Invasive Plants Treatment Proposed Action
Umatilla National Forest

Background

The Umatilla National Forest proposes to control, contain, or eradicate invasive plants on nearly 25,000 acres. These plants have the potential to displace or alter native plant communities and cause long-lasting economic and ecological problems within and outside the National Forests. Invasive plants can increase fire hazards, 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 and a lack of natural predators to keep them in check, invasive plants can spread rapidly across the landscape to non-infested areas, unimpeded by ownership or administrative boundaries.

> **Invasive plants** are defined as "non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health" [Executive Order 13122].

At present, 24 different invasive plant species are known to occur within the boundaries of the Forest. Species of greatest concern include spotted and diffuse knapweed, yellow starthistle, leafy spurge, dalmation and yellow toadflax, scotch thistle, and rush skeletonweed, among others. 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 small and in the early stages of invasion. Many of our current infestations occupy small areas, less than an acre. Treatment options and the likelihood of their success are greater for small or new invasive populations and can be controlled at lower costs than once the infestation becomes large.

The Pacific Northwest Region published the programmatic *Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants FEIS* (Regional Invasive Plant Program EIS), April 2005 along with its Record of Decision (*ROD*) for Invasive Plant Program Management on October 11, 2005 (Regional Invasive Plant Program EIS, ROD). 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 hand 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. Prior to the use of these new herbicides, site-specific treatment prescriptions for both new and previously analyzed invasive plant sites on the Forest need to be developed based on the updated herbicide tools and management direction. The analysis presented in this document will be focused on treatment methods including the use of herbicides aimed at controlling, eliminating, or contain invasive plants on the forest landscape.

The Umatilla National Forest has been treating invasive plants under direction found in the 1995 decision implementing the *Umatilla National Forest Environmental Assessment for the Management of Noxious Weeds*. The recommended treatment methods took a conservative approach, requiring years of manual or mechanical treatments on a site prior to the use of herbicides. It did not have the ability to respond quickly to any new infestations because the process only covered those sites known at the time of the 1995 decision. Ten years of monitoring has shown us that the slow approach to allowing the use of

herbicides has not been a successful strategy for reducing the impact and spread of invasive species. The strategy is labor intensive with multiple visits to sites each year and for most years the budget was not adequate to make any headway with control or eradication. The limited funds were used to control weeds along major forest roads providing funds to county weed boards for treatment costs. The Regional FEIS also provides good evidence that using herbicides only as a tool of last resort is much less effective than allowing them to be used whenever they are effective, needed, and applied according to forest plan standards and label direction.

Purpose and Need

This EIS is being prepared to allow the Umatilla National Forest to begin containing, controlling or eradicating invasive plant species within the direction found in the Regional Invasive Plant Program EIS, ROD. A large number of new and existing invasive plant populations on the Umatilla, National Forest require analysis to implement new or more effective and cost-efficient treatment actions, including the updated list of herbicides, as analyzed in the Regional Invasive Plant Program EIS. Current inventories indicate that invasive plants occupy approximately 25,000 acres on the Forest. The infestations are broadly distributed, often occurring in areas of high spread potential (e.g., along roads and trails). There are likely additional invasive plant sites that have not yet been identified and these, as well as known sites, will continue to expand and spread every year that effective treatment isn't applied.

The Purpose of this action is to provide a rapid and more comprehensive, up to date approach to the control and eradication of invasive plants that occur on the National Forest. The purpose of controlling or eradicating weed infestations is to maintain or improve the diversity, function, and sustainability of desired native plant communities and other natural resources that can be adversely impacted by invasive plant species. Specifically, there is an underlying need on the Forest to: (1) implement treatment actions to contain and reduce the extent of invasive plants at existing inventoried sites, and (2) rapidly respond to new or expanded invasive plant sites as they may occur in the future. Without action, invasive plant populations will become increasingly difficult and costly to control and will further degrade forest and grassland ecosystems. Untreated infested areas will also contribute to the spread of invasive plants onto neighboring lands.

