

# Invasive Plant Species

## Noxious Weeds

### Introduction

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Invasive, non-native plants species can inhabit and negatively alter native plant communities. A number of invasive species are recognized as noxious, meaning laws have been developed to restrict their spread and effect on the environment. Dry vegetation types and areas affected by road development, grazing, logging, fire, or other disturbances are most susceptible to weed invasion. Typically, invasive species have the ability to spread rapidly and reproduce in high numbers, which enables them to effectively crowd out native plant populations. Some can pose serious threats to the composition, structure, and function of native plant communities. Field observations, road surveys, and weed treatment records indicate that the presence and extent of invasive plant populations is established and expanding within the Porter Mount Project Area.

### Information Sources

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The Montana State noxious weed list was consulted, and invasive species of concern were identified. In addition, a recent weed risk assessment (WRA) project in the Northern Region of the USDA Forest Service (USDA Forest Service 2003) identified additional species that pose a threat to native vegetation. Noxious weed surveys were conducted in 2006 along major road corridors and proposed haul routes within the project area.

This assessment of non-native and noxious weeds incorporates by reference the Flathead National Forest's Noxious and Invasive Weed Control (NIWC) EA, March 2001. The objective of the Forest-wide project is to implement an adaptive integrated pest management strategy to control and reduce the presence of noxious and invasive weeds on NFS lands.

A WRA for the Western Montana Planning Zone of the USDA Forest Service (USDA Forest Service 2003) provided the methodology to analyze weed risk (Project File Exhibit H-3).

### Analysis Area

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#### Spatial Bounds

The analysis area for the Porter Mount Management Project is based on the area of the project's influence/impacts on the potential introduction and spread of noxious weeds within the project area. Because, ground disturbance increases the potential for weed establishment and spread, the analysis area includes all treatment units and road systems with activity related to this proposed project.

#### Temporal Bounds

The temporal bounds are 10 to 20 years after the decision is signed. Vegetation conditions would take approximately 10 to 20 years to return to a more existing closed canopy and understory cover conditions following implementation of the thinning and burning treatments. During this time, opening of the canopy and increased soil disturbance from thinning and ground activities may increase the potential for weed establishment and spread, resulting in competition with native vegetation.

## Affected Environment

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### Historic Condition

In the late 1800s, exotic plant species rapidly became established in North America due to the introduction of species for agricultural and experimental purposes. This introduction rate dropped in the mid-1900s because of the depression, wars, and decreased travel abroad. A dramatic increase in global travel and trade introduced many more species, and they are rapidly expanding in aerial distribution. Some of these species are growing at an exponential rate. Locally, establishment and rate of spread may have been influenced by timber harvest, road building, and to some degree grazing; all vectors for the spread of weeds. Most of these activities began in the 1960s on the Flathead National Forest. Some roadless areas remain relatively weed free because of healthy undisturbed native plant communities where few vectors exist for the spread of weeds.

The Flathead National Forest has been less affected than many other public lands because most invaders are best adapted to grasslands, shrublands, and warmer/drier forest types than exist here. Regardless, exotics have significantly altered species composition locally. Areas of high risk, severely impacted by noxious invaders adapted to our climate, do occur and have altered native plant communities.

### Existing Condition

#### A. Invasive Species of Concern

Areas most susceptible to invasion by weeds are areas of severe ground disturbance (e.g., parking lots, gravel pits, roads, skid trails, horse corrals, landings). Although these disturbed sites are not high-valued naturally-occurring habitat; these areas may act as sources for new invasions into undisturbed native communities. Once established on a disturbed site, many weed species can spread onto relatively undisturbed adjacent areas. Non-forested plant communities, such as grasslands and rock out crops, are also at high risk for invasion by weed species. Most forested communities are less susceptible to invasion and infestation by weed species because of the shade and competition for water and nutrients they provide (with the exception of orange and yellow hawkweeds). Though, some invasive species have been successful at invading warm/drier forest types dominated by Douglas-fir and/or ponderosa pine.

The warm-dry forest conditions found in this project area make those forest communities more susceptible to invasion, especially if they are disturbed. In addition, the project area is located in close proximity to existing disturbed areas of the lower elevation valley floor and urban interface, a developed recreation site (Blacktail Mountain Ski Area), and the Blacktail Wild Bill National Recreation OHV Trail. Consequently, the project area is more vulnerable to weed establishment, persistence, and subsequent potential risk to native habitats. Invasive plant species are more likely to establish and spread from adjacent disturbed areas such as the urban interface and more likely to persist at lower elevations.

