

United States
Department of Agriculture

Forest Service

Intermountain Region

Ogden, Utah



Invasive Species Management Strategy



FY 2009 – 2013

Cover Photo Gallery

Upper Left

Invasive aquatic invertebrate – Zebra mussels

Upper Right

Invasive pathogen – White pine blister rust

Center

Invasive plant: Leafy spurge with bio-control agents, Red-headed stem borer

Lower Left

Invasive terrestrial invertebrate – Asian long-horned beetle

Lower Right

Invasive aquatic vertebrate – Brook trout

For more information on the Region 4 invasive species program visit:

<http://www.fs.fed.us/r4/resources/invasives/index.shtml>

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USDA Forest Service Intermountain Region Invasive Species Management Strategy

Executive Summary

The region will address invasive species (IS) issues by focusing efforts and resources on seven key points which are:

1. Identify and staff key IS positions to implement an aggressive and effective IS program. Positions include, but are not limited to:
 - R4 IS Coordinator
 - R4 Regional IS Issues Team (RISIT)
 - Forest IS contact
 - Forest IS team
 - Ranger District IS contact
2. Develop and implement: 1) R4 IS Strategy, 2) Forest IS Risk Assessments, 3) Forest IS Management Plans, and 4) District IS Action Plans
 - a. Focus management on “Priority Landscapes” and associated “Eco-region” subunits by protecting un-infested areas from invasive species. Emphasize prevention and early detection and rapid response (EDRR) with appropriate eradication tools on new infestations, with repeat site visits annually.
 - b. Identify and manage key vector routes, such as roads, trails, and recreation sites; livestock and wildlife migration routes; water courses; and disturbance activities and areas.
 - c. Apply increased bio-control management on large or inaccessible IS populations. Identify and support critical research and development. Develop collectible bio-control agent populations and apply these resources across the region where appropriate conditions exist and effective agents have been identified. Acres treated with bio-control should double over the next 5 years.
 - d. Emphasize pesticides on new invaders, vector management, satellite populations, and established population perimeters. Minimize IS impacts on high value areas currently un-infested.
3. Promote Region-wide use of weed-free materials, including but not limited to hay, straw, mulch and gravel, or borrow materials. Actively apply Best Management Practices (BMPs) and include them in permit and contract clauses. Manage priority vectors to prevent further spread of IS while encouraging public education, awareness, and cooperation.

4. Initiate short-term “rehabilitation” considering desirable native and/or non-native seedings where sites are unstable. Where sites are stable but at risk and immediate establishment of native species can be expected, then promote long-term “restoration” of natural ecosystem components emphasizing native seedings.
5. As a regional emphasis, maintain National Recreation Areas free from aquatic IS. Efforts will focus on education, prevention, and early detection and rapid response.
6. Actively support partnership activities and new opportunities to expand effective landscape scale IS management. Emphasize efforts with federal agencies, states, counties, Tribes, non-government organizations (NGO’s), and Cooperative Weed Management Areas (CWMA’s).
7. Apply current business rules consistently across the Region. Emphasize consistent approach to pesticide accomplishments and reporting. Focus on high priority prevention, early detection and rapid response (EDRR), bio-control, and identify supportive business rules or direction to ensure competitive comparison of these tools with traditional pesticide accomplishments.

Introduction

The area managed by the Forest Service, Intermountain Region, spans 33 million acres over portions of six states. These forests, grasslands, and watersheds support local economies and are valued for the goods (e.g., timber, grazing) and services (clean water, wildlife habitat, recreation, and quality of life) they provide. Invasive species represent one of the major threats to the ecological integrity and biological diversity of these systems.

An *invasive species* is defined as a plant, animal, or microbe, including its seeds, eggs, spores, or other biological material that is non-native to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health (Executive Order 11312).

The Intermountain Region is host to a number of invasive species. Exotic insect infestations of concern include: *Gypsy moth*, *Japanese beetle*, *Asian longhorned beetle*, *Emerald ash borer*, and *Sirex wood wasp*. Examples of invasive plant species of greatest concern, from 88 state designated noxious weeds, include: *Spotted and Squarrose knapweed*, *Rush skeletonweed*, *Purple loosestrife*, *Dalmatian and Yellow toadflax*, *Leafy spurge*, *Musk and Scotch thistle*, *Red Brome* and *Cheatgrass*, and *Yellow starthistle*. Important exotic pathogens include: *White pine blister rust*, *Dutch elm disease*, and *Whirling disease*. Aquatic infestations include species such as *Quagga mussels*, *New Zealand mudsnails*, *Eurasian water milfoil*, and non-native fish. Broader public health concerns include pathogens such as *West Nile virus*, *Chronic Wasting Disease*, and mutating strains of flu. Addressing invasive species is a public responsibility and within the mission of the Forest Service:

“The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations” (Forest Service Strategic Plan for Fiscal Years 2004-2008).

Administrative Foundation

A number of laws, regulations, and policies relate to invasive species management. They can be found on the federal IS website, along with associated links at:
<http://www.invasivespeciesinfo.gov/laws/main.shtml>

The Forest Service National Strategic Plan for Fiscal Years 2004-2008 identified six goals to support the Forest Service mission. Goal Two specifically relates to invasive species:

“Reduce the impacts from invasive species: restore the health of the Nation’s forests and grasslands to be resilient to the effects of invasive insects, pathogens, plants, and pests.”

