

Draft Environmental Impact Statement *Summary* Bureau of Land Management



Vegetation Treatments Using Herbicides on BLM Lands in Oregon



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest 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 our 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.

Cover: Southeast of Richland along the Brownlee Reservoir (Snake River), a rancher views vast stands of medusahead (a noxious weed). The area is mixed BLM/private ownership (photographer: Matt Kniesel).

Because science cannot, in any practical sense, assure safety through any testing regime, pesticide use should be approached cautiously. (EPA scoping comment, July 28, 2008)

Our present technologies for countering invasive non-native weeds are rudimentary and few: control by biological agents, manual eradication, mechanized removal, fire, and herbicides. All have limitations; all are essential (Jake Sigg, California Native Plant Society 1999)



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
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Portland, Oregon 97208

IN REPLY REFER TO:

9015(OR932)

SEP 11 2009

Dear Reader:

Attached is the *Summary of the Draft Environmental Impact Statement (DEIS) for Vegetation Treatments Using Herbicides on BLM Lands in Oregon* or the complete *DEIS*, depending upon which you requested when you asked to be on the mailing list. The Bureau of Land Management (BLM) prepared the *DEIS* to address the affects of a proposal to add additional herbicides to the ones BLM already uses to control noxious weeds in Oregon, and to expand the uses of those herbicides beyond just the control of noxious weeds.

The 60-day comment period begins with publication of the Notice of Availability in the *Federal Register*, which is expected to occur on September 11, 2009. The comment period is expected to close November 10, 2009. Changes in these dates will be published on the website listed on the title page. The purpose of the comment period is to ensure the Final EIS includes an appropriate range of reasonable alternatives to the proposed action, and that the analysis of effects is complete, appropriately presenting and interpreting the available published information. The BLM asks that those submitting comments on the *DEIS* make them as specific as possible.

For those of you receiving only the *Summary*, be aware that the information included in it is necessarily brief, and does not include most of the references, tables, and appendices included in the body of the *DEIS*. While you are welcome to comment on the *Summary*, comments about missing or misinterpreted technical information, alternatives that should have been considered, or other similar substantive comments may wish to request a copy of the full *DEIS* at the address listed on the title page, or access it online, and direct comments to sections within the *DEIS*.

Reviewers should provide their comments during the comment period. This will enable the BLM to analyze and respond to the comments at one time and to use information acquired in the preparation of the Final EIS, thus avoiding undue delay in the decision-making process. Reviewers have an obligation to “structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer’s position and contentions.” *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 552 (1978).” *Dept. of Transportation v. Public Citizen*, 541 U.S. 752, 764 (2004). Therefore, environmental concerns that could have been raised at the draft stage may be forfeited if

not raised until after completion of the Final EIS. Comments on the DEIS should be specific and should address the adequacy of the DEIS and the merits of the alternatives discussed (40 CFR 1503.3).

Comments received in response to this solicitation, including names and addresses, will be considered part of the public record on this DEIS and are available for public inspection. Comments, including names and addresses, may be published as part of the Final EIS. If you wish to withhold your name or address from public review, or from disclosure under the Freedom of Information Act (FOIA), you must state this prominently at the beginning of your written comments. Additionally, pursuant to 7 CFR 1.27(d), any person may request that submissions be withheld from the public record by showing how the FOIA permits such confidentiality. Persons requesting such confidentiality should be aware that under FOIA, confidentiality may be granted in only very limited circumstances, such as to protect confidential business information. The requester will be informed of the BLM decision regarding the request for confidentiality. Where the request is denied, the comments will be returned to the requester, and the requester will be notified that the comments may be resubmitted with or without name and address. Comments submitted anonymously will be accepted and considered. Anonymous comments do not create standing or a record of participation. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or business, will be available for public inspection in their entirety.

For further information on this EIS, contact Todd Thomson, BLM Restoration Coordinator, P.O. Box 2965, Portland OR 97208, or via telephone at 503 808-6326 or email the EIS Team at the address on the title page.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward W. Shepard". The signature is fluid and cursive, with a large initial "E" and "S".

Edward W. Shepard
State Director,
Oregon/Washington

Thank you for your interest in public land management. We look forward to receiving your comments on the DEIS.

Enclosure

- 1 – Draft Environmental Impact Statement and/or
- 1 – Draft Environmental Impact Statement Summary

Summary
**Vegetation Treatments Using Herbicides
on BLM Lands in Oregon
Draft Environmental Impact Statement**

Bureau of Land Management

September 2009

Responsible Official:	Edward W. Shepard, Oregon/Washington Bureau of Land Management State Director
Information Contact:	Todd Thompson Restoration Coordinator Bureau of Land Management PO Box 2965 Portland OR 97208-2965 (503) 808-6326

The Draft EIS is available for public review for 60 days beginning with publication of the Notice of Availability in the *Federal Register*, expected to take place on September 11, 2009. Actual publication date will be noted on the web site below. Assuming publication on September 11, the 60-day public comment period would end on November 10, 2009.

MAIL COMMENTS TO:

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Copies of this document are also available online at <http://www.blm.gov/or/plans/vegtrtmentseis/>. Printed copies or a CD version can be obtained by contacting the Vegetation Treatments EIS Team at the addresses above.

Notice

This is a Draft EIS and a public comment period will run for 60 days. Instructions for commenting, and a description of future appeal rights that may be forgone if you do not comment, are included in the Dear Reader letter. After the comment period, a Final EIS and Record of Decision will be prepared.

