Non-native Plants

INTRODUCTION

Non-native plants are species that do not have their origin in a local area. They have not adapted to or evolved with the local environment, including native plants, animals, and disturbances. Non-native plants include exotics and noxious weeds. Exotic plants are species that have been introduced to an area, usually from a different continent. Noxious weeds are plant species designated by law that can have detrimental effects on agriculture, commerce, or public health. They spread aggressively and are difficult to manage. These species are generally new or not common to the United States. Noxious weeds present the most immediate and disruptive threat to ecosystem function of the non-native plants present on the three Forests. For this reason, the non-native plant discussion will focus primarily on noxious weeds. Portions of the woodlands, *Vegetation Diversity* section in this chapter address exotic and non-native plant issues and need for change related to vegetative diversity and properly functioning condition.

Noxious weed and exotic plant species are spreading rapidly locally, regionally, and nationally. Roads, trails, and rivers have been identified as primary conduits for noxious weed and exotic plant transport and establishment. This rapid rate of weed expansion is partly due to the lack of natural control agents in new environments, prolific seed production, physiological advantages over other plants, and a strong ability to establish in various vegetative successional stages and communities. Some landscapes are more susceptible to invasion than others, due to productivity of sites and the similarity of environmental conditions from where the plant originated. This susceptibility can affect rate of spread and the extent or size of infestations.

Noxious weeds that are classified as invaders pose the greatest threat. These plants are capable of becoming established in pristine or relatively undisturbed areas and can spread quickly over large geographical areas. Spotted knapweed, diffuse knapweed, yellow starthistle, leafy spurge, and dyers woad are good examples of invaders. These infestations can substantially change overall biological diversity by affecting the amount and distribution of native plants and animals. They can also have negative effects on recreational experiences, forest regeneration, wildlife and livestock forage, native plant resources associated with tribal rights, landscape and soil productivity, fire cycles, nitrogen cycling, riparian and hydrologic function, and water quality.

Issues and Indicators

Issue Statement - Forest Plan management strategies have the potential to influence non-native plant establishment, spread, detection, and control.

Background to Issue – A Need For Change related to non-native plant management was identified in the *Preliminary AMS for the Southwest Idaho Ecogroup* (USDA Forest Service 1997). There is a need to modify current management direction to adequately address non-native plants and their effects on ecosystem structure, composition, and function. Due to the expansion of noxious weeds, the presence of previously established exotics, and the introduction of non-native vegetative species within the three Forests, ecosystem structure, composition, and function

are at risk. These non-native plants have greatly increased from historic conditions. Exotic plants have been identified as one of the causative factors contributing to changed conditions on the landscape (ICBEMP 2000a). For example, new information contained in the Interior Columbia Basin Ecosystem Management Project (ICBEMP) and additional research (Lacey et al. 1989) have linked noxious weed invasion with the potential decline in long-term soil productivity and soil-hydrologic function and processes. Specific needs are to provide consistent management standards and guidelines for permits, special use authorizations, contracts, and Forest Service administrative activities that prevent the further spread and establishment of noxious weeds. Also needed is a prevention/ containment/control strategy that recognizes the difficulty and expense of controlling large and firmly established populations of noxious weeds and exotics. The strategy would be based on factors that favor and contribute to the establishment and spread of noxious weeds.

Management direction that recognizes jurisdictional boundaries, landownership patterns, all functional resource areas, and the appropriate levels of scale for noxious weed and exotic plant management is also needed. Idaho has finalized a state strategic plan for managing noxious weeds. The purpose of the strategic plan is two fold: 1) to heighten the awareness among all citizens of the degradation brought to Idaho lands and waters by the explosive spread of non-native weeds and, 2) to bring about greater statewide coordination, cooperation, prioritization, and action that will successfully halt the spread of such weeds and restore infested lands and waters to a healthy and productive condition. The Strategic Plan recommends the statewide formation of *Cooperative Weed Management Areas* and application of *Integrated Weed Management* prevention and control measures. Such a coordinated effort is operating within the Payette River Weed Management Area, established with a Memorandum of Understanding in 1998. Similar opportunities for coordination exist within the three Forests, particularly within the large river corridors and basins.

Initial public scoping on noxious weeds did not generate much comment. However, one pertinent comment identified the need to identify specific sources that spread noxious weeds in order to better address and treat specific causes of spread**.**

A few pertinent comments were identified from the Draft FC-RONR Wilderness EIS relating to noxious weeds. While this EIS addresses a separate action from the Ecogroup Forest Plan Revision effort, the comments are relevant due to the 1) overlapping shareholders, 2) proximity of the wilderness to or on the three Forests, 3) shared river corridors, 4) overlapping timing of the two projects, and 5) similar nature of noxious weed infestations in the two project areas. The comments generally demonstrated a high level of awareness that the noxious weed problem was a threat to the environment. While some wanted more passive methods of treatment, two-thirds of the comments indicated support for implementing an aggressive noxious weed control program that included herbicide use. Several comments stressed that control actions needed to occur now, without further delay, and some of those encouraged action without further planning.

Internal Forest Service comments were similar. While there was general agreement with the need to identify factors contributing to the spread and establishment of noxious weeds, employees also felt that noxious weed prevention and management needed to become more

multi-functional in direction and implementation. An additional concern dealt with the ineffectiveness of weed management across jurisdictional boundaries and adjacent land ownerships.

While these comments are all valid concerns, they are components of the much larger issue, presented in the issue statement concerning the Forests' ability to implement Integrated Weed Management on a long-term basis. To a large degree, the ability to address these concerns is dependent upon budgets, annual priorities, and the implementation level of resource integration. However, some variables will likely change by alternative emphasis.

Indicators - The following indicators will be used to measure the effects of noxious weeds as a surrogate for non-native plants on the three Forests, by alternative.

- *Estimated total acres of high susceptibility to noxious weed invasion within Management Prescription Categories that have a high exposure to invasion risk, moderate to high detection, and high ability to treat* – This indicator attempts to reflect three aspects of management that contribute to the effectiveness of Integrated Weed Management and will vary according to Management Prescription Category assignment. They are: 1) the level or types of travel access changes (roads and trails) and management that present risks for new weed population establishment; 2) the relative ability for new noxious weed populations to be detected by the Forest Service or the public; 3) and the relative ability and range of flexibility (funding and tools available) to treat established weed populations. As a result, Forest-wide management effectiveness will depend on recognizing the program implications of management changes and emphasis.

- *Estimated total acres of high susceptibility to noxious weed invasion within Management Prescription Categories that have a low to moderate exposure to invasion risk, low detection, and a low to moderate ability to treat* – Same as the indicator just above.

- *Estimated total noxious weed acres by Forest during the short term* - This indicator reflects the effectiveness of Integrated Weed Management, based upon certain assumptions associated about key noxious weeds species and likely effects from different activities.

- *Effects within fire regimes/PVGs that have most departed from historical conditions* – See also the *Vegetation Hazard* section for more information. These effects show the potential risk of exotic plant spread into areas that are not currently considered highly susceptible, if uncharacteristic wildland fire and stand-replacing events occur.