To accomplish this goal, the Forest Service proposed to:

- Implement and support actions to detect and monitor both established populations and new introductions of invasive plants.

- Manage populations of established invasive species using prevention, suppression, and restoration tactics to reduce impacts and restore ecosystems.
- Involve partners in developing a nationally consistent risk-modeling approach that enhances using risk maps at national, state, regional, and local scales.
- Implement risk-based detection surveys to identify forest vulnerability to invasive species based on availability of susceptible hosts, suitable environmental conditions for invasion, and likely movement pathways of invasive species.
- Cooperate with other federal, state, tribal, and non-governmental partners in conservation education efforts to increase public awareness of invasive species and encourage support and participation in management actions.

As further guidance, in 2004 the Forest Service developed the **National Invasive Species Strategy and Implementation Plan** “to apply a more effective approach to address the invasive species problem that will support its stewardship mission and the execution of Executive Order 13112 regarding invasive species.” This strategy emphasizes that improving capacity, improving and streamlining procedures, and a long-term commitment to funding flexibility are integral to the organization and success of non-native, invasive species programs at all levels. The National Strategy incorporates four key elements for invasive species management:

1. Prevention
2. Early Detection and Rapid Response
3. Control and Management
4. Rehabilitation and Restoration

In addition, the National Strategy identifies critical themes, common among the four elements, such as:

1. Partnerships and Collaboration
2. Scientific Basis (including setting priorities based on risk assessments)
3. Communication and Education
4. Organizing for Success (including long-term commitment)

The National Strategy states that, “in all cases, we will strive to be *proactive* rather than *reactive* in our actions, holistic across landscapes and ownerships, and collaborative with partners.” The strategy also identifies three guiding principles: sound science, collaboration, and accountability.

The Intermountain Region has adhered to the National Invasive Species Strategy and Implementation Plan throughout the development of this Regional IS Strategy. In the past, the R4 invasive species program focused on terrestrial plants and forest pathogens. While much of the Region will continue to concentrate on these taxa, we will broaden our emphasis to include aquatic invasive species and increase our preparedness for treating them.

Purpose

The purpose of this document is to develop and guide the implementation of effective invasive species management programs across the Intermountain Region. National Forests and surrounding lands have large and growing problems with invasive species. Despite the hard work of many

individuals, established populations of exotic species persist or are expanding at a rate faster than our capability to respond.

This strategy will guide us toward a higher level of capability and accountability in our fight against invasive species. It will address substantial and quantifiable actions regarding:

- Prevention
- Early Detection and Rapid Response
- Control and Management
- Restoration and Rehabilitation.

If developed programs are successfully implemented over the five-year life of this strategy, our increased emphasis on prevention and awareness will lower the risk of new populations becoming established. If new populations do become established, we will have greater capacity for early detection and a more timely response with appropriate management.

The direction for the construction of this Regional IS Strategy is based, in part, on the **Intermountain Region Business Plan** (December, 2007). Resource Priority A (Objective A.2) specifies: “control noxious weeds and invasive species through early detection and rapid response,” and includes these action items:

- Establish or modify Cooperative Weed Management Areas (CWMAs), as appropriate to cover all National Forest System (NFS) land.
- Control and eradicate noxious weeds.
- Complete inventories and increase acres treated/monitored.
- Increase partnership contributions.
- Reduce aquatic ecosystems at risk.

The Business Plan directs that a majority of treatments should be focused in *priority landscapes* to ensure effectiveness and efficiency, and emphasis should be on integrated pest management. The number of acres treated would be measured using existing databases. Projects that are co-funded from additional Partnership Agreements should be given the highest priority for funding. Thus, the Region’s Business Plan emphasizes *leveraging resources through partnerships to maximize effectiveness and efficiency on priority landscape*; elements that will be followed throughout the Regional strategy. Although, the Business Plan does not address *prevention* of new species introductions, prevention will be a major component of the strategy.

Strategic Actions

Organizing

A defined organizational structure with named contacts, interdisciplinary teams, and an action plan that clarifies priorities will enable successful IS management. At the Regional level, a Regional IS Coordinator will lead the Regional IS Issues Team (RISIT). The RISIT will consist of representatives from Fire, Conservation Education, Wilderness, Engineering, and Pesticides, as well as coordinators for three IS taxa. The Team will (1) coordinate IS issues, (2) network information and opportunities, (3) foster development and support of partnerships, (4) develop and recommend IS

policies, and (5) support the Regional Business Plan and associated strategies. (See the RISIT Organizational Chart, Appendix A). In addition, the RISIT will maintain an informative and educational website available to internal and external audiences. This website will support continued cooperative and coordinated Integrated Pest Management with other agencies, partners, and the public.

Forests will develop staffing, skills, and expertise by establishing an Interdisciplinary Forest IS Team and designate a Forest-level IS Coordinator, as well as District-level IS contacts. These contacts will facilitate communication between Districts and Forests, as well as the RISIT, and external partners.

