



Noxious Weeds Effects Analysis

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Methodology

Invasive species inventories along with the following indicators and measures were used in this analysis. Given the size of the project area, updating the invasive species inventory would be a multi-year effort. Fortunately, the Lolo NF has a relatively up-to-date inventory in our management database. The Lolo NF has initiated an active treatment program over the last couple of years as well which allows observational inventories every year.

Resource Indicators and Measures

Table 1. Resource condition indicators and measures for assessing effects

Effect	Indicator or Measure	Threshold for Significance	Source
Noxious Weed Establishment	Inventories and prevention	Early Detection, Rapid Response	Forest Plan, Amendment 11; 2007 Weed FEIS
Noxious Weed Spread	Prevention and Treatments	Education and Treatments	Forest Plan, Amendment 11; 2007 Weed FEIS
Noxious Weed Control	Treatments of large infestations	Broadcast Treatment	Forest Plan, Amendment 11; 2007 Weed FEIS

Consistency with Relevant Laws, Regulations, and Policy

National Forest Management Act (NFMA) Land Management Plan Consistency

The Lolo National Forest Land and Resource Management Plan (forest plan) provides standards and guidelines for noxious weed management.

Lolo Forest Plan Direction

Forest-wide direction

Weed management for the WAM project is guided by the principles and priorities established in Amendment 11 to the Lolo National Forest Plan and the Integrated Weed Management FEIS of 2007. Amendment 11 states: *“All management activities will incorporate noxious weed prevention measures. Noxious weed control projects will be focused where they may have the greatest effect on preventing weed spread or damage to natural resources, and the greatest benefit to people who are actively trying to control weeds on land adjacent to the National Forest.”* This decision provides Forest-wide standards, monitoring expectations, and guidelines for weed prevention and for weed control projects. The FEIS authorizes an adaptive and integrated weed management strategy for the Lolo NF to include treatment of new weed species, new weed infestations, and the use of new control methods. The FEIS is incorporated into this analysis by reference (see the Lolo National Forest website at <http://www.fs.usda.gov/goto/lolo/projects>).

This project is consistent with Amendment 11 of the Lolo Forest Plan as it incorporates appropriate noxious weed prevention and control measures. This is being met through ongoing pre-treatment efforts and assigned mitigation (Resource Protection Measures – RPMS).

Lolo Noxious Weed List

The Lolo NF has a list of noxious weeds that includes species in addition to the State of Montana list. This list was part of the Integrated Weed Management EIS, dated December 2007 (Lolo 2007). This list includes some species not currently consider a noxious weed by the State of Montana. Three of the species on this list are inventoried within the project and analysis area: common mullein (*Verbascum spp.*), Musk thistle (*Carduus nutans*), and tall tumbled mustard (*Sisymbrium altissimum*).

Treatment of State-listed and those listed in the Integrated Weed Management EIS would be associated with mitigation and pre-treatment efforts.

This project is consistent with targeting listed noxious weeds.

Other Relevant Law, Regulation, and Policy Consistency

Federal Noxious Weed Law

The Federal noxious weed list is determined by rule of the U.S. Department of Agriculture under the definitions and provisions of the Federal Noxious Weed Act of 1974, Title 7, Chapter 61. A Federal noxious weed is of foreign origin and is new or not widely prevalent within the United States. Federal noxious weeds are specified as aquatic weeds, parasitic weeds, or terrestrial weeds. For the purpose of weed management on Federal lands (Section 2814), a Federal agency shall adopt any list classified as noxious by Federal or State law.

The project area contains 22 species listed by Montana, as well as common mullein, musk thistle, and tall tumbled mustard.

Executive Order 13112, Invasive Species

Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, identify such actions; subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and, (vi) promote public education on invasive species and the means to address them; and not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Recent efforts have escalated the noxious weed control program within the project area. These continuing efforts would comply with this law.

Montana County Noxious Weed Control Law

The Montana County Noxious Weed Control Law (MCA 7-2101 through 2153) was established in 1948 to protect Montana from destructive noxious weeds. This act, amended in 1991, has established a set of criteria for the control and management of noxious weeds in Montana. Noxious weeds are defined by this act as being any exotic plant species which may render land unfit for agriculture, forestry, livestock, wildlife or other beneficial uses or that may harm native plant communities. Plants can be designated statewide as noxious weeds by rule of the Department of Agriculture or county-wide noxious weeds by district weed boards following public notice of intent and a public hearing.

