



Appendix F. Invasive Plants

This appendix provides background on the methodology used in the analysis of invasive plants.

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Analytical methods used to determine relative risk to introduce invasive plant species between the alternatives.

Analytical assumptions used for the effects analysis are integrated into the invasive plants portion of Chapters 3 and 4. The analytical methods used to determine the relative risk to introducing and spreading invasive plant species between the alternatives are described in this appendix.

The condition of invasive plant infestations on BLM managed lands in western Oregon can be characterized by analyzing a few invasive species. The following representative sample of invasive species is used to describe the condition of invasive plants on BLM managed lands in western Oregon on BLM managed lands:

- Yellow starthistle
- Knotweeds
- False brome
- Spotted and diffuse knapweeds
- Meadow knapweed
- Scotch and French brooms
- Dyer's woad
- Canada thistle.



Step 1

Determined the current Invasive Species Distribution Category at the fifth-field watershed level: _

The sample invasive species distribution data was imported from WeedMapper in January 2007 and reported species presence was evaluated for each square mile in a grid applied to the planning area. All of the sample invasive species distribution data was pooled for the analysis.

Invasive Species Distribution Categories of *abundant*, *limited*, and *low* were based on the known species distribution in the fifth-field watersheds:

Abundant

The sample invasive species were reported from more than 25% of the square miles within the fifth-field watershed.

Limited

The sample invasive species were reported from between less than 25% and more than 1% of the square miles within the fifth-field watershed.

Low

The sample invasive species were reported in no more than 1% of the square miles in the fifth-field watershed.

Figure XX to show Invasive Plant Distribution of selected species in the planning area.

Step 2

Determined the relative risk of introducing invasive plant species into fifth-field watersheds over the first ten years of plan implementation as a by-product of timber harvest activities for each alternative.

Step 2a -

Weights of 1 or 5 were assigned to the four timber harvest types based on their respective post-harvest light levels. Regeneration and partial harvests were assigned a weight of 5. Commercial thinning and uneven aged management activities were assigned a weight of 1.

Step 2b -

Weights of 1, 3 and 5 were assigned to logging methods based on their respective levels of soil disturbance. Aerial harvests were assigned a weight of 1, cable yarding systems a weight of 3, and ground based methods a weight of 5.



Step 2c -

A combined timber harvest activity weighted value was calculated by multiplying the weights from *Steps 2a* and *2b*.

Step 2d -

These combined timber harvest activity weights were multiplied by the number of acres modeled for harvest in the first ten years, to generate a set of values describing the level of susceptibility for invasive plant introduction as a result of probable timber harvest activities.

Step 2e -

The susceptibility values were evenly divided into three categories: *high*, *medium* and *low*.

Zero values were assigned to fifth field watersheds where there is no BLM ownership.

Figure X (Relative susceptibility of fifth field watersheds to invasive plant introduction, as a result of timber harvest activities in the first ten years) to show which watersheds would generate the most and least post-harvest light and soil disturbance from timber harvest activities.

Step 2f -

Combining invasive species presence with susceptibility generated by timber harvest activities to determine relative risk of introduction.

For each alternative a matrix, use Figure below to determine relative risk of invasive species introduction associated with timber harvest activities in the first ten years for each fifth field watershed in the planning area. Within the matrix invasive plant species distribution categories (*Low*, *Limited*, and *Abundant*) and the susceptibility categories from timber harvest activities (*Low*, *Moderate*, *High*) are related to determine relative risk of introducing invasive plants in the fifth field watersheds as a result of timber harvest activities in the first ten years.

Watersheds with a combination of *Low* invasive species distribution and *Low* or *Moderate* susceptibility for introduction of invasive plants from timber harvest activities would have the lowest risk of invasion. Fifth field watersheds with the highest category for either distribution or susceptibility would have a greater risk of invasive species introduction than watersheds with lower categories.



The greatest risk of invasion would be in fifth field watersheds where both invasive species are *Abundant* and where the susceptibility of introducing invasive plants associated timber harvest activities would be *High*.

Species distribution categories	Susceptibility categories for introduction of invasive plants from timber harvest activities		
	Low	Moderate	High
Low	Low	Low	Moderately Low
Limited	Low	Moderate	Moderate
Abundant	Moderately Low	Moderate	High

Use a figure to show by alternative the relative risk of invasive plant introduction, from timber harvest activities in the first ten years, for each fifth field watershed.

The relative risk of invasive species introduction associated with timber harvest activities in the first ten years is summarized across the alternatives in Figure A where stacked columns show the relative amounts of fifth field watersheds in each of the risk categories.

Step 3

Determined the relative risk of introducing invasive plant species into riparian habitats over the first ten years of plan implementation as a result of timber harvest and associated management activities

A similar analytical process as the one used to determine risk associated with timber harvest activities under all alternatives is used to compare the risk of introducing invasive plants into riparian habitats.

Step 3a -

Weights were applied to the different Riparian Management Area prescriptions to compare the relative risk of invasive plant introduction into riparian areas as an inadvertent by-product of timber harvest activities.

Thinning would occur within the Riparian Management Areas and is a constant proportion of the total thinning acres under all alternatives. Therefore, the thinning acres used to determine the relative risk of introducing invasive plants into fifth field watersheds in the first ten years was also be used for the riparian habitat risk analysis.