Affected Area

The affected areas for direct and indirect effects of noxious weeds are lands administered by the three National Forests in the Ecogroup. Some management areas may be highlighted in discussions, due to the significance of their contributions to Forest-wide effects. This affected area represents lands where noxious weeds or exotic plants exist and could expand into, and lands where these plants could establish due to the effects of Forest management activities, environmental conditions, and natural events.

The affected area for cumulative effects includes the lands administered by the three National Forests, and lands of other ownership both within and adjacent to these National Forest boundaries. The cumulative effects are also addressed at the Interior Columbia River Basin Ecological Reporting Unit level (see *Vegetation Diversity* section). This expanded area is necessary to show the relationship between Forest and off-Forest effects from noxious weeds and exotic plants, and to emphasize the need for coordination of non-native plant management among adjacent land owners. Although data may be limited on non-Forest System lands, the spread of exotic plants across jurisdictional boundaries can be described to identify potential cumulative effects to Ecological Reporting Units that were defined by the Interior Columbia Basin Ecosystem Assessment (ICBEMP 1997c). The Central Idaho Mountains ERU contains most (87 percent) of the Southwest Idaho Ecogroup, while small portions of the Upper Snake River and Owyhee Uplands ERUs overlay the southern divisions of the Sawtooth National Forest.

CURRENT CONDITIONS

Known Species and Infestations

Noxious weeds and exotic plants pose a serious threat to the diversity, integrity, and health of plant communities on all three Forests. There are numerous species of noxious weeds present on the Forests (see Table N-1 for known species and presence by Forest).

Table N-1. Known Noxious Weed Presence by Forest

Common Name	Scientific Name	Boise	Payette	Sawtooth
Canada thistle	*Cirsium arvense*	X	X	X
Spotted knapweed	*Centaurea maculosa*	X	X	X
Leafy spurge	*Euphorbia esula*	X	X	X
Yellow starthistle	*Centaurea solstitialis*		X*	
Rush skeletonweed	*Chondrilla juncea*	X	X	
Diffuse knapweed	*Centaurea diffusa*	X		X
Orange hawkweed	*Hieracium aurantiacum*	X		
Yellow toadflax	*Linaria vulgaris*	X	X	X
Dalmatian toadflax	*Linaria dalmatica*	X	X	X
Scotch thistle	*Onopordum acanthium*	X	X	X
Purple loosestrife	*Lythrum salicaria*	X*		
Dyers woad	*Isatis tinctoria*	X*	X	X*
Musk thistle	*Carduus nutans*	X	X	X
Hoary cress	*Cardaria ssp.*	X	X	X
Common St. Johnswort	*Hypericum perforatum*	X	X	
Black henbane	*Hyoscyamus niger*			X
Field bindweed	*Convolvulus arvensis*	X		X

*Population eradicated, may no longer exist on Forest

Ranger districts on all three Forests are continually updating their inventories of noxious weed infestations on an ongoing basis. As of 2001, the Forests have identified 17 species (Table N-1) and 47,394 acres of noxious weed infestations (see Table N-2 for breakdown by Forest and species). The South Fork of the Boise River, the South Fork of the Payette River, upper portions of the Salmon River, and the Big Wood River drainages have the largest acreages of infestations.

Table N-2. Noxious Weed Acres by Forest

Common Name	Boise	Payette	Sawtooth
Canada thistle	13*	525**	128
Spotted knapweed	1,407	237	2,491
Leafy spurge	662**	1	6,016**
Rush skeletonweed	31,657**	11	0
Diffuse knapweed	13	10	27
Yellow toadflax	2	5	1,206
Dalmatian toadflax	1,214	262**	310
Scotch thistle	35	604	33
Musk thistle	92	0	7
Hoary cress	2	32	15
Common St. Johnswort	305	35	0
Other Species	1	3	33
Total Acreage	**35,403**	**1,725**	**10,266**

*Emmett RD acreages are not available at this time.
**These numbers have been updated from the Draft EIS

The three Forests have environmental conditions very similar to landscapes from where several noxious weed species have originated, and this affects rate of expansion and establishment. Five noxious weed species (listed in Tables N-4 through N-6) have been selected to represent site susceptibility to invasion within the Ecogroup area. Dalmatian and yellow toadflax were initially considered, but not selected. Selection of the species analyzed for susceptibility was based upon one or more of the following criteria:

- The species present a significant management challenge due to physiological advantages and resistance to control - rush skeletonweed and leafy spurge (Karl et al. 1996).

- The species are present at relatively low levels, but are significant invasion risks due to historic rates of expansion, ability to invade undisturbed sites, and known scientific information - spotted and diffuse knapweed (Asher and Harmon 1994, Tyser and Key 1988, Harris 1991).

- The species have limited bio-agent availability and lack effective methods for control – rush skeletonweed (Karl et al. 1996).

- The species are not present on Forest now, but are in close proximity and spreading regionally at alarming rates - dyers woad, and yellow starthistle (Dewey et al. 1991, Roche 1994).

- The species are precursors to more pervasive noxious weeds – diffuse and spotted knapweeds.

The Interior Columbia Basin Ecosystem Assessment identified lands that were highly susceptible to noxious weed invasion for 25 species (ICBEMP 2000a). The susceptibility ratings were based on vegetation cover types and precipitation zones that have a high frequency of invasion and presence. Table N-3 identifies the percent of susceptible areas within Ecological Reporting Units that contain the Ecogroup Forests for five noxious weed species. Based upon this assessment, only a relatively small percentage (3-17) of BLM and Forest Service lands are highly susceptible to invasion. The Central Idaho Mountains ERU, which contains a majority of the Ecogroup's land base, appears to have the greatest overall susceptibility for the five species.

Table N-3. Percent of ERUs Highly Susceptible to Invasion by Species

Noxious Weed Species	Central Idaho Mtns ERU		Upper Snake River ERU		Owyhee Uplands ERU	
	All Lands	BLM-FS	All Lands	BLM-FS	All Lands	BLM-FS
Leafy Spurge	14	8	40	6	15	3
Spotted Knapweed	22	17	25	9	6	4
Diffuse Knapweed	18	17	8	10	5	5
Yellow Starthistle	11	7	29	14	6	4
Rush Skeletonweed	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Information not available in the ICBEMP documents.

Further refinement of the noxious weed susceptibility evaluation was conducted during the revision process. Tables N-4, N-5, and N-6 display the acres of lands by Forest that are highly susceptible to invasion by noxious weed species. These numbers indicate that the three Forests have a greater susceptibility to invasion than was predicted at the Interior Columbia River Basin Assessment level. Comparing the numbers in Table N-2 to the acres susceptible to invasion (Tables N-4, N-5, and N-6) reveals the potential for rapid short-term expansion and long-term effects to other resources. The Big Wood, Middle South Fork Boise River (Sawtooth NF); Lower South Fork Boise River, Boise Front/Bogus Basin, Middle Fork Boise River (Boise NF); FC-RONR Wilderness, and Weiser River (Payette NF) Management Areas are the most susceptible to noxious weed invasion (see Non-native Technical Report #1). While these numbers may not be all-inclusive, they do indicate the magnitude of the noxious weed problem and the significant potential of spread. Specific and potentially significant vectors of establishment and spread are described below.