In the project area, there is a concern that invasive plants may spread into treatment areas and undisturbed native habitats, especially where susceptible conditions exist. Weed invasion and expansion has been observed in areas of past timber management projects. Noxious weeds may alter organic matter distribution and nutrient flux such as spotted knapweed's greater ability to uptake phosphorus over some native species in grasslands (Thorpe, et. al., 2006). In addition, noxious weeds may influence species



**Spotted knapweed**

richness and displace of resident species by reducing native seedling establishment (Yurkonis, et. al., 2005).

Invasive species considered for this analysis are those listed as noxious by the State of Montana, as well as other exotic species determined to be highly invasive. They are displayed below in Table 3-13. Of the 1,062 vascular plant species known on the Flathead National Forest, about 110 are classified as exotic. Of these, over 42 species are classified as invasive. Within the project and adjacent areas, 11 noxious weed species and 7 undesirable weed species of concern have been observed as shown in Table 3-13.

**TABLE 3-13  
NOXIOUS WEED SPECIES OF CONCERN WITHIN THE PORTER MOUNT PROJECT AREA**

Scientific Name <sup>a</sup>	Common Name	Known from the Project Area	Potential invader to the Project Area
<b>Category 1 – Widespread established<sup>b</sup></b>			
<i>Acrotilon repens (C. repens)</i>	Russian knapweed		X
<i>Cardaria draba</i>	hoary cress		X
<i>Centaurea biebersteinii (C. maculosa)</i>	spotted knapweed	X	
<i>Centaurea diffusa</i>	diffuse knapweed		X
<i>Cirsium arvense</i>	Canadian thistle	X	
<i>Convolvulus arvensis</i>	field bindweed		X
<i>Cynoglossum officinale</i>	hound's-tongue	X	
<i>Euphorbia esula</i>	leafy spurge		X
<i>Hypericum perforatum</i>	St. John's-wort	X	
<i>Leucanthemum vulgare</i>	ox-eye daisy	X	
<i>Linaria dalmatica</i>	Dalmatian toadflax		X
<i>Linaria vulgaris</i>	yellow toadflax		X
<i>Potentilla recta</i>	sulphur cinquefoil	X	
<i>Tanacetum vulgare</i>	common tansy	X	
<b>Category 2 – Recently established, rapidly spreading<sup>b</sup></b>			
<i>Hieracium aurantiacum</i>	orange hawkweed	X	
<i>Hieracium caespitosum, H. floribundum, H. piloselloides, H. pretense</i>	yellow hawkweed complex	X	
<i>Lepidium latifolium</i>	perennial pepperweed		X
<i>Lythrum salicaria</i>	purple loosestrife		X
<i>Lythrum virgatum</i>	wandlike loosestrife		X
<i>Ranunculus acris</i>	tall buttercup		X
<i>Senecio jacobaea</i>	tansy ragwort	X	X
<i>Tamarix spp.</i>	salt cedar or tamarisk		X
<b>Category 3 – Not yet detected or small occurrence<sup>b</sup></b>			
<i>Centaurea solstitialis</i>	yellow starthistle		X
<i>Chondrilla juncea</i>	rush skeletonweed		X
<i>Crupina vulgaris</i>	common crupina		X
<i>Iris pseudacorus</i>	yellowflag iris		X
<i>Isatis tinctoria</i>	dyer's woad		X
<i>Myriophyllum spicatum</i>	Eurasian water milfoil		X
<b>Additional Invasives of Concern for the Flathead National Forest</b>			
<i>Achillea nobilis</i>	noble yarrow	X	
<i>Artemisia absinthium</i>	absinthium	X	
<i>Bromus tectorum</i>	cheatgrass	X	X
<i>Campanula rapunculoides (undesirable)</i>	creeping bellflower		X
<i>Carduus nutans</i>	musk thistle		X
<i>Chorispora tenella</i>	purple mustard		X

**TABLE 3-13  
 NOXIOUS WEED SPECIES OF CONCERN WITHIN THE PORTER MOUNT PROJECT AREA**

Scientific Name <sup>a</sup>	Common Name	Known from the Project Area	Potential invader to the Project Area
<i>Cirsium vulgare</i>	bull thistle	X	
<i>Elymus repens</i>	quackgrass		X
<i>Euphorbia species</i> (cautionary)	spurge (all)		X
<i>Phalaris arundinacea</i>	reed canarygrass	X	
<i>Potentilla argentea</i>	silvery cinquefoil	X	X
<i>Sonchus spp.</i>	perennial sowthistle		X
<i>Tragopogon dubius</i>	goat's bear/salsify	X	
<i>Tripleurospermum perforata</i> ( <i>Matricaria inodora</i> , <i>M. perforata</i> ) (undesirable)	scentless chamomile		X
<i>Veronica officinalis</i>	common speedwell		X

<sup>a</sup> Nomenclature follows the USDA Plants Database: USDA, NRCS 1999. The PLANTS database (<http://plants.usda.gov/plants>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

<sup>b</sup> Montana Department of Agriculture Noxious weed categories

**Category 1** is defined as noxious weeds that are currently established in the State and generally widespread in many counties of the state. Management criteria include awareness and education, containment and suppression of existing infestations and prevention of new infestations. These weeds are capable of rapid spread and render land unfit or greatly limit beneficial uses.

