Okanogan-Wenatchee National Forest
Forest-wide Invasive Plant Treatment
Environmental Impact Statement

Background

The Okanogan-Wenatchee National Forest proposes to control, contain, or eradicate known invasive plants on approximately 15,246 acres located across the Forest in five counties. Invasive plants are defined here as "non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Executive Order 13112). Invasive plants are distinguished from other non-native plants by their ability to spread (invade) into native plant communities. These plants have the potential to displace or alter native plant communities and cause long-lasting economic and ecological impacts to National Forest System lands and lands associated with or adjacent to National Forest System lands. Invasive plants can increase fire hazard, degrade fish and wildlife habitat, eliminate rare and endangered plants, impair water quality and watershed health, and adversely affect a wide variety of other resource values such as scenic beauty and recreational opportunities. Because of their strong reproductive and competitive abilities, as well as a lack of natural predators or environmental controls, invasive plants can spread rapidly across the landscape to non-infested areas, unimpeded by ownership or administrative boundaries. Untreated invasive plants spread at the unchecked rate of 8-12% annually (R6 2005 ROD) and are moving across and between National Forest System and other lands.

At present, 52 different invasive plant species are known to occur within the boundaries of the Okanogan-Wenatchee National Forest. Species of greatest concern include Dalmatian toadflax, common crupina, yellow starthistle, whitetop, St. John's wort, Japanese knotweed, orange hawkweed, houndstongue, and spotted and diffuse knapweed. Existing infestations vary across the Forest landscape; some infestations occupy small areas of less than an acre while others involve hundreds of acres. Our ability to prevent or minimize the adverse impacts to native plant communities by these and other invasive plants is greatest if populations can be treated while they are still small and in the early stages of development. Treatment options and the likelihood of success are also greatest for small or new invasive plant populations. As well, smaller populations can be controlled at lower costs than larger more established infestations.

Prior to 2005, management direction for invasive plants came from the 1988 *Record of Decision for Managing Competing and Unwanted Vegetation* (1988 ROD) and the 1989 *Mediated Agreement*. The 1988 ROD specified and limited tools available for the treatment of competing and unwanted vegetation, but did not provide administrative mechanisms for adapting new technologies. Herbicides approved for use by the Forest Service at that time were developed before 1980.

The Okanogan-Wenatchee National Forest has been treating invasive plants under direction found in the 1998 decision implementing the *Wenatchee Forest-wide Noxious Weed Environmental Assessment* and the 1997, 1999, and 2000 decisions implementing

the *Okanogan National Forest Integrated Weed Management Environmental Assessment* documents. These decisions implemented integrated weed management programs that identified containment, control or eradication management strategies and outlined manual, mechanical, cultural, biological and chemical treatments. These programs outlined prevention and early detection management direction. Several sites were identified for treatment. The Forest has also been treating invasive species under direction found in individual project-level decisions such as the 2002 *Crupina Record of Decision*, the 2008 *Blue Buck Hawkweed Project Decision Notice* and several dry forest management decision notices. Although there are exceptions, most of these previous decisions did not allow the Forest Service the ability to respond quickly to new infestations because the process only addressed those sites known at that time.

Recent invasive species inventories across the Forest suggest a substantial increase in invasive plant populations since the time of these decisions. Though some of the initial invasive plant sites identified in the previous documents were successfully contained or controlled, new sites have been identified and many existing sites have grown. This along with the identification of new species, the increase of invasive plant introductions, and the restricted selection of herbicides has limited the application and effectiveness of the previous decisions.

In April 2005, the Pacific Northwest Region (R6) published the programmatic *Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants Final Environmental Impact Statement* (R6 2005 FEIS) and *Record of Decision* (R6 2005 ROD) for invasive species program management. This decision amended all Forest Plans in the Region, adding new direction for the control or elimination of invasive plant species using prevention practices, various mechanical and non-mechanical treatments, and an updated list of herbicides for effectively responding to invasive plant threats. The new herbicides offer many advantages over the more limited set allowed previously, including greater selectivity, less harm to desired vegetation, reduced application rates, and lower toxicity to animals and people. The R6 2005 ROD standards are intended to increase treatment options and improve prevention across the Forest.

The Proposed Action included here was developed to utilize the new tools and management techniques advanced in *Pacific Northwest Region Invasive Plant Program, Preventing and Managing Invasive Plants, FEIS* (R6 2005 FEIS), and *Record of Decision* (R6 2005 ROD).

Purpose and Need

The Wenatchee National Forest Land and Resource Management Plan (WLRMP, 1990) requires that existing populations of invasive species (termed “noxious weeds”) be contained, controlled or eradicated as the budget allows (page IV-89). *The Okanogan National Forest Land and Resource Management Plan* (OLRMP, 1989) requires the control of weeds to the extent practical and that new infestations of noxious weeds are the first priority for eradication. The Pacific Northwest Region’s Invasive Plant Program for Preventing and Managing Invasive Plants Record of Decision (R6 2005 ROD), an amendment to the Okanogan and Wenatchee LRMPs, directs that invasive plant

populations be prioritized for treatment and a long term strategy be developed for restoring/re-vegetating invasive plant sites (R6 2005 ROD, page 20).

Invasive plants on the Forest are compromising the ability for the Forest Service to manage for healthy native ecosystems. Invasive plants create a host of environmental and other effects, most of which are harmful to native ecosystem processes, including: displacement of native plants; reduction in functionality of habitat and forage for wildlife and livestock; loss of threatened, endangered, and sensitive species; increased soil erosion and reduced water quality; alteration of physical and biological properties of soil, including reduced soil productivity; changes to the intensity and frequency of fires, and loss of recreational opportunities.

New and existing invasive plant populations on the Forest require analysis to implement new or more effective and cost-efficient treatments, including the Regional FEIS updated list of herbicides. The most recent inventory shows 15,246 acres infested on the Forest. There are likely additional infestations that are not yet discovered, and these, as well as known sites, will continue to expand and spread every year without effective treatment. Without action, invasive plant populations will become increasingly difficult and costly to control and will further degrade native ecosystems.

The purpose of this action is to provide a rapid and more comprehensive, up-to-date approach to control and eradicate invasive plants on the Forest. The purpose of controlling or eradicating weed populations is to maintain or improve the diversity, function and sustainability of native plant communities, and other resources that depend on them. Specifically, there is a need for: (1) containment, control and eradication of invasive plants at existing inventoried sites, and (2), rapid detection and prompt response to new and changing invasive plant populations on the Forest.

Proposed Action

The Proposed Action would authorize the treatment of currently existing invasive species on 15,246 acres across the Okanogan-Wenatchee National Forest, including known infestations on 216 acres within congressionally designated Wilderness. The proposed invasive species treatments would begin in 2010 and continue for 15 years. Invasive plants would be treated using one or a combination of manual, mechanical, cultural, biological, and chemical methods.

- **Manual Control Methods:** These methods would include non-mechanized approaches, such as hand pulling or using hand tools (e.g., grubbing), to remove plants or cut off seed heads. Manual treatments are labor intensive, effective only for relatively small areas, and would be repeated several times throughout the growing season depending on the species. Manual treatments can be effective for annual and tap-rooted weeds. Manual treatments are typically used to treat selected plants, small infestations, and in sensitive areas to avoid potential toxic impacts to non-target species or water quality.

Where sites are small or there are few individual target species, handsaws, axes, shovel, rakes, machetes, grubbing hoes, mattocks, brush hooks, and hand clippers would all be used to remove invasive plant species. Axes, shovels, grubbing hoes, and mattocks would also be used to dig up and cut below the surface to remove the main root of plants. To meet control objectives or reduce the risk of activities spreading invasive plants, seed heads and flowers would be removed and disposed of using proper disposal methods. Developed flowers or seed heads would generally be bagged and burned.