Vectors of Non-Native Plant Establishment and Spread

Roads

Most existing infestations are along or have originated from roadsides, because vehicle traffic provides ideal means for noxious weed spread. Roads and their associated vehicle traffic are the largest contributors to noxious weed expansion and pose the most difficult challenge to manage within the Ecogroup. An estimated 77 percent of the inventoried infestations are along or have originated from roadsides. Large-scale examples include: Dalmatian and yellow toadflax along State Highways 21 and 52 in the South Fork Payette River and Highway 75 along the Salmon River; rush skeletonweed along State Highways 52 and 21 between Banks and Grandjean; leafy spurge along the road systems in the South Fork Boise River corridor; and spotted and diffuse knapweed in the Big Wood River drainage adjacent to State Highway 75 and Forest Service system roads surrounding Ketchum.

Table N-4. Boise NF Acres Highly Susceptible to Invasion by Species

Noxious Weed Species	Acres Highly Susceptible to Invasion	Percent of Total Forest Acres
Leafy Spurge	858,719	33.8
Spotted Knapweed	490,121	19.3
Diffuse Knapweed	124,618	4.9
Yellow Starthistle	63,434	2.5
Rush Skeletonweed	982,237	38.6
Totals (one or more species)	**1,175,034**	**46.0**

Table N-5. Payette NF Acres Highly Susceptible to Invasion by Species

Noxious Weed Species	Acres Highly Susceptible to Invasion	Percent of Total Forest Acres
Leafy Spurge	260,826	10.9
Spotted Knapweed	156,741	6.5
Diffuse Knapweed	45,356	1.9
Yellow Starthistle	29,882	1.2
Rush Skeletonweed	381,451	18.9
Totals (one or more species)	**495,929**	**21.0**

Table N-6. Sawtooth NF Acres Highly Susceptible to Invasion by Species

Noxious Weed Species	Acres Highly Susceptible to Invasion	Percent of Total Forest Acres
Leafy Spurge	68,599	3.1
Spotted Knapweed	288,382	13.2
Diffuse Knapweed	100,587	4.6
Yellow Starthistle	8,003	0.4
Rush Skeletonweed	89,984	4.1
Totals (one or more species)	**391,067**	**18**

Most existing infestations are along, or originated from, roadsides, because vehicle traffic and road maintenance provide ideal means for noxious weed spread. Roads, trails, and rivers have also been identified as primary conduits in other areas for noxious weed and exotic plant transport and establishment (ICBEMP 1997b, Forcella and Harvey 1983, Gelbard and Belnap 2003, Watson and Renney 1974, Mass 1985, Westbrooks 1998, Cole and Landres 1996). Roads and their associated vehicle traffic are the largest contributor to noxious weed expansion within the Ecogroup area. Seventy seven percent of inventoried infestations are along or have originated from roadsides. Some of the denser infestations are near roads, which can enhance the likelihood of spread (see Non-native Technical Report #1).

Currently, there are an estimated 14,746 miles of classified and unclassified forest, county, state, and federal roads and highways on the Forests (Table N-7). The miles of roads listed in Table N-7 are generated from the three Forests' GIS database. These numbers are not the same as those listed in Table RO-1, as Table RO-1 only included classified roads. All roads are included in this analysis as an indicator to display potential for non-native plant establishment and spread.

Lower South Fork Boise River, Mores Creek, and North Fork Boise River Management Areas on the Boise National Forest; Snake River and Weiser River Management Areas on the Payette National Forest; and Big Wood River, Trapper Creek/Goose Creek, and Raft River Management Areas on the Sawtooth have some of the highest numbers of roads on the Forests (see *Soils, Water, Riparian, and Aquatic Resources* section in this chapter). Table N-7 displays the miles and percent of roads and highways within areas of high susceptibility to invasion by certain species and by Forest. Transportation of weed seed by contractor or special use vehicles or equipment is to a certain degree being managed to reduce the risk of new infestations. Use of roads by the general public presents the greater risk, due to the lack of control measures and knowledge about noxious weed spread.

Table N-7. Miles and Percent of Roads within Areas of High Susceptibility

Forest	Total Miles of Roads	Miles of Roads within Susceptible Areas	Percent of Roads within Susceptible Areas
Boise	6,356	3,702	58
Payette	5,550	1,117	20
Sawtooth	2,840	893	31
Totals	**14,746**	**5,712**	**39**

Recreation Areas and Use

Motorized and non-motorized recreation activities are likely the second most common vector of weed seed transport and establishment. This is due to the minimal control over allowing weed-free vehicles to travel Forest roads and trails. Frequently, initial infestations for noxious weeds and exotic plants occur in conjunction with trailheads, trails, campgrounds, and other developed recreation sites. Trails and sites in drainages of the South Fork Boise River, Big Wood River, South Fork Payette River, portions of the North Fork Payette River, and segments of the main Salmon River present the most significant concentrations of development use that overlap areas of high susceptibility. Currently there are 2,591 miles of motorized trails, 2,270 miles of non-motorized trails, and 427 developed campgrounds/recreation sites (Table N-8). An estimated 29 percent of the motorized trails are within areas of high susceptibility, while 20 percent of the non-motorized trails are in these areas. An estimated 28 percent of the developed sites are within areas of high susceptibility. An estimated 4.5 million summer Recreation Visitor Days occur on the combined Forests (Table N-9). Table N-8 displays the number of sites and trailheads within areas highly susceptible to invasion by species and Forest. River recreation corridors also have a large number of infestations occurring within them.

Table N-8. Recreation Use Areas and High Noxious Weed Susceptibility

Recreation Use Areas	Boise NF		Payette NF		Sawtooth NF	
	Forest Wide Total	Within High Susceptibility Areas	Forest Wide Total	Within High Susceptibility Areas	Forest Wide Total	Within High Susceptibility Areas
Miles of Motorized Trails	881	313	622	121	1,088	162
Miles of Non-motorized Trails	218	48	1,153	302	899	195
Acres Open to Motorized Travel*	524,000	183,623	509,000	105,484	787,000	208,141
Developed Recreation Sites	207	30	79	20	141	59

*Acres open to summer motorized use.

Table N-9. Forest Recreation Use

Recreation Use Criteria	Boise NF	Payette NF	Sawtooth NF	Totals
Developed Recreation Site PAOTs*	11,041	3,664	12,387	**27,092**
Summer Recreation Visitor Days (estimate for year 2000)	1,586,000	1,126,000	1,826,000	**4,538,000**

*Does not include developed ski areas.

