



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Salem District Office
1717 Fabry Road S.E.
Salem, Oregon 97306
<http://www.or.blm.gov/salem/>



In Reply To:
1790 (084.0)
Invasive Non-Native Plant Management
EA No DOI-BLM-OR-S040-2009-0002-EA

February 25, 2009

Dear Interested Public:

The *Invasive Non-Native Plant Management Environmental Assessment and Finding of No Significant Impact* (EA) has been completed and is available for review. The proposed action is for the protection and restoration of native ecosystems with a long-term integrated management strategy for invasive non-native plants throughout the Cascades Resource Area in several Oregon counties and across multiple watersheds. The proposed action and location for the proposed project area is described below.

The project area includes the entire Cascades Resource Area (CRA) lands, approximately 177 thousand acres, which are located east of Salem in Multnomah, Clackamas, Marion, and Linn Counties. The EA/FONSI document is available on the Salem District Website at <http://www.blm.gov/or/districts/salem/plans>.

If you have any questions please call Barbara Raible at (503) 375-5687. Please send written comments on the Environmental Assessment to Cindy Enstrom, Cascades Resource Area Field Manager, Salem District, Bureau of Land Management, 1717 Fabry Road SE, Salem, Oregon 97306. Comments may also be faxed to (503) 375-5622. The comment period on the Invasive Non-Native Plant Management EA will end on March 20, 2009 at 4:30 p.m.

Sincerely,

Cindy Enstrom
Cascades Resource Area Field Manager

Note: Comments, including names and addresses of respondents, will be available for public review at the same time as the EA during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for inspection in their entirety.

**Cascades Resource Area
Invasive Non-Native Plant Management**

Environmental Assessment and
Finding of No Significant Impact

DOI-BLM-OR-S040-2009-0002-EA
February 2009

United States Department of the Interior
Bureau of Land Management
Oregon State Office, Salem District
Clackamas, Linn, Multnomah, Marion Counties, Oregon

Responsible Agency: USDI - Bureau of Land Management

Responsible Official: Cindy Enstrom, Field Manager
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As the Nation's principal conservation agency, the Department of Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering economic use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

Table of Contents

FINDING OF NO SIGNIFICANT IMPACT	2
ENVIRONMENTAL ASSESSMENT	5
1.0 INTRODUCTION	5
1.1 Proposed Action.....	5
1.2 Purpose of and Need for Action	5
1.3 Conformance with Land Use Plan, Statutes, Regulations, and other Plans	7
1.4 Identification of Relevant Issues.....	9
1.5 Decisions to be Made	9
2.0 ALTERNATIVES	10
2.1 Alternative Development	10
2.2 Alternative A (Proposed Action)	10
2.3 Alternative B	17
2.4 No Action Alternative	18
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS	18
3.1 General Setting in the Context of Invasive Species	18
3.2 Vegetation.....	24
3.3 Water and Soil Resources (Water Quality, Aquatic Habitat, Fisheries, and Soil).....	26
3.4 Wildlife.....	29
3.5 Recreation and Visual Resources.....	31
3.6 Other Elements of the Environment Based On Authorities and Management Direction	33
3.7 Comparison of Alternatives with to the Decision Factors	35
3.8 Compliance with the Aquatic Conservation Strategy	35
4.0 LIST OF PREPARERS	39
5.0 CONTACTS AND CONSULTATION	39
5.1 Consultation	39
5.2 Public Scoping and Notification - Tribal Governments, Adjacent Landowners, General Public, and State County and local government offices	40
6.0 REFERENCES / GLOSSARY	40
6.1 References.....	40
6.2 Glossary.....	43

List of Tables

Table 1: Proposed Projects for 2009.....	14
Table 2: Elements of the Environment to be analyzed based on Authorities and Management Direction.....	33

List of Figures

Figure 1: Goats grazing on Minsinger Bench in the Sandy Watershed	12
Figure 2: Knotweed in the Sandy River Area before and after 2007 treatment.....	20
Figure 3. After machine treatment of 5 foot heavy infestation of blackberry	20
Figure 4: Molalla Area – mix of Knapweed, Tansy, Thistle and Scotch Broom.....	21
Figure 5: False brome: Fisherman’s Bend - BLM Recreation Area before and after false brome treatments	21
Figure 6. Ivy in the Sandy Watershed Figure 7. Vinca in the Molalla Watershed.....	21
Figure 8 Invasive Infestations Cascades Resource Area North	22
Figure 9 Invasive Infestations Cascades Resource Area South.....	23
Figure 10: False brome invading a riparian area.....	27

FINDING OF NO SIGNIFICANT IMPACT

The Bureau of Land Management (BLM) has prepared an environmental assessment (EA) for a proposal to manage invasive non-native species on BLM lands within the Cascades Resource Area in Multnomah, Clackamas, Marion, and Linn Counties, Oregon (EA # DOI-BLM-OR-S040-2009-0002). The species targeted for management and control are invasive non-native plants, hereafter called invasive species. The EA is attached to and incorporated by reference in this Finding of No Significant Impact determination (FONSI). The analysis in this EA is site-specific and is in conformance with the *Record of Decision and Resource Management Plan- Salem District*, December, 2008 (2008 ROD/RMP). The analysis supporting this decision “tiers” to the 2008 *Final Environmental Impact Statement for the Revision of the Resource Management Plan of the Western Oregon Bureau of Land Management* (2008 Final EIS) (EA Section 1.3).

The EA and FONSI will be made available for public review. The comment period ends March 20, 2009. The notice for public comment has been published in the *Albany Democrat Herald*, *Molalla Pioneer*, *Sandy Post*, and *Stayton Mail* newspapers. The EA will be posted on the Salem District website <http://www.or.blm.gov/salem/html/planning/index.htm>. Written comments should be addressed to Cindy Enstrom, Field Manager, Cascades Resource Area, 1717 Fabry Road S., Salem, Oregon 97306. Emailed comments may be sent to OR_Salem_Mail@blm.gov. Attention: Cindy Enstrom.

Finding of No Significant Impact

Based upon review of the *Invasive Non-native Plant Management EA* and supporting documents, I have determined that the implementation of this project will not have significant environmental effects beyond those already identified in the Final EIS/ RMP. The proposed action does not constitute a major federal action having significant effects on the human environment; therefore, an environmental impact statement will not be prepared. This finding is based on the following discussion. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27.

Context: Potential effects resulting from the implementation of the Proposed Action have been analyzed within the context of the Cascades Resource Area (Cascades RA). Over the next 10 years, the project would treat an estimated 4,000 acres or approximately .02% of the Cascades RA [40 CFR 1508.27(a)].

Intensity:

1. The resources potentially affected by the proposed project are: Vegetation, Water and Soil Resources (Water Quality, Aquatic Habitat, Fisheries, and Soil), Wildlife, Recreation and Visual Resources. The effects of this project are not likely to have significant adverse impacts on these resources [40 CFR 1508.27(b) (1)] for the following reasons:
 - Project design features described in (EA section 2.2.2.9) would reduce the risk of effects to affected resources to be within RMP standards and guidelines and to be within the effects described in the RMP/EIS.

- *Vegetation (EA sections 3.2)*: The project would not significantly change non-target species and abundance. No native species would be extirpated from native habitat as result of project treatments.
- *Water and Soil Resources (Water Quality, Aquatic Habitat, Fisheries, and Soil) (EA section 3.3)*: These resources will not be adversely affected because whenever feasible mechanical control methods would be used in riparian areas and in or adjacent to aquatic habitats. Herbicide use in these areas would comply with manufacture labeling requirements for storage, use, and disposal and resource area hydrologist or fisheries biologist would be consulted prior to the application of herbicides with the Riparian Reserve land use allocation.
- *Wildlife (EA section 3.4)*: The risks to wildlife are considered negligible. Most treatment areas are located in highly disturbed areas, typically along roadsides. No Special Status wildlife species commonly utilize habitat in highly disturbed areas immediately adjacent to roadways. Control methods have not demonstrated observable significant impacts resulting from the isolated use, limited acreage treated, low concentrations, rates of use, and methods of application.
- *Recreation and Visual Resources (EA section 3.5)*: The risks to visual resources as a result of the implementation of this project are negligible. It is not anticipated that this project would result in a major modification to the existing landscape within the project area. Recreation resources would benefit from the implementation of this project by providing a more enjoyable environment to recreate. These benefits would be achieved from the reduction of invasive species and restoration or retention of native habitat that provide a high quality visual and recreational experience.

2. The proposed project:

- a. Would not affect
 - i. *public health or safety* [40 CFR 1508.27(b)(2)]; The use of herbicides is in accordance with manufacturer's labels in such a manner as not to affect public health and safety. The BLM mandate is to use only U.S. Environmental Protection Agency (USEPA) – registered herbicides evaluated properly under National Environmental Policy Act (NEPA), and additional BLM requirements.
 - ii. *unique characteristics of the geographic area* [40 CFR 1508.27(b)(3)] - There are no prime farmlands located within the Cascades RA (*EA Section 3.6, Table 2*); ACECs, RNAs, wetlands, and along wild and scenic rivers will be high priority areas for elimination of invasive species.
 - iii. *districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places*, nor would the Proposed Action cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (*EA Section 3.6, Table 2*).
- b. Are not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b) (4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b) (5)].

Many methods of control have been evaluated for the majority of invasive species. Invasive species management has taken place in the Cascades Resource Area for many years with no adverse effects on water resources, or on non-target species or their habitats. There are no foreseen effects on the human environment considered to be highly uncertain or involve unique or unknown risks.

- c. Do not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration [40 CFR 1508.27(b) (6)].
 - d. Are not expected to adversely affect Endangered or Threatened Species listed under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b) (9)].
 - o *Northern spotted owl (EA section 3.4)*: Effects to the species are not significant because: Most of these projects would have no effect on the spotted owl due to the nature of the project and the location of treatment areas. Most treatment areas are located in highly disturbed areas, typically along roadsides. The project would be disturbance related and no suitable spotted owl habitat would be modified. ESA Consultation is described in *EA section 5.0*. The project maintains dispersal habitat and does not downgrade any suitable habitat within or between known owl sites.
 - o *Fish (EA sections 2.2.2.9, 0)*: Effects to the species are not significant because Federally listed fish populations and habitats would not be impacted by the treatment of invasive plants in riparian areas due to the treatments being limited in scope, frequency, and type to that delineated in NOAA's (2008) biological opinion regarding the implementation of fish habitat restoration actions. ESA Consultation is described in *EA section 5.0*.
 - e. Do not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b) (10)] (*EA Section 1.3*).
3. This project has been evaluated in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b) (7)] and it was determined that there would be a beneficial cumulative effect to native ecosystems (*EA sections 3.2, 3.5, 3.6, 3.8*).
 4. The project is consistent with applicable land management plans, policies, and programs.