Developing Action Plans and Risk Assessments

Five-Year Action Plans

Forests will develop an interdisciplinary, five-year IS Action Plan using the format described in Appendix B. Action Plans will clearly define and schedule Forest program activities that implement this Strategy. In addition, Action Plans should consider existing and desired workforce capabilities, including staffing and skills, and will also identify existing partnerships, roles, and opportunities for better collaboration.

In order to prioritize activities for the Action Plan, risk assessments will be used to determine priority landscapes, important vectors, and IS with the greatest potential risk to the Forest. Invasive species present on adjacent non-NFS land will be considered, as well as species not yet designated as invasive but exhibiting invasive characteristics. Risk Assessments can be used to identify critical pathways of IS introduction. Based on these assessments, Forests will develop and implement IS-related Forest plan standards and guides, best management practices, and contract and permit language. Forests should coordinate with state, federal, and non-government partners to develop the prevention component of the Action Plan.

The Action Plan will be updated annually to adjust to emerging issues and new species; respond to program budget direction; and allow better integration with other program needs.

The **Regional Invasive Species Coordinator** will support Forests during development of Action Plans. The Coordinator will:

- Provide technical advice and assistance to Forest Action Plans.
- Provide advice to Forests as they prepare out-year budget requests.
- Compile Forest Action Plan implementation needs into a Regional recommendation in program budget planning.
- Keep Directors updated on Action Plan funding.
- Prepare program of Regional training and coordination activities needed for implementation of Regional Invasive Species Strategy.
- Prepare an annual year-end summary of strategic accomplishments, as well as identify critical items not accomplished.

Actions for Organizing Program and Developing Action Plans

Responsible Party	<i>Organizing and Action Plans</i>
Regional Forester	Require forests to produce a 5 year Action Plan for invasive species management.
Regional IS Coordinator	Provide outline and examples for project-level risk assessments for introduction of invasive species.
Forest Supervisor District Ranger	Develop staffing, skills, and expertise on all Forest units to effectively developing and implementing integrated treatment programs. <i>(Ongoing, as outlined in Forest Action Plans)</i>
Forest Supervisor	Consider one or more full-time coordinator positions per Forest to seek out and develop grant and partnership opportunities instead of relying on someone with collateral duties to accomplish this work. Take more advantage of the opportunity to "leverage dollars." Identify and utilize all appropriate fund codes and opportunities as appropriate to treat invasive species. <i>(Ongoing)</i>
Forest Supervisor District Ranger	At least every 5 years, assess the population trends of major invasive species on the unit, including new invaders. <i>(Address in Forest action plans)</i>
Forest Supervisor District Ranger	Focus resources on prevention/control/management of priority species and landscapes through Action Plans. <i>(Ongoing, as outlined in Forest action plans)</i>
Forest Supervisor District Ranger	Annually review potential for new invaders and potential for existing invaders to move into new areas Plan prevention measures accordingly.
Forest Supervisor District Ranger	Through a Forest Risk Assessment, identify and map areas remaining intact, un-invaded ecosystems, partially invaded areas, and areas that have lost their native plant components .
Forest Supervisor District Ranger	Unless otherwise negotiated, ensure all facilities, including administrative sites, campgrounds, offices, etc., are free of invasive species. Include this requirement in all building leases when renewed. <i>(Address in Forest action plan)</i>
Forest Supervisor	Incorporate invasive species standards, guidelines, and prevention practices into Forest Land and Resource Management Plans (LRMPs).
Forest Supervisor District Ranger	When planning invasive plant management activities, use adaptive or programmatic NEPA concepts to promote flexibility. Include a reasonable anticipated expansion of treatment areas within the scope of the analysis. Scope should also cover a reasonable substitution of new products or techniques and allow management of new populations without follow-up NEPA efforts. <i>(Ongoing)</i>
Forest Supervisor	Plan and complete systematic surveys of Forest, including roadways, etc., which are key vectors of spread. Identify annual work under this item in Forest Action Plans <i>(Ongoing)</i>
Forest Supervisor	Involved in invasive treatment NEPA planning efforts to assure that timely treatment is not hampered by NEPA delays or insufficiency. Assure that all NEPA efforts on the unit have integrated the needs of invasive species prevention and management. <i>(Ongoing)</i>

Prevention

Prevention is our “first line of defense” and is arguably the most critical element of the strategy. Our goal, to prevent the introduction and/or establishment of new invasive species, can be addressed by several actions. First, promoting external education and outreach is essential. Members of the RISIT will provide and maintain key IS information on the regional website. This information will be available to internal and external audiences. The Forest Service will use a variety of educational materials targeting external groups that promote awareness of invasive threats, including signage, exhibits, presentations, and workshops. Second, internal training is needed to educate field-going personnel to recognize IS; understand vectors and preventative measures; use databases for reporting and mapping; communicate with other programs and agencies, and apply a “Safety First” attitude in all activities. Funding is needed to enable more of these educational efforts across the Region.