**Category 2** is defined as noxious weeds that have recently been introduced into the state or are rapidly spreading from their current infestation sites. These weeds are capable of rapid spread and invasion of lands, rendering lands unfit for beneficial uses. Management criteria include awareness and education, monitoring and containment of known infestations and eradication where possible.

**Category 3** is defined as noxious weeds that have not been detected in the state or may be found only in small, scattered, localized infestations. Management criteria include awareness and education, early detection and immediate action to eradicate infestations. These weeds are known pests in nearby states and are capable of rapid spread and render land unfit for beneficial uses.

## B. Surveys

Major roads and proposed haul routes were surveyed for noxious weeds in 2006. Surveyed sites are considered the areas most susceptible to noxious weed establishment, as they serve as vector corridors for spread into newly disturbed areas. Treatment units and proposed temporary roads were not surveyed.

Approximately 175 acres (~70 miles) were surveyed for invasive plants. Eighteen invasive species were mapped during the 2006 surveys. The most abundant and widely-distributed noxious weed species in the project area are spotted knapweed (*Centaurea biebersteinii*) and hounds tongue (*Cynoglossum officinale*), followed by Canadian thistle (*Cirsium arvense*) and orange hawkweed and yellow hawkweed (*Hieracium spp.*). Also present of significant concern are oxeye daisy (*Leucanthemum vulgare* and St. John's wort (*Hypericum perforatum*) as shown in Table 3-14. An additional exotic species found in high percentages in the project area is silver cinquefoil (*Potentilla argentea*).

Spotted knapweed and St. John's wort are roadside species and generally have not invaded into understory forested habitats. These species do, however, have potential for expansion into open canopies and natural occurring forest openings such as grasslands and open rock outcrops. Canadian thistle is a generalist and can invade in almost any habitat from dry to wet disturbed areas with canopy openings (personal observation). Silver cinquefoil is not on the State noxious weed list, but observations from recent years indicate that this species is expanding within the FNF. It is currently confined to roads and other disturbed compacted soils, such as old landings and skid trails in open canopies.



**Orange hawkweed**

State listed Category 2 noxious weeds species, orange hawkweed, meadow/yellow hawkweed, and tansy ragwort (*Senecio jacobaea*) are of greatest concern in the area. These species are recently established (within the last 5 to 10 years) and are rapidly expanding in established areas. Only one tansy ragwort was located in 2006, this plant was pulled.

**TABLE 3-14  
OCCUPIED ACRES WITHIN WEED SURVEY AREAS OF PORTER MOUNT PROJECT AREA**

State Category	Species	Common Name	Percent Occupied of Acres Surveyed (total 175 acres)	Acres Occupied within Surveyed Areas
<b>State Noxious Weed Species</b>				
1	<i>Centaurea biebersteinii</i>	spotted knapweed	96.10	168.18
1	<i>Cynoglossum officinale</i>	hounds tongue	20.34	35.60
1	<i>Cirsium arvense</i>	Canadian thistle	16.46	28.81
2	<i>Hieracium aurantiacum</i>	orange hawkweed	12.02	21.04
2	<i>Hieracium sp.</i>	yellow hawkweed	10.26	17.95
1	<i>Leucanthemum vulgare</i>	oxeye daisy	7.40	12.95
1	<i>Hypericum perforatum</i>	common St. John's wort	4.07	7.12
1	<i>Tanacetum vulgare</i>	common tansy	3.89	6.80
1	<i>Potentilla recta</i>	sulphur cinquefoil	1.70	2.97
1	<i>Linaria vulgaris</i>	butter and eggs	0.26	0.45
2	<i>Senecio jacobaea</i>	tansy ragwort	0.13	0.23
<b>Other Exotic Species of Concern</b>				
NA	<i>Artemisia absinthium</i>	absinthium	26.86	47
NA	<i>Potentilla argentea</i>	silver cinquefoil	20.98	36.71
NA	<i>Cirsium vulgare</i>	bull thistle	5.07	8.88
NA	<i>Achillea nobilis</i>	noble yarrow	1.23	2.16
NA	<i>Tragopogon dubius</i>	yellow salsify	0.51	0.9
NA	<i>Phalaris arundinacea</i>	reed canarygrass	0.19	0.33
NA	<i>Bromus tectorum</i>	cheatgrass	0.07	0.13

