Noxious Weeds

Introduction

In 2003, the Chief of Forest Service identified invasive weed species (noxious weeds) as one of four critical threats to the Nation's ecosystems. Invasive species can be aggressive invaders of native plant communities and are capable of dominating native habitat types, excluding native vegetation and reducing diversity and productivity of native plant species and communities. On National Forest System lands as of 1999, an estimated 6 to 7 million acres were infested with weeds, with infestations potentially increasing at a rate of 8-12 percent per year (USDA-FS 1999).

Around this time it was recognized that the Sierra Nevada was relatively free of noxious weeds but was at risk. The SNFPA added Noxious Weeds as one of five "problem areas" with an urgent need for new land management direction for the 11 Sierra Nevada National Forests (USDA-FS 2001, 2004a). In 1998, the SNF was a founding member of the Sierra-San Joaquin Noxious Weed Alliance, a Weed Management Area for Fresno, Madera and Mariposa counties. Also in 1998, in response to concern over rapid spread of noxious weeds (especially yellow starthistle), the SNF began to implement a strong integrated weed management program focused on prevention, education and early detection/rapid response as directed in the Forest Service Manual (FSM 2081.2). A significant overriding theme for the SNF and environs is the fact that most of the land base in the Forest is still not yet infested with noxious weeds. This is especially true at higher elevations of the Sierra Nevada in general (Botti 2001) and the SNF in particular.

Invasive weeds are spread in a variety of ways: vehicles, heavy equipment, bicycles and hikers' shoes and gear are just some of the vectors related to humans. Wildlife, water and wind are also factors. Motorized recreational vehicles contribute to the introduction and spread of noxious weed species by creating suitable environmental conditions for establishment and by acting as major vectors for spread as well as by physically bringing weed propagules to the forest (Trombulak and Frissell 2000).

This section describes the affected environment and environmental consequences for invasive plant species (weeds). It describes the area potentially affected by the alternatives and existing resource conditions within that area. Measurement indicators are used to describe the existing conditions for the forest. The measurement indicators are then used in the analysis to compare effects of the alternatives and to describe how well the proposed action and alternatives meet the project objectives and address concerns about noxious weed introduction and spread.

Regulatory Framework

The State and Federal laws, Forest Service direction and other regulatory direction that is relevant to the management and prevention of noxious weeds applicable to this project include:

FSM 2081.03 requires that a weed risk assessment be conducted when any ground disturbing activity is proposed and that the level of risk of introducing or spreading noxious weeds associated with the proposed action be disclosed and addressed. Projects having moderate to high risk of introducing or spreading noxious weeds must identify noxious weed control measures that must be undertaken during project implementation.

Executive Order 13112 of Feb. 3, 1999 directs Federal agencies to prevent the introduction of invasive species; to detect and respond rapidly to and control such species; to 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.

Sierra Nevada Forest Plan Amendment (USDA-FS 2004a). Standards and Guidelines for Noxious Weed Management relevant to the Travel Management DEIS are listed below (There was no noxious weed management direction in the original 1991 Forest Land and Resource Management Plan):

- Inform forest users, local agencies, special use permittees, groups and organizations in communities near National Forests about noxious weed prevention and management.
- Work cooperatively with California and Nevada State agencies and individual counties (for example, Cooperative Weed Management Areas) to: (1) prevent the introduction and establishment of noxious weed infestations and (2) control existing infestations.
- As part of project planning, conduct a noxious weed risk assessment to determine risks for weed spread (high, moderate or low) associated with different types of proposed management activities. Refer to weed prevention practices in the Regional Noxious Weed Management Strategy to develop mitigation measures for high and moderate risk activities.
- When recommended in project-level noxious weed risk assessments, consider requiring off-road equipment and vehicles (both Forest Service and contracted) used for project implementation to be weed free. Refer to weed prevention practices in the Regional Noxious Weed Management Strategy.
- Minimize weed spread by incorporating weed prevention and control measures into ongoing management or maintenance activities that involve ground disturbance or the possibility of spreading weeds. Refer to weed prevention practices in the Regional Noxious Weed Management Strategy.
- Conduct follow-up inspections of ground disturbing activities to ensure adherence to the Regional Noxious Weed Management Strategy.
- Encourage use of certified weed free hay and straw. Cooperate with other agencies and the public in developing a certification program for weed free hay and straw. Phase in the program as certified weed free hay and straw becomes available. This standard and guideline applies to pack and saddle stock used by the public, livestock permittees, outfitter guide permittees and local, State and Federal agencies.
- Include weed prevention measures, as necessary, when amending or re-issuing permits (including, but not limited to, livestock grazing, special uses and pack stock operator permits).
- As outlined in the Regional Noxious Weed Management Strategy, when new, small weed infestations are detected, emphasize eradication of these infestations while providing for the safety of field personnel.
- Routinely monitor noxious weed control projects to determine success and to evaluate the need for follow-up treatments or different control methods. Monitor known weed infestations, as appropriate, to determine changes in weed population density and rate of spread.

Many of these standards and guidelines refer to the “Regional Noxious Weed Management Strategy” which incorporates by reference the following document: USDA Forest Service Guide to Noxious Weed Prevention Practices, available on the Web at the following link:

http://www.fs.fed.us/invasivespecies/documents/FS_WeedBMP_2001.pdf

Effects Analysis Methodology

The approach to this analysis involved compiling known information (historical data) on weed species of concern to the SNF (Clines 2008; Tuitele-Lewis 2008), conducting field surveys of routes and use areas proposed for the various alternatives and using these data sources to develop project mitigation measures for routes going through or near noxious weed infestations as well as to compare the effects of the alternatives.

Noxious weed species considered in this analysis are listed in Table 153 in the Affected Environment section below. The species being considered are invasive non-native plants that possess one or more of the characteristics of a noxious weed and are undesirable on SNF lands. Based on Executive Order 13112, issued in 1999, a species is considered invasive if it: a) is non-native to the ecosystem under consideration and b) its introduction causes or is likely to cause economic or environmental harm or harm to human health (USDA-FS 2004b). This analysis focuses on plants known to occur on or near the SNF that are listed as noxious by the California Department of Food and Agriculture (CDFA, 2008) or have been placed on the list of wildland weeds published by the California Invasive Plant Council (Cal-IPC 2008).