Prevention Actions

<i>Responsible Party</i>	<i>Prevention Action</i>
Regional IS Coordinator	Regional training course for invasive species prevention. Target audience will be all employees with field going and public contact responsibilities, line officers, and key staff.
Regional Staff	Regional Fire Staff and Engineering Staff to develop BMPs to reduce risk of introduction of invasives.
Regional Staff	Provide additional resources to protect aquatic environments in National Recreation Areas from IS.
Regional IS Coordinator	Develop Regional weed-seed-free gravel and borrow source policy for NFS land activities.
Regional Staff Forest Supervisor District Ranger	Promote “Safety First” in all activities
Forest Supervisor District Ranger	Ensure ID Teams incorporate invasive species input in all project planning. Include all program needs and fund codes for invasive species monitoring and treatment in management activities, as appropriate. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Ensure all project implementation includes BMPs for prevention/spread of invasive species. Avoid management practices that increase ecosystem susceptibility to invasives <i>(Ongoing)</i>
Forest Supervisor District Ranger	Include clauses in all relevant permits and contracts that provide for appropriate preventative and/or control measures to avoid spread of invasive species
Forest Supervisor District Ranger	Ensure that gravel purchased for use on Forest roads and other NFS locations comes from pits managed to minimize the risk of spreading invasives. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Ensure that all gravel pits on NFS land are free of invasive plants. Include clauses in all relevant permits and contracts. If USFS-operated, fund and implement weed treatment as appropriate. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Coordinate with road crews, leasees, concessionaires, contractors, etc., to minimize risk of weed spread as a result of blading and other routine road maintenance operations. <i>(Ongoing)</i>

<i>Responsible Party</i>	<i>Prevention Action</i>
Forest Supervisor District Ranger	Expand use of preventive measures, including sanitizing equipment after work in infested areas, requiring certified weed-free seed and other materials for restoration, and use of certified weed-free hay.
Forest Supervisor District Ranger	Work with partners to build awareness of potential IS and their threats. Develop a public education program, including interpretive signs in campgrounds and at trailheads; use of brochures with maps and permits; school visits; etc.
Forest Supervisor District Ranger	Populate Forest Service corporate databases of record with inventory and treatment data including partnership values, where appropriate
District Ranger	Annually review potential for new invaders and potential for existing invaders to move into new areas. Plan prevention measures accordingly.

Early Detection and Rapid Response

Sometimes considered the “second line of defense” behind prevention, Early Detection and Rapid Response (EDRR) is a critical component of a strong IS program. As new IS infestations are detected, a quick and coordinated containment and eradication response will reduce negative environmental and economic impacts.

The best landscape areas to defend against IS are un-infested areas of special significance, whether due to their pristine qualities or particular vulnerability. Examples of priority landscapes may include:

- National Recreational Areas
- Research Natural Areas
 - Wilderness
 - Threatened and Endangered Species (TES) habitat
 - NFS land adjacent to National Parks, Monuments, etc.
 - Priority non-NFS land and waters

For further information on identifying priority landscapes, see the priority landscape matrix example on the Region 4 Invasive Species website.

Invasive Species Inventories

While systematic IS inventories have increased in the Region, too often early detection of new IS occurs randomly. More emphasis is needed on inventories and the input of survey data into corporate databases. Consider using volunteer surveys as a means to increase IS detection.

Monitoring and Managing Priority IS Vectors

Invasive species are quickly advancing along transportation corridors throughout the Region, and therefore, more consistent early detection and response to these populations is badly needed. Some Forest Service units are equipped with the personnel, equipment, and partners to provide vigilant monitoring of vectors, while others lack sufficient resources. It is important to recognize a wide variety of vectors and develop associated prevention and EDRR activities to protect priority landscapes in un-infested areas. Roads, trails, backcountry airstrips, boat launches, livestock driveways, wildlife movement corridors, and developed and dispersed recreation may all be key transportation corridor vectors to consider.

For effective, long-term weed prevention, all Maintenance Level 3, 4, and 5 roadsides; back country airstrips; high use waterways; and trails must be monitored on a repeating cycle of not more than 3 years. Some invasive species and unique local conditions may require more frequent monitoring of high priority vectors on a weekly, monthly, or seasonal basis. This activity is an important item that needs to be addressed in Forest Action Plans since it directly supports EDRR, a critical activity. Monitoring of some invasive species may be more difficult technically, and could involve a variety of methods and partnering with cooperating or lead agencies.

Timely Treatment Capabilities

For effective EDRR, NEPA documentation should be flexible enough to allow timely management response to new infestations. If NEPA documentation is narrowly focused or inflexible, it will not accommodate new species or new management tools that may become available.

Early Detection and Rapid Response Actions

<i>Responsible Party</i>	<i>Early Detection and Rapid Response Action</i>
Forest Supervisor District Ranger	Continue full implementation and use of corporate database(s) for IS inventories and treatment in support of performance measures accountability. Enter new data for invasive species inventories by December 15, annually. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Work with partners to develop rapid response incident teams that cross jurisdictional lines and respond quickly to verified invasive species outbreaks. Ensure availability of Forest unit resources for rapid response.
Regional Staff	Provide additional emphasis and resources to detect and eradicate new invasive species from vectors before NRA aquatic habitats are infested.
Regional IS Coordinator	Analyze Forest database records and assess Regional IS population trends. Present status of invasive species to RLT. At this presentation, propose minor adjustments to R-4 strategy, if needed. <i>(Ongoing)</i>
Regional IS Coordinator	Maintain an “early alert” information network to enable the Forests, CWMAs, R4 RISIT, and key partners to share pertinent and timely information about new infestations.