Proposed Action

Various types of treatments would be used to contain, control, or eradicate invasive plants that include the use of herbicides, physical, and biological methods. These treatments will be used on existing or new infestations including new plant species that currently are not found on the Forest. The preferred treatment method would be determined using the decision matrix displayed in Appendix A which is based on priority plant species (see Appendix B) and site location (see Appendix C). The preferred treatment method could then be adjusted based on the management objective. For example: a site determined to use herbicide can use any of the other methods while any of the non-herbicide treatments would be interchangeable. The priority species would vary by District and could change at a later time. Species priority is based on the historic investments made to control the species, its invasive nature, and how new the species is to the Forest to demand an immediate response. The actual locations of treatment can be anywhere

Management objectives

Containment is to prevent weed spread beyond the existing infestation perimeter.
Control objectives strive to reduce the extent and density of a target weed.
Eradication focuses on complete elimination of the weed species including reproductive propagules.

on the landscape including rangelands, timber harvest areas, along roads and road rights-of-way (including decommissioned roads), along trail routes, at dispersed and developed recreation sites, and on other disturbed sites (i.e. fires, flood events, and rock sources). When needed to facilitate natural plant recovery, treatments may include low impact site rehabilitation such as competitive seeding with native grass and forbs species. Since it is hard to determine which, if any, sites would require extensive mechanical scarification at this time, they will require their own analysis and decision documentation for the rehabilitation portion of the project. This analysis is being done to determine the type of treatment a site should receive to control or eradicate the invasive plant.

Treatment Methods

The Forest has identified approximately 25,000 acres needing treatment for invasive plants (see Table I below). The number of acres proposed for treatment in any given year would depend on funding and the success of past treatments. On going monitoring of the site would dictate the treatment method, whether herbicides are needed, or the type of continued or follow-up treatments needed. In any given year it is anticipated that approximately 4,000 acres would receive treatment with herbicide, manual, mechanical, or cultural methods. If all the 4,000 treated acres used herbicide, it would be less than 0.3 percent of the Forest landscape and primarily concentrated along road right-of-ways. Biological control methods are ongoing, once started the control method is maintained by residual populations or other control agents and accounts for approximately 6,300 acres on the Forest.

Table I: Acres by treatment method for each Ranger District on the Umatilla National Forest.

	Ranger District				
Treatment Method	**Heppner**	**Pomeroy**	**North Fork John Day**	**Walla Walla**	**Total**
Biological or Physical	89	46	47	3736	3917
Chemical, Physical, or Biological	4699	3138	3933	5531	17301
Chemical/Riparian, Physical, or Biological	839	1130	621	802	3392
Physical	2	6	24	6	39
Grand Total	5629	4320	4625	10075	24649

Chemical Methods: All treatments would be done in accordance with USDA Forest Service policies, regulations and Forest Plan Standards and product label requirements. When herbicide use occurs in close proximity to sensitive areas, specific design features would be used to insure that vegetation treatments do not have an adverse impact on non- target plants or animals. Chemicals approved for use, within or outside riparian areas, are listed in the *Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants FEIS* (Regional Invasive Plant EIS), April 2005 and *ROD*. Herbicide formulations, mixtures, or for follow-up treatments can contain one or more of the following 10 active ingredients: chlorosulfuron, clopyralid, glyphosate, imazapic, imazapyr, metsulfuron methyl, picloram, sethoxydim, sulfometuron methyl, and triclopyr. Additional herbicides may be added in the future at either the Forest Plan or project level through appropriate risk analysis and NEPA/ESA procedures. The application rates depend on the presence of the target species, condition of non-target vegetation, soil type, depth to the water table, the distance to open water sources, riparian areas, special status plants, and requirements of the herbicide label. Applications would be scheduled and designed to minimize the potential impacts to non-target plants and animals; the Regional Final Invasive Plant EIS

Standards 15-23 apply to chemical treatments plus additional Project Design Features developed to reduce potential impacts from herbicides. Monitoring of treated sites would determine what follow-up treatments would be needed.

Ground based or aerial application methods would be used based on accessibility, topography, and the size of treatment area**.** The following are examples of the proposed methods of application:

- **Spot spraying** – This method targets individual plants and is usually applied with a backpack sprayer. Spot Spraying can also be applied using a hose off a truck-mounted or ATV-mounted tank.
- **Wicking** – This hand method involves wiping a sponge or cloth that is saturated with chemical over the plant. This is used in sensitive areas, such as near water, to avoid getting any chemical on the soil or in contact with non-target vegetation.
- **Stem injection** – A new hand application technique currently being used on Japanese knotweed in western OR & WA.
- **Hand broadcast** – Herbicide would be applied by hand using a backpack or hand spreader to cover an area of ground rather than individual plants.
- **Boom broadcast** – This involves using a hose and nozzle from a tank mounted on a 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.
- **Aerial applications** – In areas where physical features, such as topography, raise applicator safety concerns or where the cost of ground application is prohibitive, invasive plants may be treated with the use of helicopters. Aerial application of herbicide would occur on the Pomeroy District covering approximately 980 acres on 17 sites ranging in size from 1 to 290 acres.

