False-brome Working Group Newsletter

January 2004

False-brome (*Brachypodium sylvaticum*) at McDonald Forest

TOPICS:

- **Prevention**
- **Current control techniques**
- **Current research**
- **Web sites**
- **Sample contract language (logging/road maintenance)**

NEXT MEETING: 17 March 2004
9-12am Siuslaw Natl. Forest Office
4077 SW Research Way, Corvallis

This issue of the False-brome Working Group newsletter details topics discussed at the September 25, 2003 working group meeting at the Siuslaw National Forest headquarters in Corvallis. The False-brome Working Group was formed in 2002 to unite land managers, ecologists and researchers from different agencies and institutions in Oregon who had been working independently to address the negative habitat impacts of the invasive grass *Brachypodium sylvaticum,* commonly called false-brome. The working group goal is to help land managers eradicate or contain the spread of this invasive weed through collaboration: sharing research, control methods and lessons learned from our individual efforts; devising improved control techniques and tools; inventorying known locations and assigning priorities; and increasing agency and institutional awareness of the problem.

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ALERT: False-brome in California

In early December 2003, Dr. Fred Hrusa, senior plant systematist for the CDFA Plant Pest Diagnostic Center, identified the first collection of false-brome in California, from specimens provided by Jim Johnson, a San Francisquito Watershed Council Streamkeeper. The plants came from a well-established population around Schilling Lake in Portola Valley, San Mateo County on the peninsula south of San Francisco. The false-brome extends one mile along Dennis Martin Creek from the base of the Santa Cruz Mountains up toward the crest, and is found in sunbreaks in redwood forest and in the shade in nearby mixed evergreen forest. Jim Johnson is preparing a more detailed report of the site and potential control measures. *For more information, contact Cindy McCain (*cmccain@fs.fed.us*).*

PREVENTION

The best method to prevent spread of false-brome (*Brachypodium sylvaticum*) is to stop the spread of its seed by humans, animals, vehicles and machinery, wind and rain. This can be challenging for land managers because false-brome is a prolific seed producer. Seed ripens in July and is on the plants through November or December in western Oregon. Mowing before seed set along roads and trails is one method to control spread of seed by vehicles, university researchers, forest workers and recreational users of the forest, and it can be an effective means of controlling spread from existing stands of false-brome. It may be necessary to mow two or three times to eliminate seed heads each season, so this may only be practical/affordable along the roads and trails that are most heavily used.

Vehicles and equipment used during road construction and maintenance on public and private roads as well as logging or restoration operations are common vectors of seed spread, so it is important to remove that seed before leaving the forest to avoid spreading it to other parts of the state. Beginning in 2003, the College Forest has inserted language into its logging contracts to require vehicle cleaning before leaving the site, and we spray herbicide on false-brome adjacent to harvest operations planned for later in the season to help limit the amount of seed that may come into contact with equipment, vehicles and workers.

We have also posted signs at all kiosks at all McDonald-Dunn Forest entrances to inform the general public about the false-brome issue and to ask for their help in removing seeds from clothing, pets and bikes before leaving the forest. No funding for false-brome control was approved at the College Forests, but a map that shows the areas in need of road and trailside treatment has been completed. This map will form the basis of a road and trailside eradication program to slow the spread from vehicles and recreationists on McDonald/Dunn Forest, should funding become available or other operational roadside treatments occur.

A field trip to look at the OSU Blodgett Tract false-brome in the North Coast (Columbia County) is tentatively scheduled for March 9th. We will leave from the Siuslaw N.F. parking lot at 8:30 (and can arrange to pick up people along the way). We will return by about 4:30. For more information, contact Debbie Johnson at debora.johnson@oregonstate.edu or 737-6388.

*Report by Debbie Johnson of OSU College Forests and Susan Morré (*morres@onid.orst.edu*), OSU Forest Resources/ Wildlife Science/Environmental Sciences graduate student*

CURRENT CONTROL TECHNIQUES

The Eugene District BLM and the Institute for Applied Ecology, based in Corvallis, have conducted false-brome control experiments on BLM land outside Eugene. Chuck Fairchild reports on use of the Waipuna hot foam machine to control false-brome in summer 2003:

Observations on the operation of the Waipuna

Eugene Waipuna equipment is a 1 ton flatbed truck with a 320-gallon tank and 2 200-foot hoses. The vehicle needs to be larger to handle the terrain, but this could limit where it is able to operate.

Observations on treatment capacity

Each 300 gallons will cover 1000 square feet with 2 operators and takes approximately 50 minutes in high concentrations. Medium concentrations will take about 70 minutes before refilling. Treatment is limited by the availability of water. The rig needs water support from tanks situated for fill-up or by tender truck.

Observations on treatment

The height of the BRSY slows treatment time, so mowing would speed operation and inhibit seed production. Brushing and mowing of sites with mixed vegetation would increase treatment effectiveness and reduce treatment application time. Temperature affects the results of the treatment. On hot days the treatment results are immediately visible. Rain affects treatments, and significant moisture impedes the treatment.

Other observations

- The Waipuna cannot be compared to herbicide treatments in rate of application.
- Service from the Waipuna Company is not consistent and responsive. We were shut down for 8 weeks waiting for spark arrestors.
- The system works well on monocultures of BRSY, but is challenged with mixed vegetation. This situation will challenge any treatment method, even specific herbicides.
- The young plants tend to sprout under bracken fern, salal, and other vegetation, making it hard to find. This is the hardest control situation.
- Operational time is 4-6 months in the Willamette Valley, possibly more in drier climes.

- The lease for the Waipuna unit is $700/ month, all year. The lease requires that you use their foaming agent, which costs $700/ barrel.

- The 300 gal tank has a 4% solution of water and foaming agent. The foaming agent is a mixture of corn syrup and coconut oil. It has been approved for use in California. It is not on Oregon's toxic list of chemicals.

CURRENT RESEARCH

I. *The Institute for Applied Ecology and the Eugene District BLM have been surveying federal lands and conducting research on false-brome control since April of 2002. These projects have included Waipuna trials, mulching, tilling and seeding with native grass and surveys for false-brome.*

Waipuna Trials

In Oct. 2002 the Eugene BLM and the Institute for Applied Ecology initiated an experiment to test the effectiveness of the Waipuna on controlling false-brome. The Waipuna is a truck-mounted machine which uses super-heated foam to kill herbaceous plants. Baseline data was recorded for the existing vegetation, treatment and control plots were established and changes in the vegetation were documented one year following the treatments.

Most notable of the findings was a decline in the mean cover of false-brome in the treatment plots from 44.0% in October 2002, to 7.3% in September of 2003. Meanwhile, the percent cover of false-brome in the control plots nearly doubled from 33.5% to 62.8% over the same time period (see Figure 1). Although there was a dramatic decrease in the cover of false-brome, seedlings of false-brome had a mean percent cover of 2.5% in the treatment plots. Of special interest was the increase in the relative abundance of *Rubus discolor* (Himalayan blackberry) following the Waipuna treatment. The Waipuna killed most of the live herbaceous material, leaving the woody plants and vines unharmed. In this case, Himalayan blackberry carried over and made up 46.1% of the total live vegetation, but did not necessarily proliferate as a result of the treatment. Finally, there was no significant difference in total species richness between Waipuna and control plots (p=0.48).