The Final EIS and Record of Decision are expected to be issued about July 2010. The responsible official is the BLM Oregon/Washington State Director (see title page). Since this EIS is not specifically about grazing, forest management, or resource management planning, the appeal procedures for general public land issues will apply. Therefore, a 30-day appeal period will follow issuance of the Record of Decision. The Record of Decision may be issued concurrently with the Final EIS, and the applicable appeal procedure will be described in detail in both documents. Applicable regulations can be found at 43 CFR § 4.411, 43 CFR § 4.21, 43 CFR § 4.401.

Abstract

The BLM proposes to increase the number of herbicides available for use on BLM lands in Oregon, and to expand their use beyond the noxious weed management program. Noxious weeds are spreading on BLM lands at the rate of 144,000 acres per year. The existing BLM vegetation management program (Alternative 2) is unable to effectively address the rate of spread or treat all species. New herbicides are available that would better control weeds, better meet other non-commodity vegetation management objectives, and have fewer adverse effects on humans and the environment. This EIS examines three alternatives that would meet the need: Alternative 3 would add seven herbicides west and nine herbicides east of the Cascades, to the four herbicides already being used to control noxious weeds. Herbicides use would be expanded to include the treatment of other invasive plants, and the treatment of native plants to control invasive pests and diseases; Alternative 4 would add 8 and 12 herbicides and add (to the uses described in Alt. 3) native vegetation control in rights-of-way, administrative sites, and recreation sites, and conduct wildlife habitat improvement specified in interagency conservation plans for rare species, and; Alternative 5, would add 14 herbicides statewide to the four already being used, and expand herbicide use to include any non-commodity objective. An alternative of No Herbicide Use (Alternative 1) is also included for comparison purposes. The decision will hinge on which alternative best: controls noxious and other invasive weeds; protects developments from encroaching vegetation; maintains wildlife and other habitats; reduces fire risk; complements weed control work on adjacent lands; protects flora, fauna, and human health; controls exotic plant pests and diseases, and; minimizes treatment costs and economic losses. The analysis indicates: noxious weeds would infest 1.9 to 2.2 million fewer acres under the Action Alternatives 3 and 4/5 respectively; that Alternative 4 and 5 would save \$1 million per year just in rights-of-way, administrative site, and recreation site vegetation management, and; under all alternatives and with Standard Operating Procedures and Mitigation Measures in place, risks to humans or any resource is generally low to negligible. Some additional potential mitigation is identified by the analysis. Potential additional monitoring is also identified. The preferred alternative is Alternative 4.

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Acronyms / Abbreviations

BLM	Bureau of Land Management
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
NEPA	National Environmental Policy Act
ODA	Oregon Department of Agriculture
PEIS	2007 Programmatic Environmental Impact Statement for 17 Western States
SOP	Standard Operating Procedure
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior

Summary

Introduction

This Environmental Impact Statement (EIS) presents the environmental consequences, at the programmatic scale, of a proposal to increase the number of herbicides available to the nine Bureau of Land Management (BLM) districts in Oregon for use in their existing noxious weed, invasive plant, and other non-commodity vegetation management programs. The BLM in Oregon has been limited to the use of four herbicides¹ since 1987, and their use is limited to the treatment of noxious weeds.

Vegetation management to meet the Federal Land and Policy Management Act's public lands management policies and to satisfy the mandates of other laws, policy, and management plans takes place annually on thousands of acres of BLM lands in Oregon. The BLM and its cooperators manage vegetation on thousands of acres per year to restore forest and rangeland health; provide sustainable habitat for sensitive, listed, and other species of plants and animals; reduce the risk of wildland fire; and, provide for safe use and access to a variety of authorized developments. For these treatments, a full range of non-herbicide treatment methods are described in existing management plans, have been analyzed in existing National Environmental Policy Act (NEPA) documents, and are currently in use to achieve vegetation management objectives.

In 1984, the BLM was prohibited from using herbicides in Oregon by a U.S. District Court injunction issued in Northwest Coalition for Alternatives to Pesticides, et al. v. Block, et al. (Civ. No. 82-6273-E). The injunction stemmed from a court decision that the BLM had not adequately considered, at the statewide scale, the cumulative

Terminology:

Invasive plants (or weeds) are non-native aggressive plants with the potential to cause significant damage to native ecosystems and/or cause significant economic losses.

Noxious weeds are a subset of invasive plants that are county, state, or federally listed as injurious to public health, agriculture, recreation, wildlife, or any public or private property.

Vegetation includes noxious weeds, invasive weeds, and introduced and native plants.

Native vegetation includes native and desirable non-native plants.

¹ 2,4-D, dicamba, glyphosate, and picloram

Vegetation Treatments Using Herbicides on BLM Lands in Oregon

human health effects for herbicides being used at that time. Following completion of a new EIS addressing four herbicides and their use just on noxious weeds, the injunction was modified by the court in November 1987 (Civ. No. 82-6272-BU). The injunction permits the use of the four herbicides analyzed, and limits their use to the control and eradication of noxious weeds.

In 2007, the BLM national office completed the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) and related Record of Decision, making 18 herbicides available for a full range of non-commodity vegetation treatments in 17 western states including Oregon. Oregon cannot implement that decision, however, until and unless the District Court injunction is lifted.

