CHAPTER 3

Affected Environment and Environmental Consequences

Changes Between Draft and Final Environment Impact Statement

- Updated the visitor use information.
- Added environmental analysis of Alternative 4
- Added environmental analysis of forest plan amendment concerning camps within 200 feet of meadows, streams, lakes, and key interest areas.
- Expanded analysis in each section to address DEIS comments and concerns.
- Incorporated information from 2012 Needs Assessment.
- Added an Economic and Social Analysis.
- Made numerous, minor editorial and spelling corrections.

Chapter

3

Affected Environment and Environmental Consequences

Introduction

This chapter summarizes the affected physical, biological, social, and economic environments of the project area and the effects of implementing each alternative. The scientific and analytic basis is presented for the comparison of alternatives listed in Chapter 2. The effects disclosed are based on the effectiveness of the design criteria and mitigation measures outlined in Chapter 2. The analysis of resources uses varying measures due to management direction, research, or field practice. Therefore, the effect of similar resources cannot always be directly compared, although analysis for each alternative can be compared for the same resource.

The effects resulting from each action are described in terms of their context, intensity, speed, direction, magnitude and duration. Other activities occurring in the same area over time, under certain circumstances, may have incremental effects that produce cumulative effects. It is sometimes necessary to look beyond the defined project area to determine the cumulative effects on certain resources. The effects disclose the direct and indirect effects plus the past, present, and reasonably foreseeable actions that define cumulative effect in this chapter.

Many of the effects discussed in this chapter are not easily quantified. It should be kept in mind that many of the values presented are modeled or estimated predictions of effects, and that the actual effects may not occur exactly to the degree presented. In some cases, the value of the analysis is in the comparison of the estimated effects between alternatives, rather than in the absolute values of the effects shown.

Each environmental component is discussed in terms of the consequences of implementing each of the alternatives listed in Chapter 2. This allows the reader interested in specific resources to find the effects related to that resource in one place. The following format is used for each environmental component:

- Regulatory Framework provides management direction from the Forest Plan, policy from the Forest Service Handbooks and Manuals, and laws, rules, and regulations for each resource.
- Analysis Method details how the analysis of each resource was conducted.
- Affected Environment describes the environment of the area to be affected by the alternatives, that is, the baseline environment, thus including past actions. It provides background for understanding the discussion that follows.

- Environmental Consequences of implementing each alternative are discussed. There are three types of effects considered:
  1. Direct Effects are caused by the action and occur at the same time and place [40 CFR 1508.8(a)].
  2. Indirect Effects are caused by the action but occur later in time or further removed in distance, but are still reasonably foreseeable [40 CFR 1508.8(b)].
  3. Cumulative Effects result from the incremental impacts of the action when added to other past, present, and reasonable foreseeable actions [40 CFR 1508.7].

Consistency Finding is a statement for each resource area that demonstrates how the action alternatives are consistent with the amended Forest Plan.

The Chapter begins with a discussion of past, present, and reasonably foreseeable actions that may affect the project area. Environmental components are detailed as above.

This EIS hereby incorporates by reference the wilderness, recreation, botany/sensitive plants, wildlife, hydrology, aquatics, soil, range, noxious weed, heritage resources, and air quality specialist reports in the Analysis file [40 CFR 1502.21] all of which are summarized in this chapter. Other specialist reports are wholly contained in the respective sections of this chapter. The referenced reports are located in the corresponding resource section of the Analysis file. All specialist reports contain the detailed data, methodologies, analyses, conclusions, maps, references and technical documentation (best available science) that the resource specialists relied on to reach conclusions.

Past, Present, and Reasonably Foreseeable Future Actions

The project interdisciplinary team (IDT) identified past, present, and reasonably foreseeable future actions, that might have cumulative impacts with the proposed action. Those actions in and adjacent to the project area are listed below. Each resource specialist considered different mixes of these actions, depending on the cumulative effects boundary for the resource area and the resource affected. Only those past, present and reasonably foreseeable future actions that overlap the geographic analysis area boundary for each particular resource are considered, and only if those other actions have or are expected to have overlapping effects (spatially and temporally) with the pack and saddle stock outfitter-guide project. Some past projects may still be having effects on one resource, but not another.

Past Actions

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible.

Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects.

Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."

The cumulative effects analysis in this FEIS is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

"CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making." (40 CFR 1508.7)

For these reasons, the analysis of past actions in this section is based on current environmental conditions although the effects of past actions will be aggregated with

present and reasonably foreseeable future actions in determining whether the effects from the outfitter-guide activities included in this document are significant

Present Actions

Livestock Grazing
Grazing will continue on all active allotments. No commercial livestock grazing is occurring in the Pasayten or Lake Chelan-Sawtooth Wilderness, or in the Sawtooth Backcountry. Refer to the Range section for detailed information about the active allotments.

Trail Construction and Maintenance
Declining budgets have reduced the number of miles maintained in the Pasayten to approximately 400, with an additional 100 maintained in the Lake Chelan-Sawtooth.

Trails in the North Cascades Scenic Highway, Sawtooth Backcountry, Upper Methow, Middle Methow, and Alta Lake sub-sections will continue to be maintained. Approximately 150 miles are maintained annually in these areas.

Developed Recreation Sites
The existing campgrounds and trailheads are maintained and cleaned throughout the snow-free seasons. Maintenance activities include repair and maintenance of picnic tables, fire grates, bulletin boards, buildings, water systems, roads, and other improvements.

Special Use Permits
There are currently 31 special use permittees operating in the analysis area, or in adjacent areas. There are several types of special use permits. Those held by existing permittees include:

Temporary Use – This type of permit lasts less than one year, and is for non-recurring use. None of the actual holders from 2011 and 2012 are included in this list because they change from year-to-year, although the effects of such use are considered as part of cumulative effects. There are no temporary use permits in wilderness or along the North Cascades Highway. Use in other areas is limited to avoid resource damage.

Transitional Priority Use – This type of permit is for long-term, temporary permit holders whose permits are being analyzed for conversion to Priority Use permits.

Priority Use– This type of permit lasts 1 to 10 years.

Ski-Area – This type permit is a 20-year, term permit for operating a ski area.

The following figure lists all the outfitters, type of activity, operating area, season of operation, and type of permit. The outfitter guide activities analyzed for this decision are included in the list below because they have been operating under one year permits, which expire each year. Therefore their activities are considered either present actions (if the permits for this past year have not yet expired), or past actions (if the permits from this past season have expired).

Figure 3.0-1. Existing Outfitters-Guides

Outfitter	Type of Activity	Area of Operation	Season of Operation	Type of Permit
Back-country Burros	Pack and Saddle Stock (burros)	Pasayten Wilderness, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
Cascade Wilderness Outfitters	Pack and Saddle Stock (horses and mules)	Pasayten and Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
Deli-Llama Wilder-ness Adventure	Pack and Saddle Stock (llamas)	Pasayten Wilderness, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
Early Winters Outfitting	Pack and Saddle Stock (horses and mules)	Pasayten and Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
North Cascade Outfitters	Pack and Saddle Stock (horses and mules)	Pasayten and Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
North Cascade Safari	Pack and Saddle Stock (horses and mules)	Pasayten and Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, North Cascades Scenic Highway	Summer and fall	Priority (1 year)
Sawtooth Outfitters	Pack and Saddle Stock (horses and mules)	Pasayten and Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, Alta Lake	Summer and fall	Priority (1 year)
Cascade Corrals	Pack and Saddle Stock (horses and mules)	Lake Chelan/Sawtooth Wilderness, Sawtooth Backcountry	Summer and fall	Priority (1 year)
National Outdoor Leader-ship School	Backpacking/ Wilderness Skills	Pasayten and Lake Chelan-Sawtooth Wilderness	Summer and Fall	Priority (1 year)
Outward Bound Inc.	Backpacking/ Wilderness Skills	Pasayten, Lake Chelan-Sawtooth, and Alpine Lakes Wilderness	Summer and Fall	Priority (10-year)
Wilderness Ventures	Backpacking/ Wilderness Skills	Pasayten Wilderness	Summer and Fall	Priority (1 year)
North Cascades Institute	Backpacking/ Wilderness Skills	North Cascades Scenic Highway, Pasayten Wilderness	Summer and Fall	Transitional Priority
American Alpine Institute	Climbing and Mountaineering	North Cascades Scenic Highway	summer	Priority (1 year)
YD Adventure	Climbing and Mountaineering	North Cascades Scenic Highway	Summer and fall	Priority (1 year)
Alpine Ascents Inter-national	Climbing and Mountaineering	North Cascades Scenic Highway	summer	Priority (1 year)
North Cascades Mountain Guides	Climbing and Mountaineering	North Cascades Scenic Highway	Year round	Priority (10 year)
Mountain Madness	Backpacking/ Wilderness Skills	North Cascades Scenic Highway	Summer and Fall	Priority (10-year)

Outfitter	Type of Activity	Area of Operation	Season of Operation	Type of Permit
Rendezvous Huts, Inc.	Hut Rental	Cub Creek, Rendezvous Creek Watersheds	Winter, with occasional summer use	Priority (10-year)
Sun Mountain Resorts	Mountain Biking	Sun Mountain Vicinity	Spring, Summer, and Fall	Transitional Priority
Mountain Transporter	Transportation	Methow Valley Ranger District, on open roads	Year-round	Transitional Priority
Methow Biodiversity	Backpacking/ Wilderness Skills	Bear/Ramsey/Volstead	Summer and Fall	Transitional Priority
High-lands Stage	Wagon Tours	Tonasket RD	summer	Priority (10 year)
North Cascade Heli-Skiing	Helicopter-Assisted Skiing	North Cascades Scenic Highway, Twisp River, Blackpine Basin, Sandy Butte, Chewuch River	Winter	Priority (10-year)
Chewack River Guest Ranch	Snowmobile Rental and Guiding	Methow Valley Ranger District, excluding Wilderness	Winter	Priority (10-year)
MillerBlue	Horseback Day Rides	Sun Mountain Area	Spring, summer, fall	Transitional Priority
Loup Loup SEF	Downhill Skiing	Loup Loup Ski Bowl	Winter	Ski Area (20-Year)
Methow Valley Sports Trails Assoc.	Cross Country Skiing, Snowshoeing, Summer Trail Use	North Cascades Scenic Highway, Upper Methow, Twisp River, and Chewuch Watersheds	Year round	Ski Area (20-Year)

Recreation Activities

Numerous recreation activities continue to be popular in the analysis area. On-going activities include hiking, non-outfitted (personal) pack and saddle stock use, fishing, camping in developed and undeveloped campsites, hunting, riding OHVs, riding mountain bikes, mushroom picking, driving for pleasure, and other activities.

There are approximately 163,840 visitor days in the analysis area each year, not including pack and saddle stock outfitter-guide visitor days. This figure was determined using the results of the 2000 and 2005 National Visitor Use Monitoring survey (USDA 2001d, USDA 2012b) and trailhead registrations.

Monitoring was completed in 2005 and 2010 to gather information about the number of people recreating on the National Forest. Refer to the Revised National Visitor Use Monitoring (NVUM) Results for the Okanogan National Forest, Data Collected FY2005, Revised May 2012 (USDA, 2012b), and Data Collected FY2010, August 2011 (USDA, 2011).

The findings for the 2005 monitoring were updated by the authors of the NVUM 2006 report, and issued between the Draft EIS for the Pack and Saddle Stock Outfitter-Guide Special Use Permit Reissuance, and the Final EIS. The updated results were substantially lower than the original used in the DEIS.

Because of this discrepancy, the Forest Service compiled data from the registration permits for the Pasayten Wilderness in an attempt to resolve the inconsistent results from NVUM. Wilderness visitors are required to fill out a registration permit prior to entering the Pasayten. Data from these permits was compiled and averaged for 2001 through 2011. Refer to the analysis file for full permit data.

The 2005 NVUM reported 11,000 visits to the Pasayten, with an average length of stay of 40.7 hours. Multiplying these numbers gave the total number of hours spent in the Pasayten. Dividing this product by 24 hours converted 11,000 visits to 18,654 visitor days.

The 2010 NVUM reported 5,000 visits to the Pasayten with an average stay of 12 hours. This calculated to 2,500 visitor days.

The averaged permit data showed 16,840 visitor days, which was relatively close to the 18,654 visitor days from the 2005 NVUM. This validated the 2005 results for the Pasayten and Lake Chelan-Sawtooth, and suggests the 2010 data is not reliable enough to use. There is no required permit system for the remainder of the analysis area, so NVUM data must be used to estimate visitor days. Since the 2005 NVUM data for the Pasayten appears to be close to the averaged permit data, the 2005 data for the Lake Chelan-Sawtooth and the Pasayten is assumed to be the most reliable information available.

Visitor days used for the rest of the analysis area were obtained from the National Visitor Use Monitoring Results for Okanogan National Forest, (USDA Forest Service 2001d). This data were disaggregated to give an estimate of particular portions of the analysis area. The visitor day estimates for the Sawtooth Backcountry are based on trailhead registration and visitor counts (information included in the analysis file). This area was not adequately sampled in the National Visitor Use Monitoring Program in 2000, so the use estimates were substantially lower than field observations. Refer to the registration and observation in the analysis file.

The following table lists the number of visitor days by area (not including pack and saddle stock outfitter-guide visitor days).

Figure 3.0-2. Number of Non-Outfitted Visitor Days by Area

Area	Number of Non-outfitted Visitor Days
Pasayten Wilderness	16,900
Lake Chelan-Sawtooth Wilderness	35,885
North Cascades	71,727
Sawtooth Backcountry	13,606
Bear/Ramsey/Volstead	952
Middle Methow	15,000
Alta Lake	9,770
TOTAL	163,840

Highway Maintenance
The Washington State Department of Transportation will continue to maintain the North Cascades Scenic Highway, including, but not limited to, hazard tree removal, brushing, plowing, avalanche control, pavement maintenance and repair, ditch and culvert maintenance.

Invasive Plants
Invasive plants treatment and surveys will continue to be conducted in the Lake Chelan side of the Lake Chelan-Sawtooth area as part of the Flick Creek Fire BAER treatment plan (USDA Forest Service 2006b).

Invasive plants treatment and surveys will continue to be conducted in Bear/Ramsey/Volstead sub-section as part of the Tripod BAER treatment plan (USDA Forest Service 2006e).

All the known new invader[1] noxious weed sites in and adjacent to the project area will be prioritized for integrated weed management for project year 2011 and subsequent years under existing or future Integrated Weed Management decisions. Integrated weed management will continue for New Invader weed infestations on recreation access roads, trail heads, trails, corrals, camps and off roads in areas where weeds may spread and impact recreation facilities and activities. Integrated weed management (IWM) will be accomplished through implementing the mitigation measures in this assessment and a combination of all the control methods available under existing or future Integrated Weed Management decisions, with emphasis on early detection of new infestations, rapid treatment response, and prompt revegetation. The combination of herbicide, manual, and cultural treatment under the existing and future decisions will provide effective control of small populations. Treatments will be conducted by the District Weed program with herbicide treatments authorized under the1997 and 2001 Okanogan National Forest Integrated Weed Management Decision Notices (USDA Forest Service1997e and 2000d), Wenatchee Forest-wide Noxious Weed Environmental Assessment Decision Notice (USDA Forest Service 1998) and the 2003 Crupina Integrated Weed Management Project EIS Record of Decision (USDA Forest Service 2003b). The 2003 Crupina decision allows for treatment of one specific invasive species (crupina) on the Chelan side of the Lake Chelan-Sawtooth Wilderness using integrated weed management, including the use of herbicides.

Other Present Actions
There are no other present actions in or near the analysis area that would have potentially cumulative environmental effects with the proposed action or alternatives.

<u>Reasonably Foreseeable Future Actions</u>

Livestock Grazing
The allotment that includes Bear/Ramsey will likely continue to be grazed in the future. No other livestock grazing is anticipated in other parts of the analysis area.

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1. [1] *New Invaders* are invasive plant species that occur sporadically on the Forest and that may be controlled by preventing seed production and early treatment. State listed Class A or State listed Class B and C that are locally limited in distribution on National Forest within the project area.

Trail Maintenance
The current amount of trail maintenance will continue into the reasonably foreseeable future.

Developed Recreation Sites
The existing campgrounds and trailheads will be maintained into the future.

Special Use Permits
It is reasonably foreseeable that all existing outfitter-guide permits listed above will continue based on past experience and performance. Additional temporary use permits may also be issued, but the collective number of service days is not expected to increase across the analysis area.

Recreation Activities
On-going activities are expected to continue into the future, including campground management, trail maintenance, snowmobiling, hunting, camping in dispersed camping spots, camping in developed campgrounds, riding OHVs, riding mountain bikes, hiking, mushroom picking, and driving for pleasure.

The number of visitor days expected in the future was calculated using projected changes included in the Washington State Comprehensive Outdoor Recreation Planning (SCORP) publication "*Estimates of Future Participation in Outdoor Recreation in Washington State*" (Interagency Committee for Outdoor Recreation 2003). These projected changes were for 10 and 20-year periods based on participation data from the 1999-2000 RCO survey (IAC 2003). These projections took into account NSRE data and projections for the Pacific Northwest Region, demographic trends in Washington State, the local supply of lands available for recreation activities, and other factors. The exception to this is in the North Cascades Scenic Highway corridor, where overall use increased 147% in twelve years - from 17,000 visits in 1992, to 42,000 in 2004. This rate of increase is expected to continue and result in a 100% increase in the number of people recreating in the corridor in the next 10 years.

The following figure lists current non-outfitted recreationists in each section of the analysis area, and the foreseeable number in 2023.

Figure 3.0-3. Current Number of Non-Outfitted Visitor Days and Estimated Number in 2023

Area	Non-Outfitted Visitor Days	Estimated Non-Outfitted Visitor Days in 2023
Pasayten Wilderness	16,900	18,770
Lake Chelan-Sawtooth Wilderness	35,885	39,362
North Cascades Scenic Highway Corridor	71,727	116,707
Sawtooth Backcountry	13,606	14,994
Bear/Ramsey/Volstead	952	908
Middle Methow	15,000	16,439
Alta Lake	9,770	10,699
TOTAL	**163,840**	**217,933**

Highway Maintenance
Maintenance of the North Cascades Scenic Highway will continue into the future.

Invasive Plants
A Forest-Wide Integrated Weed Management EIS is scheduled for completion in 2012, and covers a majority of the project area that is not currently covered by a decision document for herbicide treatments. The actions analyzed by the new EIS include the use of more effective, less impactful herbicides which would help control the spread and establishment of invasive plants in the project area. The application of herbicides will follow Pacific Northwest Region 6 management direction as described in section 3.4 Invasive Plants.

Other Activities
There are no other reasonably foreseeable future actions that could have cumulative environmental effects with the proposed action or alternatives.

3.1 OUTFITTER-GUIDES

The section below is a summary of the Outfitter-Guide Report which is available in the project analysis file (Zbyszewski, 2012d).

REGULATORY FRAMEWORK

Pack and saddle stock outfitter-guide activities are controlled by standards and guidelines in the Okanogan and Wenatchee Forest Plans, as amended, and the terms and conditions in the special use permits. Refer to each resource section in Chapter 3 for a detailed list of applicable standards and guidelines.

The Forest Service Handbook 2709.11 gives agency-wide direction in the administration of outfitter-guide permits (USDA, 2008b).

ANALYSIS METHOD AND DATA SOURCES

Service Days
Use data has been compiled using the most accurate data available. The number of service days actually used varies from year to year. Reliable records are available for the past 10 to 20 years. These records were used to calculate the average number of service days used in the past 20 years. Some data gaps and margins of error exist due to data interpretations. Reports of use provided by the outfitters occasionally recorded vague or unknown destination locations. The data is the best information available, and has a level of accuracy that is more than adequate for this analysis.

Outfitter-Guides
Information on each existing pack and saddle stock outfitter-guide is from the existing permits and activities of the outfitters. The effect of the alternatives, including Forest Plan amendments, on outfitter-guides is described.

Best Available Science
The best available science was used for this analysis, including the methodology and data sources described above, to describe the economic and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on resources and people.

AFFECTED ENVIRONMENT

Pack and saddle stock outfitter-guides have been taking people into the analysis area for decades. These permitted outfitter-guides provide valuable recreation opportunities for a segment of the public who do not have the expertise, equipment, or physical capabilities to enjoy these experiences on their own. The need for pack and saddle stock outfitter-guides in wilderness has been documented in *Assessment of Need for Outfitting-Guiding Assistance, Okanogan National Forest, Chelan Ranger District Portion of the Wenatchee National Forest North of Lake Chelan*, 1996 (Needs Assessment, USDA Forest Service 1996a) and *Determination of Need and Extent Necessary for Commercial Services (Outfitters and Guides) in the Pasayten Wilderness and Lake Chelan-Sawtooth Wilderness*, 2012 (USDA Forest Service, 2012a, and **Appendix B**).

The number of pack and saddle stock outfitter-guides and the number of service days has been relatively steady for the past twenty to thirty years, although there has been a decrease in actual use service days in the past five years. Several factors are possibly contributing to this, including a decreased popularity of the activity, wildfires, and the downturn in the economy. Ownership of some of the companies has changed, and three are currently not operating. The following table shows the average number of reported service days each has had over the past 20 years (excluding years of authorized non-use).

Figure 3.1-1. Pack and Saddle Stock Outfitter-Guide and 20-Year Average Reported Service Days (excluding years of non-use).

Outfitter-Guide	Average Reported Service Days
Backcountry Burros*	322
Cascade Wilderness Outfitters	1,055
Deli-Llama Wilderness Adventure	96
Early Winter Outfitting	1,412
North Cascade Outfitters	331
North Cascade Safari	891
Pasayten Llama Packing*	183
Rocking Horse Ranch*	712
Sawtooth Outfitters	801
TOTAL	**5,803**

*No longer operating

The culture and history of the main communities near the analysis area – Winthrop, Twisp, Chelan, Tonasket, and Oroville – are built around outdoor activities. The analysis area was used for hunting and gathering by native peoples for thousands of years, and with European settlement in the mid to late 19800s, the areas were utilized for mining, trapping, and grazing. Horses and mules or other pack animals were fundamental components of life during that time

as the only mode of transportation. The first trails were constructed during this era, and camps were established, many of which remain to this day.