- **Mechanical Control Methods:** This method uses hand power tools and includes such actions as mowing, weed whacking, road brushing, root tilling, and steam or infrared techniques. Choosing the appropriate treatment depends on the characteristics of undesired species present (for example, density, stem size, brittleness, and sprouting ability), the location of the infestation (e.g. Wilderness), inside or outside a riparian area; and soil or topographic considerations. These activities would typically occur along roadsides, rock sources, or other confined disturbed areas and dispersed use areas.

  Mowing and cutting would be used to reduce or remove above ground biomass. Seed heads and cut fragments of species capable of re-sprouting from stem or root segments would be collected and properly disposed of to prevent them from spreading into uninfested areas.

- **Cultural Control Methods:** Approved methods include cultural practices known to be useful for treating invasive plants such competitive planting and seeding, mulching with a variety of materials, using fertilizer/soil amendments, or other local remedies that may be determined to be effective (e.g., spraying water/salt/sugar mixtures).

  Cultural treatments would be prescribed when they are known to be effective for the undesired species of concern. Cultural treatments, such as mulching with black plastic, hay, straw, or wood chips, is feasible only for relatively small areas and is not effective to control perennial weeds with extensive food reserves. Mulching would not be used when it may have undesired results to native plant species.

- **Biological Methods:** Insects or plant pathogens that are proven natural control agents of specific weed species would be released to selectively suppress, inhibit, or control herbaceous and woody vegetation. The insect or plant pathogen attack and weaken targeted weed species and reduce its competitive or reproductive capacity. Biological controls would be used when the target species occupies extensive portions of the landscape, other methods of control are prohibitive based in cost and location, and an effective biological control regime exists. Biological weed control activities typically include the release of parasitic and "host specific" insects. Presently, insects are the primary biological control agent in use. Mites, nematodes, and pathogens are used occasionally. Treatments do

not eradicate the target species but rather reduce target plant densities and competition with desired plant species for space, water and nutrients.

Biological control activities would include collection of beetles/insects, development of colonies for collection, transporting, and transplanting parasitic beetles/insects, and supplemental stocking of populations. In most situations, a complex of biological control agents is needed to reduce weed density to a desirable level. As an example; a mixture of five or more biological control agents may be needed to attack flower or seed heads, foliage, stems, crowns and roots all at the same time or during the plant's life cycle. Bio-control agents are transported in containers that safely enclose the agent until release.

The treated areas would continue to be inventoried and monitored to determine the success of the treatments and when the released bio-control agents have reached equilibrium with the target species. Repeat visits may need to be made several times a season, and over a series of years to determine if additional release is needed or if another type of agent needs to be released or if information becomes available about new agents or combinations of agents.

- **Chemical Methods:** Chemical methods include the use of herbicides, adjuvants (e.g. surfactants, dyes), and inert ingredients in accordance with the R6 2005 ROD standards. Proposed herbicide mixtures would include one or more of the following active ingredients: chlorosulfuron, clopyralid, glyphosate, imazapic, imazapyr, metsulfuron methyl, picloram, sethoxydim, sulfometuron methyl, triclopyr, and aminopyralid. Adjuvants are compounds added to the formulation to improve its performance. They can either enhance the activity of the herbicide's active ingredient or offset any problems associated with its application. Project Design Features have been developed to reduce potential impacts from adjuvants. Inert compounds are those that are intentionally added to a formulation, but have no herbicidal activity and do not affect the herbicidal activity. Inert additives facilitate the herbicide's handling, stability, or mixing.

  Herbicide application methods would include:
  - **Spot spraying** – This method targets individual plants and is usually applied with a backpack sprayer. Spot spraying can also be applied using a hose attached to a truck-mounted or ATV-mounted tank.
  - **Wicking** – This hand method involves wiping a sponge or cloth that is saturated with herbicide over the plant. This is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in contact with non-target vegetation.
  - **Stem injection** – A hand application technique where the herbicide is injected directly into the cambium of the plant.
  - **Boom broadcast** – This involves using an applicator with either a single fan-shaped nozzle or multiple nozzles along an "arm" or extension attached to a truck or ATV. Herbicide is supplied from a tank mounted on the truck or ATV. Herbicide is applied to cover an area of ground rather

than individual plants. This method is used in areas where invasive plants occupy a large percentage of cover on the site and the area to be treated makes spot spraying impractical.

Proposed Acres of Treatment of Known Infestation by Method by Ranger District

Treatment Method	Ranger District							
	Chelan	Cle Elum	Entiat	Methow Valley	Naches	Tonasket	Wenatchee River	Total
Manual	50	50	50	150	50	50	50	450
Mechanical	50	50	50	50	50	50	50	350
Cultural	250	250	250	250	250	250	250	1750
Biological	500	500	500	500	500	500	500	3500
Chemical	1,712	1,968	2,346	799	3,299	4,399	723	15,246
Combined Total*	1,712	1,968	2,346	799	3,299	4,399	723	15,246

*These figures assume that chemical methods would be used initially on all acres, but that there are other treatment methods that may be used on some acres within the total known infested acres. The acres displayed under the chemical treatment method are inclusive of the acres of manual, mechanical, cultural and biological treatment that could occur within the acres identified for the chemical treatment method.

Herbicide treatments would be part of the initial prescription for currently identified sites on approximately 15,246 acres; However, as a result of implementing the appropriate Project Design Factors (PDFs) identified below, there would be areas within the approximately 15,246 acres that would not be authorized for treatment with herbicide. On many sites, the use of herbicides would be expected to decline in subsequent entries with manual, mechanical, biological and cultural methods becoming the common control measure over time. In other cases, although herbicide use would continue as the preferred treatment method through time; the amount of herbicide applied would greatly diminish as the infestation is brought nearer to eradication. Infested acres would be treated with an initial prescription, and retreated in subsequent years, until control objectives are met. Site-specific treatment prescriptions would be developed based on the ability to eradicate, control, contain, or suppress* an infestation.

- **Eradicate -** Totally eliminate an invasive plant species from a site. This objective generally applies to small infestations of aggressive species and/or higher priority treatment locations. At some point, larger infestations can become impossible to eradicate.
- **Control -** Reduce the size of the infestation over time; some level of infestation would be acceptable.
- **Contain -** Prevent the spread of the weed beyond the perimeter of patches or infestation areas mapped from current inventories.
- **Suppress –** Prevent seed production throughout the target patch and reduce the area coverage. Prevent the invasive species from dominating the vegetation of the area; low levels may be acceptable. *This strategy would be associated with the biological control treatment method only and would not typically be considered with other treatment methods.

Priorities for treatment and selection of treatment methods would be consistent with those described in the R6 2005 FEIS, in that the highest priority for treatment would be on new

invaders and early treatment of new infestations followed by containment, then control of larger established infestations. High priority areas (site types) for treatment would include areas of high traffic and sources of infestation (e.g. roads and parking lots, trailheads, gravel pits, recreation sites, recreation residences, utility corridors, range structural improvements, firelines and staging areas), areas of special concern (e.g. Special Status Species sites, Wilderness, Research Natural Areas, Special Interest Areas, Wild and Scenic Rivers, adjacent boundaries/access with National Parks), and riparian corridors where high threat species occur. The choice of treatment method(s) would be based on site-specific conditions including, the biology of the particular invasive species, the location and size of infestation, environmental factors, including its proximity to water and other sensitive resources (values at risk), management objectives, accessibility, and treatment costs.