The BLM in Oregon has decided not to petition the court with the PEIS, but to prepare an Oregon-specific programmatic EIS, tiered to the PEIS. This EIS was prepared primarily:

- 1) To directly address the U.S. District Court's concerns in a single programmatic document, and;
- 2) Because unlike the other western states, many of the herbicides proposed for use have not been used on Oregon BLM lands in the past 20 years.

Neither of those conditions applies to the other 16 western states, who were using up to 20 herbicides for a full range of non-commodity vegetation management objectives prior to the 2007 Record of Decision for the PEIS.

The EIS does not examine projects. Specific project proposals will require site-specific NEPA.

What Action is Proposed?

The proposed action, Alternative 4, would add 8 of the nationally-approved herbicides west of the Cascades and 12 herbicides east of the Cascades² to the four already in use (Table S-4), and expand their use beyond noxious weed treatments to include: the treatment of all invasive plants; the control of pests and diseases³; the control of native vegetation in rights-of-way, administrative sites, and recreation sites; and the treatment of vegetation to achieve habitat goals specified in interagency Recovery Plans or Conservation Agreements for Bureau Sensitive and Federally Listed species. No aerial application would be permitted west of the Cascades.

It is estimated that herbicide use would increase from 16,700 acres per year under the No Action Alternative to 45,000 acres per year under the proposed action. Because newer, more target-specific herbicides would be used, the actual pounds of herbicide applied, however, would increase less than 50 percent. All but 3,000 acres of the increase would be east of the Cascades, and 11,000 acres of the increase is estimated to be imazapic applications on invasive annual grasses including medusahead and cheatgrass, usually to help with restoration of native plants following wildfires or prescribed burns. Nine thousand acres of the increase would be to treat native vegetation causing safety and maintenance issues on rights-of-way, administrative sites, or recreation sites. These treatments are now done with non-herbicide methods, and using herbicides would save about \$1 million per year, and have a collateral benefit of killing undetected invasive plants near roads and other high-use areas and thus preventing them from being moved elsewhere.

About 5,700 acres of the proposed increase would go to improving habitat for Federally Listed or Bureau Sensitive species, mostly in sagebrush habitats east of the Cascades. Herbicides would also be available to treat native plants to

2 Districts east and west of the Cascades identified different program needs, likely because of differences in vegetation types and weed occurrence.

3 The proposal would allow the use of herbicides to remove native vegetation serving as the host for pests and diseases in State-designated quarantine areas. The control of tanoaks around Sudden Oak Death infestations in SW Oregon is the only current example of a qualifying area and pest.

control exotic pests and diseases in State-designated quarantine areas, like the area currently designated for Sudden Oak Death control in southwestern Oregon. Here, tanoak stumps near Sudden Oak Death infestations would be treated to prevent resprouting, depriving the pathogen its preferred host.

Why is the Action Needed?

Noxious weeds and other invasive plants are difficult to control. Many species simply cannot be controlled with mechanical treatments alone because their roots are deep and readily re-sprout, because they are in areas where heavy soil disturbance is not acceptable, access limitations prevent effective control, or because they would simply reseed into mechanically disturbed sites. Many plant species are not effectively controlled by the four herbicides currently available to BLM in Oregon. In spite of an aggressive vegetation management program using all available treatment methods, these plants are spreading, habitats are being degraded, and fuel buildup is increasing. About 1.2 million of the 15.7 million acres of BLM lands in Oregon are currently infested with noxious weeds at some level,⁴ and they are spreading at an estimated rate of 12 percent per year (see Appendix 7). Ecological damage from extensive noxious weed infestation is often permanent. Adverse effects include displacement of native plants; reduction in habitat and forage for wildlife and livestock; loss of threatened, endangered, and sensitive species' habitat; increased soil erosion and reduced water quality; reduced wilderness and recreation values; reduced soil productivity; and changes in the intensity and frequency of fires (USDA 2005).

There are also specific management situations where *Native vegetation* is going untreated or only partially treated because available vegetation management methods are inefficient or costly. Vegetation encroachment along roads and into other developments requires more costly control measures when compared with herbicide treatments on adjacent land ownerships. Mechanical methods can also spread invasive plants. Western juniper is encroaching into native shrub/grass communities, capturing available soil water, and altering soils in ways that inhibit retention and reestablishment of native plant communities. The plant pathogen Sudden Oak Death is getting a foothold in southwest Oregon, threatening to kill tanoaks and other plants throughout the State and lead to plant quarantines on a variety of nursery plants. Finally, the management of encroaching vegetation within road, power-line, pipeline, and other rights-of-way and developments is being conducted with non-herbicide methods at a higher cost on BLM lands than on adjacent non-BLM lands where herbicides are available. These additional costs and reduced effectiveness ultimately affect utility subscribers and/or subtract from funds available for other vegetation treatments.

To better meet BLM's noxious weed and other vegetation management responsibilities, there is an underlying *Need* for more effective vegetation control measures. Because all other known non-herbicide methods are available and being used to the extent practicable within existing funding and capabilities, the *Need* for more effective control measures translates to a proposal and alternatives to make more herbicides available for use on public lands administered by the BLM in Oregon.

What Would It Mean Not to Meet the *Need*?

