DESCHUTES NATIONAL FOREST

NOXIOUS WEED CONTROL

ENVIRONMENTAL ASSESSMENT

December 1998

Chapter 1 -- Purpose of and Need for Action (complete chapter)

Chapter 2 -- Alternatives, Including the Proposed Action (complete chapter)

Chapter 3 -- Environmental Effects (complete chapter)

Chapter 4 -- Consultation with Others and List of the Interdisciplinary Team (complete chapter)

Chapter 5 -- Integrated Weed Management Plan (complete chapter)

Literature Cited

Appendix A: Response to Public Comments

Appendix B: Herbicide Information Profiles - Not available online.

Appendix C: Map and Weed Treatment Site Locations

Maps

Deschutes and Ochoco National Forests Website
http://www.fs.fed.us/centraloregon/manageinfo/nepa/documents/so/weeds/a-ea-dec/weedea.html
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CHAPTER 1

PURPOSE AND NEED FOR ACTION

Introduction/Background

In compliance with the National Environmental Policy Act (NEPA) and the Mediated Agreement and Record of Decisions (1988 & 1992) for the Final Environmental Impact Statement (Vegetation Management, FEIS) for Managing Competing and Unwanted Vegetation, this document has been prepared to disclose the alternatives and effects of proposed treatments of noxious weed populations.

Aggressive, non-native plants, called noxious weeds, are plant species introduced from Europe and Asia that pose a threat to the Deschutes National Forest (DNF) native plant communities and wildlife species that depend on them. These noxious weed plant species can increase fire hazards, replace valuable forage with non-palatable or less nutritious forage for both wildlife and cattle, cause economic losses to adjacent farming and ranch communities, decrease the quality of recreational activities and reduce the diversity of native plant and animal communities. Because these species are not native to the area, natural controls to limit population sizes are non-existent. This allows, in some cases, rapid colonization of areas to the detriment of native plants.

In 1994, inventories conducted on the Deschutes National Forest identified 44 noxious weed

sites. Due to increased inventory efforts, reporting processes, awareness of employees and the continued spread of noxious weed populations, the Forest now has approximately 235 known sites of varying population sizes and acreages ranging from a single plant to more than 20 acres in size with thousands of plants.

Sixteen Oregon State-listed noxious weed species (Oregon Department of Agriculture) occur on the DNF (see TABLE 1, Chapter 2, for a listing of the species). Of these, the Forest is especially concerned about spotted knapweed, diffuse knapweed, dalmation toadflax, and scotch broom already located at various sites throughout the Forest. Yellow starthistle and white top have the potential to spread from existing populations on adjacent private lands to Forest Service lands and are extremely difficult to eradicate once populations are established.

Location

The project is located at various sites on the Deschutes National Forest. There are a total of 235 known noxious weed sites located in the Deschutes National Forest. Of those sites, priorities have been identified and 166 weed sites have been included for discussion in this Environmental Assessment. For detailed locations, see the Vicinity Maps located at the end of this Environmental Assessment. See also Appendix B for a listing of Map Site Numbers and their associated Maps. There are 7 different maps associated with the Treatment Sites and this appendix displays which Map Site Numbers are on which maps.

Management Direction

The National Forest Management Act (1976) specifies that National Forest System lands "provide for a diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives,...". The implementing regulations (36 CFR 219.26) for the National Forest Management Act states that "forest planning shall provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives" In addition, 36 CFR 219.27 (g) states that "management prescriptions shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest..., reductions in diversity of plant and animal species from that which would be expected in a natural forest, ...may be prescribed only where needed to meet multiple-use objectives. Planned type conversions shall be justified by an analysis showing biological, economic, social, and environmental design consequences, and the relation of such conversions to the process of

natural change."

The Noxious Weed Management Act (1974) contains provisions to prevent the dissemination of noxious weeds. Other provisions in the act authorize the cooperation of Federal agencies with agencies of State, districts, farmers' associations and similar organizations or individuals in carrying out operations or measures to eradicate, suppress, control or retard the spread of any noxious weed. In addition, 36 CFR 222.8 acknowledges the Agencies obligations to work cooperatively in identifying noxious weed problems and developing control programs in areas where National Forest System lands are located.

The Deschutes National Forest Land and Resource Management Plan (LRMP or Forest Plan) does not contain specific direction for noxious weed management. Standard FH-8, page 4-37 states that herbicides would be used in conjunction with vegetation management FEIS. Other sections of the LRMP make indirect references to maintaining habitat for wildlife species which are dependent on plant communities and habitat. Noxious weed sites occur in a variety of management areas allocated by the Forest Plan. They are as follows:

Management Area Allocation codes

DHB :	Deer habitat	SID :	Wake Butte Special Interest Area
DIR :	Dispersed Recreation	SIK :	Moffit Butte Special Interest Area
EAG :	Bald Eagle	SIL :	Lava River Cave Special Interest Area
FCS :	Front Country Seen	SIN :	Davis Lake Special Interest Area
FCU :	Front Country Unseen	SV1 :	Scenic Views - Retention Foreground
GFO :	General Forest	SV2 :	Scenic Views - Partial Retention Foreground
INR :	Intensive Recreation	SV4 :	Scenic Views - Partial Retention Midground
MBB :	Metolius Black Butte Scenic	WIN :	Wilderness
MHE :	Metolius Heritage	WIR :	Winter Recreation

MOG :	Metolius Old Growth	WS1 :	Deschutes Wild and Scenic River, Scenic Segment
MRN :	Metolius Research Natural Area	WS2 :	Deschutes Wild and Scenic River, Recreation
MSF :	Metolius Special Forest	WS3 :	Metolius Wild and Scenic River, Scenic
MV2 :	Metolius Scenic Views - Partial Retention Foreground	WS4 :	Metolius Wild and Scenic River, Recreation
MV4 :	Metolius Scenic Views - Partial Retention Mid-ground	WS6 :	Squaw Creek Wild and Scenic River, Scenic
MWP :	Metolius Wildlife / Primitive	WS7 :	Crescent Creek Wild and Scenic River, Recreation
OCR :	Oregon Cascade Recreation Area	WS8 :	Big Marsh Wild and Scenic River, Recreation
OSP :	Osprey	WSB :	Deschutes Proposed Wild and Scenic River
RNB :	Pringle Falls Research Natural Area	WSC :	Fall Proposed Wild and Scenic River
SIA :	Lava Butte Special Interest Area	WSE :	Paulina Proposed Wild and Scenic River (Creek)

Management Area Goals and Objectives for each management area can be found in the LRMP. Table 2, at the end of Chapter 2, displays the information for each weed site and its respective Forest Plan Management Area land allocation.

Forest Service Manual (FSM) direction (2080) directs National Forests to develop and implement a noxious weed management program, prevent the introduction and establishment, and contain and suppress noxious weeds. The manual also establishes priorities for prevention and control:

- First priority: Prevent the introduction of new invaders,

- Second priority: Conduct early treatment of new infestations, and
- Third priority: Contain and control established infestations.

This legislative and policy direction and LRMP guidance provides overriding direction to maintain native plant communities and the plant and animal species that are dependent on the communities and to develop and implement prevention and control strategies to eliminate or reduce the spread and incidence of noxious weeds.

Relationship to Other Plans or Decisions

Northwest Forest Plan

The Final Supplemental Environmental Impact Statement and Record of Decision on "Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl" (Northwest Forest Plan) contains little specific direction for noxious weed control. References can be found in the Standard and Guidelines for Late Successional Reserves directing that "in general non-native species (plant and animal) should not be introduced into Late- Successional Reserves". Plans are to be developed for eliminating or controlling non-native species that are inconsistent with Late-Successional Reserve objectives. During watershed analysis, the condition of the vegetation within the watershed is to be assessed especially in meeting the 9 Aquatic Conservation Strategy Objectives. Noxious weed sites can be found within all management allocations of the Northwest Forest Plan within the Deschutes National Forest: Late-Successional Reserve, Congressionally Withdrawn, Administratively Withdrawn and Matrix lands.

1994 Noxious Weed Control

In 1994, the Deschutes National Forest prepared a Decision Memo and analysis file for the control of 44 noxious weed sites on 1,657 acres. The methods of control were biological or manual. The majority of sites have been receiving treatment since March, 1994.

The majority of sites identified under this Decision Memo have been reanalyzed with this Environmental Assessment.

Grass Control Demonstration Project, Bend / Ft. Rock Ranger District

The District released a Decision Notice and Environmental Assessment (1998) to treat competing grass species with a variety of methods including the use of herbicides (glyphosate and hexazinone). The grasses and sedges are competing with tree seedlings and reducing the growth and survival necessitating replanting at high costs. No noxious weed

sites are near or within this project area.

Interior Columbia Basin Ecosystem Management Project, Eastside Draft Environmental Impact Statement

While this document does not provide current direction, it does contain information that can be utilized such as developing an integrated weed control management plan to gain control and identify prevention strategies that can reduce or eliminate the spread of new noxious weed populations.

Newberry National Volcanic Monument

The Comprehensive Plan for the Newberry National Volcanic Monument (NNVM) establishes direction for the Monument. The Monument management goals include "sustain or restore ecosystems and ensure ecosystem resiliency within the Monument and Special Management area, while providing for natural ecological succession of vegetation to the maximum extent practical." Standard and Guideline Undesirable Exotic Plant Species M-33 (pg. 35, NNVM) states "Take action to eliminate or control existing populations of undesirable exotic plant species within the Monument. Where feasible and effective, choose methods that mimic natural processes (such as prescribed fire). Other treatments that may be used where appropriate include mechanical and herbicide treatments. Establish priorities for treatment based on rate of spread, threats to native populations, etc. In some cases, the re-establishment of native species through natural regeneration methods, seeding or planting may be appropriate to reduce further encroachment by undesirable, exotic plants."

Wild and Scenic River Plans or Areas

There are numerous Wild and Scenic designated rivers in the Deschutes National Forest. Plans have been completed for the Deschutes and Metolius Rivers while Resource Assessments have been completed for the other designated rivers. For all rivers, objectives to maintain native plant communities and preserving the vegetative characteristics play an important role. For all proposed activities in wild and scenic corridors, an assessment needs to be completed to determine if proposals would impact the identified outstandingly remarkable values. It is also important to protect fisheries, hydrologic features and water quality.

Purpose and Need

The purpose of the proposed action is to develop and implement prevention and control measures to reduce the spread and incidence of noxious weed populations which are

increasing on the Deschutes National Forest. The need for action is defined by the existing management direction which calls for the management of noxious weeds and the existing condition of locations and densities of noxious weed populations on the Deschutes National Forest. The Deschutes National Forest is proposing to reduce the spread and incidence of noxious weeds in order to maintain and enhance diverse native plant communities, which are the foundation of functional ecosystems. To achieve this goal, treatments have been proposed to prevent the establishment, control, contain (reduce the spread) and/or eradicate selected noxious weed populations. Sites for treatment have been selected based on the species present, densities, response to control measures, population size and location, proximity to valuable resources, adjacent land condition and other factors.

Proposed Action

The Deschutes National Forest is proposing to treat noxious weeds with several different methods throughout Deschutes National Forest lands. The goal is to determine through analysis, the appropriate treatment methods for controlling or eradicating selected noxious weed populations. The weeds proposed for treatment are listed in Table 2, located at the end of Chapter 2 of this document.

This Environmental Assessment proposes active management on 166 of the 235 sites. Factors considered in site selection for treatment include a medium to high probability of successful treatment, a high potential for spread if not treated, and a potential for damage to adjacent native plant communities. Of the 69 other sites (approximately 1,070 acres), no treatment would be proposed due to the noxious weed species being a lower priority as determined by the population's lower potential rate of spread, lack of known effective treatment methods, population size, location to other resources and that other species are a higher priority for treatment. Many sites are proposed for a variety of treatment methods over a period of several years in order to use the most effective combination of methods to control or eradicate noxious weed populations. See Table 2 (Chapter 2) for a complete listing of sites and their proposed control treatments. In summary, the Proposed Action proposes the following array of treatments:

- manual (handpulling, clipping seed heads) (900.6 acres in 98 sites)
- biological (using insects to feed on different parts of the plant) (149 acres in 27 sites)
- chemical (using herbicides) (476 acres in 40 sites)
- prescribed fire (using controlled fire) (5 acres in 1 site)

Manual control would be proposed at 98 of the 235 sites. Proximity to streams and water was a consideration in identifying sites for manual control and also where populations were small enough to be effectively controlled manually.

Biological control would be proposed at 27 of the 235 sites. Sites were identified for biological control if the agent was the most effective for the species identified or the population was so large that it was the most prudent method to initiate.

Chemical control would be proposed for 40 of the 235 sites, with 68% of the sites occurring along roadsides or in rock quarries, cinder pits, or mine claims. Other sites include Forest Service administrative sites, grazing allotments and recreation sites. Chemical treatments may be followed up with manual and / or biological treatments to remove plants that survived the initial and subsequent treatments.

Prescribed or controlled burning would be proposed for one site on the Crescent Ranger District at Big Marsh, a large freshwater wetlands complex. The target species to control is reed canary grass, seeded in the 1950s for streambank stabilization when the marsh was in private ownership and was being grazed by cattle. The species is not listed as noxious by the State of Oregon, but it may be an aggressive invader that could eventually dominate the wetlands, reducing the variety and quality of native species perhaps reducing habitat for wildlife. Long-term monitoring plots were established in 1996 to monitor the rate of spread of the population. The proposal is to burn a small portion of the population (around 5 acres) to measure the effectiveness of burning. Additionally, prior to burning, local native species' seeds would be collected and used to revegetate the burned area.

Sites would be treated for approximately 5 years (unless eradication or control occurred within a shorter time period), with monitoring being completed to determine the effectiveness of treatment. It is probable that responses to some treatments may not be realized until after several years of treatments.

For all treatments, monitoring would be done on selected sites to determine the effectiveness of treatments and if desired objectives and reductions in populations were being realized.

Tiering

This Environmental Assessment is being prepared under guidance of the Mediated Agreement and the Final Environmental Impact Statement (FEIS) for Managing Competing and Unwanted Vegetation. The Mediated Agreement provides guidance in the use of manual, mechanical, biological, prescribed burning and chemical control for unwanted vegetation including mitigations for protection of the environment and assessment of human health risks. There are two Record of Decisions associated with the FEIS, one released initially in 1988 and an amendment released in 1992. The guidance contained in the Mediated Agreement, Record of Decisions and FEIS was followed for this Environmental

Assessment and this Environmental Assessment is tiered to the Mediated Agreement and FEIS.

Decision to be Made

The Decision to be Made is whether to implement treatment of noxious weed populations and which treatments would be implemented for specific sites and identify appropriate mitigation and monitoring measures. The amount and complexity of monitoring would also be determined. The Deschutes National Forest Supervisor would be the deciding official.

Scoping Process Used

A scoping letter dated December 10, 1997 was sent to a mailing list of over 1,400 people compiled from each Ranger District on the Deschutes National Forest (Crescent, Sisters and Bend/Ft. Rock). Additionally, county records were searched to determine landowners adjacent to sites proposed for biological or chemical control and were included in the mailing. Approximately 59 written responses and over 20 phone conversations were received and utilized to formulate mitigation measures and alternatives to the proposed action.

Numerous presentations have been made to local community groups such as the Sisters Rotarians by Maret Pajutee on February 10, 1998 and to the Sunriver Environmental Committee by Katie Grenier on April 27, 1998. Other presentations on noxious weeds has occurred to a variety of groups over the past year including during a Weed Awareness Day on June 24, 1998 to over 50 people. A small article on the use of herbicides to control noxious weeds appeared on January 28, 1998 in the Bend Bulletin. An additional article on noxious weeds and their management in Central Oregon appeared on May 3, 1998.

Issues

After the initial scoping period, the Interdisciplinary Team evaluated public and internal Forest Service comments received and developed issues. Issues guide the formulation of alternatives and mitigation measures, and are used in the evaluation of the alternatives. A measuring factor for each issue has been identified in order to determine the effectiveness of each alternative in meeting the issues.

The following are issues that aided in the development of the Alternatives.

Issue 1: Use of Herbicides

There is a concern regarding the use of herbicides in the environment. There are people that believe it is inappropriate to use chemicals when other methods, no matter how costly, can be used to control noxious weed populations. The measuring factor to display how each alternative responds to this issue is the acreage receiving herbicide applications.

Issue 2: Maintaining Native Plant Communities

There is a concern the loss of diversity in native plant communities would occur with the continued spread and incidence of noxious weed populations. Native plant species could be displaced by undesirable non-native species with a subsequent impact to wildlife species and diversity. People feel there needs to be an integrated strategy to control and eradicate noxious weeds and that all tools available should be responsibly used. The measuring factor would be the amount of acreage receiving some form of control.

The following are issues that aided in the development of mitigation measures.

Issue 3: Water Quality

There is a concern about the use of herbicides and the impacts on riparian communities, including the impacts on vegetation, fish, wildlife, insects and other riparian dependent or associated species. There is a perception that herbicides may adversely impact water quality due to leaching through the soil from application sites. The measuring factor would be the identification of sites and their potential impacts to herbicides applied within the 100 foot buffer zone adjacent to riparian areas.

Issue 4: Utilization of Prevention Strategies

There is a concern that prevention strategies are not being utilized or enforced in order to reduce the incidence and spread of noxious weeds. The Mediated Agreement identifies prevention strategies to forestall the establishment of noxious weed populations as the most desirable method of control. The measuring factor would be the identification of prevention strategies and

monitoring efforts to determine the effectiveness of the prevention strategies.

Issue 5: Impacts to unique areas including Wilderness, Special Interest Areas (SIA), Research Natural Areas (RNA), Old Growth Management Areas, Oregon Cascades Recreation Area (OCRA), and others (for a complete listing, see Chapter 3, Effects Analysis, Issue 5).

There is a concern about keeping unique areas (such as wilderness areas) weed-free. These areas are important refugia for species and are maintained in more natural states than adjacent lands under timber or other active management. A high priority would be to treat populations that have the potential to spread into unique areas. The measuring factor would be the amount of noxious weed acreage within unique areas receiving treatment.

Issue 6: Human Health Risks

There is a concern about the impacts to humans from the use of herbicides. Inappropriate handling, applications and storage could cause injury to humans, both the applicators and forest visitors to sites with herbicides. The measuring factor would be the disclosure of the human health risk assessment for each alternative and identification of mitigation measures implemented to ensure potential impacts to applicators and casual forest visitors are reduced or eliminated.

Issue 7: Impacts of herbicides to Non-target Desirable Species

There is a concern that the application of herbicides has the potential to adversely affect non-target plant species found adjacent or within treatment sites. Non-target species may include sensitive plants identified by the Regional Forester. The measuring factor would be the acreage of sensitive species potentially affected by herbicide application.

Issue 8: Spread of Forest Noxious Weed Populations to Adjacent Private Lands

There is a concern about the spread of noxious weeds beyond the forest boundary to adjacent land owners. Adjacent landowners are concerned that measures they have taken to eliminate or reduce noxious weeds on their own properties may be thwarted by the lack of control measures on adjacent federal lands. The measuring factor would be the acreage of noxious weeds not treated adjacent to other land owners.

Issue 9: Impacts of Private Land Noxious Weed Populations and Potential Spread to

Forest Lands

There is a concern about the spread of noxious weeds from sites adjacent to federal forest land, including the spread by activities of any users of the forest, contractors, general public, other forest vehicles, grazing allotment activities, state and local government agencies, etc. The measuring factor would be the identification of known private land sites, activities that cause spread and identification of measures to eliminate or reduce the activities or impacts that increase the spread of noxious weeds from sites off-forest.

Issue 10: Impacts of Control Activities on Cultural Resource Sites

There is a concern about the impacts of noxious weed control on cultural resource sites. It is not known if activities or herbicides have the potential to cause damage to known sites. The measuring factor would be the acreage of cultural sites impacted by control activities.

Issue 11: Restoration of Sites After Control Measures

There is a concern about the long-term strategy to restore sites after control measures have been effective. People are concerned that money, time and effort would be spent and that noxious weeds would recolonize the site if measures are not taken to prevent reestablishment by noxious weeds. The measuring factor would be the identification of strategies to reduce or eliminate reestablishment of noxious weeds and implementation and monitoring to determine its effectiveness.

Issue 12: Impacts of Inert Ingredients, Surfactants and Formulations on the Environment

There is a concern about the formulations, application rates, inert ingredients and surffactants used with the application of herbicides. Inappropriate use of herbicides and their formulations could cause impacts to the environment and humans. The measuring factor would be the disclosure of formulations, application rates, inert ingredients and surfactants used and their known impacts on the environment and humans.

DNF Home Page | NEPA | SO Documents | Noxious Weed Control EA

http://www.fs.fed.us/r6/deschutes/desnf/manage/nepa/documents/so/weeds/a-ea-dec/chap1.html
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CHAPTER 2

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Introduction

This chapter discusses the proposed action and the alternatives considered by the Forest Service. The proposed action is the proposal to meet the purpose and need for action. Alternatives to the proposed action were developed to meet the purpose and need for action and to address issues identified in Chapter 1. This chapter also displays a summary of the impacts of the alternatives and proposed action. As such, this chapter summarizes the Environmental Assessment (EA).

This Chapter is divided into several subsections: Process used to formulate the alternatives, alternatives considered but eliminated from detailed analysis, description of the alternatives considered in detail during the environmental analysis, mitigation measures common to all action alternatives, and an economic analysis summary.

Process Used to Formulate the Alternatives

The Interdisciplinary Team (IDT) developed alternatives by first determining which issues (Chapter 1) would be used to formulate alternatives. The team then utilized criteria for meeting each of the issues and designed alternatives for meeting the criteria. All recommendations of the IDT were reviewed periodically by the Deciding Officer's representative. People serving on the IDT are identified in Chapter 4.

Alternatives Considered But Eliminated from Detailed Analysis

More intensive use of herbicides

People felt that more intensive use of herbicides should be considered. It has become apparent that the spread of noxious weeds is at epidemic levels and may not be controllable if allowed to progress undisturbed. They felt it was of paramount concern to immediately implement control methods that would eradicate the majority of plants in the short term in order to keep populations from getting at epidemic and uncontrollable levels. This alternative was eliminated from further analysis because it was felt that other treatments utilizing methods other than herbicides have been effective at some sites and should be continued. Also, in response to public concerns regarding the use of herbicides, the IDT developed a proposal to spray high priority sites. It was felt there needed to be some time for monitoring of high priority areas before using herbicides on a large amount of sites within the Deschutes National Forest.

All methods but biological controls

People felt that the use of introducing biological agents was only compounding the problem of introducing more exotic (non-native)

species into the environment. This alternative was eliminated from further study because biological control agents authorized by the State have been extensively researched and screened prior to release in the United States. Populations of some noxious weeds necessitate the need for biological agents as a starting point to reduce noxious weeds to a more manageable level.

Implementation Schedule

Under the implementation of any alternative considered in detail in this Environmental Assessment, treatment acreages and accomplishment would be determined by yearly budgeting and workforce availability.

Deschutes National Forest Noxious Weed Information

Noxious Weed Categories

There are 3 noxious weed categories on the forest: potential invaders, new invaders and established populations. Potential invaders are those which have not been identified on the Forest but have the potential for invasion from adjacent private lands or elsewhere in the state. New invaders are populations whose level and distribution is such that all seed production can be prevented. Established populations of noxious weeds have spread to the point that they are successfully reproducing and are causing unacceptable resource damage. More information on the biology of the listed weeds can be found in the Noxious weed, Vegetation, and Human Health Assessment Report associated with this EA, especially more site specific information in relation to Ranger Districts. Noxious weeds are classified on the Forest as follows:

Table 1 : Deschutes NF Noxious Weed Species

Potential Invaders	New Invaders	Established Species
White top *(Cardia draba)*	Scotch broom *(Cytisus scoparius)*	Dyer's woad *(Isatis tinctoria)*
Yellow starthistle *(Centaurea solstitialis)*	Common houndstongue *(Cynoglossum officinale)*	Diffuse knapweed *(Centaurea diffusa)*
Kochia *(Kochia scoparia)*	Yellow toadflax *(Linaria vulgaris)*	Spotted knapweed *(Centaurea maculosa)*
Purple loosestrife *(Lythrum salicaria)*	Dyer's woad *(Isatis tinctoria)*	St. Johnswort *(Hypericum perforatum)*
Squarrose knapweed *(Centaurea virgata* spp. *squarrose)*	Scotch thistle *(Onopordum acanthium)*	Canada thistle *(Cirsium arvense)*
	Leafy spurge *(Euphorbia esula)*	Bull thistle *(Cirsium vulgare)*
	Quackgrass *(Agropyron repens)*	Tansy ragwort *(Senecio jacobaea)*
	Medusahead *(Taeniatherum caput-medusae)*	Dalmation toadflax *(Linaria dalmatica)*
	Meadow knapweed *(Centaurea pratensis)*	

Damage and Action Thresholds

The Deschutes National Forest has determined that damage thresholds have been exceeded and that action is necessary for control, eliminating or reducing the spread of noxious weed populations. More information on the action and damage thresholds can be found in Appendix C of the Noxious weed, Vegetation, and Human Health Assessment Report associated with this EA. Each site within the Deschutes National Forest, and for some adjacent private land population sites, has been identified and mapped with pertinent information recorded in an electronic database. This identification ensures the sites have been analyzed with respect to potential impacts to riparian areas and dependent species, wildlife, acquatic and soil resources.

Alternatives Considered in Detail

Alternative 1 - No-Action

Implementation of this alternative would result in continued actions already being employed such as inventory and recording of known and newly found noxious weed sites. Control activities would proceed only under other environmental analyses, such as control at administrative sites under categorical exclusions or prevention strategies which reduce the risk of establishment of new sites.

A Categorical Exclusion, with Decision Memo, was also prepared in 1994 that identified 44 sites across the Deschutes National Forest for manual and biological control. This project area covers approximately 1657 acres with varying densities of weed species from very sporadic to high densities. The majority of these sites were roadsides (34), with others being previously timber harvested areas (5), administrative sites (2), or recreation sites (3). This action would continue with the implementation of Alternative 1.

The No-Action Alternative also provides a baseline against which the action alternatives can be compared.

Alternative 1 - Mitigation Measures

Prevention measures would continue. New locations of noxious weeds would continue to be discovered, inventoried and documented. Control activities would continue under the guidance of the 1994 Categorical Exclusion (CE). Mitigation measures identified with this action (CE) would continue to be implemented such as seasonal restrictions for nesting raptors and sensitive plant species.

Alternative 1 - Monitoring

Extensive monitoring would continue at a minimal level, especially in sites with high rates of spread to determine the extent of potential future population locations and size.

Alternative 2 - Proposed Action

Proposed Action

Under this Alternative, a variety of techniques would be employed to treat existing noxious weed populations including manual pulling and clipping seed heads, using approved biological agents, prescribed burning to treat reed canary grass in Big Marsh and herbicides. The objective of this proposed action is to propose the use of herbicides on priority sites where other treatment methods are expected to be ineffective. Additionally, the proposed action identifies mitigation measures designed to reduce impacts while also reducing the use of herbicides over time. As part of this alternative also, long-term strategies have been developed for a few sites such as reseeding of native species to restore sites after successful treatment to reduce the potential for reestablishment of noxious weeds in the site.

This alternative proposes active management on 166 of the 235 sites. Factors considered in site selection for treatment include a medium to high probability of successful treatment, a high potential for spread if not treated, and potential for damage to adjacent native plant communities. Of the 69 other sites (estimated 1,070 acres), no treatment is being proposed due to the noxious weed species being a lower priority as determined by the population's lower potential rate of spread, lack of known effective treatment methods, population size and/or location to other resources. Many sites are proposed for a variety of treatment methods over a period of several years in order to use the most effective combination of methods to control or eradicate noxious weed populations. See Table 2, Chapter 2, for a complete listing of sites and their proposed control treatments. Only sites identified as chemical would have herbicides applied, other sites may have a variety of treatment methods such as an initial manual control with a followup treatment of biological control.

- manual (handpulling, clipping seed heads) **(**900.6 acreas in 98 sites)
- biological (using insects to feed on different parts of the plant) (149 acres in 27 sites)
- chemical (using herbicides) (476 acres in 40 sites)
- prescribed fire (using controlled fire) (5 acres in 1 site)

Manual control would be proposed at 98 of the 235 sites with clipping and pulling being the main method of control. Proximity to streams and water was a consideration in identifying sites for manual control.

Biological control would be proposed at 27 of the 235 sites. Sites were identified for biological control if the agent was the most effective for the species identified or the population was so large that it was the most prudent method to initiate. For a listing of Oregon State approved potential biological agents that could be used to control noxious weed populations, see the Noxious Weed, Vegetation and Human Health Assessment Report, Appendix L.

Prescribed or controlled burning would be proposed for one 5 acre area on the Crescent Ranger District at Big Marsh, a large freshwater wetlands complex. The target species to control is reed canary grass, seeded in the 1950s for streambank stabilization when the marsh was in private ownership and was being grazed by cattle. The species is not listed as noxious by the State of Oregon, but it may be an aggressive invader that could eventually dominate the wetlands, reducing the variety and quality of native species and perhaps reducing habitat for wildlife. Long-term monitoring plots were established in 1996 to monitor the rate of spread of the population. The proposal would be to burn a small portion of the population (around 5 acres) to measure the effectiveness of the treatment in controlling reed canary grass. Additionally, prior to burning, local native species' seeds would be collected and used to revegetate the burned area.