The Montana Noxious Weed Law only pertains to noxious weeds. It cannot be enforced on any weed not designated as a Statewide or district “noxious weed” (Table 2). This is the same list the Lolo NF uses for resource management and decision-making in regards to noxious weed species.

Local government has the responsibility for implementation and enforcement of weed management in Montana. Each county government is required to appoint a county weed control board, and to develop a long-term noxious weed management plan. The WAM project area is entirely in Missoula County.

Invasive plants are classified by the State of Montana by their priority for control or eradication in three categories (Table 2)

The Lolo NF maintains an active inventory of all listed noxious weeds and is constantly finding new invaders. The Lolo NF partners with the State of Montana and County Extension Offices frequently to ensure we are consistent with this law.

Table 2: Montana State Weed List (Species in bold font are known to occur within the project area on NFS lands)

Priority Level	Description	Species
Priority 1A	These weeds are not present in Montana. Management criteria will require eradication if detected; education; and prevention.	Yellow starthistle (<i>Centaurea solstitialis</i>) Dyer’s woad (<i>Isatis tinctoria</i>) Common reed (<i>Phragmites australis</i> ssp. <i>Australis</i>) Medusahead (<i>Taeniatherum caput-medusae</i>)
Priority 1B	These weeds have limited presence in Montana. Management criteria will require eradication or containment and education.	Knotweed complex (<i>Polygonum</i> spp.) Purple loosestrife (<i>Lythrum</i> spp.) Rush skeletonweed (<i>Chondrilla juncea</i>) Scotch broom (<i>Cytisus scoparius</i>) Blueweed (<i>Echium vulgare</i>)
Priority 2A	These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.	Tansy ragwort (<i>Senecio jacobaea</i>) Meadow hawkweed complex (<i>Hieracium</i> spp.) Orange hawkweed (<i>Hieracium aurantiacum</i>) Tall buttercup (<i>Ranunculus acris</i>) Perennial pepperweed (<i>Lepidium latifolium</i>) Yellowflag iris (<i>Iris pseudacorus</i>)

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Priority Level	Description	Species
		<p>Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)</p> <p>Flowering rush (<i>Butomus umbellatus</i>)</p> <p>Common buckthorn (<i>Rhamnus cathartica</i> L.)</p> <p>Ventenata (<i>Ventenata dubia</i>)</p>
Priority 2B	<p>These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.</p>	<p>Canada thistle (<i>Cirsium arvense</i>)</p> <p>Field bindweed (<i>Convolvulus arvensis</i>)</p> <p>Leafy spurge (<i>Euphorbia esula</i>)</p> <p>Whitetop (<i>Cardaria draba</i>)</p> <p>Russian knapweed (<i>Centaurea repens</i>)</p> <p>Spotted knapweed (<i>Centaurea stoebe</i> or <i>maculosa</i>)</p> <p>Diffuse knapweed (<i>Centaurea diffusa</i>)</p> <p>Dalmatian toadflax (<i>Linaria dalmatica</i>)</p> <p>St. Johnswort (<i>Hypericum perforatum</i>)</p> <p>Sulfur cinquefoil (<i>Potentilla recta</i>)</p> <p>Common tansy (<i>Tanacetum vulgare</i>)</p> <p>Oxeye daisy (<i>Chrysanthemum leucanthemum</i> or <i>Leucanthemum vulgare</i>)</p> <p>Houndstongue (<i>Cynoglossum officinale</i>)</p> <p>Yellow toadflax (<i>Linaria vulgaris</i>)</p> <p>Saltcedar (<i>Tamarix spp.</i>)</p> <p>Curlyleaf pondweed (<i>Potamogeton crispus</i>)</p> <p>Hoary alyssum (<i>Berteroa incana</i>)</p>
Priority 3	<p>Regulated Plants: (NOT MONTANA-LISTED NOXIOUS WEEDS) These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a</p>	<p>Cheatgrass (<i>Bromus tectorum</i>)</p> <p>Hydrilla (<i>Hydrilla verticillata</i>)</p> <p>Russian olive (<i>Elaeagnus angustifolia</i>)</p>

Priority Level	Description	Species
	contaminant in agricultural products. The state recommends research, education, and prevention to minimize the spread of the regulated plant.	Brazilian waterweed (<i>Egeria densa</i>) Parrot feather watermilfoil (<i>Myriophyllum aquaticum</i> or <i>M. Brasiliense</i>)