As the towns grew, the economy was based in agriculture, with sheep and cattle ranching, dairy farms, and orchards among the largest contributors. Horses and mules were a necessity for the agricultural base, and by the middle of the 20th century, horse packing became a common recreational activity. The first permit for pack and saddle stock outfitting-guiding was issued in the mid-1950s. More companies were formed, and the number of stock outfitters increased to ten by the mid-1980s. When the North Cascades Scenic Highway opened in the early 1970s, the town of Winthrop capitalized on the old west culture. Traveling into the back country with pack animals and riding horses were historic parts of the culture, and the opportunity to participate in these activities continues to attract thousands of people to the Methow Valley every year.

The current pack and saddle stock outfitter-guides are described below. Additional details are included in **Appendix E**. Outfitter-guide special use permits specify a number of service days. A service day is defined as one day, or part of a day on National Forest System lands for which an outfitter-guide provides goods or services, including transportation, to a service.

Cascade Corrals has been operating under a special use permit since 1950. The current permit is for 209 service days in the Lake Chelan-Sawtooth Wilderness and Sawtooth Backcountry.

Cascade Wilderness Outfitters has been operating under a special use permit since 1960. The current permit is for 621 service days in the Pasayten Wilderness, Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, and North Cascade sub-units.

Deli Llama Wilderness Adventures has been operating under a special use permit for llama outfitting and guiding since 1993. The current permit is for 151 service days in the Pasayten Wilderness and North Cascades sub-units.

Early Winters Outfitting has been operating under a special use permit since 1983. The current permit is for 537 service days in the Pasayten Wilderness, North Cascades, and Bear/Ramsey/Volstead sub-units. The permit also includes 355 service days for day-rides in the North Cascades area. Day rides leave from the permittee's property, the Early Winters Ranch, continue on National Forest System land, and end back at the ranch.

North Cascade Outfitters has been operating under a special use permit since 1980. The current permit is for 200 service days in the Pasayten Wilderness and North Cascades sub-units.

North Cascade Safaris has been operating under a special use permit since 1970. The current permit is for 431 service days in the Pasayten Wilderness, Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, and North Cascades sub-units.

Sawtooth Outfitters has operated under a special use permit since 1982. The current permit includes 343 service days in the Pasayten Wilderness, Lake Chelan-Sawtooth Wilderness, and Sawtooth Backcountry sub-units. The permit also includes 585 service days for day-rides in the Alta Lake area. Day rides leave from the permittee's property, the Whistlin' Pine Ranch, continue on National Forest System land, and end at the ranch.

Backcountry Burros, Pasayten Llama Packing, and Rocking Horse Ranch have gone out of business, so no longer have permits to operate on the Forest.

Campsites

Appendix A lists all the campsites regularly used by the outfitters. They use other camps periodically, but tend to return to the same camps year after year. The outfitters can use any established campsite within their permit area on the Methow Valley and Tonasket Ranger Districts, and are restricted to using designated campsites on the Chelan District.

Description of Trip Types

Pack and saddle stock outfitter-guides offer a variety of trip types to meet needs, expectations, and budgets.

- Full-service Pack Trips: Guided horseback riding trips with meals, cook, and most or all camping gear provided. Trips may be progressive or base camp type. Progressive trips have a series of camps during the trip, while base camp trips stay at one camp for the entire trip and take day rides to local attractions. Trips vary from 2 to 10 days or more.

- Standard Pack Trip: Same as full-service, except clients provide and prepare their own food.

- Full-service Hiking Trips: Guided trips with meals, cook, and most or all camping gear. The trips may be progressive or base camp type; clients hike.

- Standard Hiking Trips: Same as full-service except clients provide and prepare their own food.

- Drop Camps: Clients and gear are transported to a location and dropped off. The outfitter returns for pick-up on a prearranged day. No guiding services are provided. Most drop camps occur during high and general hunting seasons.

- Re-supply/Supply Trips: Outfitter transports only supplies to a prearranged location for clients.

- Day Rides/Hike: Horseback riding or hiking with pack support for a portion of one day with no overnight use. Day rides range from ½ hour to all day, with the majority lasting one hour.

Livestock Grazing and Confinement

The outfitter-guides use two methods for caring for stock on overnight trips; stock containment and loose grazing. Stock containment refers to tying stock to trees for short durations, tying to hitch rails or highlines, picketing stock, or holding them in a corral. Loose grazing is a technique where the stock are let loose to graze.

Loose grazing is the preferred method for feeding stock animals because it generally causes the least impact on resources. Dispersing the animals reduces concentrated impacts to vegetation and soil. More confinement can generally be equated to more impact because it concentrates impacts and contributes to restless behavior (Leave No Trace, 2001). Loose grazing does not work everywhere, however, so containment methods are also important and appropriate. Even

in camps where animals are set loose to graze, containment areas are needed to hold the animals while they are being unloaded, packed, or saddled.

Stock containment methods currently used include hitch rails, corrals, highlines, lowlines, hobbles, and pickets. Hitch rails are installed at the Sheep Mountain and Bald Mountain assigned sites. They consist of wooden side posts and a wooden top rail. There is also a corral at Sheep Mountain, constructed with wooden posts and rails. Highlines or lowlines are used at most camps. They are made by tying a rope between two trees, then tying the stock to the rope. Some outfitters occasionally use pickets to anchor stock to one spot to graze, then move the stock to a highline after feeding.

Confined stock are taken to a grazing area and watering spot, then returned. Processed weed-free feed is often brought for stock that are confined, and to areas where adequate graze is not available near the campsite.

Confinement areas within campsites impact opportunities for solitude by increasing the amount of barren core, concentrating manure, attracting flies to camp, and damaging vegetation.

Loose grazing is a method used by outfitters in camps they frequent, such as the assigned sites, to reduce the amount of time stock are contained within campsites. The outfitter identifies areas with sufficient graze typically within one to two miles of camp, depending on the location of the camp. These areas are carefully selected to move stock well away from other campsites and private stock. The stock are led to the grazing area, or travel there on their own, and left for the night. Bells are often placed on one or two of the stock to help the outfitter locate them if they don't return to camp on their own. Some outfitters hobble selected stock to help confine movement and facilitate catching, although stock can still travel very well with hobbles. In some camps, the stock are led back to camp in the mornings. In others, the stock are trained to return in the morning on their own. One to two horses are usually kept contained near the camp at night, to facilitate catching horses in the morning if needed.

Horses and mules are herd animals, so as they graze, they stay in the same general area but are widely dispersed within that area and the forage use is well distributed. As with all grazing animals, they are constantly moving across the land, eating grasses as they go. Feral free-ranging horses typically spend over half their time feeding, and around 25-35% of their time resting (Ransom and Cade 2009). Studies with pack stock grazing show horses and mules behave similar to feral free-ranging horses. After daily exercise, they feed for an initial 3-4 hour bout and then continue to graze every hour with a constant rate of movement (Olson-Rutz et al. 1996). When not grazing, pack stock rested more than traveling, similar to wild horses (Olson-Rutz et al. 1996, Ransom and Cade 2009).

The constant movement is a characteristic defensive pattern of grazers against predators. The stock form a loose herd, always nearby each other, but not tightly congregated. When water is readily available as it is in most places in the wilderness, horses do not gather at specific sites to drink as in desert environments (Salter and Hudson 1979). Outfitter-guide stock exhibit similar grazing behavior to that of free-ranging horses. Typically free-ranging horses move rapidly to and from water sources with very little feeding or loafing activities near drinking areas (Ganskopp and Vavra 1986). They prefer open areas and elevated terrain away from water and thick brush to get away from insects (Keiper and Berger 1982) and to be able to assess potential

threats from predators (Ganskopp and Vavra 1986). They avoid muddy areas because they instinctually do not want to be mired in mud, and simply because they prefer to keep their feet dry. During the night, they sleep by dozing off, and upon waking, graze while moving to a different spot.

Mules have been known to attack burros, but there has been only one documented, reported case of this in the past 20 years. The incident occurred at a trailhead, and involved outfitted mules and burros. The Forest Service worked with the outfitters to avoid outfitted parties with mules and those with burros camping in the same general area. No additional incidents were reported.

Trail Maintenance

The outfitter-guides assist in trail clearing and maintenance under authorization by the Forest Service. They often cut fallen trees out of trails on trips to and from camps, and assist in maintaining or replacing trail structures and tread. The number of miles varies from year to year, but this benefits all trail users by keeping more trails open.

Fire Control and Search and Rescue

The pack and saddle stock outfitter-guides also assist in fire control, and search and rescue operations of people lost or injured in the back country or wilderness. These are not part of their outfitter-guide permitted activities, but the outfitters' knowledge of the landscape and access routes if very valuable and helpful in these situations. They take supplies and people to and from fires, and help locate and evacuate people when needed.

Permit Administration

The outfitter-guides operate according to the terms and conditions of their special use permits. The permits themselves contain the standard terms and conditions, a description of the permitted activity, and the specific number of service days assigned to the permittee. Operating plans are part of the permit for each outfitter, and contain specific information about each company, where they operate, season of operation, and many other details about their operations. Each outfitter submits estimated use information before the operating season begins, then turns in final use reports after it concludes.

The Forest Service administers these permits by reviewing and approving operating plans, tracking service days using the estimated and final use reports, inspecting outfitter operations in the field to check for compliance with the terms and conditions of the permit (including information in the operating plan), meeting with the outfitter when needed, and completing an annual performance evaluation.

In the late 1990s, a concerned citizen began contacting the Methow Valley Ranger District with information about environmental impacts from the pack and saddle stock outfitter-guides. In response to the concerns, the Methow Valley Ranger District developed a "Wilderness Recreation, Stock, and Outfitter Use Strategy and Action Plan", signed by the Forest Supervisor on April 24, 2000. The objective of the plan was to reduce pack and saddle stock-related wilderness impacts in both the Pasayten and Lake Chelan-Sawtooth Wilderness Areas. The plan included 22 specific action items for the 2000 outfitter-guide season, and beyond, designed to address Forest Plan compliance and concerns raised by the public (USDA Forest Service, 2000e).

One of the action items recommended an internal Recreation Activity Review regarding recreational impacts in the 2000 season. The recommended review was completed with focus on the Spanish Camp/Remmel Lake area. The objective of the review was to determine if activities were in compliance with the Forest Plan. The final report, "Recreation Activity Review, Spanish Camp and Remmel Lake Area, Pasayten Wilderness" (UDSA Forest Service, 2000c) documented a number of corrections needed to bring activities into compliance; however, no conditions or threats were found that constituted an emergency or were jeopardizing the wilderness resource. In fact, the reviewers found an upward/improving trend in overall resource conditions.

The report made several findings that the Methow Valley Ranger District has since been using to guide recreation and outfitter-guide management in the Pasayten and Lake Chelan-Sawtooth wilderness areas. The actions, which have been taken over the years to address the findings, are detailed in Appendix F.

One of the findings in the review was that special use permit administration has not kept pace with the increasing complexity of social, resource, and Forest Service policy issues, nor actively sought the outfitter guides as partners to effectively model wilderness stewardship. Since that time, the Methow Valley and Chelan Ranger Districts have put a considerable amount of effort into improving administration of the permits. These efforts included more frequent field inspections of outfitter-guide operations, more frequent meetings with outfitter-guides to discuss operations, issuance of notices of non-compliance to outfitters when terms and conditions are not followed, and a standardized annual performance evaluation. The results of these efforts have been better documentation of operations and performance, and improved compliance by the outfitters with the terms and conditions of their permits.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

No pack and saddle stock outfitter-guide permits would be issued with Alternative 1. This alternative would not meet the need for pack and saddle stock outfitting-guiding identified in the Needs Assessments. This would result in an elimination of the opportunity for people who do not own pack and saddle stock, or do not have the skills required to use them, to use this mode of travel for recreation on National Forest System land within the analysis area.

Current pack and saddle stock outfitter-guide permit holders would likely go out of business. They rely on authorization to use National Forest System land and the type of backcountry opportunity provided on forest is not available elsewhere. Impacts to the individual permit holders would be substantial, based on comments received from the outfitters on the Draft Environmental Impact Statement.

The amount of trails opened and maintained would be reduced from current levels since the outfitter-guides would no longer be assisting with trail maintenance. They would also not be available to assist in fire control, or in search and rescue operations.

Alternative 2

Alternative 2 would issue pack and saddle stock outfitter-guide permits to existing outfitters, or qualified replacement applicants. This would meet the need for pack and saddle stock outfitting-guiding identified in the Needs Assessments, and continue the opportunity for people who do not own pack and saddle stock, or do not have the skills required to use them, to travel into the back country using the animals.

Alternative 2 would allow 4,620 service days, which is a small increase over the existing 4,460 days available now. The outfitters commented on the Draft Environmental Impact Statement that they would be able to sustain their businesses with this number of days, but would not be able to expand their businesses if demand increases without the increased number of days.

One of the Forest Plan amendments to wilderness standards and guidelines would allow the outfitters to use existing campsites within 200 feet of meadows, lakes, streams, and special interest areas. This would allow the outfitters to continue to use the camps they are accustomed to using, rather than seeking out other existing camp locations.

The other amendment would not allow camps to exceed 5,250 square feet of barren core. Where camps in wilderness exceed this amount, the outfitters would be required to reuse the same 5,250 square feet each time they use the camp. In camps with less than 5,250 square feet, the outfitters would not be allowed to increase the amount of barren core. The 5,250-foot maximum was based on calculations of the size of common stock camp features, such as highlines and cook tents. Refer to **Appendix C** for full details on these calculations. Based on comments received from the outfitters on the Draft Environmental Impact Statement, fitting within 5,250 square feet would be difficult to achieve. In the outfitters' professional judgment, the original calculations underestimated the size of highlines that could safely contain 18 head of stock. Attempting to keep the highline to the size used in the 5,250-foot calculation could result in injuries to the stock or people because of stock being too close together or highlines becoming loose because of an inadequate number of mid-line support trees. The outfitters would also need to reduce the amount of area typically impacted by sleeping tents, stock handling, fire ring, and the latrine. These constraints would not meet the needs of the clients, and would reduce the quality of the camping experience, according to comments received from the outfitters and other responders to the Draft Environmental Impact Statement. Refer to the analysis file for comments.

Pack and saddle stock outfitter-guides would continue to open and maintain trails, helping keep more trails available for all users. They would also be available to assist in fire control, and in search and rescue operations.

Special use permit administration would continue to ensure compliance with the terms and conditions of the permits including all aspects of the alternative, including all mitigation measures included in Chapter 2.

Alternative 3

Alternative 3 would also issue pack and saddle stock outfitter-guide permits, or qualified applicants. It would only partially meet the need for pack and saddle stock outfitting-guiding identified in the Needs Assessments. There would be a 40% reduction in service days to 2,660,

which would be a substantial decrease in the availability of pack and saddle stock outfitter guides for people wanting that commercial service.

Alternative 3 would have a substantial impact on the viability of the outfitters due to the reduction in allowable service days, based on Draft Environmental Impact Statement comments received from outfitter-guides. The reduction in service days could result in a corresponding 40% decrease in gross profits generated, assuming that the decrease in in gross revenue would mirror the decrease in service days.

The Forest Plan amendment to reduce party size to twelve in wilderness with this alternative would also have a financial impact on the outfitters. Reduced party size would likely increase operating costs. The outfitter-guides would need to take fewer clients on each trip, or make twice as many trips to full service camps, using one trip to transport the gear and food, and another to take clients and staff to camp. For example, five clients and one outfitter-guide each riding horses would be a party of twelve. The gear and food for a party of this size would need to be taken to the campsite in separate trip. The outfitters whose clients do not ride stock would be able to take more clients or pack stock as long as the total party size does not exceed twelve, since no saddle stock would be needed.

The Forest Plan amendment would prohibit the pack and saddle stock outfitter-guides from using existing campsites that are within 200 feet of wetlands, streams, lakes, and special interest areas. Approximately 46 campsites recently used by the outfitters would no longer be available for outfitter-guide use, including the Bald Mountain and Beaver Creek assigned sites. This would impact the quality of camping the outfitters could offer their clients, since many of these 46 camps are the most popular and desirable ones (based on past outfitter-guide use patterns; see outfitter-guide use reports in the analysis file. Two additional existing campsites already being used by the outfitters would be chosen and designated as assigned sites to replace Bald Mountain and Beaver Creek camps. **Appendix A** indicates which campsites would be closed to outfitters.

The Forest Plan amendment to allow up to 2,800 square feet of barren core in campsites could be achievable because of the reduced party size. Approximately 85% of the campsites used by the outfitter-guides have less than 2,800 square feet of barren core. Nearly all of the campsites used most often, including all the assigned sites, have more than 2,800 square feet of barren core. The combination of the Forest Plan amendments could force the outfitters to change their current operating procedures to take fewer clients to possibly less desirable campsites, and offer fewer services and amenities.

Pack and saddle stock outfitter-guides would continue to open and maintain trails, helping keep more trails available for all users. They would also be available to assist in fire control, and in search and rescue operations.

Special use permit administration would continue to ensure compliance with the terms and conditions of the permits including all aspects of the alternative, including all mitigation measures included in Chapter 2.

Alternative 4

Alternative 4 would issue pack and saddle stock outfitter-guide permits to existing outfitters, or qualified replacement applicants. This would meet the need for pack and saddle stock outfitting-guiding identified in the Needs Assessments, and continue the opportunity for people who do not own pack and saddle stock, or do not have the skills required to use them, to travel into the back country using animals.

Alternative 4 would increase available service days to 6,700. This would give the outfitters the opportunity to meet the demand for their services if that demand rebounds to the level seen in the early part of the last decade (refer to the 2012 Needs Assessment in Appendix B). According to the outfitters, the ability to increase the number of clients would likely allow them to cover increasing operating costs and remain viable businesses in the future.

As with Alternative 2, the Forest Plan amendment to wilderness standards and guidelines allowing the outfitters to use existing campsites within 200 feet of meadows, lakes, streams, and special interest areas would allow them to continue to use the camps they are accustomed to using.

The Forest Plan amendment concerning barren core would allow the pack and saddle stock outfitter-guides to use existing barren core in established campsites, but not create additional barren core. This would allow enough room for 12 people and 18 head of stock in every camp without changing use patterns, or impacting the quality of the camping experience for clients. This would allow safe handling and confinement of stock, and comfortable, albeit primitive wilderness campsites that would fully meet the needs and expectations of their clients.

Pack and saddle stock outfitter-guides would continue to open and maintain trails, helping keep more trails available for all users. They would also be available to assist in fire control, and in search and rescue operations.

Special use permit administration would continue to ensure compliance with the terms and conditions of the permits including all aspects of the alternative, including all mitigation measures included in Chapter 2.

Cumulative Effects

Past, present, and reasonably foreseeable future actions in or near the analysis area are listed in the first part of this chapter. The spatial boundary for cumulative effects is the analysis area plus the outfitter-guides adjacent ranches where outfitters begin trips from their land. The temporal timeframe is from the early 1900s (when outfitting first began on the Forest) through 2022 when the permits that would be issued under this analysis would expire and the effects of those permits would cease. The actions mentioned below affect, or have the potential to affect, pack and saddle stock outfitter-guides.

Past Actions

Outfitter guides have been operating on these districts for over half a century. They have built clientele that return each year, and have attracted an increasing number of clients over time.

Present Actions

Figure 3.0-1, beginning on page 3-4, lists all the outfitters currently operating in the analysis area. They are helping to meet the need for outfitting and guiding of a variety of activities, identified in the 2012 and 1996 Needs Assessments.

Reasonably Foreseeable Future Actions

It is reasonably foreseeable that all the outfitters listed in Figure 3.0-1 will continue to operate in the analysis area, meeting the need for outfitting activities other than pack and saddle stock.

It is also reasonably foreseeable that the Okanogan and Wenatchee Forest Plans will be revised in the next few years. The revised forest plan will comply with all laws and regulations, and the environmental impacts of the revision will be completed prior to implementation. The pack and saddle stock outfitter-guide permits would be amended at that time to follow the new standards and guidelines.

Alternative 1

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 1 would be to partially meet the need for outfitting and guiding, since the other outfitter-guides would continue to provide the commercial services for activities other than pack and saddle stock. There would be no outfitter-guides for the pack and saddle stock clients, so there would be no opportunity for those lacking the skill or equipment for pack and saddle stock trips.

Alternative 2

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 2 would be that the existing demand and the future demand based on the past five years of actual use for commercial outfitter-guide services for a variety of activities would be met. The effect would be that more people would have access to recreation on National Forest System land.

Alternative 3

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 3 would be that the need for outfitting and guiding identified in the Needs Assessment would only be partially met. About 40% of the established pack and saddle stock outfitter-guide services would not be able available. The effect would be that people seeking recreation opportunities other than pack and saddle stock would be able to hire commercial outfitter-guides, but the availability of pack and saddle stock commercial outfitter-guide services would not meet the demand.

Alternative 4

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 4 would be that the existing demand and the future demand based on the past ten years of actual use for commercial outfitter-guide services for a variety of activities would be met. The effect would be that more people would have access to recreation on National Forest System land.

CONSISTENCY FINDING

There are no laws or standards and guidelines specific to outfitter-guides aside from those addressing resource concerns. Refer to each section in Chapter 3 for a detailed discussion of legal and forest plan and other management direction compliance.

Pack and saddle stock outfitter guides would be required to comply with all permit terms and conditions and operating plans. This would be accomplished through on-going permit administration activities.

3.2 WILDERNESS

The section below is a summary of the Wilderness Report which is available in the project analysis file (Zbyszewski, 2012b).

REGULATORY FRAMEWORK

THE WILDERNESS ACT

The Wilderness Act of 1964 (P.L. 88-577) established the National Wilderness Preservation System. There are two wilderness areas in the analysis area. The Pasayten Wilderness was designated in 1964 with additional area added in 1984, and the Lake-Chelan Wilderness was designated in 1984.

The Act includes the management of wilderness (Sec. 2a):

> *these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness…*

Wilderness is defined by the Wilderness Act (Sec. 2c) as:

> *A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.*

The Act further defines wilderness as area (Sec. 2c):

> *…which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation…*

Commercial activities are prohibited by the Act (Sec. 4c):

> *{e}xcept as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise…within any wilderness area designated by this Act…*

The Act goes on to specifically authorize commercial service for recreational purposes (Sec. 4d6):

> *{c}ommercial services may be performed within the wilderness areas…to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.*

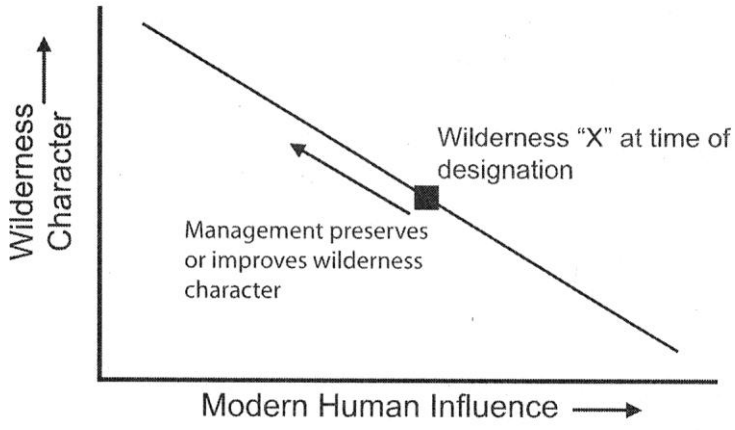
FOREST SERVICE MANUAL

The Forest Service Manual Chapter 2320.2, No. 4, directs the agency to "protect and perpetuate the wilderness character", and to evaluate whether wilderness character is degrading, stable or improving over time.