To answer that question, a No Action Alternative, Alternative 2 was analyzed. Noxious weeds would continue to spread at an estimated rate of 12 percent (144,000 acres per year), and infest about 5.9 million acres or one-third of the BLM lands in Oregon, in 15 years. Millions of acres of imperiled sagebrush habitat will be converted to medusahead and cheatgrass, which are invasive annual grasses with little habitat or forage value and prone to regular intense fires that remove all other vegetation and endanger rural communities. The BLM will continue to try, without herbicides, to control tanoak on its portion of the State quarantine area for Sudden Oak Death in southwest Oregon. Tanoak is a prolific sprouter, and the continued persistence of Sudden Oak Death at the quarantine area is thought to be at least partially related to BLM's inability to control that sprouting with herbicides. If Sudden Oak Death escapes the

4 "Infestations" range from monocultures of invasive weeds to a few stems per acre.

quarantine area and spreads unchecked as it has in California, ecological damage from the loss of most tanoak and several other host trees throughout western Oregon and possibly into Washington will be severe. Such a spread would also cost the State's nursery industry about \$1 billion per year in lost export opportunities, quarantines, and cleaning. Management of native vegetation in rights-of-ways, administrative sites, and recreation sites would continue without herbicides, costing \$1 million more per year than with herbicides, and causing ground disturbances that exacerbate the spread of invasive plants. About 3,200 acres per year of habitat improvement opportunities for Bureau Sensitive and Federally Listed species would be forgone.

A "no herbicides" alternative, Alternative 1, was also analyzed to help show how such an alternative would respond to the *Need*. Treatments under that alternative were more expensive and less effective at controlling noxious weeds. Under that alternative, noxious weeds were projected to spread to 8.6 million acres in 15 years (about one-half of the BLM lands in Oregon).

Are There Other Alternatives that Would Meet the *Need*?

Four action alternatives are identified, and the three herbicide action alternatives would meet the *Need* and meet some or all of the *Purposes*. In addition to the proposed action:

Alternative 3 would add 7 and 9 herbicides, west and east of the Cascades respectively, to the 4 currently being used (Table S-4). It would permit herbicides to be used on invasive plants other than noxious weeds, such as cheatgrass, to meet non-commodity integrated vegetation management objectives. Herbicide use would be expected to increase from 16,700 acres under the No Action Alternative to 30,000 acres under Alternative 3, although total pounds of herbicide used would decrease 30 to 50 percent because many of the additional herbicides are used in much lower quantities. More than 80 percent (11,000 acres), of the increase would be to treat the invasive annual grasses medusahead and cheatgrass east of the Cascades, usually to facilitate native plant restoration following wildfire or prescribed fire. This alternative would also make herbicides available to treat any (native) vegetation as necessary to control pests and diseases in State-identified quarantine areas, such as that for Sudden Oak Death in southwestern Oregon. The herbicides available under this alternative would be effective on almost all of the known invasive plants in Oregon. Alternative 3 would meet the *Need* and many of the *Purposes*.

Alternative 5 would add 14 herbicides to the four already being used (Table S-4), and make them available for any non-commodity vegetation management treatment. As with all the alternatives, treatments must be permitted by the product label and be consistent with the product's Oregon registration. The analysis estimates that herbicide use under this alternative would be about 50,000 acres per year, an increase of about ten percent (4,900 acres) from the proposed action. Most of this increase would go to additional habitat improvements east of the Cascades. All of the elements of the proposed action (Alternative 4) are included in this alternative, so both Alternatives 4 and 5 would meet the *Need*, and meet all eight *Purposes* at some level.

What Factors Will be Used in Making the Decision Between Alternatives?

The decision by the BLM State Director will be based on the degree to which the selected alternative meets the *Need* and *Purposes*. The *Need* is *To better meet BLM's noxious weed and other vegetation management responsibilities, there is an underlying need for more effective vegetation control measures.*

The eight *Purposes* to be variously achieved by the selected alternative are:

1. *Control invasive plant species to protect native ecosystems and the flora and fauna that depend on them.*
2. *Protect the safety and function of BLM and other authorized infrastructures by controlling encroaching vegetation.*
3. *Manage native vegetation to provide sustainable habitats for wildlife, fish, and native plants, particularly those included in the Bureau Sensitive Species program.*
4. *Manage vegetation to reduce the risk that large-scale high-intensity fires will unacceptably damage resources and human developments.*
5. *Cooperatively control invasive plants so they do not infest or re-infest adjacent non-BLM lands.*
6. *Prevent herbicide control treatments from having unacceptable adverse effects to applicators and the public, to desirable flora and fauna, and to soil and water.*
7. *Control plant pests and diseases by removing their native plant hosts when necessary to meet ODA⁵-identified control objectives.*
8. *Minimize treatment costs and improve treatment effectiveness, so economic losses from invasive plants and other vegetation growth are reduced and more of the Need can be met within expected funding.*

What are the Effects of the Alternatives?

The Herbicides

In order to identify the potential effects of vegetation control treatments, the annual acres to be treated with each herbicide, and with each non-herbicide method, were estimated for each alternative. Weed and other vegetation management specialists from the Oregon State Office and the nine district offices in Oregon made predictions of annual treatment levels for the next 10 to 20 years assuming current budget trends. Those totals are summarized below, displayed for BLM districts west and east of the Cascades (Table S-1).