Timber Harvest and Fire

Ground-disturbing activities, equipment transport and use associated with timber harvesting, road construction, road maintenance, fire suppression, or other authorized uses are other common sources influencing the expansion of noxious weeds and exotic plants. Most of these risks are being minimized with localized site restoration and rehabilitation. Opening of forested canopies in the drier forest vegetation groups (PVGs 1, 2, 4, and 5) with either fire or mechanical means can also influence the establishment and growth of new infestations. This group of activities is dependent on seed sources in the area or seed transported in from another area.

Table N-10 displays the acres of PVG 2 and 5, the acres of tentatively suited timber, and the highly susceptible acres to invasion. About half of the Ecogroup's tentatively suited PVGs 2 and 5 are in areas of high susceptibility. This amount also represents 22 percent of the Ecogroup's total acreage of high susceptibility. Several studies in the western United States demonstrate that weeds frequently invade and dominate plant communities following fire, sometimes on a large scale (Asher et al. 1999). Most of these risks can be minimized with localized site restoration and rehabilitation. Effectiveness is usually dependent on seed sources in the area or seed transported in from another area.

Table N-10. Susceptibility to Weed Invasion Within PVGs 2 and 5 by Forest

Forest	Potential Vegetation Groups (PVGs) 2 & 5	Tentatively Suited Lands in PVGs 2 & 5		Tentatively Suited, in PVG 2 & 5 w/ High Susceptibility to Noxious Weeds		
	Acres	Acres	Percent of PVGs 2 & 5	Acres	Percent of PVGs 2 & 5	Percent with High Sus-ceptibility
Boise	451,840	438,986	97	325,198	72	28
Payette	469,311	315,647	67	135,720	29	27
Sawtooth	11,027	7,836	71	7,348	67	2
Totals	**932,178**	**762,469**	**82**	**468,266**	**50**	**22**

Livestock Grazing

Noxious weed expansion may also occur to a lesser degree in the Ecogroup area with the transport of seed by livestock from infested areas. Only 25 percent of the three National Forests are considered capable rangeland, and 36 percent of the Forests do not contain allotments (see

Rangeland Resources Technical Report #3). Table N-11 displays the relationships between capable rangeland and noxious weed susceptiblity. The Boise National Forest has the greatest percentage of overlapping condition among the three Forests. While the Sawtooth Forest has the greatest amount of capable rangeland, it has only a moderate overlap.

Table N-11 Capable Rangeland Susceptible to Weed Invasion

Forest	Capable Rangeland	Acres Highly Susceptible to Noxious Weed Invasion	Capable Rangeland Highly Susceptible to Noxious Weed Invasion		
			Acres	Percent of Capable Rangeland	Percent Highly Susceptible
Boise	643,949	1,175,034	300,334	46	26
Payette	363,698	495,929	42,473	12	9
Sawtooth	683,299	391,067	177,062	26	45
Totals	**1,690,946**	**2,062,030**	**519,869**	**25**	**25**

It has been documented that seeds can be spread through livestock feces, fleeces, and hooves (Belsky and Gelbard 2000, Callihan et al. 1991). Many can pass through the digestive system and still retain their germination ability (Messersmith 1989, Belsky and Gelbard 2000). In addition to livestock, native grazers such as mule deer, bighorn sheep and elk, and some birds such as mourning doves, can perform this same role of seed spread. However, grazing of domestic livestock has shown to be an effective method in managing large infestations while assisting the ecological succession process (Goodwin et al. 2002, Asher et al. 1999).

Localized areas where excessive grazing duration and use contributes to reduced ground cover and early successional stages can become potentially susceptible to weed or exotic plant establishment. Plant communities with low average plant cover and frequent disturbance are most at risk to invasion (Beck 1998). This is consistent with findings in the Interior Columbia River Basin Assessment, as the dry shrub and perennial grasslands have seen the greatest change (See Non-forested Vegetation Technical Report), display higher vulnerability to exotics (ICBEMP 1997c), and typically have lower plant cover. The Ecogroup area has a trace amount of dry shrub (Wyoming big sagebrush). Livestock grazing has not been identified as a significant contributor to the broad-scale spread of noxious weeds in less arid or mesic areas (Stohlgren 1999). Except for a few situations within the Ecogroup, ranger district personnel have not identified livestock as significant contributors to the spread of exotics and noxious weeds.

A recent review of other publications (Belsky and Gelbard 2000) argues that livestock grazing, trampling, and seed transport have significantly increased the invasion of non-indigenous plants in arid and semi-arid areas. Most of this discussion focuses on arid environments and cheatgrass. Most of the examples given where recoveries have occurred when livestock were removed are in riparian areas and mesic to moist sites. However, a number of other studies have found that removal of livestock or disturbance does not necessarily decrease the amount of exotics (Brandt and Rickard 1994, Daubenmire 1975, Rice and Westoby 1978, Robertson 1971, West et al. 1984) or improve conditions on warm, dry sites. In addition, some weed species have been

found to invade undisturbed (not grazed) grasslands and shrublands (Enserink 1999, Harris 1991, Kleiner and Harper 1971, Lacey 1987, Lacey et al. 1990, Tyser and Key 1988, Bedunah 1992, Randall 1993a & b). The species identified as being invaders to undisturbed grasslands and shrublands in these references (leafy spurge, spotted knapweed, and diffuse knapweed) are three of the five species that are of great concern within the Ecogroup. Although it is not addressed to the extent of the mentioned species, rush skeletonweed is another exotic that has effectively invaded sites currently ungrazed by livestock within the three Forests.

ENVIRONMENTAL CONSEQUENCES

Effects Common to All Alternatives

Resource Protection Methods

Noxious weed management has been integrated into multiple scales of direction, from national to site-specific. The cumulative effect of the multi-dimensional direction described below is beneficial in the prevention, containment, and control of noxious weed species.

Laws, Regulations, and Policies – Numerous federal and state laws, regulations, executive orders and policies govern Integrated Weed Management on National Forest administered lands. Some of the more important ones relating to the use of Integrated Weed Management (IWM), the determination of factors favoring the establishment and spread of noxious weeds, and the design of prescriptions that reduce the risks, the detection and response of invasive species, accuracy and reliability monitoring are described in Appendix H, Legal and Administrative Framework. National laws and regulations have also been interpreted for implementation in Forest Service Manuals, Handbooks, and Regional Guides. Noxious weed management activities associated with Integrated Weed Management must comply with these laws, regulations, executive orders, and policies, which are intended to provide general guidance for the implementation of weed management practices, and for the protection of other potentially affected resources.