The Proposed Action would also allow for treatment of infestations that are not currently inventoried through an early detection/rapid response (EDRR) strategy and annual implementation planning. To these ends, this EIS will include analysis associated with the treatment of currently documented infestations (sites) as well as areas where invasive species are not currently present but are most likely to spread and establish over the life of this project. The EIS will include analysis of approximately 16,448 additional acres of treatment associated with EDRR. Ongoing inventories would continually locate and confirm infestation locations. Treatment recommendations for presently un-inventoried infestations would be similar to that described for known infestations, in that, herbicides would be part of the initial prescription; with manual, mechanical, biological and cultural methods becoming more common over time. Newly discovered infestations or sites would receive a high priority for treatment to eradicate the invasive plants while the infestation is small and easily treatable. Treatment prescriptions for these presently undocumented sites would be strict enough to ensure that adverse effects are minimized and remain within the scope of effects analyzed in this EIS, while still flexible enough to adapt to changing conditions over time (i.e. adaptive management). Monitoring would evaluate the effectiveness of past treatments and direct adaptive management actions over time.

Invasive plant treatment sites are widely distributed across all Ranger Districts. Invasive plant sites have been grouped into 145 treatment areas for analysis purposes. Treatment areas include approximately 15,246 acres of currently documented infestations (4,848 sites[1]), as well as, the uninfested and univentoried area between known sites where invasive species are not currently present but are most likely to spread. Estimating an average yearly spread rate of 5%[2], it can be predicted that infestations would occupy an additional 16,448 acres over the next 15 years. Because treatment areas represent the most likely areas for invasive species to spread, it can be expected that the majority of

[1] The National Resource Information System (NRIS) is a set of databases that contain resource information needed to support the business of managing national forests and grasslands. NRIS holds data on vegetation, soil and geology, air and water, animal life and social and economic data. Information on local invasive plant infestations is gathered and entered into NRIS by specialists on the Forest, including site monitoring data.

[2] The 8-12% rate of spread discussed previously under Background was reduced to 5% as 8-12% represents rate of spread if left untreated. The Okanogan-Wenatchee NF is currently treating invasive species.

early detection/rapid response would occur within the treatment areas. Additionally, treatment areas represent the full range of resource conditions where invasive species treatments would be implemented

The total number of acres of invasive species treatment to be approved in this document and decision for known and EDRR is 31,694 acre; 15,246 acres of presently known infestation and 16,448 acres under the early detection rapid response strategy. The number of acres treated in any given year would not exceed this total. However, provided the recent history of funding available to accomplish this work, it is very unlikely that we would treat the total in any given year. Additionally, Herbicide Use Buffers and limitations on the extent of treatment that would occur within the riparian area are proposed.

The Proposed Action focuses on invasive plant treatment. The R6 2005 ROD addresses standards for invasive plant prevention that are an essential part of the invasive plant management program. Further, in 2002 the Okanogan-Wenatchee National Forest adopted a noxious weed prevention strategy which includes best management practices for the prevention of invasive species spread and introduction. These practices would continue to be an important part of the Forests invasive species management strategy. This proposal focuses on the part of the program related to herbicide and other treatments that have become available since the R6 2005 ROD was signed.

A connected action of the Proposed Action is the restoration of treatment sites with desirable vegetation to prevent re-infestation. The restoration objectives may be passive (allowing native plants to fill in a site) or active (any combination of seeding, mulching, or planting). Some sites will require active re-vegetation to achieve desired future condition. This action is included as a cultural control method as described previously in this document.

Access to Work Areas

Vehicle and equipment access would involve the use of open, closed, and restricted roads, as well as, walking, horse or other pack animal and/or the use of All Terrain Vehicles (ATVs) to access invasive plant sites. Motorized access on presently closed and/or gated roads (Maintenance Level I) and/or roads that normally do not provide motorized access would be consistent with timing restrictions applicable to those individual areas as prescribed by the Project Design Factors (PDFs) described below.

Project Design Features

Project Design Features (PDFs) were developed to minimize the potential adverse impacts of invasive plant treatment and provide a framework for the EDRR strategy. Project Design Features define a set of conditions or requirements that an activity must meet to avoid or minimize potential effects on sensitive resources. The PDFs were designed to respond to site-specific resource conditions within treatment areas; including (but not limited to) the current invasive plant inventory, the presence of certain non-target or species of local interest and their habitats, proximity to water and potential for herbicide delivery to water, and the social environment. PDFs are an integral component

of the proposed action and therefore, when conditions dictate, implementation would be mandatory. Under the EDRR strategy, the applicable PDFs would be applied to new detections as well as previously documented infestations. The PDFs provide sideboards to ensure that the effects of treating new sites are similar to the effects of treating existing sites.

A-Pre-Project Planning

A-1: Prior to treatment, confirm species/habitats of local interest, sensitive areas (e.g. streams, lakes, roadside treatment areas with higher potential to deliver herbicide to water, domestic water sources, shallow water table), recreation and administrative sites, and range allotments. Apply appropriate PDFs described in the following text.

> Purpose: Ensure project is implemented appropriately.
> Source: This approach follows several previous NEPA documents to achieve successful implementation of the project when coordinating between multiple resource objectives. Pre-project planning also discussed in the previous section.

B-Coordination with Other Landowners and Agencies

B-1: Work with owners and managers of neighboring lands to respond to invasive plants that occur across multiple ownerships. Coordinate treatments within appropriate distances based on invasive plant species reproductive characteristics, and current use of area.

> Purpose: To ensure that neighbors are fully informed about nearby herbicide use and to increase the effectiveness of treatments on multiple ownerships
> Source: A variable distance based on site and species specific characteristics was chosen because it adjusts for various conditions that exist in these areas. All PDFs related to riparian areas and buffer distances will be followed.

C-To Prevent the Spread of Invasive Plants during Treatment Activities

C-1: Ensure vehicles and equipment (including personal protective clothing) do not transport invasive plant materials.

> Purpose: To minimize the potential for invasive species spread.
> Source: R6 2005 ROD Standard #1

D-Wilderness Areas[3]

D-1: In wilderness and Research Natural Areas (RNAs), invasive plants would be treated using manual methods or herbicides. Herbicide treatments may use application methods such as wicking, spray bottle, hand pressurized pumps (e.g. backpack sprayers), battery or solar powered pumps and propellant based systems such as those that use pressurized carbon dioxide.

> Purpose: To reduce the effects of invasive plant treatments on the untrammeled quality of wilderness character
> Source: Wilderness Policy FSM/FSH

E-Non-herbicide Treatment Methods

E-1: Limit the numbers of workers on any one site at any one time while treating areas within 150 feet of creeks.

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[3] Invasive plant eradication within Wilderness meets the "no impact" intent of the Wilderness Act and associated land use policies

Purpose: To minimize trampling, protect riparian and aquatic habitats, and prevent potential invasive plant spread via waterway dispersal
Source: The distance of 150 feet was selected because it incorporates the Aquatic Influence Zone for fish bearing streams

E-2: Fueling of gas-powered equipment with tanks larger than 5 gallons would not occur inside the RHCA unless there is no other alternative.

Purpose: To protect riparian and aquatic habitats
Source: The distance of 150 feet was selected because it incorporates the Aquatic Influence Zone for fish bearing streams

F-Herbicide Application

F-1: Herbicides would be used in accordance with label instructions, except where more restrictive measures are required as described below. Herbicide applications would only treat the minimum area necessary to meet site objectives. Herbicide formulations would be limited to those containing one or more of the following 11 active ingredients: chlorsulfuron, clopyralid, glyphosate, imazapic, imazapyr, metsulfuron methyl, picloram, sethoxydim, sulfometuron methyl, triclopyr, and aminopyralid. Herbicide application methods include wicking, wiping, spot, stem injection, and broadcast; as permitted by the product label and these Project Design Features. The use of triclopyr is limited to spot and hand/selective methods. The R-6 2005 ROD Standard #18 permits only the use of adjuvants reviewed in Forest Service risk assessment documents.