Approved by: Cindy Enstrom
Cindy Enstrom
Cascades Resource Area Field Manager

2/25/2009
Date

ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

This EA will analyze the environmental effects of an integrated strategy to manage invasive non-native plant species and will provide the decision-maker, the Cascades Resource Area Field Manager, with current information to aid in the decision-making process. It will also determine if there are significant impacts not already analyzed in the Environmental Impact Statement for the Salem District's Resource Management Plan and whether a supplement to that Environmental Impact Statement is needed or if a Finding of No Significant Impact is appropriate.

This is a programmatic multi-year EA covering the Cascades Resource Area (Cascades RA) and will be effective from February 25, 2009 – December 31, 2018.

Chapter 1 of this EA provides a context for what will be analyzed in the EA, describes the kinds of action we will be considering, defines the project area, describes what the proposed actions need to accomplish, and identifies the criteria that we will use for choosing the alternative that will best meet the purpose and need for this proposal.

1.1 Proposed Action

Invasive non-native species are those species whose introduction is likely to cause economic or environmental damage or harm to human health. The BLM proposes to manage and control invasive non-native plants, hereafter called invasive species, using an integrated management strategy (EA section 2.2).

1.1.1 Project Location

The project area includes the entire Cascades RA lands, approximately 177 thousand acres, which are located east of Salem in Multnomah, Clackamas, Marion, and Linn Counties. The project area crosses many watersheds (EA sections 2.2, see maps - Figure 8 and Figure 9).

1.2 Purpose of and Need for Action

1.2.1 Need for the Action

Invasive species pose an increasing threat to native ecosystems, other plant communities, aquatic and wildlife habitat, and Riparian reserves. While invasive species have long been recognized as a problem for agriculture, the potential impact to other plant communities, including wild lands and riparian areas, is receiving greater attention. There are an estimated 5,000 invasive species already established in the United States. Most of these species have displaced several native plant species and have invaded approximately 700,000 ha/year of wildlife habitat. All ecosystems (forests, rangelands, riparian areas, wetlands, etc.) are vulnerable to invasion (Pimentel, et al, 2004; <http://www.nature.org/initiatives/invasivespecies/about>, <http://www.invasivespeciesinfo.gov/unitedstates/main.shtml>).

The increase in invasive species and influence on natural resources cause concern for land management agencies and the public. New proliferations of these plants have economic, human, wildlife, aquatic, and ecosystem impacts (e.g. increased erosion, toxic allelopathic impacts, and decreased biodiversity) on public and adjacent private lands. Management of invasive species is important for maintaining natural ecosystem functions.

An invasive species management plan is needed for several reasons:

- Federal law requires that the BLM manage invasive species (see section 3.6).
- Additional control measures and emphasis on integrated treatments are needed to limit the presence and impacts of certain invasive species in the Cascades RA.
- A substantial increase in the number of visitors to public lands over the past several years has contributed to an increased spread rate and introduction of invasive species. This trend in public land use will likely continue into the near future necessitating invasive species management practices including prevention, education, and integrated weed management.
- Counties, private landowners, watershed councils, and other agencies are very concerned about the invasive species spread and the associated impacts to native species and economic interests.
- The current situation is generally still manageable with the implementation of proposed control measures.

1.2.2 Purpose (Objectives) of the Project

The purpose of this management proposal is to restore native plant communities through reduction, control, and eradication of invasive species to maintain healthy functioning ecosystems. The program would include inventories of public lands, education/outreach about the ecological and economic impacts of invasive species and monitoring of treatments. The BLM would support and enter into these cooperative invasive species treatments proposed by non-federal groups on federal and non-federal lands (i.e. county payment projects using federal funds). Projects would be consistent with supporting public land objectives, cumulative benefits, and healthy watersheds.

It is imperative to utilize partnerships to control these species that can invade ecosystems, and cross over ownership and jurisdictional boundaries. Review of projects on a case-by-case basis will determine risks to human health, agricultural crops, watersheds, riparian reserves and the environment.

1.2.3 Decision Factors

In choosing the alternative that best meets the purpose and need, the Cascades RA Field Manager will consider the extent to which each alternative would:

- Avoid introducing or spreading invasive infestations. This is to reduce and control these populations below levels that cause either undue or unnecessary environmental degradation or impair the public lands' economic productivity.
- Eradicate newly invading species before they establish on public lands.
- Maintain integrity and sustainability of natural resources and ecosystem services against the threat of invasions.

- Implement the seven goals identified in Partners against Weeds (an Action Plan for the BLM), January 1996. (Goal 1: Prevention and Detection, Goal 2: Education and Awareness, Goal 3: Inventory, Goal 4: Planning, Goal 5: Integrated Weed Management, Goal 6: Coordination, Goal 7: Monitoring, Evaluation, Research and Technology Transfer Program Implementation.

1.3 Conformance with Land Use Plan, Statutes, Regulations, and other Plans

The proposed project has been designed to conform to the following documents, which direct and provide the legal framework for management of BLM lands within the Salem District.

1. The project was designed under the following documents:
 - a. *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP) pp. 64 Resource Programs), 74 (Need for Further Analysis), Appendix J-17 (Monitoring);
 - b. *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*, April 1994 (the Northwest Forest Plan, or NWFP);
 - c. *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, January 2001; including any amendments or modifications in effect as of March 21, 2004;
 - d. *Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl* (July 2007). <http://www.epa.gov/EPA-IMPACT/2002/October/Day-21/i26779.htm> , <http://www.epa.gov/EPA-IMPACT/2007/July/Day-27/i14664.htm> Federal Register: July 27, 2007 (Volume 72, Number 144)];
 - e. *Record of Decision for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* [(September 2007) refer to Appendix I & J];
 - f. *Record of Decision BLM Northwest Area Noxious Weed Control Program EIS and ROD*, December 1985); and the
 - g. *Record of Decision Supplement to the Northwest Area Noxious Weed Control Program, Final EIS*, March 1987).
2. Since the planning and design for this project was initiated prior to the 2008 ROD, the project was evaluated and found to be in conformance with the management direction contained in the *Record of Decision and Resource Management Plan- Salem District*, December, 2008 (2008 ROD/RMP).

Revision of a resource management plan necessarily involves a transition from the application of the old resource management plan to the application of the new resource management plan.

A transition from the old resource management plan to the new resource management plan avoids disruption of the management of BLM-administered lands and allows the BLM to utilize work already begun on the planning and analysis of projects.

The 2008 ROD / RMP allowed for such projects to be implemented consistent with the management direction of either the 1995 resource management plan or the Approved Resource Management Plan attached to the Record of Decision, at the discretion of the decisionmaker (2008 ROD/RMP pp. 5-6)

This project meets the requirements designated in the 2008 ROD for such transition projects:

- a. A decision was not signed prior to the effective date of the 2008 ROD.
 - b. Preparation of National Environmental Policy Act documentation began prior to the effective date of the 2008 ROD.
 - c. A decision on the project will be signed within two years of the effective date of the 2008 ROD.
 - d. Regeneration harvest would not occur in a late-successional management area or deferred timber management area. This project is not a timber sale.
 - e. There would be no destruction or adverse modification of critical habitat designated for species listed as endangered or threatened under the Endangered Species Act.
3. The analysis in this EA is site-specific, and supplements and tiers to analyses found in the:
- *Final Environmental Impact Statement for the Revision of the Resource Management Plan of the Western Oregon Bureau of Land Management* (2008 Final EIS).
 - *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS).
 - *Northwest Area Noxious Weed Control Program Environmental Impact Statement (EIS) as Supplemented* (March 1987)).
4. *Watershed Analysis and LSR Assessment*: All of the Cascades RA's watershed analyses have addressed exotic and introduced species of concern and the need for the control and/or eradication.

The above documents are available for review in the Salem District Office. Additional information about the proposed activities is available in the *Invasive Non-native Plant Management EA Analysis File*, also available at the Salem District Office. Table 2 (EA Section 3.6) shows the elements of the environment analyzed in this environmental assessment based on authorities, and management direction (BLM Handbook H-1790-1: p. 137), [40 CFR 1508.27(b)(3)], [40 CFR 1508.27(b)(8)].

1.3.1 Relevant Statutes/Authorities

- ***Archaeological Resources Protection Act (ARPA) 1979.*** Protects archeological resources and sites on federally-administered lands. Imposes criminal and civil penalties for removing archaeological items from federal lands without a permit.
- ***Carlson-Foley Act of 1968.*** Directs agency heads to enter upon lands under their jurisdiction with noxious plants and destroy noxious plants growing on such land.
- ***Clean Air Act (CAA) 1990.*** Provides the principal framework for national, state, and local efforts to protect air quality.
- ***Clean Water Act (CWA) 1987.*** Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.

- ***Endangered Species Act (ESA) 1973.*** Directs Federal agencies to ensure their actions do not jeopardize threatened and endangered species.
- ***Federal Land Policy and Management Act (FLPMA) of 1976.*** Defines BLM's organization and provides the basic policy guidance for BLM's management of public lands. Directs the BLM to 'take any action necessary to prevent unnecessary and or undue degradation of the public lands.'
- ***Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990.*** Authorizes the Secretary 'to cooperate with other federal and state agencies, and others in carrying out operations or measures to eradicate, suppress, control or prevent or retard the spread of any noxious weed. Each Federal agency *shall* 1) designate an office or person adequately trained to develop and coordinate an undesirable plants management program for control of undesirable plants on federal lands under the agency's jurisdiction, 2) establish and adequately fund an undesirable plants management program through the agency's budgetary process, 3) complete and implement cooperative agreements with State agencies regarding the management of undesirable plant species on federal lands, and 4) establish integrated management systems to control or contain undesirable plant species targeted under cooperative agreements.'
- ***Forest Pest Management, 1990.*** See *A Guide to Conducting Vegetation Management Projects in the Pacific Northwest Region.* USDA-FS, PNW Region.

1.4 Identification of Relevant Issues

1.4.1 Scoping

Public outreach for this project consisted of scoping via the Salem District Project Update newsletter published in September 2008 and December 2008. The Salem District did not receive any comments in regards to the proposed project.

1.4.2 Issues

Issues provide a basis for comparing the environmental effects of the alternatives and aid in the decision-making process. The major issues brought forward were used to formulate alternatives, identify appropriate design features, or analyze environmental effects. There are concerns about the adverse effects of herbicides on water quality, and native plant and animal species. This issue is addressed in EA sections 2.2.2.9, and 3.2-3.4).

1.5 Decisions to be Made

The following decisions will be made through this analysis:

- To determine if a Supplemental Environmental Impact Statement (SEIS) should be prepared based on whether the proposed action would result in significant impacts to the human environment not already analyzed in the EIS prepared for the Salem District RMP and its amendments. If we determine there is no need to prepare a supplemental EIS, we will document this determination in a Finding of No Significant Impacts (FONSI).
- To determine at what level, where, and how to conduct invasive species management on BLM-administered lands in the Cascades RA.