Forest Plan Direction – Although Forest Plan noxious weed management direction and emphasis would vary somewhat by alternative, direction for all alternatives is to eradicate, prevent, control, and contain noxious weed populations on National Forest administered lands. Direction occurs at both the Forest-wide and Management Area levels. Non-native plant goals and objectives have been designed to achieve desired vegetative conditions over the long term, and to maintain or restore land productivity and ecosystem functions and processes. Goals and Objectives at the Forest-wide and Management Area levels also provide the framework for how Integrated Weed Management will be conducted. Management Area direction highlights key species for short-term strategy emphasis (either prevent, contain, control, or eradicate). Standards and guidelines for noxious weed and exotic plants are established for the primary purpose of preventing new infestations, and retarding or containing existing infestations on the three Forests. A variety of methods are used as management direction components to minimize or reduce the direct effects of noxious weeds on other resources. However, the degree each of these will be used in each forest plan alternative is dependent on the management activities and uses emphasized. All the alternatives will include the following management components:

- Establish Management Area's susceptibility to invasion and direction for site-specific project planning and implementation.
- Provide guidelines for transportation system management and development.
- Establish Forest-wide standards for land and resource administration and use to prevent the spread of non-native plants.
- Secure restrictive covenants or standards and/or other protective measures for specific areas.
- Provide a list of Best Management Practices or guidelines for use and application in project-level designs.

Forest Plan Implementation – Most aspects of Integrated Weed Management depend on local coordination and site-specific information that can change on a yearly basis. Responsibilities associated with site-specific noxious weed management and administration will not change by Forest Plan alternative, as this is determined by existing policy (FS Manual 2100, Environmental Management) and annual budget priorities. Specific project designs are dependent on the action's relation to existing noxious weed infestations, the expected level of land disturbance, timing of projects, the land's susceptibility to invasion, and locally prescribed methods for rehabilitation. These are not easily addressed at the programmatic level. However, the district planning process can and will address these factors at the project area scale. Through this process, which is the same for all alternatives, adjustments in noxious weed management practices would be made to address resource concerns in a timely, effective, and site-specific manner that involves the Forest Service and the public in land management actions. Some of the actions include:

- Establish cooperative noxious weed management areas that work to reduce potential introductions and spread from all ownerships and jurisdictions.
- Treating infestations with various chemical, mechanical, livestock grazing, or biological methods.
- Providing interpretative displays and activities.
- Initiating public education programs.
- Posting areas of infestations with informational signs.
- Properly designing projects to minimize the spread or establishment of infestations.
- Ensuring ground cover restoration or rehabilitation.
- Increasing monitoring and law enforcement.

General Effects Common to All Alternatives

An Integrated Weed Management strategy will be a part of all Management Prescription Categories (MPCs) and alternatives. Noxious weed populations will be monitored to plan annual and long-term treatment strategies. Integrated Weed management on the three Forests will continue to emphasize prevention and eradication of new infestations. A variety of methods will be available to prevent the establishment of noxious weeds, such as:

- Establishing landscape levels of susceptibility to invasion and preventive direction for site-specific projects;
- Providing guidelines for transportation system management and development;
- Establishing Forest-wide standards for land and resource administration and use;

- Securing restrictive covenants and/or other protective measures for specific areas; and
- Providing a list of prevention and control measures for use and application in project-level designs.

However, because weeds can spread so many different ways, 100 percent prevention is not feasible or cost effective (Kummerow 1992, Petroff 1994). Thus, eradication, control and containment become necessary. Treatment of weed-infested areas will include the use of cultural, mechanical, biological, and chemical control agents as described in each Forest's environmental assessment on the management of undesirable plant species. It is often suggested that non-native plants need to be eradicated when they replace native species or eliminate their habitat. But the strong persistence of non-native plants, and their high eradication costs suggest that philosophical, social, and practical dimensions need to be incorporated along with ecological considerations (Cole and Landres 1996) when developing treatment programs. Therefore, some form of area prioritization (Petroff 1994) should occur, in order to provide consistency of treatment and management when funding is limited, and to ensure certain landscapes with important resource values are restored or protected.

Noxious weed establishment will continue to occur. This assumption is based on the high rates of spread expected under natural conditions, the persistence of viable seed over several years, and our historic inability to slow or reduce noxious weed populations consistently over a long time period. Once key weed species are established, particularly on areas of high susceptibility, they will crowd out native plants, displace wildlife species, degrade foraging conditions on historic winter ranges for ungulates, increase the frequency and damaging effects of fire, increase sediment transport and erosion, and disrupt watershed function and nutrient and energy flow. Left unmanaged, noxious weeds and non-native plants will pose a significant threat to ecosystem health and integrity. Infestations of weeds will continue to exist on all three Forests at various densities and population sizes.

Like native plant species, noxious weeds will grow and spread where favorable environmental conditions for their establishment occur. Many of the species that pose threats to the Ecogroup originate from regions of the world where climatic conditions are similar to parts of southwestern Idaho. Specific portions of the landscape will provide even more favorable environmental conditions than others. These sites are dependent on such attributes as precipitation, temperature, elevation, aspect, soils, vegetative cover types, and canopy closure. The greatest proliferation and increases in density will occur on these sites. As a result, they have been classified as areas of high susceptibility to invasion. These sites will not change by alternative, because the environmental conditions are expected to remain the same. These areas will be affected by the early to mid stages of regional-scale invasion.

Non-native plants affect terrestrial and aquatic communities primarily with their physical presence and ability to compete with other vegetation. This presence influences different components of the Ecogroup Ecosystem Management framework (see Chapter 3, *Introduction*) in neutral or negative ways. The effects to ecosystem elements can be classified as either direct or indirect:

- **Non-native plant establishment can directly alter** the amount of annual and perennial vegetation present (biological); the percent of soil ground cover (physical); and the quality of terrestrial wildlife cover (biological). These are common annual effects that occur during the short term.

- **Non-native plant establishment can indirectly alter** the vegetative species' composition of an area; shrub canopy closure patterns and distribution; individual plant vigor (biological); soil surface erosion rates, the level of sediment affecting water quality, the soil productivity of a site, water runoff volume or rate (physical); the quality of threatened and endangered species habitat (biological); aquatic and terrestrial habitat condition (biological); fire regimes (physical); big game winter range (biological); the level of shrub and tree regeneration (biological); the level of individual and community net income (economic). Indirect effects will become more apparent in the latter portions of the short-term period and extend into the long term. These effects will become most apparent after 10 to 15 years of infestation.

The effects of integrated weed management are largely dependent upon the implementation effectiveness of detection, prevention, control, containment, and monitoring practices. Three considerations typically influence these weed management practices. They are: 1) the exposure risk to new weed infestation establishment, 2) the ability to detect and monitor weed populations, and 3) the relative ability to treat existing infestations.

The risk of exposure is affected by the level of activities that either transport seed or create potential sites for new seedlings to establish within an area. For example, the amount of vehicular traffic, recreation stock use, and other forms of dispersed recreation can affect the potential for seed dissemination risk. Also, soil or ground disturbance activities such as fire, construction projects, or ground-based logging activities can affect the number of potential sites for new seedlings to become established.