The amount and distribution of the above invasive plants is highly variable within the project area, ranging from scattered isolated individuals to small dense groups. These species occur along portions of many of the roads, gravel pits, and other disturbed sites. Invader weed species tend to be shade-intolerant, with the exception of orange and yellow hawkweed (personal observation). Invasive plants establish in disturbed areas where other plants are slow to establish and recover. These areas are mostly associated with road right-of-ways, landing sites for timber harvesting, gravel pits, mechanically piled slash burn piles, skid roads, mechanical site preparation treatment on well drained or shallow soils, power line corridors, and mines. Most of the area outside of these more heavily disturbed sites has experienced limited invasive plant establishment.

**C. Special Habitat of Concern for Weed Introduction**

Aerial surveys detected unique habitats of rocky outcrops and grasslands that occur within the southern portion of Unit 2 and the northern portion of Unit 3. These geologic features are typically limited in extent on a landscape scale and often provide highly specialized habitats for rare species. They are dominated by low growing forbs, perennial bunch grasses, and shrubs, often growing within moss and lichen substrates over bedrock with mostly exposed, thin soils and little overstory vegetation. These unique habitats are currently insulated from potential weed establishment from the surrounding native forested vegetation. These areas could be susceptible to weed establishment due to their open and exposed characteristics. These areas are currently relatively free of weeds, except

for the edges that are in close proximity to roads, where a few scattered spotted knapweed plants are scattered.

**D. Weed Management**

The Flathead National Forest completed an EA evaluating the effects of treating noxious and invasive plants (Project File Exhibit Q-5). A Forest-Wide Weed Management Plan is currently under development to outline methodology in prioritizing treatment and inventory and monitoring protocols. In addition, this plan will outline a methodology for minimizing the establishment and spread of invaders in all projects and Special Use Permits, such as grazing allotments and timber management areas. Currently, treatment and inventory is prioritized at quarterly meetings of the Flathead National Forest Weed Advisory Group. Factors for prioritization include:

- **Weed invasive category** as outlined in the Flathead National Forest Noxious and Invasive Weed Control EA (Project File Exhibit Q-5) and shown in Table 3-15 below.
- **Level of invasive risk** to a potential vegetation group.
  - The Western Montana Planning Zone Weed Risk Assessment is used as a tool to ascertain the level of invasiveness for weed species within potential vegetation groups (Project File Exhibit H-3).
- **Special areas** that are threatened by weed invasion.
  - Particular areas of greater conservation concern need additional protection from weed invasion. Examples would be designated wilderness, sensitive plant habitat, and pristine native plant communities.
- **Potential for increased off-site movement** of weeds that could increase the spread to new areas.
  - Weed infestations that are located along roads, at trailheads, in grazing allotments, or at high use recreation sites are higher priority for treatment because of the increased vectors of spread in these areas.

**TABLE 3-15  
 WEED TREATMENT PRIORITIZATION ON THE FLATHEAD NATIONAL FOREST**

Forest Priority	State Category	Objectives	Prioritization Factors
1	3 (Potential Invaders)	Currently absent on FNF; goal is prevention, then eradication, if possible	<ul style="list-style-type: none"> <li>• detection</li> <li>• available funds</li> </ul>
2	2 (New Invaders)	Localized containment and strong emphasis on overall population reduction	<ul style="list-style-type: none"> <li>• available funds</li> <li>• relative invasive nature of the species and its potential to displace native vegetation</li> <li>• potential for off-site movement of seeds</li> <li>• relative ecological importance of rarity of the site that could be damaged by the presence of the invader species</li> </ul>
3	1 (Widespread Invaders)	Containment and localized reduction of populations	<ul style="list-style-type: none"> <li>• available funds</li> <li>• relative invasive nature of the species and its potential to displace native vegetation</li> <li>• potential for off-site movement of seeds</li> <li>• relative ecological importance of rarity of the site that could be damaged by the presence of the invader</li> </ul>

<sup>a</sup> Project File Exhibit Q-5

### E. Control and Containment

Efforts to control the spread of noxious weeds include prevention, containment, and eradication methods. Eradication is generally limited to localized areas and Category 2 and 3 Species. Methods used for eradication include hand pulling and herbicide applications.