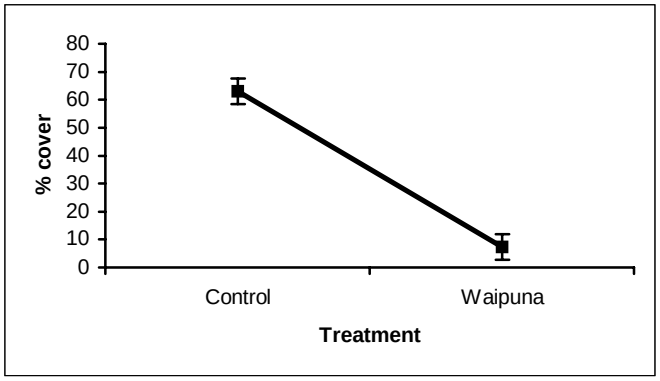


Figure 1. Percent cover of *Brachypodium sylvaticum* one year after treatment with the Waipuna.

Tilling, mulching and Competitive plantings

Prior to deactivating a forest road that was infested with false-brome, the Eugene BLM and IAE initiated experiments involving combinations of tilling, seeding with blue wildrye (*Elymus glaucus*) and mulching with blue wildrye straw. The frequency of false-brome in the treatment plots declined from 96.6 % to 36.0% one year after the treatments. This decline in false-brome frequency parallels a significant ($p = 0.029$) decline in false-brome percent cover in all of the treatments as well.

Seeding combined with tilling resulted in the lowest percent cover of blue wildrye (6.2%) while all treatment combinations that included mulching resulted in relatively high establishment, with average percent covers ranging from 27.7% to 55.5

Mulching with blue wildrye straw appears to be a very effective way to establish *Elymus glaucus* and inhibit the establishment of false-brome. Mulching may increase the survivorship of seedlings that germinate in the winter by buffering them from temperature extremes that can kill exposed seedlings. Mulch may also afford protection from seed predators, such as birds, that eat seeds before they are able to germinate and establish.

Conclusion

After surveying more than 2000 acres within 17 sections of BLM land during the 2002 field-season, it is very clear that false-brome is well established and spreading rapidly in the McKenzie Resource Area. Plants appear to be proliferating on roadsides and in areas of disturbance. From there, plants quickly radiate into adjacent habitat when seeds are transported via human or wildlife vectors. Once false-brome begins to penetrate forests it is very difficult to track and remove. We recommend aggressive eradication of false-brome before it overwhelms land managers (as it has in the McDonald Research Forest in Corvallis) and threatens biodiversity on a broad landscape level.

With its ever increasing abundance, false-brome is present on virtually all land ownership types in the Willamette Valley and Cascades. Cooperative efforts will therefore be essential to a successful false-brome eradication/containment program. The most effective control methods will involve a multi-year approach and should include roadside treatments with hot foam, mowing, mulching, hand grubbing, and consideration of limited herbicide applications.

Prevention of the spread of false-brome by cleaning equipment and clothing should be a top priority. Finally, special attention should be given to false-brome encroachment on special status species such as *Aster vialis* and Kincaid's lupine.

For more information, contact Matt Blakeley-Smith and Tom Kaye, Institute for Applied Ecology (kayet@peak.org).

II. Control of *Brachypodium sylvaticum* and Restoration of Rare Native Upland Prairie Habitat at Butterfly Meadows, Benton County

Our project goal is to protect and restore rare Willamette Valley upland prairie habitat at Butterfly Meadows (Benton County) from invasion by the noxious weed *Brachypodium sylvaticum.*

Objective 1 Conduct trial studies on herbicide treatment effects on *Brachypodium sylvaticum* and native vegetation.

Herbicide trials

Herbicides were applied in October, 2002. *Brachypodium sylvaticum* was reduced >90% in these treatments: Accord, Accord + Plateau, Accord+Pendulum, and Oust+Accord. However, the two latter combinations resulted in a reduction of native plant cover. Treatments of Plateau and Pendulum barely differed from the controls.

Perhaps the best herbicide for effective reduction of *Brachypodium sylvaticum* with the least harm to native prairie herbs was Fusilade, a grass specific herbicide. It reduced false-brome from 73% to 7.3% while retaining an average percent cover of 5.1% native species.

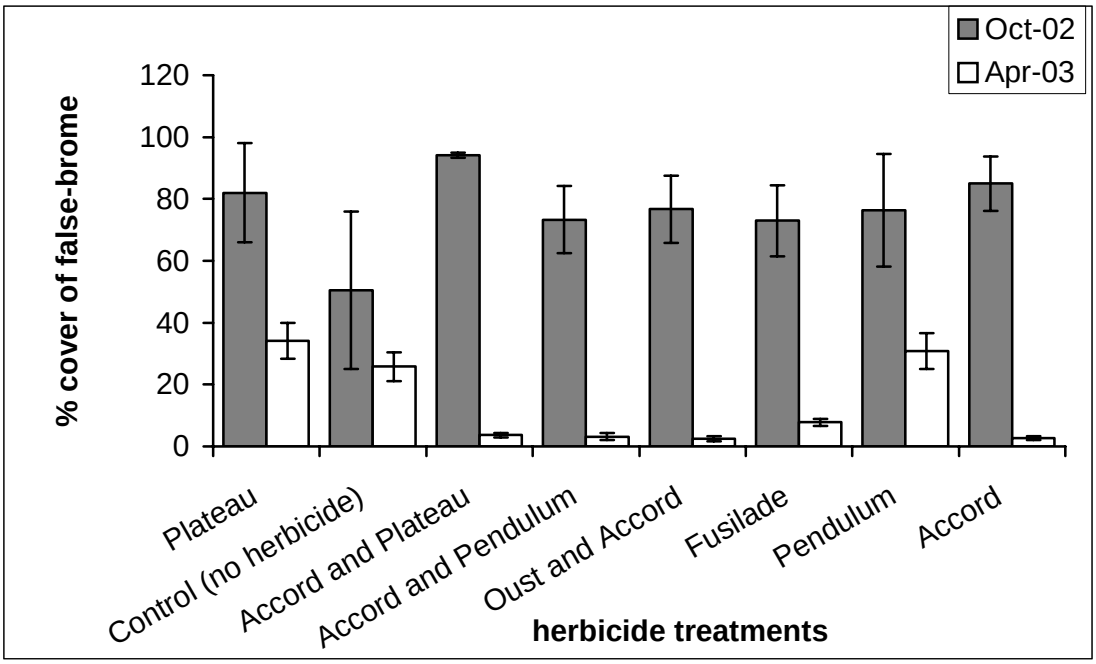


Figure 1. Abundance of false-brome before (gray) and after (white) application of various herbicide treatments.

Responses of Kincaid's lupine, Fender's blue butterfly larvae, and *Brachypodium sylvaticum* to herbicide treatments

During the summer of 2003 patches of Kincaid's lupine were randomly assigned one of 7 herbicide treatments. Accord + Pendulum and Accord+Plateau were most effective, reducing

Brachypodium sylvaticum to less than one-tenth its cover in control plots. Pendulum and Plateau alone were indistinguishable from controls however. The cover of *Brachypodium* seedlings was not significantly affected by the herbicide treatments.
Despite the strong mortality of *Brachypodium sylvaticum* in several herbicide treatments, no treatment caused a significant decline in the number of Kincaid's lupine leaves or the number of Fender's blue butterfly larvae. Fusilade had the best overall results with respect to *Brachypodium* reduction, lupine leaf and butterfly larva retention.

