

## Chapter II: Alternatives, including the Proposed Action

This chapter describes and compares the alternatives considered for the Willamette NF Integrated Weed Management Plan. It includes a description and map of treatment sites considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., acres treated with herbicides, manual and mechanical methods; acres of herbicide use near areas of high human use) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., acres treated within 50 foot riparian buffer).

Issues and purpose and need were used to drive Alternative development. The No Action alternative was developed to set a baseline, and includes no herbicide use. Alternative 2 responds to issues of herbicide use in riparian areas (within 50 feet of water) and areas of high human use, restricting herbicides in these areas. Alternative 3 responds to the need to fully implement the Region 6 ROD.

### Treatment Types

A variety of weed treatment types are proposed under the various Alternatives and range from manual to mechanical, cultural and chemical. Table 2 explains the types of activities that may be conducted under each broad heading.

Table 2: Treatment methods available for use under Alternatives A-C

Method	Description
<b>Manual Methods</b>	
Hand pulling	Hand pulling may be a good alternative in sites where herbicides or other methods cannot be used. The key to effective hand pulling is to remove as much of the root as possible while minimizing soil disturbance. For many species, any root fragments left behind have the potential to resprout.
Pulling Using Tools	Tools (e.g., shovel, hoe, weed wrench) can be used to dig the entire plant, including the roots, out of the ground. This method can be used for invasive plants with deep tap roots that can not be hand pulled adequately or that reproduce vegetatively.
Cutting	Cutting the seed head of some species can be used an intermediate step; especially if the species is spread primarily by seed. Can use loppers, hand-pruners or chainsaws.

<b>Method</b>	<b>Description</b>
Mulching	Mulching is a method that can be used to smother weeds using black or clear plastic or plant-derived materials such as straw or bark mulch.
Competitive Planting	Using seed of native species to out-compete new infestations of weeds on site.
<b>Mechanical Methods</b>	
Mowing, brushing, weed eating	Mowing and cutting can reduce seed production and retard invasive plant growth, especially in annuals cut before they flower and set seed. Some species however, resprout when cut, replacing a few stems with many that can flower and set seed.
<b>Cultural Methods</b>	
Grazing goats	Grazing can either promote or reduce invasive plant abundance at a particular site. When grazing treatments are combined with other control techniques, such as herbicides, severe infestations can be reduced and small infestations may be eliminated.
<b>Herbicide Methods</b>	
Wiping	Treatment of individual plants to avoid spraying other desirable plants. There is a low likelihood of drift or delivery of herbicides away from treatment sites. This is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in the water. Specific method includes wicking using a sponge or wick on a long handle to wipe herbicide onto foliage and stems.
Stem Injection	This method was developed to treat knotweed species in riparian areas. A hypodermic needle is used to inject herbicide into the hollow stem of the target weed, reducing the risk that any herbicide would enter the water.
Spot Spraying	Spray herbicide directly onto target plants and avoid spraying other desirable plants. Herbicide is usually applied with a backpack sprayer, although a hose from a truck-mounted tank with a hand-held wand can be used where necessary. This method is used where plants are far enough from each other to be individually discernable. The timing for spot spraying, as with any type of herbicide treatment, varies by plant species. The herbicide label would provide this information as well as wind and rain restrictions, which vary by herbicide.

## Alternatives

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### Alternative 1: No Action

Under the No Action alternative, no herbicide use is proposed. Control measures would be confined to manual and mechanical treatments to reduce or contain noxious weeds on the Willamette National Forest. The existing Weed Management Plan would be discontinued. The Forest would continue to implement the Willamette National Forest Weed Prevention Guidelines (Appendix C) No mechanized equipment would be allowed into Wilderness.