TABLE S-1. ESTIMATED ANNUAL TREATMENT ACRES WITH HERBICIDE AND NON-HERBICIDE METHODS, WEST (W) AND EAST (E) OF THE CASCADES

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Number of Herbicides	0	4	W: 11 E: 13	W: 12 E: 16	18
Herbicide Acres	0	W: 7,000 E: 9,700	W: 8,000 E: 22,300	W: 10,000 E: 35,100	W: 10,200 E: 39,800
Non-Herbicide Treatment Acres	W: 8,600 E: 33,500	W: 6,400 E: 22,400	W: 6,600 E: 21,500	W: 4,630 E: 12,075	W: 4,560 E: 10,430
Total Treatment Acres	W: 8,600 E: 33,500	W: 13,400 E: 32,100	W: 14,600 E: 43,800	W: 14,630 E: 37,175	W: 14,760 E: 50,230

In short, although there is some increased risk associated with the proposed increase in the use of herbicides, it would be limited by the implementation of the standard operating procedures (SOPs) and PEIS Mitigation Measures. The resultant slowing of noxious weed spread also more than compensates for the risks incurred. The broader array of herbicides available for use would also allow for the selection of one that is most effective at accomplishing the weed control objective with the least amount of risk to nearby non-target resources including soil and water.

Noxious Weed Effects and Rate of Spread

To help examine the effects of the spread of noxious weeds, the analysis also estimated the current spread rate for noxious weeds, and estimated how the different alternatives might be expected to change that rate.

The list of adverse effects of noxious weeds and other invasive plants is long and varied. For example, they displace native species and the ecosystems that depend upon them. Many lack fibrous root systems or adequate foliage cover, so they do not protect soils from rain splash or overland flow. Many have allelopathic effects. Many are poisonous to wildlife, livestock, wild horses, and burros. Some invade stream banks but do not hold the soils, increasing siltation of spawning gravels and reducing water quality. They displace riparian vegetation, reducing stream shading and the deposition of microfauna and detritus into streams to support the food chain. They act as barriers, limiting human and wildlife passage. The invasive annual grasses increase fire occurrence and intensity, removing sagebrush plant communities. They make rangeland unusable, displacing grazing and destroying ranches. They clog waterways and shade out native aquatic vegetation.

Under Alternative 2, herbicide and non-herbicide methods can be effective on all but about a dozen of the 121 ODA-listed noxious weeds in Oregon. Treatments under this alternative are estimated to be 60 percent effective; that is, they eliminate the treated weed so it does not require retreatment an estimated 60 percent of the time. This means 45,000 acres of annual treatments translates to 27,300 acres where the weed is controlled and will not spread. Since these treatments focus on new satellite populations, new weeds, newly infested drainages, or the edges of expanding populations where weed spread would be exponential, 27,300 acres of control translates to 273,000 fewer infested acres in 15 years.

Effective control is estimated at 30 percent for Alternative 1, where non-herbicide methods are only effective against about one-third of the noxious weeds. Alternative 3 includes effective controls for all but one of the noxious weeds; effectiveness is estimated at 80 percent. Finally, it is estimated that the 9,300 acres of native vegetation control in rights-of-way, administrative sites, and recreation sites in Alternatives 4 and 5 would control or avoid spreading undetected noxious weeds on 25 percent of those treatments, or 2,350 acres per year. Applying these calculations to each of the five alternatives results in the following 15-year calculations (Table S-2).

TABLE S-2. PROJECTED ANNUAL NOXIOUS WEED SPREAD AND ACREAGE CHANGE FOR EACH ALTERNATIVE

Alt.	Gross Treatment Acres	Treatment Effectiveness	Effectively treated acres	% annual spread in 15 years	Total acres infested in 15 years	15-year acre change from No Action	Portion of OR BLM lands infested 15 years
1	42,100	30%	12,630	14%	8,600,000	+2.7 million	1/2
2	45,500	60%	27,300	12%	5,900,000	0	1/3
3	58,400	80%	46,720	7%	4,000,000	-1.9 million	1/4
4 & 5	58,400	80% ¹	49,070	6%	3,700,000	-2.2 million	1/5-1/4

¹ Plus the 2,350 acres inadvertent gain from treating native vegetation in rights-of-way, recreation sites, and administrative sites.

Human Health and Safety

Nationally, the BLM has selected 18 herbicides from among hundreds available, picking those needed to accomplish the objectives while having the least risk to humans and the environment. This said, the additional herbicides that would become available under Alternative 3 are generally less toxic than those currently being used.

At typical rates, 2,4-D (Alternatives 2 through 5), bromacil, diuron, and tebuthiuron (Alternatives 4 and 5) are identified as having a generally moderate risk to the public and applicators, with risks ranging from none to high depending upon the exposure scenario. Diquat has a low risk in some occupational scenarios, and triclopyr, hexazinone, and diquat have a low risk in at least one of the accidental exposure scenarios evaluated. All six of these herbicides have a PEIS Mitigation Measure that prohibits application at maximum rates if feasible.

Nearly all use of bromacil, diuron, and tebuthiuron would be east of the Cascades, and bromacil and diuron would be used mostly where complete vegetation control is needed, such as for reducing fire hazard in unstaffed communications and other non-public sites, or to keep vegetation from growing into pavement edges. Diquat is only available in Alternative 5 and projected use is low; it is expected to be used only where one of the other five available aquatic herbicides would not work.

Bromacil, diuron, 2,4-D, and tebuthiuron have the highest health risks for workers. PEIS Mitigation Measures specify avoiding applying bromacil and diuron aerially. Bromacil, diuron, and tebuthiuron have the highest risks to the public. Diuron is a possible carcinogen. 2,4-D has possible endocrine disruption abilities in workers applying large amounts of 2,4-D and poses moderate to high risks to workers performing ground-based boom spraying.

