

## V. INVASIVE PLANT SPECIES – NOXIOUS WEEDS

### *Introduction*

Invasive plant species are non-native plants that 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 expanding within the analysis area.

### *Information Sources*

The Montana State noxious weed list was consulted, and invasive species of concern were identified. In addition, a weed risk assessment (WRA) project in the Northern Region of the U.S. Forest Service (Mantas 2003) has identified additional species that pose a threat to native vegetation. Project specific noxious weed surveys were not conducted, however assessments of weed populations were inferred from overlapping and adjacent general Forest weed inventories and post Wedge Fire weed surveys conducted in 2004 and 2005.

This assessment of non-native and noxious weeds incorporates by reference the 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 National Forest system (NFS) lands.

### *Analysis Area Description*

#### **Spatial Bounds**

The analysis area for this proposed project is based on the area of the project's influence/impacts 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 10-20 years after the decision is signed. Vegetation conditions would take approximately 10-20 years to return to 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/Existing Condition*

### **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 has been influenced by the increase of 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 (FNF). 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**

Areas most susceptible to invasion by weeds are areas of severe ground disturbance (e.g., parking lots, gravel pits, roads, skid trails, horse corrals). Once established on a disturbed site, many weed species can spread onto relatively undisturbed adjacent areas. Non-forested plant communities are 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). However, some invasive species have been successful at invading warm/drier forest types dominated by Douglas-fir and/or ponderosa pine. The Red Whale project area is not comprised of warm/dry forest type, instead, is predominately characterized by cool/moist forest types of subalpine fire, western larch, lodgepole and Douglas fir. The cool/moist -dry forest conditions found in this project area make those forest communities less susceptible to invasion in the forest understory. The project area is located in close proximity to urban interface where private land owners are actively developing property. However, these urban interface areas are remote with infrequent access. Consequently, the project area is moderately 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 also more likely to persist at in these disturbed areas.

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, yet not recognized by the State (Table 3-19). Of the 1,084 vascular plant species known from the Flathead National Forest, about 130 are classified as exotic. Of these, over 42 species are classified as invasive. Within the project and adjacent areas, eight noxious weed species and three undesirable species of weed concern have been observed (Table 3-19).

Table 3-19. Noxious Weed Species of Concern within the Project Area.

Scientific Name <sup>a</sup>	Common Name	Known from the Project Area or Vicinity	Potential Invader to the Project Area <sup>c</sup>
<b>Category 1 – Widespread Established<sup>b</sup></b>			
<i>Acroptilon repens</i> ( <i>C. repens</i> )	Russian knapweed		X
<i>Cardaria draba</i>	Hoary cress		X
<i>Centaurea biebersteinii</i> ( <i>C. maculosa</i> )	Spotted knapweed	X	
<i>Centaurea diffusa</i>	Diffuse knapweed		X
<i>Cirsium arvense</i>	Canada 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> ( <i>Chrysanthemum. leucanthemum</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</i> , <i>H. floribundum</i> , <i>H. piloselloides</i> , <i>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
<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>Veronica officinalis</i>	Common speedwell		NA
<i>Tripleurospermum perforata</i> ( <i>Matricaria inodora</i> , <i>M. perforata</i> ) (undesirable)	Scentless chamomile		X
<i>Tragopogon dubius</i>	Goat's bear/salsify	X	
<i>Sonchus spp.</i>	Perennial sowthistle		X

Scientific Name <sup>a</sup>	Common Name	Known from the Project Area or Vicinity	Potential Invader to the Project Area <sup>c</sup>
<i>Potentilla argentea</i>	Silvery cinquefoil	X	
<i>Phalaris arundinacea</i>	Reed canarygrass		X
<i>Euphorbia species</i> (cautionary)	Spurge (all)		X
<i>Elymus repens</i>	Quackgrass		X
<i>Cirsium vulgare</i>	Bull thistle	X	
<i>Chorispora tenella</i>	Purple mustard		X
<i>Carduus nutans</i>	Musk thistle		X
<i>Campanula rapunculoides</i> (undesirable)	Creeping bellflower		X
<i>Bromus tectorum</i>	Cheatgrass		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.

