the national grassland.

The North Dakota Department of Agriculture’s Weed Innovation Network helped match the grassland’s need with the opportunity for goat owners throughout the State to expand their operations.



*Closeup of *Aphthona nigriscutis*, a biocontrol agent, on leafy spurge. Photo by R. D. Richard, APHIS.*



*Angora goats grazing on leafy spurge. Photo by Bryan Stotts, USDA-FS.*

The grassland's goat-grazing program involves two herds of Angora and Angora-cross goats, with 1,200 animals in each herd. Under the watchful eyes of two dedicated herders, goats graze on designated spurge patches during the day and at night are returned to movable corrals. The use of herders, dogs, and corrals allows grassland managers to target specific areas for grazing, thereby reducing or eliminating impacts to sensitive areas like aspen/oak woodlands, or threatened species like the western prairie fringed orchid. In fact, the grassland's herders have been trained to identify and inventory orchids they encounter, thus adding to the species' information base.

After 5 years, managers have observed a reduction in stem densities of spurge patches. This reduction allows livestock forage plants to become reestablished.



*National grassland staff and grazing association members collecting biocontrol agents.*

The Sheyenne Valley Grazing Association is a key partner in successful leafy spurge control efforts on the grassland. The grazing association has participated in a 50–50 cost-share grant to cover both the herbicide and goat-grazing program. Grazing permittees also pay additional money for herbicide treatments beyond what is required in the grant. As a reflection of their personal commitment to furthering IPM efforts on the Sheyenne National Grassland, association members have also contributed many workdays to the collection and distribution of biocontrol insects.

# CURRENT DIRECTION

The primary emphasis of FS Research has been in the development of biological controls. The research program is concentrated in Bozeman, Montana, and Hilo, Hawaii, operating in cooperation with other State and Federal agencies and universities. FS Research works in conjunction with the USDA Agricultural Research Service (ARS) weed control project. FS Research augments the ARS effort by concentrating on sites and ecosystems common to FS lands.

Weed ecology is also a component of forest and rangeland ecology research for the Western Forest and Range Experiment Stations. Studies are ongoing on germination rates and life cycles of noxious weeds, on restoration methods for areas infested with weeds, and on the use of burning, grazing, and fertilization as alternative treatments to pesticide use.

Within State and Private Forestry, Forest Health Protection (FHP) has historically provided technical support and assistance in the pesticide and integrated pest management programs and now has

begun to provide field units with entomological and pathological technical assistance for noxious weeds, including biological control. Technical assistance is also provided to the various State Foresters and private cooperators, and FHP assists with forest health monitoring. In Hawaii, FHP staff responsibilities now include some financial support and assistance in treating noxious weeds.

FHP is responsible for reporting all pesticide use in the annual *Report of the Forest Service* to Congress. FHP participates in the National Agricultural Pesticide Impact Assessment Program (NAPIAP), which provides the necessary research for potential data gaps for pesticides currently registered with the Environmental Protection Agency. FHP has prepared and is currently updating pesticide background statements and risk assessments for pesticides commonly used in noxious weed control. These risk assessments are used to analyze and determine the potential impacts of pesticide use, such as potential adverse effects on health and safety, on NFS lands.



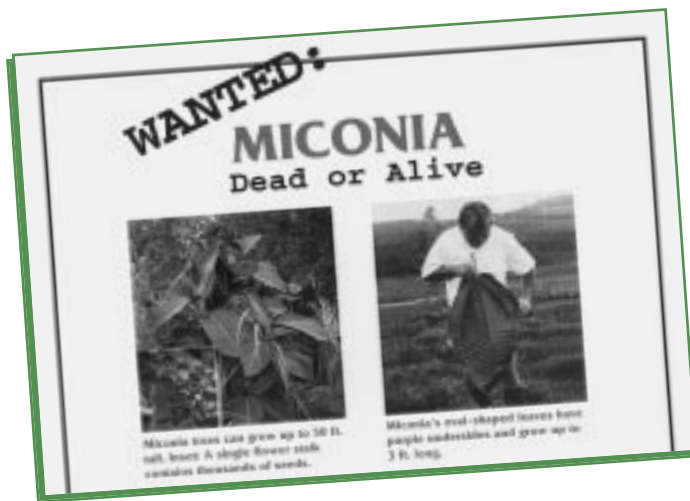
*Biocontrol research for kudzu, a serious problem species in the Southeastern United States, includes cooperators in China and FHP test plots at the Savannah River Institute, North Carolina.*



## NOXIOUS WEED RESEARCH...

### HAWAII

Hawaiian ecosystems are especially vulnerable to adverse impacts from introduced species. In fact, the main threat to Hawaii's surviving native species and natural communities is considered to be the destructive effect of invasive introduced species. To translate research data into successful, on-the-ground weed control methodologies, the FS's Institute of Pacific Islands Forestry Alien Species Team, based at Hilo, Hawaii, combines its basic research on the resiliency of Hawaii's ecosystems in the face of invasive alien species with technology transfer.



FS Research, through the work of the Institute of Pacific Islands Forestry, expands its research and management program to tackle alien species problems. Biological control research programs are placing more emphasis on the detailed, pre-release monitoring of target weeds and post-release assessment of the impact of control agents. Investigations have been started on the dynamics of weed invasions and their impacts on forest structure and processes. As part of the Alien Species Team, the FHP program coordinates and manages weed control programs to increase the effectiveness and efficiency of statewide forest weed control.

One such program is Operation Miconia. *Miconia calvescens* is an invasive tree species which forms interlocking, closed canopies that can displace

native forests by overtopping and shading out existing trees and plants. Miconia is shallow rooted and susceptible to being blown down in windstorms and causing significant risks to watersheds, as has occurred in Tahiti, where it is a major problem. A statewide collaborative effort, Operation Miconia was kicked off in 1996 by Governor Ben Caeyetano to inform the public about the potential impacts of *Miconia* and to coordinate control efforts throughout the State.

Approximately 10,000 acres on the island of Hawaii are infested with *Miconia*. Operation Miconia's control and eradication efforts on the Big Island are supervised by FHP staff on the Alien Species Team and are funded through a variety of sources, including National Fish and Wildlife Foundation "Pulling Together" cost-share grants; County of Hawaii funds; in-kind contributions from the State of Hawaii, Division of Forestry and Wildlife and Department of Agriculture; and contributions from the Campbell Estate.

The Big Island's six-member control team starts its operations at the outside edges of infestations and works toward the species' "epicenter," located near the Hamakua coast. The team uses a combination of pulling-by-hand and chemical treatments. It is also testing various chemical application techniques to determine the most effective methods to use in very rugged country. In addition, Operation Miconia uses satellite and computer technology to locate and map infestations, and then disseminates this information through the Hawaii Ecosystems at Risk Project, University of Hawaii, Department of Botany.

Since the beginning of Operation Miconia, more than 180,000 acres have been surveyed and approximately 700 acres have been treated. Some 2,000 mature or flowering plants have been killed, and 38,000 seedlings have been destroyed. However, since seeds can remain viable in the soil for up to 6 years, continued vigilance is needed in treated areas to control the emergence of new plants. Current projections indicate that *Miconia* control activities are required for another 10 to 15 years to eradicate the last flowering plants and to control seedlings.

# CURRENT DIRECTION

Management of the noxious weed program has been delegated to the Director of Range Management within NFS. Until 1995, the Range Management budget included a budget line item for noxious weed activity, with a corresponding Management Attainment Report target for number of acres treated.

However, with the reorganization of the budget in 1995, the line item was consolidated into the general range budget and some activities previously covered in range, such as inventory, were moved to the Ecosystem Management budget. This created confusion regarding sources of funding for weed activities and prompted a clarification letter by the Chief. The Chief's letter stated that any resource area that engages in ground-disturbing activities could use its funds for noxious weed activities associated with the planned ground-disturbing activity. A management target for noxious weeds was retained.

The FS's approach to the growing problem of noxious weeds has varied. Noxious weed concerns and activities have historically been based at the regional, forest, and district levels, under the umbrella of national policy. Initiatives and control programs are developed and implemented at this level often independently of other administrative units. Some regions have had active programs since the early 1970's, working closely with State and local officials on a consolidated noxious weed approach. Other regions are in the process of developing a strategy.

The FS has often played a key role at the local, county, and ranger district level. In many rural communities, the FS is a valuable resource, providing the necessary scientific expertise and organizational skills to assist county weed boards, conservation districts, and other partners in developing weed plans and applying for grants. One FS program has provided a market for a new agricultural specialty product: weed-free forage.

