Gold Crown Hazardous Fuels Reduction Project

Noxious Weeds Report

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Introduction

This report discusses the environmental effects of implementation of the Gold Crown Hazardous Fuels Reduction Project on noxious weeds. A summary of this report is included in the environmental assessment as part of the Affected Environment and Environmental Consequences section.

The Forest Service Handbook (FSH 3409) defines a strategy for managing pests, including noxious weeds, as "a decision-making and action process incorporating biological, economic and environmental evaluation of pest-host systems to manage pest populations" (FSH 3409.11, 6/86). This strategy is termed Integrated Pest Management (IPM).

The overall IPNF strategy is to contain weeds in currently infested areas and to prevent the spread of weeds to susceptible but generally uninfested areas. The 1989 IPNF Weed Pest Management EIS describes the strategy. Weed management activities in the district are guided by the Sandpoint Noxious Weed Control Project EIS (USDA 1998).

Noxious weeds are those plant species that have been officially designated as such by federal, State or county officials. In Weeds of the West by Whitson et al. (1991), a weed is defined as "a plant that interferes with management objectives for a given area of land at a given point in time." The federal Noxious Weed Act of 1974 defines a noxious weed as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States or the public health" (P.L. 93-629).

The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species established or that may be introduced in the State which may render land unsuitable for agriculture, forestry, livestock, wildlife or other beneficial uses and is further designated as either a statewide or countywide noxious weed (Idaho Code 24 Chapter 22).

Both federal and state laws define weeds primarily in terms of interference with commodity uses of the land. However, the impacts of noxious weeds on non-commodity resources such as water quality, wildlife, and natural diversity are of increasing concern.

Regulatory Framework

Federal legislation, regulations, policy, and direction that require development and coordination of programs for the control of noxious weeds and evaluation of noxious weeds in the planning process include the following:

National Forest Management Act (NFMA) (1976)

National Environmental Policy Act (NEPA) (1969)

Forest Service Manual (Chapter 2080, as amended) (USDA 2001b)

Executive Order #13112 (1999)

IPNF Forest Plan (1987)

IPNF Weed Pest Management EIS (1989)

Sandpoint Ranger District Noxious Weed Control Project EIS (1998)

Existing Condition

Methodology

Information on current weed infestations and results of weed management in the project area is derived from records of previous weed treatments and from observations during field surveys for rare plants.

Documented Noxious Weed Infestations

Documented weed species in the project area include the following:

Species	Infestation Level*
spotted knapweed (*Centaurea maculosa* Lam.)	moderate
goatweed (*Hypericum perforatum* L.)	moderate
oxeye daisy (*Leucanthemum vulgare* L.)	low
meadow hawkweed (*Hieracium pratense* Tausch.)	low
orange hawkweed (*Hieracium aurantiacum* L.)	low
common tansy (*Tanacetum vulgare* L.)	low
sulfur cinquefoil (*Potentilla recta* L.)	low
Canada thistle (*Cirsium arvense* [L.] Scop.)	low

* A description of weed infestation levels is included in the project file

These species occur along Forest roads in the project area. Spotted knapweed and goatweed also occur in natural openings in the project area, but off-road weed infestation levels are generally low overall and are scattered.

Because spotted knapweed and goatweed occur off-road in areas proposed for treatment, they are of greater concern than roadside infestations that are being actively controlled. These two species will be discussed in more detail.

Noxious Weed Species of Concern in the Project Area

*Spotted Knapweed (*Centaurea maculosa *Lam.)*

Spotted knapweed is native to Eastern Europe. It was introduced to North America, probably as a contaminant in alfalfa seed and/or ships' ballast, in the late 1800s (Maddox 1979, Ochsmann 2001, Roche et al. 1986). In 1920, its distribution was limited to the San Juan Islands in Washington. By 1980, it had spread to 48 counties in the Pacific Northwest, and by 1998 its known range included every county in Washington, Idaho, Montana and Wyoming (Sheley et al. 1998).

Spotted knapweed is a perennial species that reproduces almost entirely from seed, although some plants extend lateral shoots below the soil surface that form new rosettes. It establishes and dominates on dry, disturbed sites, especially along roads (Roche et al. 1986). It also invades relatively undisturbed perennial native plant communities in the northern intermountain region (DiTomaso 2000).