The Manual includes the Wilderness Management Model, which was modified in the publication "Monitoring Selected Conditions Related to Wilderness Character: A National Framework" (USDA Forest Service, 2005). This model is the basis for Forest Service wilderness management policy.

The Model shows the relationship between wilderness character and the human influence that affects it. The figure below shows the conceptual relationship between the two factors.

Figure 3.2-1. Wilderness Management Model



As modern human influence increases, the condition of the wilderness character declines, as shown by the diagonal line. A goal of wilderness management is to maintain or improve wilderness character from its state at the time of wilderness designation. This is often referred to as the "non-degradation policy" of wilderness management.

Wilderness character is not specifically defined in the Act. Exploring historical writings of the framers of the Wilderness Act, especially those of Howard Zahniser, its principal author,

revealed three ideals that are integral to the historic purpose of wilderness, and to understanding wilderness character:

- Natural environments relatively free from modern human manipulation and impacts.
- Personal experiences in natural environments that are relatively free from the encumbrances and signs of modern society.
- Symbolic meanings associated with wilderness (Landers, et al, 2005).

"Character" commonly means "the combination of qualities or features that distinguishes one person, group, or thing from another" (American Heritage Dictionary 1992) or "the aggregate of distinctive qualities" (Webster's Dictionary 1976). Using these definitions, wilderness character is the combination of biophysical, experiential and symbolic ideals that distinguishes wilderness from other lands. This is a complex and subtle set of relationships between the land, its management, and the meanings people associate with wilderness (Landers, et al, 2005).

NEED ASSESSMENT AND MINIMINUM EXTENT NECESSARY DETERMINATION

The Manual also includes the requirement to address the need for and role of outfitters in the Forest Plan. The Wilderness Act prohibits commercial services except "to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas."

The Forest Service completed the analysis for both the need and extent necessary, and documented the findings in a paper titled "Determination of Need and Extent Necessary for Commercial Services (Outfitters and Guides) in the Pasayten Wilderness and Lake Chelan-Sawtooth Wilderness", June 2010 (USDA Forest Service, 2010). This document was revised to respond to public comments on the Draft Environmental Impact Statement. The calculations in the 2010 document were confusing, and the finding of need was based on providing enough service days to keep the existing outfitters in business. This did not meet the intent of establishing the minimum extent necessary to meet the provisions in the Wilderness Act . The revised document is titled "Determination of Need and Extent Necessary for Commercial Services (Outfitters and Guides) in the Pasayten Wilderness and Lake Chelan-Sawtooth Wilderness", August 2012 (USDA Forest Service, 2012). This paper is referred to as the "2012 Needs Assessment" in this document. The following information is summarized from the Needs Assessment. Refer to Appendix B for complete information, analysis, and calculations.

The Needs Assessment found there is a need for pack and saddle stock outfitter guides in wilderness. The criteria used for the evaluation included:

- Is the activity allowed in wilderness?
- Does the activity educate clients about the wilderness resource?
- Does the activity promote solitude, or primitive and unconfined recreation?
- Does the activity provide a public purpose, and does the level of skill, knowledge, equipment, and safety required for the activity support the need for commercial services?

Pack and saddle stock use is an appropriate mode of transportation in wilderness, since it does not include any mechanized or motorized equipment. Outfitter-guides teach their clients about wilderness directly in conversations about wilderness, and indirectly through demonstrating how to travel and stay in the wilderness without modern conveniences. Pack and saddle stock

outfitter-guide's trips promote solitude by taking clients to remote locations within wilderness, and letting them experience primitive and unconfined recreation. The outfitters also serve a public purpose by offering trips for recreation, scenic viewing, and historic use. Their services are needed by an element of the public due to the fact that many people are not skilled in stock handling, do not own stock and equipment, do not have the knowledge of stock handling techniques that minimize resource damage, and would be endangering their lives or the lives of others because of the hazards associated with stock.

The minimum amount of commercial services needed to provide for recreation is not a number that can be precisely calculated. Rather, several factors are considered to establish a range of service days that would provide the minimum extent of commercial service. The factors include:

- need for commercial services,
- historic number of service days,
- proportional relationship between outfitter and non-outfitted use levels,
- current resource conditions and impacts from recreation use on wilderness character,
- wilderness capacity, and
- anticipated changes in overall number of recreationists and need for outfitter guides.

Historic Number of Service Days

The range of years used for this determination was from 2001 to 2010. There has been a decline in outfitter guide service days in the past five years, but the reason for that decline in unknown. The decline may be a result of wildfires, the downturn in the economy, decreased demand, or other factors. The eleven year span was selected in case the factors affecting the use change, and the need increases to the levels seen earlier in the 11-year span.

The lowest number of service days, or an average of a range of years cannot be used in the minimum extent necessary determination. The number of people needing the services of an outfitter-guide will vary from year-to-year, so the minimum extent of commercial services allowed needs to be large enough to cover the years with the largest need.

Proportional Relationship Between Outfitted and Non-outfitted Use Levels

Comparing the current visitor day totals to the largest need, approximately 30% of pack and saddle stock users need outfitter-guides services in the Pasayten Wilderness, and approximately 5% in the Lake Chelan-Sawtooth.

Current Resource Conditions and Impacts on Wilderness Character

The analysis of the impact of existing recreation use (including outfitter-guides) on wilderness character has shown that there are localized impacts to the opportunities for solitude, but these are not interfering with the current upward trend in wilderness character for the Pasayten or Lake Chelan-Sawtooth wildernesses. Current conditions meet or exceed the expectations of the vast majority of wilderness visitors (Burns, et al, 2010).

Wilderness Capacity

The capacity analyses for the Pasayten and the Lake Chelan-Sawtooth found that the existing amount of use is within the biophysical and social capacities, with some areas needing closer monitoring to ensure that wilderness character is not degraded.

Anticipated Changes in Need and Demand

There will be increasing demand for recreation in the coming years. The technical report *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation* (Hall et al., 2009) and Washington State's Interagency Committee on Outdoor recreation (Interagency Committee on Outdoor Recreation, 2003) both predict the increase. The Interagency Committee estimates that there will be a 13% increase in the number of people hiking and backing, and a 3% increase in the number of people riding horses in the next 10 years (Interagency Committee on Outdoor Recreation, 2003). These projections are used to estimate the number of people who will be recreating in the Pasayten and Lake Chelan-Sawtooth ten years from now.

The shifting demographics in the population will influence the minimum extent of commercial services needed. The need for stock outfitter guides is likely to increase as the population ages, and more people are physically unable to access the wilderness on foot or carrying a backpack. There will be approximately 25% more people in the over 50 age class by 2020 (Washington State Office of Fiscal Management, 2010). The number of people in this age class wanting to travel into the wilderness could also increase by approximately 25%. Since approximately 73% of stock outfitter-guide clients are over 49 years old, the minimum extent of stock outfitter-guide service days could be an additional 25% above and beyond the 3% increase in stock users estimated by Washington State (Interagency Committee on Outdoor Recreation, 2003).

Considering all the factors, the minimum extent of pack and saddle stock commercial services in the Pasayten will range from approximately 1,735 to 2,170 service days. In the Lake Chelan-Sawtooth, the range will be approximately 660 to 825 (Needs Assessment, 2012).

FOREST PLAN STANDARDS AND GUIDELINES

The Okanogan National Forest Land and Resource Management Plan (Okanogan Forest Plan, 1989), and the Wenatchee National Forest Land and Resource Management Plan, (Wenatchee Forest Plan, 1990) contain standards and guidelines to ensure compliance with the Wilderness Act and Forest Service Manual 2320. Standards and guidelines specify activities related to planning, facilities, use, administration, trails, in addition to fish and wildlife, vegetation, range, noxious weeds, soil and water, minerals, lands, and protection. In the Okanogan Forest Plan, these standards and guidelines are on pages 4-86 through 4-97. In the Wenatchee Forest Plan, the standards and guidelines are on pages IV-69 through IV-77, IV-227 through IV-232, and on E-4 through E-23. **Maps 1-4** and **1-5** show the wilderness areas and management areas.

Management Areas

<u>Okanogan Forest Plan</u>

In an effort to provide a spectrum of recreation opportunities appropriate in wilderness, the Okanogan Forest Plan established two wilderness management areas. These areas are Trailed (MA 15B) and Trail-less (MA 15A). **Map 1-4** and **Map 1-5** in the Map Section show division of the Pasayten and Lake Chelan-Sawtooth Wilderness Areas into these two management areas. All outfitter-guide travel routes and camps included in this EIS are within the Trailed area (MA 15B). There may be a rare instance where drop camp clients may visit on foot the Trailless area (15A) from a campsite in the Trailed area (MA 15B).

The Desired Future Condition in the Okanogan Forest Plan states that the Trailed area will provide a high to moderate opportunity for exploring and experiencing isolation and solitude, independence, closeness to nature, tranquility, and self- reliance through the application of primitive skills in an environment that offers a high to moderate degree of challenge and risk. The Trail-less area will provide an outstanding opportunity for isolation and solitude and utilizing primitive skills in an environment offering a high degree of challenge and risk. Standards in the Okanogan Forest Plan have been established that represent the appropriate social and resource conditions for the Trailed (MA 15B) and Trail-less (MA 15A) areas.

Wenatchee Forest Plan

A portion of the Lake Chelan-Sawtooth Wilderness is located on the Chelan Ranger District, and is covered by the Wenatchee Forest Plan, 1990. The Wenatchee Forest Plan has both Forestwide (LRMP, IV-69 to IV-77) and management prescription specific management direction for wilderness (WI-1, LRMP page IV-227 to IV-232, and Appendix E), and divides wilderness into four recreation opportunity spectrums: Pristine, Primitive, Semi-Primitive, and Transition. Pack and saddle stock outfitter-guides are allowed to operate in areas where their use is consistent with the standards and guidelines of the Wilderness Recreation Opportunity Spectrum.

Pristine: This area is characterized as an extensive, unmodified, natural environment. Natural processes and conditions have not been measurably affected by the actions of users. The area will be managed as free as possible from the influences of human activity. Terrain and vegetation allow extensive and challenging cross-country travel, however the use of stock is not encouraged for cross-country travel.

Primitive: The area is characterized by an essentially unmodified, natural environment. Concentrations of visitors are low and evidence of human use is minimal. The area has high opportunity for isolation, solitude, exploration, risk, and challenge.

Semi-Primitive: The area is characterized by a predominately unmodified environment of at least moderate size. Campsites and system trails are present and there is evidence of other uses. A minimum of on-site controls and restrictions are implemented to protect physical, biological, and social resources. Some facilities may be present to reduce visitor impact.

Transition: The area is characterized by a predominately unmodified environment, however, the concentrations of visitors may be moderate to high at various times. The area is characterized as having a large number of day users who are often mixed with overnight and long-distance travelers on trails near trailheads and wilderness boundaries.

The Desired Future Conditions for wilderness areas, as stated in the Wenatchee Forest Plan are that wilderness resource values will be somewhat improved through management of recreation visitor use. A general upward trend should be apparent in monitoring results. The expected increase in visitors will result in more management actions employed to reduce use in heavily impacted areas, disperse use into areas that can accommodate more

use, and more regulations to alleviate specific problems. Restoration and revegetation of heavily impacted areas will be on-going in areas where visitor use has resulted in loss of vegetation and unnatural or accelerated soil erosion. Refer to page IV-6 in the Wenatchee Forest Plan for more information on the desired future condition.

Standards and Guidelines

The Okanogan and Wenatchee Forest Plans contain standards and guidelines designed to ensure compliance with the Wilderness Act, and Forest Service policy.

Two of the four components of the Wilderness Act definition of wilderness are reflected in the standards and guidelines: "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable", and "has outstanding opportunities for solitude or a primitive and unconfined type of recreation".

The standards and guidelines frame the management direction to protect wilderness character. There are also general standards and guidelines that address the undeveloped and natural qualities of wilderness, and the opportunities for solitude or primitive and unconfined recreation. Refer to the Okanogan Forest Plan, pages 4-91 through 4-97, and the Wenatchee Forest Plan, pages IV-69 through IV-77, IV-227 through 232. The Consistency finding section of this analysis, beginning on page 3-91, includes a full list of standards and guidelines, including details of how the proposed action and alternatives comply with each.

ANALYSIS METHOD

This report analyzes and discloses the effects pack and saddle stock outfitter-guide activities have on wilderness character. Since the outfitter-guides are only a portion of overall recreation use (10% of all use and 32% of pack and saddle stock use in the Pasayten, and 2% of overall use and 6% of stock use in the Lake Chelan-Sawtooth), the environmental effects of all recreation use, and how those effects change with the alternatives, are included in the cumulative effects section.

The analysis follows the process detailed in "Applying the Concept of Wilderness Character to National Forest Planning, Monitoring, and Management", by Peter Landers et al., December 2008.

A key component of the wilderness resource is wilderness character. The concept of wilderness character comes from Section 2(a) of the Wilderness Act: " … for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness and so as to provide for the protection of those areas, the preservation of their wilderness character."

Wilderness character is, in part, an intangible concept, yet results in substantial disagreement over whether the agency is managing wilderness in a manner that meets the legal requirements of the Act. For this reason, this analysis will use concepts from the Act to help frame the discussion. The four qualities will be referred to throughout this analysis and used to represent

wilderness character. These four qualities are derived from the definition of Wilderness, Section 2(c) of the Act, which contains distinct attributes that link to the concept of wilderness character:

> *A Wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological , geological, or other features of scientific, educational, scenic, or historical value.*

The four qualities or concepts of wilderness character that will be addressed throughout this analysis are:

1. **Untrammeled** – wilderness ecosystems are essentially unhindered and free from human control or manipulation. Recreation activities do not impact this quality, since they do not intentionally control or manipulate the ecosystems.
2. **Undeveloped** – wilderness is essentially without permanent improvements or modern human occupation. Recreation activities do not impact this quality, unless they involve construction of buildings or require motorized or mechanized equipment.
3. **Natural** – wilderness ecological systems are substantially free from the effects of modern civilization. Recreation activities can influence this quality through pack and saddle stock grazing, and impacts to water quality, stream bank erosion, and disturbance to soils.
4. **Outstanding opportunities for solitude or a primitive and unconfined type of recreation** – wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge. This is the quality most affected by recreation activities. The number of visitors, and encounters between them, number and condition of campsites, number of user-created recreation facilities, and number of miles of trails all impact the opportunities for solitude, or a primitive and unconfined type of recreation (Landers et al, 2008).

Landers et al. (Landers et al, 2008) describes the technique of using these qualities in evaluating effects to wilderness character. Wilderness character is the primary administrative responsibility mandated by the Wilderness Act, but it is not defined by the Act. Wilderness character is the biophysical, experiential, and symbolic relationships and meanings that distinguish wilderness from all other lands, is supported or degraded by stewardship decisions and action, and is unique to each wilderness.

The wilderness resource analysis uses these qualities for evaluating the effects of management actions on the wilderness character. In addition to the use of the four qualities of wilderness character in the evaluation, the context, intensity, duration, and type of effects provide

boundaries for the effects analysis. For the purpose of this analysis, the following approach is used.

Context: **Local** effects are those that occur at site-specific locations within the wilderness. **Wilderness-wide impacts** would be effects to the entire wilderness.

There are activities outside the wilderness boundary of the Pasayten and Lake Chelan-Sawtooth wildernesses that may have cumulative effects when considered with the effects of the alternatives. Developed recreational sites, such as campgrounds and trailheads, exist in many locations near the wilderness boundary. In these cases, activities outside the wilderness boundary may have effects inside wilderness areas.

Intensity: The intensity of the impact considers whether the effect to wilderness character is negligible, minor, moderate, or major. **Negligible** effects are considered not detectable to the visitor and therefore expected to have no discernible outcome. **Minor** effects are slightly detectable, though not expected to have an overbearing results on wilderness character. **Moderate** effects would be clearly detectable to the visitor and could have an appreciable effect on one or more aspects of wilderness character. **Major** effects would have a substantial, highly noticeable influence on the visitor's experience and could permanently alter more than one aspect of wilderness character.

Duration: The duration of the effect considers whether the impact would occur in a short- or long–term period. A **short-term** effect would be temporary in duration, such as an encounter while traveling or camping. A **short-term** effect (to physical qualities of wilderness character) would be 1 to 2 years. A **long-term** effect would have lasting effects on the wilderness character, such as an impression from noticeable ecological impacts. Long-term physical effects to the wilderness character last 10 to 20 years.

In summary, the objective of this analysis is to forecast potential environmental effects of the proposed action and alternatives on wilderness resources with particular attention to qualities of wilderness character. Wilderness character is described by using four qualities: 1) untrammeled; 2) undeveloped; 3) natural; and 4) outstanding opportunities for solitude or a primitive and unconfined type of recreation of wilderness character. The context of impacts, intensity of impacts, and the duration and type of impacts— as defined above— further bound the analysis. The topics focus the discussion on meaningful and relevant effects.

DATA SOURCES

Pack and Stock Outfitter-Guide Activities

Pack and saddle stock outfitter-guide activities are constantly monitored as part of the special use permit administration process (see monitoring data in the analysis file). This process generates information about compliance with permit terms and conditions, camp conditions, use patterns, grazing practices, and other permit and resource information. This information was used to evaluate compliance with the Wilderness Act, FSM 2300, and Forest Plan standards and guidelines.

Service Days
Use data has been compiled using the most accurate data available. The number of service days in the existing pack and saddle stock outfitter-guide permits plus the number of days in the priority use pool is used as the current service days. The number of service days actually used varies from year to year. Reliable records for the Pasayten and Lake Chelan-Sawtooth are available for the past 10 to 20 years. Some data gaps and margins of error exist due to data interpretations. Reports of use provided by the outfitters occasionally recorded vague or unknown destination locations. The data is the best information available, and has a level of accuracy that is more than adequate for this analysis. More detailed use data, or data that goes back farther in time, is not essential and is not critical to the analysis of wilderness character attributes.

Monitoring Data
The Forest Service has been monitoring conditions in the Pasayten and Lake Chelan-Sawtooth wilderness areas for over 20 years. Specific information includes campsite conditions, including the size of barren cores, number of trees with exposed roots, and other elements. Monitoring has been done on areas around campsites where pack and saddle stock graze. This monitoring has gathered information used to determine wilderness character and the impacts of pack and saddle stock outfitter-guide activities on the character. This information was also used to determine compliance with existing Forest Plan standards and guidelines. Refer to the Wilderness folder in the analysis file for complete monitoring data.

Encounter Data
A permit system is used to gather information about wilderness trips, including date, duration, type of use, area, etc. The information from these permits, in addition to observations made by wilderness rangers, was used to determine the number of encounters a wilderness visitor is likely to have with other groups. This was used to assess the opportunities for solitude, and compliance with standards and guidelines. Refer to the Wilderness folder in the analysis file for complete encounter data and analysis.

Total Recreation Use Levels
Monitoring was completed in 2005 and 2010 to gather information about the number of people recreating in the wilderness areas. Refer to the Revised National Visitor Use Monitoring (NVUM) Results for the Okanogan National Forest, Data Collected FY2005, Revised May 2012 (USDA, 2012b), and Data Collected FY2010, August 2011 (USDA, 2011).

The findings for the 2005 monitoring were updated by the authors between the Draft EIS for the Pack and Saddle Stock Outfitter-Guide Special Use Permit Reissuance (USDA 2010), and the Final EIS. The updated results were substantially lower than the original used in the DEIS. The results of the 2010 monitoring were also issued between Draft and Final, and these results were substantially lower than the revised 2005 results.

Because of this discrepancy, the Forest Service compiled data from the registration permits for the Pasayten Wilderness in an attempt to resolve the inconsistent results from NVUM. Wilderness visitors are required to fill out a registration permit prior to entering the Pasayten. Data from these permits was compiled and averaged for 2001 through 2011. Refer to the analysis file for full permit data.

The 2005 NVUM reported 11,000 visits to the Pasayten, with an average length of stay of 40.7 hours. Multiplying these numbers gave the total number of hours spent in the Pasayten. Dividing this product by 24 hours converted 11,000 visits to 18,654 visitor days.

The 2010 NVUM reported 5,000 visits to the Pasayten with an average stay of 12 hours. This calculated to 2,500 visitor days.

The averaged permit data showed 16,830 visitor days, which was relatively close to the 18,654 visitor days from the 2005 NVUM. This validated the 2005 results, and suggests the 2010 data is not reliable enough to use.

There is no required permit system for the Lake Chelan-Sawtooth Wilderness, so NVUM data must be used to estimate visitor days. Since the 2005 NVUM data for the Pasayten appears to be close to the averaged permit data, the 2005 data for the Lake Chelan-Sawtooth and the Pasayten is assumed to be the most reliable information available.

Comparisons of Outfitted and Non-outfitted Use

The number of service days in the existing pack and saddle stock outfitter-guide permits plus the number of days in the priority use pool and the total recreation use information from the 2005 NVUM survey (USDA, 2006c & USDA, 2006d) were used to calculate the comparisons of outfitted to non-outfitted use. The number of service days varies from year to year, as does the total number of recreationists (outfitter and non-outfitted), so these percentages are merely estimates, and do not represent an exact reflection of the relationship between outfitted and non-outfitted use in any given year. This is the best available data, however, since the Forest Service calculates overall use numbers once every five years. More accurate percentage calculations are not essential or critical to the analysis of wilderness character attributes. Any impacts to wilderness character as a result of not having more precise data are not likely to affect the decision making process because they would be localized and minor in context of impacts from overall use. Current conditions and future uses are the most relevant factors to consider.