Purpose: To limit potential adverse effects on people and the environment
Source: R6 2005 ROD Standard #16, Pesticide Use Handbook 2109.14

F-2: Herbicide use would comply with standards in the Forest Plan as amended by the R6 2005 ROD, including standards on herbicide selection, restrictions on broadcast use, tank mixing, licensed applicators, and use of adjuvants, surfactants and other additives.

Purpose: To limit potential adverse effects on people and the environment
Source: R6 2005 ROD Treatment Standards

F-3: Polyethoxylated tallow amine (POEA) surfactants, urea ammonium nitrate or ammonium sulfate would not be used in applications within 150 feet of surface water, wetlands or on roadside treatment areas having high potential to deliver herbicide.

Purpose: To protect aquatic ecosystems
Source: The distance of 150 feet was selected because it is wider than the largest buffer and incorporates the Aquatic Influence Zone for fish bearing streams. This distance is sufficient to avoid harm to the aquatic environment, based on risk assessments, previous monitoring, and studies related to chemical behavior in the environment (see Chapter 3).

F4: Lowest effective label rates would be used. No broadcast applications of herbicide or surfactant will exceed typical label rates. Nonylphenol polyethoxylate-based (NPE) surfactant would not be ground-based broadcast at a rate greater than 0.5 lbs. a.i./ac (pounds of active ingredient per acre). Favor other classes of surfactants wherever they are expected to be effective.

Purpose: To eliminate possible herbicide or surfactant exposures of concern to human health, wildlife, and aquatic organisms

Source: Based on SERA Risk Assessment for imazapyr there would be no exposure concerns

F-5: Herbicide applications would occur when wind velocity is between two and eight miles per hour to reduce the chance of drift. During application, weather conditions would be monitored periodically by trained personnel.

Purpose: To ensure proper application of herbicide and reduce drift
Source: These restrictions are typical so that herbicide use is avoided during inversions or windy conditions.

F-6: To minimize herbicide application drift during broadcast applications, use low nozzle pressure; apply as a coarse spray, and use nozzles designed for herbicide application that do not produce a fine droplet spray, e.g., nozzle diameter to produce a median droplet diameter of 500-800 microns.

Purpose: To ensure proper application of herbicide and reduce drift
Source: These are typical measures to reduce drift. The minimum droplet size of 500 microns was selected because this size is modeled to eliminate adverse effects to non-target vegetation 100 feet or further from broadcast sites.

F-7: Use of sulfonylurea herbicides (chlorsulfuron, sulfometuron methyl and metsulfuron methyl), will require soils on site to be evaluated prior to treatment. Treatment of powdery, ashy dry soil, or light sandy soil can only be treated if rainfall is expected within 24 hrs of treatment.

Purpose: To avoid herbicide drift caused by wind erosion of dry soils containing sulfonylurea chemical residue
Source: Label advisory

G-Herbicide Transportation and Handling Safety/Spill Prevention and Containment
G-1: An Herbicide Transportation and Handling Safety/Spill Response Plan would be the responsibility of the herbicide applicator. At a minimum the plan would:

-Address spill prevention and containment.
-Estimate and limit the daily quantity of herbicides to be transported to treatment sites.
-Require that impervious material be placed beneath mixing areas in such a manner as to contain small spills associated with mixing/refilling.
-Require a spill cleanup kit be readily available for herbicide transportation, storage and application (minimum FOSS Spill Tote Universal or equivalent).
-Outline reporting procedures, including reporting spills to the appropriate regulatory agency.
-Ensure applicators are trained in safe handling and transportation procedures and spill cleanup.
-Require that equipment used in herbicide storage, transportation and handling are maintained in a leak proof condition.
-Address transportation routes so that traffic, domestic water sources, and blind curves are avoided to the extent possible.
-Specify conditions under which guide vehicles would be required.
-Specify mixing and loading locations away from water bodies so that accidental spills do not contaminate surface waters.

-Require that spray tanks be mixed or washed further than 150 feet of surface water.
-Ensure safe disposal of herbicide containers.
-Identify sites that may only be reached by water travel and limit the amount of herbicide that may be transported by watercraft.

Purpose: To reduce likelihood of spills and contain any spills.
Source: FSH 2109.14; H-12

H-Soils, Water and Aquatic Ecosystems

H-1: Herbicide use buffers have been established for perennial and wet intermittent steams; dry streams; and lakes and wetlands. These buffers are depicted in the tables below. Buffers vary by herbicide ingredient and application method. Tank mixtures would use the largest buffer as indicated for any of the herbicides in the mixture.

Purpose: To reduce likelihood that herbicides would enter surface waters in concentrations of concern

Source: Treatments within Riparian Habitat Conservation Areas (RHCAs) and Riparian Reserves (RRs)are allowed if they meet Riparian Management Objectives (RMOs) and Standards and Guidelines, including minimizing adverse effects to listed fish; therefore, buffers are based on label advisories, SERA risk assessments and Berg's 2004 study of broadcast drift and run off to streams. Buffers are intended to demonstrate compliance with the Okanogan-Wenatchee National Forest land and resource management plans as amended by the R6 2005 ROD Standards 19 and 20.

Herbicide Use Buffers

Herbicide treatments would become more restrictive as they occur close to water. PDFs and herbicide use buffers within the aquatic influence zone were developed based on label advisories; SERA risk assessments, and various studies of drift and runoff to streams such as Berg 2004. The scientific basis for establishing no treatment buffer widths is based on research on inherent risk of chemical contamination due to herbicide application (Moore 1975, Norris, Lorz and Gregory 1991, Bissin, Ice, Perrin and Bilby 1992). In general, research has demonstrated that the risk of aquatic organism exposure to chemical herbicides is dependent on three key factors including (1) chemical behavior, (2) the rate and methods of application, and (3) site characteristics.

The tables below, specify buffers according to treatment methods, herbicides used, risk, and type of aquatic zone. Buffers identify distances from various water bodies where treatment activities are not allowed. Ephemeral streams exist in the project area. Ephemeral drainages lack a definable channel and evidence of annual scour or deposition. Label direction and PDFs would be followed for treatments along ephemeral streams. These areas flow rarely during very high water events when herbicide use would not likely occur.

Herbicide Use Buffers in Feet[4] -Perennial Streams -Proposed Action

[4] Units are in feet and measured from bankfull channel edge unless otherwise specified.

Herbicide	Perennial Stream			
		Broadcast	Spot	Wicking or Wiping
Aquatic Labeled Herbicides				
Aquatic Glyphosate		50	Water's edge	Water's edge
Aquatic Triclopyr-TEA		None Allowed	15	Water's edge
Aquatic Imazapyr[5]		50	Water's edge	Water's edge
Low Risk to Aquatic Organisms				
Aminopyralid		100	Water's edge	Bankfull
Imazapic		100	15	Bankfull
Clopyralid		100	15	Bankfull
Metsulfuron Methyl		100	15	Bankfull
Moderate Risk to Aquatic Organisms				
Imazapyr		100	50	Bankfull
Sulfometuron Methyl		100	50	5
Chlorsulfuron		100	50	Bankfull
High Risk to Aquatic Organisms				
Triclopyr-BEE		None Allowed	150	150
Picloram		100	50	50
Sethoxydim		100	50	50
Glyphosate		100	50	50

-Herbicide Use Buffers in Feet Intermittent Streams -Proposed Action

Herbicide	Dry Intermittent Stream			
		Broadcast	Spot	wicking or Wiping
Aquatic Labeled Herbicides				
Aquatic Glyphosate		50	0	0
Aquatic Triclopyr-TEA		None Allowed	0	0
Aquatic Imazapyr[4]		50	0	0
Aminopyralid		50	No buffer	No buffer
Low Risk to Aquatic Organisms				
Imazapic		50	0	0
Clopyralid		50	0	0
Metsulfuron Methyl		50	0	0
Moderate Risk to Aquatic Organisms				
Imazapyr		50	15	Bankfull

[5] Aquatic Imazapyr (Habitat) may not be used until the risk assessment (currently underway) is completed for inert ingredients and additives.