Regional IS Coordinator Forest Supervisor District Ranger	Work with partners to identify adjacent at-risk areas and recommend immediate action.
Regional IS Coordinator Forest Supervisor District Ranger	Train field personnel how to identify and report identified new incidence of IS.
Forest Supervisor District Ranger	Assess extent of new invasion and potential to eradicate. This may require shifting priorities and funds at the Forest level.
Regional IS Coordinator	Identify needed research on biology, ecology, and eradication methods of priority IS.
Regional IS Coordinator Forest Supervisor	Develop maps of priority ecosystems and habitats placed at risk by IS.

Control and Management

Effective control and management of IS requires a clear understanding of species identification, biology, ecology, vectors of spread, and the most appropriate methods for management. All programs will employ Integrated Pest Management (IPM) principles which may include any combination of physical/mechanical, biological, cultural, and chemical techniques. Control objectives must be clearly identified and must specify whether the management intent is eradication, suppression, or containment.

Infestations should be characterized by surface area infested, density (number of organisms per unit area), and severity of threat to priority landscapes. Forests should strive to eradicate any IS infesting less than 15 acres. Where feasible, bio-controls should be utilized and pesticide applications restricted to:

- Containment of infestation perimeters.
- Maintenance of IS-free vector routes; priorities include roads, trails, airstrips, campgrounds, wildlife winter grounds, boat launches, and developed fishing accesses.
- Eradicate invasive species threatening priority landscapes.

Project planning, consistent with the National Environmental Policy Act (NEPA), and implementation should be closely integrated with TES programs to minimize risks to rare species. Treatment personnel must be trained to identify not only IS, but TES as well.

NEPA planning must be flexible enough to allow for the timely implementation or substitution of technologies, such as new pesticides and application within the scope of the original decision.

The unchecked spread of invaders along travel corridors and other important vector routes must be emphasized Region-wide. This will require higher levels of coordination and communication between USFS personnel and other federal, tribal, state, county, and NGO entities.

Control and Management Actions

<i>Responsible Party</i>	<i>Control and Management Actions Action</i>
Forest Supervisor	Continue CWMA and partnership development, support, and participation. Emphasize areas lacking CWMA's.
Forest Supervisor District Ranger	Ensure that personnel conducting treatments are familiar with TES species in order to minimize or eliminate adverse impacts. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Coordinate with partners in the development of Invasive Species Grant Projects. <i>(Ongoing)</i>
Regional Forester Forest Supervisor District Ranger	Report all IS treatments by the national reporting deadline, using the corporate database of record. <i>(By October 15th following field season)</i>
Forest Supervisor District Ranger	Emphasize coordination with agencies, local governments, or neighbors on priority vector responsibilities. As an example, ensure right-of-way weed management objectives are consistent and/or complementary across jurisdictional boundaries. <i>(Ongoing)</i>
Regional IS Coordinator Forest Supervisor District Ranger	Encourage attendance and participation in associations and professional groups to maintain and improve expertise in recognizing invaders and learning IPM techniques. <i>(Ongoing)</i>
Forest Supervisor District Ranger	Implement control, containment, or management plans of priority invasive species as identified in Forest IS plans. Areas in which eradication, immediate control, or containment may not be feasible should be identified and bio-control management should be applied where available.
Forest Supervisor District Ranger	Expand partnerships to control or manage IS across jurisdictional boundaries.
Forest Supervisor District Ranger	Monitor long-term IS population trends and the effectiveness of treatments.
Forest Supervisor District Ranger	Educate resource managers and the public on the importance of IS management and control and effects of various management and user practices.
Forest Supervisor District Ranger	Implement IS policies to include Best Management Practices, including but not limited to FSM 2080, R4 2000-2001-1
Regional IS Coordinator Forest Supervisor District Ranger	Communicate management successes in IS management to the public via press releases, media show-me trips, etc. <i>(Ongoing)</i>
Regional IS Coordinator	Annually, monitor a subset of treatments to evaluate effectiveness. Share successes and problems with other units, partners, and the public. <i>(Ongoing)</i>
Regional IS Coordinator	Distribute research findings and new information on biological, cultural, chemical, and physical controls for priority species to the field. <i>(Ongoing)</i>

Restoration and Rehabilitation

Rehabilitation and restoration are vital components of an integrated IS management program. Rehabilitation is defined as short-term mitigation to ensure minimum site stability and functionality. This may include site preparation and seeding of desirable non-native vegetation. Restoration is a long-term objective and involves returning sites to natural functions and native species. Restoration and rehabilitation may involve:

- 1) Shifting degraded areas towards their proper ecological function to prevent IS infestations. Since many invasive species, especially invasive plants, flourish in disturbed ecosystems, site condition improvement helps prevent establishment of invasive populations and reduces long-term ecosystem impacts. Burned Area Emergency Response (BAER) policy can fund monitoring and treatment of IS for up to 3 years following fire. Use of BAER funding is appropriate when exotic plants invade after a fire. BAER teams and local resource managers strive to incorporate native or desired non-native species into post-fire planning.
- 2) Management of IS where they are the primary reason for restoration. Terrestrial IS management in these cases may include re-seeding to increase competition or control practices such as bio-control, tree removal, or pesticide application. For invasive aquatic fishes, restoration of a stream reach could involve removal of non-natives with piscicides and barrier construction to prevent re-infestation from downstream populations. Appropriate tools and techniques will evolve to effectively meet challenges from a broader array of IS taxa as they become an issue.