<sup>c</sup> Potential invasive plant species of concern with potential to impacts ecosystem integrity for the analysis area.

**Inventory and Monitoring**

The Flathead National Forest has completed an Environmental Assessment analyzing the effects of treating noxious and invasive plants (USDA Forest Service 2001a - FNF Noxious and Invasive Weed Control Environmental Assessment). 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 FNF Weed Advisory Group. Factors for prioritization include:

*Weed Invasive Category*

(Table 3-20) As outlined in the Flathead National Forest Noxious and Invasive Weed Control Environmental Assessment.

*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 (USDA Forest Service 2003a).

*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 3-20. Weed Treatment Prioritization on the Flathead National Forest<sup>a</sup>**

<b>Forest Priority</b>	<b>State Category</b>	<b>Objectives</b>	<b>Prioritization Factors</b>
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> USDA Forest Service, 2001.

## Surveys

Some proposed haul routes and treatment units were surveyed for noxious weeds in 2005 and 2006. The majority of the haul routes were not surveyed. However, noxious weeds were surveyed in adjacent areas from general forest surveys and from the post Wedge Fire weed surveys. A total of 11 invasive species were mapped during 2005 and 2006 surveys. The most abundant and widely distributed noxious weed species in the project vicinity is St. John's wort (*Hypericum perforatum*), hounds tongue (*Cynoglossum officinale*), common tansy (*Tanacetum vulgare*), and spotted knapweed (*Centaurea biebersteinii*). Also present of significant concern is orange and yellow hawkweed (*Hieracium aurantiacum*, *H. floribundum*) and oxeye daisy (*Leucanthemum vulgare*), as shown in the following Table 3-21.

State listed Category 2 noxious weeds species, orange and yellow hawkweed are of greatest concern in the area. These species are recently established (within the last 5-10 years) and are rapidly expanding in established areas. In addition, these species have been observed to spread into forest environments in moist draws away from disturbed roads. For example, within Unit K, orange hawkweed occurs within old cutting units.

**Table 3-21. Weeds Species of Concern within and Near the Red Whale Project Area.**

State Category	Species	Common name	Acres Occupied in Red Whale Vicinity
1	<i>Hypericum perforatum</i>	St. John's wort	39.60
1	<i>Cynoglossum officinale</i>	Hounds tongue	32.65
1	<i>Tanacetum vulgare</i>	Common tansy	23.39
1	<i>Centaurea biebersteinii</i>	Spotted knapweed	19.16
2	<i>Hieracium floribundum</i>	Yellow hawkweed	15.81
2	<i>Hieracium aurantiacum</i>	Orange hawkweed	12.49
1	<i>Leucanthemum vulgare</i>	Ox-eye daisy	12.05
1	<i>Cirsium arvense</i>	Canada thistle	8.33
NA	<i>Artemisia absinthium</i>	Absinthium	0.08
NA	<i>Cirsium vulgare</i>	Bull thistle	0.08
NA	<i>Tragopogon dubius</i>	Yellow salsify	0.02

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, old cutting units and other disturbed sites. Invaders 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.

### **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. All river access areas along the North Fork River have been treated with herbicides for weeds. In addition, spraying occurred along roads in the Wedge Fire areas adjacent to the Red Whale project.

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 revegetation, 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.

### ***Environmental Consequences***

In the project area, there is a concern that invasive plants may be introduced and spread into treatment areas and other disturbed areas, especially where when canopies are opened up and soil disturbance exposed bare soil for weed establishment. Weed invasion and expansion has been observed in areas of past timber management projects.

To focus the invasive weed analysis and describe relevant effects, the following effects indicators are used:

- Amount of acres of ground disturbance

### **Alternative 1 - No Action**

#### **Direct and Indirect Effects**

Alternative 1 provides the least opportunity for creating new weed habitat due to no new areas of ground disturbance. However, roads currently open may continue to serve as corridors for weed spread. Invasive species considered in the analysis area could potentially expand by utilizing 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 1 proposes no ground disturbance related to this project, the potential for noxious weeds species to establish in undisturbed areas is low. With the exception of orange and yellow hawkweeds, 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. Hawkweeds are already well established within the project area. Unlike the other known weeds in the project that remain primarily within open disturbed areas, orange and yellow hawkweeds can spread into forested habitats beneath the forest canopy despite reduced understory light levels.