Some examples of programs and initiatives developed by local FS units include the following:

- ♥ Requiring State-certified weed-free forage for pack animals on NFS lands.
- ♥ Requiring cleaning of equipment prior to entering NFS lands.
- ♥ Requiring State-certified weed-free straw for construction and rehabilitation efforts such as road building, fire rehabilitation, watershed restoration, riparian restoration, and minerals reclamation projects.
- ♥ Requiring weed-free gravel for use in road building.
- ♥ Requiring airports and landing areas used in fire control to be weed-free.
- ♥ Working with lumber mills to have weed-free mill sites.
- ♥ Cooperating with State, local, and interested partners in developing educational materials and training courses.
- ♥ Cooperating on interagency, multi-State, and multijurisdictional noxious weed management plans (for example, the Greater Yellowstone Area Weed Management Plan).
- ♥ Working with local highway departments and county road crews to cooperatively spray road rights-of-way across jurisdictional boundaries.
- ♥ Working cooperatively with ARS and State researchers by providing secure research sites for the release of biological control agents on NFS lands.
- ♥ Working cooperatively with Animal and Plant Health Inspection Service (APHIS) and State weed associations by providing secure insectary sites for mass rearing of biological control insects.
- ♥ Considering the potential effects of FS actions on noxious weeds, using mitigation measures in control and project design.

## NOXIOUS WEED PREVENTION AND EDUCATION...

# NOXIOUS WEED-FREE FORAGE

In the early 1980's, FS staff recognized that some of the noxious weed species becoming established at trailheads, at campsites, and along trails were directly attributable to the use of livestock feed infested with noxious weed seeds. Some individual forests in Montana and Wyoming instituted requirements that only noxious weed-free forage be used on those forests. By the early 1990's, the Forest Service and the Utah Department of Agriculture formed a partnership that led to the development of the Nation's first statewide noxious weed-free forage certification process and to the requirement that only noxious weed-free forage be used on national forests in Utah.

Forest Service staff throughout the Western States are convinced this prevention effort is a key component in their work to slow the spread of noxious weeds on national forests. Some national forests tested a similar noxious weed-free feed requirement in wilderness or other sensitive areas before going to statewide requirements. Noxious weed-free feed is now required on national forests in Montana, Idaho, Wyoming, Colorado, and Utah. Efforts are currently underway in California, Nevada, and North Dakota for the Forest Service

and State agriculture offices to develop a similar certification process and use requirement on national forest lands.

The requirement to use only noxious weed-free feed on national forests is authorized through "closure orders," which can be legally enforced. Under a typical noxious weed-free feed program, the involved State is responsible for running the certification process through local agricultural offices. A Noxious Weed-Free Forage Producers List is published by States with closures on national forests so the public can quickly locate a source for noxious weed-free feed in their area. National forest offices help distribute the Producers List to national forest users.

In the five Western States where noxious weed-free feed is required, Forest Service staff participate in public information campaigns about noxious weed problems on public lands caused by the use of infested feed. These campaigns often focus on hunters by publishing advisories in State hunting regulations and by visiting hunters in the field and at check stations. These actions ensure that hunters are aware of noxious weed-free feed requirements if they plan to hunt with stock on the national forest.



# NOXIOUS WEED STRATEGY

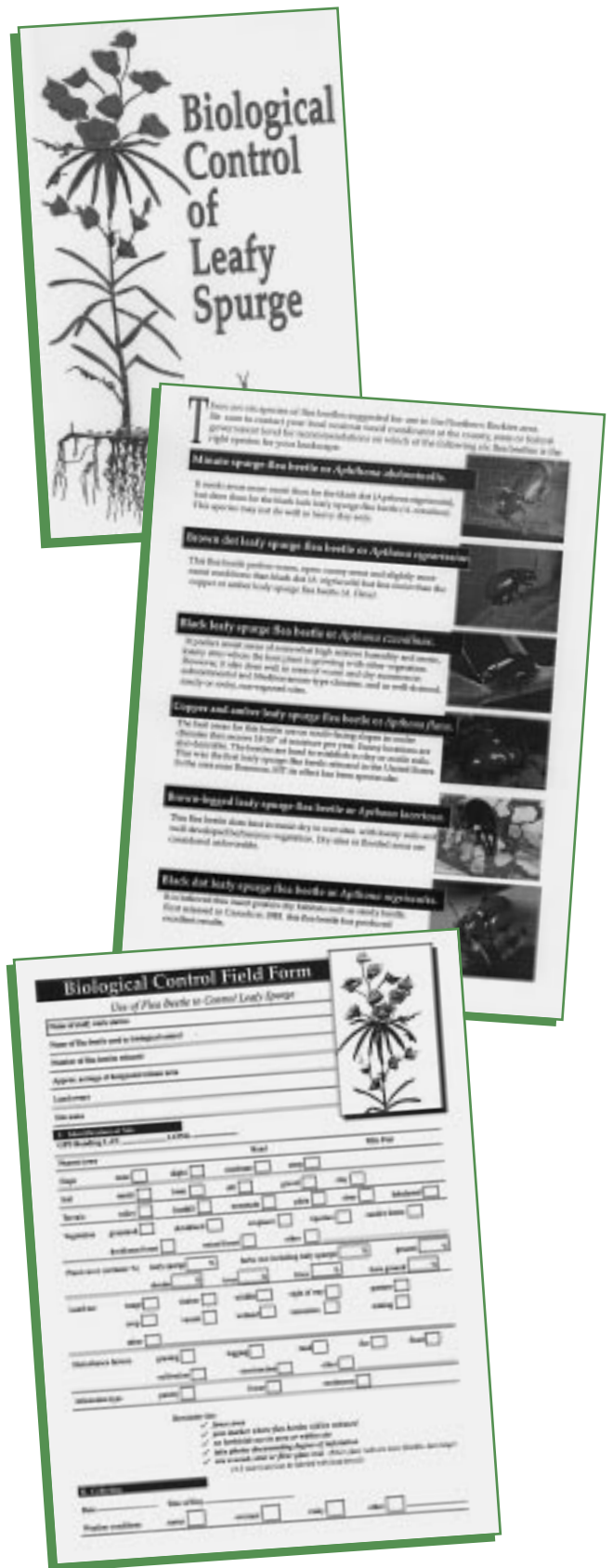
## PROGRAM DIRECTION

Four primary goals have been identified for the noxious weed program.

- ♥ Increase the understanding and awareness of noxious weeds and the adverse effects they have on wildland ecosystems.
- ♥ Develop and promote implementation of a consistent IPM noxious weed program as a high priority at all levels of the agency.
- ♥ Institutionalize consideration of noxious weeds in planning and project analysis.
- ♥ Develop strong partnerships and cooperation with private landowners, county governments, State Foresters, State and Federal agencies, extension services, universities, and the research community for a consolidated united approach.

A Forest Service model noxious weed program incorporates currently successful elements from the NFS, S&PF, and Research. All natural resource areas are responsible for cooperation in noxious weed programs and activities relating to their staff areas. Such a program requires the maintenance of close ties with private landowners, local weed boards, professional groups, other agencies, and State governments. The coordinated efforts of these groups leads to strong support in State legislatures and among congressional representatives. These efforts produce State weed legislation, State and local funding, joint public information campaigns, commitment from private landowners and a high degree of awareness from the public.

In professional societies, employees serve as active members and officers, and they support organizational activities by providing scientific expertise as well as support and sponsorship of group activities. In evaluating current and needed adjustments to the noxious weed program, it is useful to divide the noxious weed program into five areas: (1) *Prevention and Education*; (2) *Control*; (3) *Inventory, Mapping, and Monitoring*; (4) *Research*; and (5) *Administration and Planning*. An essential component to success in all five areas is coordination.



Instructional video and accompanying field forms produced jointly by the Forest Service's Northern Region and the Bureau of Land Management. These educational tools help train staff to inventory, collect, release, and monitor flea beetles as biocontrol agents.