Most studies of spotted knapweed to date have focused on its dominance of native grasslands and/or prairies (Tyser and Key 1988, LeJeune and Seastedt 2001, Ridenour and Callaway 2001).

Much of spotted knapweed's dominance over native species in those habitats may be attributed in part to root allelopathy (Ridenour and Callaway 2001). Increased availability of nitrogen in what were historically nitrogen-limited habitats that favored native grass species, and the resulting creation of phosphorus and other resource limitations in grassland soils, may also be a factor in spotted knapweed's success in grassland habitats (LeJeune and Seastedt 2001). LeJeune and Seastedt (2001) hypothesize that manipulation of soil resource availability with traditional techniques such as fire can affect the dominance of invasive species such as Centaurea in grassland habitats.

In contrast, the Gold Crown project area is largely dominated by mesic to dry forested habitats with a high shrub component. Non-forested habitats comprise a small portion of the project area (see Vegetation section of the EA). While the behavior of spotted knapweed in open grassland habitats may be mostly influenced by the above biotic factors, in forested habitats tree and shrub layer canopy cover is likely a major limiting factor.

Knapweed seeds are able to germinate under full canopy, but mature plants are uncommon in shaded areas (Watson and Renney 1974); it is typically found in open canopies, sometimes up to 20 percent but most often under canopy cover of five percent or less (Allen and Hansen 1999). Both tree and shrub canopy cover have been observed to affect the abundance of spotted knapweed in forested habitats similar to those in the Gold Crown project area (Hammet personal observations 1999-2005).

One study considered the effects of spotted and diffuse knapweed on the growth of confer seedlings in a montane forest in southern interior British Columbia (Powell et al. 1997). The results of the study were that abundant knapweed growth did not negatively impact conifer growth and survival during the three-year study period. While Powell et al. (1997) concluded that the lack of effects to conifer seedling growth was likely due to abundant moisture levels during the study period, only the interaction between conifer seedlings and knapweed was measured - all other vegetation had been removed from the site and was cleared every season (Powell et al. 1997). Other site variables such as availability of light were therefore not considered.

The habitats in which spotted knapweed now occurs had historical fire regimes of relatively frequent, low-severity surface fires to mixed-severity fires. Spotted knapweed established in most of these habitats after fire exclusion began, so it is unclear how historical fire regimes might affect spotted knapweed or how spotted knapweed may affect these fire regimes (Fire Effects Information System 2008).

Low-severity fire typically does not kill spotted knapweed plants or seeds (Sheley and Roche 1982). According to LeJeune and Seastedt (2001), low-severity fires in grasslands may increase the availability of nutrients that would allow native species to successfully compete with spotted knapweed. Although severe burns may reduce germination of spotted knapweed seeds (Abella and MacDonald 2000), severe wildfire would probably favor expansion of knapweed by creating widespread areas of bare soil and increasing the amount of sunlight that reaches the ground surface (Arno 1999, Sheley et al. 1999). Spotted knapweed infestations have been associated with reductions in forage production (Harris and Cranston 1979), plant species richness and diversity (Tyser 1990), soil fertility (Harvey and Nowierski 1989, Olson 1999) and wildlife habitat (Bedunah and Carpenter 1989), as well as increases in surface water runoff and stream sedimentation (Lacey et al. 1989).

*Goatweed (*Hypericum perforatum *L.)*

Goatweed (also known as St. Johnswort) is native to Europe, western Asia and North Africa. It was likely introduced to North America multiple times (Maron et al. 2004). The first recorded occurrence of the species in North America was from Pennsylvania in 1793; by the early 1900s it was established in many western states (Sampson and Parker 1930). Goatweed population levels were dramatically reduced following a successful biological control program begun in the 1940s in heavily infested regions of the western United States (Tisdale 1976).

Goatweed is a perennial species that reproduces both by seed and by often extensive lateral root growth that produces additional aerial crowns. In forested areas, it is commonly associated with disturbances such as roads, logging, grazing and fire. Where it occurs in forest zones in Idaho, it is abundant only in small, localized areas in naturally open ponderosa pine stands or where tree cover has been greatly reduced by logging, fire or other disturbance (Tisdale et al. 1959). Several studies suggest that goatweed requires abundant light for best development. In one study, plants subjected to 50 percent of full daylight almost all died after 15 days (Sampson and Parker 1930). More recent studies corroborate those findings (Parendes and Jones 2000). Both tree and shrub canopy cover have been observed to affect the abundance of goatweed in forested habitats similar to those in the Gold Crown project area (Hammet personal observations 1999-2005).