Chemical control would be proposed for 40 of the 235 sites, with 68% of the sites occurring along roadsides or in rock quarries, cinder pits, or mine claims. Sites have been selected based on past treatments that did not seem effective at reducing the rate of spread or eradicating the populations and there is a high risk of further spread. Herbicides would be used on dry, upland sites. Other sites include Forest Service administrative sites, grazing allotments and recreation sites. Chemical treatments would most always be followed up with manual and or biological treatments (and sometimes additional chemical treatments within the same year) to remove plants that survived the initial and/or subsequent chemical treatments or sprouted after the application.

For all treatment methods, repeat treatments may be needed for many years to eradicate or control the population. Treatment may occur several times within a season or for many seasons for a maximum of 5 years. At a minimum, at the end of 5 years of treatments, the management regime would be assessed to determine the effectiveness of controlling or eradicating the populations and whether treatments under this assessment would still be applicable.

Selection of the herbicide for application would be determined prior to the sites being sprayed and application rates would follow label directions. An initial identification of the most likely chemical has been made for each site based on target species, size of site, location and site type, potential for disturbance, proximity to water and other factors and can be found in Table 2, Chapter 2. The herbicides proposed for use include:

Glyphosate (Roundup, Rodeo, or Accord formulations)
The advantages of this herbicide are that it breaks down quickly in soil, is not absorbed from the soil by adjacent plants (therefore can be very plant specific if selectively applied), and has a low potential for leaching into ground water. This means that the effects on plants are relatively short-lived and there are minimal effects to plants that are not directly sprayed by herbicides. The disadvantage is that it is non-selective and could impact and kill non-target plants if sprayed with the herbicide. Broadcast (or boom) spraying could kill plants indiscriminently and leave the ground bare until it was repopulated by plant species.

Picloram (Tordon formulation)
The advantages of this herbicide is that it targets woody and broadleaf plants but will not injure grasses and sedges. Maintaining grasses and sedges in areas with noxious weeds may be important to prevent recolonization of the site by noxious weeds. Picloram persists in the soil for 2-4 months (half-life) and will continue to kill broadleaf vegetation during this time. This can be viewed as an advantage (reduces the number of treatments in one season, especially if the target species continues to germinate and sprout during the growing season). The disadvantage is that it could continue to prohibit desirable plants from becoming established in the site. Picloram can move through the soil and be taken up by non-target species adjacent to the application site. How far the herbicide will travel in the soil is dependent on application rates of the herbicide, soil types and weather during and after application. Picloram is also water soluble and has the potential to leach into ground water.

Dicamba (Banvel formulation)
The advantage of this herbicide is that it targets broadleaf vegetation but does not injure grasses when used at recommended label rates. Like Picloram, Dicamba persists in the soil and will continue to kill broadleaf vegetation during the growing season in which it was sprayed, which can be an advantage or disadvantage as dicussed with Picloram. Dicamba is highly mobile in soil and has the potential for leaching into groundwater.

Triclopyr (Garlon 3A formulation)
This herbicide was not identified in the public scoping letter as one of the herbicides the Forest Service was proposing for use. Comments received from the public indicated that use of the herbicide would be advantageous and should be considered. The advantage of this herbicide is that it targets broadleaf vegetation but does not injure grasses. Triclopyr does persist in the soil depending on soil types (but is not as persistent as Picloram) and weather during and after

application. It can also be taken up by non-target species adjacent to the application sites. One advantage is that organic matter and soil microbial activity in the soil reduces the potential for leaching into the groundwater. Triclopyr is effective at killing scotch broom if the plants are cut and the herbicide is applied to the cut stems. It also can be effective in reducing spotted knapweed populations that have been sprayed.

Sites would be treated for approximately 5 years, with monitoring being completed to determine the effectiveness of treatment on selected sites. It is probable that responses to treatments may not be realized until after several years of treatments.

With the implementation of Alternative 2, the 1994 Categorical Exclusion would be superceded by this Environmental Analysis and, would therefore, no longer be in effect.

Alternative 2 - Mitigation Measures

Operators, including Forest Service personnel, would comply with all local, State and Federal laws covering the storage, transport, handling, application and disposal of pesticides (herbicides are considered pesticides). To ensure worker and public health and safety, the following mitigation measures would apply to contractor or Forest Service crews that apply herbicides.

Agricultural Use Requirements: Use these products only in accordance with labeling instructions and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and other handlers of agricultural pesticides (herbicides). There is direction to not apply pesticides in a way that would contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Additional mitigation measures are identified below and are derived from "A Guide to Conducting Vegetation Management Projects in the Pacific Northwest Region" which is an implementing document for the Mediated Agreement and FEIS for Managing Competing and Unwanted Vegetation.

Mitigation measures common to both Alternative 2 and 3 can be found after the description of Alternative 3 later within this Chapter of the Environmental Assessment.

GENERAL MITIGATION MEASURES FOR HERBICIDE USE
(for use in all chemical control sites for Alternative 2)

CONCERNS	MITIGATIONS
Chemical treatments may impact non-target species.	Select formulations and application methods that reduce or limit impacts to non-target species when desired and identified.
Protection against application to non-target vegetation.	In most cases, herbicides would be directly applied to target species by weed wipers or backpack mounted sprayers. Roadside sites, unless otherwise indicated by riparian or non-target species concerns, would be area sprayed (example: boom sprayers).
Protection against impacts to non-target species or human health risk.	No application of herbicides would occur when wind speeds are in excess of 5 mph and if precipitation is expected within 48 hours..
Chemical treatments may impact ground water or aquatic habitats and plant and animal communities.	No chemicals would be applied within 100 feet of perennial streams, live intermittent streams or standing water **with a boom sprayer** . Application within 100 feet of water would be plant specific (wick applicators) or area specific (back pack sprayers) or other methods that could treat individual small areas or plants. Road crossings would be assessed prior to treatment to determine location of ephemeral/intermittent streams and surface water.
" "	Spray equipment would not be cleaned within 100 feet of perennial or intermittent streams or standing water or within riparian areas.
" "	Mixing of chemicals and transfer would not occur within 100 feet of perennial or intermittent streams or standing water or within riparian areas.

" "	Picloram would not be used in riparian areas, or within 100 feet of a perennial stream or standing body of water.
" "	Dicamba could be used on dry sites in riparian areas (high water table but no standing water) more than 100 feet from perennial streams or standing water.
" "	Triclopyr could be used in seasonally dry (intermittent) streams and riparian areas (areas of high water table but no standing water). These areas would be identified.
Ensure protection to forest workers and public near herbicide application sites.	Burning of vegetation after chemical treatment would be delayed until 1 year after application. Coordination would be done with District fuels management specialists.
Chemical treatments may impact ground water or aquatic habitats and communities or may not be applied at proper times.	Applications would not be done when weather forecasts predict rain within 48 hours of treatment.
Protection against inappropriate levels of herbicides released into the environment.	Herbicides would be applied following label directions and guidelines.
Ensure effective use of herbicides to minimize repeat applications and impacts to environment.	Time applications to appropriate period of plant development.
Protection against application of non-target sensitive species.	Herbicides would be applied with weed wipers or backpack sprayers with shields to reduce the nonintentional application to sensitive plants in identified areas..
Protection against reestablishment of treated noxious weed populations.	Most sites would be followed with annual manual control or chemical spot treatment to target plants that were missed during initial application or sprouted after application.
Ensure effective use of herbicides to minimize repeat applications and impacts to environment.	For continued use of herbicides, monitoring on selected sites must show the efficacy of treatment and that weed densities at each site would be reduced 75% or more over a 5 year period and that herbicide usage at each site is reduced more than 50% over a 5 year period. Monitoring would entail use of photo points and would be observational..
Ensure protection to forest workers and public near herbicide application sites.	Public announcement of herbicide application would be published in local papers 2 or more weeks prior to application. Signs would be posted along roads at least 1 week in advance of application.
Ensure proper application, handling, storage and disposal of herbicides and reduce risk of hazardous exposure to workers and visitors to site.	Applicators would possess a valid Commercial Applicator's license. Contract crews would be supervised by an on-site full-time licensed pesticide applicator. Forest Service crews would be supervised by a licensed public pesticide applicator.
Ensure proper application, handling, storage and disposal of herbicides and reduce risk of hazardous exposure to workers and visitors to site.	Field workers would be trained in proper safety and application procedures and informed of the risks and symptoms of accidental herbicide poisoning and treatment procedures.
Ensure protection against accidental spills, improper mixing, etc.	Carry only enough herbicides daily to be used that day. Mix only enough to use that day.
Ensure protection against accidental spills, improper mixing, etc.	Herbicide containers must be secured and prevented from tipping during transport.
Ensure protection against accidental spills, improper mixing, etc.	Emergency spill equipment must be on hand and in sufficient amounts to deal with herbicide amounts in transport. Spill plans and protocols will be developed prior to treatment and filed with the appropriate FS authority.

Ensure protection against accidental spills, improper mixing, etc.	All worker safety equipment and regulations would be used and followed as OSHA regulation, DOT and FS guidelines dictate.
Ensure protection against accidental spills, improper mixing, etc.	Materials Safety Data Sheets and Forest Service information Packets for each herbicide must be transported in each project vehicle during application and in transport and made available to interested publics on-site.
Ensure protection against accidental spills, improper mixing, etc.	Documentation done to Forest Service policy standards. A daily log of herbicides used would be supplied to forest officials; the diary would identify the type, formulation, and quantity of herbicide used on each site, the number of acres treated and name of licensed applicator applying the herbicide.
Ensure protection against contamination of public water well sites.	Notify public water suppliers of herbicide application. Buffer sites adjacent to public water wells and/or use glyphosate or manual and biological controls within 1/4 mile of wells. Continue coordination with Department of Environmental Quality to insure protection of well sites. Most well sites are located on private lands adjacent to Forest Service lands.
Ensure proper application of chemicals to target species and to increase awareness of specific locations.	Dyes would be used with herbicide formulations which enables the area sprayed to be visible.

SITE SPECIFIC MITIGATION MEASURES FOR HERBICIDE USE IN RANGE ALLOTMENTS

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
1	34	6110043	Chemical treatment in Pine Mt. Cattle allotment (Bend/Ft. Rock Ranger District) on road that runs through allotment.	In compliance with Garlon 3A (triclopyr) label instructions, livestock must be withdrawn from grazing treated grass at least 3 days before slaughter. Spraying would be coordinated with permittees.
2	186	6150022	Chemical treatment in Indian Ford Cattle allotment (Sister Ranger District) on road that runs alongside the allotment and knapweed is starting to grow through fence into allotment.	In compliance with Garlon 3A (triclopyr) label instructions, livestock must be withdrawn from grazing treated grass at least 3 days before slaughter. Spraying would be coordinated with permittees.

SITE SPECIFIC MITIGATION MEASURES FOR HERBICIDE USE, MANUAL OR BIOLOGICAL CONTROL NEAR SENSITIVE PLANT POPULATION (BEND/FT.ROCK RANGER DISTRICT)

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
3	21	6110024	(Alt. 2 & 3) Manual treatment in close proximity to green-tinged paintbrush populations (CACH).	Keep workers from trampling or driving on CACH populations by training weed control crews prior to and during treatment.
4	23	6110026	(Alt. 2 & 3) Manual treatment in close proximity to green-tinged paintbrush populations (CACH).	Keep workers from trampling or driving on CACH populations by training control crews prior to and during treatment.

5	69	6110109	(Alt 2 only) Chemical treatment in close proximity to green-tinged paintbrush populations.	Flag populations prior to treatment and avoid plants by using manual control within area. Potential sensitive plant population areas are from the private land at east end of site to the western line of Section 24.
6	69 & 70	6110109 & 6110110	(Alt. 2 only) Chemical treatment in close proximity to Jepson's monkeyflower.	At junction of Rd. 40 and Rd. 46, flag populations and avoid spraying monkeyflower plants. Use manual control within the area flagged.
7	216	6110010	(Alt. 2 only) Chemical treatment in close proximity to green-tinged paintbrush populations.	Keep workers from trampling or driving on sensitive plant populations by training control crews prior to and during treatment. If weed densities are too high, will not flag out sensitive plant populations as loss of a few individuals is less of a concern than the continued spread of noxious weeds. Apply herbicides continuously and work with adjacent landowners.

SITE SPECIFIC MITIGATION MEASURES FOR HERBICIDE USE IN OR NEAR RIPARIAN AREAS AND/OR WETLANDS

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
8	5	6110005	Alt. 2 chemical treatment adjacent to a wet meadow and in campground.	No application of herbicides where open water is present (utilize 100 foot buffer), use glyphosate to minimize impacts to aquatic species. Post notification of application of chemicals for public viewing at site.
9	62	6110102	Alt. 2 chemical treatment near ephemeral draws and riparian bottomland.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application. At the west end of the road (last 2 1/2 miles), establish buffers.
10	64	6110104	Alt. 2 chemical treatment near ephemeral draws.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
11	69	6110109	Alt. 2 chemical treatment near high watertable and ephemeral draws.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
12	70	6110110	Alt. 2 chemical treatment near high watertable.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
13	71	6110111	Alt. 2 chemical treatment near high watertable.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
14	79	6110119	Alt. 2 chemical treatment with potential surface water.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.

15	231	6110175	Alt. 2 chemical treatment near ephemeral draw.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application. Pit also has private land, coordinate control activities with Oregon Dept. of Transportation.
16	124	6120005	Alt. 2 chemical treatment near riparian bottomland, high watertable, and surface water.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
17	166	6150002	Alt. 2 chemical treatment near wet meadow.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
18	167	6150003	Alt. 2 chemical treatment near ephemeral draw and riparian bottomland.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
19	170	6150006	Alt. 2 chemical treatment near wet meadow.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
20	174	6150010	Alt. 2 chemical treatment near riparian bottomland and high watertable.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
21	34	6110043	Alt. 2 chemical treatment with potential surface water.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
22	81	6110121	Alt. 2 chemical treatment with potential surface water.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
23	181	6150017	Alt. 2 chemical treatment within riparian corridor.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
24	191	6150027	Alt. 2 chemical treatment within riparian corridor.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
25	192	6150028	Alt. 2 chemical treatment within riparian corridor.	No application of herbicides near water, 100 ft. buffer where manual treatment would be done. Flag prior to application.
54	186	615022	Alt. 2 - chemical use near Fly Creek, may impact riparian dependent species.	No application of herbicides within 100 feet of Fly Creek, utilize biological control within riparian area. Chemical application only on outer boundaries of site to contain population.

MISCELLANEOUS MITIGATION MEASURES
SPECIFIC TO HERBICIDE USE

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS

57	214	6110001 and 6130001	Seepage of chemicals from herbicide spraying into lava tube caves under treatment areas.	Treat with glyphosate within 1/4 mile of cave locations. No mixing of herbicides within this area. Hazardous spill containment plans address proper cleanup procedures to reduce contamination of cave. Outside of buffer areas, ok to use other chemicals identified.
58	15	6110017 and 6130017	Seepage of chemicals from herbicide spraying into lava tube caves under treatment areas.	Treat with glyphosate within 1/4 mile of cave locations. No mixing of herbicides within this area. Hazardous spill containment plans address proper cleanup procedures to reduce contamination of cave. Outside of buffer areas, ok to use other chemicals identified.

Alternative 2 - Monitoring

Herbicide Monitoring

Required Mediated Agreement Monitoring

- Implementation of mitigation measures to reduce or eliminate impacts.
- Signing of chemical sites.
- Notification of adjacent landowners, notice in newspaper.
- Documentation of herbicide applications.
- Documentation of costs.
- Analysis of unintended impacts.
- Documentation of accidents.
- Assessment of short and long-term effects on vegetation.
- Lessons learned that could be applied to other projects.
- Effects on human health.
    - A description of the treatment method, if a herbicide was used, record its exact identity, formulation, manufacturer, mixture, and method of application.
    - The names of each person who worked on the project, their assignment, training received, and dates of actual work.
    - Exposure incidents, accidents, and worker health complaints would also be included.
    - Documentation for exposure from the prescribed burning would be completed. Exposure incidents, accidents, and worker health complaints would also be included.
    - Documentation of exposure of humans to manual treatments, including incidents, accidents and worker health complaints.
- Efficacy of treatment (sample of selected site types), measures effectiveness of treatments to meet goals established for reduction in populations sizes, etc. Also needed for selected manual, biological and prescribed burning sites.

Recommended Monitoring Beyond Mediated Agreement

- Monitoring the trends of spotted frog populations in Big Marsh would be conducted prior and after to prescribed burning to determine if populations are located within the treatment site and what, if any, effect the burning has on populations trends.
- Water quality monitoring would be conducted at one site (#62 at the west end of the site above the irrigation district out-take) and would be monitored after rainstorms to determine if herbicides are entering aquatic systems and at what levels. Buffers on intermittent and perennial streams would be implemented and because herbicides would be applied more than 100 feet from streams it is predicted that herbicides would not be transported to the streams by overland flow. This is important because the out-take on Tumalo Creek for the irrigation district is downstream from herbicide application areas. It was felt that it is important to validate that buffers on streams are effective at keeping herbicides from entering the aquatic systems.

Alternative 3

Under this alternative, there would be no use of herbicides. Treatments would only use manual, biological or prescribed burning methods to control noxious weed populations. Sites listed under Alternative 2, the Proposed Action, as chemical would be treated with manual and/or biological techniques. All other sites would be the same treatment as in Alternative 2.

- manual only (handpulling, clipping seed heads) (900.6 acres in 98 sites)
- biological (using insects to feed on different parts of the plant) (149 acres in 27 sites)
- biological and / or manual treatment (476 acres in 40 sites)
- prescribed fire (using controlled fire) (5 acres in 1 sites)

Sites would be treated for approximately 5 years, with monitoring being completed to determine the effectiveness of treatment on selected sites. It is probable that responses to treatments may not be realized until after several years of treatments.

With the implementation of Alternative 3, the 1994 Categorical Exclusion would be superceded by this Environmental Analysis and would therefore, no longer be in effect.

Alternative 3 - Mitigation Measures

See mitigation measures common to all action alternatives later in the Chapter. Since no chemicals would be utilized, mitigations identified for protection of riparian and water quality resources would not be necessary. Manual and biological control methods replacing chemical sites of Alternative 2 would still require restriction of activities due to disturbances to nesting raptors and disturbances to sensitive plant populations.

Alternative 3 - Monitoring

Required Mediated Agreement Monitoring

- Effects on human health from prescribed burning: Documentation for exposure from the prescribed burning would be completed. Exposure incidents, accidents, and worker health complaints would be documented.
- Effects on human health from manual treatments.
    - Exposure incidents, accidents, and worker health complaints.
    - Documentation of exposure of humans to manual treatments, including incidents, accidents and worker health complaints.
- Efficacy of treatment (sample of selected types), measures effectiveness of treatments to meet goals established for reduction in populations sizes, etc. Need for selected manual, biological and prescribed burning sites.
- Reporting of impacts to humans from the use of chemicals would not be done.

Recommended Monitoring Beyond Mediated Agreement

- Monitoring the trends of spotted frog populations in Big Marsh would be conducted prior to prescribed burning to determine if populations are located within the treatment site and what, if any, effect the burning has on populations trends.

Mitigation Measures Common to Alternatives 2 or 3

The following mitigation measures would be implemented with either Alternative 2 or 3.

SITE SPECIFIC MITIGATION MEASURES TO REDUCE OR ELIMINATE DISTURBANCES TO NESTING RAPTORS AND OTHER SENSITIVE WILDLIFE SPECIES (BY DISTRICT)

In an effort to reduce the disturbing activity within 1/4 mile to nesting raptors, crew sizes for control treatments would be limited to 1-2 people and activities would not take place during inclement weather conditions. Consultation with District Wildlife Biologists would be done to determine duration of activities and amount of acceptable impacts to raptors. The mitigations below identify the timeframes to consider reduced crew sizes, duration of treatment activities within 1/4 mile of nests, and weather conditions for allowable disturbance.

BEND / FT. ROCK RANGER DISTRICT

	MAP #	SITE #	CONCERNS	MITIGATIONS
30	75	6110115	Manual treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
31	228	6110172	Biological treatment within mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
32	92	6110132	Biological treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
33	83	6110123	Manual treatment within 1/4 mile of raptor nest, riparian and wet meadow (Alt. 2 & Alt. 3).	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
34	74	6110114	Manual treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
35	91	6110131	Manual treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
36	81	6110121	(Alt. 2 Chemical treatment) & (Alt. 3 Manual/ Biological treatment) within 1/4 mile of raptor nest.	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
37	102	6110143	Manual treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
38	71	6110111	(Alt. 2 Chemical treatment) & (Alt. 3 Manual/ Biological treatment) within 1/4 mile of raptor nest (on road).	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.

CRESCENT RANGER DISTRICT

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
39	120	6120001	Manual treatment within 1/4 mile of 2 raptor nest sites (Alt. 2 & Alt. 3)	Restrict disturbing activity 3/1-9/30, or at least until after young have fledged - to be determined by monitoring by WL biologist.
40	121	6120002	Biological treatment within 1/4 mile of raptor nest (Alt. 2 & Alt. 3).	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
41	124	6120005	(Alt. 2 Chemical treatment) & (Alt. 3 Manual/ Biological treatment) within 1/4 mile of raptor nest site.	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
42	142	6120026	Prescribed burn in Big Marsh within sandhill crane and yellow rail nesting habitat and spotted frog populations (Alt. 2 & Alt. 3).	Restrict disturbing activity 5/1-7/31, to protect nesting birds, most likely a fall burn so no additional mitigations for spotted frogs.

43	143	6120027	Manual treatment near Odell Creek (Alt. 2 & Alt. 3).	No mitigations if hand pulling.
44	158	6120042	Manual treatment just more than 1/4 mile of raptor nest site. (Alt. 2 & Alt. 3).	No mitigations if hawks stay at same nest site, monitoring to determine nest location prior to disturbing activities
55	153	6120037	Manual treatment (Alt. 2 & 3) within 1/4 mile of raptor nest site.	Restrict disturbing activity 1/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.

SISTERS RANGER DISTRICT

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
45	192	6150028	(Alt. 2 Chemical treatment) & (Alt. 3 treatment) within 1/4 mile of raptor nest site.	Restrict disturbing activity 3/1-9/30, or at least until after young have fledged - to be determined by monitoring by WL biologist.
46	172	6150008	Manual treatment within 1/4 mile of raptor nest site.	Restrict disturbing activity 4/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
47	175	6150011	Manual and biological treatment within 1/4 mile of raptor nest site.	Restrict disturbing activity 3/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
48	176	6150012	Manual and biological treatment within 1/4 mile of raptor nest site.	Restrict disturbing activity 3/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.
49	167	6150003	(Alt. 2 Chemical treatment) & (Alt. 3 treatment) within 1/4 mile of raptor nest site.	Restrict disturbing activity 3/1-8/31, or at least until after young have fledged - to be determined by monitoring by WL biologist.

SITE SPECIFIC MITIGATION MEASURES FOR TREATMENT NEAR SENSITIVE PLANT POPULATIONS (FORT ROCK AND CRESCENT RANGER DISTRICTS)

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
3	21	6110024	(Alt. 2 & 3) Manual treatment in close proximity to green-tinged paintbrush populations.	Keep workers from trampling or driving on CACH populations by training weed control crews prior to and during treatment.
4	23	6110026	(Alt. 2 & 3) Manual treatment in close proximity to green-tinged paintbrush populations.	Keep workers from trampling or driving on sensitive plant populations by training control crews prior to and during treatment.
52	123	6120004	(Alt. 2 & 3) Manual treatment in close proximity to Jepson's monkeyflower.	Keep workers from trampling or driving on sensitive plant populations by training control crews prior to and during treatment for identification.
53	129	6120010	(Alt. 2 & 3) Manual treatment in close proximity to Jepson's monkeyflower.	Keep workers from trampling or driving on sensitive plant populations by training control crews prior to and during treatment for identification.

MISCELLANEOUS MITIGATION MEASURES

MIT.#	MAP #	SITE #	CONCERNS	MITIGATIONS
50	125	6120006	3 separate noxious weed populations are located within parcels proposed to be exchanged to Crown Pacific. (Alt. 1, 2 & 3)	Include parcels in analysis until land exchange proposal is final. If lands are exchanged, provide Crown Pacific with the information and don't implement treatment.
51	140	6120024	Continued densities of populations following several years of hand pulling and herbicide application at Administrative site. Adjacent private lands are infested with high densities. FS employee parking lot infested. (Alt. 2 Chemical, Alt. 3 Pull/Bioc)	Recommend working with adjacent landowners to contain/control/eradicate their populations to lessen the chance of reinfestation to FS lands. Recommend that FS and personal vehicles do not drive over areas and that vehicles are washed, especially undercarriage.
	all major road sites		People implementing treatments on major highways with heavy traffic, such as Highways. 20, 97, etc. could be subject to hazardous conditions from vehicles.	Coordinate with Oregon Dept. of Transportation for proper signing, safety apparel and permits.

Economic Analysis Summary

Costs used in the economic analysis are assumptions utilized to compare alternatives, they are estimates and in some cases may not reflect the most recent costs to accomplish control methods.

Manual Control : The Deschutes National Forest has been hand pulling noxious weed sites since 1994 with the help of Youth Conservation Corps crews, youth-at-risk programs (e.g. COSTEP) and County Corrections crews. It takes about 10 people to pull one acre in one day of heavily infested spotted knapweed (Levack, personal communication, 10/97). Costs include not only the work crews and their supervisors, but also education and supervision by Forest Service people skilled in weed identification. Costs can vary from $315/day (a crew of 16 COSTEP youth plus 1/2 day training by Forest Service GS-7 botanist) to $474/day (a YCC crew of 5 youth plus one supervisor plus 1/2 day of training by Forest Service GS-7 botanist). Averaging all the above costs, this EA estimates that manual control will cost approximately $332/acre.

Biological Control : The types of sites in which biocontrol methods will most likely be used are large, non-linear, dense populations. Costs of biocontrol agents and release would average about $40-50/acre per treatment (USDA Forest Service 1995). Therefore, averaging the above costs, this EA estimates a cost of $45/acre.

Chemical Control : The cost of applying chemicals to control a target species vary according to application method and the herbicide used. Picloram applied by backpack sprayer at a rate of 1 quart/acre costs approximately $50/acre (USDA Forest Service 1993a). New invader infestations, however, are often 1/4 acre or less in size. Truck mounted sprayers cost approximately $38/acre (USDA Forest Service 1993b). Backpack spraying is projected to be higher due to increased labor. The Ochoco National Forest (1995) estimates that herbicide costs can range from $35 to $65 per acre per treatment. Deschutes County Public Works provided cost estimates of $130/acre for backpack spraying and $95/acre for a truck-mounted boom sprayer, therefore, an average cost of $113 per acre (Ditino Martin, personal communication, 1998). Wenatchee National Forest estimates a cost of $35/acre for their noxious weed control program (USDA Forest Service 1996). Therefore, averaging the above cost information, this EA estimates that herbicide application would cost $90/acre for spraying sites as well as meeting legal requirements of the Mediated Agreement such as posting signs, notification, recording of information, and other mitigations noted previously.

Prescribed Burning : The cost for prescribed fire considers time spent in planning, site visits, pre-burn and post-burn condition monitoring, set-up and implementation. The costs for a small acreage project may appear high, however, costs would not increase appreciably or proportionately if the size of the burned area increased. Estimated costs for using prescribed fire in Big Marsh are $400 per acre.

Assumptions - Chemical sites in Alternative 2 were assumed (for economic analysis) to be manual control for Alternative 3 instead of a combination of manual and biological control.

	Alternative 1*	Alternative 2	Alternative 3
Manual Control	0 sites	98 sites	138 sites
# Acres	0	901	1,377
Cost		$300,000	$457,164
Chemical Control	0 sites	40 sites	0 sites
# Acres	0	476	0
Cost	0	$42,840	0
Biological Control	0 sites	27 sites	27 sites
# Acres	0	149	149
Cost	0	$6,705	$6,705
Prescribed Burning	0 sites	1 site	1 site
# Acres	0	5	5
Cost	0	$2,000	$2,000
TOTAL		**$351,545**	**$465,869**

* Note : The costs of implementing the 1994 Categorical Exclusion are not included in this financial comparison of Alternatives. Under present budget constraints, approximately 200-400 acres are being treated per year, mostly utilizing YCC or other crews for manual control and a large amount of biological control being utilized.

Alternative Comparison

The following is a summary table of the Issues and the Alternatives considered in this Environmental Assessment.

ISSUE	ALT. 1 - NO-ACTION	ALT. 2 - PROPOSED ACTION	ALT. 3
Issue 1: Use of Herbicides	No use of herbicides, 0 acres treated with chemicals.	476 acres treated with herbicides.	No use of herbicides, 0 acres treated with chemicals.
Issue 2: Maintaining Native Plant Communities	Continued threat to native plant communities by increasing noxious weed populations throughout the Deschutes National Forest. There are approximately 2,600 acres of noxious weeds on the Forest. This alternative least meets this issue.	Treatment of 1,531 acres of noxious weed sites would reduce the spread and density of weeds. The use of herbicides would eradicate or contain 476 acres more rapidly, decreasing the impacts to native plant communitites. This alternative best meets this issue because herbicides are the most effective treatment method, especially on large infestations.	Treatment of 1,531 acres of noxious weed sites would reduce the spread and density of weeds. No use of herbicides would occur, thereby increasing the time for control or eradication of sites. Potentially more spread of existing sites could occur. This alternative moderately meets this issue.