Under Alternatives 2 and 3 Riparian Management Area (RMA) widths are 25 feet wide on either side of the intermittent streams which would result in the highest post-harvest shade levels. The analytical assumption for risk of invasive plant introduction in the intermittent RMAs under Alternative 2 and 3 is the shade levels in these intermittent RMAs would mimic the levels in the surrounding timber harvest units. The intermittent stream post-harvest shade levels would be lower under Alternatives 2 and 3 than under the No action alternative and Alternative 1.

Susceptibility weights for invasive plant introduction to riparian habitats associated with timber harvest activities under all alternatives were assigned using Table 242.

Table 242. Susceptibility weights for harvest activity types for introduction of invasive species into riparian areas

Alternative	Timber harvest type	Susceptibility weight
All Alts	Thinnings	1
Alts 2 & 3	Uneven age management Klamath Falls	1
Alt 3	Uneven age management Medford south of Grants Pass	1
Alts 2	Regeneration harvest	2
Alt 3	Partial Harvest	2

Step 3b -

For each alternative, the weights were multiplied by the number of acres modeled for harvest in the first ten years for each harvest type to generate a set of values describing the level of susceptibility for invasive plant introduction into riparian areas from the different timber harvest types.

Step 3c -

Likewise, for each alternative, the logging methods used for these harvesting activities were also be considered to generate riparian habitat susceptibility to invasion associated with these activities in riparian habitats.

Step 3d -

Together, the riparian susceptibility values associated with harvest types and logging methods determine the overall riparian susceptibility to invasion in the first ten years of plan implementation under each alternative.

These two values were multiplied together to generate a comprehensive susceptibility value. These values ranged between E and F and were divided into three equal categories: *high*, *medium* and *low*.



Step 3e -

The riparian susceptibility category and invasive plant distribution category were used to determine the relative risk of introducing invasive species in riparian habitats for the first ten years of plan implementation using the same methods described for timber harvest activities in *Step 2e* above.

Step 4

Determined the relative susceptibility of off-highway vehicle designation areas of having invasive plant introductions as a by-product of the designation.

Step 4a -

Assigned off-highway vehicle designation weights, as identified below, to each part of the fifth field watershed having a different off-highway vehicle designation.

Off-Highway Vehicle Designation Susceptibility weights:

Open/limited Off-Highway Vehicle emphasis and potential emphasis areas = 5

Limited = 3

Closed = 0

Step 4b -

Determine the relative susceptibility for inadvertent introduction of invasive species related to off-highway vehicle use as a by-product of the off-highway vehicle designations.

For the No action and Action alternatives, the susceptibility weights were multiplied by the number of acres modeled for each designation to generate a set of susceptibility values for the fifth field watersheds. These values ranged between E and F and were divided into three equal categories: *high*, *medium* and *low*.

Step 4c -

The riparian susceptibility category and invasive plant distribution category were used to determine the relative risk of introducing invasive species in fifth field watersheds using the same methods described for timber harvest activities in *Step 2e* above.



Step 5

Determined the susceptibility of fifth field watersheds to roadside invasive plant introductions from what we know about road densities, on all ownerships, and current invasive plant distribution categories.

Step 5a –

Divided road densities into classes based on the number of miles of road:
 < 2 miles/section, 2 – 4 miles/section, 4- 8 miles/section, >8 miles/section

Step 5b –

Used Table 243 to derive roadside susceptibility categories based on invasive plant distribution and road densities in fifth field watersheds.

Table 243. Roadside susceptibility categories based on invasive plant distribution and road densities in fifth field watersheds.

Species distribution categories	Road Densities			
	< 2 miles/section	2 – 4 miles/section	4 – 8 miles/section	> 8 miles/section
Low	Low	Low	Moderately Low	Moderate
Limited	Low	Moderate	Moderately High	High
Abundant	Moderately Low	Moderately High	High	High

Step 5c –

Figure R shows the relative roadside susceptibility categories for invasive plant introduction, for each fifth field watershed.

The relative susceptibility of invasive species introduction associated with road densities and current invasive plant distribution is shown in Figure V where columns show the relative amounts of fifth field watersheds in each of the susceptibility categories.



Step 6

Determined the risk to fifth field watersheds of roadside invasive plant introductions from their invasive plant distribution categories and the relative amounts of new road construction and road related activities, by alternative.

Step 6a -

Divide the amount of new road construction and road related activities evenly into three categories, *high*, *moderate* and *low*.

Step 6b -

Used the matrix in Table 244 to determine the relative risk categories of invasive plant introduction from the amounts of new road construction and road related activities and species distribution categories.

Table 244. Matrix to determine the relative risk categories of invasive plant introduction from new road construction and related activities

Species distribution categories	Relative Levels of Road Construction and Related Activities		
	Low	Moderate	High
Low	Low	Low	Moderately Low
Limited	Low	Moderate	Moderate
Abundant	Moderately Low	Moderate	High

Step 6c -

A figure will show the relative risk of invasive plant introduction from new road construction and road related activities based on species distribution categories, for each fifth field watershed and by alternative.

The relative risk of invasive species introduction associated with new road construction and related activities and species distribution categories to be shown in a figure.