Containment methods are used to prevent weeds from spreading into new areas and reducing the coverage, if possible, in existing infestations. Containment methods include closing infested areas to travel, washing vehicles and equipment upon entering or leaving an infested area, using weed free seed and straw mulch for re-vegetation, hand pulling, and herbicide application around the perimeter of the infestation. Prevention uses similar techniques as containment, with the objective of preventing a new weed infestation rather than limiting spread of an existing one.



Washing off-road equipment

Noxious weed treatments have occurred in the project area or the Island Unit Geographic Area that surrounds this project, except for occasional hand pulling and spot spraying (< 0.75 acres total). The Island Unit is highly infested with noxious weeds and is considered one of the greatest concentrated areas of orange and yellow hawkweed on the Flathead National Forest. Management priority for this

area is low due to the large concentration of noxious weeds and the isolation of the Island Unit. This area is not connected to weed-free NFS lands where containment would be a high priority. In addition, the Island Unit and road systems within this area do not lead to special areas of unique habitats (with exception of rock outcrops and grasslands located in aerial photos) or wilderness that are generally weed free.

Management priority for this area is low due to the large concentration of noxious weeds and the isolation of the Island Unit. This area is not connected to weed-free NFS lands where containment would be a high priority. In addition, the Island Unit and road systems within this area do not lead to special areas of unique habitats (with exception of rock outcrops and grasslands located in aerial photos) or wilderness that are generally weed free.

## Environmental Consequences

### Alternative A – No Action Direct and Indirect Effects

Alternative A provides the least opportunity for creating new weed habitat as new areas of ground disturbance would not be created. However, roads currently open would continue to serve as corridors for weed spread. Invasive species considered in the project area could potentially expand by using roads as vector corridors. Once seeds are dispersed to a new site, habitat type, and disturbance patterns influence the establishment potential of invasive plant species. Because Alternative A proposes no ground disturbance, the potential for noxious weeds species to establish in undisturbed areas is low. With the exception of orange and yellow hawkweed, noxious weed species commonly require disturbance, bare ground openings, and reduced competition (early successional habitat conditions) for initial establishment. However, if established, the ability for weed species to out-compete existing native vegetation, to sustain its occurrence, and potentially alter native habitat functions is largely dependent on the habitat conditions and the life history, morphology, phenology, ecology, and reproductive biology of the individual weed species.

Orange and yellow hawkweeds are Category 2 species (recent invaders to Montana). Life history and reproductive biology of these two invasive hawkweeds allow for rapid spread, once established, not only on open areas but also under forested conditions. Unlike the other known weeds in the project area that remain primarily within open disturbed areas, orange and yellow hawkweed can spread into

forested habitats beneath the forest canopy despite reduced understory light levels (personal observations).

### **Alternative A – No Action Cumulative Effects**

The analysis area is highly susceptible to weed invasion due to its proximity to the urban development and high concentrations of existing weed populations within the area. Weed establishment is opportunistic in disturbed soils and open bare ground, common in developed urban areas. Past private, state, and forest ground-disturbing activities such as fuels management, timber harvest, road maintenance/construction, trail construction, fire suppression activities (e.g., fireline, dozer line, and safety zone construction), special use permits, grazing, OHV trail use, and PCTC land sales have contributed to the establishment and spread of noxious and invasive plants in the area. Recreational and economic land uses (OHV use, hunting, hiking, fishing, logging, firewood gathering, etc.) have also promoted the spread of weed seeds, as users and their vehicles serve as vectors for weed seed spread. Road closures may have decreased the spread of weeds because of the reduced potential of traffic to carry weed seeds. All these activities are likely to continue into the future.

Future land sales from PCTC and sales for private residence development would increase the potential for new weed spread. In addition, present and reasonably foreseeable state, private, and forest activities, such as recreation, fuels management, timber harvest, road maintenance, special use permits, grazing, and expansion of the existing OHV trail would also increase the potential for weeds to establish into new areas. All these activities have the potential to expose bare soil, act as vectors for weed seed spread, or open up disturbed corridors for spread.

With Alternative A, weed control efforts are not likely to occur in the Island Unit as this area is of low treatment priority based in the criteria listed in the Weed Management Section above. Alternative A would be less likely to address existing weed populations within the project area than would the action alternatives (that provide for treatment of haul routes within the project area). Alternative A would create the least amount of new ground-disturbed areas for potential new weed establishment and spread. Nevertheless, the total existing condition of infested weed acres is expected to continue to increase with existing uses in Alternative A.

Under Alternative A, there is potential for large, stand replacing fire. In the absence of no vegetation treatments, fuel conditions would generally persist and fuel loadings would increase throughout the project area. The overall result would be a continuation of fuel loadings with potential for increased fire risk over time. A large fire within the analysis area could potentially increase and spread noxious weeds into new areas. Wildland fire would increase exposed bare ground that may be susceptible to new weed establishment. Areas most at risk of weed encroachment following a wildland fire are areas adjacent to roads and areas where suppression activities have occurred with nearby existing weed populations.