The historic fire regimes of habitats in which goatweed occurs range from relatively infrequent, high-severity fires in wet forest types to high-frequency, low-severity fires in ponderosa pine forests. The species established in most of these habitats after fire exclusion began, so it is unclear how historical fire regimes might affect goatweed or how goatweed may affect these fire regimes (Fire Effects Information System 2008).

While it is generally purported that fire encourages establishment, vegetative spread and increased density of goatweed patches (Campbell and Delfosse 1984), the variation in the species' response to fire from study to study may reflect differences in plant community type, fire size and severity and/or season of burning. One 1975 study in north Idaho did not show any obvious changes in goatweed infestations following spring burning of brush-covered slopes and seeding with non-native herbaceous species. Goatweed seedlings are susceptible to competition from other species; multiple stresses such as defoliation by biological control agents and fire may also cause reductions in crown density of mature plants (Briese 1997).

Goatweed is well known for its medicinal and other commodity uses. However, hypericin, a chemical constituent of goatweed, causes photosensitization in animals that consume it; the effects of poisoning can lead indirectly to death. Its impact on native plant communities may not be as great as earlier literature seems to indicate, perhaps due to the moderate success of biological control efforts over the last 60 years (Fire Effects Information System 2008). The most commonly described impacts are loss of forage production and carrying capacity on rangelands and losses from livestock poisoning (Ruggiero et al. 1991).

Current Weed Management Efforts

Forest roads and trails in the project area were identified in the Sandpoint Noxious Weed Project FEIS as Sites #32 and 33 (USDA 1998a). Forest Road 2642 was first treated for noxious weeds in 1999; follow-up treatments have occurred since that year. Gold Hill trail was first treated in 1999 (spot spraying with a backpack sprayer); follow-up spot treatments with a backpack sprayer have kept this trail relatively weed-free. Weed treatment records are in the project file.

Spotted knapweed and goatweed are considered naturalized in northern Idaho and, at least to some extent, in the project area. Management of these species will emphasize reducing infestation levels and slowing their rate of spread. Biological control agents for knapweed (*Metzneria paucipunctella, Urophora affinis* and *U. quadrifasciata*) are established in Idaho (Rees et al. 1996) and have been identified in the project area. The goatweed biological control agent *Chrysolina quadrigemina* was first released in the United States in 1946 and is now well-established in Idaho (Rees et al. 1996); it has been identified in the project area. Additional biological control agents for goatweed and knapweed may be released in the project area as appropriate.

Meadow and orange hawkweed, oxeye daisy, sulfur cinquefoil and Canada thistle are currently established but are not considered naturalized in the project area. They are largely confined to Forest roads in the project area. Infestations will be monitored and contained, with eradication where feasible.

Of major concern are potential new invaders (see project file) not yet documented in the project area. In accordance with guidelines in the Northern Region Overview (USDA 1999), management priorities emphasize identification and eradication of tansy ragwort, leafy spurge and yellow starthistle. Some additional weed species listed as noxious in Bonner County and recorded as occurring there have not yet been documented in the project area. These species would be a high priority for eradication if any individuals were observed during operations or monitoring in the project area.

The inclusion of weed treatment and prevention practices in timber sale contracts since 1998 and increased funding for weed treatment have increased the likelihood of success in containing and reducing weed infestations throughout the district.

Environmental Consequences

Methodology

Analysis was conducted based on current distribution of weed species in habitats similar to those found in the proposed treatment areas and on the types of proposed project activities. The estimation of risk of weed spread and introduction of new weed invaders from the proposed activity is based on peer-reviewed literature, experience in the project area and on similar sites in the IPNF, and professional judgment.

Effects of proposed actions on noxious weed spread are based on the amount of canopy removal and on the predicted amount of soil and/or understory vegetation disturbance. Where harvest would be helicopter-based, there would be less ground disturbance than with ground-based logging. Therefore, the risk of weed spread would be lower than where ground-based logging would occur. In addition, regeneration harvests increase the risk of weed spread through significant canopy reduction, while other harvest types typically remove less canopy, with a lower risk of weed spread.

The cumulative effects analysis area describes the area beyond which effects of the proposed project cannot be detected. Determination of the cumulative effects area for weeds considered the extent of currently documented weed infestations and likely seed dispersal distances. While patterns of dispersal are not known with certainty for many plant species, in studies of *Botrychium virginianum* most spores fell within three meters of the source plant (Peck et al.