This direction would not be consistent with either the R6 ROD or the Willamette LRMP standards and guidelines. Specifically the goals/objectives and standards from the Region 6 ROD that would not be implemented include: protection of ecosystems from the impacts of invasive plants through an integrated approach that emphasizes early detection and early treatment (Goal 1), long-term restoration planning for invaded sites (Standards 12 and 13), overall prioritization of treatments (standard 11), implementation of strategies that protect sensitive ecosystem components and maintain biological diversity and function (Goal 4), and expansion of collaborative efforts using an adaptive management approach to invasive plant management (goal 5).

The estimated cost for full implementation is approximately \$12.5 million dollars/year<sup>1</sup> (Table 5).

### Definitions common to all action Alternatives

All action alternatives would provide a range of available tools and prescriptions, depending on the site type. Tools (treatment types) vary depending on what issues the alternative is attempting to address and the site type. Site types would be the same across all alternatives:

- Site type 1: Roadside, quarry, waste disposal, cut bank, little to no competing vegetation
- Site type 2: Roadside, disturbed, with competing vegetation; skid roads, landings
- Site type 3: Wilderness, TES plant, animal or fish site, Survey and Manage wildlife or botanical species site

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<sup>1</sup> This number was calculated using the number of acres at year 1=9700 and allowing manual to reduce populations by 25% per year (mechanical was reduced by 20%/yr and herbicide 80%/yr). Cost of controls were applied to number of acres in population and added up for the 10 year period (manual- \$340/acre, mechanical- \$ 100/acre, chemical- \$250/acre). Similar methodology was used for Alternatives 2 and 3 except growth rates of populations and available treatments differed by Alternative. These numbers are meant to show relative cost for Alternatives as compared to one another. Costs and estimates of reduction were taken from Olympic NF EIS: Beyond Prevention-Site Specific Invasive Species Plant Treatment Project.

- Site type 4: Administrative and recreation sites with high human use: campgrounds, trailhead parking areas, District compound
- Site type 5: Administrative and recreation sites with little human use: Powerline corridors, ski areas
- Site type 6: forested habitats
- Site type 7: non-forested habitats: meadows, rock gardens, wetlands

### **Activities common to All Action Alternatives**

Under all action alternatives, an **annual program of work** would be developed. This would prioritize treatment and restoration sites and analyze new treatment sites to determine whether they are within the scope of this analysis. The plan would be reviewed by an interdisciplinary team to determine if there need to be any restrictions on proposed treatments or changed conditions. The highest priority would be to treat new invaders whose populations we have a chance of eradicating from the WNF. The next priority would be treatment of highly sensitive areas with high biodiversity or value such as meadows and Wilderness areas.

All action alternatives would have **restoration strategies** built into them. Strategies would be based on site types. For type 1, where only the hardiest weeds survive, a no treatment and high emphasis on prevention of activities that would introduce new weeds would be the strategy. For type 2, disturbed but vegetated roadsides, native grass seed mixes would be used to reduce erosion following weed control efforts. For the rest of the site types, treatment areas would be assessed to determine treatment strategies and whether revegetation or restoration was the goal. In all cases, native plant materials will be used.

### **Alternative 2: Current Program**

This alternative responds to the issues of potential effects on human health and aquatic species. Control methods would be dependent on whether the weed site is within or outside of a **stream buffer**. Stream buffers would be defined as 50 feet from a class 1-4 stream, pond or wetland. Control methods would also depend on proximity to areas of high human use such as campgrounds, trailhead parking lots and dispersed campsites.

The existing program includes appropriate guidance for manual treatments and prevention. These would continue to be an important part of the program as a whole. Mechanical methods would be available for use everywhere except Wilderness, as long as mitigation measures for spotted owls and bald eagles have been met. Grazing by goats could occur anywhere but roadsides (site types 1 and 2) and Wilderness.

Two herbicides are currently available to treat new invaders outside of stream buffers (3232 acres) and areas of high human use (410 acres). The largest number of acres that could be treated with herbicides would be 6058. Glyphosate (Rodeo formulation) is a non-selective herbicide that would often be used in site type 1 where the only vegetation is the targeted weeds. It would only be used outside the 50 foot riparian buffer under this alternative. Application rates would typically be 2 pounds active ingredient/acre (2% solution, with a 3 quart per acre application rate).