All of the weed species identified on the SNF are of concern with regard to their potential to spread and damage native ecosystems; however, the SNF has prioritized certain weed species for surveying, monitoring and treatment due to their observed level of invasiveness and effects to local ecosystems. Species that are rated ‘A’ or ‘B’ by CDFA and/or Cal-IPC species rated as high or moderate priority are rated as high priority species for the purposes of this analysis if they warrant it based on their behavior in the central Sierra Nevada. The potential for spread of these species coupled with the capability of motor vehicles to inadvertently spread such weeds would constitute a moderate or high risk with regard to the requirements of FSM 2081.03 (noxious weed risk assessments for NEPA decisions are to rate projects as low, medium or high risk for introduction and spread of noxious weeds and to implement project mitigation measures to reduce the risk for medium and high risk projects).

Assumptions specific to the noxious weed analysis

1. This project is a ground-disturbing activity requiring a weed risk assessment. This section constitutes the noxious weed risk assessment
2. It is assumed infestations will continue to be introduced to the SNF by a variety of means. Motor vehicles will bring weed seeds and propagative parts from home areas and other areas where they traveled through weed infestations.
3. Existing weed infestations will likely spread without control programs specifically intended to eliminate weeds along roads, routes and use areas. Rate of spread will be increased by vehicular activity. Infestations located along routes where vehicles drive will spread further along the route.
4. For this risk assessment, the following categories were assigned to individual proposed roads, trails and use areas to compare the risk of noxious weed spread or introduction among alternatives. These categories were assigned based on the following factors:
    a. The risk of spread was considered high if the species is known to be highly invasive and aggressive in the SNF and the infestation is within 200 feet of a route proposed for use in that particular alternative.
    b. Risk of spread is considered to be medium if known populations of noxious weeds do not occur directly along travel routes or occur on routes where travel is

prohibited. Also, if the species that occur are considered to be less invasive and already fairly well-distributed the risk of further explosive spread is considered to be medium.

c. The risk of introduction or spread was considered low if existing inventories demonstrated that weed populations are not present along the route or infestations are present, but the route is not proposed for designation.

5. It is assumed that the dynamics of weed spread are not substantially affected by changes in vehicle class for a given road or route. E.g. changing a motorcycle route to one used by all types of motor vehicles would not increase or decrease the chance that weeds occurring along the route would be spread.

Data Sources

Known (historic) information: During the planning process, maps of known noxious weed and invasive non-native plant infestations (SNF noxious weed GIS database) were compared with routes, roads and use areas included in the proposed action and alternatives. Information on known weed infestations was organized by proximity to routes, roads and use areas as well as by analysis unit. Also considered important (especially for considering the prohibition of cross-country travel) were known concentrations of noxious weeds along major travel ways leading to the Forest and in major population centers near the SNF.

Field surveys: Botanical field surveys were conducted in 2007 and 2008 along inventoried routes, roads and use areas. All proposed routes and roads were walked; areas within 200 ft of either side of the route were examined. All proposed use areas were also surveyed in 2007 or 2008 for noxious weeds. Historical data from the SNF GIS database was used to inform survey work and known populations of noxious weeds near routes were visited to assess their current status. This information was entered into a database and is documented in the Recreation and Resource Data Report in the project record. This data is also being incorporated into the SNF GIS database.

Noxious Weed Indicators

- High priority noxious weed infestations by species within each analysis unit.
- Number of miles of facilities added (the more miles added, the higher the likelihood of new noxious weed species and/or infestation being brought to the SNF).
- Number of proposed routes, roads or use areas with noxious weed infestations within 200 feet.
- Overall number of miles open for use each month of the year.
- Overall amount of land base of SNF that would potentially receive use by motor vehicles.
- Number of noxious weed infestations by species within the ten analysis units.

Noxious Weeds Methodology by Action

Three actions are being proposed in this project: (1) the prohibition of cross-country travel, (2) adding facilities to the SNFTS and (3) changes to the existing NFTS. Effects from noxious weeds must be considered both spatially and temporally, along with indicators appropriate for comparing alternatives. A summary of the methodology and indicators are summarized for each of these main actions below:

1. Direct/indirect effects of the prohibition of cross-country motor vehicle travel.

Short-term timeframe: 1 year. Short term effects include immediate effects from changes in travel management that will be evident within the first year of implementation.

Long-term timeframe: 20 years. Climate change, unforeseeable future projects, demographic changes, etc. make assumptions beyond this time frame speculative.

Spatial boundary: The ten analysis units (SNF, excluding wilderness areas, Research Natural Areas, Roadless Areas and Botanical Areas) where cross-country travel has been occurring.

Indicator(s): High priority noxious weed infestations by species within each analysis unit.

Methodology: A qualitative comparison of the alternatives using GIS analysis of existing unauthorized routes in relation to noxious weed infestations and a discussion of the likely changes in the pattern of weed spread based on observations in the SNF over the past 10 years

2. Direct/Indirect Effects of adding facilities (presently unauthorized roads, routes and/or areas) to the NFTS, including identifying seasons of use.

Short-term timeframe: 1 year (see above).

Long-term timeframe: 20 (see above).

Spatial boundary: Areas within 200 ft of proposed routes, roads and use areas (facilities) are the boundary for analysis of noxious weed effects as infestations beyond 200 ft are assumed to be less likely to be spread by use of proposed facilities.

Indicator(s): (1) Number of miles of facilities added (the more miles added, the higher the likelihood of new noxious weed species and/or infestation being brought to the SNF). (2). Number of proposed routes, roads or use areas with noxious weed infestations within 200 feet. (3) Overall number of miles open for use each month of the year.

Methodology: (1) Botanical survey of proposed routes, roads and use areas; (2) GIS analysis of added routes in relation to noxious weed locations (3) Qualitative comparison of overall number of miles and months routes and roads are open under each alternative (season of use tables were used for this).

3. Changes to the existing NFTS (includes deletions of facilities and changing season of use. It is assumed that changing vehicle class does not change risk of weed spread (see above under assumptions)).

Short-term timeframe: 1 year (see above).

Long-term timeframe: 20 years (see above).

Spatial boundary: Analysis units (see above).

Indicator(s): (1) Overall amount of land base of SNF that would potentially receive use by motor vehicles.

Methodology: (1) Qualitative comparison of season of use tables (miles of roads open by date under each alternative).

4. Cumulative Effects

Short-term timeframe: Not applicable; cumulative effects analysis will be done only for the long-term time frame.

Long-term timeframe: 20 years.

Spatial boundary: Forestwide (in areas accessible by vehicles). Cumulative effects for weed species in the project area have the potential to affect any area in the SNF that can be driven and over time, areas beyond that.