When needed to facilitate recovery, native seed would be used to recover the site and increase competition. The method of application will consider resource protection measures specific for the site (ie. application methods would be more restricted in riparian areas). See the Project Design Features specific for chemical applications.

Physical Methods: Physical methods include manual control, hand mechanical and cultural methods.

Manual Control Methods: These methods 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, but are ineffective against perennial weeds with deep underground stems or roots or fine ryzomes that can be easily broken and left behind to re-sprout. 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 may all be used to remove invasive plant species. Axes, shovels, grubbing hoes, and mattocks are also 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 are generally bagged and burned.

Hand Mechanical Control Methods: This method uses hand power tools and includes such actions as mowing, weed whipping, road brushing, root tilling methods, or foaming, steaming, infrared, and other techniques using heat to reduce plant cover and root vigor. Choosing the appropriate treatment depends on the characteristics of undesired species present (for example, density, stem size, brittleness, and sprouting ability); the need for small scale, less than 100 square feet (Forest Plan Standard for Detrimental Soil Condition), seedbed preparation and revegetation; the sites location (eg. wilderness areas), 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 any cultural practice known to be useful for treating invasive plants such as mulching with a variety of materials, grazing animals, using fertilizer/soil amendments, competitive planting, or other local remedies that may be determined to be effective (e.g., spraying water/salt/sugar mixtures). Competitive planting would consist of a combination of methods used with planting native vegetation in small areas of disturbance, less than 100 square feet.

Grazing is often used in areas where other treatments cannot be applied, or are prohibitively expensive (e.g., large infestations), but is most effective when used in conjunction with other control methods such as herbicides or biological control. Sheep and goats have been used to control broadleaf herbs such as leafy spurge, Russian knapweed, spotted knapweed, and toadflax. 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 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.

Typically 15 to 20 years are needed to bring about an economic control level. 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.

Access to work areas

Vehicle and equipment access would involve the use of open, closed, and restricted roads as well as walking or the use of ATV to access invasive plant sites located a distance from existing roads, trails, or along decommissioned roads. ATVs may be used along closed or restricted roads to treat invasive plant populations when regular size vehicles cannot be used because of the road conditions. The use of vehicles off road would be controlled so to not to attract public use or create new trails or use areas.

When helicopters are being used for the application of herbicide, a helispot used for servicing the helicopter would be designated consisting of a rock source or other disturbed area away from streams. Service vehicles would also be located at the site and if a self contained pond is not associated with the site, water would be delivered to the helispot by a truck for mixing chemicals when needed. Water drafting would occur at approved locations using appropriate fish protection measures. Chemicals will not be mixed nor would containers be rinsed inside riparian areas. The disposal of containers and cleanup will be in accordance with labels.

Decision to be Made

The Forest Supervisor will make the following decisions based on the interdisciplinary analysis.

- Whether to select the proposed invasive plant treatments with any modifications from public scoping or comments or as described in an alternative.
- What mitigation measures are needed.
- What monitoring is required.

Maps and Additional Information

Maps for this project are very large. If you need a paper copy of the maps showing the location of sites, please contact Glen Westlund at 509-522-6009 or e-mail at gwestlund@fs.fed.us. Maps can also be found on the Umatilla National Forest internet site in the NEPA Reading Room at http://www.fs.fed.us/r6/uma/projects/readroom/. When we figure a way to place the smaller scale maps on the internet, they will be available there for review (there are about 200 pages of 14x17 inch maps). All sets of maps will be available for review at the Forest Supervisor's Office in Pendleton and the District Offices at Heppner, Ukiah, Walla Walla, and Pomeroy.

General Project Design Features

Project Design Features (PDFs) were developed to reduce some of the potential impacts the various treatments may cause. PDFs provide project design direction by listing conditions or requirements that must become a part of the activity and used to avoid or minimize potential effects on sensitive resources. These PDF are standards developed in the Regional Invasive Plant Program EIS

Prevention

Standard 1: Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis; fire and fuels management plans, Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; wildland fire implementation plans; grazing allotment management plans, recreation management plans, vegetation management plans, and other land management assessments.