1990). Noxious weed species' seeds that are heavier than *Botrychium* spores might be assumed to have similar if not more restricted dispersal patterns. Transport of weed seeds out of the project area is possible, with occasional transport over long distances (such as on vehicles). However, it would be difficult to predict the extent of such long-distance dispersal. It is likely that most seeds of noxious weeds would fall close to the parent plant.

In addition, road systems and lands adjacent to the project area have noxious weed infestations similar in composition and distribution to those in the project area, so transport of weed seeds to these lands from the project area would have little additional impact. For these reasons, the cumulative effects analysis area for noxious weeds is the project area.

Cumulative effects with regard to noxious weeds from proposed activities are generally described as very low, low, moderate or high, with the following definitions:

- *very low* = no measurable effect on existing weed infestations or susceptible habitat
- *low* = existing weed infestations and/or susceptible habitat not likely affected
- *moderate* = existing weed infestations or susceptible habitat affected, with the potential for expansion into uninfested areas and/or establishment of new invaders
- *high* = weed infestations and/or susceptible habitat affected, with a high likelihood of expansion into uninfested areas and/or establishment of new invaders.

The period for measuring short-term cumulative effects to noxious weeds and susceptible habitat is ten years following completion of the proposed activities, or, in the event of selection of the No Action Alternative, ten years after the date of the signing of the Decision Notice and FONSI. The ten-year period is based on the expected recovery and/or establishment of desired species in disturbed areas. Long-term effects to noxious weeds from loss of canopy cover are addressed below.

The following past, current, ongoing and reasonably foreseeable events apply to the cumulative effects analysis for noxious weeds:

Past Activities and Events

- Large wildfires (1922, 1926-1931)
- Timber harvest on NFS lands
- Mining activities on NFS lands
- Timber harvest on other ownership lands
- Road and trail construction
- Development on private lands
- Wildfire suppression

Current and Ongoing Activities

- Road and trail maintenance
- Wildfire suppression
- Defensible space projects on private lands
- Development on private lands

Reasonably Foreseeable Actions

- Noxious weeds monitoring and treatment

Mitigation and Monitoring

Required Mitigation

The Issues and Alternatives chapter of the environmental assessment includes the following required mitigation for noxious weeds:

- Noxious weed treatment would be conducted according to guidelines and priorities established in the Sandpoint Noxious Weed Control Project FEIS (USDA 1998a). Methods of control may include biological, chemical, mechanical and cultural. Follow-up treatments and monitoring would be conducted as needed.
- Gravel or borrow pits to be used during road construction or reconstruction would be free of new weed invader species (as defined by the IPNF Weed Specialist). A list of weed species considered to be potential new invaders is included in the project file.
- Any priority weed species (as defined by the IPNF Weed Specialist) identified during road maintenance would be reported to the District Weed Specialist. A list of priority weed species is included in the project file.
- Weed treatment of all haul routes, service landings and helicopter landings on National Forest lands would occur prior to ground disturbing activities where feasible. If the timing of ground disturbing activities would not allow weed treatment to occur when it would be most effective, it would occur in the next treatment season following the disturbance.
- All timber sale contracts would require cleaning of off-road equipment prior to entry onto National Forest lands. If operations occur in areas infested with new invaders (as defined by the IPNF Weed Specialist), all equipment would be cleaned prior to leaving the site.
- All newly constructed roads, skid trails, landings, fuel breaks or other areas of disturbance (including maintenance on existing roads) would be seeded with a weed-free native and desired non-native seed mix and fertilized as necessary. Areas that are underburned would be evaluated after the burn and seeded and fertilized as necessary.
- All straw or hay used for mulching or watershed restoration activities would be certified weed-free.
- Road segments identified for weed treatment and proposed for decommissioning would be treated prior to decommissioning.

Estimated Effectiveness

The above mitigation measures are accepted weed prevention practices developed by public land management agencies and university cooperative extension offices and promoted by weed management organizations across the nation (e.g. Sheley et al. 2002, Drlik et al. 1998, USDA 2001a). The above measures include those required in Forest Service Manual (FSM) 2080 for activities related to timber harvest and roads. They are described in FSM 2981.2- 1a and FSM 2081.2 - 6a, respectively (see project file). Also included are weed prevention practices recommended but not required (see project file).