Environmental Impacts

Affected Environment

Most noxious weeds have a strong association with disturbed areas such as roadsides, trail sides, construction projects, old homesteads, and utility sites. Regardless of “how”, removal of topsoil and low vegetative cover create favorable conditions for noxious weed colonization, as these species tend to be aggressive, early seral colonizers. Spread beyond centers of infestation occurs by transport of seeds and vegetative parts (rhizomes) on construction equipment, humans, animals, wind, and water. Many noxious weed species, particularly the most common invasive species, occur in open, dry, and disturbed habitats. However, new invader species, such as orange hawkweed, are not as limited by those habitat characteristics and occur in a wider range of site conditions.

Inventories conducted from 2001 to the present indicate approximately 55,213 acres are infested with noxious weeds, mostly scattered along trails, roads, and open areas (wildlife summer and winter ranges) within the project area. Inventory size ranges from a single plant to hundreds of acres. Infestations may overlap and be scattered across large areas or dense patches confined to small areas. Spotted knapweed is the dominant weed species within the analysis area (46,545 acres). Known weed infestations are listed by Focal Treatment Area (FTA) in Table 3. Noxious weeds are present in all FTAs.

Table 3: Sum of Mapped Noxious Weed Acres by FTA

Focal Treatment Area	Mapped Acres of Noxious Weeds
Allan Creek	23
Butler Creek	138
Clark Fork Face	378
Crystal Creek	0
Deer Creek	66
Gilbert Creek	349
Grant Creek	7
Greenough Moccasin	494
Hayes Creek	49947
Johnson Creek	151
Lavelle	16
Little Park	4
Lower Rattlesnake	2593
Marshall Creek	36
MF Swartz Creek	109
North Slope Sentinel	6
O'Brien Creek	304
O'Keefe Creek	279
Pattee	156

Focal Treatment Area	Mapped Acres of Noxious Weeds
Schwartz Creek	131
Upper Miller Hollowman	27
Grand Total	55,213

The Lolo NF has conducted multiple noxious weed treatments within the WAM project area (see Figure 1). Treatments, which have quadrupled over the past ten years, follow the integrated weed management (IWM) approach by using a variety of methods such as herbicide application, biological control releases, hand pulling, seed head clipping, education, and prevention.