The ability to detect and monitor weed populations will influence the size and density of new weed populations. Detection is strongly connected to the frequency and amount of time various management activities take place in an area during the year, consistency among personnel to detect or document sites, and the amount of visitation by the general public. For example, in areas where other resource management activities are low and administrative visits are infrequent, the likelihood of detecting new populations is also low. If a new infestation becomes established, a couple of years could potentially pass without detection, thus creating a large weed seed source that would take several years to eliminate. For example, the Supplemental Draft Environmental Impact Statement for the Frank Church - River of No Return Wilderness gives an actual scenario where a new infestation expanded from 2 to 15 acres in three-year timeframe (USDA 1999).

The ability to treat established infestations is affected by the accessibility, financial flexibility, or treatment restrictions associated with an area. The degree of accessibility will influence treatment costs and the logistics of treatment. As result, the number of acres treated and the timing of treatments will be influenced. Also, effective treatment is dependent on application of chemicals, fire or other means during certain time windows. If not treated at the correct phenological stage, eradication or control effectiveness is reduced. In addition, the ability to

finance treatments may be limited, given that some activities (e.g., timber harvest) and associated funding sources may not be allowed in certain areas. While recent years have seen an increase in the budget for the management of noxious weeds, the consistency of this funding is uncertain at best. Without consistent control or eradication efforts over a long duration, noxious weed expansion into susceptible habitats is a certainty.

The MPCs described in detail in Chapter 2 have been divided into two groups, based upon their response to the three considerations described above:

- **Prescriptions with a high exposure risk, moderate to high detection and high ability to treat** (MPCs 2.4, 3.2, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 8.0) - These MPCs would see a higher exposure risk due to the level of motorized vehicle use, the amount of roads, and types of recreation activities associated with these areas. Ground-disturbing activities are expected to be greater due to the amounts of fire, road reconstruction, site restoration, ground-based timber harvest, and dispersed recreation site uses. New infestations will likely be detected early, because administrative activities and public visitation will be higher. Infestations will likely have lower densities, due to the combination of frequent chemical and biological treatments. Accessibility to infestations will be easier, thus reducing cost, increasing the potential to treat more acreage and improve treatment timing. Interdisciplinary sources for funding integrated weed management will increase, due to the types and amount of use occurring in these areas. Management emphasis will take a balanced approach to prevention, containment, and control practices. Containment strategies will be more prevalent in order to maximize management effectiveness with available financing.

- **Prescriptions with a low to moderate exposure risk, low detection, and low to moderate ability to treat** (MPCs 1.1, 1.2, 2.1, 3.1, 4.1) - These MPCs would see a low to moderate exposure risk due to the level of non-motorized use, the low amount of roads, and types of recreation activities associated with these areas. Infestations will typically occur along travel corridors such as trails, primitive roads, and rivers. Ground-disturbing activities are expected to be minimal. This is due to the type of fire use, minimal site restoration, and the low level of ground-based timber harvest. New infestations will likely become larger and/or denser before treatment occurs. Resistance to control will likely be higher due to the amount seed produced from denser stands and the number of annual treatments needed. The duration of individual site treatments could potentially be longer. These results are due to less likelihood of early detection, since administrative activities and public visitation will be infrequent. Accessibility to infestations will be difficult, thus increasing cost and decreasing the potential to treat more acreage, with added potential to miss optimal treatment windows. Interdisciplinary sources for funding Integrated Weed Management will be less due to limited uses occurring in these areas. Typical management will emphasize prevention and early eradication. In the short term, containment practices will not be emphasized to the same degree as prevention and early eradication and control. Long-term risk of spread and potential impacts on ecosystem integrity will increase with the establishment of new infestations surrounding these areas and because detection and the ability to reduce infestation size and densities are inherently more difficult due to remote locations, a lowered ability to monitor on a regular basis, and the difficulty and cost of controlling denser stands.

Direct and Indirect Effects by Alternative

Susceptibility to Invasion

As discussed above, the MPCs have been sorted into two groups based upon exposure risk, detection, and ability to treat. The extent any one group will occur across the landscape varies by alternative. These alternative variations will directly affect the emphasis taken under Integrated Weed Management. The indirect outcome will ultimately translate into possible changes to the amount of infestation acres treated under containment or control strategies, the density of infestations, the distribution of the infestations, and how treatments occur. Table N-12 identifies the number of acres highly susceptible to invasion within prescriptions having a low to moderate exposure risk and low detection, and prescriptions having a high exposure risk and high detection and treatment.

Alternatives 4 and 6 show the least potential for short-term exposure and spread. However, due to new infestation expansion without detection, difficult treatment logistics, the proximity of existing weed infestations, and the potential for more extensive and hotter wildfires, the potential for long-term expansion and invasion is very high. The indirect results of these alternatives would also result in greater long-term potential risks to soil, water, riparian, and aquatic resources and less effective terrestrial habitat and big-game winter range. Once these elements are reduced, particularly soil productivity on the Idaho Batholith soils, the recovery time frames are long (>25 years).

Table N-12. Acres Susceptible to Invasion in Various Exposure Risk, Detection, and Treatment Groupings of MPCs

MPC Grouping	Forest	Alt. 1B	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Low to moderate risk, low detection, low ability to treat	Boise	120,263	124,554	35,029	300,168	9,503	574,995	45,626
	Payette	302,549	309,524	251,278	384,975	219,041	396,851	303,468
	Sawtooth	63,288	58,702	20,014	123,253	9,726	268,379	24,262
	Totals	**486,100**	**492,780**	**306,321**	**808,396**	**238,270**	**1,240,225**	**373,356**
High risk, moderate to high detection, high ability to treat	Boise	818,417	814,126	903,651	638,512	929,177	363,685	893,054
	Payette	178,930	171,955	230,200	96,504	262,432	84,628	178,011
	Sawtooth	298,972	303,558	342,246	239,007	352,534	93,880	337,998
	Totals	**1,296,319**	**1,289,639**	**1,476,097**	**974,023**	**1,544,143**	**542,193**	**1,409,063**

Alternatives 3 and 7 have relatively high, short-term potential risks to these same resource elements. The extent of restoration planned under these alternatives is the primary reason this may occur. However, the long-term effects are likely to be less because of the amount of restoration activities planned during the short term, the larger potential of funding sources, and the expected positive vegetative and soil outcomes of restoration. Alternative 5 will likely have the greatest long-term potential for weed seed spread across the Ecogroup area, due to the greater likelihood of disturbed sites, the least amount of restricted travel access, and the anticipated regional population growth (See the Socio-Economic section of Chapter III in the FEIS).

The containment and control aspects of integrated weed management will likely be greater under Alternatives 5 and 1B. These alternatives also have higher short-term risks from the levels of commodity production and its associated disturbance. However, treatment of new infestations is likely to be more effective due to improved detection, monitoring, and logistics of treatment. The population densities of weed infestations are expected to be less under Alternatives 1B, 2, 3, 5, and 7 due to larger treatment programs, thereby reducing seed production potential.