Summary of the Major Effects of Each Alternative

While there is a potential for adverse resource and human health effects from various elements of the alternatives, the SOPs and PEIS Mitigation Measures would minimize herbicide risks to negligible levels. Even Bureau Sensitive and Federally Listed species were deemed not at great risk because of required pre-project clearances, consultation requirements, and/or additional buffer requirements. Each alternative's projected reduction in weed spread more than compensates for any herbicide or non-herbicide treatment risk identified.

The acres estimated to be treated by each herbicide or non-herbicide method under each alternative and displayed in Chapter 3's *Background for Effects Analysis* section on Table 3-4 are integral to the following comparison of the major effects of each alternative. Selected parameters for the alternatives relevant to the effects comparison are displayed on Table S-3.

TABLE S-3. SELECTED PARAMETERS FOR EACH ALTERNATIVE RELEVANT TO THE EFFECTS COMPARISON

Parameter	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Number of Herbicides Available	0	4	W: 11 E: 13	W: 12 E: 16	18
Invasive Plant Herbicide Annual Treatment Acres	0	16,700 ²	30,300	30,300	30,300
Invasive Plant Non-herbicide Annual Treatment Acres	42,100	28,800	28,100	28,100	28,100
Native Plant Herbicide Annual Treatment Acres	0	0	0 ¹	15,100	20,000
Rate of Spread at 15 years	14%	12%	7%	6%	6%
Difference in noxious weed infested acres in 15 year compared to the No Action Alternative	Up 2.7 million	0	Down 1.9 million	Down 2.2 million	Down 2.2 million

¹ Not counting 250 acres per year pest and disease control.

² Noxious weeds only.

Alternative 1: No Herbicide Use. This alternative would provide effective control for about one-third of the noxious weed species, potentially precluding effective control around high priority Federally Listed or Bureau Sensitive species' sites, traditional gathering areas, and high-public use sites where weeds could be picked up and transported. Control activities can be hazardous to those doing the weed treatments, result in soil disturbance that can lead to reinvasion, put cultural and soil resources at risk, and cost more per acre. Weed spread is predicted to increase under this alternative as the BLM and its neighbors become less successful. Weeds are projected to infest 2.7 million more acres in 15 years than under the No Action Alternative – negatively affecting virtually every resource from wildlife to visual quality. The human environment would suffer because of decreased water quality, decreased wildlife and other elements of ecological diversity, decreased access to natural resources because of barriers like blackberries along streams, and long-term changes including loss of species or populations, loss of productivity, and altered soil chemistry. Social acceptance of this alternative is likely to be low. Although some scoping comments expressed a desire for no herbicide use, most communities are concerned with the resource damage caused by invasive plants and are aware of the higher cost and lower practicality of non-herbicide control methods.

Alternative 2: (No Action) – Use 4 Herbicides to Treat Noxious Weeds Only. This alternative would provide effective control for all but about a dozen of the 121 noxious weed species in Oregon, but does not include tools effective on some invasive and noxious weeds including the invasive annual grasses. Medusahead and cheatgrass occupy 600,000 and 5 million acres respectively. Wildfire in these grasses would continue to convert remaining sagebrush habitats, decrease range carrying capacity for wildlife, wild horses, and livestock, and increase the risk of wildfire. The four herbicides available under this alternative generally present some risk to one or more elements of the environment, and many are used more than once at a site because they are not totally effective, compounding adverse environmental effects. Repeatedly using the same herbicides also increased the likelihood that weeds resistant to that herbicide will take over the site. Cooperative weed management strategies across ownerships would continue to be problematic since BLM neighbors have moved on to other herbicides. High 2,4-D use would continue to present a hazard to applicators, non-noxious invasive weeds like cheatgrass cannot be treated with herbicides, and noxious weeds would continue to spread at 12 percent or 144,000 acres per year on BLM lands in Oregon. At this rate, noxious weeds are predicted to occupy 1/3 of all BLM lands in 15 years, causing proportionate losses in habitat (particularly for sage grouse and other sage steppe species), wild horse and livestock grazing, watershed protection, recreational opportunities, and other resource uses. Social acceptance of this alternative would be fairly high; many persons opposed to broad herbicide use on BLM lands for commodity production nevertheless would view noxious weeds with concern and consider their aggressive control with herbicides a necessary evil. Aerial application would be permitted west and east of the Cascades.

Alternative 3: Use 11 (W) or 13 (E) Herbicides to Treat Invasive Weeds and Control Pests and Diseases. This alternative would go much of the way toward accomplishing most of the *Purposes*. The availability of seven and nine additional herbicides west and east of the Cascades respectively would provide effective controls for most of the 121 noxious weed species (Appendix7: Table A7-1). Spread would eventually be reduced to 7 percent and infested acres in 15 years would be reduced by 1.9 million acres when compared to Alternative 2. The BLM would have access to most of the herbicides used by neighbors, counties, and weed control boards, making cooperative projects more feasible and providing an incentive for better control across all ownerships. Having control tools effective on most noxious weeds in Oregon increases the likelihood that weed control efforts to protect Bureau Sensitive plant and animal species' habitats and traditional use areas would be successful. The adverse effects of noxious weeds to wildlife, water, and grazing- and recreation-dependent communities would all be reduced. Air quality would be most adversely affected under this alternative: the availability of imazapic would make prescribed burning a viable tool for restoring sage steppe habitats. Prescribed burns in annual grasses simply return to annual grasses unless an effective follow-up herbicide treatment and reseeding is used.