Issue 3: Water quality	No impacts to water quality from herbicide use because no herbicides would be used. Potential negative indirect effects to riparian habitat by noxious weed invasion by displacement of native species. This alternative protects water quality.	No anticipated impacts to water quality because herbicides would not be applied within 100 feet of perennial and intermittent streams, or other riparian areas.	No use of herbicides, no impacts to riparian habitat or water quality. This alternative protects water quality.
Issue 4: Utilization of Prevention Strategies	Continued implementation of existing prevention strategies.	Implementation of additional prevention strategies in the Deschutes Integrated Weed Management Plan, see Appendix A.	Implementation of additional prevention strategies in the Deschutes Integrated Weed Management Plan, see Appendix A.
Issue 5: Impacts to unique areas including Wilderness, Special Interest Areas (SIA), Research Natural Areas (RNA), Old Growth Management Areas, Oregon Cascades Recreation Area (OCRA), and others (for a complete listing, see Chapter 3, Effects Analysis, Issue 5).	Continued threat to invasion of unique areas by noxious weed populations. There are a total of 285 acres of noxious weeds within unique management areas.	There are 267.6 acres of sites that would be treated within or adjacent to unique areas. Of these acres, there are 45.5 acres that would be treated with herbicides which would increase the probability of successful treatment within a shorter time frame than other treatment methods.	There are 267.6 acres of sites that would be treated within or adjacent to unique areas. There would not be any acres treated with herbicides. Control or eradication of the noxious weed populations would not occur at the same rate as Alternative 2 and could possibly increase the risk of spread of noxious weed populations into unique areas.
Issue 6: Human Health Risks	No impacts to human health related to herbicides because they would not be used.	Impacts to human health from manual, prescribed fire and biological treatments would be similar to Alternative 3. Because of the mitigations identified in Chapter 2, potential health risks to workers and the public from the use of herbicides are expected to be reduced from those predicted in the quantitative risk assessment of the Region 6 FEIS for Managing Competing and Unwanted Vegetation.	No impacts to human health related to herbicides because they would not be used. There could be potential impacts to human health from the 5 acre prescribed burn from smoke inhalation, injury from tools, dehydration and from other related activities. There could be potential impacts to human health from manual treatment activities such as bending, walking, muscle pulls, use of equipment such as shovels or pulaskis that would be moderated by wearing protective equipment and working in safe conditions. There would be no impacts to human health from biological controls.
Issue 7: Impacts of herbicides to non-target desirable species	No direct impacts to non-target desirable species from treatments but potential indirect and cumulative impacts due to increased spread of noxious weeds which could cause displacement of native species.	Impacts to desirable plant species would be minimized because of mitigation measures identified in Chapter 2. Triclopyr, picloram or dicamba would be used at chemical sites where it would be desirable to maintain existing grasses and sedges. Sensitive plant populations would be flagged and avoided in most cases. One Site (Map #216, 15 acres) with green-tinged paintbrush would be sprayed because noxious weeds untreated provide a larger potential for negative impacts by displacement.	No impacts to non-target desirable species from the use of herbicides.

Issue 8: Spread of NFS noxious weeds to adjacent private lands	Continued spread of noxious weed populations from federal lands to adjacent private lands.	High priority noxious weed sites were selected for herbicide treatments based on the potential risk of spread. As infestations are brought under control and seed production is eliminated, these sites would no longer serve as seed sources for spreading the infestations to adjacent lands.	The potential for immediate control is reduced with these methods because manual control is much more labor intensive and expensive, and the potential to miss plants is increased. Biological control is dependent on the effectiveness of insects and their ability to impact the growth and seed production of noxious weeds. Populations would continue to spread but not at the rates as under Alternative 1.
Issue 9: Impacts of Private Land Noxious Weed Populations and Potential Spread to Forest Lands	Continued spread of noxious weeds from private lands to adjacent NFS lands.	High priority noxious weed sites on Forest Service lands were selected for herbicide treatments based on the potential risk of spread. If Forest Service and private landowners don't coordinate control efforts, there will be adjacent seed sources reinfesting areas that were treated.	The potential for immediate control is reduced with manual and biological control methods because manual control is much more expensive and the potential to miss plants is increased.
Issue 10: Impacts on cultural sites	No impacts to cultural sites.	No impacts to cultural sites.	No impacts to cultural sites.
Issue 11: Restoration of sites after control measures	No restoration activities would take place.	Restoration activities would take place, dependent on funding and soil characteristics. Glyphosate would not be used where it is desirable to maintain grasses and sedges or it may be selected because it has less long-term soil toxicity.	Restoration activities would take place, dependent on funding and soil characteristics.
Issue 12: Impacts of inert ingredients, surfactants and formulations on the environment and humans.	No impacts to humans or the environment from inert ingredients.	The formulations proposed for use in this EA contain inert ingredients that are categorized by the EPA as low priority for testing based on chemical structure that would indicate toxic effects or absense of data or are generally recognized as safe.	No impacts to humans or the environment from inert ingredients.

TABLE 2

Weed Treatment Sites for EA

Mitigation numbers in the table below pertain to the numbered mitigations in Chapter 2. Acronyms are defined at the end of the table.

Appendix B contains a listing of the Map #s and the associated maps that they can be found on. In such, the Appendix is a cross walk between Map #s and the map locations.

SITE #	MAP #	TARGET SPECIES	Alt 2 TREATMENT	CHEM	Alt 3 TREATMENT	MITIGATIONS	SITE TYPE	STRATEGY	AC	MGMT. AREA
6110001 and 6130001	1 and 214	DIKN SPKN	CHEM	PIC DIC TRI GLY	PULL BIOC	-	Roadsides	COR	19 10 2 2	SV1 SV1 SIA SIL

6110002 and 6130002	2	DATO DIKN SPKN	CHEM	PIC DIC	PULL BIOC	-	Roadsides	PRE COR	4	DHB						
6110003	3	SCTH	PULL	-	PULL	-	Roadsides	MAIN	.5	SV1						
6110004 and 6130004	215	DATO DIKN SPKN	CHEM	PIC	PULL BIOC	-		CLIP	-	CLIP	-	Riparian	MAIN	18 2	INR WSE	
6110010 and 6130010	216	DIKN SPKN CATH	CHEM	PIC	PULL BIOC	7	Roadsides	COR	15	SV4						
6110011	10	SPKN	PULL	-	PULL	-	Roadsides	COR	.5 13 27	SIK SV1 SV2						
6110012	11	SPKN	PULL	-	PULL	-	Quarry	COR	.5	GFO						
6110013	12	DATO SPKN	CHEM	GLY	PULL BIOC	-	FS Admin. Site	COR	12	?						
6110014	13	DATO DIKN SPKN	CHEM	PIC TRI GLY	PULL BIOC	-	Roadsides	PRE COR	3.5	DHB						
6110017 and 6130017	15	SPKN STJO	CHEM	GLY	PULL BIOC	-	Roadsides	COR	1	SIA						
6110019 and 6130019	217	DIKN SPKN	CHEM	PIC	PULL BIOC	-	Roadsides	COR	.5 1 3.5	GFO SV1 SV4						
6110021	19	DATO	PULL	-	PULL	-	Forest	COR	1	DHB						
6110022	20	DATO	PULL	-	PULL	-	Roadsides	COR	1	DHB						
6110024	21	SPKN	PULL	-	PULL	3	Roadsides	COR	1.5	SV2						
6110026	23	SPKN	PULL	-	PULL	4	Forest	COR	1	SV2						
6110033	24	DIKN BUTH	PULL	-	PULL	-	Quarry	COR	3	GFO						

6110034	25	DATO DIKN SPKN	CHEM	PIC	PULL BIOC	-	Quarry	COR	7	DHB
6110037	28	CATH	BIOC	-	BIOC	-	Forest	COR	2	SV2
6110038	29	SPKN BUTH	PULL	-	PULL	-	Quarry	COR	2	OGR
6110040	31	RUTH	PULL	-	PULL	-	Quarry	COR	1	DHB
6110043	34	SPKN	CHEM	PIC	PULL BIOC	1 21	Forest	COR	2	DHB
6110044	35	SPKN	PULL	-	PULL	-	Roadsides	COR	1	OGR
6110047	38	SPKN	PULL	-	PULL	-	Forest	COR	1.5	SV2
6110049	40	CATH	BIOC	-	BIOC	-	Forest	COR	.5	GFO
6110051	41	DATO	PULL	-	PULL	-	Roadsides	COR	2	DHB
6110056	45	DATO SPKN	CHEM	DIC	PULL BIOC	-	Roadsides	COR	1	DHB
6110066	55	KN	PULL	-	PULL	-	Forest	COR	1	GFO
6110072 and 6110154	113	THIS	PULL	-	PULL	-	Trail	COR	2	INR
6110073 and 6130073	234	SPKN	PULL	-	PULL	-	Roadside	COR	1	GFO
6110101	61	DATO	BIOC	-	BIOC	-	Forest	COR	59	DHB
6110102	62	DATO DIKN SPKN	CHEM	TRI PIC DIC	PULL BIOC	9 23	Roadsides	COR	.5 19.5	GFO SV1
6110103	63	DATO	BIOC	-	BIOC	-	Forest	COR	5	DHB
6110104	64	DATO SPKN	CHEM	GLY	PULL BIOC	10	Roadsides	COR	2 23	INR SV1
6110105	65	SPKN	PULL	-	PULL	-	Forest	COR	14	WS2
6110106	66	DATO SPKN	CHEM	PIC	PULL BIOC	-	Roadsides	COR	1 .5	INR WS2
6110107	67	CATH	PULL	-	PULL	-	Forest	COR	21	GFO
6110108	68	YETO	PULL	-	PULL	-	Forest	COR	6	GFO

6110109	69	SPKN	CHEM	PIC	PULL BIOC	5,6 11	Roadsides	COR	1.5 .5 .5 .5 38	WSB INR SID SV4 SV2
6110110	70	DIKN DPKN BUTH	CHEM	GLY	PULL BIOC	6 12	Roadsides	COR	2 9.5	SV2 WSB
6110111	71	SPKN	CHEM	GLY	PULL BIOC	13 38	Roadsides	COR	8 16 1.5	EXF SV2 WS2
6110112	72	SPKN STJO	PULL	-	PULL	-	FS Admin Site	COR	3 1	INR WS2
6110113	73	SPKN CATH	PULL BIOC	-	PULL	-	Riparian	COR	5	WS2
6110114	74	RECA	CLIP	-	CLIP	34	Riparian	MAIN	39	INR
6110115	75	RECA	CLIP	-	CLIP	30	Forest	MAIN	7.5	WSB
6110116	76	RECA	CLIP	-	CLIP	-	Forest	MAIN	11	WS1
6110117	77	SPKN	CHEM	GLY	PULL BIOC	-	Roadsides	COR	1.5 1.5	INR WSC
6110118	78	DATO	CHEM	DIC	PULL BIOC	-	Quarry	COR	5	SV1
6110119	79	SPKN	CHEM	PIC	PULL BIOC	14 24	Quarry	COR	32	DHB
6110120	80	DPKN	CHEM	PIC	PULL BIOC	25	Quarry	COR	4	DHB
6110121	81	DPKN	CHEM	TRI GLY PIC	PULL BIOC	22 36	Quarry	COR	4	OSP
6110122	82	CATH	BIOC	-	BIOC	-	Roadsides	COR	1	INR

6110123	83	SCTH	PULL CLIP	-	PULL CLIP	26 33	Forest	COR	18	WS2
6110124	84	SPKN	PULL	-	PULL	-	Forest	COR	.1 1	SIA WS1
6110125	85	SPKN	PULL	-	PULL	-	Riparian	COR	1.5	WS1
6110126	86	SCBR	PULL	-	PULL	-	Forest	COR	3.5	GFO
6110127	87	SPKN	PULL	-	PULL	-	Forest	COR	3	WIR
6110128	88	STJO	BIOC	-	BIOC	-	Roadsides	COR	.5	INR
6110129	89	SCBR	PULL	-	PULL	-	Forest	COR	3	DIR
6110130	90	SPKN	PULL	-	PULL	-	Riparian, Roadsides	COR	1.5	SV1
6110131	91	SPKN	PULL	-	PULL	35	Special Mgmt. Area or Riparian	COR	4	SIA
6110132	92	CATH	BIOC	-	BIOC	32	Riparian	COR	1 4	EAG INR
6110133	93	CATH RECA	BIOC	-	BIOC	-	Special Mgmt. Areas or Riparian	COR	2	INR
6110140	99	STJO	BIOC	-	BIOC	-	Riparian	COR	2	EAG
6110142	101	CATH	PULL	-	PULL	-	Riparian	COR	.5	INR
6110143	102	SPKN STJO	PULL	-	PULL	37	Riparian	COR	9 12	EAG OSP
6110148	107	CATH	BIOC	-	BIOC	-	Forest or Riparian	COR	.5	EAG
6110155	114	SPKN	PULL	-	PULL	-	FS Admin. site (Tumalo Falls House)	COR	3	SV1
6110156	115	CATH	BIOC	-	BIOC	-	Quarry	COR	2.5	INR
6110157	116	TARA	PULL	-	PULL	-	Forest	COR	4 17	GFO WSB
6110158	117	TARA	PULL	-	PULL	-	Forest	COR	3.5	WSB
6110159	118	DIKN SPKN	CHEM	GLY	PULL BIOC	-	FS Admin. Site (Nursury)	COR	30	GFO
6110161	218	DATO	PULL	-	PULL	-	Forest	COR	.5	INR
6110162	219	SPKN	PULL	-	PULL	-	Forest	COR	1	INR

6110163	220	SPKN	PULL	-	PULL	-	Riparian	COR	1 1	EAG INR
6110164	221	CATH	BIOC	-	BIOC	-	Forest	COR	1	GFO
6110165	222	LESP	PULL	-	PULL	-	Forest	COR	1	WS2
6110166	223	STJO	BIOC	-	BIOC	-	Roadsides	COR	1	SV2
6110167	224	CATH	BIOC	-	BIOC	-	Forest	COR	1	OGR
6110168	225	SPKN	PULL	-	PULL	-	Roadsides	COR	2	GFO
6110169	226	SPKN	PULL	-	PULL	-	Roadsides	COR	1	SID
6110171	227	SPKN	PULL	-	PULL	-	Roadsides	COR	2	GFO
6110172	228	STJO	BIOC	-	BIOC	31	Roadsides	COR	1	WS2
6110173	229	STJO	BIOC	-	BIOC	-	Special Mgmt. Areas	COR	7 5	RNB WS2
6110174	212	STKN	CHEM	GLY TRI	PULL BIOC	-	Roadsides	COR	3	INR
6110175	231	DATO SPKN	CHEM	TRI PIC GLY	PULL BIOC	15	Quarry	COR	.5 7	INR SV1
6120001	120	TARA	PULL	-	PULL	39	Forest	COR	9	GFO
6120002 and 6120007	121	DATO SPKN SCTH YETO SCBR TARA CATH STJO	PULL BIOC BIOC	-	PULL	40	Roadsides	COR	6	INR
6120003	122	STJO	PULL	-	PULL	-	Roadsides		3	INR
6120004	123	SPKN STJO	PULL	-	PULL	52	Roadsides	COR	3 2	SV2 WS7

6120005	124	DIKN SPKN CATH SCTH STJO	CHEM	GLY TRI	PULL BIOC	16 41	Roadsides	COR	10 5 7 26	EAG INR SV1 SV2
6120006	125	DIKN SPKN YETO	CHEM	PIC	PULL BIOC	27 50	Roadsides (in Land Exchange)	COR	3	SV2
6120008	127	SPKN STJO	PULL	-	PULL	-	Roadsides	COR	.5 1.5	EAG WIN
6120009	128	DATO STJO	PULL	-	PULL	-	Riparian	EATR COR	38	INR
6120010	129	DIKN STJO	PULL	-	PULL	53	Roadsides	COR	.5 4 4	EAG INR WS7
6120011	130	DYWO	PULL	-	PULL	-	Roadsides	COR	.5	WS7
6120013	132	DATO	PULL	-	PULL	-	Roadsides	MAIN	2	INR
6120014	133	STJO	PULL	-	PULL	-	Roadsides	COR	.5	SV2
6120024	140	SPKN	CHEM	GLY	PULL BIOC	51	FS Admin. Site	COR	2.5	SV2??
6120025	141	STJO	PULL	-	PULL	-	Forest	COR	.5	WS7
6120026	142	RECA	BURN	-	BURN	42	Marsh	COR	5	WS8 or OCR
6120027	143	SPKN	PULL	-	PULL	43	Roadsides	COR	2	INR
6120031	147	CATH	BIOC	-	BIOC	-	Roadsides	COR	.5	SV1
6120032	148	TARA	PULL	-	PULL	-	Roadsides	COR	.5	SV1
6120034	150	STJO	BIOC	-	BIOC	-	Roadsides	COR	1.5	SV2
6120035	151	SPKN STJO	PULL	-	PULL	-	Roadsides	COR	4	SV2
6120036	152	YETO	PULL	-	PULL	-	Roadsides	COR	2	EAG
6120037	153	SPKN	PULL	-	PULL	55	Roadsides	COR	3 1 2	EAG INR SIN

6120038	154	BUTH	PULL	-	PULL	-	Roadsides	COR	2 5 4	EAG GFO SV4
6120041	157	SPKN	PULL	-	PULL	-	Roadsides	COR	4	SV2
6120042	158	BUTH	PULL	-	PULL	44	Forest	COR	31	GFO
6120045	160	CATH BUTH STJO YETO	PULL	-	PULL	-	Riparian	COR	1 .5	INR WS7
6120049	164	SPKN	PULL	-	PULL	-	Forest	COR	4	SV2
6120050	213	STJO	BIOC	-	BIOC	-	Roadsides	COR	1 2	EAG INR
6120052	235	CATH	BIOC	-	BIOC	-	Roadsides	MAIN	.5	GFO
6120053	239	TARA	PULL	-	PULL	-	Forest	COR	4	SV4
6150001	165	DIKN SPKN	CHEM	GLY	PULL BIOC	-	FS Admin. Site	COR	1	SV1
6150002	166	DIKN SPKN	CHEM	TRI GLY	PULL BIOC	17	Roadsides	COR	7 2	DHB SV1
6150003	167	DIKN	CHEM	PIC TRI GLY	PULL BIOC	18 49	Roadsides	COR	13 1.5	SV1 WS6
6150004	168	DIKN	PULL	-	PULL	-	Roadsides	COR	.5 34.5	OGR SV1
6150005	169	SPKN	PULL	-	PULL	-	Roadsides	COR	30	GFO
6150006	170	SPKN	CHEM	TRI GLY	PULL BIOC	19	Roadsides	COR	1 7	MBB SV1
6150007	171	DIKN SPKN	CHEM	TRI GLY PIC	PULL BIOC	-	Roadsides	COR	7	MBB

6150008	172	DATO DIKN	PULL	-	PULL	46	Roadsides	COR	7 1 17	MHE MRN WS4
6150009	173	DATO	PULL	-	PULL	-	Roadsides	COR	1 1.5	MHE WS4
6150010	174	DIKN SPKN STJO	CHEM	PIC TRI GLY	PULL BIOC	20	Roadsides	COR	.5 11 7 12	INR MBB MOG SV1
6150011	175	DIKN SPKN SCBR	PULL	-	PULL	47	Roadsides	COR	7 4	MBB MHE
6150012	176	STJO	BIOC	-	BIOC	48	Roadsides	COR	5	MHE
6150013	177	DIKN	PULL	-	PULL	-	Roadsides	COR	6	GFO
6150014	178	TARA	PULL	-	PULL	-	Forest	COR	6	MSF
6150015	179	TARA	PULL	-	PULL	-	Forest	COR	17 41	MSF MV2
6150016	180	TARA	PULL	-	PULL	-	Forest	COR	2	MSF
6150017	181	SCBR	CHEM	TRI	PULL CLIP	23	Roadsides	COR	4	MSF
6150018	182	TARA	PULL	-	PULL	-	Roadsides	COR	17	GFO
6150019	183	DATO	PULL	-	PULL	-	Roadsides	COR	6	GFO
6150020	184	TARA	PULL	-	PULL	-	Special Mgmt. Area	COR	20 34	FCU INR
6150021	185	TARA	PULL	-	PULL	-	Forest	COR	3.5	GFO
6150022	186	DIKN	CHEM BIOC	TRI	PULL BIOC	2 54	Roadsides Forest	MAIN	3 .5	DHB MWP
6150023	187	TARA	PULL	-	PULL	-	Forest	COR	31 1	FCS FSU
6150024	188	TARA	PULL	-	PULL	-	Special Mgmt. Area	COR	2	WS4
6150025	189	DIKN	PULL	-	PULL	-	Quarry	COR	10	DHB
6150026	190	DIKN	PULL	-	PULL	-	Roadsides	COR	37	MSF

6150027	191	SCBR	CHEM	TRI	PULL CLIP	24	Roadsides	COR	16	MSF
6150028	192	SCBR	CHEM	TRI	PULL CILP	25 45	Roadsides	COR	.5 2	MSF MV2
6150029	193	SPKN	PULL	-	PULL	-	Roadsides	COR	4 7	MSF MV4
6150031	195	DIKN SPKN	PULL	-	PULL	-	Roadsides	COR	1 3	EAG INR
6150032	196	DIKN	PULL	-	PULL	-	Roadsides	COR	74	DHB
6150033	197	DIKN	PULL	-	PULL	-	Roadsides	COR	8	MV2
6150034	198	DIKN	PULL	-	PULL	-	Roadsides	COR	.5 5	MSF MV2
6150035	199	DIKN	PULL	-	PULL	-	Roadsides	COR	21	MSF
6150036	200	DIKN STJO	PULL	-	PULL	-	Roadsides	COR	2	SV1
6150037	201	SCBR	PULL	-	PULL	-	Roadsides	COR	.5	MBB
6150038	202	STJO	BIOC	-	BIOC	-	Roadsides	COR	2 5 9	EAG INR SV1
6150039	203	STJO	BIOC	-	BIOC	-	Forest	COR	6	GFO
6150040	204	STJO	BIOC	-	BIOC	-	Forest	COR	.5	GFO
6150041	205	TARA	PULL	-	PULL	-	Forest	COR	.5	GFO
6150042	206	TARA	PULL	-	PULL	-	Forest	COR	1.5	MSF
6150043	207	STJO	BIOC	-	BIOC	-	Forest	COR	4	GFO
6150044	208	CATH	BIOC	-	BIOC	-	Forest	COR	3	GFO
6150045	209	TARA	PULL	-	PULL	-	Forest	COR	1.5	MSF
6150046	210	STJO	BIOC	-	BIOC	-	Roadsides	COR	13	MV2
6150047 and 6150049	238	DIKN	CHEM	PIC GLY	PULL CLIP	56	Quarry	COR	5	DHB
6150048	236	DIKN	PULL	-	PULL	-	Roadsides	COR	3	MSF

Target Species' Codes:

DIKN	Diffuse knapweed *(Centaurea diffusa)*	YETO	Yellow toadflax *(Linaria vulgaris)*
SPKN	Spotted knapweed *(Centaurea maculosa)*	SCBR	Scotch broom *(Cytisus scoparius)*
DATO	Dalmation toadflax *(Linaria dalmatica)*	TARA	Tansy ragwort *(Senecio jacobaea)*
BUTH	Bull thistle *(Cirsium vulgare)*	LESP	Leafy spurge *(Euphorbia esula)*
SCTH	Scotch thistle *(Onopordum acanthium)*	DYWO	Dyer's woad *(Isatis tinctoria)*
RECA	Reed canary grass (*Phalaris arundinacea)*	THIS	Thistle, unidentified species
CATH	Canadian thistle *(Cirsium arvense)*	MEHE	Medusahead *(Taeniatherum caput-medusae)*
STJO	St. John's wort*(Hypericum perforatum)*		

Chemical Codes

TRI	triclopyr	PIC	picloram
DIC	dicamba	GLY	glyphosate

Management Area Allocation codes

DHB	Deer habitat	SID	Wake Butte Special Interest Area
DIR	Dispersed Recreation	SIK	Moffit Butte Special Interest Area
EAG	Bald Eagle	SIL	Lava River Cave Special Interest Area
FCS	Front Country Seen	SIN	Davis Lake Special Interest Area
FCU	Front Country Unseen	SV1	Scenic Views - Retention Foreground
GFO	General Forest	SV2	Scenic Views - Partial Retention Foreground
INR	Intensive Recreation	SV4	Scenic Views - Partial Retention Midground
MBB	Metolius Black Butte Scenic	WIN	Wilderness
MHE	Metolius Heritage	WIR	Winter Recreation

MOG	Metolius Old Growth	WS1	Deschutes Wild and Scenic River, Scenic Segment
MRN	Metolius Research Natural Area	WS2	Deschutes Wild and Scenic River, Recreation
MSF	Metolius Special Forest	WS3	Metolius Wild and Scenic River, Scenic
MV2	Metolius Scenic Views - Partial Retention Foreground	WS4	Metolius Wild and Scenic River, Recreation
MV4	Metolius Scenic Views - Partial Retention Mid-ground	WS6	Squaw Creek Wild and Scenic River, Scenic
MWP	Metolius Wildlife / Primitive	WS7	Crescent Creek Wild and Scenic River, Recreation
OCR	Oregon Cascade Recreation Area	WS8	Big Marsh Wild and Scenic River, Recreation
OSP	Osprey	WSB	Deschutes Proposed Wild and Scenic River
RNB	Pringle Falls Research Natural Area	WSC	Fall Proposed Wild and Scenic River
SIA	Lava Butte Special Interest Area	WSE	Paulina Proposed Wild and Scenic River (Creek)

Strategy Codes

COR	Correction	MAIN	Maintenance
PRE	Prevention	ERTR	Early Treatment

DNF Home Page | NEPA | SO Documents | Noxious Weed Control EA

http://www.fs.fed.us/r6/deschutes/desnf/manage/nepa/documents/so/weeds/a-ea-dec/chap2.html
Last Update: 4/20/99
R.A. Jensen

DESCHUTES NATIONAL FOREST

NOXIOUS WEED CONTROL

ENVIRONMENTAL ASSESSMENT

CHAPTER 3

ENVIRONMENTAL EFFECTS

Introduction

This chapter discloses the potential effects or impacts of each of the alternatives described in Chapter 2. The intent of the chapter is to provide the scientific and analytical basis for the comparison of the alternatives (Table 2, located at the end of Chapter 2) and to discuss the impacts of the alternatives in relation to the issues identified in Chapter 1. The majority of information was summarized from Specialists' Reports located in the analysis file associated with this Environmental Assessment. More detailed information is contained in the specific specialist report and can be found in the analysis file for this Environmental Assessment.

The Chapter is divided into sections: Issues That Aided in the Development of the Alternatives, Issues That Aided in the Development of Mitigation Measures, Potential, Endangered, Threatened and Sensitive Species (PETS), Management Indicator Species (MIS) and Effects on other environmental, social and economic factors.

Issues That Aided in the Development of Alternatives

After the initial scoping period, the interdisciplinary team evaluated public and internal Forest Service comments and developed issues. Issues guide the formulation of alternatives and mitigation measures and are used in the evaluation of the alternatives. A measuring factor for each issue has been identified in order to determine the effectiveness of each alternative in meeting the issues.

Issue 1: Use of Herbicides

There is a concern regarding the use of herbicides in the environment. There are people that believe it is inappropriate to use chemicals when other methods, no matter how costly, can be used to control noxious weed populations. The measuring factor to display how each alternative responds to this issue is the acreage receiving herbicide applications.

Alternative 1, No-Action : Herbicides would not be used with the implementation of this alternative, therefore there would be no direct, indirect or cumulative impacts to the environment from herbicides.

Alternative 2 : There are 476 acres of noxious weed sites proposed for chemical treatment. Most of these sites are roadsides, National Forest administrative sites and quarries. Densities of target species vary by site to sporadically occurring individuals to very dense areas of noxious weeds. Application methods most often would be boom sprayers on roadsides and back pack sprayers where more species specific methods would be necessary. Hand daubers or wiper wands would be used on three sites to specifically treat Scotch broom cut stems. The herbicides proposed for use could kill desirable native species if they were sprayed. Dicamba, picloram and triclopyr would not kill grass species at the recommended rates for application, whereas glyphosate is non-selective and would kill all plants that were sprayed. Picloram is not proposed for sites if desirable non-target forbs are rooted in the spray zone. The interdisciplinary team considered the presence of target species, non-target species, amount of continual disturbance to the site, proximity to water or ephemeral streams, soil interactions, persistence in the environment and plant / chemical interactions in identifying the most likely herbicide for use on each site. See TABLE 2, Chapter 2, for a preliminary identification of the herbicide proposed for each site.

Alternative 3 : Herbicides would not be used with the implementation of this alternative, therefore there would be no direct, indirect or cumulative impacts to the environment from herbicides.