Triclopyr (Garlon 3A formulation) is selective on broadleaf plants and would be appropriate for use where there is competing grass vegetation such as in site types 2, 6 and 7. This herbicide would only be used outside the 50 foot riparian buffer under this alternative. Application rates would typically be 1 pound active ingredient per acre (1% solution or 1 1/2 quarts per acre).

Estimated cost for full implementation of this Alternative is 5.7 million dollars per year (Table 5).

Table 3. Control Methods Available Under Alternative 2

Site Type	Control Method Available Non-stream buffer	Control Method Available- Stream buffer
1- Roadside, no vegetation	Manual; Mechanical; Chemical: 2 herbicides- Glyphosate, Triclopyr	Manual; Mechanical (hand-held power tools only)
2- Roadside, competing vegetation	Same as site type 1	Same as site type 1
3- Wilderness, TES	Same as site type 1 <u>but</u> <ul style="list-style-type: none"> <li>▪ no mechanical in Wilderness</li> <li>▪ no mechanical in seasonal wildlife restriction</li> <li>▪ mitigations for TES plant sites</li> <li>▪ mitigation for TES/Survey and Manage salamander sites</li> </ul>	Same as site type 1 <ul style="list-style-type: none"> <li>▪ no mechanical in Wilderness</li> <li>▪ no mechanical in seasonal wildlife restriction</li> <li>▪ mitigations for TES plant sites</li> <li>▪ mitigation for TES/Survey and Manage salamander sites</li> </ul>
4- Administrative sites: high human use	Same as site type 1 plus cultural	Same as site type 1
5- Administrative sites: low use	Same as site type 1 plus cultural	Same as site type 1
6- Forested	Same as site type 1 plus cultural	Same as site type 1
7- Non-Forested	Same as site type 1 plus cultural	Same as site type 1

Herbicides would be applied using backpack or truck-mounted hand sprayers, by wick or injection. No herbicides would be available for use inside stream buffers.

Adjuvants are mixed with herbicides to increase herbicide absorption through plant tissues and increase spray retention (Bakke, 2002). Oil adjuvants would include Hasten or Methylated Seed Oil. A pH reducing adjuvant (LI-700<sup>®</sup>) would also be available for use. This adjuvant is sometimes recommended for use with herbicides because of greater absorption of weak acid type herbicides when the spray solution is acidic (Bakke, 2002).

**Priority** would be given to treating new invaders over established infestations. The most economical method would be used to treat infestations. Most weed populations along roadsides and within administrative sites would be treated with herbicides except where they come within 50 feet of a road. Sites within stream buffers and in wilderness would need to be treated with manual methods. Multiple treatments would be expected at these sites to keep plants from going to seed.

This Alternative provides for **Early Detection Rapid Response**. Up to twenty-five new sites per year would be added to those already approved for treatment if an analysis of the sites by an Interdisciplinary Team shows that proposed treatments of new sites are within the scope of the project design criteria of this Alternative. New sites would be published in the newspaper to inform the public.

**Monitoring** is an integral part of this Alternative. There would be annual reviews of new sites proposed for treatment. If sites are treated with herbicides, we would follow up with manual control (at least of flowering heads) and would monitor effectiveness late in the season for at least the sites along major highway corridors and major road systems (20% of all sites).

We would comply with annual reporting requirements from the State of Oregon for treatments within 6<sup>th</sup> field watersheds, detailing the amount and type of chemical used. These reports would be used to update the regulatory agencies as part of annual informational updates.

### **Alternative 3: Proposed Action**

Alternative 3 responds to the issue of treatment effectiveness. It differs from Alternative 2 in that it would allow treating weeds with herbicides within the stream buffer and would increase the number of herbicides available to five. Herbicides will be available for use in wilderness. All 753 sites could be sprayed with herbicides; 9700 acres could be sprayed. Cost of full implementation of this alternative would be approximately \$2.9 million dollars per year.