Indicator(s): (1) Number of noxious weed infestations within 200 ft of a proposed route, road or use area, (2) Number of noxious weed infestations by species within the 10 analysis units.

Methodology: (1) Botanical survey of proposed routes, roads and use areas; (2) GIS analysis of all routes and noxious weed infestations.

Affected Environment

Of the more than 1350 vascular plants known to occur in the SNF, less than 30 species are considered to be noxious weeds or invasive non-native plants requiring active management by the SNF. Noxious weeds considered relevant for the project area are shown in Table 153, along with their State Noxious Weed rating (if rated) and the California Invasive Plant Council Rating (if rated). There are no weeds on the Federal Noxious Weed List in the analysis unit.

Table 153. SNF Noxious Weed Species Relevant for the Travel Management DEIS

Scientific Name	Common Name	Cal-IPC Rating[1]	State Pest Rating[2]	P = Present in SNF (or approx. acres if known), N = near SNF, reasonable to expect within next 5 years.	Analysis Units
Bromus tectorum	Cheatgrass	High		10,000	All
Cardaria chalepensis	Lens-podded hoary cress	Moderate	B	< 1	Tamarack-Dinkey
Cardaria pubescens	Hairy whitetop	Limited	B	N	Dinkey-Kings
Carduus pycnocephalus	Italian thistle	Moderate	C	500+	South Fork Merced, Westfall, Gaggs, Mammoth, Jose-Chawanakee, Dinkey-Kings
Centaurea diffusa	Diffuse knapweed	Moderate	A	<5	Westfall
Centaurea maculosa	Spotted knapweed	High	A	< 1	South Fork Merced, Westfall, Globe, Gaggs, Mammoth, Jose-Chawanakee, Tamarack-Dinkey, Dinkey-Kings.
Centaurea melitensis	Tocalote	Moderate		1000 – 10,000	South Fork Merced, Westfall, Gaggs, Mammoth, Jose-Chawanakee, Dinkey-Kings
Centaurea solstitialis	Yellow star-thistle	High	C	3000	South Fork Merced, Westfall, Gaggs, Mammoth, Stump Springs-Big Creek, Jose-Chawanakee, Tamarack-Dinkey, Dinkey-Kings
Cirsium vulgare	Bull thistle	Moderate		1000	All
Cytisus scoparius	Scotch broom	High	C	500	All but East of Kaiser Pass
Genista monspessulana	French broom	High	C	<5	South Fork Merced, Gaggs, Mammoth,
Hypericum perforatum	Klamath weed	Moderate	C	500	All but East of Kaiser Pass
Lepidium latifolium	Perennial pepperweed	High	B	P	Dinkey-Kings, Stump Springs-Big Creek
Spartium junceum	Spanish broom	High		500	All but East of Kaiser Pass
Taeniatherum caput-medusae	Medusahead	High	C	<5	Westfall, Mammoth, Jose-Chawanakee, Dinkey-Kings
Verbascum thapsus	Woolly mullein	Limited		500	All

[1] http://www.cal-ipc.org/ip/inventory/index.php#definitions
[2] http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia_hp.htm

Surveys were carried out between 2007 and 2008 across the project area. Survey parameters were roads, trails or use areas being proposed as well as routes adjacent to them when weeds were clearly likely to reach the proposed facility due to the proximity. Infestations within 30 m (100 ft) were considered for analysis; infestations within 60 m (200 ft) were considered based on relative size of infestation and risk of spread for indirect effects. Routes that lead to or from the proposed facilities were also considered if noxious weed populations were thought to pose some risk of spread due to their location or risk level. Refer to the introduction for the Botanical Resources chapter in the Travel Management EIS for general information about the vegetation in the ten analysis units. All routes and use areas in Alternatives 2, 4 and 5 were surveyed by a SNF botanist in 2007 or 2008.

Despite the very real fact that invasive weeds continue to be introduced to new sites in the SNF via a variety of vectors (including motorized recreational vehicles), it is important to emphasize that a coordinated effort for inventorying, controlling and preventing noxious weeds and invasive non-native plants has been ongoing in the SNF since 1998. As a member of the Sierra-San Joaquin Noxious Weed Alliance (a Weed Management Area (WMA) for Mariposa, Madera and Fresno counties) the SNF is involved in cooperative efforts bringing together landowners and managers (private, city, county, State and Federal) for the purpose of controlling invasive weed species. New infestations of State A and B rated weeds are controlled promptly by county or California State Department of Food and Agriculture biologists or by Forest Service employees.

Because non-native species differ in their degree of invasiveness and competitiveness, each species warrants different levels of concern. Information on the biology and impacts of individual weed species found within the analysis unit is presented below.

Cheatgrass (*Bromus tectorum*) is found throughout California and the West but is less abundant at higher elevations in the SNF. Cheatgrass is the most widespread invasive plant in the U.S. and has a Cal-IPC rating of high. Cheatgrass out competes native and desirable species, including perennial herbaceous, shrub and tree species, for soil moisture (Bossard et al. 2000). However, SNF botanists have observed that the potential for cheatgrass to cause ecological problems varies considerably according to local conditions such as climate and disturbance regime and to date this has not posed the most severe threat to SNF ecosystems relative to the knapweeds, brooms and the non-native thistles.

Hoary cress: Two species are of concern in and near the SNF: Lens-podded hoary cress was found in 2002 in the vicinity of Dinkey Creek Road near the junction with McKinley Grove Road. This species is a B-rated noxious weed that is exceptionally difficult to control, as it has an extensive underground, horizontal stem system that produces new plants from stem and root fragments. Up to 75 percent of the biomass is underground. Herbicide use, monthly tilling for several years or sustained flooding are the only known ways to effectively control this weed (CDFA 2008). The original infestation of lens-podded hoary cress was hand-pulled and bagged in summer 2003 to prevent the plants from dropping seeds. In 2006, a hazard tree timber sale occurred within the lens-podded hoary cress infestation and equipment used for this operation subsequently traveled to other areas on the forest (Ballard 2006). The degree to which this weed has now spread is not known. Globe-podded hoary cress (*Cardaria pubescens*) was discovered at road's edge along State Highway 168 near Shaver Lake in 2008, in a frequently used turnout used by countless recreationists heading for the SNF.