Noxious Weed Spread

Infestations of weeds will continue to exist under all alternatives at various densities and population sizes. New noxious weed infestations will continue to occur on all three Forests. However, the extent of new sites and size of existing infestations will vary. This will depend upon the effectiveness of coordination between different resource disciplines and jurisdictional authorities, the spatial distribution of existing seed producing populations, the amount of highly susceptible habitat, the amount and type of disturbance, weed response to treatment, and the amount of seed transported to or retained in an area. Treatment of new or existing sites on a sustained basis will be one of the main determining factors of short- and long-term rates of spread and infestation size. Certain species will be more effectively controlled, due to the Forest population's size and the availability of treatment methods. Control is most probable with diffuse knapweed, yellow starthistle and possibly spotted knapweed in certain areas. Rush skeletonweed and leafy spurge will present formidable control and containment problems. Table N-13 identifies estimated annual broad-scale rates of spread for key Ecogroup weed species. These rates are used only as reference points for projecting potential Ecogroup spread, as they: 1) represent untreated infestations occurring under optimal growing conditions and sites; 2) do not reflect the effects of major disturbances, such as fire; and 3) do not include new infestation starts. The actual estimated rates will be based on broad assumptions about the alternatives displayed in Tables N-14 through 17.

Table N-13. Untreated Rates of Spread for Noxious Weed Species*

Species	Annual Rate of Spread (%)
Leafy spurge	12-50
Spotted knapweed	24-40
Diffuse knapweed	18-40
Yellow starthistle	6-17
Rush skeletonweed**	10-50

*Bureau of Land Management, USDI, 1985; White River NF, Draft Forest Plan EIS, 1999.
**USDA, 1999, Nez Perce, Bitterroot, Payette, Salmon-Challis NFs, FC-RONR SDEIS

Large portions of the South Fork Boise River, lower portions of the Middle and North Fork Boise River, Grimes Creek, Mores Creek, the South and Middle Fork of the Payette River, and the Hitt Mountains will contribute the most to leafy spurge rate of spread. This is due to the proximity of existing populations on and off Forest, the amount of high susceptibility sites, the amount of vehicle traffic, and the level of vegetation management. In these areas, minimal changes in vehicular traffic amounts and patterns under the different alternatives would result in minimal differences in the rate of spread for the alternatives. Spread will primarily be along

river and stream corridors and accompanying road systems. Some expansion would occur in managed timber stands with open canopies. Spurge is difficult to treat and very persistent. As a result, rates of spread and spurge stand densities will be greater where logistics of treatment are difficult, and the options and financing to treat are less. This is the case with Alternatives 4 and 6 (Table N-14).

Table N-14. Estimated Leafy Spurge Expansion During the Short Term

Alternatives	Estimated Annual Rate of Spread	Estimated Acreage After Ten Years	Rationale for Alternative Grouping and Rates
1B, 2, 3, 5, and 7	8 - 15%	14,419 – 27,020	Most treatment options, but more open forest canopies.
4 and 6	10 - 20%	17,323 – 41,355	Less treatment options, denser weed stands. More difficult to logistically treat.

Spotted knapweed will expand the greatest amounts in the Big Wood River, South and Middle Fork Boise River, Grimes Creek, Mores Creek, South Fork of the Salmon River, Big Creek in the Frank Church River of No Return Wilderness, and the upper and lower portions of the main stem Salmon River drainages. Diffuse knapweed will expand in the Big and Little Wood River, the lower South Fork Boise River, the Boise Front, and Raft River Range. This is based on the amount of high susceptibility acreage and/or the number of existing populations documented by the districts in the areas. The South Fork of the Salmon River, Big Creek in the Frank Church River of No Return Wilderness present a greater risk because there are so few established infestations in these areas of high susceptibility. Spread will mostly be along river and stream corridors and arterial road systems. Although traffic patterns and amounts may change across the alternatives, spread due to road use will not vary to any large degree, due to the substantial proportion of infestations that occur along arterial roads.

Spotted knapweed has the widest Ecogroup distribution, yet remains in relatively small pockets of relatively small infestations. Of all the species, spotted knapweed will be influenced by vegetation management activities and practices the most. Opening canopies in forested PVGs 1, 2, 4, and 5 using timber harvesting or fire, late-season grazing and trailing in existing infestations, mechanized recreation use in late summer and early fall, and all types of trail use will contribute to the spread of knapweed. Alternatives 1B, 3, 5 and 7 would see the greatest expansion of knapweed populations due to these factors. However, densities will likely remain low due to weed treatment actions. Alternative 3 is in this high category, primarily because of the amount of management activity planned in the short term. If the activities and practices implemented under Alternative 3 and 7 do not contribute to further weed expansion, then the long-term rate of spread for these alternatives will be lower than Alternatives 4 and 6. The likelihood of increased populations occurring in the FC-RONR wilderness during the short term is relatively low, but the long-term expansion potential is high due to the location of existing populations, direction of spread, and expected population levels and densities surrounding the Wilderness to the east and north. Overall vegetation management activities will be lower under Alternatives 4 and 6, but the use of fire and spotted knapweed's ability to invade undisturbed sites will still contribute to a slightly lower rate of spread.

Table N-15. Estimated Spotted and Diffuse Knapweed Expansion During the Short Term*

Alternatives	Estimated Annual Rate of Spread	Estimated Acreage After Ten Years	Rationale for Alternative Groupings and Rates
1B, 3, 5, and 7	10 - 25%	10,766 - 38,659	Open and dry forest types greater susceptibility, grazing seasons and duration of use, level of vehicle activity and motorized recreation use. Slightly higher road densities. Individual weed plant densities lower.
2, 4, and 6	5 - 15%	6,761 - 16,793	Prescribed wildfire and management ignited fire use. Moderate to high potential to invade undisturbed areas

*Diffuse and Spotted Knapweeds are combined due to their common responses to environmental influences, similar rates of spread, and control treatment effectiveness.

Yellow starthistle presents the least amount of spread potential of the five species, as its occurrence is still limited, and currently no populations exist on the three Forests. However, the lower South Fork Boise River, Arrowrock Reservoir, the lower main stem of the Salmon River, Hells Canyon, and Sage Hen Reservoir are at risk, since populations exist in Elmore, Idaho, Gem and Adams Counties.

Table N-16. Estimated Yellow Starthistle Expansion During the Short Term

Alternatives	Estimated Annual Rate of Spread	Estimated Acreage After Ten Years	Rationale for Alternative Groupings and Rates
1B, 3, 5, and 7	0 - 15%	0 - 20	Level of vehicle activity and motorized recreation use. Slightly higher road densities. More potential for physical disturbance in short term.
2, 4, 6	0 - 7%	0 - 9	Prescribed wildfire and management ignited fire use. Moderate potential to invade undisturbed areas.

Rush skeletonweed presents one of the greatest long-term risks to the entire Ecogroup. This is due to the sandy soil textures of the Idaho Batholith and the amount of high susceptibility habitat. Skeletonweed expansion during the next ten years will be greatest in the Boise River system, the South Fork Salmon River, Grimes Creek, Mores Creek, and the Middle Fork Salmon River. This can be attributed to the areas' proximity to the South Fork Payette River and road systems that connect the drainages. Populations in the South Fork Payette River would occupy most if not all the areas of high susceptibility in the drainage because of the current population size. Long-term expansion would likely occur into the Frank Church - River of No Return Wilderness and the Big Wood River. Big-game winter ranges in all these areas would experience higher rates of spread, similar to those in the South Fork Payette River. Alternatives 4 and 6 would see less expansion, due to the more extensive use of prescribed wildland fire.