Future Estimates of Recreation Use Levels

The number of visitor days expected in the future was calculated using projected changes included in the Washington State Comprehensive Outdoor Recreation Planning (SCORP) publication "*Estimates of Future Participation in Outdoor Recreation in Washington State*" (Interagency Committee for Outdoor Recreation 2003). These projected changes were for 10 and 20-year periods based on participation data from the 1999-2000 RCO survey (IAC 2003). These projections, shown in **Figure 3.2-21**, took into account NSRE data and projections for the Pacific Northwest Region, demographic trends in Washington State, the local supply of lands available for recreation activities, and other factors.

Social Monitoring Data

Another monitoring exercise was conducted in 2009 to gather information about visitor's perception of the condition of the wilderness, including sense of crowding, resource condition, social conflicts, and other elements. The results documented in the paper titled "2009 Wilderness Use Study: A comparison of Pasayten and Lake Chelan-Sawtooth Wilderness Use Patterns", May 2010, (Burns, et al, 2010) were used to evaluate opportunities for solitude, undeveloped character, capacity, and social conflicts.

Barren Core
All barren core measurements throughout this document are approximate. Barren core was calculated using measurements of barren areas within campsites, taken in the field during 2011 and 2012. These measurements were converted to square feet, and are the best data available. The bare areas are never straight-sided shapes where repeated measurements are likely to generate consistent results. Rather they are typically odd-shaped, with more than one area occurring within a single campsite. Repeat measurements of barren core will fluctuate from one year to the next based on use patterns, weather (influencing vegetation growth), and accuracy and pattern of actual measurements.

Best Available Science
The best available science was used for this analysis, including the methodology and data sources described above, to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on wilderness character.

AFFECTED ENVIRONMENT

Historic Activities
The wilderness character in the Pasayten and Lake Chelan-Sawtooth wilderness areas has been stable or on an upward trend since the areas were designated as part of the Wilderness Preservation System (1968 for the Pasayten, and 1984 for the Lake Chelan-Sawtooth). In order to understand this, it is important to consider the historic use of the areas. Human activities altered the biophysical condition of the resources prior to designation. Commercial livestock grazing and wildfire suppression had altered plant communities over much of the landscape, and fish stocking of high elevation lakes changed the aquatic ecosystems and recreation use patterns. Recreation activities (including outfitting and guiding), livestock herders, and mining activities created a network of trails, campsites, and scattered buildings in both wilderness areas. Some of the effects of these past activities are still evident today.

<u>Grazing</u>
Historical grazing changed the condition of the wilderness areas before they were designated, and continued to adversely impact the untrammeled and natural qualities of the areas while grazing continued after designation. Prior to the introduction of livestock grazing, the areas that became the Pasayten and Lake Chelan-Sawtooth Wilderness Areas were largely untouched by human activities. Grazing altered the vegetative communities across large portions of the areas. Sheep and cattle herders established camps where they stayed when the livestock were grazing. These camps were large (well in excess of the current 400 foot barren core standard), and resulted in damaged trees in and around the camps. When the grazing allotments were vacated, the condition of the landscape began to improve. Some altered vegetative communities began to slowly return to pre-grazing conditions. Campsites not used by the public revegetated. Campsites that were used by the public changed very little after the areas were designated as wilderness due to the short growing season, and impacts from continued use. These are continuing to impact the opportunities for solitude.

Wildfires and Wildfire Suppression

Wildfire is a natural process in wilderness. In the early to mid-1900s, the Forest Service started suppressing wildfires. This has had a major, adverse impact to the wilderness-wide untrammeled and natural qualities of the Pasayten and Lake Chelan-Sawtooth Wildernesses. The suppression changed the disturbance cycle of the ecosystem, leaving much of the wilderness areas with high levels of down material, which has led to higher density stands, and increased mortality from insects and disease.

Some of the lower elevations surrounding the western slopes of the Lake Chelan-Sawtooth have burned in the last 10 years. This burn pattern reduces the probability of fires burning upslope from Lake Chelan to spread fire into the wilderness, since the wilderness boundary is within approximately 50 feet of the lake's high water mark. Over 200,000 acres have burned in the Pasayten in the last 10 years. Areas burned by high severity fire in Andrews and Farewell Creek drainages continue to elevate the risk of debris slides in these two watersheds. The wildfires caused short-term displacement of recreationists, increasing use in portions of the wilderness away from the burned areas. Use patterns returned to pre-fire conditions once the fires burned out and trails were repaired to allow access.

Fish Stocking

In the 1930s, various sportsmen's associations began stocking high lakes, historically fishless waters, with various species of fish. The Washington Trail Blazers, formed in 1933, continues to volunteer for the State Department of Fish and Wildlife in this role by packing fish in on their backs and with stock. In 1958, a similar advocacy group, the HiLakers, formed around the common goal of enhancing opportunities for high lake fishing. Approximately 40 lakes have been and continue to be stocked in the Pasayten and Lake Chelan-Sawtooth wildernesses.

The stocking has major localized impacts on the natural and untrammeled quality of the wilderness areas since it changed the structure of the aquatic ecosystems in each stocked lake. In addition, stocked lakes became a focal point for recreational use. Consequently much of the higher density recreational impact in wilderness occurs in lake basins, decreasing the opportunities for solitude.

Mining

The Pasayten and Lake Chelan-Sawtooth have a history of mining activity. The biggest mine in the Pasayten is the Tungsten located near the boundary between the Tonasket and Methow Valley districts. It operated from the early 1900s to approximately the 1930s. Mineral rights for the Tungsten and several other claims in the vicinity were found to be invalid in 1989. There are four buildings still standing at the site, though not maintained by the Forest Service. The mine is a destination for some recreationists. There is a large barren core at the mine site. Unauthorized maintenance of the buildings by members of the public is having a major impact on the undeveloped quality of wilderness character and the opportunities for solitude in the vicinity of the mine. The structures interfere with the primeval character since they are evidence of modern human occupation. The sights and sounds of people at the mine decrease the remoteness of the area.

Mines were staked in the late 1890s and early 1900s on Gilbert and Crescent Mountains in the Lake Chelan-Sawtooth Wilderness Area in the upper Twisp River. Operations at the

Crescent ended around 1915 after a depression forced the Canadian company financing the operation to abandon the project. Some evidence of the old mine exist; it is not a destination for recreationists and seldom visited. The miner leasing the claims on Gilbert Mountain constructed the trail to North Lake in the 1940s to extract and transport ore. There are currently no activities at these claims. In 1984, 375 Jolly claims were established on Gilbert Mountain, however little to no activity has occurred on any of them (Portman 1993).

These mining activities had moderate, local impacts to the undeveloped quality in the immediate vicinities because they show evidence of modern human occupation. The impact is lessening over time as the buildings and mine shafts decay.

Recreation Use

People have been using pack and saddle stock to travel into the backcountry for nearly a century. Pack and saddle stock outfitter-guides have been operating in the areas for decades, before the Pasayten and Lake Chelan-Sawtooth Wildernesses were designated, and long before the Forest Plans were signed and implemented. Parties that included over twenty people, and forty head of stock were common. Camps were constructed and maintained to provide for clients' comfort, with facilities such as permanent latrines, picnic tables, cook tents with wooden floors and ovens, camp furniture, and tent pads. Trees were cut down for firewood, or to improve the view or lay-out of camps. Pack and saddle stock were tied to trees, damaging some, and exposing their roots. All these activities were completely legal and acceptable at the time. As commercial grazing was eliminated, many camps used by commercial livestock permittees were converted to pack and saddle stock outfitter camps. This created and perpetuated camps with large areas of vegetation loss and compacted bare mineral soil, trees with exposed roots, trees killed by recreation activities, and removal of all snags in and around camps.

Hiking and backpacking started to gain popularity in the 1960s and 1970s, and overtook horseback riding as the most common mode of transportation into the backcountry. Outfitter-guides offering trips in backpacking and wilderness skills have been operating in the Pasayten and Lake Chelan-Sawtooth wilderness areas since 1977. These groups occasionally use the large, established campsites, but also operate in the trail-less portions of the wilderness areas, teaching their clients about hiking, backpacking, mountaineering, survival skills, environmental and wilderness education.

Many of these campsites established by the sheep herders are used today by recreationists and outfitters. Due to the level of historic and continuing use, these hardened sites are still devoid of vegetation cover. Most of the camp areas predate the current Forest Plans and exceed current plan standards for vegetation loss and compacted bare mineral soils, and number of trees with exposed roots. The camps are having a localized, moderate effect on the opportunities for solitude because they detract from the remoteness from sights of people inside the wilderness.

Forest Service Administration

Several cabins were constructed in the wilderness areas for Forest Service employees working in the areas. The Hidden Lakes, Spanish Camp, Horseshoe Basin, and War Creek

cabins were staffed nearly every summer, and regularly maintained. The buildings are having localized, moderate impacts on the undeveloped quality of the wilderness areas.

Trail Maintenance

Trails have been maintained on a regular basis since they were developed. Both the people using the trails and the Forest Service have kept the trails open by cutting fallen trees, constructing and maintaining drainage structures and bridges, and maintaining trail tread for nearly 100 years. Trails have also been relocated when needed to prevent or correct resource damage.

In the 1970s and 1980s, the Forest Service was maintaining about 600 to 700 miles of trail in the Pasayten and 120 to 150 miles in the Lake Chelan-Sawtooth annually. Trail maintenance budgets began to decline in the 1990s, gradually reducing the miles of trail maintained annually to between 350 and 500 in the Pasayten, and 85 to 90 in the Lake Chelan-Sawtooth. This reduction concentrated people on to the maintained trails.

Trail maintenance has helped manage recreation use, but has had localized negative impacts to the opportunities for solitude by concentrating and containing use on the existing trails. The negative impact from the trails is offset by the beneficial impact of keeping traffic localized and controlled, and leaving the vast majority of each wilderness area untouched. This has protected the opportunities for solitude across most of the wilderness areas.

Restoration Activities

The Forest Service has been working to restore campsites and trails since the Pasayten became a designated wilderness in 1968, and the Lake Chelan-Sawtooth was designated in 1984. These have improved the opportunities for solitude by restoring impacted sites by controlling and limiting use, and constructing facilities at campsites to reduce further damage to vegetation and soil. A list of these recreation activities is included in the analysis file.

Pasayten Airport

The Pasayten Airport was constructed starting in 1931. It was built to accommodate small aircraft. It was maintained as a landing strip and airport until the Pasayten was designated a wilderness in 1968. The runway can still been seen, although small trees are growing on the north half. A cabin and barn are located next to the runway which the Forest Service uses as housing for wilderness rangers or as a base camp for trail maintenance. This is a destination spot for some outfitted non-outfitted pack and saddle stock users, but not used frequently because it is one of the few places with forage for stock.

Although no longer used for aircraft, the airport continues to have a moderate, local impact to the undeveloped quality of the immediate area as a result of the landing strip disturbance and the presence of the cabin.

Untrammeled Quality

The current recreation use, including the current pack and saddle stock outfitter guide activities, is having no effect on the untrammeled quality of the Pasayten or Lake Chelan-Sawtooth wildernesses. This quality pertains to the wilderness ecosystem, and whether it is essentially unhindered and free from human control or manipulation (Landers et al, 2008). Pack and saddle stock outfitter-guide activities and non-outfitted recreation use are certainly causing localized

impacts, but these are more associated with the Natural and Opportunities for Solitude qualities of wilderness character, and are discussed below. As discussed in the previous section titled "Historic Activities", livestock grazing, wildfire suppression, and fish stocking have had wilderness-wide, moderate to major, long-term impacts to wilderness character. The overall condition of both wilderness areas has been on an upward trend since designation due to the elimination of commercial livestock grazing and implementation of forest plan standards and guidelines.

Undeveloped Quality

Recreation activities are also not impacting the undeveloped quality in either wilderness. The undeveloped quality is that wilderness is essentially without permanent improvement or modern human occupation. Non-recreational structures, inholdings, use of motorized or mechanized equipment, or impacts to cultural resources degrade the undeveloped quality (Landers et al, 2008). The existing recreation use, including pack and saddle stock outfitter guides does not depend on or result in these indicators, and therefore is not impacting this quality. Building and cabins were constructed in the past for mining activities at the Tungsten Mine, trapping, the construction and maintenance of the Pasayten Airstrip, and Forest Service administration. Many of these structures remain today, and degrade the undeveloped quality of the wilderness.

Natural Quality

The natural quality refers to wilderness ecosystems that are substantially free from the effects of modern civilization. Ecological systems inside wilderness are directly affected by things that happen inside, as well as outside wilderness. Indicators of the natural quality are plant and animal species communities, physical resources, and biophysical processes (Landers et al, 2008). Recreation activities, including pack and saddle stock outfitter-guides, can impact plant communities through stock grazing, and animal communities through disturbance of individuals or habitat. Pack and saddle stock use can also impact physical resources if watering spots or trail crossings change water quality, lead to streambank erosion, or disturb soils.

The current recreation use, including existing and pack and saddle stock outfitter-guides, was evaluated in terms of impacts to plant communities and wetlands, with detailed included in the Botany section of the FEIS, and the Botany Report in the analysis file. Impacts to animal species were analyzed in the Wildlife section; water quality in the Hydrology section, and soil in the Soil section and their respective specialist's reports in the analysis file. Each analysis found localized impacts to these indicators in some locations, but no impacts wide-spread or intense enough to adversely affect the natural quality of either wilderness. Refer to the mentioned sections in the FEIS, and supporting data in the analysis file for more information.

Opportunities for Solitude or Primitive and Unconfined Recreation

Current recreation use, including pack and saddle stock outfitter-guides is impacting the opportunities for solitude in both wilderness areas, in addition to the opportunities for primitive and unconfined recreation. The meaning of solitude has been at the center of considerable debate, but was likely viewed as encompassing attributes such as separation from people and civilization, inspiration, and a sense of timelessness by early wilderness writings. Primitive recreation refers to travel that is non-motorized and non-mechanized, and requires reliance on personal skills to travel and camp. The unconfined component refers to areas free of management confinement or controls. Primitive and unconfined environments together

provide ideal opportunities for the physical and mental challenges associated with adventure, real consequences for mistakes, and personal growth that result from facing and overcoming obstacles (Landers et al, 2008).

Recreation use is impacting the remoteness from sights and sounds of people inside wilderness - an indicator of this quality. Specifically, the amount of use, number of trail contacts, impacts from recreational livestock grazing, and the number and condition of campsites all impact opportunities for solitude, or primitive and unconfined recreation. Each of these is discussed below.

Current Recreation Use

Current pack and saddle stock outfitter-guide activities are a small percentage of overall recreation use in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas. In the Pasayten, outfitter-guide clients make up about 9% of total use and 32% of the pack and saddle stock use. In the Lake Chelan-Sawtooth, outfitter-guide clients are about 2% of the total use and 6% of the pack and saddle stock use. Refer to Figures 3.10-1, 3.10-2, 3.10-3, and 3.10-4 below. The effects of pack and saddle stock outfitter guide activities are the same as those caused by non-outfitted pack and saddle stock use.

Non-outfitted groups tend to be smaller than some outfitted groups. Based on use records over the past 10 years (see use record data in the analysis file) outfitter-guides occasionally have groups with 12 people and 18 head of stock (with occasional oversize parties by written authorization), while non-outfitted groups normally do not reach this party size limitation. The average size of an outfitted pack and saddle stock group is 8 people and 14 head of stock (based on outfitter-guide use records over the past 10 years). The average size of a non-outfitted group is 3 people and 5 head of stock and non-outfitted groups tend to spend fewer days in wilderness (based on trailhead registrations) compared to outfitter-guide groups with full-service and drop camps.

In terms of evaluating the effect of pack and saddle stock outfitter-guides on the current condition of the wilderness, the analysis focuses on the environmental effects of the pack and saddle stock outfitter-guides, and the cumulative effects of all recreation activities on wilderness. The following sections discuss the use levels in each wilderness.

<u>Pasayten Wilderness</u>

The 531,541-acre Pasayten Wilderness is located on both the Methow Valley and Tonasket Ranger Districts. There are about 18,700 annual visitor days (one visitor day equals one person for one day) in the Pasayten. This number was calculated by converting the number of annual visits reported in the National Recreation Use Monitoring completed on the Okanogan National Forest in 2005 to visitor days. The number of annual visits was 11,000, and the average length of stay was 40.7 hours (averaged for the Pasayten and Lake Chelan-Sawtooth together). Multiplying these numbers gives the total number of hours spent in the Pasayten. Dividing this product by 24 hours converted 11,000 visits to 18,654, rounded to 18,700 visitor days.

About 70% are hiking/backpacking visitor days, and 30% use pack and saddle stock. This breakdown was developed by analyzing trailhead registrations, wilderness permits, and

the professional judgment of the wilderness manager and wilderness rangers on the Methow Valley Ranger District.

The number of service days in the current pack and saddle stock outfitter-guide permits plus the amount in the priority use pool were used to calculate the current percentage of overall use outfitter. None of the hikers reported in the total visitor day column are pack and saddle stock outfitter-guide clients[2]. Approximately 32% of the pack and saddle stock users are outfitted. Overall, pack and saddle stock outfitter-guide service days represent 9% of the visitor days in the Pasayten.

Figure 3.2-2. Number of Visitor days by User Group in the Pasayten, and Number of Pack and Saddle Stock Outfitter-Guide Service Days in Current Permits.

User Group	Total Visitor days	Current Pack and Saddle Stock Outfitter-guide Service Days	% of Total Visitor Days
Backpackers	13,090	0	0%
Stock Users	5,610	1,800	32%
Total	**18,700**	**1,800**	**9%**

The number of pack and saddle stock was estimated using the average party size for outfitted and non-outfitted groups. The calculations are included in the Wilderness Report in the analysis file (Zbyszewski, 2012). A stock day is one head of stock for one day. The following figure displays the approximate number of stock days, and the division between outfitted and non-outfitted users.

[2] There are commercial hiking/backpacking companies operating in the wildernesses. Refer to the cumulative effects analysis for this information, and how the use cumulatively affects wilderness character.

Figure 3.2-3. Approximate Number of Stock Days in Outfitted and Non-outfitted Parties in Pasayten Annually, and Percent of Total

	Total Number of Visitor/Service Days Per Year	Approximate Number of Stock Days Per year	Percent Stock Days of Total
Non-outfitted Pack and Saddle Stock Use	3,810	6,350	67%
Outfitted Pack and Saddle Stock Use	1,800	3,150	33%
Total	**5,610**	**9,500**	

Wilderness access from the Tonasket District includes the Irongate, Chewuch, Long Swamp and Fourteen Mile trailheads. On the Methow Valley District, the Thirtymile, Andrews, Lake Creek, Crystal Lake, and Billygoat trailheads lead to the Pasayten from the Chewuch watershed. In the Harts Pass area, trails from the Robinson Creek, West Fork Pasayten, Monument Creek, Buckskin Ridge, Harts Pass, and Pacific Crest Trail North trailheads lead to the Pasayten. The Devils Pass and Lightning Creek trails that lead from the shore of Ross Lake and the Canyon Creek trailhead enter the west side of the Pasayten.

Pack and saddle stock users favor and are more common in the Spanish Camp/Remmel Lake, Sheep Mountain/Corral Lake, and Horseshoe Basin areas of the Pasayten. The Robinson Creek and Pasayten River areas also receive some stock use, but there is a limited amount of forage and more difficult trail access so stock use is relatively light compared to Spanish Camp/Remmel Lake and Sheep Mountain/Corral Lake areas. The Hidden Lakes area also receives some stock use, with approximately one-quarter of the use with stock. Tatoosh Buttes has ample forage but stock use outside of high hunt season is limited by more difficult trail access. The Pacific Crest Trail, Buckskin Ridge area, and the portion of the Pasayten west of the Pacific Crest Trail generally have light stock use.

The highest concentration of hikers and backpackers are in the Horseshoe Basin, Pacific Crest Trail, Buckskin Ridge, middle portion of Robinson Creek area, Jackita Ridge, and Hidden Lakes areas. Sheep Mountain/Corral Lake, Spanish Camp/Remmel Lake, and Pasayten River destinations are popular but require more time for access. Lower Robinson Creek and Monument Creek trails are used primarily by day hikers.

Lake Chelan-Sawtooth Wilderness

The 153,129 acre Lake Chelan-Sawtooth Wilderness is divided between the Methow Valley and Chelan Ranger Districts. There are about 56,332 annual visitor days (one visitor day equals one person for one day) in the Lake Chelan-Sawtooth. This number was generated by the National Recreation Use Monitoring completed on the Okanogan and Wenatchee National Forests in 2005 The number of annual visits was 33,218 (USDA, 2006c & 2006d). The report states that the average length of stay was 40.7 hours (averaged for the Pasayten and Lake Chelan-Sawtooth combined), so the 33,218 visits was converted to approximately 56,332 visitor days.

About 65% are hiking/backpacking visitor days, and 35% use pack and saddle stock. This breakdown was developed by analyzing trailhead registrations, wilderness permits, and the professional judgment of the wilderness manager and wilderness rangers on the Methow Valley Ranger District.

The number of service days in the current pack and saddle stock outfitter-guide permits plus the amount in the priority use pool was used to calculate the current percentage of overall use for outfitters. As in the Pasayten, none of the hikers included in the total visitor days are pack and saddle stock outfitter-guide clients[3]. Approximately 4% of the pack and saddle stock users are outfitted. Overall, outfitter-guide service days represent 1% of the visitor days in the Lake Chelan-Sawtooth.

Figure 3.2-4. Current number of Visitor days by User Group in the Lake Chelan-Sawtooth, and Number of Outfitter-Guide Service days in Current Permits.

User Group	Total Visitor days	Current Pack and Saddle Stock Outfitter-guide Service Days	% of Total Visitor Days
Hikers	23,790	0	0%
Pack and Saddle Stock Users	12,810	715	6%
TOTAL	**36,600**	**715**	**2%**

The number of pack and saddle stock was estimated using the average party size for outfitted and non-outfitted groups. The calculations are included in the Wilderness Report in the analysis file (Zbyszewski, 2012b). A stock day is one head of stock for one day. The following figure displays the approximate number of stock days, and the division between outfitted and non-outfitted users.

Figure 3.2-5. Approximate Number of Stock Days in Outfitted and Non-outfitted Parties in the Lake Chelan-Sawtooth Annually, and Percent of Total

	Total Number of Visitor/Service Days Per Year	Approximate Number of Stock Days Per year	Percent Stock Days of Total
Non-outfitted Pack and Saddle Stock Use	12,095	20,162	94%
Outfitted Pack and Saddle Stock Use	715	1,260	6%
Total	**12,810**	**21,422**	

On the Methow Valley Ranger District, the Wolf Creek, Slate Creek, Scatter Creek, Gilbert, South Creek, Reynolds Creek, Williams Lake, War Creek, Eagle Creek, West Fork Buttermilk, East Fork Buttermilk, Scaffold Ridge, and Libby Lake trailheads provide direct access. On the Chelan Ranger District, the Fish Creek, Prince Creek trailheads provide access; these areas are located on the shores of Lake Chelan and accessible by boat.