2.0 ALTERNATIVES

2.1 Alternative Development

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) of 1969, as amended, Federal agencies shall "...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." As stated in the previous section, use of herbicides was identified as an issue and has resulted in the development of a second action alternative. No other unresolved conflicts concerning alternative uses of available resources were identified in the environmental analysis. Therefore, the EA will analyze three alternatives: the **Proposed Action** (integrated invasive plant management with the option of herbicide use), **Alternative B** (integrated invasive plant management without herbicide use), and the required **No Action Alternative**.

2.2 Alternative A (Proposed Action)

Over the next 10 years, the BLM would implement an integrated invasive species management program on no more than 4000 acres of federal lands within the resource area and non-federal lands within Multnomah, Clackamas, Marion and Linn Counties involved in partnership projects with the BLM and using federal monies. The action would occur within all land use allocations within the Cascades RA. The number of acres treated annually would be based on available funding, weather, and condition of sites. Herbicides would only be used to control listed federal, state, and county "noxious weeds".

2.2.1 Relation to Project Goals

To achieve the goals described in EA section 1.2.3, the project includes the following strategies and actions:

Goal 1: Prevention and Detection - Take rapid action to control, limit spread, and eradicate invasive species using approved methods after identification of target species. However, even the best prevention efforts will not stop all invasive species introductions. Early Detection and Rapid Response (EDRR) efforts increase the likelihood that invasions will be addressed successfully while populations are still localized and population levels are not beyond that which can be contained and eradicated. Once populations are widely established, all that might be possible is the partial mitigation of negative impacts (National Invasive Species Council 2003).

Goal 2: Education and Awareness

Generate support for invasive species control by:

- Implementing the Resource Area Weed Prevention Schedule (revised annually);
- Being a partner with County and State invasive species programs;
- Participating in the four county Upper Willamette, Mid-Willamette and Columbia Gorge Cooperative Weed Management Area program;
- Implementing BLM and Oregon State education programs;
- Educating and working with contractors and public land users;
- Participating in local activities such as the County and State Fairs; and
- Installing educational and interpretative signs at all major recreation sites.

Goal 3: Inventory - Inventories would be conducted on a regular basis to identify new infestations invading species, determine changes in rates of spread for established infestations, and determine which activities are the major contributors to the spread of invasive species.

Goal 4: Planning - Incorporate invasive species management in all Cascades RA planning efforts.

Goal 5: Integrated Weed Management - Goals 1 and 2 cannot mitigate new or established infestations; therefore, it is important that these and other goals combine with treatment of invasive species. Because Goal 5 has direct impacts on the environment, it is the focus of this EA.

Goal 6: Coordination - The District would coordinate weed management activities with local, State and Federal agencies, and private landowners.

Goal 7: Monitoring, Evaluation, Research and Technology Transfer Program

Implementation - Monitoring would be conducted annually to determine the overall effectiveness of the program and treatments, compliance with laws, regulations, and policies. The District would continue to participate in invasive species studies and provide for technology transfer as opportunities arise. Implementation of these measures would allow for periodic reassessment of treatments to ensure that the most effective and environmentally benign methods for the control and eradication of invasive species include innovations in physical, cultural, chemical, and biological management.

2.2.2 Integrated Invasive Species Management (Goal 5)

The proposed action would utilize four primary methods for invasive species control: Cultural, Physical (including prescribed fire), Biological, and Chemical (Proposed Action only). See Table 1, EA sections 2.2.2.5 and 2.2.2.6 for a list of treatments that fall into these categories.

- Cultural Control: These treatments include prevention, grazing (cattle, goats and/or sheep), and competitive plantings with native seeds/plants.
- Physical Control: Physical treatments include manual, mechanical, and burning treatments.
- Biological Control: These treatments include using natural competitors including insects, and pathogens.
- Chemical Control (Proposed Action only): Treatments include the use of herbicides or other chemical treatments appropriate to the control method determination and priorities for treatments (See EA section 2.2.2.1 and 2.2.2.6).

2.2.2.1 Control Method Determination

Selection of the appropriate methods are based on such factors as the growth and dispersal characteristics of the target species, size of the infestation, location of the infestation, accessibility of equipment, proximity to water bodies and drain patterns, potential impacts to non-target species, human use of affected areas, effectiveness of the treatment on target species, and cost. Depending on species characteristics, a combination of control methods may be necessary and may take place over several years.

New techniques, control methods, and products should receive consideration and evaluation as they become available for implementation on invasive species management projects. Decisions on control methods would take place with input from collaborating agencies and partners targeting the invasive species listed for purposed eradication or control.

Due to the length of species viability, annual proliferation from previous years, and the characteristics of certain species, treatments could occur annually for a period of 10 years or more. The BLM would develop and implement annual treatment plans based on the most recent information including: new introductions, spread of existing infestations, treatment results, new technical information and available funding (See Table 1 for a list of sites proposed for treatment in 2009).

2.2.2.2 *Cultural Control*

The BLM would include the use of culturally relevant controls if they would increase the effectiveness of integrated invasive plant management. Cultural control may be combined with other control methods.

Treatment Methods

- **Grazing:** Target species would be controlled through the use of grazing practices. The use of domestic animals is a proven method of successfully controlling some invasive species. Sheep and goats have controlled leafy spurge in several Wilderness Management Areas in the western U.S. Within the Cascades RA, goats have been used to reduce and control Scotch broom and blackberry infestations.

Figure 1: Goats grazing on Minsinger Bench in the Sandy Watershed



- **Education and Collaboration:** Promote invasive species education and collaboration. This may include: managing wildlife and/or grazing activities, preparing road management guidelines which may incorporate road closures or road restrictions, developing rock source management plans, and minimizing the use of vehicles as a vector for invasive species spread.
- **Prevention, Early Detection, and Rapid Response (EDRR):** The hallmarks of successful EDRR efforts include: 1) identifying potential new threats based on current species distribution; 2) detecting new invasive species and responding quickly to new infestations to prevent the spread and permanent establishment of these species;

3) providing adequate and timely information to decision-makers, the public, and to trading partners concerned about the status of invasive species within an area; and 4) using lessons learned from past efforts to guide current and future efforts (EDRR Guidelines Version 1).

2.2.2.3 *Physical Control*

The BLM would use physical control methods if the treatment would reduce seed source and decrease infestation. This is the preferred method if effective and cost efficient for particular species and sites. Physical controls may be combined with other control methods.

Treatment Methods

- Hand pulling: Generally appropriate for non-rhizomatous forming, tap-rooted species, and/or species which reproduce only from seed. Treatment is preferred when plant growth stage and soil conditions allow, and prior to seed-set for annual species. Hand pulling of emergent invasive plants is included.
- Girdling: A strip of bark (including the cambium) is removed around the base of woody species.
- Cutting/Mowing: Removal of the plant by cutting with: chainsaws, handsaw, pruning shears, string or blade trimmers, other hand tools, push tractor mounted mower.
- Solarization: Target species may be covered with plastic, geotextile, cardboard, or other material to kill the plant or reduce plant vigor prior to treatment with another method.
- Burning: Target species would be treated with a variety of ignition devices such as propane torches, other gas burning torches, or drip torches. A combination of piling or broadcast burning may occur. Burning is also considered a cultural control method.

2.2.2.4 *Biological Control*

The BLM would use available biological control agents, which are already established and well distributed within the resource area. New agents would be distributed on a case by case basis as they become available.

Treatment Methods:

- Biological controls utilize the inoculation of an infestation site with insects, parasites, or pathogens that specifically target the invasive species.

2.2.2.5 *Chemical Treatments*

The BLM's use of chemical controls would be directed at target species to limit the area affected and reduce disturbance to non-target species. Only approved herbicides may be used in chemical treatments. In Oregon, the BLM is currently limited to using the following herbicides: 2,4-D, Dicamba, Glyphosate, and Picloram. Chemical controls can be used alone or in combination with other treatments as part of an integrated invasive plant management strategy.

Treatment Methods

- **Stem Injection:** Stems of actively growing species with a stem diameter larger than ½ inch are injected with herbicide usually near the base of the plant. Where stems are less than ½ inch stems may be cut and injected through the stem nodes.
- **Cut-Stump:** Herbicide is applied by spray, squirt, or wicking/wiping to the stump of a plant (usually a shrub or tree) shortly after the shoot or trunk is cut down.
- **Wick & Wiping:** Use a sponge or wick to wipe herbicide onto foliage, stems, or trunk.
- **Spot Application:** Herbicide is directly sprayed onto target plants only, and spraying of desirable, non-target vegetation is avoided. Includes backpack and hand-pumped spray or squirt bottles, which can target individual plants or parts of plants (foliage, stems, or trunk).
- **Hack & Squirt:** Woody species are cut using a saw or axe or drilled; herbicide is then immediately applied to the cut with a backpack sprayer, squirt bottle, syringe, or similar equipment.

2.2.2.6 *Priorities for Treatment*

The BLM would conduct inventories to locate new infestations and to monitor the spread of known infestations. This inventory would be the basis for determining treatment strategies. The following priorities would be coordinated with local, tribal, State and Federal governmental entities, private landowners, and within cooperative weed management areas.

- **Priority 1:** Eradication/control of new or small infestations that are a known significant threat to ecosystems in areas that have a high potential for spread such as roads/trails (including rights-of-way), rivers/streams, and mineral material sites. (i.e. “T” species as listed in the ODA Noxious Weed Control Program),
- **Priority 2:** Eradication/control of invasives infestations in high-use recreation areas, special habitats, ACECS, wild and scenic rivers and newly disturbed sites,
- **Priority 3:** Containment of large invasive species populations that are reducing the presence and vigor of native plant communities.

2.2.2.7 *Areas of Treatment*

The BLM would treat approximately 100 to 500 acres annually based on available funding, weather, and condition of RA infestations. Due to the characteristics of these species and the size of the land-base involved, infestations may never be eradicated if they escape initial prevention and control measures. The intent of this proposal is to prevent initial establishment and manage large infestations of invasive species at a level where they cause negligible ecological, cultural, or economic impacts.