After evaluating the results of our pilot studies from fall 2002, we initiated additional experimental plots in August 2003. Pre-treatment data were collected in August and October 2003. Post-treatment data will be collected spring 2004. The herbicide treatments for the plots containing both Kincaid's lupine and false brome are described in Table 1 and those plots with only false brome are described in Table 2.

Table 1. Herbicide treatments and date of application for plots ($1m^2$) containing Kincaid's lupine and false brome at Butterfly Meadows. Each treatment was replicated 4 times.

	Treatment	**Rate of Application**	**Date of treatments**	
			08/01/03	**10/31/03**
1	Fusilade DX and surfactant	0.375 lb a.i./acre and MSO (1% v/v)	X	
2	Fusilade DX and surfactant	0.375 lb a.i./acre and MSO (1% v/v)		X
3	Fusilade DX and Pendulum 3.3 EC and surfactant	0.375 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)	X	
4	Fusilade DX and Pendulum 3.3 EC and surfactant	0.375 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)		X
5	Fusilade DX and Surflan AS and surfactant	0.375 lb a.i./acre and 6 lb a.i./acre and MSO (1% v/v)		X
6	Fusilade DX and Pendulum 3.3 EC and surfactant	0.188 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)	X	
7	Fusilade DX and Pendulum 3.3 EC and surfactant	0.188 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)		X
8	Accord Concentrate (glyphosate) and surfactant	2 lb a.i./acre + Activator 90 (0.5% v/v		X
9	Control (no herbicide application)			

Table 2. Herbicide treatments and date of application for plots (2m × 1.5m) containing false brome at Butterfly Meadows. Each treatment was replicated 6 times.

	Treatments	**Rate of Application**	**Date of treatments**	
			08/01/03	**10/31/03**
1	Fusilade DX and surfactant	0.375 lb a.i./acre and MSO (1% v/v)	X	
2	Fusilade DX and surfactant	0.375 lb a.i./acre and MSO (1% v/v)		X
3	Mow (Aug), Accord Concentrate (glyphosate) and surfactant (Sept)	2 lb a.i./acre + Activator 90 (0.5% v/v)	X	X
4	Fusilade DX and Pendulum 3.3 and surfactant	0.094 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)		X
5	Fusilade DX and Pendulum 3.3 EC and surfactant	0.188 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)	X	
6	Fusilade DX and Pendulum 3.3 EC and surfactant	0.188 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)		X
7	Fusilade DX and Pendulum 3.3 EC and surfactant	0.375 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)	X	

8	Fusilade DX and Pendulum 3.3 EC and surfactant	0.375 lb a.i./acre and 3.96 lb a.i./acre and MSO (1% v/v)		X
9	Fusilade DX and Surflan AS and surfactant	0.188 lb a.i./acre and 6 lb a.i./acre and MSO (1% v/v)		X
10	Accord Concentrate (glyphosate) and Pendulum 3.3 and surfactant	2 lb a.i./acre and 3.96 lb a.i./acre and Activator 90 (0.5% v/v)		X
11	Accord Concentrate (glyphosate) and Surflan AS and surfactant	2 lb a.i./acre and 6 lb a.i./acre and Activator 90 (0.5% v/v)		X
12	Accord Concentrate (glyphosate) and surfactant	2 lb a.i./acre and Activator 90 (0.5% v/v)	X	
13	Accord Concentrate (glyphosate) and surfactant	2 lb a.i./acre and Activator 90 (0.5% v/v)		X
14	Control (no herbicide application)			

Objective 2 Conduct experimental studies on reestablishing native species after removal of *Brachypodium sylvaticum.*

In November 2003, seeds of 25 native species were sowed into experimental plots that were established within the Fusilade herbicide treatment, which had previously showed from the fall 2002 pilot studies, the most promise for controlling *Brachypodium sylvaticum* without harming native vegetation and Fender's blue butterfly larvae. The experimental treatments were 1) litter left intact, 2) litter removed, 3) litter removed with sowed seeds treated with fungicide, and 4) litter removed and slug bait. Comparisons of seedling establishment and cover of non-native species to be measured spring 2004 will be made among the treatments.

A second study was initiated in which transplants of 10 native species, which had been started in a greenhouse June 2003, were planted mid-December into experimental plots established within the Fusilade, Accord, and control herbicide treatments from the fall 2002 pilot studies. Comparisons will be made on survival and cover of transplants among the three treatments.

This project was supported with a grant from the Oregon Department of Agriculture, Weed Control Council and with in-kind contributions from Starker Forests, UAP Timberland, Oregon State University, and the Institute for Applied Ecology. *For more information on the herbicide trials, contact Tom Kaye (Institute of Applied Ecology, kayet@peak.org) and for more information on the native plant restoration studies, contact Deborah Clark (Oregon State University, deborah.clark@oregonstate.edu).*

III. False-brome Seed Longevity Study at Bald Hill Park, Corvallis

A seed longevity study to investigate whether *Brachypodium sylvaticum* (false brome) seed persists in the seed bank was initiated by ecologists from The Nature Conservancy and the Institute for Applied Ecology in February 2003. Twenty eight seed packets of 100 seeds each were sewn into polypropylene mesh bags and placed in aluminum screen envelopes (to reduce herbivory) and positioned either on the surface of the ground or buried 2.5 cm below ground in both open and closed canopy habitats at Bald Hill Park in Corvallis, Oregon. The first batch of seeds (eight replications per site (sunny & shady), depth and year) were exhumed in June 2003, with the remaining batches of seeds to be exhumed in June 2004, 2005 and 2006. The results for

the first year data showed that 95% of the exhumed seeds were germinable, suggesting that the seeds can remain viable for at least several months in various environments.
For more information, contact Greg Fitzpatrick of The Nature Conservancy at fitzpatg@juno.com.

IV. *Brachypodium sylvaticum* monitoring: 2003 addendum on managed stand plots in McDonald-Dunn Forest

This update expands the 2001 monitoring report on the non-native grass *Brachypodium sylvaticum* (BRSY) in ecology plots established in 1989. The 2001 report covered unharvested plots. The 2003 report adds information on BRSY response from plots which had been harvested.

The spread of BRSY in McDonald-Dunn Forest has been a topic of interest since the species was first documented in the Forest in 1982. Dan Leavell and Connie Hubbard reported on BRSY occurrence in the McDonald-Dunn Forest based on field data collected on 115 plant classification plots in 1989 (2). Their findings indicated BRSY in all parts of the forest, and among all plant associations, although BRSY in the Soap Creek watershed was notably sparser than in other regions. Seventy-nine of the plots were resurveyed in 2001 and briefly discussed in a previous paper.

The remaining thirty-six original plots were lower priority because they had undergone some form of stand management, such as clear cutting, thinning, shelterwood establishment or patch cutting. Many of the stands were also burned and/or treated with herbicide. This small number of plots limits statistical comparison due to the variability of silvicultural treatments, locations in the forest and original vegetation. The new data from 2003 suggest some hypotheses that could be explored further.