[3] There are commercial hiking/backpacking companies operating in the wildernesses. Refer to the cumulative effects analysis for this information, and how the use cumulatively affects wilderness charater.

Non-outfitted pack and saddle stock use in the Lake Chelan-Sawtooth Wilderness has increased since the construction of the Twisp River Horse Camp in the early 1990s. The camp provides 13 campsites for people with horses or other pack animals, and has an outhouse, feeding mangers, hitch rails, high lines, and watering troughs. The camp is not used by outfitters. It is filled to capacity most weekends in July and August. The number of people riding on Twisp River trails has increased with the popularity of this camp. The majority of people using the Horse Camp are day riders, with North Lake and Louis Lake the most popular destinations. Other trails include South Creek, Scatter Creek, Twisp Pass, War Creek, and Williams Lake.

Contacts or Encounters

Outstanding opportunities for solitude, primitive, and unconfined recreation exist in most locations throughout the Pasayten and Lake Chelan-Sawtooth. Every person has a different perception of solitude, and of how many encounters with others it takes to lose the sense of solitude. The 2009 Wilderness Study gathered information on people's perception of the opportunity for solitude by asking about crowding (Burns, et al, 2010). Approximately 90 to 95% of those interviewed did not feel crowded at all or felt only slightly crowded during their trips in the wilderness areas. The feeling of crowds is grounded in a person's expectations, and about three-quarters (72% in the Pasayten and 79% in the Lake Chelan-Sawtooth) of the people saw as many or fewer people than they expected. Roughly one-half (55% in the Pasayten and 42% in the Lake Chelan-Sawtooth) of the visitors felt solitude is part of the wilderness experience, while the other half (43% in the Pasayten and 48% in the Lake Chelan-Sawtooth) felt that they did not expect complete solitude and expected to see other people some of the time (Burns, et al, 2010).

David Cole and Troy Hall found similar satisfaction levels when they conducted surveys and analyzed the data from wilderness areas around Oregon and Washington. In their paper titled *Wilderness Visitors and Experiences in Oregon and Washington: Trailhead Surveys in Thirteen Forest Service Wildernesses*, 2005, they reported that most visitors appeared to be highly satisfied with their trip and with wilderness conditions. They categorized trailheads into very high use, high use, and moderate use, with moderately used trails receiving less than one-third of the use of the very high use trails. The differences among visitors to each category of trailhead were surprisingly small. It appeared that visitors to more highly used trailheads had adjusted their tolerance of other wilderness users. Most knew what conditions they were likely to find, adjusted their expectations accordingly, and found their trips enjoyable. Most people were able to find solitude, or at least have what they considered a real wilderness experience (Cole and Hall, 2005).

Encounters between groups or parties on trails has an impact on opportunities for solitude. Hikers must step to the downhill side of the trail if at all possible when they encounter pack or saddle stock. Stock can be startled if the hikers are uphill, endangering the riders and hikers. Some hikers feel frightened or intimidated when they encounter horses or a pack string of mules on the trail, and may find it difficult or scary to step to the downhill side of the trail. This can impact the opportunities for solitude for riders and hikers, depending on the personalities of the people involved, and how the stock react to the situation.

The Forest Service has had backcountry rangers gather encounter data since 2001. Rangers record the number of groups they encounter for each section of trail and associated

destinations. Encounters with previously contacted groups are counted as a separate encounter when more than 20 minutes passes between contacts. Rangers patrol high use areas more often and are generally scheduled for the busiest use periods such as holidays and weekends. Thus their encounter data might be slightly skewed to the high end. Data collected in over 1,129 ranger patrol days and 2,400 encounters indicates that both wilderness areas are meeting Forest Plan standards for encounters: "There is a better than 80% chance of visitors not encountering more than seven encounters per day between groups while traveling on trails during all use periods." There is a 98% probability of encountering not more than seven parties on the trail in the Pasayten on any given day, and a 99% probability in the Lake Chelan-Sawtooth.

Since certain portions of each wilderness are more popular, the data was examined for different trail and travel corridors to see if standards were being exceeded at specific locations. The following tables show data for common trails and travel corridors in the two wilderness areas. Some travel corridors include several sections of trail in order to best capture typical visitor travel patterns.

Pasayten

In the Pasayten, the highest encounter rates occurred on the Pacific Crest Trail, and this was the most likely location for a visitor to have more than seven encounters. Data for the Pacific Crest Trail may be slightly skewed higher as backcountry rangers did not always differentiate encounters on the Pacific Crest Trail between the Harts Pass trailhead and Windy Pass which is a popular day hike and outside of the wilderness. Other locations that occasionally exceeded seven encounters were: the Hidden Lakes, Buckskin Ridge, Boundary Trail, Devils Dome, and Pasayten River trails. The highest likelihood of more than seven encounters generally occurred on weekends and holidays in July, August, and September, but also occurred randomly during the week. Trails such as the Pacific Crest Trail, Billy Goat, Buckskin Ridge, Chewuch, and Andrews serve as primary access routes into the wilderness so it is not uncommon for encounter rates to be higher near the trailhead and drop further into the wilderness as people disperse to various destinations. Other factors have also influenced the amount and distribution of use, which influences encounters. Weather, fire activity, featuring a particular trail or trip in the media, can cause an obvious increase or decrease at specific in use on a yearly basis on an individual trail.

Figure 3-2-6. Probability of Encountering Not More Than Seven Parties By Pasayten Travel Corridor.

Travel Corridors/Trails	Trail Numbers	Patrol days	Total Encounters	Days exceeding seven encounters	Probability of encountering more than seven groups
West Fork Pasayten	472	9	24	0	0%
Hidden Lakes	477, 458	405	647	2	0%
Robinson, Mainstem & Middle Fork Pasayten River	478, 474, 451	78	144	1	1%
Monument Creek	484	3	2	0	0%
Tatoosh Buttes	485	21	32	0	0%
Buckskin Ridge	498	28	65	1	4%
Lake Creek	500	25	78	0	0%
Larch Creek Trails	502, 502A	88	173	0	0%
Andrews Creek	504	103	196	0	0%
Chewuch	510, 360	71	118	0	0%
Crystal Lakes	517	2	6	0	0%
Boundary Trail	533	136	243	1	1%
Devils Dome, Canyon Creek	752, 738, 754	27	49	1	4%
Pacific Crest Trail	2000, 472A, 473	70	279	9	13%

Lake Chelan – Sawtooth

The Lake Chelan-Sawtooth receives more day use than the Pasayten. Popular destinations include: South Creek, North Lake, Louis Lake and Twisp Pass. The highest likelihood of more than eight encounters generally occurs on weekends and holidays in July, August and September. As in the Pasayten, there are many factors influencing amount and distribution of use, which influences encounters. Weather, fire activity, or featuring a particular trail or trip in the media, can cause an obvious increase or decrease in use on a yearly basis on an individual trail. Detailed encounter information is in the Wilderness Report in the analysis file (Zbyszewski, 2012).

Figure 3.2-7. Probability of Encountering Not More Than Seven Parties By Lake Chelan-Sawtooth Travel Corridor.

Travel Corridors/Trails	Trail Numbers	Patrol days	Total Encounters	Days exceeding seven encounters	Probability of encountering more than seven groups
South Creek	401	9	12	0	0%
Reynolds Creek	402	1	0	0	0%
Williams Lake	407	16	12	0	0%
War Creek	408	12	49	0	0%
West Fork Buttermilk	411	6	4	0	0%
North Lake	413	22	61	1	5%
Slate Lake	414	1	0	0	0%
Libby Lake	415	6	2	0	0%
East Fork Buttermilk	420	4	1	0	0%
Copper Pass	426	9	10	0	0%
Scatter Lake	427	10	22	0	0%
Louis Lake	428	13	42	1	8%
Twisp Pass	432	18	97	0	0%
Wolf Creek	527	3	35	0	0%
Scaffold Ridge	436	18	97	0	0%
Summit Trail	1259	18	97	0	0%

The duration of these impacts would be short term if all recreation activity stopped, but in reality is long-term because continued use of impacted areas is perpetuating the impacts, such as vegetation loss, soil disturbance, damaged trees, , and other impacts from modern temporary occupation. The following discussion details the existing conditions in established campsites.

Campsites

People enjoying the abundant opportunities for unconfined recreation in the Pasayten and Lake Chelan-Sawtooth Wildernesses have had an effect on ecological conditions and wilderness character. Opportunities for solitude or unconfined recreation are decreased because the sights and sounds of people detract from the remoteness of wilderness. There are approximately 637 established campsites in the Pasayten Wilderness, 75 of which are used consistently by the pack and saddle stock outfitter-guides. In the Lake Chelan-Sawtooth, there are approximately 338 established campsites, 78 of which are used by the outfitters.

Historic uses of the Pasayten and Lake Chelan-Sawtooth created campsites with relatively large areas of barren core (vegetation loss), trees with exposed roots, social trails, and other impacts. Recreationists, including outfitters, have continued to use many of these sites, perpetuating, and in some cases enlarging the camps. Outfitters have also been directed by Forest Service staff to use these large and already impacted sites whenever possible versus creating new disturbance. Since the areas were designated as wilderness, campsite locations and size have fluctuated. New campsites have been created by both the outfitted and non-outfitted public, and some established campsites have started to recover. Overall the effects

are localized, and minor on a wilderness-wide scale, and moderate on a local scale. The effects are generally long-term due to continued use and a short, dry growing season, inhibiting recovery. Vegetation tends to recover at a faster rate than damaged trees.

Both Forest Plans have standards and guidelines establishing the maximum amount of hardened area in established campsites. The Okanogan Forest Plan sets the standard at 250 to 400 square feet of "vegetation loss", and the Wenatchee Forest Plan specifies 400 to 1,000 square feet of "vegetation loss and compacted bare mineral soil." "Vegetation loss" and "vegetation loss and compacted bare mineral soil" are both alternate names for what is more commonly called "barren core." This is the area within a camp devoid of vegetation with exposed soil. The term "barren core" is used in this document in place of the Forest Plan terminology. Many campsites in both the Pasayten and Lake Chelan-Sawtooth have more than the specified number of square feet of barren core, and more than the number of trees with exposed roots. These sites do not comply with the Forest Plan standards and guidelines.

Since the implementation of Forest Plans, the Forest Service has been monitoring campsite conditions. Monitoring protocols have changed over the years, so some elements of data collected are not consistent over multiple surveys. Additionally, there may be variations in area calculations, attributable to a variety of data collectors over the years. Early surveys focused on gathering in-depth site information from sites across the wilderness, but they did not capture all of the known sites across the entire wilderness. Thus there is not baseline data for many sites.

Extensive surveys were completed in 2011 and 2012 with the goal of capturing a minimum of 95% of the known campsites for each wilderness. The survey was based on the "National Minimum Recreation Site Monitoring Protocol," but protocols were expanded to include barren core estimates. The number of damaged trees was also recorded as a part of this survey, however this number included damage to the bole as well as damage to the roots, which makes it challenging to directly correlate to the Forest Plan standard for exposed roots. As of September 2012 surveys have been completed on 242 established campsites in the Lake Chelan-Sawtooth, and 626 campsites the Pasayten. Where baseline data exists, the monitoring show that resource conditions at campsites are on an improving trend. This is true for camps that are used primarily by outfitters and for camps that are used primarily by non-outfitted stock users. There are approximately 117,694 square feet collectively in all the campsites consistently used by the pack and saddle stock outfitter-guides. This converts to approximately 2.7 acres scattered across the 531,541-acre wilderness. In the Lake Chelan-Sawtooth, there are approximately 48,534 square feet, or 1.1 acre in 153,129-acre wilderness.

Monitoring has also shown that the amount of barren core in a campsite can fluctuate from one year to the next based on use patterns and weather. Each party that uses a campsite influences the condition of the camp based on how and where stock are contained, where tents are set, and the location of the campfire ring, and other factors. Weather determines vegetative growth, so the amount of barren core can increase in dry years and decrease in wet years. Reduced trail maintenance has resulted in a decrease in use in many areas, which has corresponded to decreases in barren core. Likewise large fires in the Pasayten have had a similar effect. In the eastern Pasayten, many campsites in meadows have shown

remarkable vegetative recovery with large decreases in barren core numbers. However, other indicators such as damaged trees persist for much longer and those numbers have not shown as much improvement.

The area of barren core and number of trees with exposed roots are generally greater in campsites frequently used by stock compared to campsites never or rarely used by stock. Stock campsites often consist of a camping area and one or more stock containment areas. There is also a grazing area associated with many campsites frequented by the pack and saddle stock outfitter-guides, where stock are turned out for loose-grazing. Generally speaking, the loose-grazing stock travel up to two miles away from campsites. Grazing is dispersed across a large area, and any evidence or effects are minimized. Refer to discussion of stock containment and loose grazing, beginning on page 3-52.

In an attempt to meet the standard and guideline pertaining to trees with exposed roots, a hitching regulation for stock enacted in 1992 for the Lake Chelan Sawtooth and in 2001 for the Pasayten, prohibited tying stock directly to trees for an overnight period, or in a manner to cause damage to the roots or tree boles. While this has decreased damage to tree roots, it has resulted in a change at stock camps with high lines being used outside the traditional stock containment areas where high lines could not be properly installed. These highline areas increased vegetation loss at many horse camps.

Campsites that are used primarily by hikers generally have a camping area and a smaller or no stock containment area compared with campsites frequented by horse and mule parties. Outfitted drop camps, llama and burro outfitted parties utilize both stock camps used by the non-outfitted stock users and hiker campsites.

The campsites used by pack and stock users still exceed the standard for vegetation loss and have more than the allowed number of trees with exposed roots per site despite this upward trend. The average amount of barren core at established campsites is 1,663 square feet in the Pasayten and 602 in the Lake Chelan-Sawtooth. Most of the bigger sites in the Pasayten have more than 4 damaged trees, while less than have of the sites in the Lake Chelan-Sawtooth exceed that number.

Campsite monitoring also collected data concerning the visibility of campsites from trails and other campsites, and the distance between campsites. Approximately 77% of the campsites in the portion of the wildernesses covered by the Okanogan Forest Plan are partially or fully screened. Campsites are only visible or audible if occupied. The capacity analysis done in the 2012 Needs Assessment (**Appendix B**) demonstrated that use levels are well below the 50% occupancy level. Based on this data, the conclusion can be drawn that there is an 80% or higher probability of two or fewer campsites being visible or audible from any campsite. In the portion covered by the Wenatchee Forest Plan, there is no more than one campsite visible or audible from any one campsite because camps are either screened or over 500 feet apart.

The following table shows analysis for barren core and tree damage based on the recreation site inventory completed in 2011 and 2012. Approximately 344 sites without any barren core were excluded from this analysis. These were un-established trace sites and sites that have fully recovered.

Figure 3-2.8. Percent of Established Campsites Exceeding 400, 1,000, and 2,800 Square Feet of Barren Core and With More than Four Damaged Trees in Pasayten and Lake Chelan-Sawtooth Wildernesses

	Pasayten Wilderness		Lake Chelan-Sawtooth Wilderness	
	All sites	Sites Used by Pack and Saddle Stock Outfitter-guides	All sites	Sites Used by Pack and Saddle Stock Outfitter-guides
Sites exceeding 400 sq. feet	46%	68%	41%	27%
Sites exceeding 1,000 sq. feet	23%	40%	16%	25%
Sites exceeding 2,800 sq. feet	6%	19%	6%	22%
Average Barren Core	775	1,663	630	602
Sites with more than four damaged trees	41%	75%	39%	47%

In addition to monitoring, the Forest Service has worked over the years to bring sites into compliance with standards and guidelines. Examples of this work include: regulations intended to reduce impacts and closing sites for restoration. This work has been limited by budget constraints, but has helped contribute to the upward trend in campsite conditions. Although impacts from past use are recovering under the current management direction, campsites frequented by pack and stock users still exceed the standard for vegetation loss and have more than the allowed number of trees with exposed roots per site.

The following tables show the pack and saddle stock outfitter-guide campsites in the Pasayten and Lake Chelan-Wilderness areas which exceed 2,800 square feet currently, or exceeded 2,800 square feet in the past. Where data exist, the change in the amount of barren core at each site recorded between 1989 and 2002 is compared to the most current data. Many of the sites had not been surveyed prior to the monitoring completed in 2011 and 2012. The information for campsites with less than 2,800 square feet of barren core is included in Appendix A.

Figure 3.2-9. Established Camps in the Pasayten Used by Outfitter Guides with over 2800 square feet of Barren Core.

Camp Name	Square Feet of Barren Core (from monitoring completed from 1989 to 2002)	Square Feet of Barren Core (from monitoring completed in 2011 and 2012)	Damaged Trees (from monitoring completed in 2011 and 2012)	Comments
3 Fools	No Data	2,800	More than 10	Used occasionally by outfitters for full-service and drop camps
Bald Mountain*	No Data	3,900	Less Than 4	Used by outfitters for full-service and drop camps
Beaver Creek*	8,038	6,747	More than 10	Used by outfitters as full-service camp site.

Camp Name	Square Feet of Barren Core (from monitoring completed from 1989 to 2002)	Square Feet of Barren Core (from monitoring completed in 2011 and 2012)	Damaged Trees (from monitoring completed in 2011 and 2012)	Comments
Charlie Brown (Spanish Camp 2)	15,239	1,870	4 to 10	Used by outfitters for full-service and drop camps
Chandler (Spanish Camp 1)	9,181	60	More than 10	Used by outfitters as a drop camp
Chewuch (Drop C)	No Data	3,000	More than 10	Used by outfitters as a drop camp
Corral Lake	No Data	3,500	More than 10	Used by outfitters as a drop camp
Cougar Lake	No Data	2,916	More than 10	Used regularly by the general public as well as outfitters.
Crow Lake*	No Data	9,610	More than 10	Used by outfitters as full-service camp site.
Crow Lake 2	No Data	7,000	More than 10	Recreation camp, not used regularly by outfitters
Fred's Lake	No Data	5,400	More than 10	Used occasionally by outfitters for full-service and drop camps
Goat Lakes Basin 2	2,650	3,000	4 to 10	Used occasionally by outfitters for drop camps
Peeve Meadow	5,500	5,640	More than 10	Used occasionally by outfitters for drop camps
Sheep Mountain*	19,368	8,879	More than 10	Used by outfitters as full-service camp site.
Spanish Creek	6,000	60	4 to 10	Recreation camp, not used regularly by outfitters
Tatoosh	3,316	900	More than 10	Used by outfitters as full-service camp site
WhistlerBasin	No Data	4,020	More than 10	Used occasionally by outfitters for full-service and drop camps
Whistler Camp*	9,906	3,254	More than 10	Used by outfitters as full-service camp site

***Assigned Site**

Figure 3.2-10. Established Camps in Lake Chelan-Sawtooth used by Outfitter Guides with over 2800 square feet of Barren Core

Camp Name	Square Feet of Barren Core (from monitoring completed from 1989 to 2002)	Square Feet of Barren Core (from monitoring completed in 2011 and 2012)	Damaged Trees (from monitoring completed in 2011 and 2012)	Comments
Bike West	No Data	2,900	4 to 10	Used occasionally by outfitters for full-service and drop camps
Cascade Creek	21,000	NA	NA	Unable to locate the site, as the area burned very hot in early 2000's. No longer accessible to stock.
Muleshoe 2	9,134	3,000	More than 10	Used occasionally by outfitters for full-service and drop camps
Muleshoe North	No Data	4,200	More than 10	Used occasionally by outfitters for full-service and drop camps
Prince 4 Mile	5,600	0	Less than 4	Historically used by outfitters for full-service camps. Burned in 2003. Little to no recent use
Surprise	No Data	3,500	More than 10	Used occasionally by outfitters for full-service and drop camps
Twin Springs 1	12,245	3,071	More than 10	Used occasionally by outfitters for full-service and drop camps

Pack and Saddle Stock Outfitter-guide Camps

Pack and saddle stock outfitter guides use a combination of assigned camps (Bald Mountain, Sheep Mountain, Crow Lake, Beaver Creek, and Whistler), and designated and non-designated sites. In the Pasayten and the portion of the Lake Chelan-Sawtooth on the Methow Valley Ranger District, outfitters can camp in any established campsite, and tend to re-use the same ones over the years. In the portion of the Lake Chelan-Sawtooth on the Chelan Ranger District, outfitters are restricted to using designated campsites only. **Appendix A** includes a list of all established, regularly used campsites. The campsites are shown on **Map 3.2-1, Map 3.2-1** and **Map 3.2-3** in the Map Section of this document.

Across both wildernesses, totaling approximately 685,000 acres, there are approximately 153 camps frequently used by pack and saddle stock outfitter guides, and of these, 42, or approximately 28% (those used regularly for full-service camps) see more impacts than less frequently used campsites (refer to **Figures A-1 and A-2** in **Appendix A**). More impacts include large barren cores, excessive number of trees with exposed roots, social trails, and other impacts.

The campsites that have the most effect on the opportunities for solitude or primitive and unconfined recreation character are the assigned sites and the non-assigned sites used for full-service camps. These camps are typically set up for the entire season in the assigned sites, and for the duration of the trip in the non-assigned sites (usually 4 to 7 days). The camps usually have a kitchen area and cook tent, sleeping tents, stock handling area, fire pit area, latrine, and stock handling and tying areas. Stock are usually turned out to graze in nearby areas, but return to the camp each day so clients can take day-rides from the base camp. Keeping the stock in or near the camp for these extended times increases the amount of vegetation damage and soil exposure. There are usually social trails leading between the different sections of the camp, and often stock trails between the camp and the grazing area.

These campsites have the sights and sounds of people in the wilderness, therefore detracting from the remoteness of wilderness. They have minor to moderate localized impacts to opportunities for solitude, depending on their location and whether or not the camps are occupied. Their impact is minor to negligible at the wilderness scale.

Campsites where outfitters drop clients and do not remain at the site with their stock have fewer effects than campsites where stock remain (full service camps). These sites typically have kitchen and sleeping tent areas and a fire ring, and relatively small areas disturbed by confined stock since the outfitters only keep stock in camp for short periods. The outfitters tie stock to trees while loading and unloading, then move on to the next camp.