## NOXIOUS WEED CONTROL...

# CARIBOU AND SAWTOOTH NATIONAL FORESTS

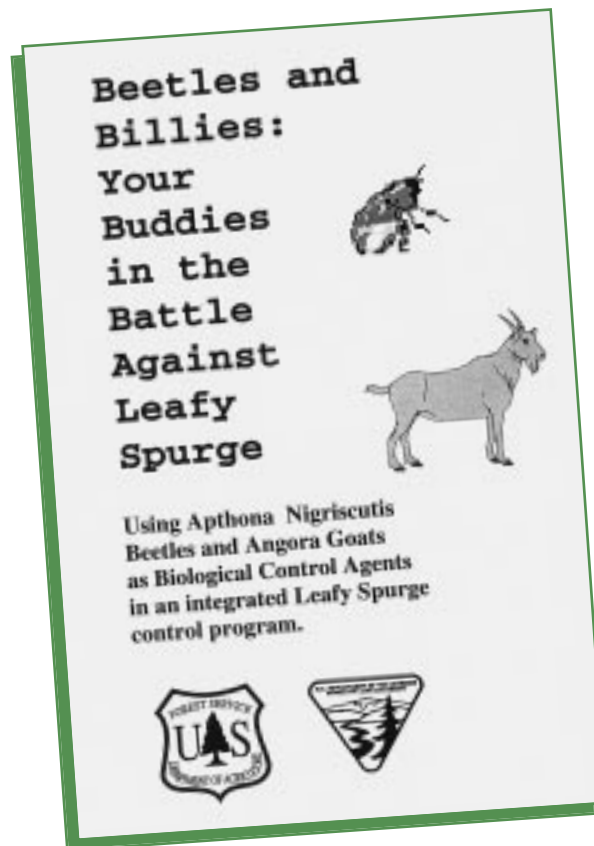
The FS's FHP field office in Boise, Idaho, has teamed up with the Sawtooth and Caribou National Forests to test control methods for leafy spurge in mountainous, coniferous environments. On national forests in the Northwest, leafy spurge is one of the most aggressive and environmentally damaging weed species that land managers face. While biocontrol agents had been successful in controlling spurge in prairie environments, it was unknown if they would work in cooler, high-elevation forested environments. This technology transfer effort represents an integration of traditional Research and S&PF responsibilities with on-the-ground applications in the national forests.

A leafy spurge infestation on the Fairfield Ranger District of the Sawtooth National Forest was first noted in 1968. By the mid-1990's, the infestation had grown to more than 22,000 acres. As part of a strategy of IPM, FS staff spray the perimeters of the infestation with herbicides to limit the increase of its boundary. Further, in coordination with Forest

Service Research, four species of *Aphthona* flea beetle have been released as biocontrol agents at about 200 sites. Beetles stress the plants, reducing their number and vigor.

FHP staff monitor release sites to determine which biocontrol agents work best under different site conditions. Monitoring results indicate that a complex of four different species of the *Aphthona* flea beetle has not only survived but also is thriving in higher elevation environments.

Many of the insects used in the Fairfield Ranger District came from the Malad Ranger District on the Caribou National Forest. In 1997, the Malad Ranger District sponsored a *Leafy Spurge Field Session*, where FHP staff showed 70 participants, including county, State, and Federal personnel, as well as private landowners, how to collect, transport, and release *Aphthona* beetles. Because the need is great and the supply of biocontrol agents is small, field session participants were also shown how to set up their own insectaries to grow more biocontrol agents for redistribution.



Forest staff produced the video "Beetles and Billies: Your Buddies in the Battle Against Leafy Spurge" for public distribution.

## NOXIOUS WEED STRATEGY

# I. PREVENTION AND EDUCATION

### OVERVIEW

Using weed-free forage and road materials and carefully selecting the species used in restoration and stabilization projects is helping to minimize the spread of noxious weeds on national forests. Partnerships with public and private groups to develop educational materials like trail-head signs, brochures, posters, videos, and displays is helping to increase public awareness about combating noxious weeds.

Prevention activities can retard or preclude the introduction and establishment of noxious weeds in noninfested areas. Education is a vital part of prevention by informing all levels of the FS, our partners, and the public of the potential impact and threat of noxious weeds.

There are numerous examples of excellent local programs that have been developed in coordination with other agencies and State and local groups. However, prevention programs have not been emphasized or implemented in all appropriate regions. The FS needs a coordinated and consistent prevention and education effort.

**Objective**—Implement a program of prevention measures on all NFS units. Emphasize prevention as an effective and cost-efficient methodology for weed control.

**Objective**—Develop and implement a program to increase awareness and understanding of noxious weed issues at all organizational levels.

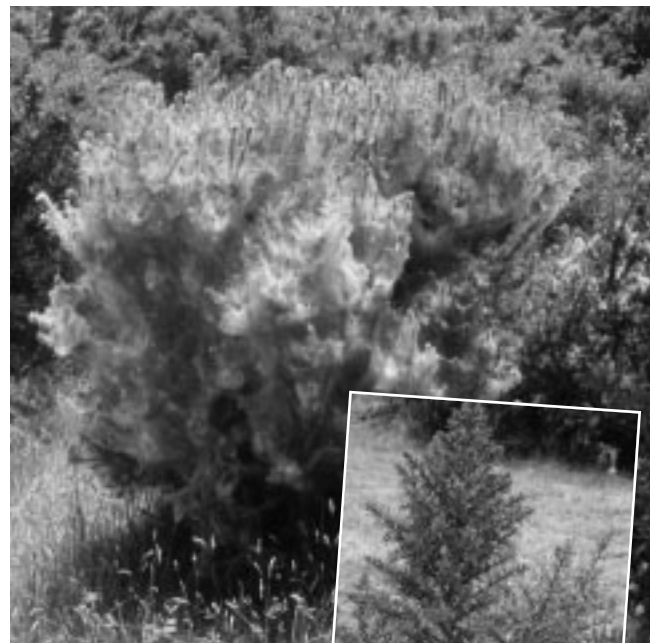
**Objective**—Work with all potential cooperators on developing educational materials—such as videos, brochures, advertisements, and classroom materials—to increase public awareness of noxious weed issues.

## NOXIOUS WEED PREVENTION AND EDUCATION...

# SIUSLAW NATIONAL FOREST

Forest Service land managers in coastal areas of Oregon find that gorse, an aggressive perennial shrub with extremely stiff, sharp thorns, can quickly dominate an area, effectively eliminating any use by humans or wildlife. In addition, gorse contains flammable oils that pose a serious fire hazard. The destruction of the Oregon coastal community of Bandon in the 1930's is attributed to uncontrollable wildfire spread through gorse-dominated vegetation.

Staff on the Mapleton Ranger District of the Siuslaw National Forest recently completed the environmental analysis for the Western Lane County Gorse Management Project, an integrated vegetation management project. The project includes a containment strategy for the most concentrated areas of gorse on the national forest and an eradication strategy for small isolated occurrences of the weed. Because gorse is primarily spread through human use, control treatments are focused on areas like trails, campgrounds, and picnic areas. A variety of treatment methods will be used to prevent gorse plants from maturing and going to seed. These include herbicide spraying, biocontrol agents like the gorse spider mite, crushing and burning, manual pulling, and mechanical removal. In unique resource areas, plans call for spot treatment of herbicides applied to individual plants.



*Spider mites cover gorse plant.*

*Gorse plant.*

A number of unique resource areas are affected by gorse in Western Lane County, including dune beaches; Highway 101, a scenic highway corridor; coastal salt spray meadows; and seasonal wetlands. Gorse treatments are required that are responsive to the unique characteristics of these areas. The gorse management strategy must also be responsive to conditions along salmon streams to protect coho and steelhead, both candidates for Federal listing as threatened or endangered species. Along these streams, gorse will be partially cleared out, and a variety of conifer species will be planted in an attempt to shade out the weed.

Prevention and education efforts are a key part of the gorse management project. Because gorse seeds are frequently transported in mud clinging to vehicles, heavy equipment, the feet of stock, big game, or humans, interpretative signs will be used throughout the national forest treatment areas informing the public about the treatment and how gorse is spread. To help minimize the spread of gorse along trails, special areas will be designated at trailheads for horse riders to clean out their horse's hooves. Administrative vehicles used in

gorse areas will be steam-cleaned to reduce the probability of gorse seeds being transported into new areas. In addition, workshops for Forest Service employees and the public will heighten understanding of how gorse is spread and actions that can help minimize its spread.

Additional Forest Service education and prevention efforts are focused in the biological control arena. Over the past 10 years, a number of control methods have been tested by Forest Service researchers and Oregon Department of Agriculture staff. Among these, the largest success involved the use of biocontrol agents, especially gorse spider mites. The mites form dramatic webbed colonies over the outer branches of gorse plants, eventually causing extensive defoliation that results in reduced plant vigor.

Populations of spider mites are so successful at some release sites that the Mapleton Ranger District will sponsor a Gorse Spider Mite Day for the public. Forest Service staff will demonstrate how to collect and transport mature spider mites so they can be distributed to other gorse areas.