Standard 2: Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of **all heavy equipment** (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands. This standard does not apply to initial attack of wildland fires, and other emergency situations where cleaning would delay response time.

Standard 3: Use weed-free straw and mulch for all projects, conducted or authorized by the Forest Service, on National Forest System Lands. If State certified straw and/or mulch is not available, individual Forests should require sources certified to be weed free using the North American Weed Free Forage Program standards or a similar certification process.

Standard 4: Use only pelletized or certified weed free feed in **wilderness and wilderness trailheads**. If state certified weed free feed is not available, individual Forests should require feed certified to be weed free using North American Weed Free Forage Program standards or a similar certification process.

Standard 5: 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 management plans, providing annual operating instructions, and adaptive management. Plan and implement practices in cooperation with the grazing permit holder.

Standard 6: Inspect active gravel, fill, sand-stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists.

Standard 7: Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or Forest-level invasive plant specialists, incorporate invasive plant prevention practices as appropriate.

Standard 8: Require the establishment of a system of roads, trails, and areas designated for motor vehicle use; and prohibit the use of motor vehicles off the designated system that is not consistent with the classes of motor vehicles and if applicable, the time of year, designated for use.

Standard 9: Prioritize infestations of invasive plants for treatment at the landscape, watershed or larger multiple forest/multiple owner scale.

Standard 10: Develop a long-term site strategy for restoring/revegetating invasive plant sites prior to treatment.

Treatment Restoration

Standard 11: Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur. Non-native, noninvasive plant species may be used in any of the following situations: 1) when needed in emergency conditions to protect basic resource values (e.g., soil stability, water quality and to help prevent the establishment of invasive species), 2) as an interim, non-persistent measure designed to aid in the reestablishment of native plants, 3) if native plant materials are not available, or 4) in permanently altered plant communities. Under no circumstances will nonnative invasive plant species be used for revegetation.

Standard 12: Use only APHIS and State-approved biological control agents. Agents demonstrated to have direct negative impacts on non-target organisms would not be released.

Standard 13: Application of any herbicides to treat invasive plants will be performed or directly supervised by a State or Federally licensed applicator. All treatment projects that involve the use of herbicides will develop and implement herbicide transportation and handling safety plans.

Standard 14: Select from herbicide formulations containing one or more of the following 10 active ingredients: chlorsulfuron, clopyralid, glyphosate, imazapic, imazapyr, metsulfuron methyl, picloram, sethoxydim, sulfometuron methyl, and triclopyr. Mixtures of herbicide formulations containing 3 or less of these active ingredients may be applied where the sum of all individual Hazard Quotients for the relevant application scenarios is less than 1.0. 3

All herbicide application methods are allowed including wicking, wiping, injection, spot, broadcast and aerial, as permitted by the product label. Chlorsulfuron, metsulfuron methyl, and sulfometuron methyl will not be applied aerially. The use of triclopyr is limited to selective application techniques only (e.g., spot spraying, wiping, basal bark, cut stump, injection).

Additional herbicides and herbicide mixtures may be added in the future at either the Forest Plan or project level through appropriate risk analysis and NEPA/ESA procedures.

Standard 15: When herbicide treatments are chosen over other treatment methods, document the rationale for choosing herbicides.

Standard 16: Use only adjuvants (e.g. surfactants, dyes) and inert ingredients reviewed in Forest Service hazard and risk assessment documents such as SERA, 1997a, 1997b; Bakke, 2003.

Standard 17: To minimize or eliminate direct or indirect negative effects to non-target plants, terrestrial animals, water quality and aquatic biota (including amphibians) from the application of herbicide, use site-specific soil characteristics, proximity to surface water and local water table depth to determine herbicide formulation, size of buffers needed, if any, and application method and timing. Consider herbicides registered for aquatic use where herbicide is likely to be delivered to surface waters.