The Forest Service monitors the outfitter camps as part of the permit administration process. The camps are visited and reviewed by Forest Service employees as often as possible during the operating season. Reviews are timed to occur when camps are occupied so conditions can be discussed on-the-ground with the outfitter, whenever possible. The following sections include information about the camps used by the outfitters.

<u>Pasayten</u>

Pack and saddle stock outfitter-guide activity occurs in the areas most popular with non-outfitted pack and saddle stock users. The assigned, Bald Mountain and Beaver Camps are in the Spanish Camp/Remmel Lake area. The assigned Crow Lake and Sheep Mountain camps are in the Sheep Mountain/Corral Lake areas. Whistler Camp, also an assigned site, is in the Pasayten River area. Assigned sites are the only ones where non-outfitted use is prohibited. The locations are shown on **Map 3.2-1** in the Map Section. Each of the assigned campsites is described below.

- The Bald Mountain Camp was creates by one of the pack and saddle stock outfitters approximately 15 years ago, and has been used as an assigned site ever since. **It has a barren core area of approximately 3,900 square feet, and 29 trees with exposed roots.** The camp is located on a flat area, on a north-east aspect, far from the summit. There is a hitchrail, but no other constructed features. Spanish Creek is approximately 300 yards below the camp. Stock are turned loose to graze on the hillsides around the camp. Stock generally graze within one mile of the camp; wet areas are traversed as stock move to and from the camp location. The original location of the Bald Mountain camp is located approximately 800 feet from the current location. It had been used by outfitter-guides and non-outfitted public for approximately 20 years prior to establishment of the new camp. The original location has since revegetated and there is no evidence of use.

- The Beaver Creek Camp, in the Spanish Camp/Remmel Lake area, was established approximately 40 years ago by sheep herders and recreational pack stock users. **It has a barren core area of approximately 6,747 square feet and 45 trees with exposed roots.** It is located in the headwaters of Beaver Creek in a grove of trees with a wet meadow to the west. Stock loose graze up on the top of Airplane Ridge, a high and dry area with ample grass for feed. There are no constructed facilities. A highline is installed seasonally for stock containment. A small, plastic pipe is installed in a spring for drinking water. The pipe is removed at the end of the operating season.

- The Sheep Mountain Camp was originally a sheepherder's camp, but has been an outfitter camp for approximately 35 to 40 years. **It has a barren core area of approximately 8,879 square feet, and 69 trees with exposed roots.** There are tent pads and a corral that were constructed before the implementation of the Forest Plans. This camp has the largest area of vegetation loss and bare compacted soil in the Pasayten. There is approximately one acre next to the camp where historic grazing has altered the vegetative community and condition. Stock loose graze toward Sheep Mountain and Peeve Pass, generally within one mile of camp.

- The Crow Lake Camp, located in the Sheep Mountain/Corral Lake area, has been used as a recreation campsite for decades, and has been used by a pack and saddle stock outfitter for approximately 10 years. **It has a barren core area of approximately 9,610 square feet, and 33 trees with exposed roots.** There are no constructed facilities, such as hitch rails, tent pads, or corrals, in the camp. A highline is installed seasonally for stock containment. It is located on a ridge approximately 1/4 mile above Crow Lake. The stock loose graze north of the camp in a basin and along a ridge.

- Whistler Camp was originally a sheep herders camp, used until sheep grazing was eliminated in the mid-1900s. It has also been used as a trail camp for pack and saddle stock users, both outfitted and non-outfitted, for nearly 50 years. **It has a barren core area of approximately 3,254 square feet, and 53 trees with exposed roots.** It is typically used by a pack and saddle stock outfitter between 2 to 7 times per year, with an average of 4 times. Stock are let loose to graze, mostly in an avalanche chute to the east of camp.

The outfitters also use other camp locations for full service and drop camps. There are approximately 75 established camps. Refer to **Appendix A** for a table that lists the majority of the camps regularly used by the pack and saddle stock outfitter-guides, and **Map 3.2-1** in the Map Section of this document shows their locations. The outfitters are not limited to camping only in these locations, but tend to return to these established spots year after year.

Lake Chelan-Sawtooth

There are no assigned sites in the Lake Chelan-Sawtooth Wilderness. The most frequently used camps include Mule Shoe, Twin Springs, and Chipmunk; all located on the Chelan Ranger District. Most trips originate in the Twisp River drainage, or from the Crater Creek Trailhead on the Methow Valley Ranger District.

The outfitters also use other camp locations for full service and drop camps. There are approximately 78 established camps. The outfitters are limited to camping only in these locations in the portion of the wilderness on the Chelan Ranger District. On the Methow Valley Ranger District, the outfitters have not been limited to certain camps on the Methow Valley Ranger District, but tend to return to these established spots year after year.

Figure E-2 in **Appendix A** lists the majority of the camps used by outfitters**. Map 3.2-2** in the Map Section of the document shows the locations.

Livestock Grazing and Confinement

The outfitter-guides use two methods for caring for stock on overnight trips into wilderness; stock containment and loose grazing, as described in section 3.1 Outfitter-Guides. Loose grazing can impact opportunities for solitude when people encounter grazing stock. The grazing areas tend to be away from most established campsites, however stock will occasionally move through an occupied campsite, especially if they are frightened and running away from danger. This happens rarely, but incidents have been reported to the Forest Service. The stock do not graze through occupied campsites because there is typically little graze in campsites. People do occasionally see stock grazing in meadows or on open hillsides, and hear the bells placed on one or two members of the herd. Rarely, people also encounter stock on main trails, and can feel intimidated if they are unfamiliar with stock behavior. In the past 10 years, only two such incidents have been reported.

There are ten drift gates in the Pasayten and Lake Chelan-Sawtooth Wildernesses. These gates are located where topography or terrain, in addition to the drift gate, helps prevent loose grazing stock from moving out of an area. The gates are constructed with native materials, and consist of parallel poles that can be slid out of the way to allow passage of hikers or stock. They detract from the opportunities for solitude in the wilderness since they are a constructed facility. They help protect the wilderness character by helping facilitate loose grazing. Having the gates is a precaution for the infrequent event that loose grazing stock leave their preferred grazing area and try to move down a trail or back to the trailhead.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

There would be virtually no difference in the effect to wilderness character from one alternative to the next since the amount of use associated with the pack and saddle stock outfitter guides is such a small percentage of overall use. The following table compares the alternatives by alternative components.

Figure 3.2-11. Comparison of Alternative Components by Alternative

Wilderness	Alternative Component	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Pasayten	Number of Service Days***	0	2,000	1,000	2,170
Lake Chelan-Sawtooth	Number of Service Days***	0	720	320	825
Common to both wilderness areas	Amount of Barren Core Outfitters Can Use (Forest Plan Amendment*)	No amendment	5,250 square feet	2,800 square feet	Existing barren core at established campsites
Common to both wilderness areas	Party Size Limit for Outfitters** (Forest Plan Amendment*)	No amendment	12 people and 18 head of stock (no amendment)	12 (combination of people and stock)	12 people and 18 head of stock (no amendment)
Common to both wilderness areas	Camping with 200 feet of meadows, streams, lakes, and special interest areas (forest plan amendment; Okanogan only)	No amendment	Camping in established campsites within 200 feet of meadows, streams, lakes, and special interest areas allowed	Camping within 200 feet of wetlands, streams, lakes, and special interest areas prohibited. Camping within 200 feet of dry meadows allowed.	Camping in established campsites within 200 feet of meadows, streams, lakes ,and special interest areas allowed

*Forest Plan amendment would only apply to pack and saddle stock outfitter-guides.
**Oversized parties may be approved if certain criteria are met. See mitigation measure 9a for criteria.
***This would be the total number of service days available. Some would be assigned to each outfitter, and the rest held in a pool. Refer to the alternative descriptions in Chapter 2 for more information.

The following sections consolidate information about recreation use and campsite condition associated with each alternate. The effects of these on wilderness character are described below for each alternative.

Recreation Use

Each alternative would have result in a slight change to the number of recreation users, which includes pack and saddle stock service days. Alternative 1 would reduce the number of people

visiting the Pasayten by 1,800, since pack and saddle stock outfitter guides would be eliminated. Alternatives 2 and 4 would slightly increase, and Alternative 3 would slightly decrease the overall number of people in the Pasayten. The following table includes the number of visitor days, outfitted and non-outfitted currently and by alternative, in the Pasayten. Non-oufitted days are included to provide context and intensity for the direct and indirect effects of the alternatives.

Figure 3.2-12. Total Visitor Days and Outfitted Days in the Pasayten, Comparing Current to Alternatives

Current or Alternative	Pack and Saddle Stock Users	Hikers	Total
Current			
Total Visitor Days	5,610	13,090	18,700
Pack and Saddle Stock OG Service Days	1,800	0	1,800
Percent of total	32%	0%	10%
Alternative 1			
Total Visitor Days	3,810	13,090	16,900
Pack and Saddle Stock OG Service Days	0	0	0
Percent of total	0%	0%	0%
Percent Change From Current Total	-32%	0%	-10%
Percent Change from Current Service Days	-100%	0%	
Alternative 2			
Total Visitor Days	5,810	13,090	18,900
Pack and Saddle Stock OG Service Days	2,000	0	2,000
Percent of total	34%	0%	11%
Percent Change From Current Total	+4%	0%	+1%
Percent Change from Current Service Days	+11%	0%	
Alternative 3			
Total Visitor Days	4,810	13,090	17,900
Pack and Saddle Stock OG Service Days	1,000	0	1,000
Percent of total	21%	0%	6%
Percent Change From Current Total	-14%	0%	-4%
Percent Change from Current Service Days	-44%	0%	
Alternative 4			
Total Visitor Days	5,996	13,090	19,070
Pack and Saddle Stock OG Service Days	2,170	0	2,170
Percent of total	36%	0%	12%
Percent Change From Current Total	+6%	0%	+2%
Percent Change from Current Service Days	+20%	0%	

The following figures display this information in graph form. The non-outfitted use is included to provide context and intensity of the effects of each alternative.

Figure 3.2-13. Total Visitor Days in Pasayten, by Alternative

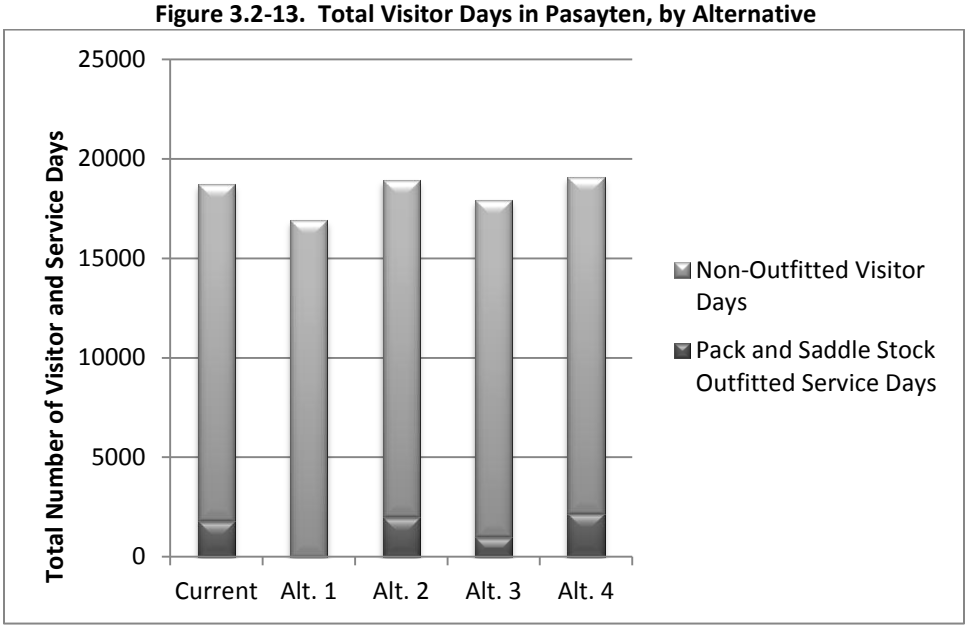
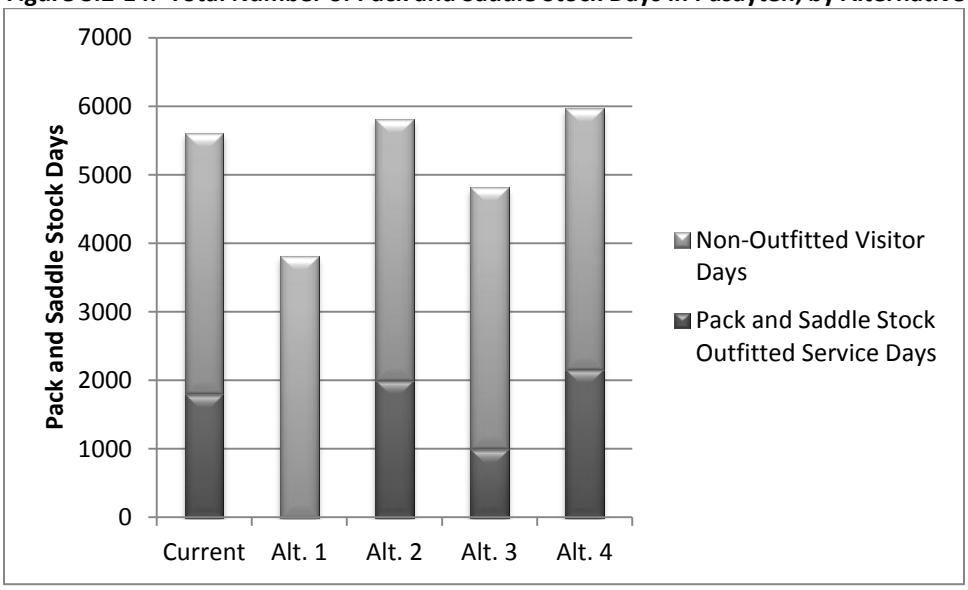


Figure 3.2-14. Total Number of Pack and Saddle Stock Days in Pasayten, by Alternative



The following figure displays the approximate number of stock days in the Pasayten, by alternative. Refer to the Wilderness Report in the analysis file for the calculations.

Figure 3.2-15. Approximate Number of Stock Days in Outfitted and Non-outfitted Parties in Pasayten Annually, and Percent Change from Current

	Non-Outfitted Stock Days	Outfitted Stock Days	Total Stock Days	Percent Change From Current
Current	6,350	3,150	9,500	
Alternative 1	6,350	0	6,350	-33%
Alternative 2	6,350	3,500	9,850	+4%
Alternative 3	6,350	1,750	8,100	-15%
Alternative 4	6,350	3,780	10,130	+7%

The following table includes the use information for the Lake Chelan-Sawtooth Wilderness.

Figure 3.2-16. Total Visitor Days and Outfitted Days in the Lake Chelan-Sawtooth, Comparing Current to Alternatives

Current or Alternative	Pack and Saddle Stock Users	Hikers	Total
Current			
Total Visitor Days	12,810	23,790	36,600
Pack and Saddle Stock OG Service Days	715	0	715
Percent of total	6%	0%	2%
Alternative 1			
Total Visitor Days	12,095	23,790	35,885
Pack and Saddle Stock OG Service Days	0	0	0
Percent of total	0%	0%	0%
Percent Change from Current Total	-6%	0%	-2%
Percent Change from Current Service Days	-100%		
Alternative 2			
Total Visitor Days	12,815	23,790	36,605
Pack and Saddle Stock OG Service Days	720	0	720
Percent of total	6%	0%	2%
Percent Change from Current Total	0.0%	0%	0.0%
Percent Change from Current Service Days	0.7%		
Alternative 3			
Total Visitor Days	12,415	23,790	36,205
Pack and Saddle Stock OG Service Days	320	0	320
Percent of total	3%	0%	1%
Percent Change from Current Total	-3%	0%	-1%
Percent Change from Current Service Days	-55%		
Alternative 4			
Total Visitor Days	12,920	23,790	36,710
Pack and Saddle Stock OG Service Days	825	0	825
Percent of total	6%	0%	2%
Percent Change from Current Total	+1%	0%	+0.13%
Percent Change from current Service Days	+15%		

The information for the Lake Chelan-Sawtooth is displayed in the following figures.

Figure 3.2-17. Total Recreation Use in Lake Chelan-Sawtooth, by Alternative

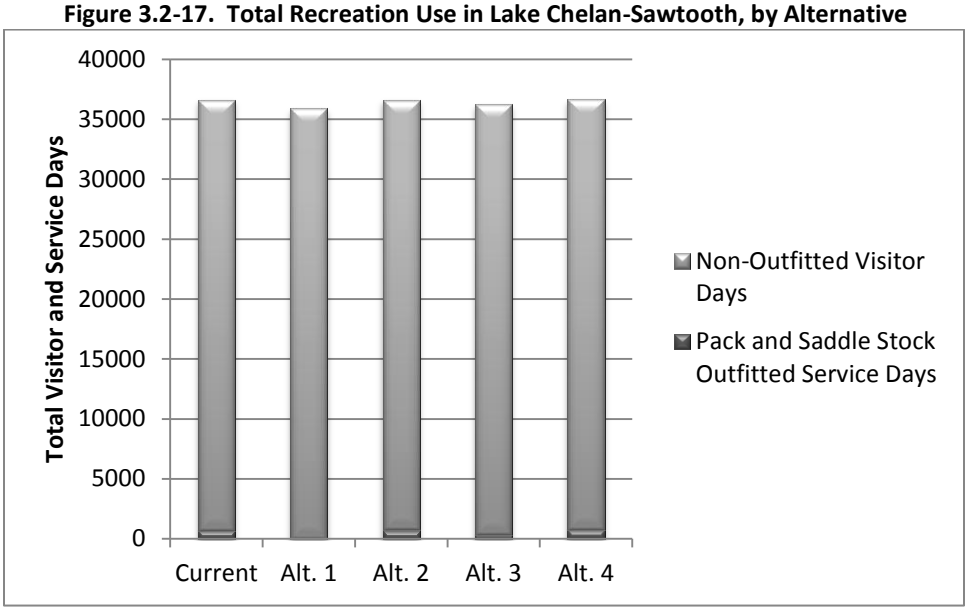
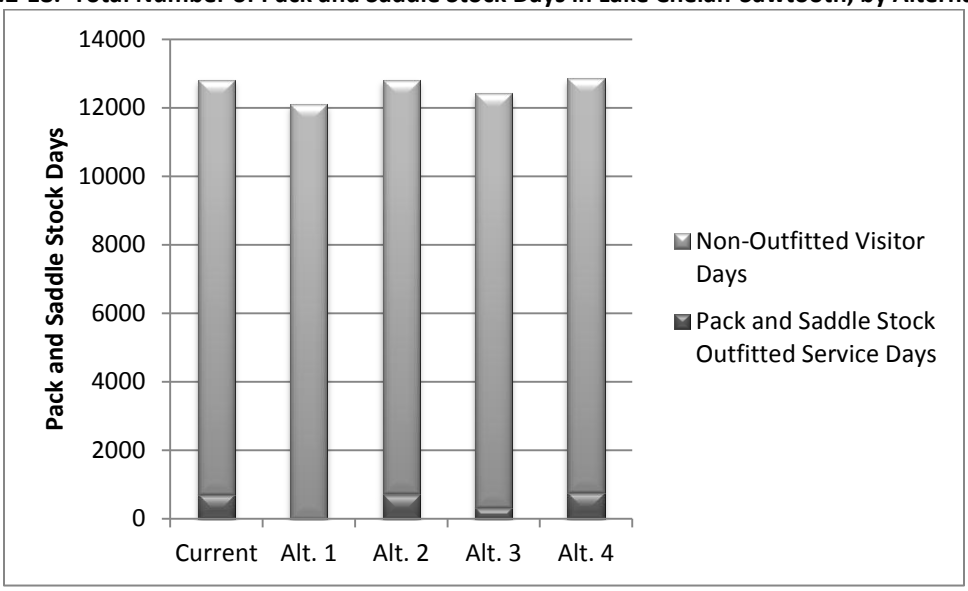


Figure 3.2-18. Total Number of Pack and Saddle Stock Days in Lake Chelan-Sawtooth, by Alternative



The following figure shows the approximate number of stock days in the Lake Chelan-Sawtooth, by alternative. Refer to the Wilderness Report in the analysis file for the calculations.

Figure 3.2-19. Approximate Number of Stock Days in Outfitted and Non-outfitted Parties in Lake Chelan-Sawtooth, Annually, and Percent Change from Current

	Non-Outfitted Stock Days	Outfitted Stock Days	Total Stock Days	Percent Change From Current
Current	20,162	1,260	21,422	
Alternative 1	20,162	0	20,162	-6%
Alternative 2	20,162	1,260	21,422	0%
Alternative 3	20,162	560	20,722	-3%
Alternative 4	20,162	1,470	21,632	+1%

Campsite Size and Condition

The size of the largest existing outfitter-guide campsites would likely change slightly under each alternative. Pack and saddle stock outfitter guides would be eliminated under Alternative 1, so there would be no effects to these camps from outfitter-guide use.

None of the alternatives would allow outfitter-guides to create new campsites, so the current conditions pertaining to campsite inter-visibility and audibility, and distance between campsites would not change.

Alternative 2 would limit outfitters to not increasing the amount of barren core, and using no more than 5,250 square feet in larger camps. This alternative would allow exclusive use of the five existing assigned for exclusive use by outfitters (Bald Mountain, Beaver Camp, Sheep Mountain, Crow Lake, and Whistler Camp). Restricting non-outfitter use in assigned sites may help to accelerate the recovery of the portion of barren core off-limits to outfitters.

Alternative 3 would set the barren core limit at 2,800 square feet, keep three existing assigned sites (Sheep Mountain, Crow Lake, and Whistler Camp) and prohibit outfitters from using the Bald Mountain and Beaver Creek because of their proximity to wetlands.

Alternative 4 would allow the outfitters to use existing barren core at established campsites, but not increase the amount. Camp management plans would be developed for all five assigned sites, and for all campsites with over 5,250 square feet of barren core.

The following table shows each of the campsites with over 2,800 square feet of barren core in the Pasayten and Lake Chelan-Sawtooth that are used by the pack and saddle stock outfitter guides, the existing amount of barren core, the amount that could be used by the outfitters, and which sites would be closed to public use (assigned sites). A narrative description of each assigned site is included in the alternative descriptions below. A list of the consistently used campsites in included in Appendix A. Outfitter-guides would be allowed (with approval) to use any established campsite large enough to accommodate the size of their party.