Additional information may be found in the Noxious Weed, Vegetation and

Human Health Assessment Report associated with this Environmental Assessment.

Issue 2: Maintaining Native Plant Communities

There is a concern the loss of diversity in native plant communities would occur with the continued spread and incidence of noxious weed populations. Native plant species could be displaced by undesirable non-native species with a subsequent impact to wildlife species and diversity. The majority of people who responded to the proposed action felt there needs to be an integrated strategy to control and eradicate noxious weeds and that all tools available should be responsibly used. The measuring factor would be the amount of acreage receiving some form of control.

Alternative 1, No-Action : Management would be continue under current direction and approved plans. No acres would be treated with the implementation of this alternative except for those under the approved 1994 categorical exclusion using only biological and manual methods of control. Noxious weeds would continue to displace native plant species, thereby decreasing vegetative diversity. Untreated infestations would continue to spread and expand, serving as seed sources for new infestations both on and off federal lands. Many herbaceous native species compete poorly against noxious weeds because weed species have life history strategies and adaptive mechanisms which allow them to take advantage of early growing seasons and to survive under extremely harsh environmental conditions.

Currently, the Deschutes National Forest is incorporating noxious weed prevention strategies into some of our management activities. These prevention actions may help in deterring new infestations, yet may have little effect on slowing the rapid expansion of established infestations.

Indirectly and cumulatively, the implementation of this alternative would impact native plant communities because noxious weeds would continue to spread and displace native plants. Insects and animals dependent on specific native species may also be displaced.

The implementation of this alternative would result in the least amount of protection of native plant communities.

Alternative 2 : Approximately 1,530 acres would receive some form of treatment over the next 5 seasons (with budget and workforce availability) with the implementation of this alternative. This alternative provides for using the

most effective tool for controlling some species (e.g., herbicides for knapweeds and dalmation toadflax). For example, observations of spotted knapweed sites sprayed with herbicides on the Mt. Hood National Forest indicate a 90-95% reduction in spotted knapweed over a three year period (Stein 1998). Using herbicides under this alternative allows high priority infestations to be chemically treated in order to reduce the size of the infestations to a level at which they would be hand-pulled. Habitat for native plant species is expected to increase in the long run under this alternative if treatments, including manual follow-up treatments, would be consistently applied. In some areas, such as noxious weed sites in interior forest communities where residual native plant communities exist, reducing noxious weeds would provide an opportunity for the weed site to be colonized by the existing native plants. In other areas, such as along major highways that are continually disturbed by road management activities, protection of native plant habitats may be an indirect and cumulative effect of weed control activities (i.e., stopping the noxious weed population before it travels further along the roads into new uninfested areas).

However, the conservative approach taken by this alternative still leaves potential risk to native plant communities. Only 40 of 235 known noxious weed sites would be proposed for chemical treatment which would be more effective at control. Of the total 235 known sites, the majority of sites (98 sites on approximately 901 acres) would be proposed for manual treatment. The scope of this proposal is conservative and not aggressive due to concerns expressed by the public about the effects of herbicides on human health and the environment. Since the majority of sites would be treated manually, which is labor-intensive, time-consuming and expensive, it would be difficult to prevent seed production on all sites because of the inability to treat all plants in many of the populations before seed matures for the season.

The implementation of this alternative would result in the greatest protection of native plant communities.

Alternative 3 : Approximately 1,530 acres would receive some form of treatment over the next 5 seasons (with budget and workforce availability) with the implementation of this alternative. Noxious weed infestations that could be effectively controlled with non-herbicide control methods (manual, biological) would help maintain native plant diversity. In some situations, where the noxious weed population is small enough and funding and workforce labor is adequate, manual treatments could be very effective. However, if manual treatments are ineffective (for example, due to the biology of the species or inconsistent and incomplete hand-pulling of sites) then existing infestations may increase in size and density, further spreading into adjacent areas. As discussed above under Alternative 2, manual treatments are labor-intensive,

time-consuming and expensive; therefore, considering the number of sites and large sizes of weed infesations, it may be extremely difficult to slow the spread of weeds such as the knapweeds and dalmation toadflax.

The implementation of this alternative would result in a moderate amount of protection of native plant communities.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Issues That Aided in the Development of Mitigation Measures

Issue 3: Water Quality

There is a concern about the use of herbicides and the impacts from herbicides on riparian communities, including the impacts on vegetation, fish, wildlife, insects and other riparian dependent or associated species. There is a perception that herbicides may adversely impact water quality due to leaching through the soil from application sites. The measuring factor would be the identification of sites and their potential impacts to herbicides applied within the 100 foot buffer zone adjacent to riparian areas.

Alternative 1, No-Action : There would be no use of herbicides with the implementation of this alternative therefore there would be no impacts to riparian communities including impacts to vegetation, fish, wildlife, insects and other riparian dependent and associated species. There may be some impacts to sedimentation as some studies indicate that runoff and sediment would be higher in areas that had large number of spotted knapweed plants compared to sites with natural vegetation such as bunchgrasses (Lacey, 1989).

Alternative 2 : The State of Oregon does not have water quality standards for the herbicides proposed for use with this alternative, only that application and label instructions are to be followed. The probability would be low to minimal that water quality would be adversely impacted because of mitigation measures identified in Chapter 2. The mitigation measures for all herbicide sites would be applied to insure that herbicides would not be sprayed within 100 feet of riparian areas, intermittent or perennial streams, or high water tables. Given the leachability rate, soil decomposition rate, soil half-life, and distance to ground water in the sites, impacts to water quality would be negligible with the

implementation of this Alternative and the associated mitigation measures. The chance for overland flow of herbicides would also be negligible due to the permeability of the soils, distance to riparian areas and wetlands, and the mitigation to not spray if weather forecasts rain or thunderstorms within 48 hours of application. Mobility studies have shown that picloram, triclopyr, and glyphosate have minimal flow in the soil substrate (Newton, 1994). Dicamba has the potential for mobility in subsurface water but has a soil half-life of 1 to 2 months.

There would not be any measurable impacts to water quality from manual or biological control treatments.

This alternative would reduce the probability of contamination of the ground water to minimal levels by implementing the mitigation measures identified above and also found in Chapter 2.

Aquatic Conservation Strategy Objectives identified in the Northwest Forest Plan would be met with this alternative. The 9 objectives can be found on page B-11 of the Record of Decision for the Northwest Forest Plan. Treatment within riparian reserves would be limited to manual treatment, prescribed burning or biological control. Watershed analyses conducted on the Deschutes specify a need to control noxious weed populations to restore native plant and animal communities.

Monitoring of water at specific sites would be done to determine if runoff was occurring if funding and workforce constraints allow.

Alternative 3 : There would be no use of herbicides with the implementation of this alternative therefore there would be no impacts to riparian communities including impacts to vegetation, fish, wildlife, insects and other riparian dependent and associated species from the use of herbicides.

Aquatic Conservation Strategy Objectives would be met with the implementation of Alternative 3. Only manual, biological or burning would be done within the riparian reserves. No herbicides would be applied with this alternative.

Issue 4: Utilization of Prevention Strategies

There is a concern that prevention strategies are not being utilized or enforced in order to reduce the incidence and spread of noxious weeds. The Mediated Agreement for Managing Competing and Unwanted Vegetation identifies that

prevention strategies to forestall the establishment of noxious weed populations are the most desirable methods of control. The measuring factor would be the identification of prevention strategies and monitoring plans to determine the effectiveness of the prevention strategies.

All Alternatives : In 1997, the Deschutes National Forest increased its efforts to prevent the spread of noxious weeds by incorporating prevention strategies into some management activities. For example, timber sale contracts include a USFS Region 6 contract clause that requires any logging equipment moved onto National Forest land be free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds (Timber Sale Contract Clause C6.343, Option 2). Other examples as include having clauses for cleaning machinery and heavy equipment in service contracts. District Weed Coordinators for the Forest have also begun to complete Noxious Weed Risk Assessments for proposed projects; for those projects having a moderate to high risk of spreading noxious weeds with mitigations being developed that aim to reduce this risk. This Environmental Assessment would implement the Integrated Weed Management Plan (IWMP) that would include prevention actions. (See Appendix A for a copy of the proposed Integrated Weed Management Plan). Regardless of the alternative selected, the Forest would continue to incorporate prevention strategies to reduce the incidence and spread of noxious weeds.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Issue 5: Impacts to unique areas including Wilderness, Special Interest Areas (SIA), Research Natural Areas (RNA), Old Growth Management Areas, Oregon Cascades Recreation Area (OCRA), and others.

There is a concern about keeping unique areas (such as wilderness areas) weed-free. These areas are important refugia for species and are maintained in more natural states than adjacent lands under timber or other active management. A high priority would be to treat noxious weed populations that have the potential to spread further into special areas. The measuring factor would be the amount of noxious weed acreage within special areas receiving treatment. Those unique management areas are as follows:

Metolius Old Growth	Davis Lake Special Interest Area
Metolius Research Natural Area	Wilderness
Metolius Special Forest	Deschutes Wild and Scenic River
Metolius Wildlife Primitive	Metolius Wild and Scenic River
Oregon Cascades Recreation Area	Squaw Creek Wild and Scenic River
Pringle Falls Research Natural Area	Crescent Creek Wild and Scenic River
Lava Butte Special Interest Area	Big Marsh Creek Wild and Scenic River
Wake Butte Special Interest Area	Deschutes Proposed Wild and Scenic River
Moffit Butte Special Interest Area	Fall River Proposed Wild and Scenic River
Lava River Cave Special Interest Area	Paulina Creek Proposed Wild and Scenic River

In most unique management areas, such as Wilderness, Special Interest areas, Wild and Scenic Rivers and Research Natural Areas, maintenance of native plant communities is emphasized as a desired future condition. These natural areas have not been systematically surveyed for noxious weeds. Therefore, the full potential risk of a no-action alternative is unknown. Currently, the Forest has only one noxious weed site mapped in a Research Natural Area (St. Johnswort in Pringle Falls Research Natural Area).

Alternative 1, No-Action : There are 284.6 acres of noxious weed sites within unique management areas. If action is not taken to reduce the spread of noxious weeds, it would be likely that additional natural areas will become infested with these weeds, impacting native plant communities and long-term management goals. Management goals for Wilderness, Special Interest, and Research Natural Areas include maintaining natural conditions.

Alternative 2 : There would be 267.6 acres of noxious weed populations treated within unique management areas. Of these treated acres, 204.1 would be treated manually, 13 acres would be treated biologically, 5 acres would be treated with prescribed burning and 45.5 acres would be treated with herbicides. No treatment would occur in 17 acres within unique management areas. Currently, the majority of noxious weed infestations exist along roads that are highly used by the public to access the Deschutes National Forest. This alternative proposes chemical treatment along many of these roads in order to reduce the presence and spread of these weeds. This action will help protect these natural areas from the threats of noxious weeds. For example, one high priority area is Three Creeks Road that travels from Sisters, Oregon to subalpine meadows adjacent to Three Sisters Wilderness Area. Chemically treating spotted knapweed will provide an opportunity to reduce the size of the population to a point at which manual control will be effective. Due to the high public use of Three Creeks Meadow, this area receives a lot of recreational

disturbance that opens habitats for spotted knapweed. Treating spotted knapweed before it reaches these meadows will protect a sensitive plant (Newberry's gentian) as well as Three Sisters Wilderness Area.

This alternative best protects the native plant communities in unique management areas by aggressively treating noxious weed populations within the unique management areas and along roads and other areas that could provide a route into unique areas.

Table 3 displays the acreage of treatment by Management Area for Alternative 2.

Table 3 : Alternative 2 Treatment in Unique Management Areas

Alternative 2	Acres of Treatment					
Management Area	**Chemical**	**Manual (Pull & Clip)**	**Biological**	**Prescribed Burning**	**Treat Total**	**No Treatment**
Metolius Old Growth	7.0	0	0	0	7.0	9.0
Metolius Special Forest	20.5	93.5	0	0	114.0	0
Metolius Wildlife Primitive	.5	0	0	0	.5	0
Oregon Cascades Rec. Area	0	0	0	5.0	5.0	0
Research Natural Area	0	0	7.0	0	7.0	0
Special Interest Area	5.5	7.6	0	0	13.1	0
Wilderness	0	.5	0	0	.5	0
Wild and Scenic River	3.5	80.5	6.0	0	90.0	8.0
Proposed Wild and Scenic River	12.5	22.5	0	0	35	0
TOTAL	**45.5**	**204.1**	**13.0**	**5.0**	**267.6**	**17.0**

Alternative 3 : Under this alternative, the 40 sites planned for chemical treatments in Alternative 2 would instead receive manual treatment (hand-pulling) and/or biological control treatments. Noxious weed infestations that jeopardize natural areas would be considered high priority sites.

This alternative moderately protects the native plant communities in unique management areas because weed populations would not be treated as aggressively as in Alternative 2. Manual and biological controls would take more time to realize results and contain the populations; therefore the potential for increased spread into unique areas would be greater than Alternative 2.

Table 4 displays the acreage of treatment by Management Area for Alternative 3.

Table 4 : Alternative 3 Treatment in Unique Management Areas

Alternative 3	Acres of Treatment					
Management Area	**Chemical**	**Manual (Pull & Clip)**	**Biological**	**Prescribed Burning**	**Treat Total**	**No Treatment**
Metolius Old Growth	0	7.0	0	0	7.0	9.0
Metolius Special Forest	0	114.0	0	0	114.0	0
Metolius Wildlife Primitive	0	.5	0	0	.5	0
Oregon Cascades Rec. Area	0	0	0	5.0	5.0	0
Research Natural Area	0	0	7.0	0	7.0	0
Special Interest Area	0	13.1	0	0	13.1	0
Wilderness	0	.5	0	0	.5	0
Wild and Scenic River	0	84	6.0	0	90.0	8.0

Proposed Wild and Scenic River	0	35.0	0	0	35	0
TOTAL	**0**	**249.6**	**13.0**	**5.0**	**267.6**	**17.0**

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Issue 6: Human Health Risks

There is a concern about the impacts to humans from the use of herbicides. Inappropriate handling, applications and storage could cause injury to humans, both the applicators and forest visitors to sites treated with herbicides. The measuring factor would be the disclosure of the human health risk assessment for each alternative and identification of mitigation measures implemented to ensure potential impacts to applicators and casual forest visitors are reduced or eliminated.

The issue of human health risks from the use of herbicides is discussed below under Alternative 2, which is the only alternative that proposes the use of herbicides. However, effects from other types of treatment (i.e., manual and biological control) must be disclosed. These effects would apply to all action alternatives and are discussed briefly below. USDA Forest Service (1988) describes human health effects from all treatment methods in greater detail and lists measures for reducing environmental and human health risks.

Manual Treatment. Most manual treatments for sites in this EA would involve hand-pulling, clipping, digging, or grubbing. However, chainsaws and axes may be used on scotch broom sites. When temperatures are high, workers may experience increased fatigue, heat exhaustion, or heatstroke. Hand-pulling can cause back strains and frequent rest and stretching are important to alleviate this potential problem. Recently, concerns have been raised that plants in the knapweed genus (Centaurea spp.) may contain chemical compounds that can fester in open wounds and possibly be carcinogenic, causing tumors. Workers must wear gloves to prevent this situation. Power equipment, such as chainsaws, is loud and can require the use of protective gear to prevent hearing impairment. In forestry conditions, where site conditions can be extreme, handtools can be hazardous.

Biological Control. No hazards to human health have been identified for biological controls. USDA Forest Service (1988) requires that all Forest

Service uses of biological control organisms would be in cooperation with the USDA Agriculture Research Service or under individual, approved state programs.

Prescribed Burning. Only 5 acres (Site #6120026 and Map # 142) would be proposed for prescribed burning with the implementation of Alternatives 2 and 3. In the majority of cases, injuries to humans could occur from the use of tools, exertion, debris, footing, etc. In extreme cases and rarely, injury and mortality could result from burns to the skin during escaped fire situations. Workers would be exposed to smoke which could cause lung and eye irritation. More long-term exposure could result in long-term lung irritation from inhalation of smoke. The FEIS for Managing Competing and Unwanted Vegetation estimates that one minor injury would occur for every 500 acres burned and one disabling injury would occur for every 7,500 acres burned. The injury rate would be lower for the site identified because only grasses, sedges and forbs would be burned. Total days of smoke exposure over a 5 year period would be 2 or less than 1/2 day per year.

Alternative 2 : **Chemical Control.**

This alternative would utilize herbicides to control 40 noxious weed sites on 476 acres. Health and safety risks associated with herbicide use under this alternative are applicable to both workers engaged in project activities and the general public who may live nearby or recreate within or adjacent to the project area who could be exposed to herbicide drift (though minimal because no aerial spraying would be proposed with this Environmental Assessment), to vegetation with herbicide residues or to herbicides resulting from an accidental spill. Exposure risk to nearby residents is expected to be similar to that of forest visitors.

Tables below display the estimated health risks associated with each chemical to the public and project workers.

Table 5 : Estimated Health Risks To The Public

Situation	General Health	Reproduction
	DICAMBA	
Routine Application	Low	Moderate
Large Spill	Moderate	High
	GLYSOPHATE	

Routine Application	Low	Low
Large Spill	High	High
	PICLORAM	
Routine Application	Low	Low
Large Spill	High	High
	TRICLOPYR	
Routine Application	Low	Low
Large Spill	High	High

Table 6 : Estimated Health Risks To Project Workers

Situation	General Health	Reproduction
	DICAMBA	
Aerial Mixer / Loader	Low	Low
Backpack Sprayer	Low	Moderate
Right of Way Mixer / Loader	Negligible	Negligible
Hack and Squirt	Low	Moderate
	GLYSOPHATE	
Aerial Mixer / Loader	Low	Low
Backpack Sprayer	Moderate	Moderate
Right of Way Mixer / Loader	Negligible	Negligible
Hack and Squirt	Low	Low
	PICLORAM	
Aerial Mixer / Loader	Negligible	Negligible
Backpack Sprayer	Negligible	Negligible
Right of Way Mixer / Loader	Negligible	Negligible
Hack and Squirt	Negligible	Negligible

	TRICLOPYR	
Aerial Mixer / Loader	Low	Low
Backpack Sprayer	Moderate	Moderate
Right of Way Mixer / Loader	Negligible	Negligible
Hack and Squirt	Low	Low

The Record of Decision to the Regional FEIS for Managing Competing and Unwanted Vegetation (Regional FEIS) determined that the four herbicides proposed for use in this EA were among those that could be used with acceptable risk as long as certain precautions and restrictions were applied. The Regional FEIS requires mitigation measures to minimize effects from the use of herbicides All of these mitigation measures would be complied with, as well as additional, more restrictive, mitigation measures designed for this proposed project. There are no unusual conditions that indicate this alternative would cause greater effects on worker and public health than those disclosed in the Regional FEIS and Herbicide Information Profiles. Because of these mitigations, potential health risks to workers and the public from the use of herbicides are expected to be reduced from those predicted in the quantitative risk assessment of the Regional FEIS. For example, though the Rodeo formulation of glyphosate can be used in riparian areas, this EA restricts the use of herbicides within 100 ft. of perennial streams and lakes. In ephemeral streams or ditches, herbicides will not be used if weather forecasts predict precipitation within two days. This would reduce the risks of herbicide transport downstream. Dyes and signing would be used in herbicide application areas to ensure that the public would know exactly where herbicides have been applied. Also, the use of dyes can be an effective method for ensuring there is not overlap in spraying areas and to help herbicide applicators monitor their application accuracy (Owsley 1998).

When considering public notification, posting, and signing requirements, worker restrictions, mitigations, and health monitoring requirements, most of the potential exposure to workers should be reduced and the public should not be exposed at all. To the extent practical and feasible, treatment methods would shift to non-herbicide methods once an infestation is brought under control and reduced in size and density.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental

Assessment.

Issue 7: Impacts to Non-target Desirable Species

There is a concern that the application of herbicides has the potential to adversely affect non-target plant species found adjacent or within treatment sites. Non-target species may include sensitive plants identified by the Regional Forester. The measuring factor would be the acreage of non-target species (and their identification, especially if sensitive) potentially affected.

Alternative 1, No-Action : Herbicides would not be used with the implementation of this alternative, therefore there would be no direct, indirect or cumulative impacts to non-target species from herbicides.

Alternative 2 : There are 476 acres of noxious weed sites proposed for chemical treatment. All sites have been assessed for their potential to contain desirable non-target species and known presence of sensitive plants. Most sites with sensitive plants have been identified to flag and avoid the use of herbicides in the flagged area. (See the Mitigations in Chapter 2 for avoiding sensitive plant populations.) Manual control would be used to control the noxious weeds within the flagged areas. Roadside sites on the Sisters Ranger District and Map Site # 216 would not have the sensitive plant populations (Peck's penstemon and green-tinged paintbrush) flagged to avoid. These sensitive plants do not normally occur within the road prism in high densities with individuals normally occurring in the adjacent forested areas. Loss of individuals from spraying herbicides would be less impactive than not spraying and losing habitat due to the displacement by noxious weeds. There would be 15 acres treated with herbicides where green-tinged paintbrush may occur within the road prism (Map # 216). Other individuals of the population would not be sprayed that exist in the adjacent forested non-treatment areas.

Sites with desirable non-target species in high densities were identified and glysophate was not proposed in order to maintain grasses. Other sites were identified for back pack spraying with application to only target species.

See also impacts identified under Issue 1.

Alternative 3 : Herbicides would not be used with the implementation of this alternative, therefore there would be no direct, indirect, or cumulative impacts to non-target species from herbicides.

Additional information may be found in the Noxious Weed, Vegetation and

Human Health Assessment Report associated with this Environmental Assessment.

Issue 8: Spread of Forest Noxious Weed Populations to Adjacent Private Lands

There is a concern about the spread of noxious weeds beyond the forest boundary to adjacent land owners. Adjacent landowners are concerned that measures they have taken to eliminate or reduce noxious weeds on their own properties may be thwarted by the lack of control measures on adjacent federal lands. The measuring factor would be the acreage of noxious weeds not treated adjacent to other land owners. See Issue 9 for acreages of noxious weeds receiving treatment on National Forest system lands that are adjacent to private lands.

Most counties and states have ordinances that require private landowners to control noxious weeds on their property. Recently, the city of Sisters, Oregon added noxious weeds to its list of public nuisances (City Ordinance 5.335), which states: ``No person in charge of property may permit or cause to exist vegetation that…is an invader species such as Knapweed." If noxious weed infestations are not controlled on Forest Service land, these weed infestations could spread to adjacent private lands. For Example, Sunriver Owners Association sent a letter to the Bend/Fort Rock District Ranger asking the Forest Service to spray weeds on Forest Service roadsides that lead to and from their resort. Sunriver resort is actively working to reduce their weed infestations and wish to eliminate the threat of reinfestation from noxious weeds on Forest Service lands.

Alternative 1, No-Action : If no actions are taken to control noxious weed infestations, the potential for spread to adjoining public and private lands is high, particularly for roadside and trail infestations. Since weed species are highly competitive, their spread over time could severely conflict with the management objectives of non-Forest areas.

Alternative 2 : Under this alternative, high priority noxious weed sites were selected for herbicide treatments based on the potential risk of spread. Control of these sites would occur more rapidly because of the effectiveness of treatment with herbicides. As infestations are brought under control and seed production would be reduced or eliminated, these sites would no longer serve as seed sources for spreading the infestations to adjacent lands. There would be 19 acres of noxious weeds sites on National Forest system lands that would not receive treatment and could potentially spread to adjacent lands.

This alternative best protects adjacent land owners from noxious weeds that could spread from FS lands.

Alternative 3 : Noxious weed sites slated for herbicide application in Alternative 2 would be manually and / or biologically controlled. The potential for immediate control is reduced with these methods because manual control is much more expensive and the potential to miss plants is increased. Biological control is dependent on the effectiveness of insects and their ability to impact the growth and seed production of noxious weeds. There would be 19 acres of noxious weeds sites on National Forest system lands that would not receive treatment and could potentially spread to adjacent lands. Populations would continue to spread but not at the rates as under Alternative 1.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Issue 9: Impacts of Private Land Noxious Weed Populations and Potential Spread to Forest Lands

There is a concern about the spread of noxious weeds from sites off forest, including the spread by activities of users of the forest, contractors, general public, other forest vehicles, grazing allotment activities, state and local government agencies, etc. The measuring factor would be the identification of known private land sites, activities that cause spread, and identification of measures to eliminate or reduce the activities or impacts that increase the spread of noxious weeds from sites off-forest.

Much of what is discussed above under Issue 8 applies to this issue. In areas where private lands and National Forest lands adjoin, noxious weed prevention and control would only be successful if all landowners work together. Recent partnerships have been formed to elevate local awareness by the public about the noxious weed problem in an effort to prevent further spread of these weeds. For example, a coalition of partners (Deschutes National Forest, Deschutes County Watershed Council, Deschutes County Public Works, Oregon Department of Agriculture, Native Plant Society of Oregon, Oregon Department of Fish & Wildlife, and Prineville BLM) have just received a two-year grant to fund noxious weed education efforts. In addition, Deschutes National Forest Botanists have been providing noxious weed education to the public through slide shows and nature hikes.

Landowners adjacent to proposed herbicide and biological control sites were

notified of the proposed action and some of the people who responded stated that they had not known about the noxious weed problem. Several people asked that we increase our noxious weed education efforts. Education and development of partnerships would be necessary to ensure noxious weed control efforts on one parcel of land are not futile because adjacent lands are not being treated.

Alternative 1, No-Action : Same as for Issue 8. If no actions are taken to control noxious weed infestations, the potential for spread to adjoining public and private lands would be high, particularly for roadside and trail infestations. Since weed species are highly competitive, their spread over time could severely conflict with the management objectives of one or all adjacent landowners.

Alternative 2 : Under this alternative, high priority noxious weed sites on Forest Service lands were selected for herbicide treatments based on the potential risk of spread. If Forest Service and private landowners don't coordinate control efforts, there will be adjacent seed sources reinfesting areas that were treated. There are approximately 142.5 acres of noxious weeds mapped that occur on private lands. These areas are adjacent to federal land noxious weed sites that would receive treatment except for 19 acres which would not receive treatment. Of the sites proposed for treatment, 91 acres would be treated with herbicides that would more effectively treat the noxious weed populations. This would reduce the seed production and therefore reduce the continued spread of noxious weeds to adjacent lands.

Alternative 3 : Noxious weed sites slated for herbicide application in Alternative 2 would be manually and / or biologically controlled (91 acres). The potential for immediate control is reduced with these methods because manual control is much more expensive and the potential to miss plants is increased. Biological control is dependent on the effectiveness of insects and their ability to impact the growth and seed production of noxious weeds. Populations would continue to spread but not at the rates as under Alternative 1.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Issue 10: Impacts of Control Activities on Cultural Resource Sites

There is a concern about the impacts of noxious weed control on cultural resource sites. It is not known if activities or herbicides have the potential to

cause damage to known sites. The measuring factor would be the acreage of cultural sites impacted by control activities.

No Action Alternative: Approved management activities would continue to occur inlucing the 1994 decision to implement control on 44 noxious weed sites with biological and manual control. Cultural clearance for these sites has already occurred. There would be no impacts to cultural resources because no activities other than inventory and monitoring would take place on additional sites identified in this environmental assessment.

All Action Alternatives : Through the analysis of this proposal, there would be no impacts to cultural resources with the implementation of any alternative. Under the terms of the 1995 Programmatic Agreement (1995 PA) among the USDA-Forest Service, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer Regarding Cultural Resources Management on National Forests in the State of Oregon (1995 PA), the eradication of noxious weeds through the application of herbicides and hand removal (including hand tools such as shovels to dig up roots) is considered a Non Undertaking. This means that further consideration of the project (undertaking) under the Section 106 guidelines for compliance with the National Historic Preservation Act are not required for these aspects of the undertaking.

For those parts of the undertaking that involve treatments, such as clipping, mowing, prescribed burning, or biological controls, it is determined that these activities fall within the 1995 PA Exemptions in Appendix B for Types of Undertakings Excluded from Case-by-Case Review Based on Inspection or Monitoring. Item 2 under the Engineering / Transportation would be most applicable to this situation in that it allows for "seeding and planting, blading, or the ripping of native or non-native surfaced roadways or trailways." Although the activities mentioned above are not precisely the same as those quoted, the end result of mowing, burning, and clipping do not represent as great a potential for disturbance as do blading or ripping.

Issue 11: Restoration of Sites After Control Measures

There is a concern about the long-term strategy to restore sites after control measures have been effective. People are concerned that money, time and effort would be spent and that noxious weeds would recolonize the site if measures are not taken to prevent reestablishment by noxious weeds. The measuring factor would be the identification of strategies to reduce or eliminate reestablishment of noxious weeds and implementation and monitoring to

determine its effectiveness.

Sheley et. al. (1996) propose a model for weed management that is based on the primary causes of plant succession: site availability, and availability and performance of different plant species. The goal is to shift the dynamics toward a desired plant community. A healthy, weed-resistant plant community consists of a diverse group of species which occupy most of the niches.