Sulfometuron Methyl		50	15	Bankfull
Chlorsulfuron		50	15	Bankfull
High Risk to Aquatic Organisms				
Triclopyr-BEE		None Allowed	150	150
Picloram		100	50	50
Sethoxydim		100	50	50
Glyphosate		100	50	50

-Herbicide Use Buffers in Feet – Lakes and Wetlands

Herbicide	Wetlands			
		Broadcast	Spot	Wicking or Wiping
Aquatic Labeled Herbicides				
Aquatic Glyphosate		100[6]	Water's edge	Water's edge
Aquatic Triclopyr-TEA		None Allowed	15	Water's edge
Aquatic Imazapyr*		100[5]	Water's edge	Water's edge
Aminopyralid		100	15	High water mark
Low Aquatic Hazard Rating				
Imazapic		100	15	High water mark
Clopyralid		100	15	High water mark
Metsulfuron Methyl		100	15	High water mark
Moderate Aquatic Hazard Rating				
Imazapyr		100	50	High water mark
Sulfometuron Methyl		100	50	5
Chlorsulfuron		100	50	High water mark
Greater Aquatic Hazard Rating				
Triclopyr-BEE		None Allowed	150	150
Picloram		100	50	50
Sethoxydim		100	50	50
Glyphosate		100	50	50

*Aquatic Imazapyr (Habitat) may not be used until the risk assessment (currently underway) is completed for inert ingredients and additives.
** If wetland, pond or lake is dry, there is no buffer.

[6] If wetland, pond or lake is dry, there is no buffer.

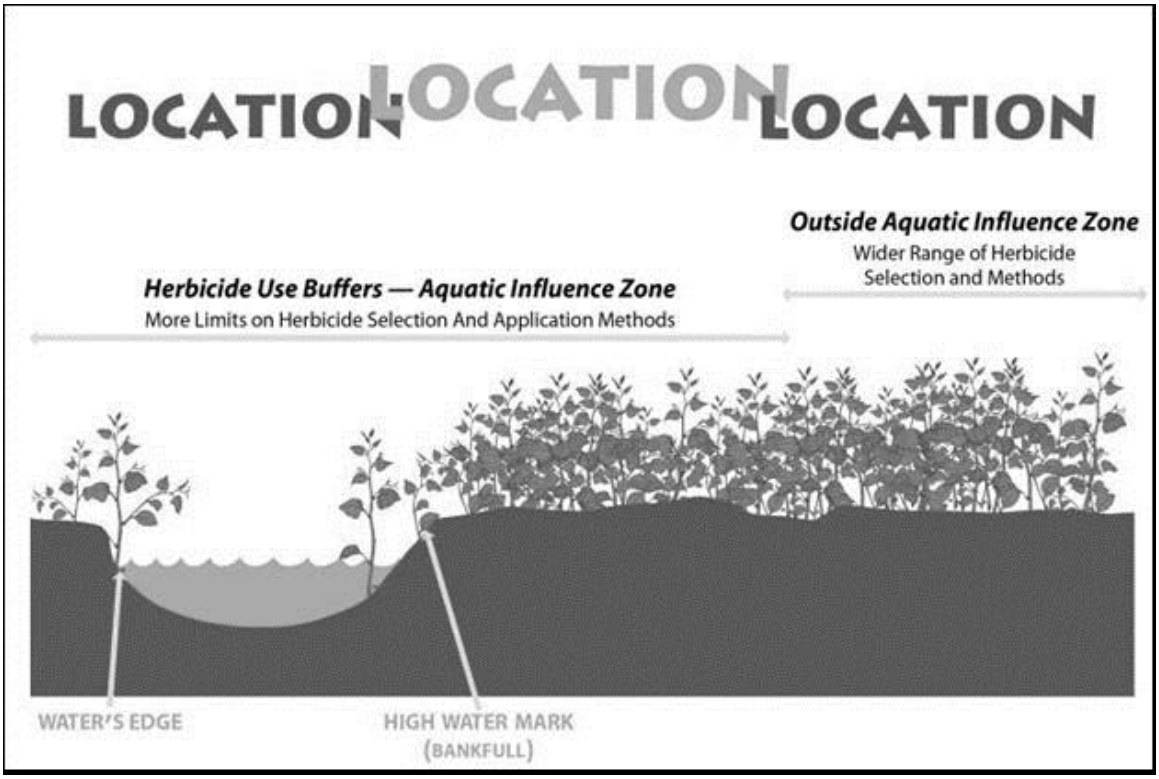

Illustration of how herbicide selection and application methods in the established buffer widths are more limited in Aquatic Influence Zones

The above figure illustrates how the Aquatic Influence Zone restricts application methods and herbicides to only those approved for use in aquatic areas. "Aquatic Influence Zone" is not equal to the "buffer widths" listed in the tables above. For purposes of analysis in this EIS, the Aquatic Influence Zone is defined by the innermost half of the RHCA/Riparian Reserve. For instance, a 300 foot RHCA/RR would have an Aquatic Influence Zone of 150 feet. Establishing buffer widths reduces the potential for herbicides to come in contact with water via drift, leaching, and runoff at or near concentrations of concern.

H-2: No broadcast of high aquatic risk herbicides on roads that have a high risk of delivery to water (generally roads in the Aquatic Influence Zone. These herbicides are picloram or triclopyr (Garlon 4), glyphosate, and sethoxidim.

Purpose: To ensure high risk herbicides are not delivered to streams in concentrations that exceed levels of concern
Source: SERA Risk Assessments, R6 2005 FEIS Fisheries Biological Assessment

H-3: In riparian and aquatic settings, vehicles (including all terrain vehicles) used to access invasive plant sites for invasive plants treatment, for broadcast spraying would remain on roadways, trails, parking areas, and existing dispersed camping areas to prevent damage to riparian vegetation, soil, water quality and aquatic habitat.

Purpose: To protect riparian vegetation and aquatic habitats
Source: Common Control Measures Table

H-4: Avoid use of clopyralid on high-porosity soils (loamy sand or coarser).

Purpose: To avoid leaching or ground water contamination
Source: Label advisory

H-5: Avoid use of chlorsulfuron on soils with high clay content (finer than loam).

Purpose: To avoid excessive herbicide runoff
Source: Label advisory

H-6: Avoid use of picloram on shallow or coarse soils where there is potential for ground water or surface water contamination according to herbicide labels. No more than one application of picloram would be made within a two-year period.

Purpose: To reduce the potential for picloram to enter surface and/or ground water and/or accumulate in the soil. Picloram has the highest potential to impact organisms in soil and water, and tends to be more persistent than the other herbicides.
Source: SERA Risk Assessment. Based on quantitative estimate of risk from worst-case scenario and uncertainty

H-7: Avoid use of sulfometuron methyl on shallow or coarse soils where there is potential for ground water or surface water contamination. No more than one application of sulfometuron methyl would be made within a one-year period.

Purpose: To reduce the potential for sulfometuron methyl accumulation in the soil; sulfometuron methyl has some potential to impact soil and water organisms and is persistent.
Source: SERA Risk Assessments: Based on quantitative estimate of risk from worst-case scenario and uncertainty

H-8: Lakes and Ponds – No more than half the perimeter or 50 percent of the vegetative cover within established buffers or 10 contiguous acres around a lake or pond would be treated with herbicides in any 30-day period. This limits area treated within riparian areas to keep refugia habitat for reptiles and amphibians.