BRSY patterns in McDonald-Dunn

Areas of the McDonald-Dunn forest were delineated by watershed and ridge top boundaries. The southern half of the McDonald-Dunn Forest has northeast-tending connectivity from the Oak Creek and Jackson Creek watersheds to Lewisburg Saddle and Nettleton Ridge above the Peavy Arboretum (see map). Plots in these areas occur with predominantly southeast to southwest-facing macropositions. The Soap Creek watershed essentially forms the back side of this grouping, and plots there tend to be east to northwest-facing. The incidence of BRSY in both original and re-measured data is somewhat correlated to southern aspects. The data collected in 2003 also corroborates a pattern noticed in 2001 showing the species moving northeast from Oak Creek to the Peavy Arboretum and the associated flank of Nettleton Ridge.

The northern half of the McDonald-Dunn Forest includes the southeast-facing lower tributaries of Soap Creek, the Soap Creek Farm and, further north, the Berry Creek Farm and the east to northeast-facing slopes of the Berry Creek watershed. In 2001, the data did not suggest that BRSY colonization was imminent in the northern half of the forest. Data from managed stands in 2003 also do not show significant increases in BRSY coverage in the north, but individual plot data do pose some interesting questions.

2003-harvested plots

The 2001 report reported on trends without management. However, response of BRSY in managed stands is a wide concern. The thirty-six plots remeasured in 2003 suggest that treatment alone does not predict BRSY abundance. Location in the Forest appears to affect results significantly. Further, some areas within the Forest were largely excluded in 2001, especially near the Peavy Arboretum where almost all of the plots fell in managed stands. Twelve plots were surveyed anew in 2003 at the Peavy Arboretum end of Nettleton Ridge. Three plots were also revisited in Oak Creek, five in the Jackson Creek/Lewisburg Saddle area, six near the Soap Creek Farm, and ten in the Berry Creek watershed (Table 1).

Table 1: Plot locations-2001 and 2003.

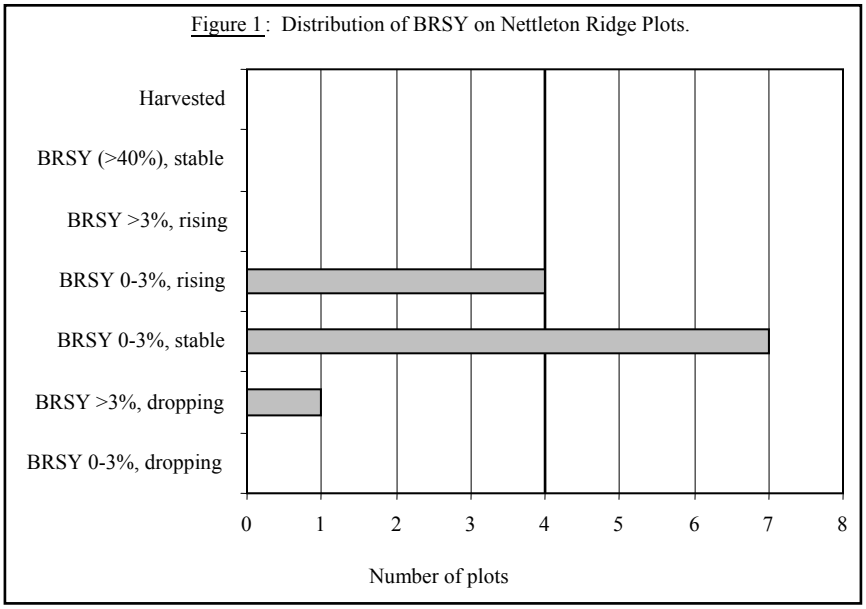
Forest Region	2001 Plots	2003 Plots
Nettleton Ridge (Peavy Arboretum)	0	12
Oak Creek Watershed	24	3
Jackson Creek / Lewisburg Saddle	27	5
Soap Creek Tributaries	8	6
Berry Creek watershed	10	10
Upper Soap Creek watershed	10	0

The Oak Creek watershed is the most heavily affected by BRSY colonization. BRSY levels measured in 2003 following silvicultural operations were similar to those without management in 2001. No herbicide or burning was used, so possibly increased light availability and competition from other species could be the primary factors on the plots. Similar to untreated stands, *Brachypodium* jumped significantly on two plots to 70-80% cover, and rose insignificantly on a plot which already had 60% coverage in 1989. Plots in this area were part of patch cut or single tree selection harvests in 1994 and 1988; however middle canopy coverage was dense in the patch cut stand in 2003, and mature crown density was high on the other two plots.

Aspect appears to play a significant role in the establishment of BRSY in the Lewisburg Saddle area and the upper reaches of the Jackson Creek watershed. In 2002, 10 plots on the southeast-facing Jackson Creek side had significantly increased BRSY coverage above 3%, and two more were dense but unchanged. On the northwest-facing side of Lewisburg Saddle however, 12 plots had ≤ 3% BRSY in 1989 that were stable or decreasing, while only two plots had more that 3%. In 2003, four more plots were re-measured on the Jackson Creek side after treatments including a thinning, two shelterwoods and a clear cut. BRSY coverage on all four plots was ≤ 4% in 1989, and remained unchanged. Only one plot was re-measured on the northwest side of the saddle, where BRSY had drifted from 3% to 0%. This plot was not managed, but was close to patch cut areas. All five of these plots had low to moderate tree canopy density (<50% in any stratum), but comparatively dense and diverse shrub and/or forb species representation (average of 18 species, 30%-100% coverage). Poison oak cover has rebounded to 70% on one plot where herbicide was applied in 1991; shrubs are least dense on one plot where herbicide was applied in 1999. Competition for sunlight on northwest-facing slopes could be a factor in limiting BRSY around the junction of the Jackson Creek watershed and the Lewisburg Saddle.

The 2001 report on the *Brachypodium* condition hypothesized that data from Nettleton Ridge might indicate a general northeast migration of the species from more densely covered watersheds such as Oak Creek and Jackson Creek. In 1989, 10 out of 12 plots had ≤3% coverage. 2003 managed-stand plot re-measurements from the northeastern end of Nettleton Ridge show that *Brachypodium* coverage has changed appreciably on five plots (Figure 2). Two of these have leapt to 25% and 45%. Two others have risen to 7% and 9%. One plot at the very top of the ridge has fallen from 25% to only 3%. This plot was thinned, but the upper canopy is only 10% less dense in 2003 than in 1989. It is not clear from the data whether or not the plot was burned or sprayed following treatment, and other explanations for the drop in BRSY are not apparent (* data sheets missing for this plot). Cover on seven plots shifted <±3%, which is considered stable.

Figure 1: Distribution of BRSY on Nettleton Ridge Plots.



In the north half of the McDonald-Dunn, current conditions appear less favorable to BRSY colonization. Part of this may reflect the absence of an upwind epicenter; part may reflect weed management from McDonald-Dunn Forest managers.

Plots along the tributaries and bottomlands of lower Soap Creek and the Soap Creek Farm have undergone two clear cuts, two patch-cuts, a shelterwood treatment, and one clear cut nearby on the uphill side. One treatment was carried out in 1997 and the rest were carried out in 1989, the year of the original survey. Each of the six plots had <5% BRSY in 1989, and only the plot not directly managed increased significantly (+6%) by 2003. These changes are concurrent with eight other original plots that were re-measured in 2002. Those plots were also <5% BRSY cover and held stable or dropped. Competition in the shrub and forb layers stands out as a possible contributor in suppressing BRSY advancement. Shrub layers account for 50-100% cover, and forb species make up 10-30% cover on these plots. On managed plots, poison oak, Himalayan blackberry and trailing blackberry were especially abundant, and Canada thistle was a prominent forb. On the un-managed plot, native species dominated the shrub and forb layers; BRSY was attributed to the influence of the clear cut uphill. Herbicide was used following all

silvicultural treatments, though the similarities between BRSY cover measured in 2002 and in 2003 suggests the herbicide effect after 14 years is minimal.