A strategy was developed to select two to three sites and test the feasibility and effectiveness of rehabilitation. If the testing is successful and funding allows, rehabilitation would be increased to other appropriate sites. Two preliminary noxious weed sites have been selected on the Deschutes National Forest to test the concepts outlined by Sheley et. al. (1996) as time and funding allow. These two sites would be visited in the field season of 1998 to further evaluate their potential for revegetation. If the sites are inadequate (e.g., due to poor soils or a lack of residual native plant communities), an attempt would be made to select other sites to take their place.

In addition, this EA proposes small-scale (i.e., less than 5 acres) experimental burning and seeding with native grass and sedge species in a wetland called Big Marsh to test the effectiveness of prescribed burning on reed canary grass.

Alternative 1, No-Action : Though this alternative is a No-Action Alternative, the Forest is still treating 44 sites with manual and biological control that were covered in a precious decision in 1994. Revegetation of some of those sites may occur. Additional sites identified with this environmental assessment would not be available for revegetation.

Alternative 2 : In this alternative, herbicides would provide an opportunity to open niches for 2-3 years for other more desirable plants to fill (Sheley 1998). Priority revegetation sites focus on herbicide sites to reduce the reliance on herbicides over time and take advantage of open niches created by the herbicides. Other sites proposed for manual or biological control would also be available for restoration activities unless local, native species recolonize the area naturally.

Alternative 3 : In this alternative, manual sites would take priority over biological sites for revegetation efforts. Manual control is labor intensive and can be ineffective on large infestations. However, it can be effective on small infestations, and these sites would receive a higher priority for revegetation.

Additional information may be found in the Noxious Weed, Vegetation and

Human Health Assessment Report associated with this Environmental Assessment.

Issue 12: Impacts of Inert Ingredients, Surfactants and Formulations on the Environment

There is a concern about the formulations, application rates, inert ingredients and surffacants used with the application of herbicides. Inappropriate use of herbicides and their formulations could cause impacts to the environment and humans. The measuring factor would be the disclosure of formulations, application rates, inert ingredients and surfactants used and their known impacts on the environment and humans.

The issue of human health risks from the use of herbicides and their formulations, application rates, and inert ingredients is discussed below under Alternative 2. Alternatives 1 and 3 do not propose the use of herbicides, therefore there would be no effect to the environment from formulations, inert ingredients or surfactants.

The Regional FEIS for Managing Competing and Unwanted Vegetation requires the use of herbicide formulations that contain only inert ingredients which are recognized as generally safe by Environmental Protection Agency (EPA) or which are of a low priority for testing by EPA. Use of other inerts (identified by EPA as a high priority for testing or those that have been shown to be hazardous) requires full assessment of human health risks incorporated into the NEPA decision-making process.

The formulations proposed for use in this EA contain inert ingredients that are categorized by the EPA as low priority for testing based on chemical structure that would indicate toxic effects or absence of data or are generally recognized as safe. The Garlon 4 formulation of triclopyr does contain kerosene but this was analyzed in the FEIS for Managing Competing and Unwanted Vegetation. Effects can be found on page 130, Chapter IV of the FEIS.

This EA addresses environmental effects on the following herbicides (formulations are in parentheses): dicamba (Banvel), glyphosate (Rodeo), picloram (Tordon 22K), and triclopyr (Garlon 3A). Herbicide Information Profiles provide information, if it is available, on surfactants and inert ingredients.

Table 7 : Comparison of available information regarding inert ingredients for the herbicides proposed for use in the EA. Information is taken from Herbicide

Information Profiles.

	Dicamba (Banvel formulation)	Glyphosate (Rodeo formulation)	Picloram (Tordon 22K formuation)	Triclopyr (Garlon 3A formulation)
All Inerts Identified?	No	Yes	No	No
% Inert Ingredients	30.0% Ehtylene glycol; 53.4% Unidentified	None	75.6% (water and dispersing agents)	55.6% (water, surfactants & Ethanol)

Additional information can be found in the discussion of effects regarding Issue 6.

Additional information may be found in the Noxious Weed, Vegetation and Human Health Assessment Report associated with this Environmental Assessment.

Proposed, Endangered, Threatened, and Sensitive Species

The Forest Service policy is to protect the habitat of federally listed, proposed and sensitive species from adverse modification or destruction, as well as to protect individual organisms from harm or harassment as appropriate (FSM 2670.3). All Forest Service projects, programs, and activities are to be reviewed for possible effects on Proposed, Endangered, Threatened, and Sensitive (PETS) species, and the findings are to be documented in the decision notice (FSM 2672.4).

ANIMALS

Seven animal Proposed, Threatened, Endangered or Sensitive species (PETS) and/or their habitats are known or suspected to occur within the project area. The following is a summary of the Biological Evaluation and Assessment and identification of the effects analysis. Further information can be found within Biological Assessment / Evaluation located in the

analysis file associated with this Environmental Assessment. Level 1 consultation with US Fish and Wildlife Service has been completed.

Northern Bald Eagle : Suitable nesting, roosting and foraging habitat occurs within the project area. Five treatment sites are proposed within 1/4 mile of eagle nests and one site is within roosting and potential nesting habitat. Crews conducting noxious weed control activities could disturb nesting eagles. Seasonal restrictions (January 1 to August 31) have been identified to restrict disturbing activities within 1/4 mile of nests. Wildlife biologists would ascertain the reproductive status of individual nests and would waive restrictions if reproduction is not occurring that particular year.

Alternative 1, No-Action : No effect.

Alternative 2 & 3 : No effect if applicable mitigation measures are followed.

Northern Spotted Owl : Suitable nesting, roosting and foraging habitat occurs within the project. Two treatment sites are proposed within 1/4 mile of spotted owl nests, 20 are located within Critical Habitat Units, and 27 are located within Late Successional Reserves. Crews conducting noxious weed control activities could disturb nesting owls. Seasonal restrictions (March 1 to September 1) have been identified to restrict disturbing activities within 1/4 mile of nests. Wildlife biologists would ascertain the reproductive status of individual nests and could waive restrictions if reproduction is not occurring that particular year.

Alternative 1, No-Action : No effect.

Alternative 2 & 3 : No effect if applicable mitigation measures are followed.

Greater Sandhill Crane : Suitable nesting, rearing and foraging habitat occurs at Big Marsh (Crescent Ranger District), as well as numerous locations throughout the Deschutes River corridor. Crews conducting noxious weed treatment activities could disturb nesting sandhill cranes. Seasonal restrictions (May 1 to July 31) have been identified to restrict disturbing activities during the sandhill crane reproductive season.

Alternative 1, No-Action : No impact.

Alternative 2 & 3 : No impact if applicable mitigation measures

are followed.

Townsend's Big Eared Bat : Suitable habitat occurs within the project area; no maternity or hibernaculum caves are known to occur near any treatment area, but the bats may forage in or near treatment areas.

All Alternatives : No impact.

Preble's shrew : Suitable habitat occurs in wetlands and riparian areas in the project area.

Alternative 1, No-Action : No impact.

Alternative 2 : No impact if applicable mitigation measures are followed for protection of riparian habitat.

Alternative 3 : No impact.

Pygmy rabbit : Suitable habitat occurs in big sagebrush areas in the project area.

All Alternatives : No impact.

Spotted Frogs : Suitable habitat occurs in wetlands and riparian areas in the project area.

Alternative 1, No-Action : No impact.

Alternatives 2 & 3 : No impact if applicable mitigation measures are followed for protection of riparian habitat.

Additional information may be found in the Biological Assessment / Evaluation of Threatened, Endangered, and Sensitive Wildlife Report associated with this Environmental Assessment.

FISH and **INVERTEBRATES**

Three Threatened, Endangered or Sensitive species and/or their habitat is known or suspected to occur within the project area. The following is a summary of the Biological Evaluation and

Assessment and identification of the effects analysis. Further information can be found within Biological Assessment / Evaluation located in the analysis file associated with this Environmental Assessment. Level 1 consultation with US Fish and Wildlife Service has been completed.

Bull trout : Bull trout are known to spawn and rear in streams of less than 50° F water temperature for the first two years of life. Migratory subadults move to larger rivers or lakes to further mature. Bull trout are associated with overhead cover in the form of cobble/boulder substrates, wood and deep pools.

Alternative 1, No-Action : No effect.

Alternative 2 & 3 : No effect if applicable mitigation measures are followed.

Redband trout : Inland rainbow populations in the Columbia River basin have been separated from inland Klamath Basin and coastal stocks. Inland redband trout have the ability to withstand a wide range of habitat quality, especially temperature. Most inland stocks of rainbow have been influenced by introductions of hatchery stocks and few pure indigenous stock of inland rainbow may exist. A study of the genetic composition of the inland rainbow trout of the Deschutes basin is in progress.

Alternative 1, No-Action : No impact.

Alternative 2 & 3 : No impact if applicable mitigation measures are followed.

Cascades apatanian caddisfly : The habitat is described for this species is small streams with gravel and cobble substrates with moderate to low velocities. This species is not in fast moving water or high gradient streams or in pools or slow current where silt covers the cobbles. There is some association with springs and instream wood.

Alternative 1, No-Action : No impact.

Alternative 2 & 3 : No impact if applicable mitigation measures are followed.

SENSITIVE PLANTS

Several species of plants identified as Sensitive by the Regional Forester for the Forest Service occur in or near noxious weed treatment sites. These are as follows:

Table 8 : Sensitive Plant Species

Common Name	Scientific Name
Jepson's monkey flower	*Mimulus jepsonii*
Peck's penstemon	*Penstemon peckii*
Newberry's gentian	*Gentiana newberryi*
Pumice grape-fern	*Botrychium pumicola*
Estes' artemisia	*Artemisia ludoviciana* var. *estesii*
Green-tinged paintbrush	*Castilleja chlorotica*

Effects Analysis

Alternative 1, No-Action : No treatment would be implemented with this Alternative. Under a previous decision, noxious weed control activities would continue on 44 sites under the analysis provided in a Categorical Exclusion signed in 1994 where manual and biological control sites have been identified. Negative direct impacts would result from people driving on, trampling, or pulling green-tinged paintbrush, Newberry's gentian and Peck's penstemon. Competition from noxious weeds for nutrients, light and water could directly impact the survival of sensitive plant populations.

Indirect impacts : Negative indirect impacts would result from the continued occupation of sites by noxious weeds and the continued spread into sensitive plant sites. It is probable that noxious weeds would outcompete sensitive plants for space, water and nutrients.

Cumulative impacts would result to sensitive plants thoughout their ranges due to other activities occurring with the management of the National Forest System lands. All these activities could contribute to the continued introduction and spread of noxious weeds. The density and area covered by noxious weeds in the future would continue to increase, displacing sensitive and other native species.

Alternative 2 : This alternative uses a variety of techniques to control noxious weed populations. No direct impacts to senstive plants are expected from biological control activities. Negative direct impacts could result from sensitive plants being sprayed with

herbicides, especially in areas along roadsides where boom sprayers would be employed. Some loss of individual plants would occur if plants exist within the road prism and herbicides were used on these sites. For Site 6110010 (Map #216), sensitive plants would not be flagged for avoidance but herbicides would be applied due to the high density of noxious weeds present. It was determined by the Interdisciplinary team that herbicide treatment was less detrimental to the sensitive plant population as a whole than no treatment and that the subsequent loss of a few individual sensitive plants was acceptable. It would be more effective to be able to treat the noxious weed population with herbicides with the risk of losing a few individual sensitive plants while maintaining the population. Negative direct impacts could also result from manual control activities from workers trampling, driving on or pulling individual plants. Damage to individual plants could result in mortality or reduced flowering and seed production.

Indirect impacts to sensitive plants from herbicides are dependent on the herbicide selected for each site. See the Soils section for more information regarding the translocation properties and duration in the soil of the herbicides selected.

Beneficial indirect impacts result with the implementation of Alternative 2 from the resultant removal of noxious weed populations thereby increasing areas that could be occupied by sensitive plants.

Cumulatively, in the long-term, noxious weed control treatments, including the use of herbicides, would be beneficial to existing sensitive plant populations and unoccupied habitats.

Alternative 3 : The impacts to sensitive plants with the implementation of Alternative 3 are similar to Alternative 2 except that no herbicides would be utilized with this alternative.

Indirect impacts of implementing Alternative 3 are similar to implementing Alternative 2 in biological and manual control of noxious weed populations.

Cumulative impacts of implementing Alternative 3 would result in a commitment to labor intensive, long-term efforts to contain, control or eradicate noxious weed populations using methods proposed in this alternative. Without a total commitment, weeds would become established in new sites and existing sites (both small and large) would adversely affect sensitive plant populations and habitat.

Risk Analysis

Alternative 1 : Alternative 1 would have the highest risk for negative impacts to sensitive

plants and their habitats. The impacts to *Penstemon peckii* and its habitat would be most detrimental if the noxious weeds are not treated aggressively. Approximately 7 sites of *Penstemon peckii* would be impacted by the expansion of noxious weed populations. Direct, indirect, and cumulative effects to *Penstemon peckii* would impact individuals or habitat, and may contribute to a trend towards Federal listing or cause a loss of viability of the species. For the other sensitive plant species listed above, direct, indirect and cumulative effects may impact individuals or habitat, but would not be likely to contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Alternative 2 : This alternative has the lowest risk rating for negative impacts and highest likelihood for beneficial impacts to sensitive plants. The direct, indirect and cumulative effects of the noxious weed control treatments may impact individuals or habitat, but would not be likely to contribute to a trend towards Federal listing or cause a loss of viability to populations or species.

Alternative 3 : This alternative has a moderate risk rating compared with Alternative 1 and 2. Treatments to contain, control or eradicate noxious weed populations may impact individuals or habitat, but would not be likely to contribute to a trend towards Federal listing or cause a loss of viability to populations or species.

Additional information on the impacts to sensitive plantes can be found in the Biological Evaluation for Plants associated with the analysis file of this Environmental Assessment.

Management Indicator Species (MIS)

Wildlife species have been identified in the Deschutes National Forest Land and Resource Management Plan as management indicator species (MIS) because their populations are believed to be influenced by forest management activities. Those chosen may be (1) candidate, endangered, threatened, or sensitive species on Federal or Oregon State lists, (2) have special habitat needs, (3) are popular for hunting or trapping, (4) are nongame species of special interest or (5) indicate the effects of management for other species within major biological coummuntities. Additional information on MIS and their habitat requirements can be found in the Wildlife Specialist report located in the analysis file associated with this Environmental Assessment.

Species of Concern (SOC) are those species identified by the US Fish and Wildlife Service as being subject to potential listing in the future but need further study. They have not been identified as sensitive by the Regional Forester.

The following is a listing of MIS, S (State of Oregon Sensitive Listed), and SOC with habitat

present in the project area and the effects of implementing the proposed alternatives on these species populations and habitats.

BIRDS

Species	Status
Northern Goshawk	MIS, SOC
Cooper's hawk	MIS
Sharp-shinned hawk	MIS
Great gray owl	MIS
Great blue heron	MIS
Cavity nesters (woodpeckers)	MIS
Waterfowl	MIS
Western sage grouse	SOC
Harlequin duck	SOC
Red-tailed hawk	MIS
Osprey	MIS
Golden eagle	MIS
Yellow rail	S

MAMMALS

Species	Status
North American lynx	SOC
Pacific fisher	SOC
Small-footed myotis	SOC
Long-eared myotis	SOC
Long-legged myotis	SOC
Yuma myotis	SOC
Elk	MIS
Mule deer	MIS
American marten	MIS

AMPHIBIANS and REPTILES

Species	Status
Northern sage lizard	SOC
Cascades frog	S

Alternative 1, No-Action : There would be no direct effects to MIS, SOC or Oregon State listed sensitive species associated with the implementation of this alternative. Indirect and

cumulative effects may result over time with the continued spread of noxious weeds thereby impacting native plant communities which may impact the forage base, reproductive habitat or other components necessary for the continued presence of the identified species in the project area.

Alternative 2 : All of the above listed species are either known to occur or have habitat within the areas proposed for treatment.

- **Disturbance** - Any wildlife present may be subject to short-term disturbance from implementation of weed treatments. In general, treatments would be of short duration and limited scope, and disturbance would not cause detrimental effects to wildlife species. However, short-term disturbances to nesting raptors during the reproductive season could cause nest failure or abondonment. Mitigation measures for seasonal restrictions, crew size, duration of activities within 1/4 mile of active nests and weather constraints have been identified to reduce impacts to nesting raptors. Monitoring by District Wildlife bioloigsts of the nest site would be done to determine reproductive status and seasonal restrictions may be waived if nesting is not occurring in a given year.
- **Prescribed burning** - Five acres have been proposed at Big Marsh on the Crescent Ranger District (Map # 142, Site #6120026). This area provides important habitat for spotted frogs, sandhill cranes, yellow rails and other wetlands species. Conducting the burn after the reproductive season for species would reduce or eliminate impacts to populations. The burn intensity and duration would not be long and impacts to individuals (frogs) that could not escape the burn may result but are not likely. Mitigations measures identifying the timing of the burn have been identified for this treatment site.
- **Herbicide applications** - Application of herbicides presents a certain level of risk to all species occurring or feeding in the project area. Herbicide applications will be localized in some sites to individual plants and applied with a boom sprayer along roadsides in other sites. The herbicides identified for use have a low potential for bioaccumulation and a low potential for negative impacts to vertebrate species when used under prescribed application rates. There is, therefore, a slight direct risk to wildlife expected at most application sites. Non-target forage vegetation may also be impacted in sites where boom sprayers are used or where backpack spayers are used without shields but would be of small scale. From available literature, potential effects of chemicals to fish and amphibians appears to be greater than other vertebrates. Mitigation measures have been identified to provide 100 foot buffers on riparian areas.

Alternative 3 : Effects of distrubance and prescribed burning would be the same as presented in Alternative 2 above.

Alternatives 2 and 3 : Overall, implementation of Alternatives 2 or 3 would result in beneficial impacts to local wildlife species by limiting the negative impacts of noxious weeds

on native vegetation. With the implementation of the mitigation measures identified in Chapter 2, there would be no negative impact to local wildlife species or habitat with either alternative.

Soils Resource

A complete description of the existing soils resource can be found in the Soil Resource Assessment Report contained in the analysis file associated with this Environmental Assessment. Additional characteristics of the herbicides proposed for use in Alternative 2 are also included in this report.

Table 9 : Herbicide Characteristics

	Glyphosate	Triclopyr	Dicamba	Picloram
Leachability	none	very little	moderate	rapid
Soil decomposition rate	slow	rapid	moderate	moderate
Soil half-life (months)	none	<1	1 to 2	2 to 4

Alternative 1, No-Action : The No Action alternative would maintain noxious weed dominated sites where they currently exist and continue to incur direct effects on the soil resource. Although no additional disturbance to the soils on the sites would occur as a result of physical, biological or chemical control of noxious weeds, the current levels of compaction and/or the lack of organic litter and duff would be maintained on these sites. Lacey et al. (1989) showed that runoff and sediment yield were higher for sites dominated by spotted knapweed as compared to sites dominated by bunchgrass types. Sites dominated by spotted knapweed were shown to have lower infiltration rates as a result of the structure of live vegetative cover and the lower levels of litter on the soil surface.

The persistence and potential spread of noxious weed populations on these sites would limit and/or decrease the amount of litter and duff on the soil surface over time as a result of the lessened resistance of noxious weed biomass to weathering. The amount of biomass produced by noxious weed dominated communities does not appear to be significantly different than

that produced by native plant communities, indicating that the amount of nutrients available for plants and soil development would not be altered. Direct effects on soil structure and pH may be altered over time as a result of the type of biomass produced, although research quantifying these changes is limited.

Alternative 2 : Alternative 2 proposes to treat 166 noxious weed sites with a variety of chemical (40 sites - 476 acres), biological (27 sites - 149 acres), manual (98 sites - 901 acres) and prescribed burning (1 site - 5 acres) treatments. In general, chemical treatments would have some direct effects in the short term on the soil resource, biological treatments are expected to have minimal effects on the soil resource, manual treatments would have minimal disturbance and potentially beneficial effects on already disturbed sites, and burning within the Big Marsh meadow would have limited direct effects on the soil resource.

Chemical Treatments

Four herbicides are proposed for use under this alternative, including picloram, glyphosate, triclopyr and dicamba. The effects of herbicide applications on the soil and groundwater resources relates directly to the type of herbicide and rate of application, the characteristics of the soil types present, and the timing and amount of precipitation following application. The primary elements examined as potential effects include: 1) the absorption characteristics and persistence of herbicide residues in the soil, 2) the effects of herbicides on microbes and, 3) the likelihood of leaching of herbicide residues into groundwater systems or the accumulation in overland flows.

(1) Absorbtion characteristics and persistence

The persistence of a herbicide is defined as the length of time that residues of the initial application remain detectable in the soil. The decay rate, also known as the half-life, is defined as the length of time for half of the intitially measured residues to degrade to other chemical forms in the soil.

The herbicides proposed for application are primarily degraded by microbes after their adsorption to ionic sites provided by organic matter or soil colloids, otherwise known as the cation exchange capacity (CEC) of the soil. Their persistence and half-life are thus directly related to the adsorption characteristics of the herbicide, the cation exchange capacity of the organic and combined A and A/C mineral soil horizons and the amount of microbes that are present and active in the soil horizons in which residues accumulate. Initial residues may also be lost from a site from dilution by rainfall and subsquent movement in overland flows.

The adsorption characteristics of the four herbicides are included in Table 1 in

the Soils Report, although an adsorption factor for triclopyr was not found. The CEC for soil types on the Forest range from approximately 8 to 20 meq/100g of soil, a figure that is relatively low due to the minimal amount of clay colloids and relatively low amounts of organic matter in the mineral soil. Microbial biomass of a few pumice and ash soils on the Forest was measured to range from 324 to 345 mg C/kg of soil (Busse, pers. comm.), suggesting that there are sufficient amounts present to degrade the herbicide residues that are not translocated into vegetative roots, moved offsite by overland flows or degraded by sunlight. Soil temperatures at the time of application may delay initial degradation if temperatures are at or below measurable microbial activity, although temperatures conducive to microbial activity would be expected to be reached within the first month of application.

As a result of these factors, the persistence and decay rates for the herbicides applied are expected to be consistent with those described in the Herbicide Information Profiles and research literature, although monitoring is recommended to measure this for the pumice and ash soils found locally. Although short-term substitution of herbicide residues for plant available nutrients may occur on ionic exchange sites provided by organic matter or soil colloids, site productivity is not expected to be altered as a result of these applications.

Picloram

The persistence of picloram has been measured to be approximately 1 year, although residues have been retained on sites for longer, especially in arid or cold regions. The half-life of picloram is generally accepted to be 2 to 4 months. Picloram residues have a moderate affinity for ionic sites and are readily degraded by soil microorganisms. This herbicide is highly soluble and would be susceptible to dilution in rain water and subsequent accumulation in overland flows during the immediate weeks following application.

Glyphosate

The persistence and decay rate of glyphosate in soils examined in literature that are of similar temperature regimes and biological activity as the soils located in the proposed application areas ranges from 3 months to a year, and 1 to 2 months, respectively (Stark, 1982) and (Roy, 1989). Glyphosate residues have a very strong affintity for ionic sites and are unlikely to leach into groundwater systems. The persistence and rates of decay for the residues that are held within the organic and mineral soil horizons are expected to be similar to those cited in research literature.

Dicamba

The persistence of dicamba is generally lower than the other herbicides due to its high solubility and rapid degradation by microbes. The half-life of dicamba is generally accepted to be 1 to 2 months. Dicamba is not strongly adsorbed to soil colloids and is readily dissolved into soil water following initial adsorption to soil colloids or organic matter sites.

Triclopyr

The persistence of triclopyr is approximately 8 to 10 months, with a half-life of 1 to 3 months. Triclopyr is weakly adsorbed to organic matter and soil colloids and can be detached into soil water following initial adsorption. This herbicide is readily degraded by microorganisms and is expected to have a half-life and persistence similar to that described in research literature.

(2) Effects on Microbes

Direct effects of herbicide application and persistence include the potential for decreasing microbial populations or altering species composition of microorganisms in the soil profile. Three of the herbicides proposed for use under this alternative are readily degraded by microorganisms and show moderate to low levels of toxicity to soil organisms. Dicamba appears to have the highest level of toxicity to microorganisms. Research on the direct effects of herbicides on microorganisms is limited in detail. Additional information can be found in the Soils Resource Assessment Report.

(3) Accumulation in groundwater or overland flow

Herbicide solubility and persistence, soil permeability and percolation rates, and precipitation patterns following application are the primary factors in determining the level of risk for the accumulation of herbicide residues in groundwater or overland flows.

Buffers included around perennial and intermittent streams and areas with high seasonal water tables are intended to reduce the possibility of diluted residues from reaching a perennial stream or surface body of water.

Residues of glyphosate that are dissolved in surface water are subject to rapid degradation as a result of chemical reactions stimulated by light (USDA Forest Service 1984). Glyphosate persists for extended periods of time in groundwater or water in the soil profile where light is absent. Dilution is the primary process

for the dissipation of this herbicide in groundwater. Glyphosate is highly unlikely to reach groundwater beneath the application areas.

Picloram, triclopyr and dicamba are all highly soluble in water and subject to degradation by sunlight and microorganisms in surface waters. The half-life of triclopyr in water exposed to sunlight is less than 24 hours.

Biological Treatments

Treatment of approximately 149 acres would occur with the release of adult insects whose larvae or adult stages are capable of targeting noxious weed seeds or plant fibers for food. A list of these species can be found in the Noxious Weed, Vegetation and Human Health Assessment Report. The release of these insects is unlikely to directly affect the soil resource, although additional competetion may alter existing soil organism populations. Research literature addressing competetion and population dynamics with the addition of species specific insects is limited in scope.

Manual Treatments

Approximately 901 acres on 98 sites would be physically treated by pulling or clipping existing noxious weed species. These treatments would generally have a beneficial effect on the soil resource by contributing biomass for decay and eliminating competition for native plant species. Weed biomass that is pulled or clipped would be left onsite unless the plants have produced flowers or set seed, in which case the material would be bagged and disposed off site. Biomass left on site would initially contribute to organic matter levels on site that function as surface cover and would subsequently be available for microbial degradation into plant available nutrients.

The pulling of plants from specific sites would remove roots from the soil profile and provide aeration in the mineral soil rooting zone. The infiltration rates of these sites may also increase slightly. The majority of the sites proposed for treatment are disturbed from past activities and would benefit from any increases in aeration provided from this operation. Native species that were present on site or, as in the case of a few of experimental sites, transplanted or seeded would benefit from these changes in soil conditions and the reduction of competition for available water and nutrients.

Prescribed Burning Treatments

The treatment of approximately 5 acres of Big Marsh using prescribed fire would have limited effects on the soil resource. Soil productivity is not likely to be detrimentally affected since burn intensities are unlikely to be high enough to create a long duration of temperatures exceeding the volatilization temperatures of inorganic forms of nutrients in the soil profile.

Although the reduction of reed canary grass composition is the stated goal the treatment is unlikely to remove all of the live organic matter on the site, providing production of biomass to contribute to nutrient recycling in the future.

Alternative 3 : The 40 sites covering approximately 476 acres which are proposed for chemical application under alternative 2 would be treated with biological and manual means under alternative 3. The potential effects of herbicide residues on soil conditions, organisms and ground or surface water systems would not occur under this alternative. The effects of biological and manual treatments would be similar to those described under Alternative 2, except over a wider area.

Air Quality

Alternative 1, No-Action : There would be no burning proposed with this alternative, therefore there would be no direct, indirect, or cumulative effects to air quality.

Alternatives 2 & 3 : There would be five acres burned at Big Marsh on the Crescent Ranger District to determine the effectiveness of burning reed canary grass. Smoke would be produced but its duration and concentrations would be slight due to the vegetation (mostly grasses, forbs and sedges) proposed for burning. Burning would be done in accordance with the Oregon Smoke Management Plan. These measures include (1) maintaining satisfactory atmospheric environments in designated areas and other sensitive areas consistent with the plan objectives and smoke drift restrictions, (2) writing a burn plan which includes burning prescriptions, (3) adhering to smoke management forecasts and advisories, and (4) limiting smoke impacts to downwind communities and Class 1 Wildernesses (Diamond Peak and Mt. Theilson Wildernesses).

There would be no aerial application of herbicides with this EA.

Fisheries

Alternative 1, No-Action : Untreated populations of noxious weeds in or adjacent to riparian areas would have the potential to indirectly affect aquatic resources. Because many noxious weed species are not as effective at stabilizing soils and preventing erosion as native species, the displacement of native vegetation increases the potential for fine sediment into the aquatic environment. Noxious weed displacement of native riparian vegetation could also affect the degree of shading and organic material accumulating in the aquatic systems.

Alternative 2 : Herbicide applications on 40 sites (476 acres) would have a very low potential to adversely affect fish and aquatic invertebrate species if applied in accordance with the mitigation measures identified such as 100 foot no herbicide application areas adjacent to riparian areas, streams (intermittent and perennial), and high water table areas. The analysis of herbicide use on riparian resources and fisheries in the FEIS for Managing Competing and Unwanted Vegetation concluded that the likelihood of exposure of fish populations to toxic concentrations of herbicides used would be low (USDA, 1988). Of the 4 herbicides proposed for use, picloram is moderately toxic to fish and slightly toxic to aquatic invertebrates. Dicamba is practically non-toxic to aquatic invertebrates and warmwater fish, and slightly toxic to coldwater fish (rainbow trout). Glyphosate is practically non-toxic to fish and aquatic invertebrates. All four herbicides have low bio-concentation factors in coldwater fish and are rapidly excreted as the concentration in the water decreases due to dilution and / or degradation.