Table 1: Proposed Projects for 2009

<i>Table 1: Proposed Projects for 2009</i>			
<i>Species</i>	<i>Watershed/Area</i>	<i>Acres</i>	<i>Project Objectives/Treatment Method</i>
New Invader, i.e. star thistle, garlic mustard (EDRR)	Resource Area wide		Early Detection Rapid Response – Eradication using the most effective method known
Spotted Knapweed	Molalla	1	Manual treatment past 3 years; possible herbicide use for eradication

Table 1: Proposed Projects for 2009			
Species	Watershed/Area	Acres	Project Objectives/Treatment Method
Spotted Knapweed	Molalla	<1	New population in 2008 – manual or herbicide for eradication – multiple years
	Quartzville	3	Manual treatment has been unsuccessful along this roadside infestation with two new small populations found within one mile, along road. Herbicide will be used to control the spread and possible eradication within 5 years.
	Other sites – previously found & new sites	<1	All old sites need to be monitored and retreated if needed – manual or herbicide.
Meadow Knapweed	Molalla	2	Manually treated in 2008, needs retreatment and monitoring.
	North Santiam	1	One small site known – mowed by neighbor. Other roadside sites have been treated by Marion County.
Knotweeds	Sandy River	50	Sandy River Riparian Habitat Protection Project. (www.nature.org/oregon manual & herbicide)
	Sandy River upland	3	Herbicide and mechanical treatment of blackberry; cultural – replanting 2009
	Crabtree Creek	1	Herbicide treatment by ODA
	South Santiam		South Santiam Watershed Council is heading up project on private lands
	Molalla		Clackamas SWCD has done an inventory on River system and working on outreach
English Ivy	Sandy River	10	Sleepyhollow project with the Nature Conservancy (TNC) and watershed council; TNC also manually treats ivy when found in small patches. Other isolated patches in area.
	Near Colton	< 1	Continue hand pull
	Near Wilhoit	< 1	Continue hand pull
Blackberry	Cotton Creek	15	Mechanical treatment for 2 years Planting with trees in 2009 with continued maintenance.
Scotch broom	Little Sandy	15	Mechanically treated in 2008, retreat in 2009, then plant or retreat.
	Molalla	100	Manual cutting/pulling of roadside areas.
False Brome	North Santiam / Fisherman's Bend	20	Herbicide/manual treatment of known populations; inventory
	Little North Santiam		Inventory ongoing; treat any sites found
	Quartzville	10	Retreat and monitor roadside populations. Herbicide treatments
	Quartzville Creek		Inventory population along creek, manual and herbicide depending on water levels.
Mixed Species	Lower Sandy		Metro, The Nature Conservancy (TNC), BLM and City of Portland lands. Metro Sandy Gorge Restoration Project funded by an OWEB grant includes manual, mechanical, and herbicide treatments of invasives.

Table 1: Proposed Projects for 2009			
Species	Watershed/Area	Acres	Project Objectives/Treatment Method
Mixed Species	Sandy	160	Minsinger Bench Stewardship project is an ongoing project with goals of forest restoration of pasture land through invasives control (manual, mechanical and herbicide) and replanting with native species.

2.2.2.8 *Special Management Areas*

In Areas of Critical Environmental Concern (ACECs), Wild and Scenic River Corridors, and Table Rock Wilderness: Treatment strategies would be in accordance with direction established in the RMP and specific management plans for these areas. (i.e. no mechanical treatment would be allowed in wilderness areas). These special areas are a high priority for EDRR programs.

In Municipal Watersheds and Riparian Reserves: Consideration for treatment of invasive species would begin if it is determined that these species are posing a threat to the health of the watershed or riparian reserves. Treatment strategies would be coordinated with the municipal watershed managers, hydrologist, and fish biologist.

2.2.2.9 *Project Design Features*

The following is a summary of project design features that would be incorporated into the Proposed Action to reduce the risk of effects to the resources described in EA section 3.0.

All Control Methods

Re-establishment of Native vegetation

- Native vegetation would be used to help control invasives through planting/seeding sites if adequate native species sources are not present within the project area.

Special Status Species:

- If any Special Status species (Threatened, Endangered or Sensitive species) were found in treatment areas, site-specific mitigation measures would be identified and implemented in accordance with applicable laws and directions.
- Invasive plant treatments in riparian areas on streams with federally listed fish populations would be conducted consistent with NOAA's (2008) biological opinion regarding habitat restoration activities in Essential Fish Habitat (EFH) for federally listed salmon and steelhead species.
- If federally listed species occur within or near the treatment site, mitigation would be developed to eliminate effects on the species if possible. If effects to federally listed species are in excess of those described in the applicable BOs issued by the USFWS and NOAA Fisheries, then ESA section 7 Consultation would be reinitiated.
- Control Activities in any sensitive areas for wildlife will be seasonally restricted during nesting seasons. Control methods within disruption distances of known Special Status Species sites such as the spotted owl would be seasonally restricted from March 1 to July 15 when noise disturbance is expected to exceed ambient noise levels.

Monitoring

- Treated sites would generally receive short and long-term monitoring to determine effectiveness of meeting treatment objectives, impacts on non-target species, and to determine the need for follow-up treatments.

Physical Control

- All sites proposed for mechanical treatments would be reviewed for impacts to cultural resources and botanical special status species.

Biological Control

- The development and use of biological controls would occur in accordance with the Oregon Department of Agriculture (ODA) and Oregon Department of Environmental Quality (DEQ).

Chemical Control (Proposed Action Only)

General

- Application would take place only in accordance with the manufacturer's label and by qualified/certified applicators. Methods of application could include wiping or wicking, injection, backpack sprayer, see Standard Operating Procedures from Appendix J in the BLM Vegetation Treatments Using Herbicides September 2007 Final Programmatic (EIS/ROD) (See EA section 1.3 #5). The EIS/ROD Standard Operating Procedures are summarized in Appendix J, Tables B-1 and B-2. Examples include: incorporate prevention measures into projects, minimize soil disturbance to the extent practical consistent with objectives, re-vegetate disturbed soil, use native material.

Water Resources

- Proposed chemical treatments adjacent to lakes or streams would occur in accordance with the Record of Decision (ROD) for Northwest Area Noxious Weed Control Program (1987), in accordance with the BO from NOAA Fisheries (ARBO, 2008), and in accordance with labeled use.

Recreation Sites

- Temporary closer of recreation sites might occur while chemicals are applied and postings to notify the public of any hazards that may be present.

Monitoring

- If Special Status species are located near or within areas of chemical application (Alternative A only), monitoring would be conducted to assess impacts to the Special Status species.

2.3 Alternative B

Alternative B is identical to the Alternative A (Proposed Action) except that no Chemical control would take place under Alternative B.

2.4 No Action Alternative

An integrated invasive plant management program would not occur under this alternative with the exception of the control of listed noxious weeds, which is required by Federal Noxious Weed Act of 1974 as amended and the Carlson-Foley-Act of 1968 (Federal Noxious Weed List http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist2006.pdf , Oregon Department of Agriculture Noxious Weed Policy and Classification http://www.oregon.gov/ODA/PLANT/WEEDS/docs/weed_policy.pdf).

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

The following resources are affected by this project: Vegetation, Water and Soil Resources (Water Quality, Aquatic Habitat, Fisheries, and Soil), Wildlife, Recreation and Visual Resources.

3.1 General Setting in the Context of Invasive Species

Invasive species infestations began a few centuries ago but primarily in the mid-1800's when non-native species began arriving from other countries (new invaders continue to arrive) without the natural enemies, such as fauna, insects, and pathogens that kept them in check in their country of origin. Consequently, these species are typically very aggressive and have the ability to dominate many wild landscapes. For example, in its native habitat, purple loosestrife only comprises one to four percent of the native vegetation, but in North America densities of up to 80,000 stalks per acre have been recorded (Strefer, 1996). Thus, purple loosestrife (*Lythrum salicaria*) out competes and forces out native species and reduces biodiversity (Nyvall, 1995). Invasive species commonly occur in the most productive sites such as riparian areas, benches along streams and rivers and other sites with deep, fertile soils.

The BLM has almost 2100 miles of roads across the publicly owned lands and control of many roads that cross private land in the Cascades RA. Many access roads are owned by private forest industry and are now gated. There are over 23,000 miles of road within the larger resource area boundary that encompasses all ownerships and four counties. Invasive species are aggressive and become established quickly along road right-of-ways and other disturbed areas.



Safety issues can arise when Scotch broom or other invasive species become tall enough to block line of sight. Vehicles serve as an effective vector for moving seeds of many invasive species. Other vectors include birds, wind, and water (especially during flood events).

Invasive species are undesirable for a variety of reasons. Invasive species infestations:

- Deviate natural flow patterns of rivers and watersheds affecting seasonal fish migration patterns, which can affect recreational fishing;
- Reduce aquatic and riparian habitat biodiversity;
- Decrease overall biodiversity within all impacted ecosystems;

- Alter soil conditions that can contribute to soil erosion;
- Trigger allergic reactions and induce physical injuries in humans and other species; and
- Cause economic losses in agriculture, forestry, and recreation.

Several invasive perennial and annual species, including spotted, diffuse (white), and Russian knapweed (*Centaurea maculosa*, *diffusa*, and *repens*), leafy spurge (*Euphorbia esula*), and yellow starthistle (*Centaurea solstitialis*) are moving into native adapted ecosystems (Harris, 1991). Some exotic species such as ivy, holly and false brome can invade shaded forest environments (undisturbed climax communities) and compete with adapted native species that disrupts ecosystem functions (Bedunah, 1992). False brome (*Brachypodium sylvaticum*) in the Willamette Basin invades shaded forests, oak prairies, and riparian habitats where it competes for moisture and suppresses native regeneration. <http://www.appliedeco.org/invasive-species-resources/FBWG>

Other invasive species include common mullein (*Verbascum thapsus*), tansy ragwort (*Senecio jacobaea*), St. John's wort (*Hypericum perforatum*), Canadian (*Cirsium arvense*) and bull thistles (*Cirsium vulgare*), butterfly bush (*Buddleia*), and reed canary grass (*Phalaris arundinacea L.*). Gorse (*Ulex*) was found on Highland Butte and eradicated in the Wildcat drainage on public land. Occasional diffuse knapweed, spotted knapweed and meadow knapweed have been hand-pulled along Highway 26. ODA sponsors a site WEEDMAPPER where all entities may post known weed sites. (<http://www.weedmapper.org>) New invasive species are being identified as soon as possible on public lands.

Aquatic invasive species also have certain traits that make them successful in habitats that they invade. Invasive aquatic and wetland species generally:

- Tolerate a wide range of environmental conditions including soil and water acidity, water and air temperature, water salinity, water level fluctuations, and dissolved oxygen;
- Reproduce early, often, in large numbers, and in multiple ways (e.g., by fragmentations, seeds, and rhizomes);
- Grow rapidly; and
- Resist management control efforts

Several aquatic plants are on Oregon's list of noxious weeds including hydrilla (*Hydrilla verticillata*), Eurasian watermilfoil (*Myriophyllum spicatum*), and South American waterweed (*Egeria densa*). These weeds aggressively invade aquatic environments, displacing native vegetation by forming dense stands or large subsurface mats, and alter the dynamics of aquatic ecosystems. They also impede flows in waterways, increase flooding, clog pumps and boat propellers, and limit use of waterways for recreation (see <http://oregon.gov/ODA/PLANT/WEEDS/statelist2.shtml>).

Some of these species can be treated with herbicides, but chemical treatment is difficult because of potential impacts to non-target species. South American waterweed and Eurasian watermilfoil are already present in much of western Oregon. Hydrilla is not present in Oregon, but populations of hydrilla have been found in lakes and rivers in California, Idaho, and Washington.