### Cumulative Effects

The project area is highly susceptible to weed invasion due to its proximity to the urban development. Weed establishment is opportunistic in disturbed soils and open bare ground, common in development of urban areas. This may result in a high risk level of spread from adjacent urban areas to disturbed areas in the project.

Past ground disturbing activities such as timber harvest, road construction, trail construction, road maintenance, and fire suppression activities (e.g. fireline, dozer line, and safety zone construction) have contributed to the establishment and spread of noxious and invasive plants in the area. Recreational and economic land uses (hunting, hiking, fishing, logging, mushroom harvesting, firewood gathering, etc.) have also promoted the spread of weed seeds, as users and their vehicles serve as vectors for weed seed spread. The 2003 Wedge Fire (in the vicinity of the Red Whale project area) exposed extensive acres of bare soils that were susceptible to new weed establishment. Post fire herbicide treatments have contributed to the control and containment of existing weed occurrences in the upper North Fork Flathead drainage.

All these activities are likely to continue into the future. Surveys have detected new and growing infestations resulting from other proposed and ongoing actions. Road closures have likely decreased the spread of weeds. Roads remaining open within this no action alternative would continue to serve as corridors for weed expansion. Because this area is less weedy than other parts of the Forest, weed control efforts may be considered a priority in this area as treatment efforts may be more effective in containing and controlling spread as compared to other Forest areas which take more effort to control. Herbicide treatments in the surrounding area associated with the post

### **Alternatives 2, 3 and 4**

#### Direct and Indirect Effects

Vegetation treatments, slashing, prescribed burning, hauling, temporarily opening currently closed roads, and new temporary road constructions 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 or open roads are expected to have greater vulnerability to weed colonization and spread. Areas used for landings with can also be highly impacted.

#### *Timber Harvest and Other Vegetation Treatments*

The effects of vegetation treatments 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. All alternatives propose ground-based systems (tractor/skidder) with wheeled machinery. This activity would create disturbance to soils and expose bare soil for potential weed establishment. Skyline cable systems or helicopter logging systems are not proposed for any alternative. Ground based machinery may spread weed seeds if not washed prior to use; therefore design features include cleaning all off-road equipment prior to entering the area. Use of dedicated skid trails would also minimize spread across units. Other features designed to minimize soil impacts (see Design Features in Chapter 2) would also aid in reducing noxious weed spread. Alternative 4 proposes the most acres ground disturbance over all, followed by Alternative 2 then 3.

In addition, the greater the canopy opening the more light available to weed species that typically establish and persist in open canopies. The treatment types are listed in Table 3-22 in order of less canopy cover to more canopy cover. Stands with more canopy opening are more likely to have new weed establishment than stands with less canopy openings. Alternative 4 proposes the greatest number of acres of treatments for more open canopies, followed by Alternative 2, then 3.

**Table 3-22. Logging System and Retention Acres, Listed in Order from Most Ground Disturbance to the Least.**

	<b>Prescription</b>	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
1	Patch Seedtree	No action	124	112	173
2	Thin Sapling 30%	No action	118	0	118
3	Thin Sapling	No action	414	94	1299
	Thin Small/Med Tree	No action	879	394	1316
	Thin Sapl/Small Tree	No action	451	327	585
4	Light Understory Thin	No action	92	0	92
	<b>Grand Total</b>		<b>2078</b>	<b>927</b>	<b>3583</b>

Slashing treatments methods would pose a risk to new weed establishment. Pile/burning or chipping or removing slash from the site are proposed for all alternatives. The more bare soil exposed from the slash treatment method, the more germination substrate is available for colonizing weed seeds. Slash treatment methods using excavators to pile slash would commonly disturb more ground and expose more bare soil than hand piling the slash piles. In addition, underburning the units and burning the slash piles would expose bare mineral soil to create a favorable environment for noxious weeds. Consolidated fuels in slash piles would also burn hotter than dispersed underburns and expose more bare mineral soils. Chipping or removing slash would create the least opportunity for new weed establishment