Alternative A would also not expose the unique rocky outcrops and grassland habitats (Units 2 and 3) to opening up adjacent forested vegetation that currently insulate these areas from weed establishment.

### **Alternatives B and C Direct and Indirect Effects**

Vegetation treatments and temporary road construction are proposed for this project. General effects on the risk to weed establishment and spread are discussed below by activity. Areas with more acres of ground disturbance, open roads, or open canopies are expected to have greater vulnerability to weed colonization and spread.

**A. Timber Harvest and Other Vegetation Treatments**

The effects of logging are variable depending on the amount of ground disturbed during the activity; the more bare soil exposed, the more germination substrate is available for colonizing weed seeds. Ground-based systems (tractor) with wheeled machinery usually disturb more ground than skyline cable systems, which use a combination of both skyline and tractor operating systems. Areas used for landings with any logging system can also be highly impacted.

The amount of area disturbed may vary by prescription planned. With the Thinning from Below Non-commercial prescription, less volume would be removed, more canopy cover (shade) would remain, and less soil would be disturbed than as compared to the other harvest prescriptions. Alternative B proposes more non-commercial harvesting (hand treatments) than Alternative C. The remaining prescriptions listed in Table 3-16 would remove more volume, have greater ground disturbance, and retain less canopy cover.

**Alternative B** proposes the greatest number of acres of Commercial Thinning, Seed Tree, Clearcut with Reserves, Salvage, and Sanitation treatments. Alternative B also proposes the greatest number of acres of tractor logging. This alternative would have the greatest risk to native communities in the project area from weed establishment and spread than Alternatives C or Alternative A. The differences in these logging systems and prescriptions by alternative are displayed in Table 3-16

**TABLE 3-16  
LOGGING SYSTEM AND PRESCRIPTIONS BY ALTERNATIVE**

	<b>Alt. A (acres)</b>	<b>Alt. B (acres)</b>	<b>Alt. C (acres)</b>
<b>Logging System</b>			
Skyline	0	488	332
Tractor	0	689	543
Tractor/Skyline	0	199	160
Tractor/Helicopter	0	26	26
Skyline/Helicopter	0	19	46
Helicopter	0	0	222
Hand	0	13	8
<b>Total</b>	<b>0</b>	<b>1434</b>	<b>1337</b>
<b>Prescription</b>			
Commercial Thinning	0	546	561
Seed Tree	0	410	349
Salvage	0	66	66
Sanitation	0	63	63
Sanitation with Pre-Commercial Thin	0	13	13
Clearcut with Reserves	0	323	277
Thin From Below-Non-commercial	0	13	8
<b>Total Harvest Acres</b>	<b>0</b>	<b>1434</b>	<b>1337</b>
Ecosystem Burning	0	128	128
<b>Total Treatment Acres</b>	<b>0</b>	<b>1562</b>	<b>1465</b>

Machinery can also spread weed seeds if not washed prior to use; therefore, Design Criteria (See Table 2-13) include cleaning all off-road equipment prior to entering the area. Use of dedicated skid trails would also minimize spread across units. Other criteria designed to minimize soil impacts would also aid in reducing noxious weed spread (Please refer to the Soils Section of this document).

The potential for weed establishment into native plant communities from proposed fuels treatments also depends on the amount of ground disturbed during the activity. As discussed above with logging

systems, the more bare soil exposed, the more germination substrate is available for colonizing weed seeds. Fuels treatment methods using excavators to pile slash would disturb more ground and expose more bare soil than hand piling the slash piles. In addition, underburning harvest units and burning the slash piles would expose some bare mineral soil to create a favorable environment for noxious weeds. Consolidated fuels in excavator slash piles would burn hotter and expose more bare mineral soils than dispersed underburns or scattering of slash for underburning. Alternative B would pose more risk to weed establishment as this alternative proposes the greatest proportion of excavator piling and burning as displayed in Table 3-17.