Purpose: To reduce exposure to herbicides by providing some untreated areas for some organisms to use
Source: SERA Risk Assessments: Based on quantitative estimate of risk from worst-case scenario and uncertainty regarding effects to reptiles and amphibians.

H-9: Wetlands – Wetlands would be treated when soils are driest. If herbicide treatment is necessary when soils are wet, use aquatic labeled herbicides. Favor wicking or wiping treatment methods where effective and practical. No more than 10 contiguous acres or fifty percent individual wetland areas would be treated in any 30-day period.

Purpose: To reduce exposure to herbicides by providing some untreated areas for some organisms to use
Source: SERA Risk Assessments. Based on quantitative estimate of risk from worst-case scenario, uncertainty in effects to some organisms, and label advisories

H-11: Herbicide use would not occur within 100 feet of domestic wells or 200 feet of domestic spring developments. For stock tanks located outside of riparian areas, use wicking, wiping or spot treatments within 100 feet of the watering source.

Purpose: Safe drinking water. Also to reduce the potential chance of herbicide delivery to watering systems for grazing animals
Source: Label advisories and state drinking water regulations

H-12: When chemicals need to be carried over water by boat, raft or other watercraft, herbicides will be carried in water tight, floatable containers.

Purpose: Lower the risk of herbicide being delivered to streams in concentrations that exceed levels of concern
Source: Best management practice

H-13: In aquatic settings, herbicide applications from water's edge to bank-full width will be limited to 2 acres for every 1.6 miles of stream length per 6th field HUC. Treatments above bankfull, within the aquatic influence zone (riparian area), would not exceed 10 acres along any 1.6 mile of stream length per 6th field HUC.

Purpose: Limits the extent of treatment from the water's edge through the aquatic influence zone so that adverse effects are within the scope of analysis
Source: Analyses based on SERA risk assessment worksheets. Ten acres is based on GLEAM model factors.

I – Botanical Species of Local Interest[7] (SOLI)

I-1: Botanical surveys may be necessary prior to treatment applications to identify vascular and non-vascular SOLI occurrence in or near areas proposed for invasive plant treatments. Lists of target SOLI to include in each treatment area will be developed by qualified botanical personnel based on the range and distribution of SOLI species and the presence of suitable SOLI habitat. If surveys are deemed necessary, they will be conducted within the proposed treatment area and immediately adjacent to the treatment area as follows: 100 feet of planned broadcast treatments, 10 feet of planned spot treatments, and/or 5 feet of planned hand herbicide treatments.

Purpose: To ensure SOLI are protected and surveys are conducted when appropriate
Source: Forest Service Manual 2670 and applicable federally listed recovery plans

I-2: If circumstances will not permit surveys prior to treatment then all suitable SOLI habitat identified to occur within and around the treatment area will be managed as if the habitat were occupied by SOLI species. In absence of botanical surveys: no ground based broadcast, spot, or hand treatments will occur within 100 feet of SOLI habitat.

Purpose: To ensure SOLI are protected and surveys are conducted when appropriate
Source: Forest Service Manual 2670 and applicable federally listed recovery plans

I-3: Modify treatments to protect SOLI occurrences based on their distance from the treatment area:

--Greater than 100 feet: All ground based treatments are permitted (see I-6 for additional buffer restrictions).

[7]Botanical Species of Local Interest (SOLI) to include Threatened, Endangered, and Sensitive species, other rare and uncommon species, special forest products and culturally significant plants.

--100 to 10 feet: Manual and mechanical methods permitted. Broadcast herbicide methods permitted if SOLI can be completely protected using a protective cover, otherwise use other protective measures such as low-pressure spot-spray, directed spray applications or hand application methods to eliminate any potential for drift.

--Less than 10 feet: No broadcast spraying is permitted. Spot treatment using hand application methods is permitted. For saturated or wet soils see I-6. Manual treatment methods are permitted. Precautions must be taken to avoid any contact with individual SOLI.

Purpose: To ensure SOLI are protected and surveys are conducted when appropriate
Source: Forest Service Manual 2670 and applicable federally listed recovery plans

I-4: Picloram will not be used within 50 feet of federally listed plant species

Purpose: To ensure protection of emerging seedlings and potential non-target plant root uptake due to herbicide soil persistence
Source: applicable US FWS conservation strategies and recovery plans.

I-5: In the vicinity of SOLI, restoration and cultural treatments, including seeding and/or use of fertilizer, will be under the direct supervision of the district or forest botanist to ensure that plant communities are restored to their desired condition without negative impacts to existing SOLI populations or individuals. The vicinity areas will be evaluated on a case by case basis.

Purpose: To ensure soil chemistry/biology is not negatively impacted which can potentially alter the subsequent establishment of resident seedbank species.
Source: Professional judgment

I-6: When vascular or non-vascular SOLI plant species are within 10 feet of saturated or wet soils at the time of herbicide application, only hand methods (wiping, stem injection, etc.) would be used. Avoid the use of picloram and imazapyr in this situation, and use aquatic triclopyr with caution as typical application rates can result in concentrations greater than estimated or measured "no observable effect concentration" to aquatic plants (R6 2005 FEIS, Table 4-47).

Purpose: To ensure SOLI are protected and surveys are conducted when appropriate
Source: Forest Service Manual 2670 and applicable federally listed recovery plans.

I-7: A USDA Forest Service botanist would use monitoring results to refine buffers in order to adequately protect vascular and nonvascular plant species of local interest.

Purpose: To prevent any repeated effects to SOLI populations, thereby mitigating any long term effects
Source: Broadcast buffer sizes are based on Marrs, 1989 based on tests on vascular plants. Spot and hand/select buffer distances are based on reports from experienced applicators. Uncertainty about effects on non vascular plants would be addressed through monitoring (See I-9)

I-8: The impacts of herbicide use on plant Species of Local Interest (SOLI) are uncertain, especially regarding lichen and bryophytes. The potential for variances in aerial drift due to uncontrolled weather conditions during treatment may also be uncertain. To manage this uncertainty, representative samples of herbicide treatment sites adjacent to vascular and non-vascular plant SOLI would be monitored. Within 500 feet of herbicide broadcast treatment sites and 20 feet of herbicide spot and hand treatment sites would be evaluated before treatment,

immediately after treatment, and two to three months later as appropriate. Treatment buffers would be expanded if damage is indicated; as determined by the local Forest Service botanist.

Purpose: To prevent any repeated effects to SOLI populations, thereby mitigating any long term effects

I-9: A pre-work review would occur prior to implementation to ensure that prescriptions, contracts and agreements integrate appropriate Project Design Features.

Purpose: To ensure that the appropriate PDFs are applied to protect SOLI.
Source: Standard operating procedures

I-10: Monitoring would occur during implementation to ensure Project Design Features are implemented as planned. An implementation monitoring form will be used to document daily field conditions, activities, accomplishments and/or difficulties. Contract administration mechanisms would be used to correct deficiencies. Herbicide use will be reported as required by the Forest Service Health Pesticide Use Handbook (FSH 2109.14).

Purpose: To ensure that the appropriate PDFs are implemented to protect SOLI.
Source: Standard monitoring procedures

I-11: Effectiveness monitoring would occur before, during and after treatment to determine whether invasive plants are being effectively controlled and to ensure non-target vegetation, especially native vascular and non-vascular species of local interest are adequately protected.

Purpose: To ensure treatments are effective and SOLI are adequately protected.
Source: R6 2005 ROD and FEIS, Appendix M: Inventory and Monitoring Plan Framework

J-Wildlife Species of Local Interest

J-1 Grey Wolf, Canada Lynx, grizzly Bear
J-1a: Treatments within 1 mile of active wolf dens would be timed to occur outside the season of occupancy (April 1 through June 30).