Table N-17. Estimated Rush Skeletonweed Expansion During the Short Term

Alternatives	Estimated Annual Rate of Spread	Estimated Acreage After Ten Years	Rationale for Alternative Groupings and Rates
1B, 2, 3, 5, and 7	10 - 20%	70,846 – 177,688	Spread along road systems, especially south facing slopes. Resistance to chemical and mechanical treatment, negative response to early summer sheep grazing.
4 and 6	5 - 15%	42,672 – 113,729	Negative to neutral fire response.

Table N-18 represents the combined estimated rate of spread for the five species after ten years. Overall, the alternatives are most influenced by the spread of knapweeds and rush skeletonweed. Alternatives 1B, 3, 5, and 7 would likely have the largest rates of spread, which is primarily due to the higher risks of seed dispersal associated with activities and practices.

There are five other species that may become key species for control on the Ecogroup in the near future. They are orange hawkweed, Dyers woad, purple loosestrife, yellow toadflax, and Dalmatian toadflax. These plants are either not on the Forests at this time but are in close proximity (Dyers woad, purple loosestrife), or their current rates of spread are relatively low (yellow and Dalmatian toadflax) in part because of on-going control efforts.

Table N-18. Ten-Year Acreage Estimate of Key Weed Species in the Ecogroup

Alternative	Weed Infestation Acres After Ten Years
Alternative 1B	96,051 – 243,387
Alternative 2	92,035 -- 221,510
Alternative 3	96,051 – 243,387
Alternative 4	66,765 – 171,886
Alternative 5	96,051 – 243,387
Alternative 6	66,765 – 171,886
Alternative 7	96,051 -- 243,387

Exotic Plant Invasion Into Wildfire Areas

The risk of exotic plant infestations occurring within wildfire areas will be a concern under all the alternatives, and this risk is taken partially into consideration in determining areas of high susceptibility. However, determination of areas with high susceptibility does not take into consideration areas at risk for uncharacteristic stand-replacing fires or characteristic lethal fires. Where stands are replaced with an early successional stage with large proportions of exposed soil, there is an increased potential for exotic plant invasion. Forested PVGs 1, 2, 4, and 5 present the greatest risk, as these groups typically occur adjacent to or in conjunction with areas of high susceptibility to key noxious weed species invasion, and have fire regimes that are currently most departed from historical conditions. These PVGs occur more frequently on the Boise and Payette National Forests. Therefore, this analysis is confined to those two Forests. For the Boise National Forest, Alternatives 2, 3, 4, 6 and 7 reduce the overall hazard below the

current condition in the long term. Because of more hazardous desired conditions, Alternatives 1B and 5 would increase the overall hazard above the current levels in the long term. For the Payette, overall hazard increases for all alternatives. This is different from the Boise because the Forest starts out with a far less hazardous condition, particularly in PVG 5. Alternatives 1B and 5 produce the greatest hazard in these areas over the long term.

Cumulative Effects

Noxious weeds do not recognize political or administrative boundaries. Effective management must involve all affected parties including local, regional, state and other federal agencies, public land users, industry, and private landowners. Idaho finalized a state strategic plan for managing noxious weeds in 1999 (ISDA 1999). The purpose of the plan is two fold: 1) to heighten the awareness among all citizens of the degradation brought to Idaho lands and waters by the explosive spread of nonnative weeds, and 2) to bring about greater statewide coordination, cooperation and action that will successfully halt the spread and restore infested lands to a healthy and productive condition. The plan recommends the statewide formation of Cooperative Weed Management Areas and Integrated Weed Management practices.

The establishment of Coordinated Weed Management Areas (CWMAs) and their level of cooperation and coordination will play a significant role in how effective Forest Plan Alternatives will be in the prevention, eradication, containment, and control of noxious weeds. Three CWMAs have already been established and three more are currently being proposed. The Upper Payette and Salmon CWMAs have been very effective in their initial stages. The management ability of multiple agencies and private ownerships will, in part, be dependent on the amount of flexibility available for Integrated Weed Management. Alternatives 2 and 3 will provide the greatest opportunity for flexibility. Alternative 4 and 6 will likely limit the number of new infestations, but will increase the levels and amount of coordination and logistics needed. As a result, these alternatives are more dependent on good communication and relationships, which come with potentially greater risks in accomplishing outcomes. Alternatives 1B and 5 rely more heavily on treatment and will likely cost more for implementation.

Looking at the three Forest's noxious weed influence to the broader scale of the ICBEMP Ecological Reporting Units, the following trends for the alternatives can be expected:

- Under all alternatives, the extent of the Forests' contribution of the five noxious weed species to the Upper Snake, Central Idaho Mountains and Owyhee Uplands is expected to increase. The Central Idaho Mountains would see the greatest increases due to the significant potential rates of spread, proximity of noxious weed seed sources, and the amount of the landscape highly susceptible to invasion on the three Forests. Alternatives 3 and 7 are expected to provide the best opportunity for minimizing the extent of long-term exotic plant spread because of the short and long-term emphasis on vegetative community restoration and the potential greater range of treatment options. Alternatives 1B, 4, and 5 would see the greatest extent of contributions of exotics in the long term.

- Under all alternatives, perennial grasslands, sagebrush (on the Boise Forest and northern portion of Sawtooth) and PVGs 1, 2 and 5 will likely see the greatest expansion of the five noxious weeds analyzed after several decades. Alternatives 3, 4, and 6 will potentially see the least contributions in the forest vegetation groups over the long term (five deceades) because of the lowered risk of uncharacteristic wildfire. See the *Vegetation Hazard* section of this EIS and associated technical report for more detailed information. Alternatives 1B, 2, and 7 will see more risk to PVGs 2 and 5 due to the amount of acreage in moderate and high density condition and the amount of expected disturbance over the long term. These contributions will be most apparent on the Boise Forest and secondly on the Payette Forest. While Alternatives 4 and 6 have a reduced risk in the forested vegetation groups, they are ranked the highest for the non-forested vegetation communities. This risk is due to the increased number of sagebrush acres in the very high canopy closure class, creating the potential for greater burn severity and larger wildfires. Site recovery from high intensity fires can be a limited/slow process and creates an environment for greater weed cover (Goodwin et al. 2002, Asher et al. 1999). As result, post wildfire weed management costs will likely increase under these alternatives (4 and 6), particularly where noxious weeds are present. These contributions will be most apparent on the southern portion of the Boise Forest and most of the Sawtooth Forest.

See also the cumulative effects in the *Vegetation Diversity* section for an assessment of effects on non-forested vegetation at the Ecological Reporting Unit scale