With the implementation of mitigation measures identified in Chapter 2, short-term entry of biologically significant levels of herbicides into surface waters should be prevented.

Biological, prescribed burning and manual treatment effects are the same as those discussed under Alternative 3 below.

Alternative 3 : There would be no potential for chemical contamination of fish or invertebrate species because no herbicides are proposed for use with the implementation of this alternative. Impacts to fish and aquatic species from manual treatments would primarily result from compaction (minor) and runoff events on bare soils. The amount of acreage treated within a watershed would be small compared to the overall acreage and impacts of compaction from other activities such as timber harvesting. Due to the small area proposed for treatment with prescribed fire, no degradation of water quality or fish habitat would result from the burning activities. There would be no impacts to water quality or fish habitat with the use of biological control agents. Because biological and manual treatments take more time for results to be realized, adverse effects to riparian vegetation and watershed vegetation diversity would indirectly impact fisheries and aquatic habitat. The effects would be similar to Alternative 1 but would result in some gains in noxious weed population control.

Alternatives 2 and 3 : Neither action alternative would result in substantial adverse impacts on the fisheries resource due to manual or biological treatments which may cause increased sedimentation (from compaction) or riparian vegetation alteration.

Hydrology

A discussion on water quality can be found under Issue 3.

During the analysis of this proposal, it was discovered that public water wells were located within 1 mile of proposed herbicide treatment sites. Most wells are located on private lands adjacent to National Forest lands though a few wells are located on federal lands and administered under a special use permit. Private companies maintain the wells and supply water to homeowners in areas not supplied by city water. Most wells are hundreds of feet deep and access the large aquifer. There are no restrictions currently in effect for the use of herbicides within a specified distance of public water wells. Forest officials are currently in contact with the private companies and have notified them of the proposed activities. Mitigation measures include using only glysophate or manual or biological treatments within 1/4 mile of public wells. Forest officials are also in contact with Oregon State Department of Environmental Quality to insure measures are implemented to protect public water wells. Based on the mitigations identified above and in Chapter 2, it is unlikely that implementation of either Alternative 2 or 3 would result in impacts to public wells. Cumulative impacts to public water wells could also occur from private landowners' activities, especially from shallow, unsealed wells that could allow surface runoff and subsurface flow of fertilizers or herbicides which may contaminate ground water.

Visual Resource

Alternative 1, No-Action : Visuals along well traveled roadways would continue to be impacted by noxious weed infestations. To the casual forest visitor, who may not be able to identify noxious weeds, this may not be an apparent problem. In some cases, flowering noxious weeds can be considered beautiful. In some areas where sites are covered under the 1994 Categorical Exclusion, noxious weeds would continue to be treated but changes to native plant communitites would take longer due to the emphasis on less effective manual and biological controls.

Alternative 2 : Treatments of noxious weed populations would reduce the vegetation along some heavily traveled roadsides. Some sites would naturally recolonize with local native species, other sites may remain deficient of vegetation due to the continued disturbance by road maintenance or recreational activities. With the use of herbicides on roadsides and recreation sites, changes from noxious weed plant species to native species would occur at a more rapid rate than with biological or manual control measures.

Alternative 3 : Treatments would be similar to Alternative 2, with the chemical sites becoming manual and / or biological. Longer time periods would be necessary for the eradication of noxious weed populations. Results would be similar to Alternative 2, with longer time frames for the effects of treatments to be realized.

All Alternatives : On most National Forest lands, vegetation management along roadsides is conducted by the Forest Service. On well traveled routes within National Forest system lands, in some cases, counties or states maintain the roads and rights-of-way and conduct vegetation management though are not permitted to utilize herbicides unless the proper environmental documentation has been completed. This necessitates coordination among the governing agencies to insure proper management of noxious weeds and visuals occurs.

Vegetation

All Alternatives : Vegetation has already been discussed under Issue 2 in relation to native species. Impacts to merchantable timber would be negligible for all alternatives in the short and long-term.

Recreation

Alternative 1, No-Action : Noxious weed populations would continue to increase, especially around sites where vehicles are continually transporting seeds from other areas. Changes in vegetation would occur with noxious weeds replacing native plant species. People recreating near or in noxious weed populations may be impacted by the undesirable plant species from a visual and aesthetic standpoint. People expect to see natural vegetation in the forest and with more education occurring in the area, people would realize the amount of non-native species occurring around their favorite recreation sites. Other impacts could be incurred from the decrease in wildlife forage thereby indirectly decreasing the availability of wildlife which would impact viewing of native wildlife species. Other potential impacts could arise from decreases in wildlife forage perhaps impacting big game travel patterns and populations numbers with indirect effects to hunter success rates and economic contributions to local communities.

Alternative 2 : This alternative would be the most aggressive in controlling the spread and incidence of noxious weed populations and would provide for the best maintenance and improvement in native plant communities. Over time, noxious weed populations would be reduced and eradicated in some areas. Forest visitors would see a change from non-native species to a more natural appearing landscape with more biodiversity. Opportunities for viewing wildlife, hunting and other forms of recreation would continue to occur with the maintenance of native vegetation.

Alternative 3 : This alternative would have similar impacts as Alternative 2 but would occur over a longer period of time. Manual and biological treatments would not be as effective in the short-term in reducing and controlling noxious weed popoulations. The potential for the continued spread of noxious weeds would be greater than Alternative 2 but less than Alternative 1. Forest visiters would see change from non-native species to a more natural appearing landscape in a longer time frame than Alternative 2.

Cave Management

Alternatives 2 & 3 : Two lava tube caves are located below (approximately 25 to 50 feet) herbicides sites (Map #214, Site #6110001 and Map #15, Site #6110017). Mitigations measures identified in Chapter 2 protect caves from seepage from the use of herbicides. Manual or biological control or glysophate would be used within 1/4 mile either side of the approximate location of the underground lave tube caves. Manual and biological controls would have no impact on the caves. Glysophate becomes inert when contacted with soil so there would be no detrimental impact to the lava flow tube caves (see also the Soils effects section earlier in this Chapter).

Wild and Scenic Rivers

Alternative 1, No-Action : With the implementation of this alternative, noxious weeds would continue to spread and impact the native plant and animal communities within Wild and Scenic River corridors. There are 98 acres of noxious weeds needing treatment within established Wild and Scenic rivers and 35 acres within Wild and Scenic Rivers proposed for inclusion in the system. See Issue 2 for further information.

Alternatives 2 and 3 : With the implementation of both these alternatives, control would be accomplished on 90 acres in the Wild and Scenic rivers and on 35 acres in the proposed rivers. See the tables in Issue 5 for identification of the treatments proposed. The treatment of all but 8 acres would contribute to maintaining native plant and animal communitites. The effects of treatment would be negligible to the outstandingly remarkable values and in the cases of vegetation would be beneficial by providing for the maintenance of native plant and animal communitites.

Range Resources

Alternative 1, No-Action : With the implementation of this alternative, noxious weed species would continue to increase in densities, spread to new sites and increase in scope within the Deschutes National Forest. Noxious weeds would continue to displace less competitive native species thereby decreasing the forage base for domestic grazers. More and more lands would be necessary to maintain the existing numbers of cow / calf pairs currently grazing the forest.

Alternative 2 : With the implementation of this alternative, noxious weed populations would be targeted for treatment with eradication or containment the objective on priority sites. The use of herbicides would be more effective at treating some sites due to the continual disturbance occurring due to required road maintenance activities. Displacement of native populations would occur at a significantly reduced rate compared with Alternative 1.

Two sites (Map # 34 and #186) proposed for herbicide application are within or adjacent to active range allotments. These sites have been tentatively identified for picloram and triclopyr respectively. The use of the Garlon 3A formulation (triclopyr) requires removal of cattle from treated areas 3 days prior to slaughter (label instructions). Coordination would be done with the permittees for these allotments.

Alternative 3 : With the implementation of this alternative, effects would be similar to Alternative 2 but would occur at a slower rate due to the lack of treatment with herbicides.

Social Factors

All Alternatives : There are no additional known direct, indirect, or cumulative effects on consumers, Native Americans, minority groups, women or civil rights except those relating to human health already discussed elsewhere in this Environmental Assessment.

Irreversible Commitments of Resources

The term irreversible commitment of resources describes the loss of future options. It relates primarily to nonrenewable resources, such as minerals or cultural resources, or to factors such as soil productivity that are renewable only over long periods of time. For all action alternatives, there is no irreversible commitment of resources as opportunities have not been precluded.

Irretrievable Commitments of Resources

The term irretrievable applies to the loss of production, harvest, or use of natural resources because of management decisions. Irretrievable resource commitments are unavoidable, because managing resources from any given purpose necessarily precludes the opportunity to use those resources for other purposes. For all action alternatives, there is no irretrievable commitment of resources as opportunities have not been precluded.

Effects on Prime Farmland, Rangeland, and Forest lands

There are no prime rangelands, farmlands or forest lands within the project area. (Prime Forest lands does not apply to lands within the National Forest System.) With the implementation of Alternative 1, continued spread and incidence of noxious weeds on federal lands could impact adjacent private lands which may be considered prime farmland or rangeland. Implementation of Alternatives 2 and 3 would initiate the process and procedures for controlling and eradicating noxious weed populations with Alternative 2 utilizing herbicides on sites with the most potential to spread beyond existing population areas. Alternative 2 would be the best alternative for reducing or eliminating the potential of noxious weeds spreading to adjacent private lands from federal lands. (See also discussions on Issue 8.)

Mediated Agreement Questions

The Mediated Agreement for the FEIS for Managing Competing and Unwanted Vegetation requires that Forests consider and analyze the strategy of prevention. The following six questions are part of this analysis. Due to a large number of sites being analyzed in this EA (166 of 235 known sites), each site was categorized into one of six site types to facilitate answering these questions:

Type 1 - - Roadsides
Type 2 - - Quarries and Cinder Pits
Type 3 - - Riparian Areas
Type 4 - - Special Management Areas
Type 5 - - Forest Service Administrative Sites
Type 6 - - Forested

Each site is categorized into site types and displayed in Table 2 located at the end of Chapter 2 of the EA. Appendix I of the Noxious Weed, Vegetation and Human Health Assessment Report defines these site types in greater detail.

1. What is the role and nature of associated vegetation?

Site types 1 and 2 usually have sparse, weedy native and non-native vegetation. In many cases, noxious weeds have replaced parts of the historical native plant communities. Soils have often been very disturbed. Site types 3, 4, and 6 usually still have a high predominance of native plants (except roadside riparian areas) which provide their normal riparian functions. Noxious weeds at these sites are often new invaders which have the potential to replace more and more native vegetation as time goes on. Vegetation at site type 5 can vary from highly maintained landscaping to gravel, weedy parking lots to a naturescape setting at the Sisters Ranger District. At site type 5, weeds occur in disturbed areas, such as along fences, roads and in gravel parking lots.

2. Do conditions exist that favor the presence of competing and unwanted vegetation?

Site types 1 and 2 are usually repeatedly disturbed areas, where good topsoil has been removed and replaced by gravel and cinders. Activities such as digging, mowing, trampling, and debris acculumation are common. These activities do favor the presence of competing and unwanted vegetation such as noxious weeds. Additionally, vectors for weed transport and introduction are always present. These include but are not limited to passenger vehicles, agricultural machinery, livestock trucks, construction equipment, and road maintenance vehicles. All these activities favor weed invasion. Site type 5 receives high amounts of human use and can favor weeds in those areas that are repeatedly disturbed.

Disturbed areas within site types 3, 4 and 6 can favor the presence of noxious weeds. Examples of these disturbed areas include high-use riparian areas (e.g., Meadow Camp and Dillon Falls along the Deschutes River have been invaded by spotted knapweed), riparian rehabilitation projects, trail construction, timber harvesting areas, etc. In some cases, such as high use recreation areas, it is difficult to control the repeated disturbances that are favoring noxious weeds. In other areas, such as timber harvest units, the Forest is incorporating a contract clause aimed at preventing weeds from being introduced into uninfested areas.

3. If conditions exist that favor the presence of competing and unwanted vegetation,

have past management actions exacerbated the situation?

Historical use of soil residual herbicides along highway road shoulders to maintain clean road shoulders, safe sight distance and easy road maintenance helped to eliminate the native grasses and herbs that might compete with weeds at Type 1 sites. After road construction, areas with bare soil are often not seeded or seeded with non-native mixes that might either be contaminated with weed seeds or don't allow native seedlings to become established. In Type 3 areas, riparian areas are often highly used by the public for boating and fishing access, hiking, picnicking, etc. Native vegetation can be somewhat resilient in these areas due to more available moisture, however, streambanks can be trampled and vegetation denuded from the high amount of public use. Examples of areas that receive high public use that now have noxious weeds include Meadow Picnic Area and Dillon Falls along the Deschutes River. Type 4 sites include wilderness areas that do receive high amounts of public use including hiking, backpacking, horseback riding, trail packing with llamas, etc. The level of noxious weed infestations are currently unknown; these areas need to be surveyed. Other site type 4 areas are Research Natural Areas and Special Interest Areas. In Research Natural Areas, past management actions have usually not exacerbated the situation being as these areas are to be managed in a natural state. Special Interest Areas, such as Lava Lands, receive high amounts of public use which can favor noxious weeds. In the past, noxious weeds were largely ignored in type 5 sites; however, in the past 3-4 years, efforts have been made to control noxious weeds and prevent their spread. Past management actions vary greatly in type 6 sites (General Forest), with some actions probably resulting in increased noxious weed sites (e.g., timber sales, range allotments) whereas other actions have likely not exacerbated the situation.

4. Do natural controls exist on the site?

One natural control is the presence of native and/or desirable non-native vegetation that could recolonize the noxious weed site and begin to outcompete the noxious weeds. Site type 1 is so disturbed that few native or desirable non-native plants exist. Site type 2 will vary, depending on the past history and use of the quarry. Site types 3, 4, and 6 will vary. The riparian areas of site type 3 often have native vegetation nearby that could recolonize a noxious weed site once the weeds are controlled. In these riparian areas, the availability of moisture is important. In site types 4 and 6, native vegetation is often still present. Site type 5 varies, depending on the type of administrative site.

Because noxious weeds are introduced from exotic ecosystems, natural insect and disease controls do not exist on site. Introduced biological control agents may be present at some sites but large dense stands of the host plant are usually needed to support the insect populations. In New Invader situations, there often are not enough host plants available for

the biological control agent populations to grow to an effective size.

5. Can management actions be taken that either encourage natural controls or help avoid the conditions that favor the presence of competing and unwanted vegetation?

This question is discussed previously under Issue 11. Sheley et. al. (1996) propose a model for weed management that is based on the primary causes of plant succession: site availability, and availability and performance of different plant species. The goal is to shift the dynamics toward a desired plant community. A healthy, weed-resistant plant community consists of a diverse group of species which occupy most of the niches.

At type 1 and 2 sites, seeding with either native or desirable non-native seed as soon as appropriate following treatments may help prevent weed seedlings from becoming established. Gravel or rock pits at site type 2 could be quarantined until free of weeds. Allowing more low-growing vegetation along road corridors (Site Type 1) instead of constantly mowing would provide competition with weeds. Unfortunately, these sites often have tough microclimates and establishing native and desirable non-native vegetation may be difficult. At site type 3, immediately reseeding and replanting with native plants would provide competition with weed seedlings. However on the Deschutes National Forest, riparian areas (site type 3) often receive continual disturbance from recreationists. In some areas where the stream banks are denuded of vegetation, areas have been replanted with native shrubs and roped off from the public. An education program is necessary to encourage the public to comply and stay out of these revegetated areas. Site types 3, 4 and 6 often offer the most potential for attempting to revegetate noxious weed sites. Site type 5 would vary; in some areas, it may be useful to revegetate.

Overall, increasing public awareness of noxious weeds and prevention measures would help at all sites. The Forest's Integrated Weed Management Plan (Appendix A) would list action items aimed at preventing the spread of noxious weeds.

6. Is it feasible to undertake the management actions, and if not, why? If undertaken, are impacts on other Forest Service objectives and goals acceptable?

In site type 1, along state- and county-managed roads, the need for safe driving sight distances and winter driving conditions will continue the pattern of low or sparsely vegetated roadsides and the use of gravel, cinders, or sand in the winter. However, partnerships have been started between the road management agencies to work towards achieving common goals. Allowing and introducing more native and/or desirable non-native vegetation along

roadsides may be feasible. On Forest Service roads, requiring timely seeding and revegetation of road corridors after construction work is within Forest Service objectives and goals. Managing weed sites to favor the reestablishment of a healthy native plant community are within goals and objectives for site types 3, 4, and 6. In site type 3, changing recreational management practices to exclude use in riparian areas near noxious weed infestations is not practical. These areas, such as Meadow Picnic Area and Dillon Falls, are well-established, high use areas that are cherished by the public. However, noxious weed prevention education could be done through signing and by explaining to Forest visitors the reasons for on-going noxious weed control. Prevention is vital in site type 4 because many of the natural areas, such as Wilderness and Research Natural Areas, are relatively weed-free. Some high use areas in site type 4, especially areas in the Newberry National Volcanic Monument (e.g., Paulina Peak Road and Lava Lands Visitor Center), offer opportunities to educate the public while controlling weeds. These areas often have adjacent native plants that can recolonize the sites after weeds are controlled; however, continual public use of the areas would need to be managed. Site type 6 areas occur in a variety of land management allocations; however, one overall goal of the Deschutes National Forest is to have healthy plant communities (called Forest Health). Reestablishing the balance to favor native vegetation over noxious weeds is integral to achieving forest health. And, as part of forest health, weed prevention begins with ensuring Forest Service vehicles that depart from site type 5 are free of noxious weed seeds. It is feasible to control weeds at these sites. However, at vehicle compound areas (e.g., the Scott Street Compound), it is not feasible to restore natural controls (i.e., native vegetation or biological controls). These areas should be considered for paving due to the constant disturbance by vehicles.

DNF Home Page | NEPA | SO Documents | Noxious Weed Control EA

http://www.fs.fed.us/r6/deschutes/desnf/manage/nepa/documents/so/weeds/a-ea-dec/chap3.html
Last Update: 4/20/99
R.A. Jensen

DESCHUTES NATIONAL FOREST

NOXIOUS WEED CONTROL

ENVIRONMENTAL ASSESSMENT

CHAPTER 4

CONSULTATION WITH OTHERS AND LIST OF THE INTERDISCIPLINARY TEAM

This Chapter is a listing of people that were consulted or participated in the process of developing and evaluating the issues, alternatives and effects analyses described in the Environmental Assessment. It also includes a listing of those individuals, agencies and organizations receiving scoping letters and notification of the availability of the EA for review.

A. Deschutes National Forest consultants

Don Sargent, Forest Range Administrator, Deschutes National Forest

Tom Walker, Fisheries Biologist, Bend / Ft. Rock Ranger District, Deschutes National Forest

David Summer, Forest Natural Resource Team Leader, Deschutes National Forest

Cindi Click, Forest Herbicide Coordinator, Deschutes National Forest

Carrie Sammons, Public Affairs Officer, Deschutes National Forest

B. Interdisciplinary Team

Katie Grenier, Forest Botanist and Project Leader, Deschutes National Forest

Maret Pajutee, Ecologist, Sisters Ranger District, Deschutes National Forest

Pat Joslin, Botanist, Bend / Ft. Rock Ranger District, Deschutes National Forest

Kathleen Cooper, Ecologist, Bend / Ft. Rock Ranger District, Deschutes National Forest

Carolyn Close, Botanist, Crescent Ranger District, Deschutes National Forest

Rick Dewey, Assistant Forest Botanist, Deschutes National Forest

Marc Wilcox, Forest Hydrologist, Deschutes National Forest

Tom Merritt, Forest Fisheries Biologist, Deschutes National Forest

Marci Mondt, Wildlife Biologist, Bend / Ft. Rock Ranger District, Deschutes National Forest

Peter Sussmann, Forest Soil Scientist, Deschutes National Forest

Gery Ferguson, Forester, IDT Leader / Writer / Editor, Deschutes National Forest

C. Agencies, Organizations and Individuals Providing Oral Comments

Paul Dewey, Sisters Forest Planning Committee

Norma Grier, Northwest Coalition for Alternatives to Pesticides

Tim Lillebo, Oregon Natural Resources Council

Susan Prince, Columbia River Bioregion Campaign

Jenifer Lippert, Willamette National Forest

Pat Creedikan, Oregon Department of Transportation

Nita Rauch, Bend Pine Nursury, Deschutes National Forest

Ditino Marten and Roger Olson, Deschutes County, Public Works

Kathleen (Kathy) Backstrum-Goodrich, Environmental Coordinator, Weed Manager, Sunriver

Tonia Wolf, Eastside Conservation Ontology

Karl Urban, Umatilla National Forest

Terry Lilybridge, Wenatchee National Forest

Roger Brewington, Laidlaw Water District

Mark Currens, Avion Water Co., Inc.

Cheryl Fuller, Sun Mountain Water Systems, Inc.

Del Esau, Roats Water System

Marty Moody, Water Wonderland Improvement District

Terry Penhollow, Sunriver Utilities

Dave Crider, Crescent Water Association

D. Agencies and Organizations Receiving Scoping Letters, Documents or Letters of Availability

4th Sisters Owners Association, Jane Meadows

A G Cook Company, George Berscheid

A Shear Solution, Shelly Lehman

A&M Machine Shop, Al & JoAnn McCloud

AAA Office

Agri-Pacific Resources, Inc., Christopher Meyers

Ahern Living Trust, Betty Ahern

Alice V. Wissman Living Trust

Alliance News Journal

American Rivers Council, Tom Cassidy

Amity High School, Kary Hayes

Apache Tears, Linda Wilcox

Associated Oregon Loggers, Mike Miller

Associated Oregon Loggers, Rex Storm

Associated Press News Dept.

AT&T

Avion Water Co., Inc., Mark Currens

Avion Water Co., Inc., Jan Wick

Azusa Pacific University

B & S Logging Inc.

Barclay Contractors, Eldon Howard

Mt. Hood National Forest

Myrmo & Sons, Inc..

National Park Service, Erik Hauge

National Park Service

National Parks and Conservation Assoc.

Native American Environ. Services

Native Plant Society, Stu Garrett, M.D.

Native Plant Society, Mark Egger

Natural Resources Defense Council, Marc Albert

Natural Resources Research Library, SJ & Jessie Quinney

NEDC, Marc Fink

Northwest Coalition for Alternatives to Pesticides, Pat Rasmussen

Northwest Environmental Defense Council, Aaron Jennings

Northwest Special Forest Products Association

NW Coalition for Alternatives to Pesticides., Norma Grier

NW Forestry Assoc., Wayne Ludeman

Nw Pine Products, Tom Hicks

Ochoco Lumber Co.

Ochoco National Forest, Scott Lusk

Bell Land & Cattle Co.

Bend Badminton Club, William Boyer

Bend Bulletin, Greg Bolt

Bend Chamber Of Commerce, Gary Capps

Bend City Commissioners

Bend Mapping and Blueprint Inc., Glenn Adams

Bend Metro Parks & Recreation

Bend Ski Co.

Best Western Ponderosa Lodge, Inc.

BIA, George Mayfield

BIA Warm Springs Agency, Bodie Shaw

Big Mountain Towing, Ken & Sue Hillsberry

Big Pines RV Park, William & Judy Scally

Black Butte Mountain Bikers, Phil Meglasson

Black Butte Ranch Assoc.

Black Butte Ranch Assoc., Dayton Hyde

Black Butte Resort, Cheryl & Norm Scott

Blazer Construction Co.

BLM Lakeview District, Bob Bolton

BLM Prineville District, Larry Thomas

Blue Lake Resort

Ochoco National Forest, Sue Kocis

Ochoco National Forest, Mike Fisher

Ochoco National Forest

Odell Lake Homeowners Assoc., Chris Smith

Odell Lake Lodge & Resort, John & Janet Milandin

Odell Sportsman, Mark & Vicki Bolton

Okanogan National Forest

Old Cascades Wilderness Com, Patricia Loveland

Olympic National Forest

Oregon Cattlemen's Association

Oregon Department of Transportation, Rolland Van Cleave

Oregon Dept. of Revenue, Nils Heggem

Oregon Dept. of Agriculture, Glen Miller

Oregon Dept. of Agriculture, Tim Butler

Oregon Dept. of Agriculture, Dave Langland

Oregon Dept. of Agriculture, Eric Coombs

Oregon Dept. of Environmental Quality

Oregon Dept. of Fish & Wildlife, Larry Pecenka

Oregon Dept. of Fish & Wildlife, Ted Wise

Blue Mtn. Biodiversity Project, Karen Coulter

Blue Ribbon Coalition, Aelena Cook

Bohemia Sno-Sledders, Mary Palmer

Boise Cascade Corp., R. Kirk Ewart

Boise Cascade Corp., Mark Nystrom

Brandt-Nelson, Lark & Brandt, William Brandt

Bureau of Indian Affairs, Gerald Henrikson

Bureau of Land Management, Steve Castillo

Bureau of Land Management, Pete Schay

Bureau of Land Management, Elaine Zielinski

Bureau Of Reclamation

Burns Paiute Tribe, Irwin Peck

Burns Paiute Tribe, Minerva Soucie

Burns Paiute Tribe, Linda Reed-Jerofke

Burns Paiute Tribe, Kenton & Cecil Dick

Camp Davidson Christian Camp, Larry Rose

Camp Tamarack, Ted Jones

Cascade Meadow Ranch, Matt Chappell

Cascade Motorcycle Club, Larry Ulrich

Central Electric Coop.

Central Oregon Audubon Society

Oregon Dept. of Fish & Wildlife, Roger Smith

Oregon Dept. of Fish & Wildlife, Chip Dale

Oregon Dept. of Fish & Wildlife, Steve George

Oregon Dept. of Fish & Wildlife, Clair Kunkel

Oregon Dept. of Fish & Wildlife

Oregon Dept. of Fish & Wildlife, Glen Ardt

Oregon Dept. of Fish & Wildlife, David Doran

Oregon Dept. of Fish & Wildlife, Bill Castillo

Oregon Dept. of Fish & Wildlife, Corey Heath

Oregon Dept. of Fish & Wildlife, Steve Marks

Oregon Dept. of Forestry, Leroy Kline

Oregon Dept. of Geo/Mining, Dennis Olmstead

Oregon Dept. of Transportation, David Culver

Oregon Dept. of Transportation, Pat Creedican

Oregon Dept. of Transportation, Shelly Schmidt

Oregon Eagle Foundation

Oregon Forest Homeowners Assoc., Cindy Banzer

Oregon Hunters Assoc., Gary Fowles

Oregon Natural Desert Assoc., Gillian Lyons

Oregon Natural Desert Assoc., Joy Belsky

Oregon Natural Resource Council, Don Heiken

Central Oregon Community College, Christin Ott-Hopkins

Central Oregon Flyfishers

Central Oregon Flyfishers, Mike Ogle

Central Oregon Forest Issues Committee, Steve Huddleston

Central Oregon Marine, Frank Ellis

Central Oregon Nordic Club, Jill Dougherty

Central Oregon Nordic Club, Dave Bateman

Central Oregon Pumice Corporation, William Miller

Central Oregon Small Woodlands Assoc., Lynne Breese

Central Oregonian News Department

Central Point Lumber, Warren Hudspeth

Chambers Communication Corp

Chelsea Trees Inc.

Chevron USA, Inc.

Chiloquin Ridge Riders

Circle De Lumber Company, Stan Martindale

Circle De Lumber Company

City Of Klamath Falls, Joseph Riker

City Of Klamath Falls, Chuck Rhodes

Oregon Natural Resources Council, Wendell Wood

Oregon Natural Resources Council, Tim Lillebo

Oregon State Parks & Recreation

Oregon State Snowmobile Assoc.

Oregon State Snowmobile Assoc., Marilyn Peterson

Oregon State Snowmobile Assoc., Howard Gieger

Oregon State Snowmobile Assoc., Roger Schmidt

Oregon Trail Equestrian, Margie Gregory

Oregon Trails Advisory Comm., Jim Ramsey

Oregon Water Resources

Oregonian

Oregonians for Food & Shelter, Terry Witt

OSU Dept. of Botany & Plant Pathology, Dr. Donald Zobel

OSU Dept. Of Forest Management, Jim Boyle

OSU Extension Service, Stephen Fitzgerald

Ouzel Outfitters, Beth Steinberg

P & M Cedar Products, Steve Carter

Pacific Gas Transmission Co., Gary Walker

City of Sisters, Gary Frazee

CO Motorcycle & ATV Club, Robert Greenstreet

CO Motorcycle & ATV Club, Klaus Hohman

CO Motorcycle & ATV Club, Steve Trenhaile

CO Motorcycle & ATV Club, Wendell & Lori Gump

CO Motorcycle & ATV Club, Mike & Pam Falcioni

CO Motorcycle & ATV Club, Bill & Jeanie Kloepper

CO Res. for Independent Living, Glenn Vancise

CO Snowmobile, ATV & Marine, Ron Jensen

Cold Springs Resort, Jim McLean

Colville National Forest

Confederated Tribes Of Warm Springs, Dee Sehgal

Confederated Tribes Of Warm Springs, Clay Penhollow

Confederated Tribes of Warm Springs, Wendell Jim

Confederated Tribes Of Warm Springs, Scott Stuemke

Confederated Tribes Of Warm Springs

Confederated Tribes Of Warm Springs, Louie Pitt

Confederated Tribes Of Warm Springs, Terry Luther

Pacific Marine Technology Library

Pacific Rivers Council, Mary Scurlock

PacifiCorp, Richard Barnette

Pape Brothers Inc, Don Rayborn

PGT Expansion Project, John Cassady

Pine Meadow Ranch, Doro Sokol

PIW Industries, Inc.