*Recreationists surrounded by gorse plants.*

## NOXIOUS WEED STRATEGY

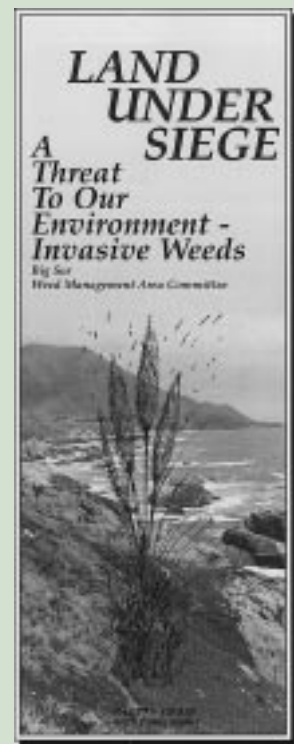
# I. PREVENTION AND EDUCATION (CONTINUED)

### Short-Term Emphasis Items

- ♥ Encourage the implementation of a weed-free forage program in all wilderness areas by 2002.
- ♥ Encourage implementation of a weed-free forage program for all NFS lands by the year 2005.
- ♥ For all ground-disturbing activities, provide a series of standard mitigation measures such as:
  - Clean equipment prior to entering NFS lands;
  - Use weed-free materials (that is, gravel and seeding mixtures);
  - Include weed prevention measures in fire planning and firefighting (for example, weed-free airports and landing sites, weed-free camp locations, and so forth); and
  - Develop Best Management Practices (BMPs) and contract C-clauses for potential inclusions in contracts.
- ♥ Facilitate the development of restoration/rehabilitation strategies and techniques, including development of new seed sources, seeding techniques, posttreatment, and management.
- ♥ Increase awareness of noxious weeds and their potential impact at all levels of the agency through briefings and training sessions. Reward and recognize successful projects and programs.
- ♥ Provide for increased communication for units and individuals working in noxious weeds. Where possible, integrate with existing programs such as the pesticide newsletter, research news, and *Range Writer*, the FS range management newsletter.
- ♥ Develop interagency interpretive signs for placement at portals, at trailheads, and along roadsides to alert forest users about the noxious weed program and their role in prevention and control.
- ♥ Continue technology transfer and technical assistance to State Foresters and private cooperators.

### Long-Term Emphasis Items

- ♥ Develop national/regional training programs in policy, plant identification, and integrated pest management. Where possible and appropriate, integrate training with local and State agencies
- ♥ Identify and classify vulnerable and nonvulnerable ecosystems and vegetation types.
- ♥ Develop training materials and programs for contractors on NFS lands.
- ♥ Develop educational materials for inclusion in wildflower days, NatureWatch, and other environmental education programs.
- ♥ Develop advertising campaigns, leaflets, and other materials to educate forest users on noxious weeds, how they spread, and how they can be contained in conjunction with local, State, and Federal agencies and cooperators.
- ♥ Develop a consolidated effort including brochures, school materials, interpretive sign content, videos, internal training and public outreach to contractors, private landowners, elected officials, and the general public.
- ♥ Cooperate with other agencies, States, universities, and organization in developing and funding noxious weed educational materials for use by multiple organizations.
- ♥ Develop a national advertising campaign in coordination with States and other agencies.





## NOXIOUS WEED CONTROL...

# NEZ PERCE NATIONAL FOREST

The 1994 creation of the Salmon River Weed Management Area marked a turning point in weed management in central Idaho. After a number of years of independent work, the county weed supervisor, neighboring private landowners, and staff of the Nez Perce National Forest were ready to try a new, cooperative approach to their noxious weed problem.

The Salmon River Weed Management Area is a cooperative venture involving public and private lands and is focused on identifying common objectives and priorities for noxious weed management. The 500,000-acre Weed Management Area is dominated by dry grasslands and steep slopes. Roughly 40,000 acres are affected by 17 noxious weed species, with yellow starthistle the predominate problem species.

According to Nez Perce range staff, a crucial step in the Salmon River Weed Management Area Coordinating Committee's success to date was the creation of a weed-status inventory to facilitate a common understanding of the problem. Along with the inventory, participants developed an areawide noxious weed map. Crews from the county, Bureau of Land Management, and Forest Service mapped weeds across jurisdictional boundaries, while private landowners brought in reports of weed sightings.

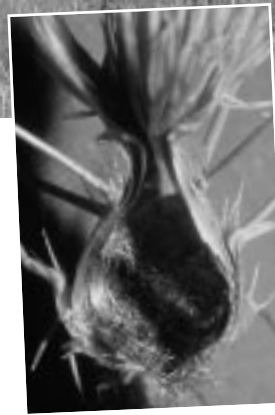
Committee meetings gave participants the forum to discuss the results of their control efforts. Notably, the inventory identified new invasive species that the committee selected as high priority for treatment. The committee also used the map to set objectives and plan annual activities. Initial control efforts focused on yellow starthistle, in part because the 30,000 acres affected by this species had a clear geographic boundary and the committee believed their cooperative efforts could be effective in preventing its spread beyond that boundary.

The coordinating committee created an annual operating plan for the upcoming year that describes each participant's proposed weed management activities. The committee also developed a long-range management plan for each weed species.

The Salmon River Weed Management Area effort is considered a success in a number of respects. Since its inception, weed-control efforts on both



*Yellow starthistle biocontrol agent collection field trip in Idaho.*



*Damage to yellow starthistle seed head by biocontrol agent.*

public and private lands have increased, and, importantly, cooperative public-private relationships are stronger and more focused on mutual benefit. Participants know their neighbors are contributing to the cause and believe their personal efforts will count for more.

As a participant in the Salmon River Weed Management Area, the Nez Perce National Forest is working with a number of partners on biological control of yellow starthistle. Forest Service Research has helped develop a biocontrol project and locate a source of successful biocontrol agents. Forest staff know that for successful biocontrol they must "manage the insects" by building up insect populations where they can be most effective. In support of this approach, the University of Idaho's Department of Plant, Soil, and Entomology is setting up a monitoring program for the insect release sites.

## II. CONTROL

### OVERVIEW

The FS's 20 years of experience with noxious weeds has shown that IPM, using a full complement of control methods, is the most effective approach. In the IPM strategy, new and small infestations or those near sensitive areas are given top priority for treatment.

Programs to control noxious weeds have been instituted on many ranger districts within the agency. However, many forests and districts have not implemented a viable noxious weed program. Given the number of acres infested and the projected rates of spread, it is clear that there are currently insufficient funds to address even a small percentage of the areas infested. Funds are insufficient to support program development in new areas, and it is difficult to retain adequate funding to support viable existing programs.

Pesticides remain a key component in an IPM approach to noxious weed control. The required NEPA environmental analyses, such as environmental impact statements and environmental assessments necessary to use pesticides, have not been completed for many regions and forests.

**Objective**—Develop an IPM strategy and program for each NFS unit where noxious weeds occur. The IPM strategy should consider and employ all control treatments, including biological control, prevention, mechanical, and chemical.

**Objective**—Participate in the development of local weed management units to consolidate and coordinate weed control across jurisdictional boundaries.

**Objective** - Provide leadership in scientific expertise, organization skills, and administrative support to local weed-control efforts.

**Objective** - Develop strategies to eradicate, control, and contain noxious weeds on public lands.

**Objective**—Rapidly respond to new infestations with aggressive treatment or eradication.

### Short-Term Emphasis Items

- ♥ Implement followup inventory treatment on all ground-disturbing activities.
- ♥ Develop a strategy to complete the necessary environmental analysis to permit the appropriate use of pesticides in all regions.
- ♥ Develop a rapid response strategy on each forest to respond to new infestations.
- ♥ Ensure that control activities do not adversely affect threatened, endangered, or sensitive species or site water quality.

### Long-Term Emphasis Items

- ♥ Develop an IPM strategy for the containment, control, and potential eradication of weeds on all FS units where appropriate. Include priority species and treatment areas.
- ♥ Provide sufficient funding to each NFS unit to implement a locally developed noxious weed strategy.
- ♥ Develop noxious weed management areas in cooperation with private landowners and local and State governments (for example, the Greater Yellowstone Area Weed Management Plan).
- ♥ Develop BMP's for all ground-disturbing activities, which would include appropriate prevention and mitigation.
- ♥ Develop multiagency, multiregion strategies for new and existing weed species.
- ♥ Emphasize the use and development of biological control agents.
- ♥ Emphasize control and containment of noxious weeds in special areas such as wilderness and research natural areas, including the use of herbicide where appropriate.
- ♥ Emphasize use of native vegetation in weed control activities.

## NOXIOUS WEED CONTROL...

# MEDICINE BOW-ROUTT NATIONAL FOREST

The Jackson County Weed Management Partnership, initiated by the Forest Service's Parks Ranger District in north-central Colorado, is one of six pilot projects selected by the State of Colorado to demonstrate the effectiveness of a coordinated and "boundaryless" approach to weed management.

In 1993, range staff on the Parks Ranger District of the Medicine Bow-Routt National Forest approached the Jackson County Commissioners about forming a multiagency weed management partnership. Compared with adjacent counties with similar serious weed infestations, it appeared Jackson County could be successful in weed-control efforts if all agencies worked together. A coordinated approach to noxious weed management was considered critical if Jackson County was to maintain the upper hand with weeds.