#### *Wildlife Habitat Prescribed Burning*

Prescribed burning areas are located within Moose, Red Meadow, Hay and Moran Creeks. A low to moderate intensity prescribed fire would be applied across these areas to change the existing vegetative condition to one where there is a more diverse mix of forested and shrub/forb dominated areas. Creating this type of vegetation structure is intended to improve early spring range/habitat for wildlife species such as grizzly and black bear, elk, deer, and moose. The low

to moderate burn intensity are not expected to expose large patches of bare mineral soils. For all action alternatives, new weed establishment into these wildlife burn areas are not a high risk.

*Temporary Road Construction and Haul Routes*

Portions of the existing Forest Service road network would be utilized to implement this project. Use of existing roads for hauling may facilitate new weed establishment as equipment and hauling trucks may serve as vectors, transporting existing weed occurrences along roads to new areas. Alternative 4 proposes the greatest number of miles for hauling, followed by Alternative 2, then 3.

In addition, several miles of currently closed roads would be temporarily opened for hauling and activity access. Opening new roads would expose soils in some cases, increasing likelihood of new weed establishment on bare soils. Alternative 2 poses the highest risk for potential new weed establishment with 6 miles of currently closed roads that would be opened for temporary use during project activities. This is followed by Alternative 4, with 5.3 miles proposed, then Alternative 3 with 3.6 miles proposed.

All action alternatives propose 0.3 miles of new temporary road construction. 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.

Proposed weed control actions, revegetation, and closing temporarily opened roads to vehicular use would lessen the establishment and spread of weeds (see Design Criteria in Chapter 2).

*Road and Trail Closures*

Several currently yearlong or seasonally opened roads and trails are proposed for seasonal and yearlong closures to wheeled motorized access (Table 3-23). Road and trail closures during spring, summer, and fall months would reduce the potential for these roads and trails to serve as vector corridors for new weed establishments. Alternative 3 proposes the greatest miles of yearlong roads and trail closures, followed by Alternative 2 and 4.

**Table 3-23. Road Access**

Proposed Road Access Activity		Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Roads</b>					
<b>Current</b>	<b>Proposed change</b>				
Yearlong Open	Seasonal closure*	0	4.6	0	4.6
Seasonally Open	Yearlong closure	0	0	4.2	0
Yearlong Open	Yearlong closure	0	0	8.6	4.0
<b>Trails</b>					
<b>Current</b>	<b>Proposed change</b>				
Yearlong Open	Seasonal closure*	0	0	0	5.6

Proposed Road Access Activity		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Seasonally Open	Yearlong closure	0	15.2	18	15.2
Yearlong Open	Yearlong closure	0	8.4	9.9	2.8

\* Closure from Dec. 1 to June 30

For all action alternatives a berm is proposed to replace a gate barricading access to 7.4 miles of road. The berm would further restrict access to this road, reducing the potential for weed spread.

### Cumulative Effects

In addition to the cumulative effects described for the no-action alternative above, 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 analysis 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.

In summary, many past, present, and foreseeable actions have and would contribute to weed risk and spread in the project area. Additional acres, outside and adjacent to the treatment units would become more susceptible to weed invasion from a number of weed species as a result of this action. 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 greatly reduced, however, by design features that would lessen the impact of weed spread; specifically aggressive weed treatments, soil stabilization measures, revegetation of disturbed sites, and restoration of constructed temporary roads.

### ***Regulatory Framework and Consistency***

Management direction for noxious and invasive weed control on the FNF 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 Forest Service Manual, Chapter 2080, Noxious Weed Management, and have been incorporated into the FNF Forest Plan. Treatment and monitoring of known weed populations in the project area will be implemented under the authority and guidance of the Flathead National Forest Noxious and Invasive Weed Control Decision Notice (May 2001) and EA (March 2001). These were designed to meet legal requirements and Forest Service policies for noxious weed control. The proposed project incorporates and is consistent with the FNF Weed Control Decision. Design features and management requirements for actions proposed under this project follow requirements documented in the Forest Service Manual Amendment for Noxious Weed Management, road and timber management projects.

This page left intentionally blank.