Monitoring has shown that non-chemical treatments have not been fully successful in eradicating or controlling many past and existing invasive species infestations. The prevalence of current infestations is extensive and persistent enough that all control options need to be considered (within the context of BLM's budget).

Current Level Of Infestations

An inventory on resource area lands occurs every five years if funding allows. The last inventory took place in 2004 (Maps of the Cascades RA infestations - Figure 8 and Figure 9). Figures 2-7 show infestations within the Cascades RA.

Figure 2: Knotweed in the Sandy River Area before and after 2007 treatment



Figure 3. After machine treatment of 5 foot heavy infestation of blackberry



Figure 4: Molalla Area – mix of Knapweed, Tansy, Thistle and Scotch Broom



Figure 5: False brome: Fisherman’s Bend - BLM Recreation Area before and after false brome treatments



Figure 6. Ivy in the Sandy Watershed



Figure 7. Vinca in the Molalla Watershed



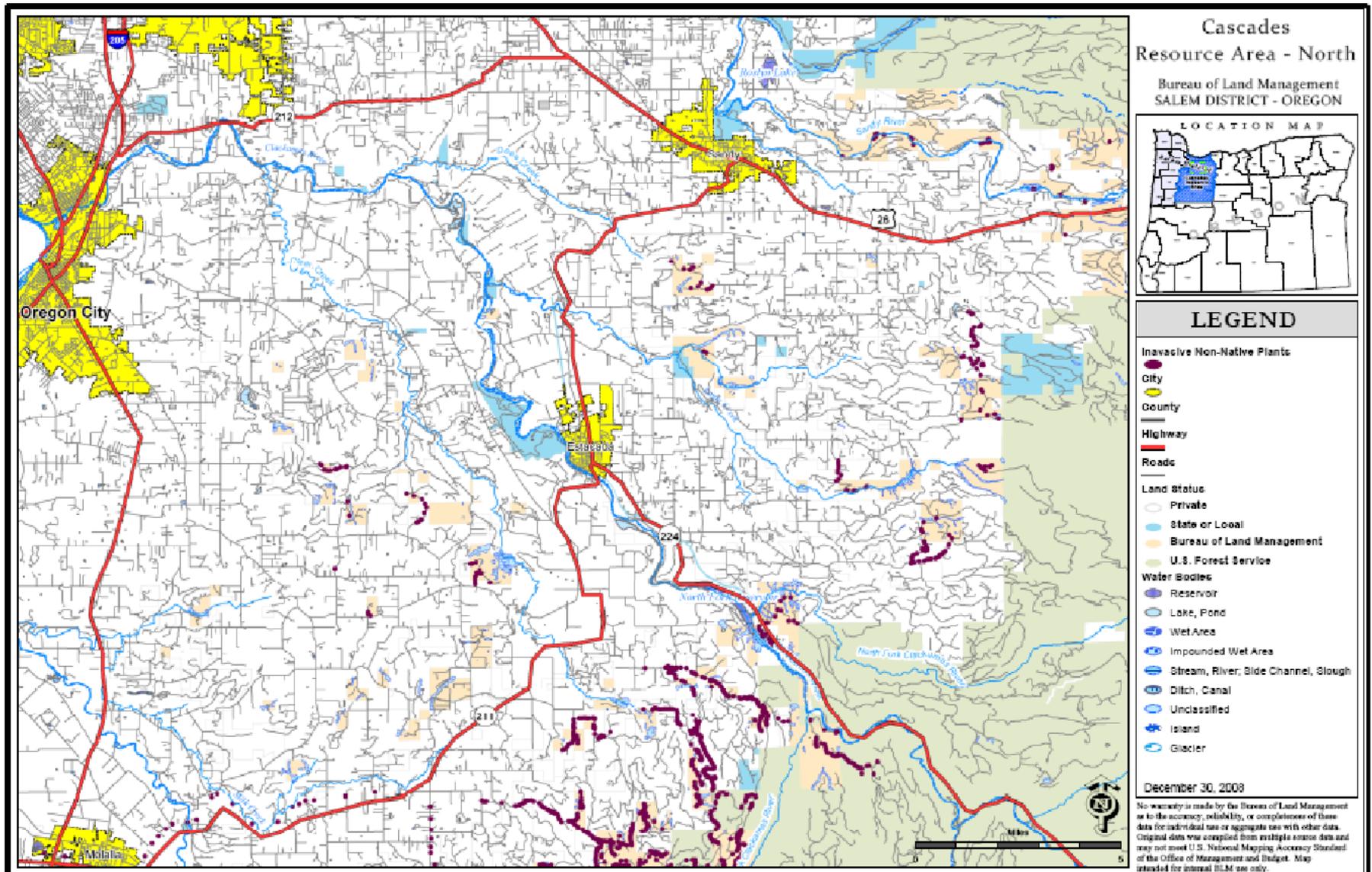


Figure 8 Invasive Infestations Cascades Resource Area North

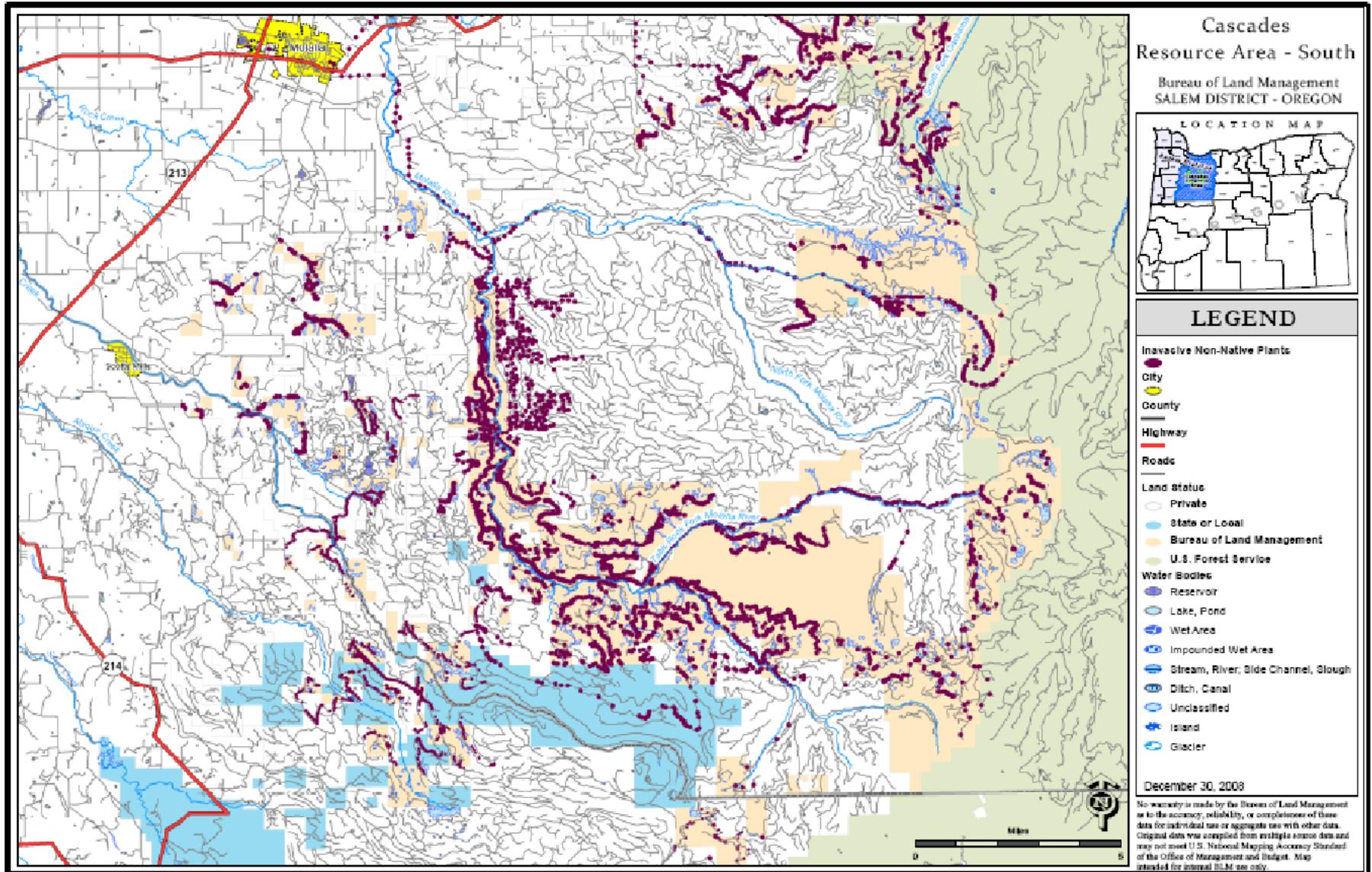


Figure 9 Invasive Infestations Cascades Resource Area South

3.2 Vegetation

Affected Environment

Invasive species have invaded forest and riparian reserves mainly by the transportation system, although wind and animals are also vectors for moving the seed. Areas where the vegetation has been disturbed, whether naturally or by man, are the most susceptible. Invasive species utilize cover ability to block the sun from native species preventing photosynthesis from occurring. Dominance of invasive species over native plants alters and degrades native wildlife habitats and contributes to the depletion of ecological health. Dense cover can also prevent native species from seeding and reduce the biodiversity of a site; the impacts from invasive species make management a key part of maintaining the healthy ecological system.

Riparian vegetation along the rivers actively interacts with the river providing a multitude of functions, including: slowing flood flows, filtering sediment, contributing organic materials, and providing hiding cover for fish. Riparian hardwoods also serve as important habitat for many bryophyte and lichen species that require a humid cool environment. Invasive species, such as knotweeds, can completely dominate the riparian area and crowd out the native vegetation and alter river channels.

Special Status Plant Species

There are many known populations of BLM special status plant species in the resource area. Through time, the natural forces of rain, wind, and erosion created a complex environment. The adaptive responses of plants to these environmental factors have resulted in a diverse and complex flora and fauna in many parts of the resource area. Moist and swampy areas (resulting from numerous springs) establish conditions for wetland plants while rocky south-facing openings offer hot and dry conditions favoring other species.

Natural disturbances (fire, flood, and windstorm) have been frequent in the past. Such natural disturbances fragment ecological communities causing many types and stages of species succession. Although disturbance is a natural part of the ecological cycle, these disturbed areas are susceptible to invasive species infestations.

Most special status and rare native species cannot out-compete invasive species. One example is tall bugbane (*Cimicifuga elata*), a native that grows along roadsides, fence rows and forested environments; it is susceptible to invasive species domination. An area in the Neal Creek area has an invasive Himalayan blackberry (*Rubus discolor*) population that is on the increase and threatening to take over and exclude the rare Tall Bugbane.