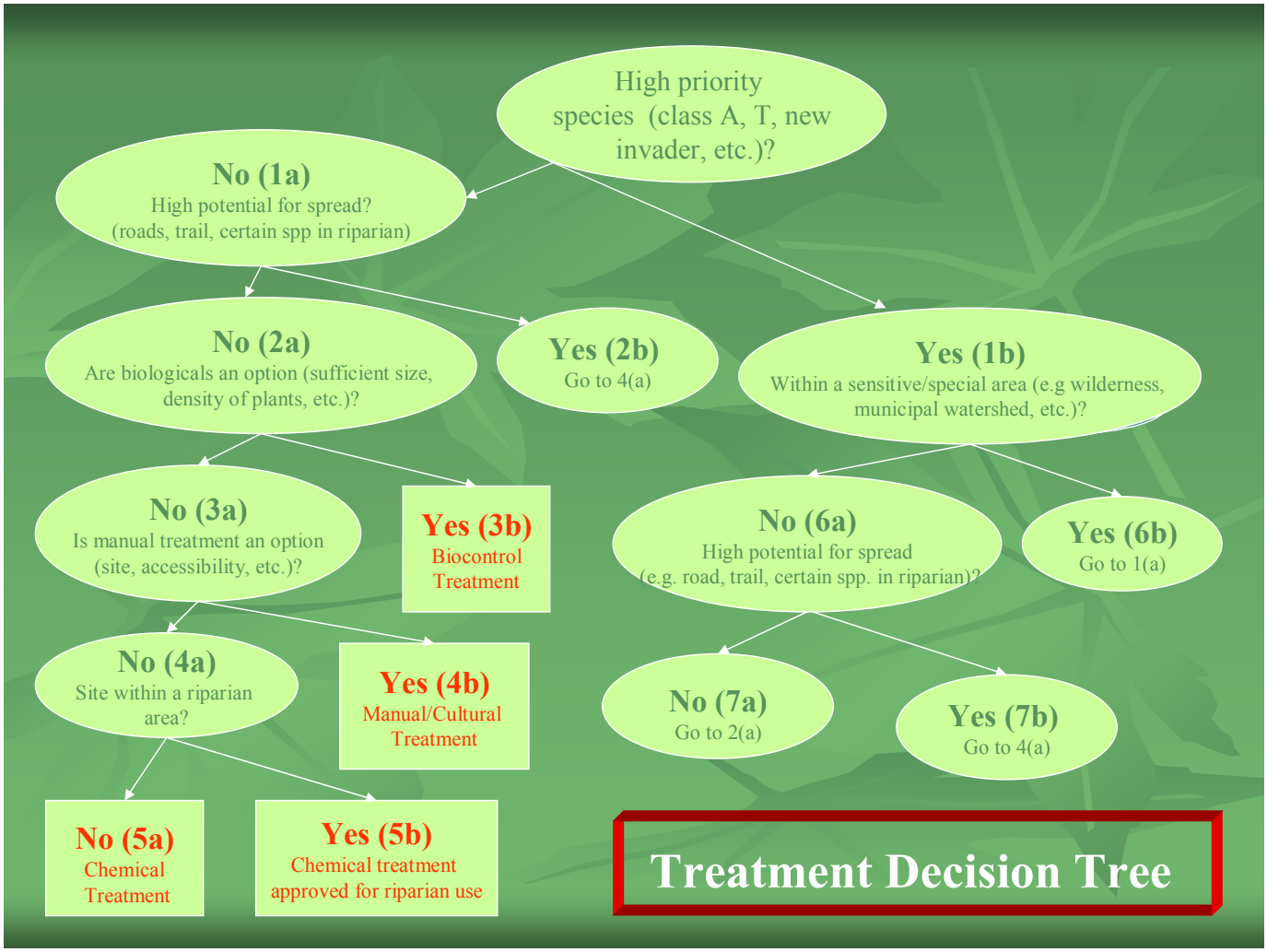
Standard 18: Design invasive plant treatments to minimize or eliminate adverse effects to species and critical habitats proposed and/or listed under the Endangered Species Act. This may involve surveying for listed or proposed plants prior to implementing actions within unsurveyed habitat if the action has a reasonable potential to adversely affect the plant species. Use site specific project design (e.g. application rate and method, timing, wind speed and direction, nozzle type and size, buffers, etc.) to mitigate the potential for adverse disturbance and/or contaminant exposure.

Standard 19: Provide a minimum buffer of 300 feet for aerial application of herbicides near developed campgrounds, recreation residences and private land (unless otherwise authorized by adjacent private landowners).

Standard 20: Prohibit aerial application of herbicides within legally designated municipal watersheds.