Italian thistle (*Carduus pycnocephalus)* has been spreading rapidly in the foothills of the Sierra Nevada over the past 10 years and has now been found as high as 4,000 feet elevation. This is an annual weed introduced from Europe in the 1930s. This species spreads by mucilaginous (sticky) seeds via wind, animals and vehicles and can blanket the ground with dense stands of plants that allow no other species to grow (Bossard 2000). Small patches of Italian thistle that may have

been transported by motorcycles were found in Miami Motorcycle area in 2004 and promptly removed by SNF botanists.

Knapweeds: Both spotted knapweed (*Centaurea maculosa*) and diffuse knapweed (*C. diffusa*) are bushy, aggressive, weeds that have displaced native vegetation catastrophically in other parts of the western U.S. similar to the Sierra (e.g. the Rocky Mountains). Both of these species have the potential for severe damage to ecosystems, recreation, ranching and watershed integrity (CDFA 2009). Both are A-rated pests considered highest priority for eradication by the California Department of Food and Agriculture (CDFA 2009). One infestation of diffuse knapweed exists near Chowchilla Mountain Road, in Mariposa County. Since 2001, about 20 new infestations of spotted knapweed have been found in and near the SNF and most have been promptly eradicated. The rate of arrival and detection of spotted knapweed seems to be increasing, most have been found along roadsides, but some infestations were tracked to contractors' vehicles from out of State and some have been accidentally transported in log cabin kits from the Rocky Mountain States. There are nine sites in the project area where spotted knapweed has been eradicated (1 SFM, 2 WES, 3 GLO, 1 SSB and 1 TAD). There are four sites in the project area with active spotted knapweed sites (2 WES, 2 TAD). See Figure 6 for a display of spotted knapweed occurrences on and around the SNF.

Yellow starthistle (*Centaurea solstitialis*) has been a primary target of the SNF weed program since 1998. This spiny annual plant has increased its range in California exponentially since it was first introduced in the mid-1850s to its current estimated range of 15 million acres (15 percent of the State of California). On public lands, yellow starthistle renders recreational areas useless due to its painful spines. Plants are toxic to horses and out-compete more desirable plants on rangelands, reducing productivity of the land. The Sierra-San Joaquin Noxious Weed Alliance has successfully used the concept that yellow starthistle was advancing upslope in the SNF along a "leading edge" of outlier infestations that were still small enough to eradicate. Control efforts have focused on preventing the leading edge of yellow starthistle from continuing to move upslope (primarily via roads) and have been successful in moving the leading edge downwards with the ultimate goal of keeping the SNF free of this weed. With major infestations thriving in the Central Valley and other parts of California, it is a weed that will continue to be introduced to the Forest on tires and in contaminated soil, it is recognized that a strong early detection and rapid response program will always be necessary to prevent re-infestation. There are major infections of yellow starthistle in the SFM, WES and JCH analysis units. The "leading edge" location is located in the SSB analysis unit.

Tocalote (*Centaurea melitensis*) is similar in appearance to yellow starthistle, but is already a more established and probably less aggressive, component of the vegetation. In the foothills, especially in the three major river canyons of the SNF, tocalote is found over broad areas, sometimes in dense patches that preclude native plants, but often at lower densities that seem to allow coexistence of native plants. Plants tend to grow more densely along roads, which means they will continue to be spread via vehicles picking up seed in their tires (J. Clines, SNF Botanist, field observations). Except for small new outlier patches, control of tocalote is beyond the capabilities of SNF personnel. The prevention of spread into clean areas is the most effective strategy at this point.

Bull thistle (*Cirsium vulgare*), although generally not as invasive as other noxious thistles, competes with and displaces native species and decreases forage values in meadows at elevations up to 7,000 feet elevation (Bossard, et al. 2000). Bull thistle does not seem more prevalent along motor vehicle routes than elsewhere in the Forest. Cal-IPC rates bull thistle as having Moderate ecological impact, but notes that this species can be very problematic regionally and especially in riparian areas (CAL-IPC 2008)

Brooms: Scotch broom (*Cytisus scoparius*), **Spanish broom** (*Spartium junceum*) and **French broom** (*Genista monspessulana*) are all non-native, aggressive shrubs that can expand rapidly across disturbed lands and form monocultures. The foliage is toxic to wildlife, the seeds are long-lived and hardy and Scotch and Spanish broom are highly flammable due to the presence of volatile oils in the foliage (CDFA 2009). These species are concentrated in the vicinity of Bass Lake, Blue Canyon, Big Creek and Stump Springs Road, as well the San Joaquin River Canyon downstream of the Forest. Some control by manual and chemical means has been done each year but none of the infestations are yet eradicated. Several infestations of French broom were discovered in 2007 along dirt roads leading to Feliciana Ridge, these could be spreading via vehicle tires annually, as no removal has been done yet (Clines 2007). As most of the broom sites in Forest occur along roads, vehicle tires could pick up contaminated soil and move seeds to new sites.

Perennial Pepperweed (*Lepidium latifolium*) is a deep-rooted perennial herb that has been found in two sites in wetlands near Shaver Lake. Both infestations, though found in 2002, are still present. One infestation is along State Highway 168 in Fresno County, just outside the SNF near Shaver Lake and large plants (over 4 feet tall) were seen leaning into the roadway in full bloom in 2008. Plants were removed and bagged in 2008, but in previous years seeds were likely released onto the asphalt and carried to new sites by vehicle tires. New infestations of this noxious weed are expected to show up elsewhere in the SNF as a result. This species is a threat to wetlands and once established is extremely difficult to control (CDFA 2009).

Medusahead (*Taeniatherium caput-medusae*) is the most troublesome of the non-native annual grasses found in the Forest. This grass invades rangelands and replaces desirable forage plants. The high proportion of silica found in its tissues slows decomposition of medusahead, resulting in thick thatches of residual plants. Medusahead seeds are able to germinate through this thatch but most other plants cannot, thus infestations spread and persist (CDFA 2009). Superficially this grass is not visually distinctive to a layperson, thus new infestations are not reported to SNF weed personnel with the same frequency as more obvious species (e.g. yellow starthistle, brooms, spotted knapweed). This species doubtless travels on muddy tires as it grows along dirt roads in the vicinity of Bass Lake, Sivils Meadow, Burrough Mountain and Jose Basin.

Mullein (*Verbascum thapsus*) is considered a Cal-IPC weed of Limited impact, but has seeds that are long-lived in the soil. After fires, high densities of mullein plants can prevent revegetation with native species (Bossard 2000). Other types of disturbance, such as churning of soil by motor vehicles, can have similar effects.