Environmental Effects

3.2.1 Alternative A

Targeted Species (EA Table 1): Mortality or severe injury of plants, eradication, reduction or control of populations, and reduction and/or prevention of seed production would be the direct effect to targeted invasive species from all treatment methods.

Biological treatments and manual control methods would generally only affect targeted species therefore improving the biodiversity of a given area. Depending on the method of chemical treatment (i.e. type of application) there would be little to no impact beyond target species.

Non-Targeted Species: Mechanical treatments could affect non-targeted species if mowing or disking is used. Some non-targeted species may also be killed or injured because of herbicide exposure. Eradication or control methods that cause the least damage would be used for treatment of invasive species near known sites of special status species.

Overall Landscape: The indirect and cumulative effects of the proposed action would be restoration over time of native habitats, ecosystem services, biodiversity, and natural river flows. This project does not prevent the attainment of any of the Aquatic Conservation Strategy Objectives (Section 3.8). The proposed action would be a better landscape-level management approach because it proposes to manage invasive species more effectively by using the most effective combination of control methods.

3.2.2 Alternative B

Targeted Species (EA Table 1): Impacts are similar to Alternative A, except it may eliminate the ability to eradicate or control some target species effectively.

Non-Targeted Species: There could be adverse effects to sensitive native populations that are overwhelmed from invasive species that require the use of herbicides for control or eradication. Invasive species could displace native species and degrade native species' habitats.

Overall Landscape: Controlling invasive species throughout a watershed in the Cascades RA increases the effectiveness of control efforts. Knotweed would have dominated the streambanks of the Sandy River or other waterways and prevented native species from growing without the Sandy River Riparian Habitat Protection Project with the TNC and involved landowners from 2002 to 2008. Over the past 8 years, the project has achieved a high level of control including a 90% reduction in knotweed stem in the watershed and reduced the overall infestation area to less than 5% of its original cover (TNC report, 2008).

3.2.3 No Action Alternative

Targeted Species (EA Table 1): Impacts are similar to Alternative B, since some control of listed noxious weeds is required by law.

Non-Targeted Species: There could be adverse effects to sensitive native populations that are overwhelmed from invasive species that require the use of herbicides for control or eradication.

3.3 Water and Soil Resources (Water Quality, Aquatic Habitat, Fisheries, and Soil)

Affected Environment

Water

Because water is so vital in ecosystems, invasive species in wetlands and along rivers and streams can have major impacts on the entire riparian and upland ecosystems. The Cascades RA has over 2100 miles of streams, half of which support fish populations. In general, these streams have good water quality and are cool and clear. However, sedimentation, turbidity, and nutrient recycling are a concern in streams that are listed as water quality limited by the Oregon Department of Environmental Quality (<http://www.oregon.gov/DEQ/WQ/>).

According to the Resource Management Plan (RMP) the beneficial uses within resource area are resident and anadromous fish, municipal water, domestic, irrigation use, and water contact recreation. The predominant non-consumptive uses of water on BLM lands are propagation of salmonids and other fish and aquatic life. There are several municipal watersheds within the resource area.

Knotweed (*Polygonum cuspidatum* and *P. sachalinense*) has invaded 41 miles of the Sandy River riparian area, from its headwaters to the confluence with the Columbia. Knotweed grows extremely fast (10 feet + in 2 months), and expands by rhizomes very rapidly. It can spread via root fragments and/or stems during floods, which allow it to quickly occupy newly deposited flood debris and other disturbed sites and permanently replace slower growing native vegetation, even in undisturbed sites. Prime habitat for knotweed includes floodplains, back channels, ox bows, flood channels, and any place where floods deposit debris or where river water slows; in short, prime wintering habitat for salmonids. Despite the aggressive spread of knotweed and other invasive species, many are still at a point that is manageable if treated in the near future (See TNC report for 2008 www.nature.oreg/oregon)

Fish

The Cascades RA contains populations of anadromous fish species, as well as several resident species. Invasive species, such as knotweed, holly, ivy, periwinkle, bouncing bet (*Saponaria officinalis*), and butterfly bush on the Sandy River, are altering the vegetative composition along the streams.

Invasive species have an adverse effect on floodplain function, sediment delivery, and erosion. False brome on the North Santiam River can completely dominate the understory on the floodplain. Efforts to restore fish habitat may be impaired by the presence of dense patches of false-brome and knotweed along rivers in the resource area. Disturbance of the vegetation along the riverbanks could increase populations of invasive species and reduce the establishment of native riparian vegetation that provides shade and structure for fish habitat.



Figure 10: False brome invading a riparian area

Soil

Invasive species occur on different soil types throughout the area. Soils that have been disturbed (roadsides, rock quarries, heavily used recreation areas, and dry, nutrient deficient sites) have the greatest populations of invasive species. Some invasive species, such as knapweed (*Centaurea*), can thrive on very poor, rocky shallow soils along roads and out-compete native vegetation.

Invasive species that alter hydrologic cycles, sediment deposition, erosion, and other ecosystem processes can cause serious ecological damage (Vitousek, 1986). Some invasive species allow excessive water run-off contributing to increased ecological soil damage. In contrast, native species utilize and absorb all needed water before allowing run-off to occur. Tap-rooted invasive species such as spotted knapweed can increase surface runoff and soil erosion rates (Lacey, et al., 1989). Other invasive species, such as salt cedar may lower water tables and trap more sediment than native species altering water channels (Blackburn, 1982). Blackberry and English ivy out-compete desirable native species that have greater soil stabilizing capacity.

Environmental Effects

The environmental effects in the following sections apply equally to water, fish, and soils.

3.3.1 Alternative A (Proposed Action)

Cultural, Physical, And Biological Treatments: Cultural, physical and biological treatments would have negligible impacts on water quality. Hand pulling of plants would cause minimal, short-term disturbance of soil and undetectable impacts to water quality, aquatic habitats, and fish populations. Mechanical mowing or addition of biological control agents would not affect soil and water resources. The use of prescribed fire would not be used in highly erodible areas such as steep slopes, and would only cause limited to minor localized soil erosion.

Competitive seeding/planting along roadsides would reduce the area open for soil erosion and improve soil stability. The risks of any negative adverse impacts are reduced with the Project Design Features (see Section 2.2.2.9).

Chemical Treatments: Treatment methods are selected due to their low potential for adversely affecting aquatic species and facilitation of riparian restoration through invasive plant control (NOAA 2008).

The isolated use and application procedures (i.e. spraying individual plants and/or wicking) would help to prevent herbicides from reaching streams and affecting fisheries. Few impacts to water resources or water quality would be expected when the manufacturer's label requirements for use are followed, and project design and mitigation measures are implemented. Only Glyphosate (aquatic-approved version) is currently approved for use near or adjacent to water, and its use would have little effect on fish and aquatic habitats (VEIS 1991, NOAA 2008). When chemical control methods (i.e. Glyphosate) are used, only a very small amount would enter the water and would not likely kill any aquatic invertebrates or fish because of its low toxicity level to aquatic organisms (NOAA 2008).

Additionally, application techniques and timing would minimize risk of water and soil contamination, and leaching into streams (VEIS, 1991, NOAA 2008). Some herbicide residue could enter waterways through overland flow if a large rain event occurred shortly after application. The risk of negative impacts would be minimal because of rapid dilution. No adverse impacts to floodplains have been identified. The risk of impacts to water and soil resources is greatly reduced with implementation of the Project Design Features (see Section 2.2.2.9).

Federally listed fish populations and habitats would not be impacted by the treatment of invasive plants in riparian areas due to the treatments being limited in scope, frequency, and type to that delineated in NOAA's (2008) biological opinion regarding the implementation of fish habitat restoration actions. NOAA's (2008) biological opinion provides guidance for the general criteria for the use of herbicides limit daily-use, efficient volatilization, application, spill prevention, and equipment cleaning. Current laws and policies require a certified/licensed pesticide applicator to oversee all herbicide application projects. Project actions will follow all provisions, requirements, and permits of the Clean Water Act for water quality standards as described by Oregon Department of Environmental quality (NOAA 2008).

Compared to Alternative B and the No Action alternative, this alternative would allow for the restoration of riparian areas invaded by large populations of invasive species such as knotweed, spotted knapweed, and false brome. Currently, the only successful method for controlling and eliminating large populations of these invasive species in riparian areas is through chemical treatments.

3.3.2 Alternative B

The effects of cultural, physical, and biological treatments are identical to the Proposed Action with the following exception. If invasive species are treated only through manual/mechanical treatments, large populations of invasive plants in riparian areas would continue to expand and replace native species on BLM and other land ownerships and have effects similar to the No Action Alternative. With no chemical treatments, current aquatic conditions would be maintained only in areas with small populations of invasive species that can be successfully treated with mechanical or biological treatments.

3.3.3 No Action Alternative

The “no action” alternative would result in the continuation of current conditions and trends at this site as described in the *Affected Environment*. Large populations of invasive species in riparian areas would continue to expand and replace native species on BLM and other land ownerships. Knotweed expansion is expected to reduce riparian and aquatic habitat quality in the Sandy River basin because stream shading from native riparian vegetation will be lost as knotweed replaces native species. Similarly, false brome would continue to invade riparian areas on North Santiam River and Quartzville Creek.

Depending on the species and its relationship to conditions around it, undesirable results could occur. Undesirable impacts occur with each invasive species, but types of impacts differ by species. For instance, spotted knapweed is generally not a dense cover and produces compounds to prevent other plants from growing near it; therefore, much of the soil is left bare and more susceptible to erosion. Knotweeds can completely take over a site, especially on streambanks. The indirect and cumulative effects would be the loss of native vegetation, which is adapted to the soil and water conditions present on the site. Native vegetation takes longer to establish and regenerate; the invasive plant species use this opportunity as the upper hand to cover more area therefore allowing for more erosion to occur. Native plants hold the soil in place to help prevent excessive erosion and increased sedimentation into streams.

3.4 Wildlife

Affected Environment

The Cascades RA provides diverse habitat for the full complement of wildlife species in the Western Oregon Cascades Province. The different age classes and dominant forest types offer many different habitats, along with special habitats such as meadows, rocky outcrops, rivers, ponds and cliffs.

Invasive plant species impact the composition, structure and functioning of the surrounding environment and its ability to provide suitable habitat for native fauna. These alterations change the way a species interacts with its environment, which may require more energy and increase the threat of predation. For example, when an invasive species such as false brome dominates the vegetation, it may have negative effects on forage and cover for small and large mammals, native insects, and songbirds. Another example, purple loosestrife, reduces desirable waterfowl plants such as cattails that are preferred habitats for muskrats and long-billed marsh wrens (Rawinski and Malecki, 1984).

Native wildlife has adapted to native vegetation for food, shelter, and breeding. Replacement of native plant species with invasive species has resulted in altered and degraded native habitats, reducing wildlife habitat quality. The greatest impacts to conifer forest habitats from invasive species occur in the understory when small or large openings are created in the overstory forest canopy. Changes occur in the ground cover and understory layers of forest stands, affecting the species mix of grasses, forbs and shrubs. These habitat alterations can result in indirect effects to the prey base for species higher on the food chain.