For new weed invaders, the estimated effectiveness of the above measures is high; the measures are expected to be very effective at preventing establishment of new invaders. According to current research (Hobbs and Humphries 1995), early detection and treatment of infestations before explosive spread occurs can significantly reduce the social cost of weed invasions.

For existing infestations that occur along road rights-of-way, estimated effectiveness is moderate; the measures are expected to be somewhat effective at reducing the spread of these in the project area. For existing infestations that have spread off the road, estimated effectiveness is low. Effectiveness of treatments on National Forest lands could be reduced if adjacent landowners do not treat their weed infestations. Existing weeds and new invaders are also spread by wildlife, winds, water and hikers – the mitigation measures would have no effect on these sources of weed spread.

Required Monitoring

In addition to mitigation, Chapter 2 of the environmental assessment contains required monitoring.

IPNF Forest Plan Monitoring

According to the Forest Plan, "many noxious weed species (knapweed, goatweed, thistle, tansy, etc.) are widespread, and…major programs to eradicate such species are not possible within expected budget levels". IPNF direction is to give priority to small infestations of "species new to an area, where moderate control actions have a good chance of preventing the establishment of new problems." Noxious weed control will be based on an integrated pest management approach.

Project Monitoring

Pretreatment of roads and equipment as proposed (Features Common to All Action Alternatives) would be documented on sale inspection reports. The effectiveness of seeding disturbed areas would be evaluated upon completion of the activity. Treated areas would be surveyed and monitored according to treatment priorities established in the Sandpoint Noxious Weed Control Project FEIS.

Effects Common to Alternatives A and B

Direct and Indirect Effects

With implementation of either alternative, seeds from any weeds on private and Forest roads in the project area may still be transported within and out of the area by vehicles, people, birds, and wildlife. Untreated weed infestations on private lands in the project area could spread to public lands.

Cumulative Effects

Existing Infestations

Cumulative effects with regard to existing weed infestations are expected to be low to moderate under both alternatives, considering the following:

Past Activities and Events

Past wildfires, mining activities, timber harvest and road and trail construction provided areas of disturbance of soil, vegetation and canopy cover for invasion by non-native plant species, including noxious weeds. Because of inadequate past weed prevention and control practices, the effects of these activities on noxious weed spread are still evident.

The loss of tree canopy cover from past timber harvest may have been a factor affecting weed spread in the project area. As the tree canopy in open stands closes, shade-intolerant weeds will, over the long term, be displaced. This process could take another 20-30 years or more. In areas with a high shrub component, recovery of the shrub canopy layer has been much quicker to affect the density of offroad noxious weed infestations in the project area (see the above discussion of the effects of canopy cover on spotted knapweed and goatweed).

Current and Ongoing Activities

Road maintenance activities may result in ground disturbance that would be conducive to the spread of existing weed populations. The current levels of weed treatment and monitoring on Forest Service roads in the project area would reduce the risk of weed spread from these activities.

New Invaders

Under both alternatives, cumulative effects with regard to new invaders are expected to be low when combined with all of the above past, current, ongoing, and reasonably foreseeable actions. Under Alternative A, because no new disturbance would occur, and because current treatment and monitoring would continue, no new invaders would be expected to become established. Under Alternative B, because of mitigation measures designed to detect and eradicate new invaders, no new invaders are expected to become established.

Alternative A – No Action

Direct and Indirect Effects

Under this alternative, there would be no change from current management activities in the project area. Because there would be no new road construction, timber harvest or underburning, the risk of weed spread would not change from current levels. Indirectly, however, the continued increase in fuel loading could increase the risk of weed spread in the context of a higher risk of stand-replacing fires (see Fire/Fuels section of the EA).

Cumulative Effects

When combined with the following past, current and ongoing activities and events, the No Action alternative has potential cumulative effects on the spread of noxious weeds that differ from those of the proposed action, as discussed below. All other cumulative effects of Alternative A are described above under Cumulative Effects Common to Alternatives A and B.

Past Activities and Events

Past wildfire suppression in the project area has increased the risk of severe, stand-replacing fires. Implementation of the No Action alternative would not address these accumulated fuels in the project area. The risk of severe, stand replacing fires would be higher under this alternative than under proposed action. There would therefore be a higher risk of widespread vegetation and/or soil disturbance, which would cause an increased risk of weed spread and introduction across the project area.