Standard 21: Prior to implementation of herbicide treatment projects, National Forest system staff will ensure timely public notification. Sign treatment areas to inform the public, and forest workers of herbicide application dates and herbicides used. If requested, individuals will be notified in advance of spray dates.

Appendix A: Decision tree framework for how to treat invasive plant sites.



Description

Box 1a — Site contains low priority invasive species (Priority 3 or 4). See Appendix B.

Box 1b — Site contains high priority invasive species (Priority 1 or 2). See Appendix B.

Box 2a — Site does not have a high spread potential (e.g., not in close proximity to roads, trails, or quarries).

Box 2b — Site has a high spread potential, such as sites near roads, trails, or quarries (Site Type 1, Appendix C).

Box 3a Site is not conducive to treatment with biological agents. Effective biological control agents may not be available for the target species, and/or the infestation size and plant density are not sufficient for sustaining viable biocontrol populations.

Box 3b Site is conducive to treatment with biological agents. Criteria include: (1) effective biological control agents are available for the target species, and (2) the infestation size and plant density are sufficient for sustaining viable biocontrol populations.

Box 4a Site is not conducive to manual control treatment. The infestation is greater than 3 acres and/or is not accessible via road or trail.

Box 4b Site is conducive to manual control treatment. Criteria include: (1) size is less than 3 acres, and (2) site is accessible by road or trail.

Box 5a Site is not within a PACFISH defined RHCA.

Box 5b Site is within a PACFISH defined RHCA (Site Type 5, Appendix C).

Appendix B. Invasive species priorities by Ranger District

Admin	Speciescode	Speciesname	Priority
1402	CEBI2	spotted knapweed	1
1402	LIDA	dalmation toadflax	1
1402	LIVU2	yellow toadflax	1
1402	ONAC	scotch thistle	1
1402	SEJA	tansy ragwort	1
1402	CEDI3	diffuse knapweed	2
1402	CYOF	hounds tongue	2
1402	ARMI2	common burdock	3
1402	CYSC4	scotch broom	3
1402	CIAR4	canadian thistle	4
1402	HYPE	st. john's wort	4
1404	CESO3	yellow starthistle	1
1404	HICA10	yellow hawkweed	1
1404	LIDA	dalmation toadflax	1
1404	ONAC	scotch thistle	1
1404	SEJA	tansy ragwort	1
1404	CEBI2	spotted knapweed	2
1404	CEDI3	diffuse knapweed	2
1404	PORE5	sulphur cinquefoil	2
1404	CADR	whitetop	3
1404	LIVU2	yellow toadflax	3
1404	ARMI2	common burdock	4
1404	CIAR4	canadian thistle	4
1404	CYOF	hounds tongue	4
1404	HYPE	st. john's wort	4
1405	CADR	whitetop	1
1405	CANU4	musk thistle	1
1405	CEBI2	spotted knapweed	1
1405	CEDI3	diffuse knapweed	1
1405	CESO3	yellow starthistle	1
1405	EUES	leafy spurge	1
1405	HIPI2	tall hawkweed	1
1405	LIDA	dalmation toadflax	1
1405	LIVU2	yellow toadflax	1
1405	ONAC	scotch thistle	1
1405	SEJA	tansy ragwort	1
1405	CYOF	hounds tongue	2
1405	PORE5	sulphur cinquefoil	2
1405	ARMI2	common burdock	3
1405	LALA4	everlasting peavine	3
1405	TACA8	medusahead	3
1405	CIAR4	canadian thistle	4
1405	HYPE	st. john's wort	4
1406	CANU4	musk thistle	1
1406	CESO3	yellow starthistle	1
1406	CHJU	rush skeletonweed	1
1406	CYSC4	scotch broom	1
1406	EUES	leafy spurge	1
1406	HICA10	yellow hawkweed	1
1406	LIDA	dalmation toadflax	1
1406	ONAC	scotch thistle	1
1406	SEJA	tansy ragwort	1
1406	CEBI2	spotted knapweed	2
1406	CEDI3	diffuse knapweed	2
1406	CERE6	russian knapweed	2
1406	PORE5	sulphur cinquefoil	2
1406	CADR	whitetop	3
1406	LIVU2	yellow toadflax	3
1406	ARMI2	common burdock	4
1406	CIAR4	canadian thistle	4
1406	CYOF	hounds tongue	4
1406	DACA6	wild carrot	4
1406	HYPE	st. john's wort	4
1406	PHAR3	reed canarygrass	4
1406	TACA8	medusahead	4

1402 is the Heppner District
1404 is the Pomeroy District
1405 is the North Fork John Day District
1406 is the Walla Walla District

Priority 1 = Generally State Class A or T listed species. Goal is to eradicate new populations and/or control existing populations of these aggressive and harmful species
Priority 2 = Goal is to contain existing populations of aggressive species
Priority 3 = Goal is to eradicate new populations and/or control existing populations of these less aggressive invasive species
Priority 4 = Goal is to contain existing populations of less aggressive invasive spp.