For example, migratory birds, invertebrates, and amphibians can be affected by habitat degradation due to the establishment and spread of invasive plants. These species and their prey depend on native vegetation, and invasive plant species do not provide high quality vegetation for food, cover and breeding.

Environmental Effects

3.4.1 Alternative A (Proposed Action)

The direct effects of control treatments to Special Status Wildlife Species is expected to be minor because most treatment areas are located in highly disturbed areas, typically along roadsides. No Special Status wildlife species commonly utilize habitat in highly disturbed areas immediately adjacent to roadways that are often sparsely vegetated and often occupied by invasive species.

The presence and spread of invasive species has negative short-term, long-term, and cumulative impacts on native wildlife species. Controlling invasive species and encouraging native species would help restore native wildlife habitats, providing higher quality habitat for many wildlife species, including migratory birds, invertebrates, and amphibians. Removal of invasive species along waterways will contribute to improved biodiversity in the riparian areas and provide higher quality habitat for wildlife.

Physical Control: Mowing of ditches could disturb ground-nesting birds and result in unintentional take, if conducted during the nesting season. Mowing would also remove cover for small ground dwelling mammals. The noise disturbance associated with mechanical removal could disturb sensitive breeding sites for spotted owls or bald eagles, requiring seasonal restrictions within disruption distance of known sites.

These impacts to cover and/or forage for birds and mammals from prescribed fire would not be extensive enough to affect populations because project design features would limit the size of the treatment areas and intensity of prescribed fire. Over the long term, the effects of invasive control would be beneficial because they would help restore native habitats and plant communities and prevent additional degradation due to invasions.

Biological Control: The use of biological controls, like parasites, predators, pathogens, and competitive native species should not negatively affect any wildlife species (Harris, 1991). All introduced biological control species would be tested prior to release to verify compatibility with native species and host-specificity (controls inhibit only target invasive species). The use of biological controls represents no likely disruption to native insect populations.

Chemical Control: Implementation of this alternative would have the greatest possibility of directly, indirectly, or cumulatively affecting wildlife species immediately following the application of herbicides. The risk to wildlife species would be a risk of sickness or death because of being inadvertently exposed to the herbicide. The risk of exposure would be very low to non-existent risk with hand or ground based application of herbicides and the low number of acres treated (VEIS, 1991). The general application of chemical treatments is in a form and at such low rates that they do not represent an impact to herbivores.

However, there is potential for bioaccumulation, or slow uptake into the food chain with repetitive use of some herbicides if used outside the labeled directions for use. Using herbicides in accordance with the labels and with using proper application equipment would minimize any foreseeable adverse affects.

3.4.2 Alternative B

This alternative will have the same effects to wildlife as the Alternative A with the exception of the herbicides. Without the use of herbicides, this alternative is not expected to slow the spread of some invasive weeds before adverse, negative impacts to wildlife habitats are noted. Many habitats would not be treated effectively without efficient and cost effective control measures such as the use of herbicide. The opportunity for early detection and rapid response to control invasive plant infestations may be delayed.

3.4.3 No Action Alternative

Habitat with invasive plant species have the potential to affect native wildlife species until restoration of the preferred native wildlife habitat occurs. A continuous spread of invasive species would have different short and long-term impacts on birds and terrestrial mammals. In the short-term, direct, indirect, and cumulative effects on native species would be negligible. Over the long-term, reduction in forage or cover from invasive species could directly affect native wildlife dependent on native herbaceous vegetation. For example, seed-eating birds or small mammals such as voles could experience negative impact from losses to seed food source as invasive species replace native vegetation. Losses of cover provided by native vegetation could impact ground dwelling species and decline in prey could directly affect predators such as red-tailed hawks and weasels.

3.5 Recreation and Visual Resources

Affected Environment

3.5.1 Recreation

The Cascades RA has a range of recreational uses from wilderness to developed campgrounds. Use of the area has been rising at rates at least as great as the rate of population growth for Portland. Some of the main recreational uses within the resource area are fishing, hunting, hiking, river rafting, picnicking, swimming, nature study, OHV (off-road highway Vehicle), mining, camping, GPS navigation, orienteering, and scenic driving.

Multiple use non-motorized trails are more difficult and costly to maintain with heavy infestations of Scotch broom, thistle, and/or Himalayan blackberry. Invasive species also distract or block the scenic quality and experience of a person trying to enjoy the outdoors. Blackberry bushes and thistle have aggressive thorns that can make for a painful experience when overgrowing trails. A large expanse of non-native blackberry, Scotch broom, or ivy instead of native trillium on a forest floor of oxalis diminishes aesthetic values while hiking.

3.5.2 Visual Resources

Several areas of the Cascades RA are especially scenic, which has resulted in congressional designations of segments of wild and scenic rivers. Segments of the Sandy River, the Salmon River, and Quartzville Creek were designated for outstanding scenic values along with the Mt. Hood Corridor. Many people drive the forest roads to appreciate the scenic forest. Invasive species, commonly found along roads, have an adverse effect on scenic quality.

Environmental Effects

3.5.3 Alternative A (Proposed Action)

3.5.3.1 Recreation

Temporary closures of recreational areas and facilities during and chemical and mechanical treatments could inconvenience the public seeking recreation and leisure activities on public lands (recreationists would not be exposed to chemical treatments). Manual and mechanical treatments would have no significant impact because of the size of the areas treated and targeted removal of invasive species.

Elimination and control of invasive species and promotion of native species should serve to maintain a high quality experience for recreating visitors. It would also reduce the spread of invasive species to other recreation sites from recreational visitors traveling between contaminated areas. The indirect and cumulative effects would present no significant or foreseeable impact to the recreational environment. The result of treatments would promote native habitats and increase high quality experiences for visitors.

3.5.3.2 Visual Resources

The control and eradication of invasive species would enhance the scenic quality. As a result of the proposed treatments, visual impacts would be short duration (one or two years) while the site is restored with native vegetation. Where individual plants or small groups of plants are treated, the effect would most likely not be noticeable to the casual public land user. Native seeding and planting would likely follow treatments.

3.5.4 Alternative B

3.5.4.1 Recreation

Direct effects are similar to Alternative A and could still include closures despite not using herbicides. Indirect and cumulative effects are also similar with the exception that failure to utilize chemical controls. Some invasive species cannot be controlled without chemical treatments individually or in combinations with other control methods. Uncontrolled invasive plants degrade habitat and reduce the aesthetic and recreational quality of the environment. This could result in loss of recreational and educational opportunities as invasive plants displace native species. Invasives species such as English ivy and non-native blackberry can form dense coverage blocking access to trails and completely eliminate native species.

3.5.4.2 *Visual Resources*

The impacts would be similar to the proposed action in Alternative A with the exception that some invasive species would escape control with cultural, physical, and biological treatments alone.

3.5.5 **No Action Alternative**

There would be no interruption to recreation use under this alternative. No temporary closures of recreational areas and facilities would take place because no treatments would be performed. Conditions described in the affected environment would continue.

3.6 **Other Elements of the Environment Based On Authorities and Management Direction**

Table 2: Elements of the Environment to be analyzed based on Authorities and Management Direction

<i>Element of the Environment /Authority</i>	<i>Remarks/Effects</i>
Air Quality (Clean Air Act as amended (42 USC 7401 et seq.)	This project is in compliance with this direction because air quality impacts would be of short duration (one burn period during implementation of prescribed fire). Burning could temporarily reduce air quality until the gases and particulates that make up smoke are dissipated or dispersed in the atmosphere (EA Section 2.0).
Cultural Resources (National Historic Preservation Act, as amended (16 USC 470) [40 CFR 1508.27(b)(3)], [40 CFR 1508.27(b)(8)])	This project is in compliance with this direction and the project would have no effect on this element because cultural resource inventories of the affected area would precede management actions that include any ground disturbing activities that could potentially damage cultural resources.
Ecologically critical areas [40 CFR 1508.27(b)(3)]	Project design features (EA sections 2.2.2.9) would protect ecologically critical areas. Treatments are expected to reduce or eliminate the adverse effects invasive species are having on natural habitats (EA section 3.2, 3.3, 3.4)
Energy Policy (Executive Order 13212)	This project is in compliance with this direction because this project would not interfere with the Energy Policy (Executive Order 13212).
Environmental Justice (E.O. 12898, "Environmental Justice" February 11, 1994)	This project is in compliance with this direction because project would have no effect on low income populations.
Fish Habitat, Essential (Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002)	This project is in compliance with this direction because NOAA's Biological Opinion (2008) found habitat restoration actions would not result in adverse modification of EFH. Effects to this element are addressed in text (EA Section 3.3).
Farm Lands, Prime [40 CFR 1508.27(b)(3)]	The project would have no effect on this element because no prime farm lands are present on BLM land within the Cascades RA.
Floodplains (E.O. 11988, as amended, Floodplain Management, 5/24/77)	This project is in compliance with this direction because the proposed treatments would not change or affect floodplain functions.

<i>Element of the Environment /Authority</i>	<i>Remarks/Effects</i>
Hazardous or Solid Wastes (Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.) Comprehensive Environmental Response Compensation, and Liability Act of 1980, as amended (43 USC 9615)	Although herbicides are considered a hazardous material, this project is in compliance with this direction because no unacceptable impacts are anticipated by following the label for application and disposal. Effects to this element are addressed in text (EA Section 2.2.2.9, 3.3, 3.4).
Healthy Forests Restoration Act (Healthy Forests Restoration Act of 2003 (P.L. 108-148)	This project is in compliance with this direction and the project would have no effect on this element because treatments would decrease the risk of fire and help restore forests to healthy functioning native habitat (EA Section 3.2)
Migratory Birds (Migratory Bird Act of 1918, as amended (16 USC 703 et seq)	This project is in compliance with this direction because treatments would restore natural resources that could degrade habitat for migratory birds. Addressed in text (EA Section 3.4).
Native American Religious Concerns (American Indian Religious Freedom Act of 1978 (42 USC 1996)	This project is in compliance with this direction because no Native American religious concerns were identified during the scoping period (EA section 5.2).
Noxious weed or non-Invasive, Species (Federal Noxious Weed Control Act and Executive Order 13112)	This project is in compliance with this direction because the purpose of the project is to meet this authority (EA Sections 1.2, 1.3)
Park lands [40 CFR 1508.27(b)(3)]	Addressed in text (EA Section 3.5).
Public Health and Safety [40 CFR 1508.27(b)(2)]	Safety along roads would be improved because vegetation could be controlled through multiple integrated methods. Species, such as Scotch broom have a higher likelihood of carrying fire away from the road, so control of all roadside vegetation is important in high-use areas where ignitions from passing vehicles could ignite wildfires. Effects of herbicides on humans can also be found in Chapter 9 of Oregon Pesticide Applicators Manual (OPAM) and in the Material Safety Data Sheets. The greatest health risk is to workers applying the herbicides. To ensure pesticides are applied safely and effectively, anyone handling and applying herbicides on public land within the Cascades RA would be certified and licensed by the ODA or the U.S. Department of Interior in the proper methods of handling and applying herbicides. By following the manufacturer's label and procedures in OPAM, no unacceptable effects to users are anticipated.
Threatened or Endangered Species (Endangered Species Act of 1983, as amended (16 USC 1531)	This project is in compliance with this direction because there would be no adverse effects on Threatened or Endangered Species (EA Section 3.3, 3.4).
Water Quality –Drinking, Ground (Safe Drinking Water Act, as amended (43 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	This project is in compliance with this direction because treatments would reduce invasive plants that could degrade water quality. Addressed in text (EA Sections 2.2.2.9, 0, 3.4)
Wetlands (E.O. 11990 Protection of Wetlands 5/24/77) [40 CFR 1508.27(b)(3)]	This project is in compliance with this direction because treatments would reduce invasive plants that could degrade wetlands. Addressed in text (EA Section 3.3, 3.4)
Wild and Scenic Rivers (Wild and Scenic Rivers Act, as amended (16 USC 1271) [40 CFR 1508.27(b)(3)]	This project is in compliance with this direction because treatments would reduce invasive plants that could degrade the visual quality of rivers Addressed in text (EA Section 3.5)
Wilderness (Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.)	This project is in compliance with this direction because treatments would reduce invasive plants that could degrade wilderness. Addressed in Text (EA Sections 2.2.2.9, 3.0)