Porter Log Home Construction, Mrs. Porter

Portland General Electric

Portland General Electric, Greg Concannon

Potash & Company, Jeremy Potash

Power Engineers, Jim Hoffman

Predator Project Tom Skeele

Prineville Sawmill Co

R & I Logging, Roy Holloway

Rain Forest Action Movement, William Foerderer

Redmond Saddle Club, Eugene Davis

REI Co Op

RELCO Tank Line, Inc.

Roats Water System, Del Esau

Robert Burt & Rebecca Burt Family Trust

Confederated Tribes Of Warm Springs, Frank Delbert, Sr.

Consolidated Pine, Elden Ward

CORIL, Don Stewart

COSPEN LLC

Crane Prairie Resort, Patrick Schatz

Crescent Auto Repair, Lynn Ackley

Crescent Community Club, Terri & Michael Anderson

Crescent Country Market, John & Donna Carey

Crescent Creek Cottages, Jim Durbin

Crescent Creek Logging, Steve Ward

Crescent Lake Gas & Groceries, Mark & Debi Walker

Crescent Lake Lodge & Resort, Gary & Maggie Hoeppner

Crescent Lake RV Park, Jerry Russell

Crescent Motel, Donna McGavin

Crescent Oil, Robert Haines

Crescent Post Office, Mary Ann Keown

Crescent Rural Volunteer Fire, Jeff Larkin

Crescent RV Park, Mel & Georgia Bonner

Crescent Satellite, Don & Trudy Kearney

Robert E Morris Contracting

Robert H. Loud Family Trust

Rogue River National Forest

Rosebud Contracting, Darlene Woods

Roseburg Forest Products Co. Ivan Erickson

Ross Trust

Samuel S. Johnson Foundation, Mary Krenowicz

Samuel S. Johnson Foundation, Becky Johnson

SBM

Schad's Family Restaurant, Dave & Shirley Schad

School District No. 41

Shelter Cove Resort, Doug & Berniece Macmillan

Shirbeck Inc.

Sierra Club Legal Defense Fund, Victor Sher

Sierra Club Legal Defense Fund, Todd True

Sierra Club Legal Defense Fund

Sierra Club, Juniper Group, Daniel Stotter

Sierra Club, Sierra Group, Kent & Lois Gill

Siskiyou National Forest

Sisters Chamber of Commerce

Crescent Tavern, Phyllis Fullerton

Crescent Texaco, Jeff & Wendy Coker

Crescent Travel, Rex & Lynne Underwood

Crescent Water Association, Dave Crider

Crook-Deschutes FSA, Cameron Kirsch

Crossroads Prop Owners Assn

Crown Pacific Ltd., Ray Jones

Crown Pacific Ltd., Pat Hanna

Crown Pacific Ltd.

Crown Pacific Ltd., Ted Young

Crown Zellerbach Corp., Sam Layman

Cultus Lake Resort, Thomas May

Data Retrieval Corp

Davis Family Limited Partnership

Defenders of Wildlife, Wendy Hudson

Del's Archery Den

Deschutes County Commissioners

Deschutes County Dept. of Public Works, Roger Olson

Douglas Timber Operators Inc., Troy Reinhart

Dunn Family Trust, Jack & Imogene Dunn

Dunn Rev. Living Trust

Sisters City Council

Sisters Forest Planning Com., Mark Goddard

Sisters Saddle Pals 4-H Group, Doug Bermel

Sisters School District #6

Sisters Sno Go-Fers, Gene Baldwin

Sisters Sno-Go-Fers, Judy Hurtley

Sisters-Camp Sherman Fire Dept.

Siuslaw National Forest

Siuslaw National Forest, Dan Segotta

Skyline Trail Riders, Inc., Jim Goodwin

Smith Properties, William Smith

Sno Go-Fers, Bill Rice

Sno-Vu Shorthorns, Neil Davis

South Valley State Bank, Dave Huckims

Spring River Acres Assoc., Arnie Tronson

Squaw Creek IRRigation District, Marc Thalacker

Squaw Creek Irrigation District

Stone's Ski & Sports

Storm Company, David Gates

Summerlane Development, Inc.

Durdan Rev. Trust

DW Stone Towing, Doyce & Bobbi Stone

EA Engineering, Ronald Bockelman

Eastside Conservation Ontology, Tonia Wolf

Eastside Protection Project, Susan Prince

Edgington Road District Assoc.

EMCOM

Enduro-Arabians, J. L. & R Cogburn

Ensr Consulting And Engineering, Drew Ludwig

Environmental Awareness Group, Mark Moore

Equine Management, Inc., David Herman

Ernst Brothers, Gil Ernst

ETUX, John Carter

Eugene Burrill Lumber Co., Dan Goltz

Fallon Living Trust, W. Dale & Katherine Fallow

First Baptist Church of Crescent

Five Creek Limited Partnership

Fort James Corp.

Foster Wheeler Env Corp, Allan Wolfson

Fowler Living Trust

Fremont National Forest, Rick Elston

Sun Mountain Water Systems, Inc., Cheryl Fuller

Sun-Dor-Co, Richard Urban

Sunriver Nature Center, Sue Hinton

Sunriver Owners Assoc.

Sunriver Properties Oregon Ltd., Dan Young

Sunriver Utilities, Terry Penhollow

Suttle Lake Resort, Jim Schmit

Suttle Lake UMC Camp, Tim Stover

Sweeney's Workensport

Sycan B. Corporation, Elizabeth Leo

Syracuse College, Robert Cymbala

Terraco, Inc.

Tetratech, Brent Lebl

Texaco Inc, George Sennatt

The Bulletin

The Bulletin, Michele LaBounty

The Confederated Tribes, Jody Calica

The Klamath Tribe, Craig Bienz

The Klamath Tribe

The Klamath Tribe, Terrence O'Connor

The Klamath Tribe, Cheryl Tupper

Fremont National Forest

Fremont National Forest, Paul Miller

Friends of Black Butte Ranch, Victoria Churchill

Friends of the Metolius, Toni Foster

Frisbee Family Limited Partnership

Frisbee Revoc. Trust

Frontier Advertiser

Geothermal Resources International, Inc., Jim Combs

Gifford Pinchot National Forest

Gilchrist Beauty Shop, Chris Archer

Gilchrist Real Estate

Gilchrist Restaurant, Rick Ward

Gilchrist School, Duane Barstad

Gilchrist Supermarket, Carol Jocks

Gilchrist Texaco, Ron Cussins

Gold Beach Ranger District, David Pivorunas

Gott Joint Revocable Living, Donald Sr. & Geraldine Gott

Grant Union High School

Green Trails Maps, Chuck Kitterman

Greystone, Deblyn Mead

The Nature Conservancy, Lynn Gooch

The Nugget, Eric Dolson

The Pacific Rivers Council, David Boyles

The Pines Water System, Inc.

The Redmond Spokesman, Scott Maben

The Wilderness Society

The Wildlife Society, Gene Silovsky

Thousand Trails Resort

Timber Data Co., Mark Rasmussen

Timber Land Improvement, Lonnie Horner

Tollgate Property Owners Assoc.

Tosco Corp.

Tribal Council of the Burns Paiute Tribe

Trout Unlimited

Trout Unlimited, Eric Schulz

Trout Unlimited, Tom Wolf

Twin Lakes Resort, Bill Sisson

Twin Rivers Logging Co., Dale Bonnell

U. of Oregon Library, Tom Stave

U.S. Environmental Protection Agency

U.S. Environmental Protection Agency

Grizzly Mountain Aviation, Sharon Gatlin

Halfway House Gallery & Gifts, Cal & Lorna Birrer

Handcrafter Log Homes

Harris Porter Saw Shop, Harris Porter

Herald & News

High Desert Riders, Leland Hayward

Indian Hill, LLC, B. Meyer

Inn of the 7th Mountain

International Paper, Dave Niessner

Izaak Walton League, David Kucera

James River Corp., Sam Layman

Jay Demaris Logging

Jefferson County Commissioners

Jefferson County Library

Jefferson County Planner, Steve Galliano

JoAnn's Boutique, JoAnn Reinks

K/P Corporation, James & Judith Knapp

Kayaks (Whitewater Assoc.), Bob & Eileen Woodward

Ken's Gun Shop, Ken Jordan

Klamath County Commissioners

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U.S. Fish & Wildlife Service, Jeffrey Dillon

U.S. Fish & Wildlife Service, Doug Olson

U.S. Fish & Wildlife Service, Kaz Thea

U.S. General Accounting Office, Chester Joy

U.S. General Accounting Office, Brent Hutchinson

U.S. General Accounting Office, Bill Walter

U.S. Timberlands Services, Martin Lugus

Umatilla National Forest

Umpqua National Forest

United Public Workers, Gary Rodrigues

University of California Library

University of Oregon

University Of Oregon Library

Unocal, Eric Steger

USDA Forest Service PNW, Charles Philpot

USDA Forest Service SPS, Kathryn Mattimore

USDA Forest Service SPS

USDA Soil Consv Service

USDA, FS, SPS, Charlotte Cox

USDI BLM, Jim McConnell

Klamath County Planning Dept.

Klamath Executive Committee, Chuck Kimbol

Klamath Woodland, Pete Brandsness

KLE Enterprises, Ken Evans

Knight Library Serials Dept.

Kolish Hartwell Dickinson, J. Pierre Kolish

KTVZ21

KWSO Radio, Sue Ryan

L & D INC.

La Pine Chamber of Commerce

La Pine Realty

Laidlaw Water District, Roger Brewington

Lake County Commissioners

LaPine Forestry Services, Inc., Robert Otteni

Lelco Inc., Verne Everett

M&L Enterprises, Larry Geiber

M.R.F.H.A., Richard Hanson

Malheur Lumber Company, P. Jenkins

Malheur National Forest

Manley's Tavern, Maurie Anderson

Mazamas

USDI Bureau Of Indian Affairs, Robert Sassaman

USFS PNW Regional Office

USFS PNW Regional Office, Gary Smith

Veterans of Foreign Wars, Tom Cox

VFW Women's Auxiliary, Catherine Poncil

Wagon Wheel Water Co., George Page

Waldo Wilderness Council, Doug Norlen

Walker Rim Riders, Harry Brown

Wallowa Whitman NF

Water Wonderland Improvement District, Marty Moody

Wenatchee National Forest, Kris Martinson

Wenatchee NF

Western Forest Industries Assn.

Western Radio Services Co Inc., Richard Oberdorfer

Western States Petroleum Assoc., Janet Merthan

Weyerhaeuser Company, R.N. Pierson

Weyerhaeuser Company, John Monfore

Wild River Owners Assoc., Inc.

Wild Wilderness, Dale Neubauer

Metolius Meadows Property Owners Assoc., Inc.	Wilderness Trail Riders, Inc., Ted Lyster
Metolius Recreation Assoc.	Willamette Industries
Metolius River Summer Homes, Carol Nygaard	Willamette Industries, Tucker Williamson
Midstate Electric Coop.	Willamette National Forest, Pat Ford
Minerals Exploration Coalition	Willamette National Forest, Jenny Lippert
Mohawk Restaurant, Ken Curbow	Willamette NF
Montana Natural Resources & Conservation, Mark Kelley	Willamette Pass Inn, George & Alicia Prigmore
MT. Bachelor, Inc., David Marsh	Willamette Pass Ski Area, Eric Johnson
Mt. Baker/Snoqualmie National Forest	Willamette Tree Association, Robert Lindsay
Mt. Hood National Forest, Marty Stein	Willamette Valley Grotto
	Winema National Forest, Bob Castaneda
	Winema NF
	Woodsman Motel, Charlie O'Neal
	Yamazoe International, Inc., Kuni Tokoyama
	Young's Cutstock, Jake Young

E. Individuals Receiving Scoping Letters, Documents or Letters of EA Availability

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Mike Adcock	Sally & Arlo Goodwin	Jeff & Susan Pape
Roger Ager	Kyle Gorman	Robert Parker
R. D. Aikens	Robert & Tena Grabar	Tom Parker
John B. Akin	Kenneth Graham	Representative Del Parks
Daphene Alldredge	Dan & Marilyn Graham	Gerald Patterson
Bill Allenby	Lewis Grant	Kerry Paulson
Maynard & Jacolyn Alves	Jane Grant	Warren Pavlat
Douglas J. Amsberry	Richard Grauer	John & Jill Pavlicek
Bruce & Cynthia Anderson	Doug Green	Timothy Peacock
Donald J. Anderson	Allen Greendale	John Peaks
Paul A. Anderson	Kendrick Greer	Jack Peasley
Margaret Anderson	George & Martha Gregory	Dick Pellissier
Kim Anding	E. Gary & Elsie Grimler	Ruth Penner
Lloyd Anicker	J. Groom	Michele Penner
Ben Arshi	Tom and Maggie Gunn	Glenn & Ruth Percival
Ned Austin	Jim Gustafson	Peyton & Ruth Perkins
Joel & Susan Aylor	Kenneth & Mary Gustafson	J. Mark Perkins
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William Baer, Jr.

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Lyle Barkman

Michael Barkman

Donald & June Barnum

Bob Barss

John & Patricia Bates

Michael Bauer

Garth Baxter

Byron Beach

James Beck

Robert A. Bender

Dennis & Jill Benhower

Fran A. & Wendy L. Benjamin

Roger Berg

Thomas Berkemeier

Douglas & Margaret Bermel

Rody Hagen

Lester R. Haglund

Robert & Pamela Haines

Howard A. Hall

Karl C. Hallstrom

Ray Hamilton

Jack W. Hammack

Nancy Hanna

William Hanzen

Margaret C. Hardie

Oval Hardy

Robert & Shalen Hargreaves

Harry Harlow

Warren Harmon

Ronald & Christine Hart

Kenneth Hart

Don Hartsough

Leslie Hatfield

Mike & Barbara Haxby

Gary and Colleen Haynes

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Michael & Trisha Peterkin

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William Peterson

Joe A. Petrovich

John Picarazzi

Calvin & Irene Pihl

David & Joyce Place

Rick Plants

Harold & James Pliska

John H. Jr. & Ethel H. Plummer

Don Podrabsky

Karel & Alena Polesny

Delores Porch

John & Diane Prichard

Stanley Prihar

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Roy Pruett

Pamela S. Pruitt

David & Beth Quick

Bob Quitmeier

Daniel & Candia Bernstein	Hal Heideman	Ruth Raizin
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Donald Bettis	John Heimes	Don Ratliff
Donald Bilodeau	George & Virginia Heldt	Kevin & Patricia Rea
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Buck Blakely	Kathleen A. Helser	Starr W. Reed
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Dave & Kathy Blann	Helen Herman	Paul & Jenny Reuter
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Bruce Brandt

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James Branham

Molly Brann

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Eugene Brick

Mark & Diane Bridges

Deborah Hogan

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Arthur Holmes

Bueford Holverson

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Clarence & Mary Hoodenpyle

David Hook

Hyman Hops

Blaine & Nancy Hoskins

Kay Houck

James & Gertrude Howarth

Laurel Hubbard

Doris & Linda Huff

Donna & Patrick Hughey

Jewel Hult

Errette Hummel

Don Hummel

Leonard Rex Hutchins

John & Tammy Hyland

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Rodney & Kimberly Chambers

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Robert & Christina Jones

Garry Journey

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John Nelson & Anna Judy

Helmut Junge

Kurt & Mollie Jurgenson

Orville & Ruth Justus

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Charles & Mary Jane Culver	Roberta L. Leonhardy	Carolyn C. Taylor

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Keith Cyrus	Jonathan Levy	Robert & Diane Taylor
Tom & Darlene Dain	Gary Lewis	William G. Taylor
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Dick & Joanie Dufourd	David Mc Clain	Douglas & Rebecca Treadwell
Robert Dusenbery	William Mc Conochie	Lionel Treepanier
Laurence Dyer	Roy & Ella Mc'Caul	Bruce Troyer
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Antoinette Eames	Ian Mcandie	Dorothy J. Turner
John & Jenifer Earls	Greg McClarren	Marjorie S. Turner
Richard & Anna Edin	Albert Mccollam	Carlos & Sylvia Valdez
William & Mary Edwards	William A. McConochie	Richard & Kendra Van Patten
James & Patricia Edwards	Ronald & Dorinda McCormick	Kip Vandenover
Ron Eggelston	Bruce McCullough	Gary Vanderhoff
Lyle Ellickson	Charles & James McGregor	Frank Vaughan
Barbara D. Ellingboe	John & Lelia McIntire	John Veatch II
James Ellingboe	James & Caroline McKay	Sandra Veeck
Lillian Englmann	Albert D. McKenzie	Kathryn Venator

C. Enyart

Kimbell Erdman

Arthur Erickson

William Ernst

Robert Ervin

Larry Erwin

Peter & Joseph Esherick

Kelly Esterbrook

Ron Estes

Gary Estes

Dale R. Evans

Rob Evans

Dan Evans

Jack & Evalyn Evans, Jr.

Larry Everson

Harry Farley

Ronald L. Farmer

Eugene Farnham

Leo Farnworth

E Lucille Farr

Adela A. Fast

Kenneth McKenzie

Dimetra & J. McLain

Mike McMurray

Oscar Medrano

Elizabeth Meier

Paul Merrell

John Merritt

Bertha L. Metcalf

Patrick & Ursula Metke

Brian Richard Metke

Mark & Marie-Louise Metzdorff

Leonard & Mary Mickel

Charles Middleton

David E. & H. Ramona Miller

Cameron & Nancy Miller

Robert Miller

Virgil Miller

Roy Miller

Sterling Miller

Roy Milner

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William Wadsworth

Robert L. Waer

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Holly J. Wagner

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John & Mary Ward

Rory S.Warner

Kathryn & George E. Warner

Jean & G. Douglas Waters

Rebecca Wood Watkin

Genevieve Watson

Jairus & Laura Watson

Thomas Watton

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Clifford Fisher	John & Donna Montgomery	Bernice Werzberger
Edwin & Laurene Fitzjarrell	Kenneth Moore	Arnold Westling
Kurt Flynn	James Moore, Jr.	Representative Ben Westlund
Donald Fontenot	Boyd Morgan	Mindy Whaley
Bruce Forbes	Myrtice Morrison	Tracey L. Whitaker
Sandy Force	Christopher & Diana Morrison	Paul White
Dick Ford	Maurice Mortier	Michael & Mary White
William Foster	Guy Mount, III	Robert Whittier
Mark & Toni Foster	M.J. Moyer	Janice Wickham
C. Francis	Ronald & Roberta Muggerud	Doc Wiekel
Aubrey Frank	Dan Mulligan	W. B. Wiggins
Vernon Fraser	Bob Mullong	Richard Wilderson
Eugene Freese	Michael & Melva Murphy	John Williams
Liz Frenkel	David Naro	Richard Williams
John Frewing	Keith and Janet Nash	Joyce Williams
Bob Frick	Dave Naslund	Lonnie & Carol Williams
Don & Emilie Frisbee	Jack Nelson	R.S. & Delia Wilson
George & Merra Frochen	Earl Nelson	Donald & Paula Wilson
Dean Gaiser	Steven & Lorraine Nelson	Richard P. Wilson

Georgia Gallagher

Richard L. Gambrall

Lee Gammon

David & Judith Gardiner

Jack Gardner

Lee Garl

Max Garoutte

John H. Garren

Barbara Garretson

Thomas & Lana Garrett

John L. Garrick

Mike Garske

John & Kathy Gartland

Norm & Dorothy Geer

Richard & Maxine Gehr

M.J. Gemmet

Michael L. Gerber

John Geyer

Richard Gibson

Jerzy Giedwoyn

Benjamin H. Gilchrist

Dick Nelson

Donald & Carol Nelson

Jay Nelson

David Nelson

Eric Nelson, CPM

Pamela B. Neves

Stephen E. Neville

Carl Newport

Robert P. & June Newton

Michael & Mary Niderost

Sharon M. Nofziger

Dave Nolte

William Norris

James D. Noteboom

Karl E. Nulton

Theadore D. Nyden

Mary O'Brien

Patrick J. O'Rourke

Mike & Nancy Obymako

Mike Obymako

Gerald Oliver

Donald & Priscilla Wilt

Bob Wineman

Ronald W. Winner

Ethel E. Wirtz

Vicki Wittman

Roger Wolcott

Ellen C. Wood

Erskine Wood

Chuck Woosley

John Wright

Richard & Deborah Wright

John L. & Margaret L. Wujack

Senator Ron Wyden

Henry & Virginia Wydra

Nicholas Wylie

Chris Wyne

Laurel Yocom

Bruce Young

Zig Zakovics

Glenn A. Zane

Ernest Zapf

Jerome & Waltrout Goertzen	Lynn Ontiveros	Piotr Zenczak
Daniel L. Goldy	Douglas & Roxanne Osborne	Jo Ellen Zucker
Monica Gollmyer	Stan Owen	Peter Zuercher
Irene Goodnight	Philip Paden	

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CHAPTER 5
DESCHUTES NATIONAL FOREST
INTEGRATED WEED MANAGEMENT PLAN

November 1998

The Deschutes National Forest (DNF) Integrated Weed Management Plan (IWMP) is a supplement to the DNF Noxious Weed Environmental Assessment. Together, these documents represent an effort to manage noxious weeds on DNF in a manner consistent with direction provided in the Regional Final Environmental Impact Statement (FEIS) for Managing Competing and Unwanted Vegetation, its Record of Decision (ROD), and the associated Mediated Agreement. Specifically, the IWMP is an effort to 1) increase noxious weed management in funded or authorized actions on DNF, 2) identify and promote actions within the noxious weed management strategies of prevention, early treatment, and maintenance, 3) generate internal and external awareness of the importance of noxious weed management actions, and 4) cooperate with neighbors in the management of noxious weeds.

Schedule of Projects

Project activities, such as vegetation treatments, fuels reduction treatments, and road construction and deconstruction, can have a moderate to high risk of spreading noxious weeds. On a project

level, District or Forest Weed Coordinators will assess the level of risk. Where appropriate, field surveys can be completed to verify the risk level for the project and the type of control and mitigation measures to be developed. For those projects with a moderate to high level of risk, noxious weed control and mitigation measures will be developed.

Contract Provision

A weed free vehicle and equipment provision currently included in some DNF contracts will be included in projects with a moderate to high level of risk of spreading noxious weeds, such as timber harvesting, fuels reduction treatments, and road construction and deconstruction. For other types of projects, including those with a relatively low risk of spreading noxious weeds, we recommend that this provision be considered for inclusion in contracts. The provision will require that contractors avoid moving their vehicles and equipment through weed infested sites. If movement through a population of noxious weeds is unavoidable, undercarriages of potentially contaminated vehicles and equipment will be thoroughly washed before entry is made into non infested areas.

Prevention

Actions to prevent weed encroachment will include the following:

- DNF vehicles or machinery will not park in or unnecessarily drive through weed infested areas.
- Undercarriages of DNF vehicles or machinery potentially contaminated with noxious weed fruits and seeds will be thoroughly washed before entry is made into non infested areas.
- Assure that vehicles or heavy equipment on loan to, or shared by DNF for activities such as road maintenance and riparian restoration are free of noxious weeds.
- Use gravel and fill that comes from weed free sources. Inspect aggregate pits to identify weed free sources. Pit management plans will be updated in consultation with District or Forest Weed Coordinator to prevent infestation of weed free pits and to prevent spread from weed infested pits. Quarries and cinder pits will be a top priority for noxious weed treatments.
- Conduct surveys for noxious weeds at currently designated wildfire suppression camps on DNF. For any weed infested sites it will be necessary either to relocate the camp or promptly take action to remove the weeds.
- In Range Annual Operating Plans of permittees:
    - Strongly consider excluding livestock (by timing or otherwise) from high priority noxious weed sites where the animals are likely to cause a spread of weeds off site.

- Hay or straw used on DNF be noxious weed free if at all possible. (As of 6/98, weed-free hay is not available and the State of Oregon does not have a program for certified weed-free hay. However, Oregon State University Extension Service and Central Oregon hay growers are working together to initiate a voluntary weed-free certification trial program.)
- Require that permittees take precautions to prevent transport of noxious weeds, from public or private lands, by either transport vehicles or livestock, when operating on DNF.
- Livestock grazed at known noxious weed sites on public or private lands be fed weed free hay or pellets for 10 days prior to entry to DNF.

Early Treatment

Among sites occupied by noxious weeds, newly infested sites are the most easily eradicated. Detection and early treatment of such sites will be promoted by weed awareness workshops for field going DNF personnel and volunteers that will include directions for data collection, reporting, and appropriate treatment (if any) at fortuitously encountered, newly infested sites.

Maintenance

Where appropriate, to restrict further encroachment by noxious weed populations that are too large to eradicate, use road closures and/or signing to quarantine weed infestations that are high risk centers of weed seed dispersal.

Awareness

Successful noxious weed management on DNF will require a broad base of internal and external support. Providing DNF employees and the local public with a diversity of opportunities to increase their awareness of noxious weeds, and the risks they pose to central Oregon, is critical to gaining this support. Actions to enhance internal and external awareness of noxious weeds will include the following:

- Provide four yearly (one at each unit of Forest) training sessions on noxious weed identification for Forest Service employees prior to field season. Sessions will also include information about threats posed by noxious weeds, reporting suspected new sites, how noxious weeds are dispersed, and the importance of avoiding weed dispersal via DNF

vehicles and machinery.
- Present specialized programs to fleet and road managers, recreation, wilderness managers, sale administrators, trailhead hosts, campground hosts, concessionaires, as needed. Solicit critiques on how the weed prevention program is working and ways to improve it, and how Weed Coordinators can further help.
- Feature weed identification, prevention, or control presentation at SO and each District once per year. Try quick weed identification tests.
- Develop a list of noxious weed talking points that can be used internally (e.g., Interdisciplinary Team meetings, contractor and permittee meetings) and externally (e.g., to media, at lectures, or field trips).
- Provide weed identification materials (e.g., color postcards, booklets) and maps of documented District weed sites to field going personnel, contractors, and permittees each year.
- Conduct one weed control workday (e.g., such as the Weed and Feed) with District or Forest personnel each year.
- Forest and District Weed Coordinators will write at least one noxious weed article per year for publication in local newspapers, Volcanic Vistas, or other publications available to the general public. These articles will also be posted in the DNF Friday News.
- Display a weed poster and/or provide a free brochure featuring noxious weed prevention, at Forest recreational sites. Develop suitable poster and/or brochure if necessary.
- Post information on weed identification, prevention, and control on the Forest Web Page.
- Provide, both externally and internally, information about annual DNF weed management activities, such as herbicide applications, which might affect the users of the Forest.

Cooperation

At minimum, DNF cooperative noxious weed control efforts will include the following:

- Meet with Counties, Oregon Department of Transportation (ODOT), Oregon Department of Agriculture (ODA), or other agencies at least once a year to continue developing cooperative strategies.
- Develop a partnership with ODA or Counties to develop simple, illustrated mailings for private landowners with weed infested lands near DNF lands. Develop a mechanism for mailing to appropriate landowners.
- Solicit low cost or volunteer public assistance in DNF noxious weed management activities such as inventory, monitoring, education. and manual control.
- Participate in two-year, seven-partner, GWEB grant, funding noxious weed education.

IWMP Revision

Forest and District Weed Coordinators will meet annually to evaluate noxious weed treatments and consider revision of the IWMP.

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APPENDIX A

Response to Public Comments

Notice for Public Comment was published in the Bend Bulletin September 16, 1998. The public comment period for the Noxious Weed Environmental Assessment (EA) ran from September 17 to October 16, 1998. On September 14, 1998, copies of the EA were mailed to 78 individuals or organizations who had requested an EA. Letters were also mailed to 1,240 people or organizations informing them of the availability of the EA and asking if they would be interested in reviewing it. In addition, the EA was made available to the public via the Deschutes National Forest Internet web site. During the comment period, nine additional EAs were mailed in response to requests.

A total of 16 comments were received. One individual made oral comments on the EA during a telephone conversation. Written comments were received from 15 parties. There were no comments received via Internet.

The following sections summarize comments and provide responses to those comments.

A. Alternative Preferences

- Ten of 16 respondents stated that they support the proposed action (i.e., Alternative 2).

- Three of 16 respondents did not state support for a particular Alternative but wrote a general letter stating concerns about the weed problem and the need for the Forest Service to do something about it.
- Three of 16 respondents prefer Alternative 3; two are strongly opposed to the use of herbicides and felt that prevention had not been addressed; one stated a preference for Alternative 3, but did not comment further on the herbicide issue.