Native Plant Materials Policy

National USFS policy (FSM 2070.3) promotes the use of native plants in rehabilitation and restoration where practicable. Testing seed to be used in restoration projects is highly recommended to avoid accidental seeding of invasive plants.

Region 4 will continue to emphasize reliable sources of native seed stock for future use. Storage of large amounts of seed can be an issue. The Intermountain Region entered into a partnership to construct the Great Basin Research Center in Ephraim, Utah. This interagency facility ensures up to 100,000 pounds of seed storage for the Intermountain Region. Additional opportunities for seed storage may be secured as Forests negotiate with cooperating agencies region-wide.

Restoration and Rehabilitation Actions

<i>Responsible Party</i>	<i>Restoration and Rehabilitation Actions Action</i>
Forest Supervisor	Ensure that certified weed-free products are used for erosion control, mulch, and other purposes. Weigh the benefits of mulch and erosion products against the possible import of non-native plants, even in certified weed-free products. (i.e., cheatgrass or other species not on State Noxious Weed Lists). <i>(Ongoing)</i>
District Ranger	
BAER Team	

<i>Responsible Party</i>	<i>Restoration and Rehabilitation Actions Action</i>
Regional IS Coordinator	Develop web-based or other information and technology transfer tools to communicate disturbance ecology and invasive species, establishment methods for natives, species habitat (native community) relationships, and genetic range.
Regional Forester	Working with partners, develop an infrastructure for producing, purchasing and warehousing seed supplies, and other native and desirable non-native plant materials on a Regional basis.
Regional Forester Regional IS Coordinator Forest Supervisor District Ranger	Develop and implement a Regional policy that incorporates the best available science on using native or desired non-native species for restoration and rehabilitation.
Region IS Coordinator	Compile, highlight, and share information about existing restoration and rehabilitation successes around the Region about IS.
Regional IS Coordinator, Regional Botanist Regional Ecologist	Identify and coordinate rehabilitation and restoration needs with research and development.
Regional IS Coordinator, Regional Botanist	Prioritize and develop native plant stock that is resistant to invasive insects and pathogens.
Regional IS Coordinator, Regional Botanist	Work with partners to facilitate education and awareness to nurseries regarding desired native and non-native vegetative species.
Regional IS Coordinator Regional Botanist Forest Supervisor District Ranger	Evaluate monitoring results and assess effectiveness of restoration action.
Regional IS Coordinator Regional Botanist Regional Ecologist	Use ecological assessments to identify better ways to restore ecosystem function.

Building Partnerships and Collaboration

Invasive species cross ownership boundaries. It is crucial that we maintain healthy, active relationships with our neighbors and do so in a financially responsible manner. Lead agency responsibilities regarding invasives vary with taxon (see table below). In general, the Forest Service initiates projects involving terrestrial or aquatic plants. For other taxa, the USFS maintains a cooperating role.

Invasive Species Group	USFS Lead	USFS Cooperating	Lead agency/ group
Terrestrial plants on NFS land	x		USFS

Aquatic plants on NFS land	x		USFS
Non- native fish and other aquatic vertebrates		x	State wildlife agencies
Fish and wildlife pathogens (e.g., chronic wasting disease, whirling disease, chytrid fungus)		x	State wildlife agencies
Aquatic invertebrates (e.g., mussels, crustaceans, algae)		x	State wildlife agencies, US Geologic Survey, or Corp of Engineers
Forestry-related insects & pathogens on NFS lands		x	APHIS, State Dept. of Agriculture
Forestry-related insects & pathogens on non-NFS lands		x	State Forestry, USFS State and Private Forestry
Terrestrial vertebrates, including birds		x	State wildlife agencies, US Fish and Wildlife Service

A large part of the IS program is the partnerships developed with federal, tribal, state, county or NGOs in which non-federal dollars are matched with federal dollars to promote cooperative management activities.

To maximize efficiency and effectiveness of management efforts, it is essential that we continue CWMA and other partnership support and develop opportunities through appropriate agreements. Agreements enable the use of federal funds for partner activities or services and non-federal funds deposited through collection agreements.

Program Accountability

Follow-through on our commitments maintains credibility with Congress, fiscal controllers, neighbors, partners, and the general public. “FACTS Invasives” is the corporate database of record where IS treatments are concerned. Region 4 will take the following actions to ensure our reporting database accurately reflects optimal program activities, which support improved program effectiveness.

Performance Measures “Business Rules”

Business rules for the invasive species program provide direction and usually cover priorities, accomplishment reporting, and accountability. These rules can change annually and can be regional or national in scope. It is the Regional Invasive Species Coordinator’s responsibility to interpret and convey rules to the Forests and ensure compliance.

Historical noxious weed program success was evaluated by acres treated which favored herbicide applications. Improved understanding of effective IPM programs and availability of new tools for all taxa now embrace: 1) Prevention; 2) EDRR; 3) Control; and 4) Rehabilitation/Restoration. Business rules must support a broader array of practices emphasizing long-term effectiveness and cost efficiencies. The Region will take an active role in identifying new supportive business rules to reflect a more efficient and balanced IS program.