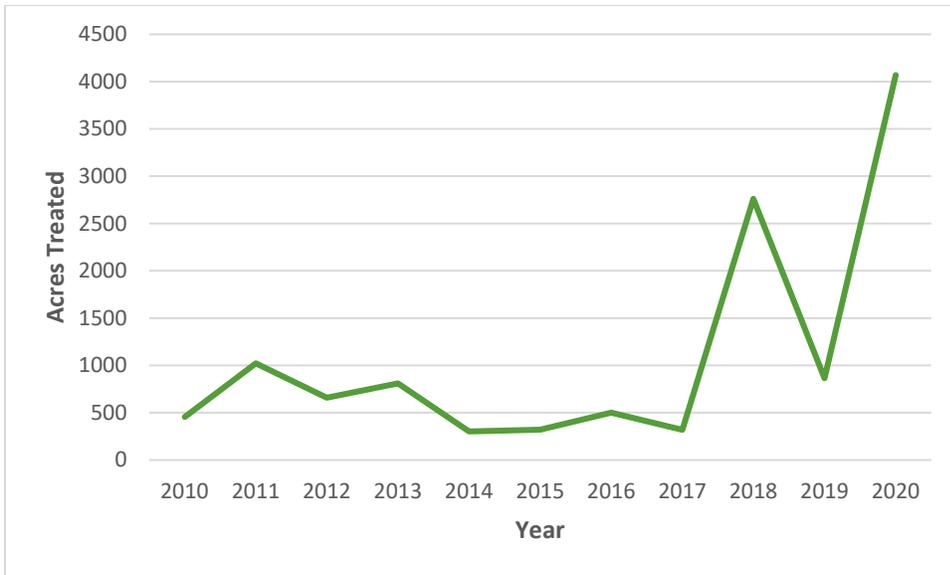


Figure 1: Acres treated using an IWM approach on the Missoula Ranger District

Environmental Impacts of No Action

The implementation of the Integrated Weed Management FEIS (2007) allows the Lolo NF (including the Missoula RD) to treat noxious weeds under an adaptive management strategy; incorporating mechanical, biological, and chemical weed control along with educational efforts directed at the prevention and management of noxious weeds (in addition, prior environmental assessments included portions of the WAM project area prior the 2007 FEIS). Analysis of the effects of noxious weed treatments is included in the 2007 FEIS. Noxious weed control has been ongoing since 1992 in the form of herbicide treatment, biological control releases, hand-pulling, and educational efforts. Herbicide treatments have and will continue to be applied to roadsides, trails, and open meadows infested with various weed species on a scheduled interval. Biological controls have and will continue to be released on leafy spurge, spotted knapweed, yellow and dalmatian toadflax, and St. Johnswort infestations, as needed. Hand-pulling methods will continue on houndstongue and common mullein populations and incidental small infestations discovered in remote, relatively weed-free areas. Treatment of weeds within the WAM project area can be implemented under the authority and guidelines of the 2007 FEIS. All methods will continue regardless of implementation of the WAM project in order to maintain previous noxious weed control and suppression efforts.

Environmental Impacts of Alternative B

Given the extensive presence of noxious weeds in the project area (both species richness and abundance) the risk of spreading existing noxious weed infestations and establishment of new weed infestations would increase in all proposed treatment areas (Allendorf and Lundquist 2003, Lockwood et

al. 2005). Potential treatments pose an increase in disturbance, a decrease in canopy density, and a change in cover type. Disturbance levels vary by proposed treatment (road building, prescribed fire, thinning, etc.); however, the resulting direct impact would remain elevated due to the simple occurrence of soil and vegetative changes and increased human activity (Aukema and Carey 2008, Nelson et al. 2008). Additionally, research has shown increases in nutrient availability often promote invasion of some noxious weeds due to their ability to rapidly uptake nutrients and their efficiency utilizing available nutrients (Funk and Vitousek 2007, Sutherland and Nelson 2010, Besaw et al. 2011). The actions proposed include reducing competitive vegetation, which would increase nutrient availability to all remaining species, including noxious weeds.

The most impactful proposed treatment is the shaded fuelbreaks. Opening the canopy along road sides would create conditions highly conducive to noxious weed spread (Birdsall et al. 2012). The majority of the noxious weeds are located along the roadsides. Between logging activities to create the shaded fuelbreaks and the resulting open canopy, noxious weeds would inevitably creep into the forest beyond the treatable area for noxious weeds. Most truck sprayers can spray a 60-foot swath (30 feet either side) and most hose reels can stretch 150 feet. A shaded fuelbreak of 400 feet (potential maximum width) is well beyond the reach of any mobile ground sprayer. Aerial treatments may be possible, but the terrain and layout of the roads makes it difficult and highly dangerous to apply. Once the noxious weeds leave the treatable area beyond the roadsides, they are nearly impossible to treat. Over the last three years, the Missoula Ranger District has been treating noxious weed infestations along the roads now identified for shaded fuelbreak treatments in order to deplete the seedbank and reduce infestation levels. Seed can remain viable in the soil or duff/litter mat from 2 to 20 or more years depending on the species. Most noxious weed seeds are relatively large and heavy and need to be distributed by animals or mass movement of ground cover (e.g., road construction) and some seed are able to be transported through wind and water movement (Dekker 1999). The past three years of treatments along roads identified for shaded fuelbreaks have been helpful to reduce the noxious weeds, however, the majority of these roads are open roads that are traveled regularly for administrative use and by the public. Noxious weed seeds and propagules can attach to vehicles and be distributed along the road as they fall off, constantly introducing noxious weeds to an area. This means the roads with shaded fuelbreaks would need to be continually treated for multiple years before, during, and after implementation. Without the prior to and follow up treatments (RPMs NW-1 through 3) impacts along the road sides and neighboring forested areas (within the shaded fuelbreaks and beyond) would be negative, major, and long-term. With the implementation of the RPMs, these impacts would be reduced until the time noxious weed treatments are discontinued, to negative, moderate, and short-term.