Purpose: To minimize disturbance and reduce energy demands on denning wolves, lynx and grizzly bear
Source: Federal Register, Vol. 68, No. 62 4(d); Vol. 65, No. 58; Programmatic Biological Opinion (U.S. Fish and Wildlife Service 2008), p. 11.

J-1b: For wolves, treatments within 0.50 mile of occupied rendezvous sites would be timed to occur outside the season of occupancy (April 1 through August 31) unless treatment activity is within acceptable ambient noise levels and human presence would not cause wolves to abandon the site (as determined by a local specialist).

Purpose: To minimize disturbance/impacts to wolves at rendezvous sites.
Source: Buffer is based on expected range of disturbance

J-1c: Consultation with US Fish and Wildlife Service (FWS) would be reinitiated (unless determined otherwise by FWS) if/when wolf dens or rendezvous sites are discovered in the vicinity of treatment sites.

J-2 Northern Spotted Owl

J-2a: Project activity that creates noise above ambient levels (i.e. weed-eaters, mowers, etc) will not take place within ¼ mile of a nest site or an activity center whose status is unknown, or unsurveyed nesting habitat between March 1 and July 31. Local knowledge may be used to adjust dates to site-specific conditions. This condition may be waived in a particular year if nesting or reproductive success surveys reveal that spotted owls are not nesting or no young are present that year (as determined by a local specialist). Waivers are valid only until March 1 of the following year.

Purpose: To minimize disturbance to nesting spotted owls and protect eggs and nestlings.
Source: Programmatic BO (U.S. Fish and Wildlife Service 2008), p. 11

J-3 Marbled Murrelet

J-3a: Project activity that creates noise above ambient levels (i.e. weed-whackers, mowers, , etc) will not take place within 1/4 mile of a nest site or an activity center whose status is unknown, or unsurveyed nesting habitat between April 1 and September 15. Local knowledge may be used to adjust dates to site-specific conditions. This condition may be waived in a particular year if nesting or reproductive success surveys reveal that marbled murrelets are note nesting or no young are present that year. Waivers are valid only until April 1 of the following year. This applies within suitable portions of treatment areas.

Purpose: To minimize disturbance to nesting marbled murrelets and protect eggs and nestlings.
Source: Programmatic BO (U.S. Fish and Wildlife Service 2008), p. 11

J-4 Bald Eagle

J-4a: Treatment of areas within 0.25 mile, or 0.50 mile line-of-site of bald eagle nest would be timed to occur outside the nesting/fledgling season, which is generally January 1 to August 31. Local knowledge may be used to adjust dates to site-specific conditions. This only applies to treatment activity that creates noise above ambient levels and human presence that would cause eagles to abandon the nest (as determined by a local specialist). Occupancy of nest sites (i.e. whether it is active or not) would be determined each year prior to treatment.

Purpose: To minimize disturbance to nesting bald eagles and protect eggs and nestlings
Source: Bald Eagle Management Guidelines for OR-WA (Anonymous); Programmatic BO (U.S. Fish and Wildlife Service 2003), p. 129

J-4b: Noise-producing activity above ambient levels would not occur between October 31 and March 31 during early morning or late afternoon near known winter roosts and concentrated foraging areas. Disturbance to daytime winter foraging areas would be avoided.

Purpose: To minimize disturbance and reduce energy demands during stressful winter season
Source: Bald Eagle Management Guidelines for OR-WA (Anonymous); Programmatic BO (U.S. Fish and Wildlife Service 2003), p. 129

J-5 Peregrine Falcon

J-5a: Clopyralid would not be used within 1.5 miles of peregrine nests more than once per year. Picloram would not be used within 1.5 miles of peregrine nests more than once every two years (see PDF H6)

Purpose: To minimize risk of exposure to hexachlorobenzene (HCB).
Source: Pagel J. unpublished data.

J-6: Great Gray Owl
J-6a: Do not broadcast spray NPE surfactant in mapped opening habitat (i.e. within suitable portions of treatment areas.

Purpose: To minimize exposure of owls to NPE surfactant from ingesting contaminated prey.
Source: Tables 5 & 6 in Appendix P of R6 2005 FEIS

J-7: Larch Mountain and Van Dyke's Salamanders
J-7a: Avoid broadcast spraying of herbicide in talus or rocky outcrops, springs, seeps or stream margins; rather, utilize wiping, wicking and spot spraying methods. Conduct manual or selective herbicide treatments within ¼ mile of suitable Larch Mountain salamander talus habitat. Utilize aquatic design criteria for suitable habitat in riparian areas, streams, rivers, rocky outcrops and in talus (see PDFs H-1, H-4, H-13)

Purpose: To reduce likelihood of exposure to contaminated soil and water.
Source: Herbicide characteristics and risk to amphibians in SERA risk assessments, and professional opinion of local biologist

J-8: Painted Turtle
J-8a: The local Forest Service Biologist would review treatment locations, timing, and methods to minimize adverse impacts to painted turtles. To minimize impacts to painted turtles conduct treatments prior to April 1 or between August 1 and September 30, when effective for invasive plant control. Treat only portions of the painted turtle habitat in any one season (refer to PDF H-8 for herbicide treatment limitations to lakes and ponds.

Purpose: To minimize disturbance, trampling, and herbicide exposure to painted turtles.
Source: 2005 MOU between Washington Dept. of Fish and Wildlife and USDA Forest Service; David Anderson, WA Dept. of Fish and Wildlife, personal communication, 2005.

J-9: Masked Duskysnail (*Lyogyrus n. sp. 2*)
J-9a: To minimize adverse impact to masked duskysnails, utilize aquatic design criteria for aquatic ecosystems (see PDFs H-1 through H-13) with an emphasis on potential habitat i.e., lakes (H-8 and H-12, H-13).

Purpose: To minimize risk of trampling and herbicide exposure.
Source: Herbicide characteristics in SERA risk assessments, and professional opinion of local taxa expert.

J-10: Blue-gray taildropper (*Prophysaon coeruleum*)
J-10a: In known sites or high potential suitable habitat outside of roadside treatment locations, avoid manual, mechanical, or herbicide treatments when soil moisture is high (generally late fall to late spring).

Purpose: To minimize risk of trampling and herbicide exposure.
Source: Herbicide characteristics in SERA risk assessments, and professional opinion of local taxa expert.

J-11: Chelan Mountain snail (*Oreohelix n. sp.*)
J-11a: In known sites or within mapped high potential suitable habitat conduct manual or selective herbicide treatments. Coordinate treatment methods, timing and locations annually with local Biologist.

Purpose: To minimize risk of trampling and herbicide exposure.
Source: Herbicide characteristics in SERA risk assessments, and professional opinion of local taxa expert.

J-12: Puget Oregonian (*Cryptomastix devia)*
J-12a: Outside of western gray squirrel habitat, conduct manual or selective herbicide treatments within 50 feet of big-leaf maple trees that are larger than 20 inches dbh when soil moisture is low. Avoid broadcast spraying of herbicides within suitable habitat. Coordinate treatment method, timing, and locations annually with local Biologist.

Purpose: To minimize risk of trampling and herbicide exposure.
Source: Herbicide characteristics in SERA risk assessments, and professional opinion of local taxa expert.

J-13: Western Gray Squirrel
J-13a: No herbicide treatments within 50 feet of hardwood stands (e.g. aspen, big-leaf maple, and other areas with a hardwood leaf litter component) within mapped western gray squirrel habitat. Coordinate treatment method, timing, and locations annually with local Biologist.

Purpose: To minimize impacts to ephemeral biota such as fungi, important forage for the western gray squirrel.
Source: Opinion of local biologist.