The Jackson County partnership in the Upper North Platte Weed Management Area involves 10 cooperating entities that are responsible for Federal, State, and private lands within the weed management area, including the town of Walden. The weed management partners meet each spring to develop an annual work plan, which includes education, inventory, and treatment projects. The weed advisory board, composed of local landowners, evaluates and prioritizes treatment areas by looking at

noxious weed occurrences rather than jurisdictional boundaries. The partners pool staff and equipment and fund a weed coordinator who is responsible for coordination and implementation. At the end of the season, a wrap-up meeting is held to review what has been accomplished, to discuss problems and opportunities, and to lay the groundwork for the next season's efforts.

While there were a few initial reservations about embarking on this program, by the second year of implementation Jackson County Commissioners enthusiastically endorsed Forest Service range conservationist Tom Smith's presentation about the weed partnership at the western regional conference of the National Association of Counties.

The numerous accomplishments of 1997 mark it as a pivotal year in the integrated weed management program. A county fund was created for the administration of weed management projects, and weed infestations were inventoried and mapped on the county's computerized Geographic Information System (GIS). Increased awareness and involvement from other agencies and private landowners allowed more acres to be treated than ever before. Through the educational efforts of the county extension office and the county weed coordinator, public awareness of the need for proactive weed management is on the upswing in Jackson County.

*Range staff on Parks Ranger District, contributors to the Jackson County Weed Management Partnership.*



# III. INVENTORY, MAPPING, AND MONITORING

### OVERVIEW

The Forest Service is leading the National Rangeland Assessment, a report on the condition of all rangelands, public or private, in the United States. All Forest Service regions are increasing inventory activities for noxious weeds. Standardized guidelines for inventoring and monitoring noxious weeds on all Federal lands will shortly be published, allowing agencies to share noxious weed information across jurisdictional boundaries.

The Forest Service lacks a consistent methodology for inventoring and mapping vegetation. Some regions, forests, and districts have developed mapping and database standards, but few are consistent over wide areas. Analysis or displays of noxious weeds over broad areas is therefore difficult. This problem of consistent data standards is mirrored by other agencies, counties, and States, which compounds the difficulty of integrating noxious weed programs across jurisdictional boundaries. Many of the current inventory efforts are incompatible with computerized GIS, and therefore it has been difficult to integrate noxious weed issues into forest plans and landscape or other broad-scale analyses.

**Objective**—Develop consistent inventory, data, and mapping standards across resource, agency, and jurisdictional boundaries.

**Objective**—Map noxious weed infestations on all NFS lands in a manner compatible with modern technologies such as GIS and Global Positioning Systems (GPS).

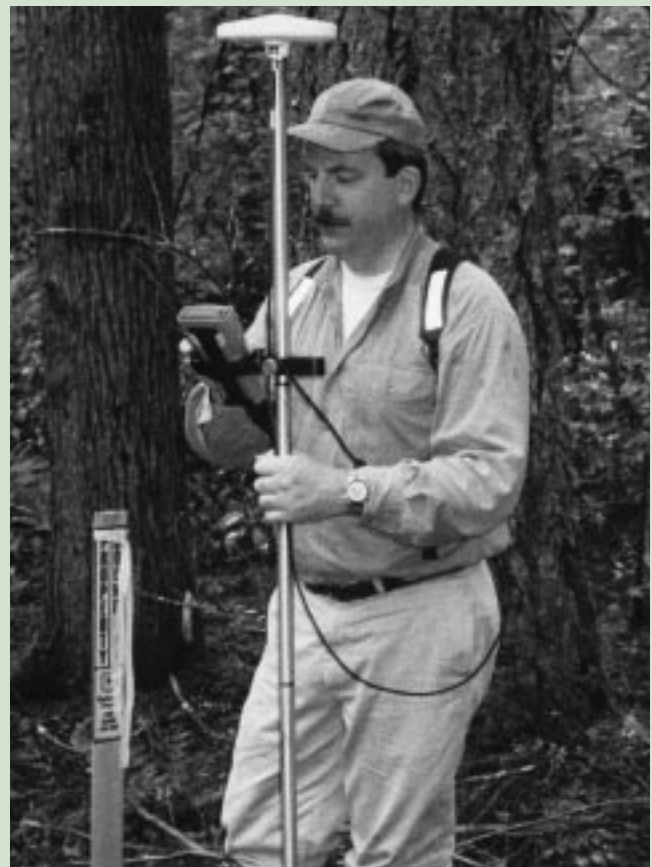
**Objective**—Develop consistent, effective, minimal-monitoring standards.

### Short-Term Emphasis Items

- ♥ Implement minimum mapping standards, like the Greater Yellowstone Area standards, agreed upon in 1997.
- ♥ Develop sample minimum monitoring standards for inclusion in revisions of forest plans.

### Long-Term Emphasis Items

- ♥ Develop interagency, interjurisdictional mapping, inventory, and data standards.
- ♥ Develop forest, regional, and national maps for all noxious weed infestations on NFS lands.
- ♥ Implement the use of remote sensing, GIS, GPS and other technologies.
- ♥ Complete a literature summary on the uses of remote sensing in weed inventories.



*Global Positioning Systems (GPS) use satellites to produce precise maps of noxious weed infestation locations.*



## NOXIOUS WEED INVENTORY, MAPPING, AND MONITORING...

# MIDWIN NATIONAL TALLGRASS PRAIRIE

The 15,000-acre former munition-production facility, the Joliet Arsenal, is located about 40 miles southwest of Chicago, within a midwest urban population area of some 8 million. The arsenal provides a unique setting for a unit of the FS, which, since 1997, jointly manages the site with the Illinois Department of Natural Resources. Ecosystem restoration of the Arsenal's tallgrass prairie was a primary objective identified for the Midwin National Tallgrass Prairie by the Joliet Arsenal Citizens' Commission and the Illinois Land Conservation Act of 1995.

Forest Service and Illinois Department of Natural Resources staff participate in laying a scientific foundation for the development of a management plan for Midwin. At the local, or "micro-site" level, Tallgrass Prairie staff have begun inventorying and mapping the current condition of vegetation. Of the 60 invasive species inventoried, 22 species were identified as presenting the most immediate management problem and were prioritized for treatment.

The inventory and mapping effort includes identifying which invasive plants pose the most significant threat to native species, how severe infestations of each invasive species are, and the potential for spread each species poses. A specific IPM manual has been prepared for each of the priority invasive species on the Midwin. The IPM manual includes a series of recommendations for potential control methods, including mechanical, chemical, biological, and prescribed burning.

Inventory and mapping work on a larger scale is part of the Prairie Parklands "macro-site" effort, which involves an approximately 40,000-acre area of public and private lands in Northeastern Illinois, including Midwin. In an effort to trim inventory costs, one feature of the macro-site effort incorporates remote sensing. Through a grant from the National Aeronautics and Space Administration, Prairie Parklands staff ground-check the findings of high-altitude satellite photographs on the Midwin site. The ground-check tests the accuracy and feasibility of remote sensing for invasive species inventories.



*Garlic mustard, an invasive species in the Midwin National Tallgrass Prairie.*

Long-term plans call for the establishment of about 40 miles of seedbeds to be used in restoration planting. They will include specialized seedbeds to raise prairie, savanna, and wetland plant species. Staff horticulturists at Midwin have developed the beds because commercial nurseries currently are unable to keep up with the enormous demand for seed that restoration will require. The beds will also allow the project to proceed cost effectively. Volunteers at the Tallgrass Prairie helped create and maintain the first seedbeds, and they remain involved in the ongoing expansion of the seed production areas.

## NOXIOUS WEED INVENTORY, MAPPING, AND MONITORING...

# LOS PADRES AND STANISLAUS NATIONAL FORESTS

Noxious weeds adversely impact more than the traditionally affected forests and rangelands in California. Areas of historic, prehistoric, and scenic significance—including Highway 1, the designated “All American Highway” along the California coast, and the Jordan Creek/Bower Cave Special Interest Area, are currently the focus of some innovative noxious weed efforts.

The Monterey Ranger District noted an increase in noxious weeds threatening wildland values and creating an increased fire hazard on public lands. While many weeds apparently start along the coast, they move rapidly inland and pose a threat to riparian areas, designated wilderness areas, and designated botanical areas. Noxious weeds threaten endangered species’ habitat as well. One such example is Smith’s blue butterfly.

In response, the Big Sur Weed Management Area was formed by the Big Sur Multi-Agency Advisory Council. Participants include the Monterey Ranger District of the Los Padres National Forest; California Department of State Parks; CALTRANS, the California Highway Department; the Monterey County Planning and Building Inspection Department, and private property owners.



*Pampas grass.*



*Typical pampas grass site along coast of California.*

Through a grant from the California Exotic Pest/Plant Council, the Big Sur Weed Management Area Committee developed a joint invasive plant inventory for the transfer of hand-drawn maps to a computerized GIS. Based on the inventory, priority areas and target species for treatment were identified. Potential for partnerships or shared efforts among committee members is a criterion in selecting priority sites for treatment.