Ongoing Activities

Ongoing wildfire suppression in the project area would increase the probability of severe stand-replacing fires. Implementation of the No Action alternative would contribute to the continued accumulation of fuels in the project area. As fuels continue to accumulate, the probability of severe stand-replacing fires, and the resulting widespread vegetation and/or soil disturbance, would lead to an increased risk of weed spread and introduction across the project area.

Reasonably Foreseeable Actions

Noxious weed treatment and monitoring would follow guidelines and priorities established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). Treatment of Forest roads in the project area would likely continue to protect previous investments. If appropriated funding is available, biological control agents may be released in off-road knapweed and goatweed infestations in the project area. However, no Knutsen-Vandenberg (KV) funding would be available for any weed treatment.

In the short term, the No Action alternative would contribute a low level of cumulative effects to the risk of weed spread. Over the long term, implementation of this alternative would further increase the risk of severe stand-replacing fires. Should such a fire occur, it would likely cause existing infestations to spread to previously uninfested areas. It would also provide the disturbance that would allow dormant weed seeds in the soil to germinate. However, the occurrence and intensity of a future wildfire in the project area is difficult to predict.

Alternative B – Proposed Action

Direct and Indirect Effects

Because the proposed action includes both timber harvest and construction of new temporary and permanent roads, there is a greater risk of weed spread than with the No Action alternative. The risks and potential for direct and indirect effects on weed spread associated with proposed activities are discussed below.

Risk of Weed Spread from Project Activities

Implementation of 207 acres of regeneration harvest, 129 acres of commercial thinning, 213 acres of thinning with group selection, six acres of overstory removal and 11 acres of harvest in rock outcrops would increase the risk of weed spread to varying degrees. Approximately six acres along Gold Hill Trail would be thinned by hand, with a low risk of weed spread.

Approximately 65 acres would be logged by helicopter, which causes the least amount of ground disturbance and therefore carries a low risk of weed spread. Approximately 238 acres would be skyline-harvested, which creates a small amount of ground disturbance in corridors and thus has a higher risk of weed spread than helicopter logging. Tractor logging (including tractor, tractor with line pulling, tractor swing and cut-to-length) causes the most ground disturbance and thus carries a higher risk of weed spread than either helicopter or skyline logging; this type of harvest would occur on about 264 acres.

Following timber harvest, approximately 263 acres would be broadcast burned to treat fuels, while 227 acres would be machine piled (either grapple piling or excavator piling). Yarding of unmerchantable material (YUM) would occur on 42 acres, and a combination of broadcast burn/YUM would occur on 22 acres. Approximately six acres would be hand piled, while 13 acres would require no fuels treatment.

Underburning would produce vegetation disturbance that might lead to a spread of spotted knapweed and goatweed (but see the discussion above concerning the predicted response of native understory shrubs in shrub-dominated forest stands). Machine piling would produce ground disturbance that would be conducive to the spread of these two weed species. Required mitigation as proposed in Chapter 2 would reduce but would not eliminate this risk. Yarding of unmerchantable material would create less ground disturbance than underburning or machine piling, and hand piling would pose no risk of weed spread, since no ground disturbance would occur.

Construction of 2.2 miles of new permanent road and 0.13 mile of new temporary road would create disturbance conducive to weed introduction and spread. Required mitigation as proposed in Chapter 2 would reduce but would not eliminate this risk. The new temporary road would be decommissioned following completion of project activities. This activity could also pose a risk of weed spread. Preventive seeding and monitoring after road decommissioning would reduce but would not eliminate the risk of weed spread.

Expected Direct and Indirect Effects of Project Activities

Existing Weed Infestations Confined to Roads in the Project Area - Oxeye daisy in particular tends to increase with expansion of canopy openings (Hammet and Klarich 1996 personal observation). However, because it occurs at low levels in the project area, is largely confined to road rights-of-way and is being actively controlled, potential for spread of this species from project activities associated with canopy removal would be low under the proposed action. For the same reasons, and given the required mitigation described in Chapter 2, the isolated infestations of sulfur cinquefoil, Canada thistle, common tansy and hawkweeds would also not be expected to spread.