The amount of barren core in any campsite with less than 2,800 square feet existing would not change as a result of pack and saddle stock outfitter-guide use under any alternative. Refer to Appendix A for a list of all campsites.

Figure 3.2-20. Existing Amount of Barren Core in Established Camps Exceeding 2,800 and Amount That Could Be Used by Outfitters in Each Alternative.

Camp Name	Existing square feet of Barren Core	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Amount of Barren Core Outfitters Could use	Assigned outfitter camp?	Amount of Barren Core Outfitters Could use	Assigned outfitter camp?	Amount of Barren Core Outfitters Could use	Assigned outfitter camp?	Amount of Barren Core Outfitters Could use	Assigned outfitter camp?
3 Fools*	2,800	n/a	n	2,800	n	No OG Use	n	2,800	n
Bald Mountain *	3,900	n/a	n	3,900	y	No OG Use	n/a	3,900	y
Beaver Creek*	6,747	n/a	n	5,250	y	No OG Use	n/a	6,747	y
Chewuch	3,000	n/a	n	3,000	n	No OG Use	n/a	3,000	n
Corral Lake	3,500	n/a	n	3,500	n	2,800	n	3,500	n
Cougar Lake*	2,916	n/a	n	2,916	n	2,800	n	2,916	N
Crow Lake*	9,610	n/a	n	5,250	y	2,800	y	9,610	Y
Crow Lake 2*	7,000	n/a	n	5,250	n	2,800	n	7,000	n
Fred's Lake*	5,400	n/a	n	5,250	n	No OG Use	n/a	5,400	n
Goat Lakes Basin 2*	3,000	n/a	n	3,000	n	2,800	n	3,000	n
Peeve Meadow*	5,640	n/a	n	5,250	n	No OG Use	n/a	5,640	n
Sheep Mountain*	8,879	n/a	n	5,250	y	2,800	y	8,879	y
Whistler Basin	4,020	n/a		4,020	n	No OG Use	n	4,020	
Whistler*	3,254	n/a	n	4,020	y	2,800	y	4,020	y
TOTAL*	**69,666**			**68,656**		**19,600**		**69,666**	
Bike West**	2,900	n/a	n	2,900	n	2,800	n	2,900	n
Twin Springs 1**	3,071	n/a	n	3,071	n	2,800	n	3,071	N
Mule Shoe 2**	3,000	n/a	n	3,000	n	2,800	n	3,000	n
Mule Shoe North**	4,200	n/a	n	4,200	n	2,800	n	4,200	n
Silver Lake**	4,540	n/a	n	4,540	n	No OG Use	n/a	4,540	n
Surprise Lake**	3,500	n/a	n	3,500	n	No OG Use	n/a	3,500	n
TOTAL	21,211			21,211		11,200		21,211	

*Pasayten Wilderness
**Lake Chelan-Sawtooth Wilderness

Alternative 1

There would be no pack and saddle stock outfitter-guides under Alternative 1, therefore there would be no effects to wilderness character from outfitter-guide activities. However this alternative would result in a slight improvement in wilderness character, specifically in the natural quality and opportunities for solitude. It would not provide the commercial services necessary for wilderness appropriate recreation. The elimination of pack and saddle stock outfitter guides would reduce impacts from grazing, and slightly improve water quality, and slightly reduce streambank erosion and soil impacts at stock watering and gathering locations. There would be localized improvements in the opportunities for solitude at some established campsites because the reduction in the sights and sounds of people would make the areas feel more remote. Opportunities for solitude or primitive and unconfined recreation would also improve since the number of pack and saddle stock users in each wilderness would be reduced. People needing the services of pack and saddle stock outfitter guides would not be able to travel into the wilderness and benefit from the opportunities for solitude, or primitive and unconfined recreation.

Untrammeled and Undeveloped Qualities

Alternative 1 would have no effect on the untrammeled or undeveloped qualities of the Pasayten or Lake Chelan-Sawtooth wildernesses. As discussed in the Affected Environment section above, these qualities are influenced by intentional manipulation of wilderness ecosystems, or use of motorized or mechanical equipment or transportation methods. These qualities are discussed in the cumulative effects section below, since other past, present, and reasonably foreseeable future actions have affected these qualities.

Natural Quality

The reduction (32% in the Pasayten and 6% in the Lake Chelan-Sawtooth) in the number of people and pack and saddle stock with this alternative may have minor, localized beneficial impacts to the natural quality of the Pasayten and Lake Chelan-Sawtooth wildernesses. Fewer stock would graze in wetlands and potentially cause stream bank erosion at watering sites and trail crossings. More detail is included in the Botany, Water, and Aquatic resource sections of this chapter.

Opportunities for Solitude or Primitive and Unconfined Recreation

Use Levels and Encounters

This alternative would result in a reduction in the number of pack and saddle stock users in the Pasayten and Lake Chelan-Sawtooth wildernesses. The reduction in use (32% in the Pasayten and 6% in the Lake Chelan-Sawtooth) could improve this wilderness quality for some. The number of encounters on trails would be reduced, and would be most noticeable in the portions of the wildernesses more frequently used by the pack and saddle stock outfitters. This could have a beneficial effect on the opportunity for solitude in the Spanish Creek/Remmel Lake and Larch Pass/Sheep Mountain areas.

Campsite Size and Condition

Non-outfitted pack and saddle stock users would continue to use the existing campsites discussed in the Affected Environment section and listed in **Figures A-1 and A-2**. The use would be less frequent and for shorter durations. This, coupled with potentially smaller average party sizes (because private parties tend to be smaller than outfitter-guide parties), could increase the rate of recovery, and give the most beneficial improvement to the opportunities for solitude or primitive and unconfined recreation and natural character of both wildernesses compared to Alternatives 2, 3, and 4. The camps with a barren core larger than the standard and guideline would continue to be out of compliance with the standard, however the overall frequency of use, especially of those favored by outfitters, may decrease, potentially accelerating the rate of recovery. Full recovery of these areas could take decades of non-use for vegetation to regrow, and for trees with exposed roots to die, and fall down. The actual rate of measurable changes in the size of barren core cannot be estimated, since all sites would continue to be used to some extent, and revegetation would depend on frequency and duration of use, and camping practices of non-outfitted users.

Pasayten

The most popular portions of the Pasayten, including Spanish Camp/Remmel Lake and Larch Pass to Sheep Mountain would still be frequented by non-outfitted pack and saddle stock users. The Pasayten Airport would still receive some non-outfitted stock use, but the limited amount of forage, and lack of any destination lakes would generally continue to result in light use. The Pasayten River drainage would also receive some stock use, especially at Whistler Camp along the Middle Fork Pasayten. Use here would be much lighter than in Spanish Camp/Remmel Lake, or Sheep Mountain/Corral Lake because forage is somewhat limited. Stock use at Hidden Lakes would be light due to lack of forage. Tatoosh Buttes has ample forage but stock use would continue to be limited because the trail is difficult, and water supply is limited.

The effects of Alternative 1 on the expected future conditions of the existing assigned sites are described below. There would be no effects to the approximate 2.7 acres of existing barren core from pack and saddle stock outfitter-guides at these campsites, but the sites would still be used by non-outfitted parties.

Outfitter Camps

- The Bald Mountain Camp would likely receive little use because it is off the main trail. People would have to pass several established campsites before reaching Bald Mountain. They would likely stay at the campsites normally used by the public now. The site would have a higher potential for recovery since the number of people and the stock at the campsite over a season would be reduced.

- The Sheep Mountain Camp is also located off the main trail, and approximately 20 miles from the trailhead. This would be a longer ride than most people make in a day. The site would have a higher potential for recovery since the number of people and the stock at the campsite over a season would be reduced.

- The Crow Lake Camp was used by the public prior to the outfitter establishing a camp there, so it may be used more frequently than Bald Mountain and Sheep

Mountain. Since the average party size would likely be smaller, this camp would not likely increase in size. Future use would likely be confined to the existing area.

- The Beaver Creek Camp is located off the main trail, and the average visitor would not find the location. The site would have a higher potential for recovery since the number of people and the stock at the campsite over a season would be reduced.

- Whistler Camp would still receive pack and saddle stock use since it is located near the main trail, in an area where grazing is limited. The average party size and duration of use would be less than the current use, as with the other campsites. This camp would not likely increase in size, and future use would likely be confined to the existing area.

Lake Chelan-Sawtooth
As in the Pasayten, people would continue to use the 1.1 acres of barren core in existing campsites however there may be a reduction in the number of campsites and the frequency of use. The most popular campsites, including those currently used by outfitters, would still be used by people with pack and saddle stock.

Stock Containment and Loose Grazing
Impacts within stock containment areas in campsites currently used by outfitter-guides could potentially reduce in size, since the average non-outfitted group has fewer stock than outfitted groups. This would have a beneficial effect on opportunities for solitude because of the improvement in camp conditions, especially in the amount of barren core.

There would be no loose grazing outfitted stock, however non-outfitted stock users may still use this technique since it minimizes impacts, and is the suggested method in Leave-No-Trace principles. There would be a reduction in the number of animals grazing, however, so encounters with stock away from camps or on trails, stock traveling though occupied campsites, and the sound of bells on loose grazing herds would all be reduced. This would have a beneficial impact on opportunities for solitude.

Meeting the Need for Commercial Services
This alternative would not provide the commercial pack and saddle stock services needed for wilderness recreation. People who require the services of an outfitter-guide would not be able to travel into the wilderness, and would not have access to this historic type of wilderness recreation, or be able to enjoy the opportunities for solitude or primitive and unconfined recreation offered there.

Effects Common to Alternatives 2, 3, and 4

Untrammeled and Undeveloped Qualities
Alternatives 2, 3, or 4 would have no effect on the untrammeled or undeveloped qualities of the Pasayten or Lake Chelan-Sawtooth wildernesses. As discussed in the Affected Environment section above, these qualities are influenced by intentional manipulation of wilderness ecosystems, or use of motorized or mechanical equipment or transportation methods. These

qualities are discussed in the cumulative effects section below, since other past, present, and reasonably foreseeable future actions have affected these qualities.

Natural Quality

The mitigation measures listed in Chapter 2 would reduce impacts to the natural quality of wilderness character as follows: These would all be effective in reducing impacts since they would be part of the terms and conditions of the special use permits, and therefore required of the pack and saddle stock outfitter guides.

Stock Grazing and Containment

- 8a. Using loose grazing as the preferred method for stock would reduce impacts caused by stock contained for long periods of time on high lines, hitch rails, in corrals, or tied to trees by dispersing the impacts. Restrictions on loose grazing would minimize potential damage to vegetation and soil when conditions are too wet, or when grazing has been heavy.

- 8b. Designating and approving the location of overnight stock handling facilities would avoid impacts from these facilities placed too near streams, lakes, wetlands, and other sensitive resources.

- 8c. Requiring supplemental feed under certain conditions would reduce the potential for damaging from grazing stock to vegetation and soil when an area is too wet, has been overgrazed, or there are other resource concerns.

- 8d. Prohibiting overnight picketing of stock in subalpine meadows would minimize soil disturbance and damage to vegetation in meadows.

- 8e. Designating suitable grazing areas during times of high use would minimize potential damage to vegetation and impacts to plant communities from overgrazing.

- 8g. Requiring outfitter-guides to pack in and supply all necessary feed when range conditions do not allow grazing of pack stock eliminate potential damage to resources by not allowing stock to graze.

Vegetation and Soils

- 10a. Prohibiting the cutting or removal of green trees and other live vegetation (other than for approved maintenance on system trails), and minimizing trampling or other damage to vegetation beyond what is likely to recover in one growing season would reduce potential impacts to live vegetation.

- 10b. Replacing or smoothing out soils displaced by activities such as latrine construction or pawing by stock to the extent practical would reduce soil damage within campsites.

- 10c. Identifying travel routes to minimize impacts to wet soil and meadow areas would help reduce damage to areas of wet soil and meadows caused by stock creating or increasing braded trails through wetlands.

Invasive Species

- 13a. Outfitters removing any plant material attached to vehicles, shoes, clothing, or the bodies of pack and saddle stock would prevent the spread and introduction of invasive species.

- 13b. Using supplemental feed that is commercially processed, weed-free certified processed hay cubes and certified weed-free hay (36 CFR 261.58(t) would prevent the spread and introduction of invasive species.

- 13c. Feeding commercially-processed feed or hay that is certified weed-free for several days prior to trip departure would reduce the risk of spreading invasive species. .

- 13d. Outfitters following a weed identification and mapping program under Forest Service direction would help target noxious weed populations for control or eradication.

- 13e. Outfitters surveying campsites for weeds, and assisting in control measures as directed by the Forest Service would help target noxious weed populations for control or eradication.

Opportunities for Solitude or Primitive and Unconfined Recreation

The following mitigation measures would reduce impacts to the opportunities for solitude or primitive and unconfined recreation. These would all be effective in reducing impacts since they would be part of the terms and conditions of the special use permits, and therefore required of the pack and saddle stock outfitter guides.

Campsites

- 1a. Approving all camp locations prior to use, and using only established campsites large enough to accommodate the party size when faced with an emergency or occupied campsite would help reduce impacts to opportunities for solitude by avoiding too many outfitters in one area, creating new campsites, or increasing the size of existing campsites.

- 1b. Camp Management Plans would reduce potential impacts to opportunities for solitude by managing large campsites to ensure they do not increase in size, and to prevent cashing of supplies or equipment. Limiting new facilities in assigned sites to those needed for resource protection, and not soling for comfort and convenience would keep the campsites as undeveloped as possible, and protect opportunities for solitude by reducing the visual impact of campsites.

- 1c. Limiting the amount of barren core the outfitters could use to 5,250 square feet (Alternative 2) or 2,800 square feet (Alternative 3), or to the existing amount (Alternative

4), and developing camp management plans for all sites with more than 5,250 square feet (Alternatives 2 and 4) or 2,800 (Alternative 3) would reduce potential impacts to opportunities for solitude by managing large campsites to ensure they do not increase in size.

- 1d. In Alternative 4, allowing outfitter-guides to use existing barren core in established campsites would keep the condition and size of the campsites on a stable trend.

- 1e. Requiring the outfitters to use existing barren core, and not create new of additional barren core or bare mineral soil would minimize impacts to opportunities for solitude by keeping barren core as small as possible. The impact of the campsites on the feeling of remoteness would not increase. Temporary increases as a result of camp restructuring or restoration, with no net increase in the amount of barren core, would ensure non-degradation of the wilderness, while allowing alternations to be made in campsites to address resource concerns. It also recognizes that the amount of barren core in any given campsite would vary from year to year, based on weather, non-outfitted use patterns, and vegetation growth.

- 1f. Prohibiting outfitters from exposing roots on any trees would reduce potential impacts to opportunities for solitude by not allowing increase in the impacted area around trees in campsites.

- 1g. Prohibiting outfitters from creating new campsites would prevent degradation of the wilderness, or potential impacts to opportunities for solitude from an increase in campsite density.

Campsite Use Limitations

- 2a. Limiting outfitted pack and saddle stock use at Hidden Lakes, Spanish Camp/Remmel Lake, Corral Lake/Crow Lake would reduce potential impacts to opportunities for solitude in these popular destination spots by limiting the number of outfitted stock parties.

- 2b, c, d, e, & g. Limiting pack and saddle stock use to drop camps only at Silver Lake, Buckskin Lake, Ferguson Lake, Fred Lake, Doris Lake, Black Lake, Oval Lakes, North Lake, Louis Lake, Star Lake, Tuckaway Lake, Bernice Lake, and Surprise Lake would reduce potential impacts to opportunities for solitude in these popular destinations spots by limiting the number of outfitted stock parties. This would reduce crowding, and decrease the chance that campsites would not be available for non-outfitted parties, and avoid potential impact from stock. .

- 2f. Prohibiting pack and saddle stock outfitter-guide camping at Twisp Pass or Libby Lake would prevent any impacts to opportunities for solitude, or impacts from outfitted stock.

- 2h. Requiring that all non-assigned sites be available on a “first-come, first-served” basis, and removing all equipment and materials at the end of each trip would reduce potential impacts to opportunities for solitude or primitive and unconfined recreation by allowing any party to make camp in any unoccupied campsite (exclusive of assigned sites), and not

allowing outfitters to leave camps set up between trips, therefore making the site unavailable to non-outfitted parties when the site is unoccupied.

- 2i. Requiring stock to be tied on high lines and fed from nose or feed bags in campsites within the Chelan Ranger District portion of the Lake Chelan-Sawtooth Wilderness would reduce impacts to the opportunities for solitude by avoiding encounters with loose stock and avoid littering stock containment areas with feed.

Campfires and Firewood

- 3 c. Prohibiting the cutting of standing trees, including snags would avoid potential impacts to opportunities for solitude from stumps or damaged trees around campsites decreasing the feeling of remoteness.

- 3d.Allowing firewood to only be stored at assigned sites, and requiring it to be uncovered and out of sight of any Forest Service system trail, and prohibiting skidding of firewood with stock would reduce potential impacts to opportunities for solitude by reducing the visual impact of assigned sites.

Regulations

- 4a. Requiring outfitters and their clients to comply with all applicable rules and regulations would ensure compliance with some specific forest plan standards and guidelines that minimize impacts to wilderness character. Refer to **Appendix D** for a list of regulations.

- 4b. Requiring outfitters to review regulations with clients would ensure they understand the rules and increase compliance with the rules, minimize impacts to wilderness character. Refer to **Appendix D** for a list of regulations.

Leave-no-trace

- 5a. Requiring the outfitters to follow Leave-No-Trace principles would reduce potential impacts to opportunities for solitude or primitive and unconfined recreation by reducing the sights and sounds of outfitter-guide parties as they travel on trails, camp, and allow stock to graze. It would also reduce residual impacts to campsites, leaving areas in a more natural-looking condition.

- 5b. Requiring the outfitters to review leave-no trace practices with clients, including those at drop camps would reduce potential impacts to opportunities for solitude or primitive and unconfined recreation by reducing the sights and sounds of outfitter-guide parties as they travel on trails, camp, and allow stock to graze. It would also reduce residual impacts to campsites, leaving areas in a more natural-looking condition

Trails

- 6a. Limiting outfitters to existing trails wit well-established tread, and prohibit constructing, placing, or maintaining any kind of trail without authorization would reduce potential

impacts to opportunities for solitude by preventing outfitters from increasing trail density and unauthorized trail construction.

- 6b. Restricting trail maintenance to Forest Service system trails and access trails to established camps would reduce potential impacts to opportunities for solitude by preventing outfitters from increasing trail density and unauthorized trail construction.

Sanitation and Litter

- 7a. Requiring proper management of human waste would reduce potential impacts to opportunities for solitude by improving campsite conditions.

- 7b. Requiring heavy concentrations of stock manure near campsites or in other areas where stock have been tied or held to be scattered away from open water would reduce potential impacts to opportunities for solitude by improving campsite conditions and protect water quality

- 7c & d. Requiring proper disposal of hunting refuse and dead stock to be disposed of away from campsites, trails, and sources of water would reduce potential impacts to opportunities for solitude by improving campsite and trailside conditions, and protect water quality.

Party Size

- 9 a & c. Limiting party size, only allowing oversized parties that meet the limitations in the forest plan standards and guidelines, and not allowing cripples, colts, or unbroken stock on trips would reduce potential impacts to opportunities for solitude by reducing encounters with outfitted stock parties on trails, decreasing impacts from grazing stock, and reducing impacts to campsite conditions.

Alternative 2

Alternative 2 would be essentially the same as the existing use, so the current effects to wilderness character described under the Affected Environment section would continue. There would be a minor beneficial impact to opportunities for solitude compared to the existing condition, however. The Forest Plan amendments allowing outfitters to use existing campsites and restricting outfitters to use the same 5,250 square foot area of barren core in camps exceeding that size, along with the mitigation measures prohibiting outfitters from creating new camps, or increasing the size of existing camps, would have a minor beneficial impact to opportunities for solitude. Opportunities for primitive and unconfined recreation would be maintained for those needing the services of an outfitter-guide, but would continue the current minor, localized adverse impacts on solitude by maintaining the current number of outfitter-guide pack and saddle stock use and activities such as campsite location and grazing in the wilderness. This alternative would provide enough commercial services to meet the low end of the range of minimum extent necessary. Refer to the Needs Assessment in Appendix B for a discussion of the minimum extent necessary.

Natural Quality

There would be no changes in the natural quality in the Pasayten and Lake Chelan-Sawtooth wilderness areas since there would be virtually no change in the number of people and pack and saddle stock compared to current numbers (refer to Figure 3.10-8 and Figure 3.10-12). There would be no increase in grazing pressure on plant communities, or increase in the risk of introduction and spread of invasive species. This level of grazing would not alter plant communities, or increase impacts to sensitive or rare plant species. There would continue to be isolated spots of damage to stream banks, but not at a level that would degrade aquatic habitat or water quality.

More details are included in the Botany, Water, Aquatic, Range, and Invasive Species reports.

Opportunities for Solitude or Primitive and Unconfined Recreation

Use Levels and Encounters

There would be virtually no change in the number of people using pack and saddle stock with this alternative (4% in the Pasayten and 0.7% in the Lake Chelan-Sawtooth) compared to the existing condition, so for other users, the opportunities for solitude would not change from the existing condition. People would continue to encounter people with stock, especially in those areas frequented by pack and saddle stock outfitter-guides. Campsite occupancy would remain unchanged from the current condition.

Campsite Size and Condition

The outfitter guide activities would continue to reduce opportunities for solitude in the localized areas near campsites because the sights and sounds of their camps and activities would decrease the feeling of remoteness. The level of impact would be the same as the existing condition, but more than Alternative 1.

Outfitters would be restricted to only using identified, established campsites, and not increasing the amount of barren core at any established site. They would not be permitted to create new travel routes, or expose roots on trees.

The forest plan amendment restricting the amount of barren core the outfitters could use would result in a slight improvement in the opportunities for solitude compared to the existing condition. In campsites where the barren core exceeds 5,250 square feet, the outfitters would not be permitted to use in excess of 5,250 square feet of the barren core area, and would reuse the same portion each time.

The current assigned sites, Bald Mountain, Sheep Mountain, Beaver Creek, Crow Lake, and Whistler, would continue as assigned. These campsites would be closed to the public; use would be closely monitored and controlled to accelerate their recovery. The other existing campsites listed in **Figures E-1** and **E-2** would also be used by the outfitters, but would also be open to the public.