The Berry Creek watershed and Berry Creek Farm are the farthest north parts of the McDonald-Dunn Forest. Ten of the original 1989 plots were re-surveyed in 2001, and all had dropped to BRSY cover levels <3%. In 2003, ten more plots, all in clear cut areas, were likewise surveyed, and all but one ended up with <3% BRSY. BRSY was in fact eradicated from six. Eight of these areas were clear cut in 1997 or later, two were clear cut previously, and all were treated with herbicide afterward. Eight of them were also burned. Whether or not this management prescription was intended to eradicate the presence of BRSY, it was successful in doing so. Additionally, there is a formidable shrub and forb layer returning. Himalayan and trailing blackberry, poison oak, and Canada thistle again are dominant on the plots, and the low and middle canopy classes are fairly dense as well.

One plot in the Berry Creek area is most distinctly not following the trend. Plot 51 was clear cut, sprayed and burned in 2001, yet on this plot BRSY has exploded from 1% to 60% cover. The area is described as a past oak-ponderosa pine savannah type with encroaching Douglas-fir. It is in a very low-lying slope position and is close to a major Road and the McDonald-Dunn forest boundary. This combination of factors suggests that proximity to a constant seed source is responsible for the BRSY success at this plot.

Management Effects

The managed stand data suggest several hypotheses on BRSY response to harvest and subsequent silvicultural treatments. One hypothesis was that BRSY would respond positively to increased light availability from removal of the tree overstory, but may be limited by increased competition from other species. Initial impressions of the BRSY response is that BRSY does in fact respond favorably to increased light availability, but the consistency of a response is obscured by a relatively small sample size and variable treatments among plots. It appears that BRSY is most aggressive where forb and shrub coverage is low. Conversely, BRSY is less successful when competing with the dense growth of trailing blackberry, Himalayan blackberry and Canada thistle. These plants can be considered fierce competitors in their own right. The Himalayan blackberry and Canada thistle are also aggressive non-natives and all three species are especially common in disturbed areas.

BRSY appears highly susceptible to herbicide following harvests. Treatments in the Berry Creek watershed eradicated the species on six plots. However, data are lacking on long-term effectiveness of herbicide use. Unresolved questions include effectiveness of herbicide where seeds are continually re-introduced along roads and trails, or from nearby un-herbicided stands. Another question is how herbicide treatments immediately following harvest compare with those applied under an undisturbed canopy.

Lastly, topographic barriers have been shown to be somewhat effective in at least slowing the progression of BRSY from high density to low density areas. It may be useful to incorporate land breaks as well as mechanical means and public awareness for slowing the migration of BRSY into more remote areas of the forest.

Data from all 119 original plant classification plots has now been collected both in 1989 and in 2001-03. *Brachypodium* cover has been shown to vary based on a number of factors including aspect, elevation and light availability; slope is also a suspect factor. Perhaps the greatest missing piece from the available data is a discussion of the vectors BRSY may have followed to arrive on these plots in the first place. Vectors such as wind dispersal, vehicle traffic, animal and hiker traffic, stream transport and proximity to the nearest seed source or silvicultural disturbance should be folded into quantitative analysis. Interactions between environmental variables and stand conditions should also be explored.
For more information, contact Cindy McCain at Siuslaw National Forest headquarters in Corvallis (cmccain@fs.fed.us) or Susan Morre (morres@onid.orst.edu).

V. *Other false-brome research proposals:*
Dave Vesely and Dr. Howard Meyer (Dept. of Animal Science) have applied for a grant to experiment with sheep grazing to control false-brome. Treatments will investigate the efficacy of grazing in retarding growth and inhibiting seed production of established false-brome plants.

Michelle Poyourow and Dr. Keith Karoly (Reed College) have submitted "Genetic Analysis of an Invasive Grass, False-brome (Brachypodium sylvaticum), in the Willamette Valley, Oregon" to Northwest Science. Their work suggests that the false-brome sites near Eugene and Springfield are probably where the original introduction began.

WEB SITES WITH FALSE-BROME INFORMATION

For more information on false-brome please refer to the following websites:

http://www.appliedeco.org/FBWG.htm
http://tncweeds.ucdavis.edu/alert/alrtbrac.html
http://groups.ucanr.org/ceppc/Brachypodium_sylvaticum_Alert/
http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=BRSY
http://www.ou.edu/cas/botany-micro/ben/ben277.html
http://www.plant-identification.co.uk/skye/gramineae/brachypodium-sylvaticum.htm
http://www.bioimages.org.uk/HTML/R26775.HTM
www.appliedeco.org/reports.html

SAMPLE CONTRACT LANGUAGE

Jennifer Lippert of Willamette National Forest put together the following contract information for reference by anyone working on contract language that addresses weed control:

BLM Example Contract Stipulations

The mitigation measures presented in this are consistent with the following documents:
Federal Noxious Weed Act, 1974 (PL 93-629), Carlson-Foley Act,1968 (PL 93-583), FLPMA, 1976, US DOI Bureau of Land Management, Bureau Manual 9015 - Integrated Weed Management

BLM Manual 9015 States the following:

Section .02 Objectives

"The BLM has and shall continue to remain active in developing, demonstrating, and applying the essential science, technology, and stewardship necessary to effectively manage and prevent the spread and infestation of noxious weeds :.. to more fully integrate all BLM programs into actions which will improve the quality and ecological conditions of lands under the BLM management in the United States." '.

Section .03 Management Priorities:

.34B Assessment

"Require all contractors involving land disturbing activities as road construction, campground construction, range improvement, timber sale, mining, oil and gas activities, or other resource related activities such as fire control, to clean all equipment prior to entering project sites on BLM lands. Use stipulations in contracts, permittee leases, and other authorizations if necessary to accomplish this objective."

C. "Ensure that all contracts involving ground-disturbing activities contain provisions which hold contractors responsible for the prevention or control of noxious weeds caused by their operations."

EXAMPLES FROM CONTRACTS:

Example 1a - Noxious Weed Prevention and Control Mitigation Measures

1.0 NOXIOUS WEED CONTROL

1.1 In order to prevent the potential spread of noxious weeds into the Salem or Eugene District BLM, the operator shall only be allowed to use logging, construction, rock crushing, and/or transportation equipment that is relatively clean of noxious weed seeds prior to entering the job site.

1.2 If equipment is not considered "clean" by the BLM, it shall be cleaned prior to entering the job site. Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds into BLM lands. Cleaning prior to entering the job site may be accomplished by using a pressure hose.

1.3 Only logging and construction equipment inspected by the BLM shall be allowed to operate within the project area, or in the immediate vicinity of the project area. All subsequent move-ins of logging and construction equipment, as described in 1.1 of this section, shall be treated the. same as the initial move-in.

1.4 Prior to initial move-in of any logging or construction equipment, and all subsequent move-ins, the operator shall make the equipment available for BLM inspection at an agreed upon location off federal lands.