Additional impacts include the possibility of increased vectors by user-created trails and temporary roads which create disturbances known to facilitate noxious weed spread and establishment (Gelbard and Belnap 2003, Birdsall et al. 2012). Activities associated with project implementation might also increase the potential for noxious weed spread and eventual establishment. Staging areas, vehicles, fill, hand tools, incidental disturbances, and other unexpected sources of weed seed spread and propagation may occur during implementation. However, RPMs and BMPs should reduce these impacts. Wildlife is another vector for noxious weed spread and establishment. The project area experiences a great deal of wildlife activity from ungulates, birds, bears, and a wide-variety of mammals. Potential FTAs have evidence of heavy use from migration trails to simple ocular observances. This project would not be expected to change the population dynamic of most wildlife species but would allow more of the area to be accessible with thinning and burning (see Wildlife Specialist's Report). This would be a negative consequence of the project that would last beyond the implementation period.

Past noxious weed spread within the project area boundary is facilitated by recreational activities and natural vectors (e.g., wind, water, wildlife). Lands within the project area boundary not under NFS jurisdiction continue to be a threat to noxious weed spread. Noxious weed spread and establishment would degrade the native vegetative community, reduce water quality through soil erosion, and reduce wildlife habitat over time. The Missoula RD would continue to identify weed treatment needs in the project area and treat infestations through implementing the Lolo NF Integrated Weed Management EIS (Lolo 2007). Ultimately, increased management and ground disturbances could result in moderate impacts to

noxious weed establishment and expansion (beyond the current level). RPMs to monitor and treat noxious weeds would decrease this impact to minor. Though weed treatments would decrease the potential for increased spread and establishment, which is beneficial, the general impacts from disturbance and increased management would be considered negative due to the potential loss of native or desired vegetation for ecosystem resiliency in areas that are not able to be treated.

Effective treatment for cheatgrass and other annual grasses is still being explored. Cheatgrass infestations would be monitored until a solution for control becomes available. Existing cheatgrass infestations are expected to expand as part of this project.

Because Alternative B includes RPMs designed to decrease noxious weed spread and treat known infestations, the impact would be moderate to minor and the extent of the impact would be short-term. Impact definitions are as follow:

Negligible: Noxious weed infestations would remain at their current infestation level and expand at the current rate of spread.

Minor: Noxious weed infestations would be increased over a relatively small area, the effects would be localized and are not expected to expand beyond a specific disturbance area. No new noxious weed species would be introduced or the potential would be low.

Moderate: Noxious weed infestations would increase or expand over a relatively wide area and/or across multiple sites. The increases would be noticeable and require additional management actions beyond this project. New infestations would be expected to develop.

Major: Noxious weed infestations would be expected to overtake native plant populations over a relatively large area. Infestation levels would be so great there would be a permanent loss to native vegetation.

Short-term: during project implementation; control efforts would taper after 3 years.

Long-term: After project implementation is complete, control efforts continue beyond 3 years, infestation levels continue until shrub and tree canopies mature (beyond 20 years).

Beneficial: this term is not to be confused as being beneficial to the expansion of noxious weed infestations. Beneficial impacts refer to the control, suppression, and eradication of noxious weed infestations.

Negative: This term refers to the expansion, introduction, and increased establishment of noxious weed infestations.

Resource Protection Measures

NW-1	To reduce or eliminate the introduction or spread of weeds	Prior to and post log haul conduct ground-based noxious weed herbicide treatments along planned NFS haul roads.	Haul Routes	Sale	S	Forest Plan, Amendment 11, Integrated Weed Management Plan FEIS, Effects
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NW-2	“	Include in all contracts the standard Contract Provisions: C/CT6.351 (or equivalent) – Washing Equipment: This clause requires the purchaser to clean all off-road equipment before moving into project area so that weed seeds are not spread.	Project Area	Sale	S	Forest Plan, Amendment 11, Integrated Weed Management Plan FEIS, Effects
NW-3	To reduce or eliminate the introduction or spread of noxious weeds and impacts of herbicide treatment	Weed treatments will tier to Lolo National Forest Integrated Weed Management Plan (USDA Forest Service 2007), including approved herbicides, treatment strategies, and mitigation measures. Implement mitigation measures 1 through 48 (starting on page 28 of Lolo National Forest Integrated Weed Management EIS [2007]). These include evaluating the weed site for sensitive plant habitat, implementing Region 1 weed prevention practices and BMPs, following herbicide application law, and posting signs where herbicides are applied.	Project Area (per Weed EIS)	Service and Sale	S	Forest Plan, Amendment 11, Integrated Weed Management Plan FEIS, Effects

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