In this alternative, the Forest Prevention guidelines would be important in limiting new infestations. For existing weed populations, manual control could occur in all site types. Mechanical methods would be available for use everywhere except Wilderness, as long as mitigation measures for spotted owls and bald eagles have been met. Grazing by goats could occur anywhere but roadsides (site types 1 and 2) and Wilderness.

Glyphosate (Rodeo and/or Aquamaster formulation- see Alternative 2 for discussion) and imazapyr (Habitat formulation) would be available for use in stream buffers. Adjacent to water, from 0-10 feet, only stem injection (Aquamaster only) and wiping of weeds (with Rodeo, Aquamaster or Habitat) would be allowed. In addition, within 10-50 feet of a stream backpack spray of glyphosate and imazapyr would be allowed.

Table 4. Control Methods Available Under Alternative 3

Site Type	Control Method Available Non-stream buffer	Control Method Available- Stream buffer
1- Roadside, no vegetation	Manual; Mechanical; Chemical: 5 herbicides-Rodeo, Triclopyr, Clopyralid, Sethoxydim, Imazapyr	Manual; Mechanical (hand-held power tools only); Chemical: Rodeo or Habitat via wiping 0-50 ft, backpack within 10-50 ft., stem injection with Aquamaster 0-50 ft
2- Roadside, competing vegetation	Same as site type 1	Same as site type 1
3- Wilderness, TES	Same as site type 1 <u>but</u> - no mechanical in Wilderness - no mechanical in seasonal wildlife restriction - mitigations for TES plant sites - mitigation for TES/Survey and Manage salamander sites	Same as site type 1 <u>but</u> - no mechanical, hot foam in Wilderness - no mechanical in seasonal wildlife restriction - mitigations for TES plant sites - mitigation for TES/Survey and Manage salamander sites
4- Administrative sites: high human use	Same as site type 1 <u>but</u> ▪ add cultural	Same as site type 1
5- Administrative sites: low use	Same as site type 1 plus cultural	Same as site type 1
6- Forested	Same as site type 1 plus cultural	Same as site type 1

7- Non-Forested	Same as site type 1 plus cultural	Same as site type 1
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Imazapyr is a non-specific herbicide used on post-emergent vegetation. It can be absorbed via leaves or roots. The Habitat formulation would be used within riparian buffers (wipe in the 0-50 foot riparian zone and backpack spray in the 10-50 foot riparian zone). In upland sites, either the Habitat or Arsenal formulation could be used. Application rates would typically be 0.45 pounds active ingredient/acre.

Two other herbicides would be available for use outside 50 foot riparian buffers. Sethoxydim (Poast formulation) is grass-specific and would be appropriate for use where there is competing broadleaf vegetation such as in site types 2 or 7. Application would be limited to false brome and reed canarygrass sites with high amounts of herbaceous vegetation. No application would occur within 50 foot buffers or in sites with high water table and permeable soils. Application rates would be 0.3 pounds active ingredient per acre (2 pints/acre).

Clopyralid (Transline formulation) is very effective on members of the aster family and would be used along road corridors to treat spotted knapweed. Under this alternative, clopyralid would not be used in 50 foot stream buffers or where there are highly permeable soils and a high water table. Rates would average 0.35 pounds active ingredient/acre (1/3-2/3 pints/acre).

Herbicides would be applied using backpack or truck-mounted hand sprayers, by wick or injection.

Adjuvants could be mixed with herbicides to increase herbicide absorption through plant tissues and increase spray retention (Bakke, 2002). Oil adjuvants to be used include Hasten or Methylated Seed Oil. A pH reducing adjuvant (LI-700<sup>®</sup>) would also be available for use. This adjuvant is sometimes recommended for use with herbicides because of greater absorption of weak acid type herbicides when the spray solution is acidic (Bakke, 2002). Only LI-700 would be available for use within the 50-foot riparian buffer.