1.4.1 Logging and construction equipment will be visually inspected by a qualified BLM specialist, to verify that the equipment is, or has been reasonably cleaned. Requirements as outlined above may be waived by a qualified BLM specialist if conditions warrant.

1.5 Requirements to wash equipment may be waived by a qualified BLM specialist if intended move is from one "weed free area" to another "weed free area".

The consequences of not incorporating these proposed measures into the proposed project would likely increase the probability of spreading noxious weed seeds into the proposed project area. Reasonable cleaning of the logging and construction equipment involved in operations would likely remove a large amount of the noxious weed seed from the machinery. It is understood that cleaning the equipment will not remove 100% of the noxious weed seed, but the inclusion of the proposed mitigation measures into project operations would be consistent with Bureau Manual policy, would have a high probability of preventing, controlling, or reducing the spread of noxious weeds on BLM lands, and would prove to be a prudent step to take in reducing the need for costly weed eradication in the future.

Justification

Since there can be no assurance as to where vehicles and/or equipment come from, the possibility of weed seeds being imported into the area must be considered high. We are not only concerned with the spread of existing weed species into new, uninfested areas, but the importation of new weeds that do not currently exist. These stipulations should not only be considered for logging contracts, but should be incorporated into any contract where not only soil disturbance is possible, but where any off-road vehicle travel is likely. For every dollar spent in prevention, we save thousands in treatment! Contractors must be made aware of the fact that if environmental hazards or threats exist, or are promulgated by their actions, they may not be able to continue their chosen profession on public lands in the future.

Example 1b - Noxious Weed Prevention and Control Mitigation Measures

1.0 NOXIOUS WEED CONTROL

1.1 In order to prevent the potential spread of noxious weeds the Purchaser shall be required-to-clean-all equipment involved in all soil disturbing activities, prior to entry on BLM lands.

1.2 Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds into BLM lands. Cleaning prior to entry onto BLM lands may be accomplished by using a water pressure hose.

1.3 Only equipment cleared for use, by the BLM, shall be allowed to operate within the project area, or in the immediate vicinity of the project area. All subsequent move-ins of additional equipment shall be treated the same as the initial move-in.

1.4 Prior to initial move-ins of equipment and all subsequent move-ins, the Purchaser shall make the equipment available upon request for BLM inspection.

1.4.1 Equipment will be visually inspected to verify that the equipment has been reasonably cleaned.

Example 1c - Noxious Weed Prevention and Control Mitigation Measures

1.0 NOXIOUS WEED CONTROL

1.1 In order to prevent the potential spread of noxious weeds into the xxx Project Area, the operator shall be required to clean all logging and construction equipment and vehicles prior to entry on BLM lands.

1.2 Cleaning shall be defined as removal of all dirt, grease, plant parts, and material that may carry noxious weed seeds into BLM lands. Cleaning prior to entry onto BLM lands may be accomplished by using a pressure hose.

1.3 Only logging and construction equipment inspected by the BLM shall be allowed to operate within the project area, or in the immediate vicinity of the project area. All subsequent move-ins of logging and construction equipment shall be treated the same as the initial move-in.

1.4 Prior to initial move-in of all logging and construction equipment, and all subsequent move- ins, the operator shall make the equipment available for BLM inspection at an agreed upon location off federal lands.

1.4.1 Logging and construction equipment will be visually inspected by a qualified BLM specialist, to verify that the, equipment has been reasonably cleaned.

The consequences of incorporating these proposed mitigation measures into the proposed project would likely reduce the probability of spreading noxious weed seeds into the proposed area. Reasonable cleaning of the

logging and construction equipment involved in operations would likely remove a large amount of the noxious weed seed from the machinery. It is assumed that cleaning the equipment will not remove 100% of the noxious weed seed, but the inclusion of the proposed mitigation measures into project operations would be consistent will Bureau Manual policy, would have a high probability of preventing, controlling, or reducing the spread of noxious weeds on BLM lands, and would prove to be a prudent step to take in reducing the need for costly weed eradication in the future.

Example 2 - Vehicle and Equipment Cleaning - Roseburg example

Special Provisions To Control The Spread of Noxious

A. Vehicle and equipment cleaning

1. Cleaning shall consist of the removal of soil and debris by washing with a high pressure hose or steam cleaning. Inspection sites will be agreed to by the CONTRACTOR and the BLM. All petroleum product residues shall be contained at wash sites and dealt with in accordance to DEQ standards. CONTRACTOR shall provide an approved plan for the cleaning station that demonstrates that the station meets all DEQ and water quality regulations. All necessary permits shall be obtained by CONTRACTOR. All cleaning sites shall be located off BLM administered lands.

2. All equipment shall be cleaned as designated by the responsible BLM official, in accordance with section A.1 above.

3. INITIAL CLEANING: All construction, drilling, and logging equipment shall be cleaned prior to entering the proposed area. An exception will be made for the transportation of personnel if all vehicles are confined to operating on bituminous or gravel-surfaced roads and staying on the designated surfacing at all times. The responsible BLM official will designate access routes and vehicles parking areas.

4. EXIT CLEANING: All equipment shall be cleaned prior to leaving areas of infestation except (a) Heavy equipment, pickups and utility vehicles which do not leave hard surfaced roads.

Example 3 - Timber Sale Stipulations for Noxious Weed Prevention

YARDING

In addition, the Purchaser shall insure that all logging equipment is cleaned off prior to operating on BLM lands. Removal of all dirt; grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.

Noxious weeds in the immediate area of yarding operations shall be mowed to ground level prior to the start of logging activities.

All logging and construction equipment and vehicles operating off of main roads shall be cleaned off prior to leaving the job site when the job site includes noxious weed populations. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.

ROAD CONSTRUCTION MAINTENANCE USE

Road graders used for road construction or maintenance would grade towards any known noxious weed infestations. If no good turn around area exists within one half mile that would allow the operator to grade towards the noxious weed infestation, then the operator would leave the material that is being moved within the boundaries of the noxious weed infestation.

Example 4 - Weed Free Native Seed

Following are examples of contract language clauses that could be used in all future contracts to mitigate any invasive plant materials being introduced or spread on public lands through the use of seed/straw.

Seed delivered shall meet certification standards of:

Purity	94% minimum
Germination	85% minimum
Other Crop Seed	1 % maximum
Inert matter	4% maximum
Weed Seed	1 % maximum

No Noxious Weed Seed

Example 5 - Weed Free Straw

Items to consider in ordering straw or developing contract specs for weed free straw:

1. Order/purchase "native" straw if possible.
2. Request "weed-free" straw and provide a list of the invasive plant species to the grower that you would not accept.
3. If non-native straw is not available be selective on type of straw ordered/purchased - select straw from non-invasive crop seed such as fescue straw and do not purchase straw from invasive grass crops such as rye-grass. Much residual seed is left in these straw bales.
4. Most grass seed field crops are sprayed with dicot sprays to comply with seed certification and the elimination of broad-leaved noxious weeds - ask to review the seed certification which should list what non-native species were present in the crop seed harvested.
5. Because monocot splays are generally not used on grass seed crops it will be important to identify non-target grass species that might be included in the straw. Consider working with the grower and arranging field inspections prior to purchase of weed-free straw
7. Continue to work with others on the possibility of forage certification
8. Contract specs could require a declaration of the seed crop harvested with "Other Crop Seed, Weed Seed and Noxious Weed" as listed under Example 4 -'Weed Free Native Seed.