The ability to use herbicides to help control Sudden Oak Death or other State-designated pests and diseases would provide the State and other cooperators a unified, potentially more successful approach to protecting ecosystems and the nursery industry from this pathogen. The cost per acre of effectively treated noxious weeds would be reduced 20

percent. The acres treated with herbicides that are a moderate risk to applicators (2,4-D) would be reduced by about 70 percent east of the Cascades. Potential adverse effects to fish and wildlife would be reduced when compared to the No Action Alternative. Social acceptance of this alternative is likely to be high; even persons opposed to most herbicides on publically owned wild lands view noxious weeds and other invasive plants as a serious problem, and most will understand the additional herbicides made available under this alternative are more efficient and less environmentally toxic. No aerial application would be permitted west of the Cascades.

Alternative 4: (Proposed Action) – Use 12 (W) or 16 (E) Herbicides to Treat invasive Weeds plus Limited Additional Uses. This alternative is predicted to reduce noxious weed spread to 6 percent per year and result in 2.2 million fewer infested acres in 15 years when compared to the No Action Alternative. Herbicide use would reduce native vegetation control costs in rights-of-way, administrative sites, and recreation sites by nearly \$1 million per year. These treatments would slightly reduce dust and vehicle emissions, reduce the likelihood of occupational injuries by reducing mechanical (chainsaw etc.) treatments on steep wooded slopes, and reduce the adverse visual effects of mowing in some vegetation types. They would also preclude the need to separately spray noxious weeds along roads prior to mowing, and inadvertently control 2,350 acres per year of unidentified or low-priority noxious weed populations along roadsides and other areas where there is a high likelihood of their being picked up and moved by vehicles. Alternative 4 would also provide herbicides for about 5,000 acres of habitat improvement for Bureau Sensitive and Federally Listed species identified in interagency Conservation Strategies, 65 percent of which would be new opportunities currently deemed impractical without herbicides.

Of the additional herbicides added by this alternative, bromacil, diuron, and tebuthiuron have the highest risk to humans, fish, and for diuron, wildlife. They are active both pre- and post-emergent, with applications being restricted to the eastern side of the State where they will be used to treat vegetation along roads, pipelines, pump stations, and other non-cropland areas. Most of the tebuthiuron would be applied to sagebrush at low rates to improve sage grouse habitats. PEIS Mitigation Measures restrict application to typical rate if feasible, specify avoiding aerial application of bromacil and diuron, and specify increased buffers on water and Federally Listed and Bureau Sensitive species' habitats. Finally, the social acceptance of using any herbicides to treat native vegetation along public roads, where there is a perception of unguarded exposure and the possibility of direct contact or ingestion of sprayed materials, will be less than the social acceptance for Alternative 3, at least west of the Cascades. No aerial application would be permitted west of the Cascades.

Alternative 5: Use 18 Herbicides to Treat Invasive Weeds and Meet Non-Commodity Vegetation Management Objectives. This alternative would add 4,900 acres of herbicide use above what is proposed for Alternative 4, for any non-commodity treatment objective. Most of this increase would be for additional habitat improvement projects east of the Cascades. It would also make all 18 BLM-approved herbicides available throughout the State, with 4,000 acres of the increase split between 2,4-D and imazapic. Aerial application would be permitted west and east of the Cascades. Additional habitats would benefit as not all Western juniper and rabbitbrush encroachment expected to be treated under this alternative is within Bureau Sensitive and Federally Listed species' habitats covered by Alternative 4. As with Alternative 4, social acceptance of approving herbicide use for a fairly unspecified group of projects may not be high, but all but 200 acres would be east of the Cascades where environmental risk is lower, the advantages more apparent, and the public acceptance of herbicide use is higher.

Can Any of the Adverse Effects be Mitigated?

The analysis indicated that by using the SOPs and PEIS Mitigation Measures, the potential for adverse effects was low. Where the potential for adverse effects is identified, potential mitigation measures are identified and will be considered by the decision-maker.

Most potential mitigation measures were variations on measures already adopted by the PEIS. Some suggest limitation on application rates or methods for several of the herbicides with risks identified in risk assessments documents.

What Monitoring is Necessary?

Where the BLM is already using herbicides, formal monitoring is required by various BLM manuals. Environmental Protection Agency and ODA annual reporting is also required, and relevant consultation documents typically include monitoring requirements. This monitoring includes implementation monitoring, relying in particular on Pesticide Use Proposal documents for every application, followed by Pesticide Application Records filled out within 24 hours of each application. Both documents have sufficient detail to determine if all planning and application requirements are met.

Effectiveness monitoring includes visiting every application site again after treatment, and maintaining weed maps. Biological control agent releases are also monitored, and monitoring is required of any BLM activity judged to have a moderate or high likelihood of spreading noxious weeds.

In addition to existing monitoring, the selection of one of the action alternatives could create a changed circumstance or condition (e.g. a concern over a potential environmental effect) that would suggest a need for additional monitoring. Those circumstances might include the use of the newly adopted herbicides with different ecological risks than the four herbicides currently used, more acres being treated, more acres being treated in proximity to people or susceptible environmental resources, more use of broadcast spraying with its potential for drift, or simply increasing the use of “new” herbicides above EIS-estimated levels as weed specialists become more familiar with their advantages. To respond to this potential need, the monitoring appendix suggests a five year examination of weed spread to see if the selected alternative is making the expected difference, and monitoring of the application of herbicides identified in the analysis as high risk to a particular resource in a particular setting.