**Priority** would be given to treating new invaders over established infestations. The most economical method would be used to treat infestations. A decision Matrix for treatment options under Alternative 3 is displayed in Figure 2. Most weed populations along roadsides and within administrative sites would be treated with herbicides where manual control has been ineffective. These sites would be posted before and after treatment (see Mitigation Measures).

**Early Detection Rapid Response** would be a part of this alternative. A total of 3,000 additional acres could be treated under the life of this Environmental Assessment. Within riparian 50 foot

buffers, there would be a cap on the number of acres that can be treated per 6<sup>th</sup> field watershed: no greater than 10 contiguous acres and 1.5 miles along a river corridor would be treated yearly.

New sites would be analyzed by an Interdisciplinary Team to ensure that proposed treatments are consistent with Project Design Criteria and that they need no additional surveys or mitigation measures. New sites would be published in the newspaper to inform the public as part of our annual announcement of treatment areas.

**Figure 2. Example of a Decision Matrix for Weed Control Under Alternative 3**

1. Is the weed population small (< 50 plants) and manual control effective?
  - Yes..... Manual
  - No..... 2
  
2. Is the site known for culturally used plants?
  - Yes..... Manual
  - No..... 3
  
3. Are you dealing with established weed infestations that can be reduced in biomass using mechanical means or is your goal simply to stop seed set?
  - Yes..... Mechanical with PDC for TES birds and Arch sites; no mechanical treatment in Wilderness
  - No..... 4
  
4. Is the site within a riparian buffer zone? (within 50 feet of water)
  - Yes.....Is your site 0-10 feet from the bank? ..... Manual , Inject with Glyphosate, or Wipe with Glyphosate or Imazapyr
  - .....Is your site 10-50 feet from water?..... Manual, Mechanical, Inject with Glyphosate, or Backpack or wipe with Glyphosate or Imazapyr
  - No..... 5
  
5. Are there TES species or habitat?
  - Yes..... Manual or follow PDCs for Botanical or Fisheries resources with herbicide use
  - No..... 6
  
6. Is the soil permeable and near a high water table?
  - Yes..... Manual , Mechanical, Spot spray with all chemicals except clopyralid
  - No..... 7
  
7. Choose the method that is most effective. This will probably be herbicide treatments followed up by manual control of plants missed. Use the herbicide that is most specific for the species you want to eradicate. For example, clopyralid is highly effective on knapweeds. Sethoxydim is grass specific so it would be a good choice to use on a grass like false brome where there is a competing stand of vegetation.

**Monitoring** would be an integral part of this alternative. There would be annual reviews of new sites proposed for treatment. If sites are treated with herbicides, we would follow up with manual control (at least of flowering heads) and monitoring effectiveness late in the season for at least the sites along major highway corridor and major road systems (20% of all sites). For sites where access is more difficult, we would use the comparison of herbicide being applied per site as a measure of effectiveness from year to year.

We would comply with annual reporting requirements from the State of Oregon for treatments within 6<sup>th</sup> field watersheds, detailing the amount and type of chemical used. We would also comply with the R6 ROD monitoring, if any of our sites are chosen as high risk.

### **Alternatives Considered But Eliminated from Detailed Consideration**

There were several control methods that were discussed but eliminated from detailed consideration. Biological control was considered as a method to be discussed under the Alternatives. The current Willamette LRMP standard and guideline FW 259c reads, “Implementation of the IWM program shall allow for release of biological control agents wherever established weed populations would support them. Agents released must be tested and sanctioned by the U.S. Department of Agriculture.” This standard was consistent with new direction (Standard 14, R6 ROD, USDA2005a), so a decision was made not to include this treatment method in the analysis.

Prescribed burning was also considered as a control method to be discussed under the Alternatives. However, the use of prescribed burning is rarely only for noxious weed treatment; it is used to reduce fuels, to stimulate wildlife forage, to emulate natural disturbance regimes. The specific places where weeds may be treated with prescribed burning have not been delineated, so it would be impossible to conduct site-specific analysis on them. The Team felt that this control method was better treated in environmental analyses when prescribed burning projects are proposed.