3.7 Comparison of Alternatives with to the Decision Factors

This section compares the alternatives with regard to the following Decision Factors, which are described in EA section 1.2.3.

3.7.1 Decision Factors

The extent to which the alternatives would:

- Avoid introducing or spreading invasive infestations. This is to reduce and control these populations below levels that cause either undue or unnecessary environmental degradation or impair the public lands' economic productivity.
- Eradicate newly invading species before they establish on public lands.
- Maintain integrity and sustainability of natural resources and ecosystem services against the threat of invasions.
- Implement the seven goals identified in Partners against Weeds (an Action Plan for the BLM), January 1996. (Goal 1: Prevention and Detection, Goal 2: Education and Awareness, Goal 3: Inventory, Goal 4: Planning, Goal 5: Integrated Weed Management, Goal 6: Coordination, Goal 7: Monitoring, Evaluation, Research and Technology Transfer Program Implementation.

3.7.1.1 *Alternative A (Proposed Action)*

The proposed action would result in 1) increased public knowledge and awareness of invasive species problem, 2) a better inventory of invasive species, 3) a reduction in new infestations, 4) containment, and reduction of large infestations, and 5) improved ecosystem health for uplands and riparian areas throughout the Cascades RA. The use of herbicides increases the probability that there will be a reduction in new weed infestations and control of certain invasive species (i.e., knotweed and knapweed). Coordination and cooperative implementation of control measures using appropriate equipment, observing labeled application, and employing only certified personnel would minimize reduce the risk of effects (EA sections 2.2.2.9, 3.1-3.6).

3.7.1.2 *Alternative B*

The effectiveness of using only manual, mechanical and biological controls on certain invasive species is limited at preventing the spread and proliferation of infestations. Restricting the use of chemical controls may result in an increase in invasive species spread and encourage the continued degradation of native habitat and healthy ecosystem functions.

3.8 Compliance with the Aquatic Conservation Strategy

Based on the environmental analysis described in the previous sections of the EA, the BLM has determined that the project complies with the ACS on the project (site) scale. The following describes how the project complies with the four components and nine objectives of the Aquatic Conservation Strategy.

3.8.1 Four Components of the Aquatic Conservation Strategy

The BLM has reviewed this project against the ACS objectives at the project or site scale with the following results.

Component 1 - Riparian Reserves: The project would comply with Component 1 by reducing invasive species populations, preventing new infestations, restoring native ecosystems within Riparian Reserves. Addressed in text (EA section 3.2-3.6)

Component 2 - Key Watershed: The project would comply with Component 2 by establishing following standards and guidelines associated with Key watersheds (EA section 2.2.2.9).

Component 3 - Watershed Analysis: The project would comply with Component 3 because all of the Cascades RA's watershed analyses have addressed exotic and introduced species of concern and the need for the control and/or eradication. This project would comply with ACS component 3 and ACS objectives by addressing terrestrial recommendations for reducing noxious weed, and aquatic recommendations for water quality.

Component 4 - Watershed Restoration: The project would comply with Component 4 by restoring native ecosystems within Riparian Reserves (EA sections 2.2.2.9, 3.2, 3.3)

3.8.1.1 Aquatic Conservation Strategy (ACS) Objectives

Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Action Alternatives: The removal and/or control of invasive species under Alternative A would help ensure that the lands are managed in compliance with the ACS objectives. The riparian and wetland habitat on the lands would be protected from invasive species, which would encourage a diversity of native species. This would contribute toward maintaining the complexity of aquatic systems. Removal and/or control of certain invasive species are unobtainable under Alternative B.

No Action Alternative: The no action alternative would have an adverse effect on this objective. Noxious weed would still be treated under the No Action Alternative; however other invasives would persist and may increase as disturbances increase over time.

Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia.

Action Alternatives: The invasive species management program as outlined in Alternative A would restore some of the wetlands, floodplains and uplands. Species such as Japanese knotweed can quickly take over riparian sites and crowd out native species destroying any connecting habitats. Controlling invasive species infestations would restore connecting habitats. Species such as the knotweed may not be controlled without the use of herbicides under Alternative B.

No Action Alternative: see ACS Objective 1, above

Objective 3: Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Action Alternatives: Most invasive species do not stabilize soils nor do they provide the habitat needed for floodplains. Native species that have adapted over the years to the streams and river ecology would provide greater protection to the shoreline and banks. Under Alternative A species such as the Japanese knotweed that can easily establish in floodplains on the Sandy River are controllable with the use of herbicides. Alternative B does not have the option of herbicide use, so control will not be as successful.

No Action Alternative: see ACS Objective 1, above

Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and the benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Action Alternatives: As discussed above, the invasive species management would increase the amount of native riparian and wetland habitats managed for ACS objectives and contribute toward meeting this objective especially with restoration efforts on the disturbed lands. Alternative A has more options and has a greater success meeting the objective than Alternative B.

No Action Alternative: see ACS Objective 1, above

Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of sediment regime include timing, volume, rate, and character of sediment input, storage, and transport.

Action Alternatives: Changes in the sediment regime could occur if invasive species such as knotweed were allowed to become the dominant species. By controlling or eradicating invasive species, native species, which have adapted to high and low water flows, are more likely to maintain and restore the sediment regime. The Nature Conservancy has found that applying herbicide to the cut end of Japanese knotweed is the most effective way of controlling and eradicating this species. This would only be an option under Alternative A and not Alternative B.

No Action Alternative: see ACS Objective 1, above

Objective 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Action Alternatives: An invasive species management program would work to maintain and restore natural in-stream flows by providing native vegetation along riparian areas, which have adapted to high and low flow regimes. Alternative A has more options for controlling species than Alternative B.

No Action Alternative: see ACS Objective 1, above

Objective 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Action Alternatives: Any floodplains and meadows that have invasive species will be prioritized for management since inundation could help spread invasive species downstream. The proposed management action should help maintain and restore this objective. Use of chemical controls under Alternative A will help restore native vegetation on floodplains being invaded by knotweed (or any other invasive species that may develop in the riparian areas). Control is less likely under Alternative B.

No Action Alternative: see ACS Objective 1, above

Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Action Alternatives: Invasive species management will help restore diversity of native communities by allowing native species to repopulate sites. Native species are adapted to the conditions and ecological processes in riparian areas and wetlands. See ACS objective 7, above.

No Action Alternative: see ACS Objective 1, above

Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Action Alternatives: Invasive species tend to create monocultures and crowd out the native species. Using an integrated approach and eradicating some of the most invasive species can accomplish a more effective and successful restoration effort. Alternative A allows for the use of chemicals that when applied directly on the target species has shown effective control of invasive species such as knotweed, which can create monocultures. Alternative B does not include this option and invasive species may escape control.

No Action Alternative: see ACS Objective 1, above

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5.0 CONTACTS AND CONSULTATION

5.1 Consultation

5.1.1 ESA Section 7 Consultation

5.1.1.1 *Fish and Wildlife Service*

Project Consultation: It is anticipated that most of these projects would be disturbance related and would have no effects on Threatened or Endangered terrestrial species (spotted owls) due to the nature and locations of these treatments. Pursuant to Section 7 of the Endangered Species Act, any of these projects that May Affect spotted owls would be consulted on with the United States Fish and Wildlife Service under programmatic habitat modification and/or disturbance related consultations. Activities within disruption distance of known spotted owl sites would be seasonally restricted.

5.1.1.2 *Fish Consultation with NOAA's National Marine Fisheries Service (NMFS)*

The BLM fisheries biologist has determined that the proposed invasive plant treatments outside of the Riparian Reserve land use allocation would have no effect on Threatened or Endangered Fisheries. Within the Riparian Reserve land use allocation, proposed cultural, physical, biological control methods are covered under the Biological Opinion for Fish Habitat Restoration Activities Biological Opinion (ARBO) (June 2008) pp. 23- 34.

For chemical control outside the guidelines outlined in the ARBO, the BLM will reinitiate consultation with NMFS prior to project implementation. Additionally, the project would incorporate any additional design features required as a result of the Terms and Conditions contained within the corresponding Biological Opinion.

5.1.2 Cultural Resources - Section 106 Consultations with State Historical Preservation Office:

The project area occurs in the physiographic region of the Western Cascades. Survey techniques are based on those described in Appendix A of the Protocol for Managing Cultural Resource on Lands Administered by the Bureau of Land Management in Oregon. Pre-project survey and post-project survey would be conducted according to standards defined in the Protocol Appendix A. Ground disturbing work would be suspended if cultural material is discovered during project work until an archaeologist can assess the significance of the discovery.

5.2 Public Scoping and Notification - Tribal Governments, Adjacent Landowners, General Public, and State County and local government offices

The Invasive Non-native Plant Management project was included in the September 2008 and December 2008 Project Update newsletters. No comments were received on this project.

6.0 REFERENCES / GLOSSARY

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6.2 Glossary

Invasive Species (also called invasive plants or target plants) – In this document the species targeted for management and control are invasive non-native plant species and will be called invasive species, invasive plants, or target plants.

Major Issue - An issue within the scope of a proposed action, which is used to formulate
Non-target Plants – Treatments are not directed at these plants, although they may be affected because of their location.

Target Plants – Treatments are directed at these specific plants to control or eradicate.