Environmental Consequences

See the effects methodology section above regarding how this analysis was conducted. Noxious weeds and invasive non-native plants found during botanical surveys along proposed routes are listed for each alternative in Table 154.

Table 154. Summary of Noxious Weed Species Found on or Near or on Unauthorized Routes (Alt 1) or Proposed NFTS Facilities (Alts 2,4 and 5) by Alternative

Species	Analysis Units	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Cheatgrass	Westfall; East of Kaiser Pass	X	X	N/A	X	X
Spotted knapweed	Dinkey Kings	X		N/A	X	X
Yellow starthistle	Westfall; South Fork Merced	X		N/A		X
Bull thistle	Westfall; Globe; Gaggs; Tamarack-Dinkey; Dinkey-Kings	X	X	N/A	X	X
Klamathweed	Westfall; Gaggs	X		N/A	X	X
Woolly mullein	Tamarack-Dinkey	X		N/A		

Where weed infestations were found growing directly adjacent to routes, close contact with vehicles and/or riders would enable spread of seeds from the parent plant as weed species have evolved this type of strategy (dispersal by wind, water and contact with animal vectors). The spread of these species would occur and their subsequent establishment in new areas would make it harder for control or eradication efforts by the SNF. Invasive non-native species have been observed to increase in areas of regular motor vehicle use (Prose, Metzger and Wilshire1987). Impacts from weeds would not only harm native plants through competition for resources (light, water, nutrients) but also impact local wildlife species (which do not browse most noxious weeds), grazing and recreation activities outside of motor vehicle riding (hiking, camping, equestrian activities (Bossard 1991; Randall 1996; Bangsund, Leistritz and Leitch 1999; Eiswerth et. al 2005).

The overall risk of weed introduction and spread by alternative is summarized below in Table 155. Weeds that were actually found along proposed roads, trails and use areas are distinguished with an asterisk. The remaining species are shown because they exist in or near the Forest along major travel ways where they area likely to be spread by motorized use of the SNF (see Affected Environment).

Table 155. Risk of Spread of Noxious Weeds by Alternative

Species	Alt 1	Alt 2	Alt 3[1]	Alt 4	Alt 5
Cheatgrass*	Moderate	Low to Moderate	N/A	Low to Moderate	Low to Moderate
Tocalote*	Moderate	Low	N/A	Low	Moderate
Yellow starthistle*	High	Low to Moderate	N/A	Low to Moderate	Moderate to High
Bull thistle*	Moderate	Moderate	N/A	Moderate	Moderate
Klamathweed*	High	Moderate	N/A	Moderate	High
Common mullein*	Moderate	Low	N/A	Low	Low
Brooms (3 species)	Moderate to high	Low	N/A	Low	Low
Medusahead	High	Moderate	N/A	Moderate	Moderate
Italian thistle	High	Moderate	N/A	Moderate	Moderate
Whitetop (2 species)	Moderate	Low	N/A	Low	Low
Perennial pepperweed	Moderate to High	Low	N/A	Low	Low to Moderate
Spotted and diffuse knapweed	Moderate to high	Moderate	N/A	Moderate	Moderate
Overall risk of weed introduction and spread:	Moderate to high	Low to moderate	N/A	Low to moderate	Moderate

1. Risk for Alternative 3 is not applicable (N/A) because this alternative does not propose any additions to the NFTS.

Alternative 1 –No Action

Direct and Indirect Effects

Continued Cross-country Travel

All noxious weed species listed in Table 156 are located within the project area and therefore could be further spread by motor vehicle riding under this alternative. Close contact with vehicles and/or riders would enable spread of propagules from the parent plant as discussed above. As weeds spread and proliferate, their subsequent establishment in new areas would make it harder for control or eradication efforts by the SNF, primarily because cross-country travel would result in far too large of a potential area for Forest Service weed staff to check regularly (in contrast to designated routes which could be systematically surveyed). Thus early detection and rapid control of new, small infestations is less likely with continued cross-country travel. In other words, the likelihood is greater that new infestations would establish and spread across larger areas before detection, thus becoming too expensive to treat or eradicate.

Table 155 displays the risk of spread among alternatives. Table 156 below shows the risk of spread posed by motor vehicle activity under this alternative.

Table 156. Alternative 1 – Risk of Weed Introduction and Spread

Species	Risk of Spread
Cheat grass*	Moderate
Tocalote*	Moderate
Yellow starthistle	High
Bull thistle*	Moderate
Klamathweed*	High
Common mullein*	Moderate
Brooms (3 species)	Moderate
Medusahead	High
Italian thistle	High
Whitetop (2 species)	Moderate
Perennial pepperweed	Moderate – High
Spotted and diffuse knapweeds	High – Hgh

* species were those found along facilities during surveys. Other weed species listed are aggressive weed species currently observed to be spreading on the SNF.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Prohibition of Cross-country Travel

Prohibiting cross-country motor vehicle travel under this alternative will greatly reduce the risk of noxious weed spread as compared to Alternative 1. Reducing the amount of unauthorized routes available from 479 miles under Alternative 1 to 50 miles will also greatly help in decreasing the risk of noxious weed spread. Direct and indirect effects resulting from this prohibition are the reduced amount of mileage in which motor vehicle riders could be conceivably in contact with weed plants or propagules. Reduced contact with those plants and with soil containing weed seeds reduces the probability that seeds will be transported by vehicles. Because prohibiting cross-country travel reduces the geographic area over which new weed introductions might occur, Forest Service staff are more likely to detect new infestations early while they are still small and easily controlled. Early detection and rapid response are key components of successful weed control programs.

Addition of Facilities

Indicator 1- Number of miles of facilities added. Alternative 2 proposed trails and roads total approximately 50 miles. This compares with 479 miles in Alternative 1 (inventoried unauthorized routes), 0 miles in Alternative 3, 51 miles in Alternative 4 and 90 miles in Alternative 5. Thus Alternative 2 poses a much lower risk than Alternative 1 and an intermediate level of risk of weed introduction and spread compared to the other action alternatives.

Indicator 2- Number of proposed routes, roads or use areas with noxious weed infestations within 200 feet.

Tables 153 and 154 list the species affected by proposed routes discussed in the analysis below.

ROAD AND/OR TRAILS

BULL THISTLE

Five proposed routes are within 200 feet of bull thistle infestations. These proposed routes include JH-104, JH-105, JH-107, JH-125 and SR-112. Direct effects expected over the next year would be movement of seeds and contaminated soil via motor vehicles – either expanding the area of current infestations or transporting seeds to new sites where new infestations would then establish. Indirect effects (over the next 20 years) would be that continued soil disturbance within an active weed infestation may favor bull thistle over the surrounding native vegetation.