The Deciding Official deemed aerial herbicide application not an option in this analysis due to potential adverse effects on water resources. The ID Team discussed the need for boom spraying and decided that we wanted to be as conservative as we could with our herbicide treatment methods and that boom spraying, having a greater potential for drift than hand-held spray methods, was not necessary.

Many other herbicides were available for use under the R6 ROD. The Team analyzed the new and potential invader weeds on the Forest and looked at the list of herbicides available and their environmental effects, and chose the herbicides that would be most effective on the target weeds with the least environmental effects. If a herbicide were to become available that was less

environmentally hazardous while being equally or more effective on our target weeds, we would conduct a supplemental analysis and potentially add it.

## **Project Design Criteria (Mitigation Measures) Common to All Action Alternatives**

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In response to public comments on the proposal, mitigation measures were developed to ease some of the potential impacts the various alternatives may cause. The mitigation measures may be applied to any of the action alternatives.

### ***Herbicide Application***

1. Herbicides will be used according to label instructions.
2. Herbicide use will comply with standards in the *Pacific Northwest Regional Invasive Plant Program – Preventing and Managing Invasive Plants* FEIS (2005), including standards on herbicide selection, broadcast use of some herbicides, tank mixing, licensed applicators, and use of adjuvants, surfactants and other additives (standards 15, 16, and 18- Appendix A)
3. Applicators will use Personal Protective Equipment when applying herbicides. This includes long-sleeved shirts, long pants, gloves, shoes plus socks, eye protection for application and chemical-resistant apron for cleaning, mixing and loading herbicides.
4. Spray equipment will be calibrated prior to seasonal start-up and periodically throughout the season to assure accuracy in applications. Spray tanks will not be washed or rinsed within 150 feet of any live water. All herbicide containers and rinse water will be disposed of where they will not cause contamination of waters.
5. No more than daily use quantities of herbicides shall be transported to the project site.
6. Equipment used for transportation, storage, or application of herbicides shall be maintained in a leak-proof condition.
7. Favor transportation routes with less traffic, less adjacent water bodies, and fewer blind curves. Use a guide vehicle when more than one vehicle is traveling to the site, or when large quantities or other circumstances dictate.
8. Applicators will develop an Emergency Spill Response Plan developed with and approved by the USDA Forest Service, on-site during treatments. The plan would identify reporting procedures, methods to clean up accidental spills, including reporting spills to the appropriate regulatory agency.
9. Apply during the months of April-October. No application when rain is forecast within the next 24 hours and when wind speed exceeds 10 miles per hour. No herbicide application would occur within 100 feet of water bodies when wind velocity is greater than 5 mph.
10. A pre-operations briefing will be required annually prior to treatment between a USDA Forest Service weed coordinator and the lead contractor or employee and documented to brief spray personnel on the location of sensitive resources (streams, lakes, wetlands, sensitive plants) and to review operational details. The briefing will include safety issues, location, timing, application method, herbicides approved for use, project design criteria, and other pertinent topics.

11. Mechanized spraying equipment should remain on roadways, trails, parking areas or other disturbed areas to prevent damage to vegetation and soil, and potential degradation of water quality and aquatic habitat.
12. All water bodies, campgrounds, wetlands and meadows as well as roadsides will be clearly marked in the field at least one week prior to and following application of herbicides in a project area.
13. To minimize herbicide application drift, use low nozzle pressure; apply as a coarse spray, and use nozzles designed for herbicide application that do not produce a fine droplet spray.

#### ***Public Protection***

14. Public notice of proposed herbicide applications locations will be published in the local papers one month in advance of herbicide application (Standard 23)
15. Administrative sites and developed campgrounds will be posted or closed in advance of herbicide application, normally 3 days, to ensure that no inadvertent public contact with herbicide occurs. All roadsides and trailhead parking lots will be posted at least one week in advance and after application of herbicides to provide advanced notice to the public.