**TABLE 3-17  
 FUELS TREATMENT METHOD ACRES LISTED IN ORDER OF MOST GROUND DISTURBANCE  
 TO THE LEAST**

Fuels Treatment	Alt. A (acres)	Alt. B (Acres)	Alt. C (Acres)
Excavator Pile/Burn/Chipping	0	724	673
Excavator Pile/Yard Tops/Lop and Scatter	0	30	30
Yard Tops/Lop and Scatter	0	135	174
Lop and Scatter	0	13	8
Underburn		532	452
Ecosystem Burning	0	128	128
<b>Total</b>	<b>0</b>	<b>1562</b>	<b>1465</b>

Establishment of noxious weeds within treatment units is expected. However, within the forest units, native vegetation is also expected to compete with noxious weeds and recover as canopies become increasingly closed over the next 10 to 20 years. For non-forest or dry-type native plant communities (Douglas-fir and ponderosa pine dominate cover types), establishment of noxious weeds may persist for longer periods or indefinitely, due to the dry and open habitat conditions of these communities types.

Both action alternatives would expose the unique rocky outcrop and grassland habitats (Units 2 and 3) to opening up adjacent forested vegetation that currently insulate these areas from weed establishment. The areas are susceptible to weed establishment due to their open and exposed characteristics. Invasive weeds commonly establish in exposed soil and open canopy that is typical of



**Skyline Logging**

this habitat. Natural disturbance processes affecting these geologically influenced habitats include slumping, rock fall, and erosion. However, both action alternatives may increase exposed soils within these habitats and potentially introduce exotic plants during implementation. In addition, management activities, such as this project, occurring adjacent to these areas could potentially influence the habitats. Removal of the overstory canopy in other harvest units, either above or below the habitats, could alter the associated shade and moisture regime.

Alternatives B and C both propose 39 acres in Unit 2 of Commercial Thinning with yarding tops of trees, and lopping and scattering or chipping of slash material. However, Alternative C would primarily use helicopter logging systems with some skyline operations, and Alternative B would primarily use tractor logging system with some skyline operations in this stand. Helicopter logging systems would reduce the level of exposed soils potential for weed establishment. In addition, Alternative B, proposes construction of a temporary road within Unit 2 (north of this stand), further increasing the potential for weed establishment and spread into the unique habitats. Alternative B proposes 77 acres in Unit 3 (Stands 10902012 and 10902013) and Alternative C proposes 39 acres (Stand 10902013) for Seed Tree treatments using skyline operations. Alternative C excludes Stand 10902012 that has the

majority of the rock outcrop and grassland openings. Both alternatives propose underburning. Alternative B would have a higher potential for weed establishment than Alternative C, due to the greater acres proposed in Alternative B for this unit.

For both Alternative B and C, Design Criteria (See Table 2-13) would reduce the potential for weed establishment within these special habitat areas. Where trees are present along Forest Development Road #5373 (adjacent to Units 2 and 3), a 50-foot leave tree buffer would be established along the road. This buffer would help continue to insulate the rocky outcrops and grasslands from potential new weed establishment after implementation. Ground-based equipment would avoid these areas when practical during implementation. In addition, lop and scattering with underburning or chipping would be used to reduce fuels within these stands. Concentrated pile burning would not occur within these stands or over the rock outcrops and grassland openings. In addition, post harvest weed surveys would occur in all (ground disturbed areas) treatment units and lands affected by activities; slash pile burns, and all existing and temporary system roads used for the project (See Appendix A). Based on results from the surveys, weed treatments would occur as needed in these areas. Surveys and treatments are dependent upon funding. These measures would not eliminate all weed seeds from establishing within these unique habitats, but would reduce the potential for establishment and spread.

Ecosystem Burning: Prescribed burning, using aerial and hand ignition methods are also proposed for both action alternatives (Unit 1). Burning would be of cool, low to moderate intensity. Although there is potential for weed establishment into this unit, the potential for establishment and spread into the burned areas is low due to the low intensity burns. Low intensity burning, mimicking the natural fire, may invigorate native species germination as native plants are adapted to natural disturbance such as fire. Should weeds become established, potential for spread of weeds would be lower than that of the ground disturbance described above. The Ecosystem Burns would have short term low-intensity disturbance that would promote understory native vegetation to compete with potentially establishing weeds. Past prescribed burns in the Truman and Stoner Creek drainages have revegetated with native vegetation and minor components of noxious weeds (Project File Exhibit Q-5).

### **B. Temporary Road Construction and Haul Routes**

Portions of the existing road network would be used to implement Alternatives B and C. Use of existing roads facilitates weed establishment and spread because cars and trucks, along with mountain bikes and horses, are among the main vectors of weed spread. All action alternatives propose similar miles of roads for hauling.

Temporary road construction activities would expose bare soil and parent material, creating suitable substrates for weed germination. In addition, use of these temporary roads may also contribute to the dispersal and spread of weed seeds into the newly disturbed units. Alternative B proposes **4.74 miles** of temporary roads and would pose the highest risk of altering native plant communities with the greatest potential for weed expansion and dispersal. Alternative C proposes construction of **0.86 miles** of temporary road. This alternative would provide fewer miles of exposed bare soil and reduce the risk of invasive weed establishment. Proposed weed control actions, revegetation, and closing these roads to vehicular use would lessen the establishment and spread of weeds (See Design Criteria, Table 2-13).