In addition, the committee developed and distributed a brochure that includes photo identification of the most common invasive plants in the area and describes what the public can do to ensure that they do not contribute to the invasive plant problem. The Weed Management Area Subcommittee facilitates a unified effort on both public and private land for effectively managing common problems with weeds.

The 1,600-acre Jordan Creek/Bower Cave Special Interest Area on the Groveland Ranger District, Stanislaus National Forest, includes a historic ranch and way station and the Bower Cave. The cave is both a significant cultural site to the local Me-Wuk Indians and a 100-year old tourist attraction.

By 1994, an estimated 500 acres at this site were infested with yellow starthistle. The inventory indicated approximately 125 starthistle plants per square foot, which translates to roughly 5 million noxious thistle plants per acre. To help return native vegetation, a multiyear project of prescribed burning and native species planting was started in 1997. The first burn was a success, with most of the starthistle consumed. In the fall of 1997 annual grasses were seeded to act as fuel to help carry future prescribed burns. As control of starthistle is gained, native plants and grasses will be planted at the site.

New partnerships make important contributions to the starthistle control project. Firefighters from the Forest Service and California Conservation Corps staffed the first prescribed burn at their own cost, using the fire as a training opportunity. Their contribution helped stretch scarce noxious weed treatment funds on the ranger district. An Annenberg Rural Challenge Grant to the local county school district will fund an outdoor course in monitoring and research at the site. Students will conduct before-treatment and after-treatment starthistle plant counts as part of their course work.

*Right: Mariposa County Fire Department volunteer lighting a strip of yellow starthistle. Photo by Lisa Linde.*

*Below: Firefighters walking through waist-high starthistle. Starthistle burning in background. Photo by Lisa Linde.*





# IV. RESEARCH

### OVERVIEW

Forest Service scientists are focusing biological control research on high-elevation and natural area noxious weeds. Research efforts are also examining new integrated pest management strategies combining a number of treatment methods. Much of the agency's weed research is being conducted in coordination with universities and other research institutions across the globe.

**M**ore research on biological control of weeds is needed to meet the challenge of new noxious weed introductions into the country. The FS and ARS biocontrol programs should continue to cooperate in co-located laboratories, related research, and other collaborative situations.

In addition to biological control, research is needed on the ecological processes of weed invasion and establishment, especially in native ecosystems. Additional information is needed on the vulnerability of individual vegetation types and habitats; reductions in site diversity and productivity following invasion of noxious weeds; loss of wildlife habitat; changes in visual quality; alternative treatments such as burning, mowing, and grazing; and the economic cost.

**Objective**—Expand cooperation with ARS and the Natural Resources Conservation Service in biological control, weed ecology research, and the use of native species in revegetation. Also provide to USDA Cooperative State Research, Education and Extension Service (CSREES) weed research needs so these priorities can be identified in the National Research Initiative and Special Grants Program.

**Objective**—Strengthen coordination with APHIS to receive early alerts in a timely manner on accidentally imported weed species that might become a problem on NFS lands.

**Objective**—Strengthen research efforts in noxious weeds, including all aspects of weed ecology, plant community dynamics, and alternative control methods.

# BIOLOGICAL CONTROL

**F**orest Service researcher Dr. George Markin's work on biocontrol of noxious weeds is built upon a number of international cooperative efforts. Markin conducts biocontrol research on a variety of noxious weeds, including Rush skeletonweed, Scotch-broom, gorse, kudzu, and tansy ragwort. Because these noxious weeds are not native to North America, Markin's research takes on a foreign focus. Markin notes, "Because the need is so great and the number of scientists in the field is small, there is no reason to compete; instead, I know I can rely on any of the 200-plus biocontrol scientists across the globe to readily share information with me about their findings and help me locate potential biocontrol agents." Markin also works closely with the ARS facilities and staff located throughout the world.

Markin works with cooperators in Uzbekistan and the Republic of Georgia on a search both for potential pathogens and insect biological control agents for Rush skeletonweed, a major problem in southern Idaho. Studies are also underway in Greece and Turkey to determine the suitability for release in North America of two root-boring caterpillars as control agents for Rush skeletonweed. A colony of these caterpillars has been established under Markin's supervision at the Montana State University quarantine laboratory in Bozeman and is supplemented regularly by new shipments from Greece.

The Oregon Department of Agriculture's program for control of Scotch-broom and gorse in western North America has joined an international effort by Australia, New Zealand, and Chile in the search for natural enemies of these weeds. Markin's project has introduced selected agents into quarantine in Montana for final host-testing. Also in Bozeman, he is studying a mite- and foliage-feeding caterpillar, as well as a seed-feeding beetle, supplied to him by cooperators in England, France, and Portugal.



In 1997, in cooperation with the FS Southern Forest Experiment Station and the Department of Interior's Great Smokey Mountains National Park, Markin undertook an effort to determine the feasibility of using biological control for kudzu, a devastating weed species covering millions of acres of forests and agricultural lands in the Southeastern United States. Kudzu, a native of Japan and China, is a major problem in southern pine forests because of its tenacity and ability to climb, overtop, and subsequently smother, mature trees. No biological control agents are currently available in the United States for kudzu control.

Dr. Markin visited China in 1997 to learn about the protocols, regulations, and requirements for working in that country. Then, based on observations, published reports, a review of herbarium specimens, and a computerized climatic match, the southeastern province of Anhui was chosen as the most likely area to search for the natural enemies of kudzu. After observing numerous natural enemies attacking kudzu in Anhui, Markin initiated an agreement with entomologists in the Agriculture Department of the Anhui University to conduct a 2-year study to identify those that might have potential for controlling kudzu.

Most recently, Markin is at work on tansy ragwort, a large infestation of which was recently found in northwestern Montana on the Flathead and Kootenai National Forests. Tansy ragwort was at one time a major problem on the West Coast, but an earlier biological control program there almost completely controlled it west of the Cascade Mountains. Unfortunately, the same biocontrol agent released on infestations east of the Cascades has failed to become established. In an effort to find cold-hardy strains of approved biocontrol agents, Markin has begun a study of the natural enemies of tansy ragwort found in the Alps of Switzerland.



*Dr. George Markin in China working with Chinese entomologists and students, reviewing herbarium specimens.*

### IV. RESEARCH (CONTINUED)

**Objective**—Increase cooperation with all members of the research community, including FS Research, the Wilderness Research Institute, the Inventory and Monitoring Institute, other agencies, universities, and extension services.

#### Short-Term Emphasis Items

- Clearly identify and prioritize research needs in noxious weeds, optimizing limited research funds.
- Evaluate current research projects for potential application to noxious weed ecology.
- Coordinate research efforts with other agencies, such as ARS, NRCS and CSREES.
- Develop a strategy for FS research efforts. Coordinate research strategies and priorities with concurrent research efforts in other agencies, universities, and extension services.

#### Long-Term Emphasis Items

- Encourage basic research in weed ecology, including competitiveness, habitat requirements and limitation of individual weed species, pesticide effectiveness, and pesticide residue in wild-land settings.
- Expand research on biological control agents, including insects, pathogens, and livestock. Expand research coordination with local universities and extension services.
- Expand research in the use of remote sensing technology to identify and track invasive and noxious weeds in the field.

### V. ADMINISTRATION AND PLANNING

#### OVERVIEW

Forest Plans are one tool for ensuring that noxious weeds are given appropriate priority within an ecosystem management approach. The NEPA process allows the FS to evaluate the degree of threat from noxious weeds as well as evaluate the treatment options available. Development of cooperative weed management areas, or “WMA’s,” with neighbors through programs such as the “Pulling Together” partnerships, helps to pool resources and expertise to accomplish more in prevention, treatment, and control than any one party could achieve alone.

While widely recognized as a potential threat to ecosystem viability, noxious weeds are often not fully considered in landscape and other ecosystem-based analyses.

Some analyses fail to consider the potential effect of the proposed action on noxious weeds. Some forest plans are silent on noxious weeds, or direction is weak. There remains inconsistent manual direction for noxious weeds in the various resource areas.

**Objective** - Encourage coordination and collaboration between the FS, other Federal agencies, State, local, and tribal governments, and the university/research community to promote increased efficiencies and effectiveness of noxious weed management programs.

**Objective**—Integrate consideration of noxious weed issues into forest planning and analysis.

**Objective**—Provide consistent direction and support for management of noxious weeds to all resource areas and within all levels of the organization.

#### Short-Term Emphasis Items

- Ensure that the noxious weed program is an emphasis item of the Chief.
- Pursue a multifunded line item budget for noxious weeds and provide adequate funding.
- Include noxious weed issues in the Resources Planning Act assessment.
- Develop prototype of minimum forest plan goals, objectives, standards and guidelines for inclusion in forest plan revisions.