Prevention is the most cost-effective tool. Current national reporting does not recognize nor reward this activity. It will be necessary for the Region, Forests, and Districts to emphasize this important

activity and transfer associated expenses into reportable accomplishments. While the initial impact will increase unit costs for treatments, the long-term outcome will be a more effective and efficient program emphasizing a broader array of management activities.

EDRR is the second highest priority activity. This activity requires more time and resources to “find” the new invader, typically a “needle in the haystack” situation. Overall expenses for this activity are normally quite high resulting in a non-competitive unit-cost comparison with traditional pesticide application programs. Region 4 will pursue an interim business rule to promote and reward EDRR.

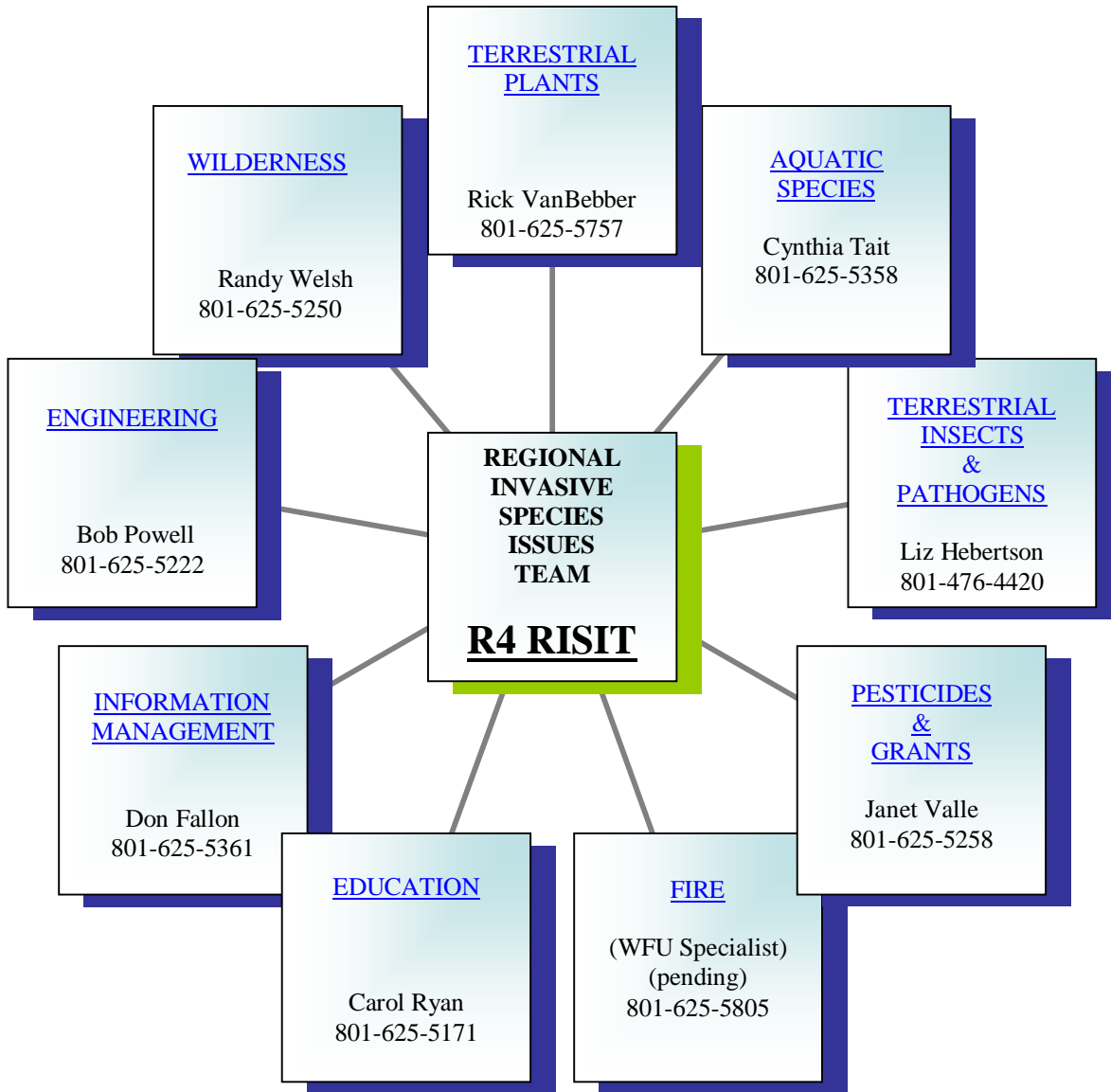
Biological control is a relatively new tool which is also not competitive with pesticide applications where annual “efficacy” reporting is concerned. It may take up to 5 years before bio-control efficacy can be accurately measured, while pesticide efficacy is often measured in the same season of application. An effective invasive species management program must incorporate approved and acceptable bio-control to improve long-term management. The Region will initiate development of a Business Rule to promote and reward the use of approved bio-control.

In the terrestrial noxious weed arena, inconsistent herbicide treatment reporting parameters have been a historical issue. Accomplishment reporting within Region 4 ranges from conservative figures based on Daily Applicator Records to liberal “gross polygons” treated. In the latter case, an “infested area” may be visited, with only a portion being treated, while the entire infested area is reported as an accomplishment. Evaluating treatment efficiencies and effectiveness for National level reporting requires a smaller range of variability. Thus, the Region will work to identify a business rule to address this issue.