**Canadian thistle seed**

### **Alternatives B and C Cumulative Effects**

The Cumulative Effects Worksheet, located in the Invasive Plants Project File (Exhibit H-4) considers and describes proposed activities in addition to the past, current, and reasonably foreseeable activities listed at the beginning of this chapter in Tables 3-1 and 3-2. Those activities that cumulatively contribute indiscernible effects are not included in this section. Those activities that cumulatively affect the species or habitat are discussed below.

In addition to the cumulative effects described for Alternative A, the action alternatives would also contribute to cumulative effects to the degree described in the direct and indirect effects section above for each proposed activity.

People, vehicles, domestic animals, wildlife, and wind are all vectors contributing to the transport of weeds within the project area. Once seeds are dispersed to a new site, habitat type and disturbance patterns influence the establishment potential of invasive plant species. The potential for each species to establish is also dependent on life history, morphology, phenology, ecology, and reproductive biology of the individual weed species.

Many past, present, and foreseeable actions have and would contribute to weed risk and spread in the project area (See discussion of Alternative A above). Additional acres, outside and adjacent to the treatment units, would become more susceptible to weed invasion because of the action alternatives. Areas with greater miles of open roads, road use, and bare ground exposure would increase facilitation of weed spread. This contribution to cumulative effects would be moderated, however, by Design Criteria that would reduce the potential for new weed introduction and spread into existing uninfested areas; specifically weed treatments (pre and post haul treatments), soil stabilization measures, revegetation of disturbed sites, restoration of constructed temporary roads and post implementation monitoring/treatment of areas with high potential for new weed establishment resulting from the vegetation treatments (post implementation monitoring/treatment dependent on funding – See Appendix A). The objectives of the weed treatments associated with Alternatives B and C are to reduce the short-term potential for new establishment into the newly disturbed areas created by this project, not to reduce the total infested acres of the project area. Haul routes for the project would be treated for noxious weeds. These haul routes do contain existing populations of noxious weeds which will be treated under the action alternatives. Alternative A would treat 0 miles, Alternative B would treat **61.46 miles** and Alternative C would treat **63.20 miles**.

As with Alternative A, the potential for wildland fire to occur in the analysis area exists with Alternatives B and C. Wildland fire and associated suppression efforts may also contribute to the spread and establishment of new weed populations. With Alternatives B and C, the potential for wildland fire to occur in the analysis area may be reduced by treatments. In addition, wildland fire burning after treatments of Alternative B or C may not burn with the same intensity as Alternative A. The decreased intensity may reduce the potential for weed establishment. However, old skid trails or other remnant staging areas from Alternative B and C treatments may act as establishment points or corridors for weed establishment and spread. Also, as with Alternative A, suppression efforts from potential wildland fire may also increase the potential for weed spread into new areas. The degree of suppression efforts deployed as compared to Alternative A is unknown and is dependent on the type of wildland fire that may occur.

In summary, Alternatives B and C may increase the infested noxious weed acres from existing conditions, more so than Alternative A, even with the lack of weed treatments and risk of a larger wildland fire for Alternative A. The risk of weed establishment from a large wildland fire occurring in the future under Alternative A is less than risk of weed establishment from the known treatments to occur under Alternatives B and C. Furthermore, Alternative B would have the higher potential for weed establishment over Alternative C and would have potentially greater impacts to the unique rocky outcrop and grassland habitats within Units 2 and 3. Potential for weed establishment in

Alternatives B and C would be ameliorated with Design Criteria and monitoring and treatments discussed above.

## **Regulatory Framework and Consistency**

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Management direction for noxious and invasive weed control on the Flathead National Forest is set at the National and Forest levels. Forest Service policies were developed in response to Federal laws guiding implementation of noxious weed control actions. These policies are set forth in Amendment 2000-95-5 of the FSM, Chapter 2080, Noxious Weed Management, and have been incorporated into the Forest Plan. Treatment and monitoring of known weed populations in the project area would be implemented under the authority and guidance of the Flathead National Forest Noxious and Invasive Weed Control Decision Notice (Project File Exhibit Q-5). These were designed to meet legal requirements and Forest Service policies for noxious weed control. The proposed project incorporates and is consistent with the Flathead's Weed Control Decision. Design Criteria and management requirements for actions proposed under this project follow requirements documented in the FSM Amendment for Noxious Weed Management, road and timber management projects.

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