These potential new monitoring needs are identified as optional in the Monitoring appendix (Appendix 3), and the decision-maker will identify monitoring when the Record of Decision is signed.

Which Alternative is Preferred?

Alternative 4, the Proposed Action, is the Preferred Alternative. It reasonably meets the *Need* and all eight *Purposes*. Like Alternative 3, the additional, generally newer, herbicides are more target-specific, can be used in lower doses, and are generally less likely to adversely affect non-target plants and animals than the four herbicides currently in use. Alternatives 3, 4, and 5 would also be effective against a wider array of invasive plants, including the invasive annual grasses medusahead and cheatgrass, as well as other weeds for which there are currently no effective controls available to the BLM in Oregon. The ability to treat native vegetation encroaching on rights-of-ways, recreation sites, and administrative sites with herbicides under Alternative 4 reduces cost for these regular maintenance treatments by about \$1 million per year, would reduce ground disturbance that can encourage invasive plants, and would eradicate small undetected populations just getting established along roads and other public use areas. Alternative 4 would also allow the use of herbicides for improving habitat for Federally Listed and Bureau Sensitive species like sage grouse.

Alternative 5 would have the same benefits as Alternative 4, plus it would make herbicides available for the full range of non-commodity resource management activities. Although Alternative 5 is estimated to increase herbicide use only an additional 10 percent from Alternative 4, and most of this increase would be expected to go toward additional habitat improvement projects not practical without herbicides, the open-ended nature of the types of projects to be conducted makes accurate effects estimation in this document more difficult, and would depart from the narrow program clarity and focus requested by many of the scoping comments.

TABLE S-4. HERBICIDES AVAILABLE UNDER EACH ALTERNATIVE

Herbicide	Characteristics and Target Vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
<i>Herbicides Currently Approved for use on BLM Lands in Oregon (for noxious weed control only)</i>						
2, 4-D	Selective; foliar absorbed; post-emergent; annual/perennial broadleaf weeds. Key species treated include burningbush, mustard species, and Russian thistle.		√	√	√	√
Dicamba	Growth regulator; annual and perennial broadleaf weeds, brush, and trees. Key species treated include knapweeds, burningbush, and Russian and other thistles.		√	√	√	√
Glyphosate	Non-selective; annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees. Key species treated include annual, biennial, and perennial grasses and broadleaf weeds, and woody shrubs.		√	√	√	√
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs. Key species treated include knapweeds, leafy spurge, and starthistle.		√	√	√	√
<i>Additional Herbicides Proposed for Use in One or More of the Alternatives</i>						
Bromacil	Non-selective; inhibits photosynthesis; controls wide range of weeds and brush. Key species treated include annual grasses and broadleaf weeds, burningbush, and Russian thistle.				√ (E ¹)	√
Chlorsulfuron	Selective; inhibits enzyme activity; broadleaf weeds and grasses. Key species treated include biennial thistles and annual and perennial mustards.			√ (E)	√ (E)	√
Clopyralid	Selective; mimics plant hormones; annual and perennial broadleaf weeds. Key species treated include knapweeds, mesquite, and starthistle and other thistles.			√	√	√
Diffufenzopyr + Dicamba	Post-emergent; inhibits auxin transport; broadleaf weeds. Key species treated include knapweeds, burningbush, and Russian thistle and other thistles.					√
Diquat	Non-selective and foliar applied. Key species treated include giant salvinia, water-thyme, and watermilfoils.					√
Diuron	Pre-emergent control; annual and perennial broadleaf weeds and grasses. Key species treated include annual grasses and broadleaf weeds, burningbush, and Russian thistle.				√	√
Fluridone	Aquatic herbicide to control submersed aquatic plants. Key species treated include water-thyme and watermilfoils.			√	√	√
Hexazinone	Foliar or soil applied; inhibits photosynthesis; annual and perennial grasses and broadleaf weeds, brush, and trees. Key species treated include mesquite and scrub oak.			√	√	√
Imazapic	Selective post-emergent herbicide; inhibits broadleaf weeds and some grasses. Key species treated include downy brome, leafy spurge, medusahead, and mustards.			√	√	√
Imazapyr	Non-selective; pre-emergent and post-emergent uses; absorbed through foliage and roots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include saltcedar.			√	√	√
Metsulfuron methyl	Selective; post-emergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include annual and perennial mustards and biennial thistles.			√	√	√
Sulfometuron methyl	Broad-spectrum pre and post-emergent control; inhibits cell division; grasses and broadleaf weeds.			√ (E)	√ (E)	√
Tebuthiuron	Relatively non-selective soil activated herbicide; pre and post-emergent control of annual and perennial grasses, broadleaf weeds, and shrubs. Key species treated include creosotebush, oak, Russian olive, and sagebrush (thinning).				√ (E)	√
Triclopyr	Growth regulator; broadleaf weeds and woody plants. Key species treated include mesquite and saltcedar.			√	√	√

1 - Only allowed in BLM Districts east of the Cascades

Vegetation Treatments Using Herbicides on BLM Lands in Oregon

United States Department of the Interior
Bureau of Land Management
333 SW 1st Avenue
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