## NOXIOUS WEED ADMINISTRATION AND PLANNING...

# Ocala National Forest

In northern and central Florida, invasive nonnative species are an emerging problem in the national forests. Coordinated control efforts on invasive species can be hampered if adequate legislative recognition and authority is not available. Therefore, in response to recommendations from the Task Force on Invasive Upland Exotic Plants, the Florida legislature recently amended State statutes to include the control of invasive upland exotic plants, such as cogon grass, on public lands.

Cogon grass was imported to Florida in the 1940's to help control soil erosion and to provide forage. Cogon grass can quickly become a monoculture, aggressively crowding out native plants. There are no known biological control agents for the species in Florida; and, if allowed to grow tall, its razor sharp leaves make consumption by wildlife impossible. In addition, because it burns hot and fires move quickly through it, cogon grass also poses a severe fire threat to the urban interface where homes are scattered among forest lands.

The Task Force recommendation and amended State statute helped set the stage for expanded

cooperative control efforts in Marion County. Planning is underway to eradicate this species from three distinct areas that involve the Ocala National Forest and private and State lands.

The earlier success of Ocala National Forest to control cogon grass infestations led the Lake George Ranger District to expand the scope and partners involved in upcoming eradication efforts. The new cogon grass eradication plan is a cooperative venture between the Forest Service, Florida Departments of Environmental Protection and State Parks, county parks, water management districts, and private corporations and landowners.

The plan calls for surveys delineating the boundaries of infested areas, treatment with pesticides, monitoring, followup re-treatment until eradication is complete, and revegetation where necessary. Since forest staff have found that a significant source of cogon grass infestation is yard clippings dumped in the forest, an educational campaign includes informational kiosks at dump sites within the national forest.

*Botanist Lorraine Miller inspects cogon grass on the Ocala National Forest. Photo by Bruce Ackerman, Ocala Star Banner.*





# V. ADMINISTRATION AND PLANNING (CONTINUED)

### Short-Term Emphasis Items

- ♥ Ensure that there is consistent manual direction for noxious weed management in all resource areas. As part of the ongoing manual review, ensure that all outdated and conflicting clauses are eliminated.
- ♥ Develop a glossary of common terms and definitions.
- ♥ Clarify legal definitions of a “noxious weed.”
- ♥ Clarify and/or develop protocols for the listing of noxious weeds at both the Federal and State levels to ensure that noxious weeds may be treated as they appear in new areas or States.

### Long-Term Emphasis Items

- ♥ Ensure that members of Congress and their staffs have firsthand knowledge and awareness of on-the-ground noxious weed conditions, impacts and trends, and the cost of implementing IPM to prevent, control, and eradicate noxious weeds.
- ♥ Ensure that noxious weeds and their potential effects on native plant communities, threatened, endangered and sensitive species, and dependent wildlife species are considered in environmental analyses for project activities and landscape assessments.
- ♥ Ensure that the “no action/no noxious weed control” alternative is analyzed, fully reviewing the environmental and economic consequences of no treatment. Establish clear policy direction for the use of multiresource (multistaff area) funding for noxious weed management efforts.
- ♥ Encourage the coordination of weed management programs with adjacent and intermingled landownership.
- ♥ Encourage FS participation in local weed boards, organizations, and rural development planning.
- ♥ Cooperate with Federal, State, and local road and highway departments to integrate cooperative control efforts across all ownership.



*Cogon Grass. Photo by Jeff Lotz, Division of Plant Industry, FL.*



## NOXIOUS WEED ADMINISTRATION AND PLANNING...

# LINCOLN NATIONAL FOREST

In a few counties in New Mexico, county officials and public land managers have jointly initiated an effective administrative tool to respond to increasing noxious weed infestations that adversely affect Federal, State, county, and private land ecosystems.

Through a Memorandum of Understanding (MOU) created in Otero County in 1997, a coalition of public, State, county, and private entities seeks to coordinate, encourage, and formalize the cooperative relationships necessary for effective management of alien noxious weeds. Otero County's MOU includes the implementation of integrated weed management action plans and treatment projects, as well as prevention and education programs.

The Lincoln National Forest is a signatory to the Otero County MOU, which includes the county commissioners, the Otero County Soil and Water Conservation District, the Natural Resources Conservation Service, the Bureau of Land Management, the Bureau of Indian Affairs, the Mescalero Apache Indian Tribe, the FS, the New Mexico State Highway and Transportation Department, and the Cooperative Extension Service. In addition, the Farm Bureau also has been actively involved in control efforts.

To ensure that the goals and objectives of the MOU are achieved, the coalition has designated representatives to an interagency work group that meets whenever necessary to coordinate plant control efforts, funding, public awareness and involvement programs, and management objectives.

Through agreements in the MOU, members of the coalition plan and appropriate funds to attack jointly the Otero County noxious weed problem. In the absence of mandatory statewide noxious weed legislation, regional and forest employees find that these types of agreements are a positive approach toward the containment and control of noxious and invasive weed species.

Efforts of the coalition have already produced results that benefit the Lincoln National Forest in southern New Mexico. The public has been made aware of the extent of the noxious weed problem and supports the program. Treatment of highway corridors reduces the threat of weeds spreading along State and county highways and roads. Private landowners voluntarily treat infestations within and adjacent to national forest boundaries.

In all, this program is a win-win situation for everyone and demonstrates what can be done cooperatively, without mandatory State legislation.



*Musk thistle.*



*Teasel.*

## NOXIOUS WEED STRATEGY

### INTERDEPARTMENTAL USDA ACTIVITIES

- ♥ Cooperate on issue development on a policy level.
- ♥ Develop research cooperatives with sister agencies.
- ♥ Cooperate on developing educational materials and programs.
- ♥ Develop cost-share agreements for research and demonstration projects.
- ♥ Act as reviewer for sister agencies' programs or research development.
- ♥ Define research needs and focus programs and funding across agencies.



*Leech Lake Reservation, Division of Resources Management, cooperative purple loosestrife control project with Chippewa National Forest. Photo by Steve Mortensen.*

### COOPERATION WITH OTHER FEDERAL AGENCIES

- ♥ Combine efforts with other Federal agencies to ensure that data are compatible and accessible within the FS and to outside users.
- ♥ Cooperate on control and prevention activities on adjacent lands and with other land management agencies.
- ♥ Cooperate in research for developing new technologies.
- ♥ Cooperate in inventory, monitoring, and mapping, use of remote sensing information and database management for compatible data systems with other land management and research agencies.
- ♥ Cooperate in development of educational programs.
- ♥ Pool funding with sister agencies for more efficient use of funds on projects of common interest.
- ♥ Work with other Federal agencies to justify a line item in the Federal budget for a multiagency invasive and noxious weed budget, modeled after Fire or IPM.
- ♥ Continue to support and participate in the Federal Interagency Committee for Management of Noxious and Exotic Weeds.

# NON-FEDERAL PARTNERS AND COOPERATORS

- ♥ Cooperate on control and prevention activities with adjacent public and private landowners.
- ♥ Pool funding with public and private landowners for the most efficient use of funds in noxious weed management.
- ♥ Cooperate in educational projects.
- ♥ Continue to educate and build a constituency to support Federal action and funding support of a multiagency budget line item.
- ♥ Encourage active participation of FS professionals in scientific weed societies, county weed boards, and weed coalitions.
- ♥ Seek cooperation and challenge cost-share funding from private sources including cooperate foundations, grants and organizations.
- ♥ Interact with international partners in developing international cooperation on noxious weed issues and programs.



*Tahoe National Forest volunteers working on musk thistle removal.*

*Photo by Kathy Van Zuuk.*

*Leafy spurge control tour on Sheyenne National Grassland, involving researchers, grazing association members, and cooperators.*

# FOREST SERVICE NOXIOUS WEED COORDINATORS

## National Contacts

Deborah C. Hayes, Ph.D.  
National Noxious Weed Coordinator  
USDA Forest Service  
P.O. Box 96090 AB-3S  
Washington, DC 20090-6090  
PH: 202-205-0847  
FAX: 202-205-1096  
EMAIL: dhayes/wo@fs.fed.us

Rita Beard  
Washington Office Detached Office  
USDA Forest Service  
3825 E. Mulberry  
Fort Collins, CO 80524  
PH: 970-498-1715  
FAX: 970-498-1660  
EMAIL: rbeard/wo,ftcol@fs.fed.us

Dave Thomas  
Forest Health Protection Noxious Weed Coordinator  
USDA Forest Service  
FHP AB-2S  
P.O. Box 96090  
Washington, DC 20090-6090  
PH: 202-205-0889  
FAX: 202-205-1139  
EMAIL: dthomas/wo@fs.fed.us