Existing Weed Infestations Occurring Off-Road in the Project Area - The risk of weed spread in areas proposed for underburning would vary for different plant communities. Those dry areas where shrub species are predicted to dominate may be at lower risk, while dry grass and forb-dominated communities may be at higher risk for weed invasion, depending on the season and severity of the burn in each community type. For example, ninebark sprouts vigorously following a fire and has been found to be more abundant on burned than unburned locations (Noste and Bushey 1987). Recovery of the brush component will eventually shade out many weed species, especially goatweed (Fire Effects Information System 2008).

Goatweed and spotted knapweed occur in the project area in both previously disturbed and undisturbed habitats. Both may increase, at least temporarily, in some areas following harvest and fuels treatment activities. This may be due not to invasion from adjacent infestations but to germination from seed already present in the soil (Fire Effects Information System 2008). Harris and Gill (1997) suggest that when a pine plantation (or forest) reaches stand closure, goatweed may disappear from aboveground vegetation, but remain as seed in the soil seed bank. When fire or other disturbance occurs in such sites, the species may establish from seed as part of the initial postfire community.

Experimental evidence suggests that spotted knapweed gains dominance in part by its ability to outcompete native grasses for nutrients (Fire Effects Information System 2008). Other evidence suggests that as succession proceeds and nutrients become less available, the competitive advantage shifts back to native plants such as bluebunch wheatgrass (*Pseudoregneria spicata*) (Fire Effects Information System 2008).

Season of burning may affect these species' response to fire. In one study of goatweed's response to burning, the native grass and forb component remained dominant in prescribed burn areas following a fall burn, because goatweed seedlings are poor competitors (Briese 1996). In a study of fall burning versus spring burning on spotted knapweed in western Montana, the knapweed volume doubled two years following a fall burn but was not recorded before or after a spring burn of lesser intensity on an adjacent site (Noste 1982).

While both species are considered naturalized in the western states and are not likely to be eradicated, their effects on other resources can be reduced by integrated practices such as biological and chemical control. The re-establishment of desired species following disturbance can also reduce the incidence of spread of goatweed and knapweed. As stated above, goatweed seedlings are poor competitors; spotted knapweed is also outcompeted by some desired non-native species such as "Durar" hard fescue (*Festuca trachyphylla*) and "Covar" sheep fescue (*Festuca ovina*) (Harrison et al. 1996). Both of these grass species are often included in seed mixes for disturbed sites.

Summary of Expected Direct and Indirect Effects

Based on past monitoring (see project file), successful weed treatment would remove the majority of new seed source for existing weed infestations, which occurs on roadsides, and would slow the spread of existing weed infestations within the project area.

Preventive seeding of native and desired nonnative species in areas of new disturbance would reduce the risk of weed spread. Continued treatment of existing weeds along haul routes on NFS lands would also reduce the risk of weed spread. Contract requirements to clean off-road harvest equipment prior to entry into the sale area would further reduce the risk of introduction of weeds. The risk of introduction and establishment of new weed invaders to the project area is expected to be low with implementation of the required mitigation.

Weed prevention and treatment measures would reduce but not eliminate the potential for spread of goatweed and knapweed within the project area.

Cumulative Effects

This section describes the cumulative effects that are expected with implementation of the proposed action. All other cumulative effects of this alternative are described under Cumulative Effects Common to Alternatives A and B.

Proposed Activities under Alternative B

Short-term cumulative effects regarding susceptibility to weeds would be associated with ground disturbing activities proposed under this alternative. Proposed mitigation (see Chapter 2 - Features Designed to Prevent the Spread of Noxious Weeds) would reduce but not eliminate the risk. Over the long term, the loss of tree canopy cover from implementing the proposed activities is considered temporary. As tree canopy closes, susceptibility of areas proposed for harvest and/or underburning would decrease. This process could take 40-50 years. In areas with a high shrub component, recovery of the shrub canopy layer would be much quicker. For example, Merrill (1982) found that twig densities on ninebark increased through the third postfire growing season and that shrub heights on burned and unburned sites were equal by the fourth season.

Proposed treatment of existing infestations on haul routes with approved herbicides and preventive seeding and monitoring on skid trails (see Chapter 2 - Features Designed to Prevent the Spread of Noxious Weeds), would greatly reduce the risk of transporting goatweed and spotted knapweed off-site.

Pre-treatment of any new weed infestations on the temporary roads proposed for decommissioning followed by preventive seeding would reduce the risk of further spread over time to current levels. In addition, newly decommissioned roads would be monitored to detect new weed invaders and to assess the success of preventive measures. Without the recurring disturbance of road maintenance and use, and with increasing canopy coverage of desired species, risk of weed spread on the decommissioned road would decline to below the level for open or gated roads.