Conclusion

Invasive species management is no longer exclusively a terrestrial problem. Although invasive plant (noxious weed) and forest insect and disease issues continue as a priority, aquatic ecosystems will also be emphasized in Region 4. Impacts from all invasive species, aquatic and terrestrial, are on the rise affecting priority landscapes and resources region-wide. This strategy will guide Region 4 programs with emphasis on prevention, as well as effective management strategies employing Integrated Pest Management activities. Coordination with partners, including federal, state, and local agencies, Tribes, NGO’s, and interested publics is a priority. A defined organization, with additional support and training, will allow safe, dedicated, and knowledgeable employees to meet the increasing challenges from invasive species.

Appendix A----R4 Regional Invasive Species Issues Team Organization



APPENDIX B

Outline for a 5 year plan for each NATIONAL FOREST

Note: Preparing a Forest Invasive Species Plan should include a Risk Assessment which identifies species and vectors, priority landscapes, ecoregion sub-units, and disturbance regimes which currently exist or reasonably threaten ecosystem integrity on the Forest. Example(s) of an assessment of risk is provided on the Region 4 Invasive Species website.

The following outline or checklist of items may be included in a Forest plan.

Introduction

- Existing Condition - Overview of status of infestation on the Forest by species and brief description of the problem.
- Description of forest's program to date.
- Reference to LMP direction re: Invasive species, FSM, FS National Strategy.
- II. Prevention
 - Describe existing prevention/education activities
 - Opportunities: Identify potential future invaders (top ten); educate Forest Service personnel re: pathways to introduction and project risk.
 - Outline Action Items (e.g., incorporate contract clauses for equipment cleaning into all contracts involving ground disturbance).
 - Identify community education opportunities.
- III. Early Detection and Rapid Response
 - Describe existing EDRR system.
 - Opportunities: Train field personnel to identify new invasives; have an initial attack plan for dealing with small, new infestations and have an alert system in place.
 - Outline Action Items.
- IV. Control and Management
 - Describe existing projects, and status of NEPA documents for IS control.
 - Identify existing situation. Present inventory and monitoring status. Tie information to what cooperators are doing, inventories, GIS info, etc.
 - Evaluate the adequacy of existing invasive species inventories.
 - Identify gaps in data for priority species.
 - Identify gaps in data for priority areas.
 - Update inventories as needed.
 - Identify the unit's top five priority invasive species. Priority species are low in abundance and control is mostly feasible unit-wide. These species have the ability to establish dominance in plant communities and invade a variety of relatively healthy ecosystems.
 - Provide management objective maps for each priority species. By species, identify both eradication areas and containment areas.
 - Include rehabilitation/restoration plan in weed control projects where needed.
 - Create timetables for inventory and/or treatment of all roads on the Forest/Grassland unit. Unless otherwise negotiated, Levels 3, 4, and 5 roadways and major system trails will be inventoried and treated on no more than a 3 year cycle. Level 1 and 2

roads will be on no more than a 5 year cycle. Where responsibility lies with state or county departments of transportation, identify needed coordination with the appropriate agency to ensure completion of roadside detection and treatment according to the identified schedule. For roadside weed management considerations review information and links on the regional IS website.

Identify the Forest or Grassland's priority monitoring and treatment areas

- Identify key areas for routine monitoring and treatment and assign frequency of visits.
 - Roadways, campgrounds.
 - Riparian corridors.
 - Administrative sites/Visitor centers.
 - Special resource value areas, i.e., key wildlife habitats.
- Action items.
- V. Rehabilitation/Restoration
 - Opportunities: Re-vegetate with native species after control actions such as fire.
 - Action items.
- VI. Organizational Needs
 - Identify funding needed to implement the planned program of work and incorporate this need into Unit's program budget planning.
 - Identify the appropriate array of internal funding codes for the Unit's Invasives Program, as well as external grants and other sources. Identify the cost in NFS dollars vs Partnership dollars.
 - Identify program outputs possible with a 10 percent funding increase.
 - Identify current staffing and responsibilities; assign role of Unit Invasive Species Coordinator for each unit.
 - Identify gaps in capability to conduct implement strategy elements and meet the planned program of work.
 - Identify current and desired annual acreage treatment levels. Annual desired treatment levels are approximately one-third of existing populations.
 - Identify planned annual acreage treatment levels. Planned treatment levels should indicate a substantial trend toward treatment of one-third of existing acreage (priority species) annually, over the life of this strategy.
 - Evaluate the capabilities and training needs of the local invasives networks, (CWMA's, county weed personnel, FS personnel, contractors, etc.) to fulfill the action plan's desired treatment levels.
 - Address current situations and future foreseeable developments that may affect existing workload capabilities.
 - Assess the validity and effectiveness of the Unit's Invasive Species Action Plan, based on population trends of major invasive plant species. Are the assumptions and guidance of the Forest/Grassland's Invasive Species Action Plan correct? Can we accomplish our long-term objective if we follow the Plan? The results of this assessment should dictate 5 year revisions of the Action Plan.
 - Identify strengths and successes, and prescribe corrective actions.