JH-104, JH-105, JH-107 and JH-125, all located in Tamarack-Dinkey analysis unit, link to each other in a relatively short route. The spread of propagules without any treatment is likely over time but the overall impact would be low as bull thistle is locally common in the SNF in montane forest vegetation types. SR-112 is found in Westfall analysis unit and will have the same direct/indirect effects. Mitigations have been proposed for these five unauthorized routes if they are selected to be part of the NFTS: manually treat each occurrence with hand tools or pulling for at least one year before bringing the route into the system. Subsequent monitoring would occur periodically at an interval to be determined by a SNF botanist.

KLAMATHWEED

Route PK24 in the Westfall analysis unit goes through a Klamathweed infestation. While the risk of spread is much reduced from Alternative 1, direct effects over the next year would be increased acreage of existing infestations and spread of seeds to new areas, resulting in new infestations. the mitigation measure for this plant are the same as for bull thistle: manual control would occur for at least 1 year before the route can be brought in the system (NX-1), this action, coupled with subsequent monitoring of the routes at an interval to be determined by a SNF botanist would reduce the risk of spread to low.

Table 157. Alternative 2 – Unauthorized Routes Proposed to be Added as NFTS Trails

Route	Affected species	# of infestations	Mitigation measure	Risk of spread with mitigation measure applied	Analysis unit
PK24	Klamathweed	2	NX-1	Low	Westfall
SR-112	bull thistle	1	NX-1	Low	Westfall

Table 158. Unauthorized Routes Proposed to be Added to the NFTS of Roads

Route	Affected species	# of infestations	Mitigation measure	Risk of spread with mitigation measure applied	Analysis unit
JH-104	bull thistle	1	NX-1	Low	Tamarack-Dinkey
JH-105	bull thistle	1	NX-1	Low	Tamarack-Dinkey
JH-107	bull thistle	1	NX-1	Low	Tamarack-Dinkey
JH-125	bull thistle	1	NX-1	Low	Tamarack-Dinkey

USE AREAS

No use areas proposed under this alternative would be affected by noxious weeds so there are no effects for use areas**.**

Changes to the Existing NFTS

Indicator 1 – Overall amount of land base of SNF that would potentially receive use by motor vehicles.

SEASON OF USE

Road closures under Alternative 2 would pose less risk of noxious weed introduction and spread than Alternative 1 and would be comparable to the other action alternatives as wet-weather closures would protect many native plant species from indirect effects such as soil erosion, deposition and compaction (healthy native plant communities are better able to resist weed invasion). The absence of vehicles until later in the spring or early summer would prevent some weed species from dispersing seeds via mud on vehicles because hand-pulling could be done before gates are opened. This would result in lower rates of dispersal across the SNFTS. Year round closures would slow dispersal rates for noxious weeds as well as diminish disturbance to native plant communities, thereby reducing the ability for noxious weed propagules to become established.

Cumulative Effects

Long term risk or weed introduction and spread under Alternative 2 along other present and foreseeable projects across the Forest it is likely to be lower than under Alternative 1. With a reduced transportation system in place and the prohibition of cross-country travel, the contribution of Alternative 2 to the spread and establishment of weeds on the SNF would not push the forest over any thresholds of cumulative effects for weed spread (much less likely than under Alternative 1). Over time, with continued control, monitoring and eradication efforts by the SNF for all weed species shown in Table 153, this alternative will greatly aid in diminishing vectors for noxious weeds by having a defined, manageable system that could be regularly surveyed.

Alternative 3

Direct and Indirect Effects

Prohibition of Cross-country Travel

Similar to those listed under Alternative 2 except there will not be any proposed additions to the NFTS for Alternative 3. This reduces the amount of mileage from 479 miles to zero miles being proposed for the SNF for facilities added. The reduction to zero miles and acres added for motorized facilities enhances the effectiveness of prohibiting cross-country travel for noxious weeds.

Changes to the Existing NFTS

Indicator 1 – Overall amount of land base of SNF that would potentially receive use by motor vehicles.

SEASON OF USE

Effects would be similar to alternative 2.

Cumulative Effects

Cumulative effects for Alternative 3 and other projects in the non-wilderness portions of the SNF for noxious weeds are greatly reduced in comparison to other alternatives for the Travel Management DEIS. With no added facilities and only the existing motorized routes to consider,

the risk for spreading noxious weeds is low under Alternative 3; therefore the cumulative effects for this alternative are considered low relative to the other alternatives, especially Alternative 1.

Alternative 4

Direct and Indirect Effects

Prohibition of Cross-country Travel

The effect on noxious weeds by prohibition of cross-country travel is similar to that discussed in Alternative 2 with the exception of added facilities proposed in the section below.

ADDITION OF FACILITIES

Indicator 1- Number of miles of facilities added. A summary of proposed routes and roads containing noxious weeds within 200 ft or less from the route are listed in Tables 159 and 160. The amount of trail mileage proposed in total for this alternative is 50 miles. In comparison, Alternative 1 has 479 miles, Alternative 2 has 50 miles, Alternative 3 has 0 miles and Alternative 5 has 90 miles.

Indicator 2- Number of proposed routes, roads or use areas with noxious weed infestations within 200 feet.

Tables 159 and 160 list the proposed routes discussed in the analysis below.

ROADS AND/OR TRAILS

CHEATGRASS

Two proposed trails are within 200 ft of two populations of cheatgrass. These routes include JM-38 and SR-36z in Westfall analysis unit. Direct effects after one year would be the spread of seeds by vehicles to other parts of the SNFTS; indirect effects within twenty years would be the continual disturbance in and around the known infestations, creating a favorable habitat for cheatgrass to thrive. Cheatgrass populations are frequently found in the SNF but most are small (< 1 acre) and do not seem to be endangering native plants or ecosystems to a large extent. It is also underreported in surveys as it is found often in small occurrences throughout the project area that do not impact species diversity in those areas and as a result, is not noted. Due to these factors, negative direct and indirect effects of spreading cheatgrass from these proposed trail is considered low.