McDonald Forest

Draft False-brome Management Plan

Objective: Reduce the amount of seed leaving the forest

1. Clean logging equipment

Require that logging and construction equipment is surface washed using water from fire trucks or other sources (sale by sale determination) to remove false-brome seeds

- Keep water from this washing process that is contaminated by petroleum away from streams
- Don't concentrate petroleum contaminants in one place
- Kill seeds deposited in these areas after sale is completed

Excluded equipment: rock trucks, log trucks, incidental vehicles, crew vehicles that do not leave roads or treated roadsides.

2. Reduce the amount of false-brome in seed when logging occurs Spray concentrations of false-brome with herbicides

- Spray roadsides in sale to both reduce contamination in rock and the amount of seed in contact with crew. Seed ditches with something that is not invasive.
- Pre-treat false brome areas in sale.

3. Reduce the amount of false-brome seeds that recreationists are spreading

- Develop a map of where there are heavy concentrations of false-brome along roads and trails
- Establish a set of priorities for road and trail herbicide treatments.
- Set up some trials to see what types of treatments and seeding work best and are most cost effective.

Develop a list of species we can use along roadsides for replacement.

- Develop an interpretive display at Oak Creek and brochures to educate public. Include boot brushes and encourage people to remove seeds from their shoes.

4. Reduce the amount of false-brome seeds that the staff are spreading.

- Wash seeds from vehicles before going to another tract.
- Install a boot washer; boot brushes
- Educate staff , students and contractors

Forest Service Prevention Guide

The Guide to Noxious Weed Prevention Practices provides a toolbox of ideas for use in mitigating identified weed risks in resource management operations. The Guide adds no new requirements or regulations.
In 2001 two weed prevention practices are required by Forest Service policy:

1. For forested vegetation management operations, use equipment cleaning contract provisions WO-CICT 6.36 (see Appendix 1)
2. Post and enforce weed-free feed orders, where they exist. (FSM 2081.03).

All other weed prevention practices in this Guide are optional for use based upon an analysis of weed risks. This list of practices, if applied, is considered to be good overall direction, however, not all of these practices can be implemented in every project.

When considering the use of a weed prevention practice for a specific project or resource program, evaluate the efficacy of the weed prevention practice to meet the goal, its feasibility to implement in the specific situation, and its cost-effectiveness. A determination of cost effectiveness may consider the probability and cost of weed control if a weed prevention practice is not used and the relative contribution of the project or activity to the overall weed risk at the site.

General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs

Goal 1: Incorporate weed prevention and control into project layout, design, alternative evaluation, and project decisions.

- Practice 1: Environmental analysis for projects and maintenance programs will need to assess weed risks, analyze potential treatment of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs, to include the use of herbicides, if needed, at the onset of project planning.

Goal 2: Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Practice 2: Before ground-disturbing activities begin, inventory and prioritize weed infestations for treatment in project operating areas and along access routes. Identify what weeds are on site, or within reasonably expected potential invasion vicinity, and do a risk assessment accordingly. Control weeds as necessary.
- Practice 3: After completing "Practice 2" above, to reduce risk of spreading weed infestations, begin project operations in uninfested areas before operating in weed infested areas.
- Practice 4: Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- Practice 5: Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Clean equipment before entering National Forest System. lands; a Forest Officer, in coordination with the Unit Invasive Species Coordinator, needs to approve use of on-Forest cleaning sites in advance. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway. Seeds and plant parts need to be collected when practical and incinerated. Remove mud, dirt, and plant parts from project equipment before moving it into a project area.
- Practice 6: Clean all equipment, before leaving the project site, if operating in areas infested with weeds. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Seeds and plant parts need to be collected when practical and incinerated.
- Practice 7: Workers need to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. Proper disposal means bagging the seeds and plant parts and incinerating them.
- Practice 8: Coordinate project activities with any nearby herbicide application to maximize cost effectiveness of weed treatments.
- Practice 9: Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established. Sites could include road and trail rights-of-way, and other areas of disturbed soils.

Goal 3: Prevent the introduction and spread of weeds caused by moving infested sand, gravel, borrow, and fill material in Forest Service, contractor and cooperator operations. For practices 10 through 12 below, work with the responsible transportation agencies to voluntarily adopt these practices where county and state governments have responsibility for maintenance of roads that cross National Forest System lands.

- Practice 10: Inspect material sources on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication, and strip and stockpile contaminated material before any use of pit material.
- Practice 11: Inspect and document the area where material from treated weed-infested sources is used, annually for at least three years after project completion, to ensure that any weeds transported to the site are promptly detected and controlled.
- Practice 12: Maintain stockpiled, uninfested material in a weed-free condition.

Goal 4. In those vegetation types with relatively closed canopies, retain shade to the extent possible to suppress weeds and prevent their establishment and growth.

- Practice 13: Retain native vegetation in and around project activity to the maximum extent possible consistent with project objectives.

Goal 5: Avoid creating soil conditions that promote weed germination and establishment.

- Practice 14: Minimize soil disturbance to the extent practical, consistent with project objectives.

Goal 6. Where project disturbance creates bare ground, consistent with project objectives, reestablish vegetation to prevent conditions to establish weeds.

- Practice 15: Revegetate disturbed soil (except travelways on surfaced projects) in a manner that optimizes plant establishment for that specific site. Define for each project what constitutes disturbed soil and objectives for plant cover revegetation.

- Practice 16: Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching as necessary. Use native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available. Always use certified materials in areas closed by administrative order. Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g. road embankments or landings)

- Practice 17:Use local seeding guidelines to determine detailed procedures and appropriate mixes. To avoid weed-contamination, a certified seed laboratory needs to test each lot against the all-State noxious weed list to Association of Seed Technologists and Analysts (AOSTA) standards, and provide documentation of the seed inspection test. There are plant species not on State and Federal noxious weed lists that the Forest Service would consider non-native invasive weeds. Check State and Federal lists to see if any local weeds need to be added prior to testing. . Seed lots labeled as certified weed free at time of sale may still contain some weed seed contamination. Non-certified seed should first be tested before use.

- Practice 18: Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least three (5) growing seasons following completion of the project. For on-going projects, continue to monitor until reasonable certainty is obtained that no weeds have occurred. Provide for follow-up treatments based on inspection results.

Goal 7: Improve effectiveness of prevention practices through weed awareness and education.

- Practice 19: Provide information, training and appropriate weed identification materials to people potentially involved in weed introduction, establishment, and spread on National Forest System lands, including agency managers, employees, forest workers, permit holders, and recreational visitors. Educate them to an appropriate level in weed identification, biology, impacts, and effective prevention measures.

- Practice 20: Provide proficient weed management expertise at each administrative unit. Expertise means that necessary skills are available and corporate knowledge is maintained.

- Practice 21: Develop incentive programs encouraging weed awareness detection, reporting, and for locating new invaders.

Goal 8: Set the example; maintain weed-free administrative sites.

- Practice 22: Treat weeds at administrative sites and use weed prevention practices to maintain sites in a weed-free condition.