## Northern Region: MT, ID, ND, Northwestern SD

Jim Olivarez  
R-1 Noxious Weed Coordinator  
USDA Forest Service  
Fed. Bldg., P.O. Box 7669  
Missoula, MT 59807  
PH: 406-329-3621  
FAX: 406-329-3132  
EMAIL: jolivarez/r1@fs.fed.us

David Atkins  
R-1 FHP Noxious Weed Coordinator  
USDA Forest Service  
Fed. Bldg., P.O. Box 7669  
Missoula, MT 59807  
PH: 406-329-3134  
FAX: 406-329-3132  
EMAIL: datkins/r1@fs.fed.us

## Rocky Mountain Region: CO, KS, SD, and Eastern WY

R-2 Noxious Weed Coordinator  
USDA Forest Service  
740 Simms St.  
Golden, CO 80401  
PH: 303-275-5005  
FAX: 303-275-5075  
EMAIL: /r2@fs.fed.us

Susan Johnson  
R-2 FHP Noxious Weed Coordinator  
USDA Forest Service  
P.O. Box 25127  
Denver, CO 80225  
PH: 303-275-5065  
FAX: 303-275-5075  
EMAIL: sjohnson/r2@fs.fed.us

## Southwestern Region: AZ and NM

John Conner  
R-3 Noxious Weed Coordinator  
USDA Forest Service  
517 Gold Avenue SW  
Albuquerque, NM 87102  
PH: 505-434-7200 or 505-842-3227  
FAX: 505-842-3807 or 505-434-7218  
EMAIL: jconner/r3@fs.fed.us

Doug Parker  
R-3 FHP Noxious Weed Coordinator  
USDA Forest Service  
Fed. Bldg., 517 Gold Avenue, SW  
Albuquerque, NM 87102  
PH: 505-842-3280  
FAX: 505-842-3800  
EMAIL: dparker/r3@fs.fed.us

## Intermountain Region: Southern ID, NV, UT, and Western WY

Curt Johnson  
R-4 Noxious Weed Coordinator  
USDA Forest Service  
Fed. Bldg., 324 25th St.  
Ogden, UT 84401  
PH: 801-625-5600  
FAX: 801-625-5483  
EMAIL: cjohnson/r4@fs.fed.us



Dave Baumgartner  
R-4 FHP Noxious Weed Coordinator  
USDA Forest Service  
Fed. Bldg., 324 25th St.  
Ogden, UT 84401  
PH: 801-625-5258  
FAX: 801-625-5716  
EMAIL: dbaumgartner/r4@fs.fed.us

**Pacific Southwest Region:  
CA, HI, Guam, and Trust Territories**

Cheri Rohrer  
R-5 Noxious Weed Coordinator  
USDA Forest Service  
630 Sansome St.  
San Francisco, CA 94111  
PH: 415-705-2545  
FAX: 415-705-1166  
EMAIL: crohrer/r5@fs.fed.us

R-5 FHP Noxious Weed Coordinator  
USDA Forest Service  
630 Sansome St.  
San Francisco, CA 94111  
PH: 415-705-2660  
FAX: 415-705-1140

Duane Nelson  
Institute of Pacific Islands Forestry  
USDA Forest Service  
1643 Kilauea Ave.  
Hilo, HI 96720  
PH: 808-935-6292  
FAX: 808-935-9801  
EMAIL: dnelson/r5@fs.fed.us

**Pacific Northwest Region:  
OR and WA**

Gary Smith  
R-6 and FHP Noxious Weed Coordinator  
USDA Forest Service  
333 SW 1st Ave., P.O. Box 3623  
Portland, OR 97208  
PH: 503-808-2914  
FAX: 503-808-2469  
EMAIL: gsmith/r6pnw@fs.fed.us

**Southern Region: AL, AR, FL, GA, KY, LA, NC, OK,  
SC, TN, TX, VA, PR, and Virgin Islands**

Levester Pendergrass  
USDA Forest Service  
R-8 Noxious Weed Coordinator  
1720 Peachtree Rd., NW  
Atlanta, GA 30367  
PH: 404-347-3908  
FAX: 404-347-4448  
EMAIL: lpendergrass/r8@fs.fed.us

Paul Mistretta  
R-8 FHP Noxious Weed Coordinator  
USDA Forest Service  
1720 Peachtree Road, NW, Room 925N  
Atlanta, GA 30367  
PH: 404-347-2229  
FAX: 404-347-1800  
EMAIL: pmistretta/r8@fs.fed.us

**Eastern Region:  
CT, DE, FL, IA, IN, ME, MD, MA, MI, MN, MO,  
NH, NJ, NY, OH, PA, RI, VT, WV, and WI**

Eunice Padley  
USDA Forest Service  
R-9 Noxious Weed Coordinator  
310 W. Wisconsin Ave., Room 500  
Milwaukee, WI 53203  
PH: 414-297-1977  
FAX: 608-262-2500  
EMAIL: epadley/r9@fs.fed.us

Russ McKinney  
R-9 FHP Noxious Weed Coordinator  
USDA Forest Service  
100 Matsonford Road  
5 Radnor Corp Ctr. Suite 200  
Radnor, PA 19087-4585  
PH: 610-975-4124  
FAX: 610-975-4200  
EMAIL: rmckinney/na@fs.fed.us

**Alaska Region: AK**

Mary Stensvold  
R-10 Noxious Weed Coordinator  
USDA Forest Service  
204 Siginaka Way  
Sitka, AK 99835  
PH: 907-747-4210  
FAX: 907-747-4331  
EMAIL: mstensvold/r10\_chatham@fs.fed.us

Ed Holsten  
R-10 FHP Noxious Weed Coordinator  
USDA Forest Service  
3301 "C" St., Suite 522  
Anchorage, AK 99503-3956  
PH: 907-271-2573  
FAX: 907-271-2897  
EMAIL: eholsten/r10\_chugach@fs.fed.us

# FOREST SERVICE RESEARCH CONTACTS

## National Headquarters

Sheila M. Andrus, Ph.D.  
USDA Forest Service  
Vegetation Mgmt. and Protection Research Staff  
14th and Independence Ave., SW  
P.O. Box 96090  
Washington, DC 20090-6090  
PH: 202-205-1561  
FAX: 202-205-2497

## Research Station Headquarters

### North Central Forest Experiment Station

USDA Forest Service  
1992 Folwell Avenue  
St. Paul, MN 55108  
PH: 612-649-5000  
FAX: 612-649-5285

### Northeastern Forest Experiment Station

USDA Forest Service  
5 Radnor Corporate Ctr., Suite 200  
Radnor, PA 19087  
PH: 610-975-4223  
FAX : 610-975-4200

### Pacific Northwest Research Station

USDA Forest Service  
333 S.W. 1st Avenue  
P.O. Box 3890  
Portland, OR 97208  
PH: 503-326-3592  
FAX: 503-808-2130

### Rocky Mountain Research Station

USDA Forest Service  
240 West Prospect Road  
Fort Collins, CO 80526-2098  
PH: 303-498-1100  
FAX : 303-498-1010

### Pacific Southwest Forest and Range Experiment Station

USDA Forest Service  
800 Buchanan Street, West Bldg  
Albany, CA 94710-0011  
PH: 510-559-6300  
FAX: 510-559-6440

### Southern Research Station

USDA Forest Service  
200 Weaver Blvd  
P.O. Box 2680  
Asheville, NC 28802  
PH: 704-257-4300  
FAX: 704-257-4840

### Forest Products Laboratory

USDA Forest Service  
One Gifford Pinchot Drive  
Madison, WI 53705-2398  
PH: 608-231-9200  
FAX: 608-231-9592

### International Institute of Tropical Forestry

USDA Forest Service  
Call Box 25000  
UPR Experimental Station  
Rio Piedras, PR 00926-5000  
PH: 787-766-5335  
FAX: 787-766-6302

# ACKNOWLEDGMENTS

The following people supplied information, ideas, or photographs for the noxious weed stories. Thanks to all who generously contributed their time for this publication.

Guy Anglin	Duane Nelson
Tom Barbouletos	Jim Olivarez
Bob Bridges	Eunice Padley
Bob Brittain	Dick Reardon
H. Dan Brown	R. D. Richard
Julie Concannon	Cheri Rohrer
John Conner	Larry Samson
Bev Corbett	Steve Schumacher
Rose Davis	Dan Segotta
Jim Federicks	Beth Shimp
Jennie Haas	Jody Shimp
Kirk Johnson	Gary Smith
Jeff Kwasny	Tom Smith
Andy Kratz	Mary Stensvold
Leonard Lake	Larry Stritch
Eric Lane	Chuck Sundt
Jim Lile	John Taylor
George Markin	Dave Thomas
Lorraine Miller	Eric Ulaszek
Paul Mistretta	Kathy Van Zuuk

## **Noxious Weed Strategy**

Deborah Hayes and Rita Beard

## **Forest Service Noxious Weed Stories**

Jan Lerum

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