Appendix C. Invasive Plant Site Types for Umatilla Invasive Plant EIS.

Site Type	Description
Site Type 1: High Spread Potential sites such as Road, quarries, Trails, etc.	Sites within 100 ft. of roads, trails, and quarries. This site type can range from rocky, gravelly, historically bare ground sites on road shoulders, abandoned roads, and road cutbanks, with little to no

Examples of species treatment prescriptions: This is presented to give the reader an example of what would be proposed fro major species of concern. A prescription for each invasive species will be developed for the analysis.				
Taprooted Biennials or Perennials				
Spotted knapweed (CEBI2) **Diffuse knapweed** (CEDI) **Meadow knapweed** (CEDE5) Tap rooted Biennials or Perennials	*Centaurea biebersteinii* *C. diffusa* *C. jacea x nigra* *(C. jacea; C. nigra)*	- Hand pull or dig small, easily accessible populations. Multiple entries per year are required. Pull bolting plants prior to seed set. Bag flowering plants and dispose of properly. Success will depend on consistent labor for each growing season until plants are eradicated. - Mowing is possible, but timing is critical. - These treatments may take up to ten years due to long term seed viability. - If chemicals are used, manual treatments could be used for follow-up. Relative amounts of herbicide to manual treatments would decline over time. - Revegetate with desirable species at high priority sites when possible.	**Upland**: 1 - Clopyralid 2 - Picloram **Riparian/High Water Table/Porous Soils**: Aquatic labeled Glyphosate (will require the most repeated treatments)	***Drier upland sites (Road, Quarries & Upland Forest/Rangeland):*** Boom broadcast spray in dense cover, where dominant plant community is non-native. Spot spray whenever possible, especially in areas with good native plant cover. ***Roads, Recreation Sites, Special Management Areas, TES plant & wildlife sites, & any sites where more selective treatment is desired:*** Spot) spray to target individual plants. ***Wet Meadows, Riparian:*** Wick applications with appropriate chemicals to target specific plants. ***Timing:*** Preferred treatment is spring before bud stage or early summer so use less herbicide. ***Notes:*** Yearly revisits will be necessary; the number of which is dependent on the chemical used and the seedbank.
Rhizomatous Perennials				
Dalmation toadflax (LIGEDA) **Butter 'n' eggs** (LIVU) Rhizomatous Perennials	*Linaria genistifolia ssp.dalmatica* *Linaria vulgaris*	- Hand pull or dig small, easily accessible populations. Multiple entries per year are required. Plants can be left on site, but may reduce germination of desirable species due to mulching effect. Success will depend on consistent labor for each growing season until plants are eradicated. -Cutting stands in spring or early summer will eliminate plant reproduction, but not the infestation. - These treatments may take up to ten years due to long term seed viability. - If chemicals are used, manual treatments could be used for follow-up. Relative amounts of herbicide to manual treatments would decline over time. - Revegetate with desirable species at high priority sites when possible. Plant communities in good condition may recover without replanting.	**Upland:** 1. Picloram 2. Chlorosulfuron 3. Imazapic (Use in native grass stands; fall application only) **Riparian/High Water Table/Porous Soils:** Aquatic labeled Glyphosate	***Drier upland sites (Road, Quarries & Upland Forest/ Rangeland):*** Boom broadcast spray in dense cover, where dominant plant community is non-native. However, this species tends to be scattered, so spot spraying (backpack or on OHV) is usually more appropriate. ***Timing:*** Apply during active growth in spring before bloom or in late summer or fall during re-growth. ***Notes:*** Revisits will be necessary; the number of which is dependent on the chemical used and the seedbank. This control could vary by site. Even after three years of consecutive treatments, control may range widely.