J-14: Mardon Skipper, Lustrous Copper, Meadow Fritillary, and Melissa Arctic
J-14a: Use manual or only selective herbicide application methods and avoid use of ester formulations of herbicide and NPE-based surfactants in known butterfly habitat. Use herbicides on only a portion of a known site in any one year. Coordinate treatment method, timing, locations, amount of habitat treated annually with local Biologist.

Purpose: To minimize exposure to herbicides, surfactants, and trampling while effectively protecting and improving habitat.
Source: Herbicide characteristics and risk to insects in SERA risk assessments; Sucoff et al. 2001; Bramble et al. 1997; Bramble et al. 1999; and professional opinion of local biologists, Conservation Asessment for the Mardon Skipper (USDA Forest Service and USDI Bureau of Land Management 2007)

J-15: Raptors
J-15a Active nest sites should be protected from disturbance above ambient levels during the dates specified. Local biologist will determine appropriate distances for planned operations prior to implementation.

Golden eagle	February 15 – September 1
Osprey	April 1 – August 31
Red-tailed hawk	March 1 – August 31
Northern goshawk	March 1 – September 31

Cooper's hawk	April 1 – August 31
Sharp-shinned hawk	April 1 – August 31
Prairie falcon	March 1 – June 30
Great gray owl	March 15 – June 30
Long-eared owl	April 1 – July 15
Great horned owl	February 15 - July 15
Peregrine falcon	March 1 – June 30

Purpose: To minimize or eliminate disturbance to nesting raptors.
Source: Management Consideration for Forest Raptors on the Okanogan-Wenatchee and Colville National Forests (Haggard and Gaines 2004), Great Gray Owl Survey Protocol (Regional Interagency Executive Committee 1995)

K-Public Notification

K-1: The public would be notified about upcoming herbicide treatments via the local newspaper or individual notification, fliers, and posting signs. Forest Service and other websites may also be used for public notification.

Purpose: To reduce the risk of inadvertent public contact with herbicide
Source: R6 2005 ROD Standard #23, and Okanogan-Wenatchee National Forests Weed Prevention Strategy (2002)

L-Special Forest Products

L-1: Triclopyr would not be applied to foliage in areas of known special forest products or other wild food collection areas.

Purpose: To reduce the chance that people might be exposed to harmful doses of triclopyr
Source: Appendix Q of the R6 2005 FEIS

L-2: Special forest product gatherers would be notified about herbicide treatment areas when applying for their permits. Flyers indicating treatment areas may be included with the permits.

Purpose: To reduce the risk of inadvertent public contact with herbicide
Source: R6 2005 ROD Standard #23, and Okanogan-Wenatchee National Forests Weed Prevention Strategy (2002)

American Indian Tribal and Treaty Rights

M-1: American Indian tribes would be notified annually as treatments are scheduled so that tribal members may provide input and/or be notified prior to gathering cultural plants.

Purpose: To ensure that no inadvertent public contact with herbicide occurs and that cultural plants are fully protected.
Source: Government to Government agreements between American Indian tribes and the Okanogan and Wenatchee National Forests

M-2: The Forest Archaeologist will annually assess areas where mechanical treatment that could cause damage to cultural resources is proposed. Weed wrenching and grubbing techniques will not be used in known archaeological sites. Instead, treatment methods that would have no potential to affect cultural resources will be used.

Purpose: To avoid adverse impacts to cultural resources
Source: Common practice

N-Rangeland Resources

N-1: Use available administrative mechanisms to incorporate invasive plant prevention practices into rangeland management. Examples of administrative mechanisms include, but are not limited to, revising permits and grazing allotment plans, providing annual operating instructions, and adaptive management. Plan and implement practices in cooperation with grazing permit holder.

Purpose: To ensure proactive adaptive measures are taken to eliminate future spread of invasive plants
Source: R6 2005 ROD Standard #6

N-2: Permittees will be notified of annual treatment actions at the annual permittee operating meeting, and/or notified within two weeks of planned treatments of infestations greater than one acre in size.

Purpose: To ensure permittee has knowledge of activities occurring within the allotment
Source: Best management practice

N-3: Follow most current EPA herbicide label for grazing restrictions

Purpose: To ensure grazing animals are not exposed to chemicals
Source: EPA labeling requirements

O-Human Health

The following PDFs limit herbicide use to below maximum rates to avoid scenarios of concern for worker health (Also refer to PDF F-4). Implementation of these design features avoids concern for worker health based on worst case scenarios in the risk assessments (HQ greater than 1).

O-1: Triclopyr would not be applied by backpack spray at any rate that exceeds the FS typical rate (1.0 lb a.i./acre).

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-2: Sulfometuron methyl would not be applied by backpack spray at any rate higher than 0.2 lb. a.i. /acre (this is between typical – 0.045 lb ai/acre and highest rate - 0.38 lb per acre).

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-3: Sulfometuron methyl would not be broadcast applied at any rate higher than 0.12 lb. a.i. /acre (this is between lowest label rate of 0.03 lb ai per acre and typical which is 0.045 lb a.i./acre).

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-4: Picloram would not be broadcast applied at any rate higher than 0.5 lb. a.i./acre (this is between typical – 0.35 lb ai/acre and highest rate – 1 lb ai/acre)

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-5: NPE surfactant would not be applied by backpack spray at any rate that exceeds the FS typical rate (1.67 lb a.i./acre)

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-6: NPE surfactant would not be broadcast applied at any rate greater than 0.5 lb a.i./acre (well below typical rate).

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-7: Rates of any NPE use (backpack or broadcast) in areas of special forest products or heavy public use areas would not exceed 0.5 lb per acre.

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

O-8: Garlon 3A triclopyr would be used instead of Garlon 4 where ever possible.

Purpose: To reduce the potential of adverse effects to human health
Source: R6 2005 FEIS, Appendix Q

P-Restoration

P-1: Long-term site strategy for highly disturbed areas that have high potential for weed invasion such as old fields or old homesteads, follow guidelines and techniques outlined in *Guidelines for Revegetation for Invasive Weed Sites on National Forests and Grasslands in the Pacific Northwest* (Erickson et al.2003)

Purpose: To ensure highly disturbed sites are successfully restored or re-vegetated with desirable vegetation
Source: R6 2005 ROD Standard #12

P-2: In areas where broadcast application is used to treat highly infested areas, evaluation of potential re-infestation by new or nearby invasives would be considered and restoration and/or revegetation measures would be implemented to ensure protection of native vegetation and soils. Also see Treatment Restoration Standard #12 in the R6 2005 FEIS and ROD.

Purpose: To ensure those sites are successfully restored with desirable vegetation
Source: R6 2005 ROD Standards #3 and #12 and Guidelines for Revegetation for Invasive Weed Sites on National Forests and Grasslands in the Pacific Northwest (Erickson et al. 2003)

Possible Alternatives

The No Action alternative will serve as a baseline for comparison of alternatives. Under the No Action alternative, the Okanogan-Wenatchee National Forest would continue to treat invasive plant species as authorized under existing National Environmental Policy Act (NEPA) documents including; current noxious weed, dry forest restoration, and other site-specific projects. Additional action alternatives may be developed to respond to significant issues, if any.

Responsible Official and Nature of the Decision to be Made

The responsible official for this project is the Okanogan-Wenatchee National Forest Supervisor Rebecca Lockett Heath. Supervisor Heath will decide whether or not invasive species will be treated on the Forest, and if so, what mitigation measures and monitoring requirements will be required for implementation.

Preliminary Issues

Several analysis efforts related to the treatment of invasive species on National Forests in Washington and Oregon (Region 6) have been completed or are currently on-going at this time. Preliminary issues identified during the scoping process associated with these efforts have included: human health/public and worker exposure to herbicides, effects of herbicide on native and non-target vegetation including threatened, endangered and special status plants, and the effects of herbicide on wildlife including threatened, endangered and special status animals and aquatic organisms, including special status fish.