Past Activities and Events

Past wildfire suppression in the project area has increased the risk of severe stand-replacing fires (see Fire/Fuels section of the EA). The proposed treatments under Alternative B would reduce the current fuel loading, thereby reducing the risk of widespread wildfire disturbance conducive to weed spread.

Current and Ongoing Activities

While wildfire suppression in the project area would continue in order to protect multiple resource values, the proposed action would, to some degree, increase the ability to safely use prescribed fire and periodically reduce fuel loads and to suppress an unwanted wildfire (see Fire/Fuels section of the EA). When combined with the proposed action, ongoing wildfire suppression would decrease the probability of severe, stand-replacing fires. There may be a lower risk of widespread, severe disturbance of vegetation, soil and tree canopy than under the No Action alternative.

Reasonably Foreseeable Actions

Noxious weed treatment and monitoring would follow guidelines established in the Sandpoint Noxious Weeds Control Project EIS (USDA 1998a). Mitigation measures to reduce the risk of weed spread from project activities would complement past investments in weed management made by the Forest Service on roads in the project area. Forest roads to be used for hauling during implementation of the project would be treated as needed. In addition, Knutsen-Vandenberg (KV) funding from proceeds of the timber sale may be available to supplement appropriated funding for release of biological control agents in offroad infestations of spotted knapweed and goatweed.

Weed treatment activities would be successful in controlling goatweed and spotted knapweed along road prisms, but in the short-term would not have a significant effect on these species where they occur away from Forest roads. These two species are considered naturalized in the project area, and would not be eradicated by weed treatment efforts.

The short-term management goal for goatweed and spotted knapweed is to reduce the risk of seed and plant parts being transported out of the project area. The long-term goal is to reduce the size of infestations and slow the rate of spread within the project area. Based on past monitoring (see project file), continued treatment of existing infestations on roads in the project area would greatly reduce the risk of transporting these species off-site.

Determination of Cumulative Effects

When combined with all of the above activities, cumulative effects under the proposed action with regard to existing weed infestations are expected to be low for oxeye daisy, meadow hawkweed and Canada thistle, based on their current levels of infestation.

Cumulative effects for spotted knapweed and goatweed would likely be moderate, given their current levels of infestation. Off-road infestations of spotted knapweed and common goatweed would be expected to persist, since these species are considered to be naturalized in the project area. Treatment of off-road infestations with biological control agents may reduce the size of the infestations but would not eliminate them. Cumulative impacts to suitable habitat for this species would be low to moderate.

Compliance with the Forest Plan and Other Regulatory Direction

According to Forest Plan (USDA 1987) direction, infestations of many noxious weed species, including knapweed, goatweed and common tansy, are so widespread that control would require major programs that are not possible within expected budget levels (Forest Plan, p. II-7). Forest Plan direction is to "provide moderate control actions to prevent new weed species from becoming established". The No Action alternative meets Forest Plan direction by not creating disturbance conducive to new noxious weed invasions or spread of existing weed populations. Alternative B meets Forest Plan direction by providing moderate control actions through project design, as required by the Forest Plan, to prevent new weed species from becoming established. It should be noted that, since the Forest Plan was implemented in 1987, the issue of weed infestations on national forest lands has evolved to encompass broader issues of native ecosystem integrity and the effects to non-commodity resources and ecosystem processes. The forest plan revision process will consider the increased emphasis on weed management.

Mitigation measures described in Chapter 2 to reduce the risk of weed spread (See Features Designed to Prevent the Spread of Noxious Weeds) are as required in Forest Service Manual Chapter 2080, as amended (USDA 2001b). In addition, several recommended, but not required, practices related to roads and timber harvest activities are included (see Chapter 2). FSM requirements and regulations related to noxious weeds are included in the project file.

According to Executive Order #13112 (1999), "Federal agencies whose actions may affect the status of invasive species, shall, to the extent practicable and permitted by law, identify such actions; subject to the availability of appropriations and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and not authorize, fund or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species…unless…the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

At the project level, noxious weeds have been identified and weed prevention measures incorporated into the proposed action. The potential for weed spread was disclosed for the proposed action. In addition, the consequences of failure to implement the proposed action with regard to the risk of widespread weed invasion in the aftermath of a severe, stand-replacing fire were analyzed.

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