Leafy spurge (EUES) Rhizomatous perennial	*Euphorbia esula*	- Requires combination of techniques for successful control. Multiple entries per year are required. - Repeated mowing or hand cutting can control seed production but must be used with herbicides for adequate control of the site. - Repeated mowing could reduce competitive ability of desirable species. - Some success has been found with using biological control (flea beetle) with fall herbicide treatments. - Grazing when managed carefully (timing, livestock species, etc.) may help control leafy spurge (***see Common Control Measures)***.	**Upland:** 1. Picloram 2. Glyphosate 3. Imazapic **Riparian/High Water Table/Porous Soils:** Aquatic labeled Glyphosate	***Drier upland sites (Road, Quarries & Upland Forest/Rangeland):*** Spot spray whenever possible. Boom broadcast spray in dense cover, where dominant plant community is non-native and leafy spurge population is large. ***Moist to Wet meadows (high water table) and Riparian***: Wick application to target individual plants. ***Timing*:** ***Notes***:
Russian knapweed (ACRE3) Perennial with adventitious shoots	*Acroptilon repens*	- Hand-pulling Russian knapweed is very difficult, but can be effective for small infestations during the establishment year only. Pull plants when soil is wet and before seeds have formed. Remove all plant parts from site. - Cutting or mowing reduces the current year growth and will eliminate seed production, but will not kill the roots of this species. Cut/mow several times annually to control existing top growth; re-emerging plants will be smaller in size and lower in vigor. Must be frequently repeated (at least 3 times/year – spring, summer, and fall). - Discing or plowing produces broken root fragments that spread quickly and resprout. - Russian knapweed is poisonous to horses. Livestock will graze, but it is usually avoided. Grazing provides only a negligible effect on vigor and viability of root system. - In most situations, Russian knapweed cannot be effectively managed by herbicides alone. - Lasting control requires an integration of techniques (mechanical, manual, chemical, and possibly biological control), proper land management, and revegetation to outcompete the thistle (The Nature Conservancy 1998). - Competitive plantings are usually necessary.	**Upland:** 1. Chlorosulfuron 2. Clopyralid 3. Clopyralid + Triclopyr (Redeem) 4. Glyphosate, Imazapic, or Metsulfuron **Riparian/High Water Table/Porous Soils:** Aquatic labeled Glyphosate	***Drier upland sites (Road, Quarries & Upland Forest/Rangeland):*** Boom broadcast spray in dense cover, where dominant plant community is non-native. Spot spray whenever possible, especially in areas with good native plant cover. ***Sensitive Sites or Special Management Areas where more selective treatment is desired:*** Spot spray to target individual plants. ***Moist to Wet meadows (high water table) and wetlands/riparian***: Wick application with manual follow-up treatments. ***Timing***:

Annuals				
Yellow starthistle (CESO3) Annual	*Centaurea solstitialis*	- Hand-pull small patches or maintenance programs where plants are sporadically located. Remove all above ground material (leaving even a two inch piece of stem can result in recovery if leaves and buds are still attached at base of plant. Pull after bolted but before it produces viable seed. On relatively large populations of < 40 acres, start removing plants at outward edge of population and work toward interior (Bradley Method). - Mowing can be useful but timing is critical (before viable seed production, but too early can result in rapid regrowth), - In areas with many non-target species, early summer tillage will control yellow starthistle provided roots are detached from the shoots; repeated cultivation will be necessary in same season when rainfall stimulates germination. - Mazzu (2005) discusses biological control, prescribed burning, and grazing. Timing and intensity of grazing and type of grazing animal needs to be considered. Prescribed burning may be best used after herbicide treatment. Two biological control insects have reduced seed production by up to 76% in California. - Revegetate high priority sites if needed with desirable species if possible.	**Upland**: 1 - Clopyralid 2 - Picloram 3 - Glyphosate **Riparian/High Water Table/Porous Soils**:	***Drier upland sites (Road, Quarries & Upland Forest/Rangeland):*** Boom broadcast spray in dense cover, where dominant plant community is non-native. Spot spray whenever possible, especially in areas with good native plant cover. ***Sensitive Sites (e.g., adjacent to moist meadows or riparian areas) or Special Management Areas where more selective treatment is desired:*** Spot spray or wick application to target individual plants. ***Timing***: ***Notes***: Yearly revisits will be necessary; the number of which is dependent on the chemical used and the seedbank.