#### ***Botanical Resources***

16. Surveys for Botanical Species of Concern (Region 6 sensitive and Survey and Manage) shall be completed 100 feet from herbicide application prior to treatment if the area is potential habitat and the area has previously not been surveyed as part of a project area survey.
17. Where an invasive plant species is to be treated within 3 feet of a sensitive plant species (non-rhizomatous only) or within 5 feet of a sensitive non-vascular species, the invasive plant should be either manually treated (for perennial species, as close to all of the roots as possible) or herbicide application should be hand-wiping. Use a non-leaching herbicide such as glyphosate, to ensure herbicide is not taken up by roots of sensitive plant.
18. When using selective/hand herbicide treatment methods, reduce further invasive plant invasions on the sites by protecting non-target vegetation when possible.

#### ***Water Quality, Aquatic Organisms***

19. Herbicides will not be applied within 50 feet of a class 1-4 stream, pond or wetland (Alternative 2 only).
20. Glyphosate may be used for stem injection and plants may be wiped with glyphosate or imazapyr from 0-10 feet from bank edge. These methods plus spot spray with glyphosate and imazapyr may be used from 10-50 feet. (Alternative 3 only).
21. Where the road ditch line flows directly into surface water (e.g. stream, pond, reservoir) spray only when the ditch line is dry. Treat ditches connected to the stream network as intermittent streams.
22. Do not use clopyralid where there is a high water table and rapid soil permeability. Do not use

clopyralid, sethoxydim, or Garlon 3A in riparian buffer areas.

23. Ground-based mechanized equipment will not be allowed within 25 feet of streams, ponds, or wetlands.
24. Use erosion control measures (e.g., silt fence, native grass seeding) where de-vegetation may result in delivery of sediment to adjacent surface water. Soil scientists or hydrologists will assist in evaluation of sites to determine if treatment is necessary and the type of treatment needed to stabilize soils.

### *Wildlife*

25. No mechanized activity within 0.25 miles, or 0.50 mile line-of-sight of a bald eagle nest site, shall occur between January 1 and August 31, unless the nest is verified to be unoccupied by the District Wildlife Biologist. Exceptions to this standard are the well-traveled state highways that bisect the Forest- Highway 20, 22, 126 and 58.
26. No mechanized activity within .25 miles , or .5 mile sight distance, of a known bald eagle communal roost, unless the roost is verified to be unoccupied by the District Wildlife Biologist.
27. Chainsaw use within 65 yards of known spotted owl activity centers or unsurveyed suitable habitat will be prohibited during the critical breeding period (March 1 to July 15) to avoid disruption of breeding owls.
28. No areas within 100 feet of a spring or seep will be sprayed with an herbicide without appropriate surveys for sensitive salamanders or mollusk as determined by the unit biologist.

## Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 5. Comparison of Alternatives.

	Alternative 1: No Action	Alternative 2: Modified Current	Alternative 3: Proposed Alternative
Acres of invasive plant habitat within 50 feet of water treated with herbicides	<b>None</b>	<b>None</b>	<b>3232</b>
Acres of TES Fish habitat adjacent to herbicide treatments	<b>None</b>	<b>None- PDC is 200 foot buffer</b>	<b>1552 acres</b>
Acres of high human use with potential for herbicide treatment	<b>None</b>	<b>None</b>	<b>410</b>
Potential for drinking water contamination	<b>None</b>	<b>None- No herbicide within 50 foot buffer</b>	<b>None-No application results in reaching threshold of harm</b>
Cost of full implementation over 10 year period	<b>\$12,579,444</b>	<b>\$ 5,775,260</b>	<b>\$2,929,456</b>
Maximum number of acres treated with herbicides	<b>0</b>	<b>6058</b>	<b>9700</b>

Early- Detection Rapid Response	<b>None</b>	<b>25 new sites can be added/year</b>	<b>3000 acres can be added over 10 years, not to exceed 10 contiguous acres and 1.5 miles along a river corridor</b>
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