B. Overview of Comments

All respondents agree on the fact that noxious weeds pose serious threats to ecosystem health. Fifteen of 16 respondents clearly stated concerns about noxious weeds and the need to take action to reduce or eliminate infestations; one of 16 respondents implied these same concerns. Of the 16 respondents, three are concerned about the use of herbicides; 13 support aggressive measures to reduce noxious weeds.

C. Comments and Responses

Comments were categorized into general categories, and, as necessary, placed into subcategories. Following are responses to those comments.

As part of the comment analysis, each piece of correspondence was logged in with a reference number. As comments were identified within each piece of correspondence, a second number was assigned. For example, comment number 3-4 represents the fourth comment taken from letter number three.

Once a comment was identified, it was placed into a category. Generally, responses were developed to answer questions or provide references to analysis contained in the EA. Comments may have been answered singly or in groups, with the aim being to provide as specific a response as possible, while avoiding a large amount of duplication of responses.

Support Proposed Action

The majority of people wrote comments in support of Alternative 2, the preferred alternative. Some respondents encouraged the Forest to take more aggressive actions. Specific comments

supporting the proposed action are as follows:

Comment: Noxious weeds pose a significant problem for both natural resources and land uses on the Forest. The preferred alternative represents an appropriately aggressive, yet well-targeted approach (8-1).

Comment: We unanimously agree with Alternative 2 for the following reasons (10-1):

- **When managing, use the entire available `` arsenal'' to best accomplish the task.**
- **This is the best application of available science and management experience.**
- **This sets a precedent for the future.**
- **This appears to be the most cost effective approach for the most satisfactory results.**
- **This is the both effective and efficient.**

Comment: The mitigation measures and monitoring described under Alternative 2, and other similar safeguards tailored to sites and ecosystems where control actions are directed, will provide a level of environmental protection well above that resulting if the invasive plants are allowed to multiply uncontrolled (15-2).

Comment: It is essential that the Deschutes National Forest takes an aggressive approach to the noxious weeds currently on the Forest. Your choice of Alternative 2 is the only choice available if you want to lessen the impact of the weed species on the Forest. It is great that the Deschutes National Forest will have an EA to deal with a problem long overdo for attention. But I have a concern that just having a plan is not enough. Without the dollars to implement the EA the Forest is where it was 10 years ago….Be encouraged that, as a whole, the Deschutes National Forest is not heavily infested. Although I'm certain there are more weed sites unidentified on the Forest, this EA if implemented properly will go a long way to averting an ecological and economic disaster (16-1; 16-2; 16-3).

Response:

> The Purpose and Need for the Noxious Weed EA reflect the above comments and the need to develop and implement prevention and control measures to reduce the spread and incidence of noxious weeds in order to maintain and enhance diverse native plant communities.

Be More Aggressive

Comment: Ware concerned at the increasing number of plants along the entire length of

Indian Ford Road, on both private lands and Forest Service property. We feel that without committed intervention on the part of the Forest Service, the problem is well on the way to becoming umanageable. Therefore, we wholeheartedly support an all out war against these noxious plant pests (9-1).

Comment: We need to be as aggressive as possible in preventing noxious weeds to spread on the forest (7-1).

Comment: The preferred alternative is the best alternative to treat the identified sites. We look at this as being the minimum that you could do since there are some noxious weed sites that won't be treated at this time. We feel you should reconsider this and include more sites or you will continue to always have noxious weeds as they continue to expand (12-2; 12-3).

Comment: I endorse your selection of the preferred alternative (Alternatie 2) for the reasons you describe and encourage even more aggressive control efforts as described below. The documented increases in known colonized sites and greatly enlarged acreage during only three years since the initial inventory, also, indicates that the noxious plant threat is dynamic and swift. I do not believe that, if this challenge is to be met, you can afford to squander more time on study and/or analysis. As new control techniques are introduced (and show promise; not are proven effective: and other populations are discovered, action should be taken as quickly and aggressively as available resources will allow (15-1).

Response:

A scoping letter dated December 10, 1997 was sent to a mailing list of over 1,400 people, asking people to provide input regarding our proposal to treat noxious weeds. People wrote to say that more intensive use of herbicides should be considered. It has become apparent that the spread of noxious weeds is at epidemic levels and may not be controllable if allowed to progress undisturbed. They felt is was of paramount concern to immediately implement control methods that would eradicate the majority of plants in the short-term in order to keep populations from getting at epidemic and uncontrollable levels. The Interdisciplinary Team considered an alternative which increased the number of sites proposed for herbicide spraying but this alternative was eliminated from further analysis. The reasons are explained in the Noxious Weed EA (page 2-1). At this time, herbicides are proposed only on high priority sites. It was felt there needed to be some time for monitoring of high priority areas before using herbicides on a larger number of sites within the Deschutes National Forest.

Prevention

Comment: The Noxious Weed EA does not adequately address prevention…Region 6 must address prevention first. This can be done by closing roads, limiting off road vehicle use (especially in high risk areas) and excluding cattle from public lands. (2-1, 2-4).

Response:

An Integrated Weed Management Plan (IWMP) is included in the Noxious Weed EA, and outlines prevention strategies (EA, Chapter 5). Prevention strategies include avoiding weed-infested areas, cleaning vehicles, using gravel and fill from weed-free areas, and working with range permittees to reduce the spread of noxious weeds by livestock. The majority of roadside noxious weed infestations are along major state and county highways, and it is not feasible nor within the scope of this EA to close those roads. The Deschutes National Forest realizes that prevention is the cheapest and most effective means of controlling noxious weeds, and has developed the IWMP to increase internal communication between our various resource management departments so that we can all work together to prevent further spread of noxious weeds. Deschutes National Forest Botanists are working internally to increase awareness and concerns about noxious weeds, as well as providing public education.

Comment: Mitigation is not the same as prevention (2-2).

Response:

In Forest Service NEPA (National Environmental Policy Act) documents (e.g., Environmental Assessments and Environmental Impact Statements), mitigations are often included to ensure that wildlife, plants, and other resources are protected from the impacts of management activities, and these mitigations often are, indeed, prevention measures. On the Deschutes National Forest, we have been incorporating noxious weed mitigations that are directly related to preventing the spread of noxious weeds into uninfested areas. For example, the Deschutes National Forest has been incorporating a special provision into timber sale contracts that requires ``all equipment moved onto National Forest land is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds" (Timber Sale Contract Clause C6.343). This requirement is to prevent the introduction of noxious weed seeds onto Forest Service lands. The Integrated Weed Management Plan that is implemented with this Noxious Weed EA requires that this provision be expanded to other types of projects that have a moderate to high level of risk of spreading noxious weeds (Deschutes National Forest Integrated Weed Management

Plan, Chapter 5, Noxious Weed Control EA).

Comment: The EA fails to consider implementation of larger, more systemic noxious weed prevention measures that could be taken for greater prevention success, such as reducing or eliminating clearcutting, other heavy logging, new road building, mining and livestock grazing and providing a weed-free shuttle service instead of private transportation seasonally into high use areas where repeated re-infestation takes place in travel corridors from vehicle seed dispersal (14-5).

Response:

It is outside of the scope of this EA to eliminate clearcutting, road building, mining, and livestock grazing. However, the enclosed Integrated Weed Management Plan does require that a noxious weed risk assessment will be done for proposed projects. For those projects that have a moderate to high level of risk of spreading noxious weeds, noxious weed control and mitigation measures will be developed, and a weed-free vehicle and equipment provision would be included in contracts as a measure to prevent movement of noxious weed seeds into uninfested areas. Therefore, these types of prevention and mitigation measures would be incorporated into projects that have a moderate to high risk of spreading noxious weeds, such as timber harvesting and road building (Integrated Weed Management Plan, page 5-1).

Education

Comment: Simultaneously, a massive public information campaign should be launched. User groups need to be educated on the importance of maintaining native plant populations, the ways in which weeds are spread and the reasons why they are so harmful to ecosystems (2-4).

Response:

The Integrated Weed Management Plan (IWMP) commits to educational activities that target both Forest Service employees and the public. In addition to these commitments, the Deschutes National Forest has and will continue to provide noxious weed education to the public. Examples of these efforts include:

- The Deschutes National Forest is working with 7 groups (Deschutes County

Watershed Council, Deschutes County Public Works, Oregon Department of Agriculture, Prineville BLM, Native Plant Society of Oregon, Oregon Dept. of Fish & Wildlife, and Woodside Ranch Homeowner's Association) on a two-year noxious weed education program that is funded by a grant from the Governor's Watershed Enhancement Board.

- In 1998, Deschutes National Forest Botanists provided 29 noxious weed educational presentations as part of working with FS employees, youth groups, and correction crews to hand-pull weeds, and conducting wildflower hikes and presenting slide shows and lectures to a variety of groups, including boy scouts, homeowner associations, school groups, garden clubs, and Youth Conservation Corps groups.

Herbicides

Comment: You cannot legally implement the use of chemical controls with no Prevention strategy. It violates the Mediated Agreement. Introducing complex herbicides into an ecosystem is risky at best and, without adequate preventions, you are clearly setting up these areas for more invasions (2-3).

Response:

The Deschutes National Forest does have a prevention strategy that is part of the Integrated Weed Management Plan (see EA, Chapter 5).

Comment: We recognize the problems associated with noxious weeds and feel that appropriate use of herbicides must be part of the solution. Hopefully, the Deschutes National Forest can demonstrate the effectiveness of herbicides to the public. In addition, this project can also demonstrate how herbicides can be applied in a safe and environmentally sound manner. After gaining the trust and support of the public, the Forest should consider broadening the use and application of herbicides to deal with the noxious weed problem on a more proactive basis (11-1; 11-2).

Response:

The EA requires the following mitigations to ensure safe and environmentally

sound application of herbicides:

- Measures for herbicide use to ensure worker and public health and safety, and protection of water quality, TES plants, wildlife, and fish, and protection of wetlands and fish (pages 2-7 through 2-11).
- Additional site-specific mitigation measures to reduce or eliminate disturbances to nesting raptors and other sensitive wildlife species, sensitive plant populations, as well as several miscellaneous mitigation measures related to human safety and coordination with adjacent landowners for more effective weed control (pages 2-14 through 2-16).
- Monitoring to reduce or eliminate impacts. This includes water quality monitoring to validate that 100 ft. buffers on streams are effective at keeping herbicides from entering the aquatic systems (pages 2-11 through 2-12).

Comment: We agree with the need to treat noxious weeds. These weeds need to be controlled when the populations are small. We think that you should treat noxious weed sites with the method that will be the most effective and at the lowest cost. Some of the labor intensive methods, such as hand pulling, are very costly and quite often must be done over and over again. This is not cost effective. You need to consider more use of chemical treatments when you know that there will not be any negative effects to other plant or to values. We know that herbicides are the most effective method and they should be used more often rather than using them as a last resort (12-1).

Response:

As discused above in the response to public comments that the Forest needs to be more aggressive in fighting noxious weeds, the Noxious Weed EA Interdisciplinary Team considered an alternative which increased the number of sites proposed for herbicide spraying but this alternative was eliminated from further analysis. The reasons are explained in the Noxious Weed EA on page 2-1. At this time, herbicides are proposed only on high priority sites. It was felt there needed to be some time for monitoring of high priority areas before using herbicides on a larger number of sites within the Deschutes National Forest.

Comment: There was insufficient public disclosure of known potential human health risks of herbicide use, and insufficient detail presented on potential effects to wildlife, soils, water quality, native plants, etc. of proposed herbicide use. The EA also failed to analyze long-term economic benefits of not using herbicides (e.g. more fertile soils, less water

contamination, reduced human health costs, less impacts to wildlife populations, etc.). The EA also neglected to consider potential impacts to soil productivity that could be irreversible and herbicide contamination of edible and medicinal plants that represent irretrievable commitments of resources from herbicide use (14-3, 14-4, 14-6, 14-7, 14-8).

Response:

a. Insufficient Public Disclosure of Human Health Risks of Herbicide Use. An analysis of effects on human health is presented in the Noxious Weed EA (pages 3-8 to 3-11) and on pages 6-9 of the Noxious Weed, Vegetation and Human Health Assessment Report, which is stored in the project analysis file at the Deschutes National Forest Supervisor's Office (USDA Forest Service 1998a). This analysis is tiered to the Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation in the Pacific Northwest Region (hereafter called ``Region 6 FEIS), which analyzed and disclosed human health effects from herbicide exposure in Appendices D and H (USDA Forest Service 1988a).

To better address this comment, Herbicide Information Profiles, formerly presented as appendices in the Noxious Weed, Vegetation, and Human Health Assessment Report (in the project analysis file) are now included as Appendix B in this Noxious Weed EA. These documents further elaborate on human health effects (USDA Forest Service 1992a, 1992b, 1993c, 1994).

The Record of Decision to the Region 6 FEIS determined that the four herbicides proposed for use in this EA were among those that could be used with acceptable risk as long as certain precautions and restrictions were applied. The Region 6 FEIS requires mitigation measures to minimize effects from the use of herbicides. The Deschutes National Forest would comply with all of these mitigation measures, as well as additional, more restrictive mitigation measures designed for this proposed project. There are no unusual conditions that indicate that Alternative 2 would cause greater effects on worker and public health than those disclosed in the Region 6 FEIS and Herbicide Information Profiles.

When considering public notification, posting, and signing requirements, worker restrictions, mitigations, and health monitoring requirements, most of the potential exposure to workers should be reduced and the public should not be exposed at all. To the extent practical and feasible, treatment methods would shift to non-herbicide methods once an infestation is brought under control and reduced in size and density.

b. Insufficient Detail on Potential Effects to Wildlife. Potential effects to wildlife species was addressed in the following sections: 1) in the Noxious Weed EA, pages

3-17 to 3-19 address potential effects to Proposed, Endangered, Threatened, and Sensitive Wildlife Species, and pages 3-21 to 3-22 address potential effects to Wildlife Management Indicator Species, U.S. Fish & Wildlife Species of Concern, and State of Oregon Sensitive Wildlife Species. The information in the EA is further documented in two reports stored in the project analysis file for this EA: 1) Biological Assessment and Evaluation of Threatened, Endangered, and Sensitive Wildlife, and 2) Noxious Weed Control Wildlife Report. Potential effects on wildlife species were evaluated for each noxious weed site proposed for treatment in this EA, and site-specific mitigation measures were developed. These mitigation measures are listed in the EA on pages 2-14 to 2-15. The effects analysis concluded there would be no impacts to any of these species if applicable mitigation measures are followed. The analysis also determined that ``overall, implementation of Alternatives 2 or 3 would result in beneficial impacts to local wildlife species by limiting the negative impacts of noxious weeds on native vegetation" (EA, page 3-22).

c. Insufficient Detail on Potential Effects to Soils and Soil Productivity. The EA discusses effects to soils on pages 3-23 to 3-27. The primary elements examined as potential effects include: 1) adsorption characteristics and persistence (mistakenly labelled as ``absorption" in the EA; this mistake has been corrected); 2) effects of herbicides on microbes; and 3) likelihood of leaching of herbicide residues into groundwater systems or accumulation in overland flows. The Soil Resource Assessment Report, located in the analysis file associated with this EA, describes soil types and characteristics on the Deschutes National Forest, and discusses chemical and physical pathways and decay rate for each of the four proposed herbicides. The analysis concluded that ``in general, chemical treatments would have some direct effects on the soil resource, biological treatments are expected to have minimal effects on the soil resource, physical treatments would have minimal disturbance and potentially beneficial effects on already disturbed sites, and burning within the Big Marsh meadow would have limited direct effects on the soil resource." (EA, page 3-23).

d. Insufficient Detail on Potential Effects to Water Quality. The EA addresses water quality on pages 3-4 through 3-5 and pages 3-28 through 3-29. Analysis of potential effects is documented in the Water Resource Assessment Report, which is stored in the project analysis file. In addition, the Soils Resource Assessment Report, also stored in the project analysis file, provides information on characteristics of the proposed herbicides related to accumulation in groundwater or overland flow and persistence in water. Further discussion about mitigations for publi water wells is found in the EA on page 3-28.

During the analysis, those noxious weeds sites proposed for chemical treatment that are in or near riparian areas were identified and mitigations were developed to

reduce the probability of impacts to water quality (see EA, Site Specific Mitigation Measures for Herbicide Use In or Near Riparian Areas and/or Wetlands, pages 2-9 through 2-11, and General Mitigation Measures for Herbicide Use, pages 2-7 through 2-9). There would be no application of herbicides within 100 ft. of water; instead, manual treatments would be done within this buffer area. To protect streams, open water, and wetlands, the Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation (FEIS) requires a buffer width of 50 ft. for non-aerial application of herbicides (USDA Forest Service 1988a, page II-106). However, the Interdisciplinary Team for this EA felt more comfortable doubling the required buffer width in order to better ensure that water.

e. Insufficient Detail on Potential Effects to Native Plants. Potential effects to native plants from the use of herbicides was addressed in the EA on page 3-3. In the long term, habitat for native plant species is expected to increase with Alternative 2, if treatments, including manual follow-up treatments to herbicide spraying, are consistently applied. However, the EA does note that the Forest is proposing herbicide treatments on only 40 of 235 known noxious weed sites, and since the majority of sites would be treated manually, which is labor-intensive, time-consuming and expensive, it would be difficult to prevent seed production on all sites, thereby leaving a potential risk to native plant communities.

Though there could be short-term losses to individual non-target plant species from contact with herbicides, plant community diversity is expected to increase in the long-term because of noxious weed control efforts. In areas with healthy, residual native plant species intermixed with the noxious weeds, where possible, herbicides would be applied with weed wipers or backpack sprayers with shields. Other mitigation measures, such as no application of herbicides when wind speeds are in excess of 5 mph and if precipitation is expected within 48 hours, are intended to reduce potential impacts to non-target plant species.

f. Long-term economic benefits of not using herbicides (e.g. more fertile soils, less water contamination, reduced human health costs, less impacts to wildlife populations, etc.). Based on the mitigation measures identified in Chapter 2 of the EA, it was determined that there would be no measurable impacts to soils, water quality, human health, and wildlife.

g. Herbicide contamination of edible and medicinal plants that represent irretrievable commitments of resources from herbicide use. The Purpose and Need of the EA states that the Deschutes National Forest proposes these actions to reduce the spread and incidence of noxious weeds in order to maintain and enhance diverse native plant communities, which are the foundation of functional ecosystems (page 1-5). Noxious weeds have taken away or severely impaired our ability to manage for healthy ecosystems (USDA Forest Service 1995). There are

numerous publications documenting negative effects of noxious weeds on native plants.

Additional Alternative

Comment: The EA should also have included an alternative using no biological agents rather than assuming on the public behalf that this is impossible.

Response:

This alternative was considered (see ``Alternatives Considered But Eliminated from Detailed Analysis'' on page 2-1 of the EA). During the initial scoping period, some people did write to say that the use of introducing biological agents was only compounding the problem of introducing more exotic (non-native) species into the environment. This alternative was elminated from further study because biological control agents authorized by the State have been extensively researched and screened prior to release in the United States. Populations of some noxious weeds necessitate the need for biological agents as a starting point to reduce noxious weeds to a more manageable level.

Burning

Comment: We are opposed to planned prescribed burning at Big Marsh on the Crescent Ranger District, due to potential impacts to rare spotted frogs and water birds, including sandhill cranes and yellow rails. We note that habitat degradation affecting these species through removal of non-target plants was not analyzed. (14-2).

Response:

The Noxious Weed Control Wildlife Report, which is stored in the project analysis file, states: "The prescribed burn proposed at Big Marsh would be 5 acres or smaller. While this area provides important habitat to such species as cascades frogs and yellow rails, correct timing of the treatment could prevent negative impacts." Under "Mitigation Measures Common to Alternatives 2 or 3" (EA, pages 2-14 through 2-15), the following mitigation would be followed to address concerns about prescribed burning in Big Marsh within sandhill crane and yellow rail nesting habitat and spotted frog populations: Restrict disturbing activity 5/1-7/31 to protect

nesting birds. The prescribed burning would most likely be conducted in the fall, so no additional mitigations were needed for spotted frogs. Burning in the fall would also avoid impacts to nesting wetland birds and amphibians (Wildlife Report, page 2).

Revegetation

Comment: We know it is not enough just to remove the offending weeds. In order to insure that they not reappear, we must set up a condition to encourage and promote the reintroduction of native plants and grasses. No noxious weed eradication program will be effective without ensuring that there is money available for replanting (2-6).

Response:

In the EA, Issue 11 addressed restoration of sites after noxious weed control measures (page 3-15). As part of the analysis conducted for the EA, a strategy was developed to select two or three noxious weed sites and try revegetating these sites as time and funding allow. The Noxious Weed, Vegetation, and Human Health Assessment Report (stored in the project analysis file) further discusses this strategy (pages 11 through 13) and explains a model for weed management by Sheley et. al. (1996) that would be used to test the feasibility and effectiveness of rehabilitation of noxious weed sites. The Deschutes National Forest's Noxious Weed Coordinator, Plant Pathologist and Ecologist recently (November 1998) submitted a grant proposal in an attempt to secure funding to accomplish this work.

Partnerships

Comment: Are adjacent landowners involved to accomplish cooperative work? Weed do not respect boundary lines. We hope the USFS is looking for opportunities to cooperate. How has this been addressed? (10-2).

Response:

The Deschutes National Forest has been actively involved in partnership efforts to solve noxious weed problems. These efforts involve adjacent landowners. One of these efforts is the Upper Deschutes Noxious Weed Education and Outreach Program that is funded by a Governor's Watershed Enhancement Board grant and

involves the following partners: Deschutes National Forest, Deschutes County Watershed Council, Deschutes County Public Works, Oregon Department of Agriculture, Oregon Department of Fish & Wildlife, Prineville Bureau of Land Management, Native Plant Society of Oregon, Deschutes Soil & Water Conservation Service, and Woodside Ranch (a Homeowner's Association).

Comment: Efforts being made by the Deschutes Forest are critical to stem the spread of noxious weeds and we support the Forest's efforts. Through Oregon Dept. of Fish & Wildlife volunteers and staff, we will work with the Forest to develop programs to stem the spread of noxious weeds while meeting ODFW fish and wildlife conservation objectives. These programs could range from identification of noxious weeds by guzzler volunteers to working with Forest staff to permanently close and rehabilitate roads (13-4; 13-5).

Response:

Oregon Department of Fish & Wildlife is one of the partners in a collaborative effort of federal, state, and county agencies working with private non-profit organizations and private landowners to increase awareness about and find solutions for noxious weed problems. We applaud their efforts and appreciate their willingness to help at an even greater level.

Suggestions

Some respondents took the time to make suggestions on how to improve our noxious weed prevention and control efforts. These suggestions include:

- Get groups to Adopt-A-Weed-Plot for manual control (6-2).
- Consider closing roads, off highway vehicle restrictions (especially in high risk areas) (2-4; 13-3).
- Consider excluding cattle from public lands (2-4).
- A Homeowner's Association offered to serve as a focal point from which to disseminate information to their members about Forest Service control operations, and to volunteer for pulling and disposal operations (9-2).
- Look for opportunities to cooperate with adjacent landowners (10-2).
- This project can be used to demonstrate how herbicides can be applied in a safe and environmentally sound manner (11-2).
- We need to establish a unified approach to noxious weed control in central Oregon (13-6).
- Work cooperatively with other governmental entities to control noxious weeds and their

spread. An intergovernmental consortium needs to be established in Deschutes County that is linked to the Deschutes Basin, if noxious weed control is to be effective (13-3).

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http://www.fs.fed.us/r6/deschutes/desnf/manage/nepa/documents/so/weeds/a-ea-dec/appenda.html
Last Update: 4/20/99
R.A. Jensen

DESCHUTES NATIONAL FOREST

NOXIOUS WEED CONTROL

ENVIRONMENTAL ASSESSMENT

APPENDIX B
Noxious Weed Treatment
Site numbers and associated Map numbers

The Table below displays the locations of noxious weed treatment sites on the different maps located at the end of the Environmental Assessment.

MAP #1	MAP #2	MAP #3	MAP #4	MAP #5	MAP #6	MAP #6B
165	1	1	1	121	10	186
166	2	66	5	122	18	
167	3	67	6	123	164	
168	12	68	7	124		
169	13	69	8	125		
170	15	70	11	127		
171	19	71	14	128		
172	20	72	16	129		
173	25	77	21	130		
174	30	81	22	131		
175	31	83	23	132		
176	41	88	24	133		

177	45	89	26	137
178	61	92	27	138
179	62	93	28	139
180	63	96	29	140
181	64	97	32	141
182	65	98	34	142
183	70	99	35	143
184	73	101	36	144
185	74	102	38	145
187	75	103	39	146
188	76	104	40	147
189	78	105	44	148
190	79	106	47	149
191	80	107	48	150
192	82	109	49	151
193	84	110	50	152
194	85	111	51	153
195	86	112	52	154
196	87	116	53	157
197	90	117	54	158
198	91	120	55	159
199	100	121	56	160
200	108	124	57	161
201	114	134	58	162
202	115	135	59	213
203	118	136	60	233

204	119	144	69	234
205	212	145	94	235
206	214	153	95	
207	217	154	113	
208	218	155	215	
209	219	220	216	
210	222	221	234	
236	224	223		
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DESCHUTES NATIONAL FOREST

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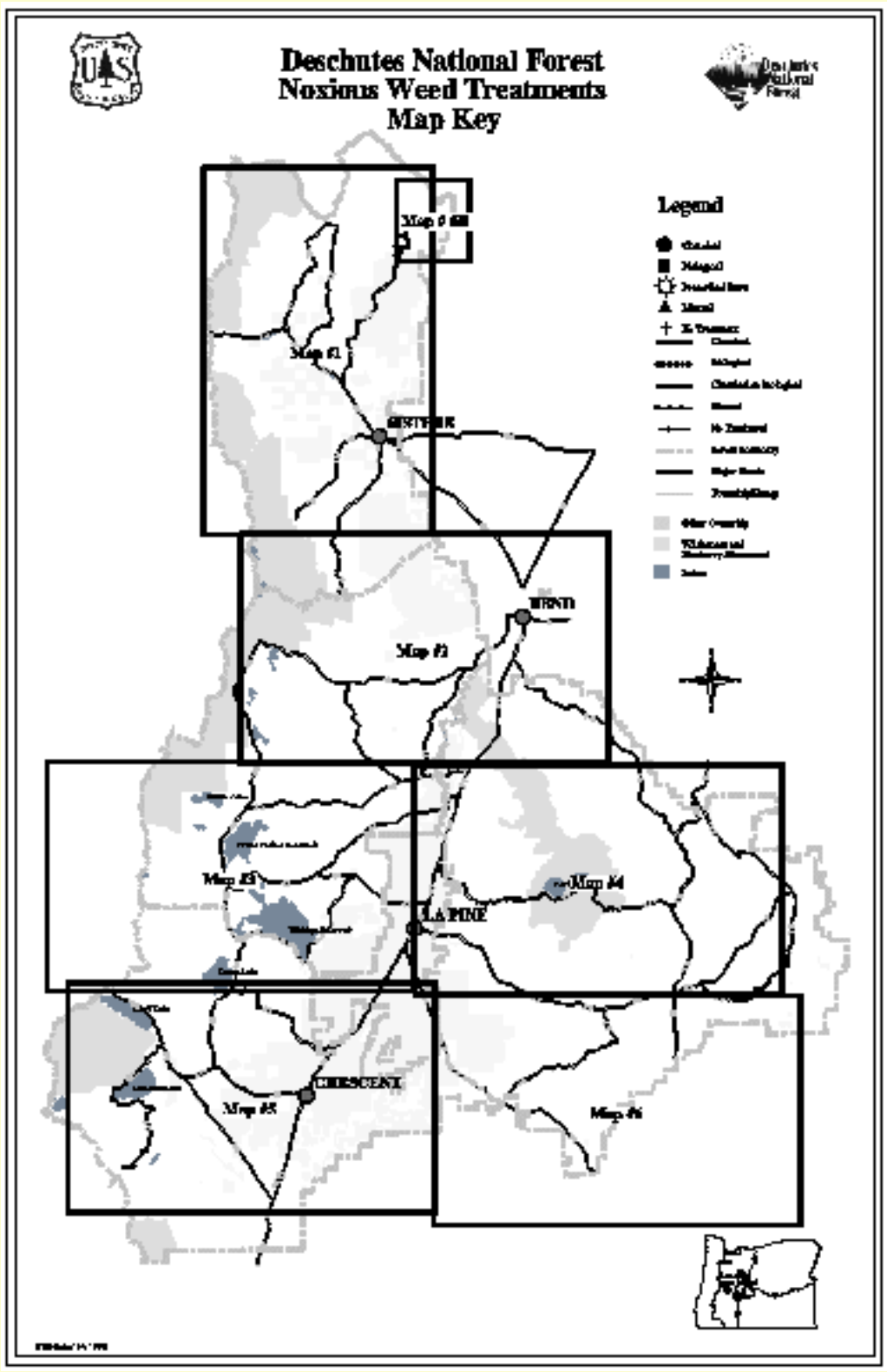
Map Index



[Detailed Map #1](#) [Detailed Map #3](#) [Detailed Map #5](#)

[Detailed Map #2](#) [Detailed Map #4](#) [Detailed Map #6](#)

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