Forest Service Contract Language

C6.36 – EQUIPMENT CLEANING. (7/00) Unless the entire Sale Area is already infected with noxious weeds, Purchaser shall ensure that prior to moving on to the Sale Area all off-road equipment, which last operated in areas known by Forest Service to be infected with noxious weeds, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall certify in writing that off-road equipment is free of noxious weeds prior to each start-up of timber sale operations and for subsequent moves of equipment to Sale Area. Measures taken to ensure that off-road equipment is free of noxious weeds will be identified. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. A current list of noxious weeds of concern to Forest Service is available at the Forest Supervisor's Office.

Purchaser must clean off-road equipment prior to moving between cutting units on this timber sale that are known to be infested with noxious weeds and other units, if any, that are free of such weeds. Sale Area Map shows areas, known by Forest Service prior to timber sale advertisement, that are free of specific noxious weeds species of concern.

Purchaser shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of noxious weeds. Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools are not required.

Purchaser shall notify Forest Service at least 5 working days prior to moving each piece of off-road equipment on to the Sale Area, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. If the prior location of the off-road equipment cannot be identified, Forest Service may assume that it was infested with noxious weed seeds. Upon request of Forest Service, Purchaser must arrange for Forest Service to inspect each piece of off-road equipment prior to it being placed in service.

If Purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, Purchaser and Forest Service shall agree on methods of cleaning, locations for the cleaning, and control of off-site impacts, if any.

New infestations of noxious weeds, of concern to Forest Service and identified by either Purchaser or Forest Service, on the Sale Area or on the haul route, shall be promptly reported to the other party. Purchaser and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found.

C6.343 (OPTION 2) - CLEANING OF EQUIPMENT. (12/97) To prevent the introduction of the seeds of noxious weeds onto National Forest land, Purchaser shall ensure all equipment moved onto National Forest land is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall employ whatever cleaning methods necessary to ensure compliance with the terms of this provision, and shall notify Forest Service prior to moving each piece of equipment onto National Forest land, unless otherwise agreed in writing. Notification will include identifying the location of the equipment's most recent operations.

Purchaser shall certify in writing, compliance with the terms of this provision prior to moving equipment onto a new sale area. For the purposes of this provision, "equipment" includes all logging machinery except for log trucks, chip vans, pickup trucks, cars, or other vehicles used to daily transport personnel.

C(T)6.42 (1/93) ROAD CONSTRUCTION All earth moving road construction equipment shall be pressure washed to remove dirt and other material capable of housing unwanted seed, prior to entering project area. Sale Administrators or their representatives will certify that each piece of equipment has been washed and is free of seed.

R6/SPS-601.011: Engineering Contracts **July 15, 2002**

601.01 Work. Add the following:

In order to prevent the spread of noxious weeds, the contractor shall be required to clean all construction equipment prior to moving it to the project area. This cleaning shall remove all soil, plant parts, seeds, vegetative matter, or other debris that could contain or hold seeds. Only construction and maintenance equipment, and the equipment necessary to transport said equipment, so cleaned and inspected by the Forest Service will be allowed to operate within the project area. All subsequent move-ins of equipment to the project area shall be treated in the same

manner as the initial move-in. This requirement does not apply to service vehicles, water trucks, pickups, cars, and/or similar vehicles.

Contractor shall employ whatever cleaning methods necessary to ensure that construction and maintenance equipment is free of noxious weeds. Equipment shall be considered free of soil, seed, and other such debris when a visual inspection does not disclose such material. Equipment or components disassembly, or the need for specialized tools, are not required.

Unless otherwise agreed, Contractor shall give the Forest Service at least 24 hours notice when equipment is ready for inspection. Notification will include an agreed upon location where the equipment will be available for inspection by the Forest Service. Inspection will be required after every cleaning.

Forest Service shall approve the methods of cleaning and the locations for the cleaning.

New infestations of noxious weeds of concern to Forest Service and identified by either Contractor or Forest Service, on the Project Area or on the haul route, shall be promptly reported to the other party. Contractor and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. A current list of noxious weeds of concern to Forest Service is available at each Forest Service office.

MEASUREMENT

601.02 Method. Add the following: The equipment shall be cleaned prior to moving onto this project. This initial cleaning shall not be included in the measurement for payment. Payment under this item will only be made if subsequent cleanings are ordered by the Forest Service. Measurement shall be on an "each" basis, meaning one complete cleaning of all equipment required for this contract. Subsequent cleanings necessitated by the Contractor's action but not directed by the Forest Service will not be included in the measurement for payment.

<u>Implementation Requirements for all Forest Service Projects in Region 6</u>

All off-road equipment shall be cleaned prior to coming onto National Forest lands as to be free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Notify the Purchaser/Contractor of this requirement in the six-month sale program announcement and General section of the Prospectus.

When NEPA analysis concludes that the cleaning of off-road equipment is needed, the following actions are required:

1. For timber sales, in the General Section of the Prospectus, notify the Purchaser/Contractor that cleaning of off-road equipment will be required. Include specific requirements; prior to bringing onto National Forest lands, after operations in Units 2, 4, etc. Also include the appraisal allowance ($/CCF) made for this work.

2. Have maps of known infested sites available for review by Purchaser/Contractor.

3. Cost the required work as shown above.

4. When using the FS-2400-6 and -6T contracts, include specific cleaning requirements in Special Provision C or CT6.315# - Sale Operation Schedule. See the provision Instructions for a sample. Also, show the infested sites on the Sale Area Map, per B or BT1.1, using map symbol "NXW". In the FS-2400-3T or -3P contract, list cleaning requirements in Special Provision 21.3# Sale Operation Schedule, and on the Sale Area Map. In the FS-2400-4 contract, list cleaning requirements in Other Condition 22#, and on the Sale Area Map.

5. Engineering has developed Special Project Specification R6/SPS 601.011 specifying cleaning requirements.

6. Inspect equipment prior to off-loading from transportation vehicle. Move off National Forest lands if cleaning is needed prior to start of operations, unless otherwise agreed.

7. Required cleaning on National Forest lands will be with compressed air, high pressure water, or other specified methods to assure equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Use of solvents, detergents, etc. to clean equipment on National Forest lands is prohibited.

8. Cleaning of equipment after operations in infested units will be in areas specified by the Forest Service. Run-off will not be allowed to enter streams and will be contained with methods specified to minimize movement of water from the cleaning site. Soil contaminated with invasive plants and seedpods will be disposed of by the Purchaser/Contractor off National Forest land.

9. Stockpiles of rock and other materials related to road construction and reconstruction, and road maintenance that contain Invasive Plants shall have the top six (6) inches scraped off, set aside, and treated. Monitor the pile and treat again if invasive plants reappear. The remaining stockpile can be used as needed.

10. Equipment such as skyline yarders, brush cutters or flailers, all terrain vehicles (ATV) or similar equipment, which operate on or from road surfaces shall be considered off-road equipment. Required cleaning will be for those equipment components that operate off the road surface, i.e., road graders and ATV's that operate infested areas, flailer head, cable, drums, blocks, motorized carriages and other carriages that may get into the ground, etc.

11. Inspections should be complete and thorough without the use of specialized equipment and done in a manner similar to fire inspections. While inspections do not require the disassembly of components, opening of hoods, panels, storage places, etc. is appropriate.

12. Close communication and coordination between project and contract personnel, and persons doing the inspecting, are essential for successful implementation and administration of invasive plant requirements.