BULL THISTLE

Eight proposed routes will are within 200 ft of eight populations of bull thistle. These routes include:

Westfall- PK-09x and SR-36z

Globe- TH-54z

Gaggs- BP37

Tamarack-Dinkey- JH-104, JH-105, JH-107 and JM-51

Bull thistle is common especially in mixed-conifer forest on the SNF. While many areas have bull thistle, occasionally it can flourish and can have notable impact on understory plants, meadows and disturbed forest areas. The direct and indirect effect of these populations spreading beyond those routes is considered moderate. Mitigations for this plant are the same as those listed for it under Alternative 2 with manual treatment occurring for at least 1 year before the route is opened.

After these mitigations have been implemented, the risk of spreading bull thistle is considered to be low.

KLAMATHWEED

Two proposed trails are within 200 ft of two populations of Klamathweed. JM-38 and SR-36z are in the Westfall analysis unit. Klamathweed effects include the spread of propagules by vehicles and continual disturbance in or near areas of infestation. The risk of spread is moderate to high. As the Miami Mountain Motorcycle area (where these routes are located in Westfall analysis unit) already has abundant Klamathweed, the risk of spread is only moderate for the immediate vicinity (spreading weeds to other areas already occupied by that weed). But if motor vehicle riders continue on to uninfested (clean) areas without cleaning their vehicles, the risk to those areas is high.

Table 159. Alternative 4 – Unauthorized Routes Added as NFTS Trails

Route	Affected Species	# of Occurrences	Mitigation Measure	Risk of Spread	Analysis Unit
JM-38	Klamathweed, cheatgrass	1 each	NX-1	Moderate, Low	Westfall
TH-54z	Bull thistle	1	NX-1	Moderate	Globe
BP112	Klamathweed	1	NX-1	Moderate	Gaggs
SR-36z	Cheatgrass, Bull thistle, Klamathweed	1 each	NX-1	Low, Moderate, Moderate	Westfall

Table 160. Alternative 4 – Unauthorized Routes Added as NFTS Roads

Route	Affected Species	# of Occurrences	Mitigation Measure	Risk of Spread	Analysis Unit
BP37	Bull thistle	1	NX-1	Moderate	Gaggs
JH-104	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JH-105	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JH-107	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JM-51	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
PK-09X	Bull thistle	1	NX-1	Moderate	Westfall

USE AREAS

No proposed use areas under Alternative 4 are expected to have any significant effects on noxious weeds.

Changes to the Existing NFTS

Indicator 1 – Overall amount of land base of SNF that would potentially receive use by motor vehicles.

SEASON OF USE

Effects are similar to Alternative 2.

Cumulative Effects

Cumulative effects from this alternative and other forest projects on bull thistle and Klamathweed can be considered moderate without mitigation and low with mitigations taking place. As discussed before, the spread of both bull thistle and Klamathweed have occurred throughout the SNF and have done so through other vectors besides vehicles (animals, wind, water) but the potential impact to the proposed routes and roads from these weeds is not insubstantial. With mitigations the risk of spread is low but not zero especially when considering projects and activities expected over the next 5 to 10n years (road maintenance, road hazard removal, prescriptive burns, thinning, grazing). Cheatgrass will likely continue to spread albeit slowly and is not expected to pose a significant threat to forest ecosystems as a result of this alternative and other concurrent projects.

Alternative 5

Direct and Indirect Effects

Prohibition of Cross-country Travel

Effects from the prohibition of cross-country travel on noxious weeds are similar to those analyzed under Alternative 2 with the exception of added facilities listed below.

Addition of Facilities

Indicator 1- Number of miles of facilities added. There are 90 miles of routes being proposed in this alternative. This compares with 479 miles in Alternative 1, 50 miles under Alternative 2, 0 miles in Alternative 3 and 51 miles under Alternative 4. Tables 161 and 162 list all known proposed routes and roads that are known to have noxious weed effects.

Indicator 2- Number of proposed routes, roads or use areas with noxious weed infestations within 200 feet. See tables 161 and 162 for the listing of routes being proposed in the discussion below.

ROADS AND/OR TRAILS

CHEATGRASS

Two proposed routes come within 200 ft of two populations of cheatgrass. These routes include SR-36z and SV32 in Westfall analysis unit. Direct/indirect effects from this species are expected to be low due to its relatively low rate of spread on the SNF as discussed in Alternative 4. No mitigations are being implemented for these routes.

TOCALOTE

One proposed trail is found within 200 ft of one population of tocalote. This trail includes TH-10z in Dinkey-Kings analysis unit. Tocalote has spread across much of the Dinkey-Kings analysis unit in scattered occurrences totaling thousands of acres. Its ecological impact as of now seems not to be as severe as the closely related yellow starthistle on the SNF. However, some occurrences are large and noticeably dominate native plants in annual grasslands, oak woodlands and/or chaparral. Direct and indirect effects of this species will be low to moderate; the highest risk is the potential spread to another area that does not currently contain tocalote. No mitigations have been proposed at this time due to its inconclusive status on the SNF. If monitoring reveals spread by motor vehicles, then appropriate actions will be taken, including removing the trail from the Sierra MVUM until appropriate management has occurred.

YELLOW STARTHISTLE

One proposed trail is within 200 ft of one population of yellow starthistle. This trail is SV32 in Westfall analysis unit. Yellow starthistle may pose the highest relative risk of spread of any noxious weed species in Alternative 5. Control and eradication efforts on the SNF aim to keep this species at or below its current leading edge. This area is considered behind that leading edge yet the potential for vehicles to spread this species cannot be ignored as its impact on native vegetation is dramatic. Monotypic stands form quickly and can spread rapidly over various habitats. Negative direct and indirect effects from this species are considered high without treatment. With manual treatment done and monitoring in place, then the risk could be lowered to moderately low. It is not yet decided how long after manual treatment occurs that the route should be opened but at the minimum it will be one year. Monitoring and periodic treatment of germinants will continue annually; if yellow starthistle shows sign of spreading beyond its known boundaries, the route should be taken off the MVUM until additional mapping, assessment and manual treatment occurs.

BULL THISTLE

Eighteen proposed routes are within 200 feet of a total of 18 populations of bull thistle. These routes include by analysis unit:

Westfall- JG135, JM-22y, JM-51, PK-09x, SV25, TH-02, TH-07, TH-08 and SR-112: Direct/indirect effects will be the same for in all analysis units for bull thistle. Westfall analysis unit has the most occurrences with nine total known occurrences along proposed routes and roads. The risk of spreading this weed without treatment is moderate as there are many occurrences in this alternative but the relative abundance of this plant in mid-elevation areas on the SNF reduces the impact of these occurrences. With manual treatment, that risk would be reduced to low.

Globe- TH-54z: One occurrence of bull thistle. Effects and mitigations are the same as above.

Gaggs- AE34, BP37: Two occurrences with the first (AE34) coupled with an occurrence of Klamathweed and the other by itself. Treatments for the first occurrence would be combined with mitigations for Klamathweed. Otherwise, effects and treatment methods remain the same.

Tamarack-Dinkey- JH-104, JH-105 and JH-107: Previously discussed under Alternatives 2 and 4. No change to direct and indirect effects or mitigations from those alternatives under Alternative 5.

KLAMATHWEED

Nine proposed routes are within 200 ft of nine populations of Klamathweed. These routes include by analysis unit:

Westfall- JM-14x, JM-38, JM-41, JM-44, SR-36z, SV16 and TH-02: Seven occurrences of Klamathweed are within 200 ft of proposed routes or roads in Alternative 5. This relatively high number of occurrences is more than Alternatives 2 or 4 and so the risk of spread under this alternative is moderate to high when no mitigations are considered. With manual treatment of these occurrences, this risk is lowered to moderately low. As this species is pernicious on the SNF, proposed routes or roads with Klamathweed cannot be completely low risk, even with treatment. The Westfall area contains a large amount of Klamathweed currently and risk of spread within this area is not as high due its prevalence. But many areas of the SNFTS do not have this species in this alternative and are at greater risk of having it establish along those roads or routes. Additionally, the large amount of occurrences needing treatment and then subsequent monitoring would be harder to accomplish effectively due to the relatively high number found.

Gaggs- AE-34 and BP112: Same as above; effects and mitigations would be the same as for Westfall occurrences along routes or roads.

Table 161. Alternative 5 – Unauthorized Routes Added as NFTS Trails

Route	Affected Species	# of Occurrences	Mitigation Measure	Risk of Spread	Analysis Unit
JG135	Bull thistle	1	NX-1	Moderate	Westfall
JM-14x	Klamathweed	1	NX-1	Moderate to high	Westfall
JM-22y	Bull thistle	1	NX-1	Moderate	Westfall
JM-38	Klamathweed	1	NX-1	Moderate to high	Westfall
JM-41	Klamathweed	1	NX-1	Moderate to high	Westfall
JM-44	Klamathweed	1	NX-1	Moderate to high	Westfall
SV16	Klamathweed	1	NX-1	Moderate to high	Westfall
SV25	Bull thistle	1	NX-1	Moderate	Westfall
TH-02	Bull thistle, Klamathweed	1 each	NX-1	Moderate; Moderate to high	Westfall
TH-07	Bull thistle	1	NX-1	Moderate	Westfall
TH-08	Bull thistle	1	NX-1	Moderate	Westfall
TH-10z	Tocalote	1		Moderate	Dinkey-Kings
TH-54z	Bull thistle	1	NX-1	Moderate	Globe
AE-34	Bull thistle, Klamathweed		NX-1	Moderate; Moderate to high	Gaggs
BP112	Klamathweed	1	NX-1	Moderate to high	Gaggs
SR-112	Bull thistle	1	NX-1	Moderate	Westfall
SR-36z	Cheatgrass, Bull thistle, Klamathweed	1 each	NX-1	Low; Moderate; Moderate to high	Westfall
SV32	Cheatgrass, Bull Thistle, Yellow starthistle	1 each	NX-1	Low; Moderate; High	Westfall

Table 162. Alternative 5 – Unauthorized Routes Added as NFTS Roads

Route	Affected Species	# of Occurrences	Mitigation Measure	Risk of Spread	Analysis Unit
BP37	Bull thistle	1	NX-1	Moderate	Gaggs
JH-104	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JH-105	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JH-107	Bull thistle	1	NX-1	Moderate	Tamarack-Dinkey
JM-51	Bull thistle	1	NX-1	Moderate	Westfall
PK-09X	Bull thistle	1	NX-1	Moderate	Westfall

USE AREAS

None of the use areas being proposed in Alternative 5 have any known weed issues or concerns and so there are no effects for use areas in this alternative for noxious weeds.

Changes to the Existing NFTS

Indicator 1 – Overall amount of land base of SNF that would potentially receive use by motor vehicles.

SEASON OF USE

Effects would be similar to Alternative 2, but because more miles of roads, routes and use areas would be open for more months, more opportunities for weed introduction and spread would exist under Alternative 5 than under Alternatives 2, 3 and 4.

Cumulative Effects

Cumulative effects for Alternative 5 will be greater than those in Alternatives 4 or 2 due to the relative amount of noxious weed occurrences- resulting in a higher risk of weed spread. In comparison to Alternative 1, however, Alternative 5 will have a low risk of spreading weeds. Bull thistle has the most infestations near facilities; this may result in some dispersal of Bull thistle around the SNFTS if mitigations were not implemented. As bull thistle has already established itself throughout many areas in the SNF, this risk is not as high as it would be for other weeds. Cheatgrass may be slightly affected but it is not considered a moderate or high risk for spread so it will be only a low risk for dispersal. Klamathweed has nine occurrences on proposed routes under this alternative and coupled with ongoing and future projects on the SNF, moderate cumulative effects from this alternative are possible if mitigation is not implemented. Even with mitigations occurring, this particular species is currently increasing in the SNF (Tuitele-Lewis 2008) and mitigations may only partially reduce the cumulative effect from this alternative. Yellow starthistle along one route proposed under Alternative 5 (one infestation in the Westfall analysis unit). With the mitigation of manual treatment occurring before the route can be used, cumulative effects would not occur.

Compliance with the Forest Plan (LRMP) and Other Regulatory Direction

Alternative 1

Complies with Forest Plan (LRMP) and Forest Service Direction concerning noxious weeds? No. Contradicts Executive Order 13112 of Feb. 3, 1999.

Alternative 2

Complies with Forest Plan (LRMP) and Forest Service Direction concerning noxious weeds? Yes.

Alternative 3

Complies with Forest Plan (LRMP) and Forest Service Direction concerning noxious weeds? Yes.

Alternative 4

Complies with Forest Plan (LRMP) and Forest Service Direction concerning noxious weeds? Yes.

Alternative 5

Complies with Forest Plan (LRMP) and Forest Service Direction concerning noxious weeds?
Yes, although the work load that this alternative brings with monitoring and treatment of noxious weeds is higher than other alternatives and it will be harder to comply with Forest Service and SNF standards and regulations.