There could be improvements at campsites with barren cores exceeding 5,250 square feet as the unused portions begin to revegetate, although recovery would be more effective at assigned sites as opposed to non-assigned sites because the public could continue to use the

entire area. The revegetation at some camps would be slow because of the short, harsh growing season, and the possibility that non-outfitted users would continue to use the area. Other sites would recover more quickly based on the amount of non-outfitted use they receive and site conditions.

The amendment allowing outfitter-guides to use existing campsites within 200 feet of meadows, streams, lakes, and special interest areas would continue the current impacts to opportunities for solitude since the existing campsites would be used.

Pasayten

Pack and saddle stock outfitter-guides would continue to use the existing campsites in the Pasayten. Most of their activity would be in the Spanish Camp/Remmel Lake area (Bald Mountain and Beaver Creek assigned sites), Sheep Mountain/Corral Lake area (Sheep Mountain and Corral Lake assigned sites), Middle Fork of the Pasayten (Whistler Camp assigned site), and in the Tatoosh Buttes/Hiddlen Lakes area.

The effects of Alternative 2 on the conditions of the assigned sites currently used by outfitters are described below. A complete list of camps used by the outfitters, including barren core and number of damaged trees, is in **Appendix A**.

The current conditions at non-assigned sites would not change with implementation of this alternative since they would continue to be used by both the outfitter-guides and the public. Camp management plans would be made for Crow Lake 2 (currently with 7,000 square feet of barren core), Fred's Lake (with 5,400 square feet of barren core), and Peeve Meadow (with 5,640 square feet of barren core). The camp management plans would identify the 5,250 square feet of barren core the outfitters could use on visit. The amount of barren core would not be expected to decrease, however, due to the non-outfitted use.

- The Bald Mountain Camp would continue to have a barren core of approximately 3,900 square feet. A camp management plan would be developed and followed to prevent creating additional barren core, exposing more roots on trees, and creating additional travel routes. The camp would be closed to public use, so further degradation should not occur.

- The Sheep Mountain Camp has an existing barren core of 8,879 square feet. A camp management plan would be developed and followed, identifying 5,250 square feet of barren core area the outfitters can use which would prevent creating additional barren core, exposing more tree roots, and creating additional travel routes. The entire camp would be closed to the public, so the remaining unused 3,625 square feet of barren core would begin to recover.

- The Crow Lake Camp, located in the Sheep Mountain/Corral Lake area, has an existing barren core of 9,610 square feet. As with the other assigned sites, a camp management plan would be developed, identifying 5,250 square feet of barren core the outfitters can use. This would prevent creating additional barren core, exposing more tree roots, and creating additional travel routes.

The entire camp would be closed to the public, so the remaining unused 4,360 square feet of barren core would begin to recover.

- The Beaver Creek Camp has an existing barren core of 6,747 square feet. A camp management plan would be developed and followed, identifying 5,250 square feet of barren core area the outfitter-guide can use which would prevent creating additional barren core, exposing more roots on trees, or creating travel routes. The entire camp would be closed to the public, so the additional 1,497 square feet of barren core would begin to recover.

- Whistler Camp has an existing barren core of 3,254 square feet. The camp size and condition would not change with this alternative because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides.

Lake Chelan-Sawtooth

The pack and saddle stock outfitter-guides would continue to operate in the Lake Chelan-Sawtooth Wilderness. Most of their trips would be to Williams Lake, Oval Lakes, Baldy Mountain area, and Wolf Creek. There are no outfitter-guide campsites with over 5,250 square feet of barren core in the Lake Chelan-Sawtooth Wilderness. The amount of barren core at these campsites would not change with implementation of Alternative 2.

Under Alternative 2, a total of 9,482 square feet (two-tenths of an acre) of barren core in the Pasayten Wilderness would no longer be affected by any use because this area would be closed to use by both outfitter-guides and the general public (assigned sites). The amount of time recovery of these areas would take would depend on the microclimate of each campsite. In addition, 1,528 square feet of undesignated barren core in the Pasayten would no longer be affected by outfitter-guides, but impacts from the general public would still continue because the undesignated barren core would not be closed to the general public (see cumulative effects). This totals 11,010 square feet, or approximate three-tenths of an acre scattered across the Pasayten, that would no longer be impacted by pack and saddle stock outfitter-guides. Approximately 105,571 square feet of barren core, or 2.4 acres would continue to be used by the pack and saddle stock outfitter-guides. There are no outfitter camps in the Lake Chelan-Sawtooth with more than 5,250 square feet, so the amount of barren core used by the outfitters in this wilderness would not change from the existing condition; 48,534 square feet, or 1.1 acres.

Figures A-1 and A-2 in Appendix A list the camps consistently used by the outfitters, including the amount of barren core and number of damaged trees. These camps would continue to be used for full-service and drop camps. The mitigation measures included in the alternative would be effective at regulating outfitter-guide activities to meet the amended standards and guidelines.

Stock Confinement and Loose Grazing

Loose grazing would be the preferred method for caring for stock in the wilderness areas (see Mitigation Measure 8a, page 2-15). This would limit the amount of time stock are confined in camp, thus reducing the size of and amount of disturbance in confinement area.

More confinement can generally be equated to more impact because it concentrates impact and contributes to restless behavior (Leave No Trace, 2001).

People would continue to encounter or hear grazing stock, so impacts to opportunities for solitude from stock would continue. People may see stock in meadows, on trails, or near campsites, and may hear the bells used to help locate the herds. These encounters would likely be infrequent, based on the very limited reports of such encounters over the past decade. The 4% increase in service days compared to the existing condition would likely not cause a noticeable increase in these encounters.

Meeting the Need for Commercial Services

This alternative would provide enough commercial services to meet the low end of the range of minimum extent necessary. If the need increases due to the aging population, the alternative would fall short of meeting the need (upper end of the minimum extent necessary range Pack and saddle stock wilderness recreation would be accessible to the portion of the population needing the services due to physical limitations, or lack of skill and equipment. Those needing the services of an outfitter would be able to travel into the wilderness and enjoy the opportunities for primitive and unconfined recreation.

Alternative 3

Alternative 3 would have a minor improvement in wilderness quality compared to the existing condition, but not as much of an improvement as Alternative 1. One forest plan amendment would prohibit outfitters from using existing campsites within 200 feet of wetlands, streams, lakes, and special interest area while allowing use of existing camps within 200 feet of meadows. Another amendment would require that they use the same 2,800 square foot area of barren core in camps exceeding that size. A third amendment would reduce the pack and saddle stock outfitter-guide party size to 12 heartbeats (people and stock). The mitigation measures would prohibit outfitters from creating new camps, or increasing the size of existing camps. All these components would have an increase the opportunities for solitude and natural qualities of the wilderness compared to the existing condition. The alternative would not meet the low end of the range of the minimum extent necessary, so opportunities for primitive and unconfined recreation would be reduced from current levels for people requiring the services of an outfitter-guide.

Natural Quality

The natural quality of the Pasayten and Lake Chelan-Sawtooth wilderness areas would be improved from the existing condition with this alternative. There would be a 14% decrease in the number of people using pack and saddle stock in the Pasayten, and 3% decrease in the Lake Chelan-Sawtooth, but these small decreases would not be enough to change current conditions.

The forest plan amendment prohibiting the outfitter-guides from using camps within 200 feet of wetlands, streams, lakes, and special interest areas while allowing use of camps within 200 feet of dry meadows would reduce the likelihood of outfitter-guide impacts to wetlands, lakes, and streams. Loose grazing stock could still access wetlands, streams, and lakes, but the heaviest impact would occur in close proximity to campsites, so prohibiting

outfitter-guide use of these campsites would reduce impacts. Approximately 42 campsites would be closed to outfitters, including the currently assigned Bald Mountain and Beaver Creek Camps. The current impacts to vegetation, soil, water quality, and aquatic habitat from outfitter-guide activities in the 42 campsites would cease, although non-outfitted use at these cites would likely continue.

This reduced amount of stock grazing would reduce impacts to plant communities, and sensitive or rare plants compared to the existing condition, but not as much as the effects of Alternative 1. There would continue to be isolated spots of damage to stream banks, but not at a level that would degrade aquatic habitat or water quality. Invasive species may be introduced and spread by pack and saddle stock, but the mitigation measures requiring cleaning equipment prior to wilderness entry and for certified weed-free feed would reduce the risk.

More detail is included in the Botany, Water, Aquatic, Range, and Invasive Species resource sections of this chapter.

Opportunities for Solitude or Primitive and Unconfined Recreation

Use Levels and Encounters

The number of people using pack and saddle stock would be reduced from the existing condition with this alternative (14% in the Pasayten, and 3% in the Lake Chelan-Sawtooth). The reduction in the Lake Chelan-Sawtooth would likely go unnoticed in terms of encounters and campsite occupancy, but people in the Pasayten may notice a slight decrease in encounters on the trails and campsite occupancy.

The forest plan amendment reducing the party size for pack and saddle outfitter guide groups could have a beneficial impact to the opportunities for solitude compared to the existing condition. No outfitted group would exceed a total of 12 people and stock, with the exception of the occasional authorized oversized party. This would substantially reduce the encounters with large pack strings on trails, and result in fewer pack stock in and around camps. This benefit may be reduced or eliminated if the outfitters make multiple trips to and from camps in order to provide the service clients expect while not exceeding the smaller party size, which could increase the number of encounters between outfitted and non-outfitted groups on trails.

Campsite Size and Condition

The pack and saddle stock outfitter-guides would be prohibited from using approximately 46 existing campsites due to their proximity to wetlands, streams, lakes, or special interest areas (within 200 feet), including the assigned sites at Bald Mountain and Beaver Creek. Sheep Mountain, Whistler, and Crow Lake camps would remain assigned sites. All assigned campsites would be closed to the public, and use would be closely monitored and controlled to accelerate the recovery of areas outside the designated barren core. The other existing campsites listed in **Figures A-1** and **A-2** would also be used by the outfitters, but would also be open to the public.

Outfitters would be restricted to only using identified, established campsites, and not increasing the amount of barren core at any established site. They would not be

permitted to create new travel routes, or expose roots on trees. In campsites where the barren core exceeds 2,800 square feet, the outfitters would not be permitted to use in excess of 2,800 square feet of the barren core area, and would be required to reuse the same portion each time.

The effect of the amendments would be a minor to moderate improvement in the opportunities for solitude or primitive and unconfined recreation of both wilderness areas compared to the existing condition because the smaller campsites and smaller party sizes would help the areas feel more remote by reducing the sights and sounds of the outfitter camps and groups.

There would be some slow improvements at the assigned sites as the unused portions begin to revegetate. The revegetation at some camps could be slow because of the short, harsh growing season, and the likelihood that non-outfitted users would continue to use the area. No new camps, travel routes, or exposed roots on trees would be permitted by outfitters, so the overall amount of Wilderness affected by outfitter-guides would not increase.

The current conditions at non-assigned sites would not change with implementation of this alternative since they would continue to be used by both the outfitter-guides and the public. Camp management plans would be made for all camps with more than 2,800 square feet of barren core (all campsites listed in **Figure 3.2-20** not closed to outfitter-guide use). The camp management plans would identify the 2,800 square feet of barren core the outfitters could use on visit. The amount of barren core would not be expected to decrease in non-assigned sites, however, due to the non-outfitted use (refer to cumulative effects discussion).

The intensity of the impacts to the opportunities for solitude or primitive and unconfined recreation and natural qualities would be lower with this alternative compared to Alternatives 2 or 4, since less existing barren core would be used by outfitters, potentially allowing for vegetative recovery at existing campsites. The difference between the alternatives would be negligible at the wilderness scale, and minor to moderate at the local level.

Pasayten

Pack and saddle stock outfitter-guides would continue to use the existing campsites in the Pasayten. Most of their activity would be in the Spanish Camp/Remmel Lake area (Bald Mountain and Beaver Creek assigned sites), Sheep Mountain/Corral Lake area (Sheep Mountain and Corral Lake assigned sites), Middle Fork of the Pasayten (Whistler Camp assigned site), and in the Tatoosh Buttes/Hiddlen Lakes area.

- The Bald Mountain Camp would be closed to outfitter-guides. It would likely receive little use because it is off the main trail. People would have to pass several established campsites before reaching Bald Mountain. They would likely stay at the campsites normally used by the public now. The site would have a higher potential for recovery since the number of people and the stock at the campsite over a season would be reduced.

- The Sheep Mountain Camp has an existing barren core of 8,879 square feet. A camp management plan would be developed and followed, identifying 2,800 square feet of barren core area the outfitter can use. Outfitter-guide activities that would perpetuate the barren core on the additional area would not be allowed. The camp would be closed to the public, so the additional 6,079 square feet of barren core would begin to recover.

- The Crow Lake Camp has approximately 9,160 square feet of barren core. Two thousand eight hundred square feet would be identified for the outfitter to use. A camp management plan would be developed to identify and monitor the barren core. Outfitter-guide activities that would perpetuate the barren core on the additional area would not be allowed. This camp would not be closed to the public, so the recovery of the additional 6,360 square feet would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- The Beaver Creek camp would be closed to outfitter-guides. It is located off the main trail, and the average visitor would not find the location. The site would have a higher potential for recovery since the number of people and the stock at the campsite over a season would be reduced.

- Whistler Camp has approximately 4,020 square feet of barren core. A camp management plan would be developed to identify the 2,800 square feet of barren core the outfitter could use. Outfitter-guide activities that would perpetuate the barren core on the additional barren core would not be allowed. The camp would be closed to the public, so the additional 1,220 square feet of barren core would begin to recover.

Lake Chelan-Sawtooth

The pack and saddle stock outfitter-guides would continue to operate in the Lake Chelan-Sawtooth Wilderness. Most of their trips would be to Williams Lake, Oval Lakes, Baldy Mountain area, and Wolf Creek. There are no outfitter-guide campsites with over 2,800 square feet of barren core in the Lake Chelan-Sawtooth Wilderness. The amount of barren core at these at these campsites would not change with implementation of Alternative 3.

Under Alternative 3, a total of 13,659 square feet (three-tenths of an acre) of barren core in the Pasayten Wilderness would no longer be affected by any use because this area would be closed to use by both outfitter-guides and the general public (assigned sites). Approximately 79,665 square feet of undesignated barren core at campsites in the Pasayten, and 17,874 square feet in the Lake Chelan-Sawtooth would no longer be affected by outfitter-guides, but impacts from the general public would still continue because the undesignated barren core would not be closed to the general public (see cumulative effects). The amount of time recovery of these areas would take would depend on the microclimate of each campsite. The total amount of barren core the outfitters would use in the Pasayten Wilderness in Alternative 3 would be approximately 38,029 square feet, or 0.9 acres. In the Lake Chelan-Sawtooth, they would use approximately 30,660 square feet, or 0.7 acres. .

Figures A-1 and A-2 in Appendix A list the camps consistently used by the outfitters, including the amount of barren core and number of damaged trees. These camps would continue to be used for full-service and drop camps. The mitigation measures included in the alternative would be effective at regulating outfitter-guide activities to meet the amended standards and guidelines.

Stock Confinement and Loose Grazing

Loose grazing would be the preferred method for caring for stock in the wilderness areas (see Mitigation Measure 8a). This would limit the amount of time stock are confined in camp, thus reducing the size of and amount of disturbance in confinement area. More confinement can generally be equated to more impact because it concentrates impact and contributes to restless behavior (Leave No Trace, 2001).

There would be a 52% reduction in service days with this alternative compared to the current amount. People would continue to encounter or hear outfitted stock grazing, so impacts to opportunities for solitude from stock would continue, but at a noticeably reduced level. People may see stock in meadows, on trails, or near campsites, and may hear the bells used to help locate the herds. These encounters would likely be infrequent, based on the very limited reports of such encounters over the past decade, and would be less frequent than with implementation of Alternatives 2 or 4.

Meeting the Need for Commercial Services

The alternative would not meet the low end of the range of the minimum extent necessary, so opportunities for primitive and unconfined recreation would be reduced from current levels for people requiring the services of an outfitter-guide. Pack and saddle stock wilderness recreation would be accessible to about half of the people needing the services due to physical limitations, or lack of skill and equipment. The unserved half would not have the opportunity to experience the primitive and unconfined recreation offered.

Alternative 4

Alternative 4 would result in minor localized impacts to wilderness character compared to the existing condition because the 20% increase in service days. The outfitter-guide activities would impact opportunities for solitude in and around campsites, and along trails because the sights and sounds of their activities and clients would detract from the remoteness of those localized areas. The forest plan amendments allowing the outfitters to use existing campsites within 200 feet of meadows, streams, lakes, and key interest areas, and to use the existing barren core at any campsite without increasing the barren core would prevent degradation of wilderness character by avoiding creation of new campsites and not increasing the current amount of barren core.

Opportunities for primitive and unconfined recreation would be maintained for those needing the services of an outfitter-guide, but would increase the current minor, localized adverse impacts on solitude by maintaining the current number of outfitter-guide pack and saddle stock use and activities such as campsite location and grazing in the wilderness. This alternative would provide enough service days to meet the upper end of the range of minimum extent necessary. Refer to the Needs Assessment in Appendix B for a discussion of the minimum extent necessary.

Natural Quality

The outfitter-guide activities would continue the current minor, localized impacts to the natural quality in wildernesses. The impacts would be the greatest with this alternative compared to Alternatives 1, 2, and 3. There would be a 20% increase service days in the Pasayten and a 6% increase in the Lake Chelan-Sawtooth. Even with this increase, the impacts to the natural quality would be minor because the dispersed, loose-grazing stock would not alter plant communities, and would only slightly increase impacts to sensitive or rare plant species. There would continue to be isolated spots of damage to stream banks, but not at a level that would degrade aquatic habitat or water quality.

More details are included in the Botany, Water, Aquatic, Range, and Invasive Species reports.

Opportunities for Solitude or Primitive and Unconfined Recreation

Use Levels and Encounters

There would be small increases in the number of people using pack and saddle stock with this alternative compared to the current condition (6% in both the Pasayten and the Lake Chelan-Sawtooth). For other users, the opportunities for solitude would not be noticeable from the existing condition. People would continue to encounter people with stock, especially in those areas frequented by pack and saddle stock outfitter-guides. Campsite occupancy would increase slightly, but not enough to make finding established campsites difficult for non-outfitted recreationists.

Campsite Size and Condition

The existing campsites would continue to be used by the outfitter-guides. Bald Mountain, Sheep Mountain, Beaver Creek, Crow Lake, and Whistler would remain assigned sites. These campsites would be closed to the public; use would be monitored and controlled. The other existing campsites listed in **Figures E-1** and **E-2** would also be used by the outfitters, but would also be open to the public.

Outfitters would be restricted to only using identified, established campsites, and not increasing the amount of barren core at any established site. They would not be permitted to create new travel routes, or expose roots on trees.

The effect of the barren core and campsite location amendments would result in no degradation to the opportunities for solitude, from the current minor, localized impacts. The impacts would be greater than Alternative 1, 2, or 3 because of the increase in service days. The amendment allowing outfitter-guides to use existing campsites within 200 feet of meadows, streams, lakes, and special interest areas would maintain the current impacts to opportunities for solitude since the existing campsites would be used.

The current conditions at non-assigned sites would not change with implementation of this alternative since they would continue to be used by both the outfitter-guides and the public. Camp management plans would be made for Crow Lake 2 (currently with 7,000 square feet of barren core), Fred's Lake (with 5,400 square feet of barren core), and Peeve Meadow (with 5,640 square feet of barren core). The camp management plans would identify the

existing barren core, and be used to ensure the outfitters are not increasing the barren areas. The amount of barren core could increase from use by non-outfitted recreationist, however.

Pasayten

Pack and saddle stock outfitter-guides would continue to use the existing campsites in the Pasayten. Most of their activity would be in the Spanish Camp/Remmel Lake area (Bald Mountain and Beaver Creek assigned sites), Sheep Mountain/Corral Lake area (Sheep Mountain and Corral Lake assigned sites), Middle Fork of the Pasayten (Whistler Camp assigned site), and in the Tatoosh Buttes/Hiddlen Lakes area.

The effects of Alternative 4 on the conditions of the assigned sites are described below. A complete list of camps used by the outfitters, including barren core and number of damaged trees, is in the full wilderness report in the analysis file.

- The Bald Mountain Camp, an assigned site, would continue to have a barren core of approximately 3,900 square feet. The camp size and condition would not change with this alternative because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides. A camp management plan would be developed and followed to monitor conditions. The camp would be closed to public use, so further degradation should not occur.

- The Sheep Mountain Camp, an assigned site, has an existing barren core of 8,879 square feet. The camp size and condition would not change with this alternative because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides. A camp management plan would be developed and followed to monitor conditions. The camp would be closed to public use, so further degradation should not occur.

- The Crow Lake Camp, located in the Sheep Mountain/Corral Lake area, would continue to have a barren core of approximately 9,610 square feet. The camp size and condition would not change with this alternative because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides. A camp management plan would be developed and followed to monitor conditions. The camp would be closed to public use, so further degradation should not occur.

- The Beaver Creek Camp, an assigned site has an existing barren core of approximately 6,747 square feet. The camp size and condition would not change with this alternative because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides. A camp management plan would be developed and followed to monitor conditions. The camp would be closed to public use, so further degradation should not occur.

- Whistler Camp, an assigned site, has an existing barren core of approximately 4,020 square feet. The camp size and condition would not change with this alternative

because outfitter-guides would be prohibited from creating additional barren core, exposing more tree roots, or creating additional travel routes by outfitter-guides. A camp management plan would be developed and followed to monitor conditions. The camp would be closed to public use, so further degradation should not occur.

Lake Chelan-Sawtooth
The pack and saddle stock outfitter-guides would continue to operate in the Lake Chelan-Sawtooth Wilderness. Most of their trips would be to Williams Lake, Oval Lakes, Baldy Mountain area, and Wolf Creek. Barren core would not increase from outfitter-guide activity at any campsite.

Under Alternative 4, the existing 117,694 square feet of barren core (2.7 acres) in the Pasayten outfitter camps and 48,534 square feet (1.1 acres) in the Lake Chelan-Sawtooth outfitter camps would continue. Since the outfitters would be allowed to use all existing barren core, there would be reduction.

Figures A-1 and A-2 in Appendix A list the camps consistently used by the outfitters, including the amount of barren core and number of damaged trees. These camps would continue to be used for full-service and drop camps. The mitigation measures included in the alternative would be effective at regulating outfitter-guide activities to meet the amended standards and guidelines.

Stock Confinement and Loose Grazing
Loose grazing would be the preferred method for caring for stock in the wilderness areas (see Mitigation Measure 8a, page 2-15). This would limit the amount of time stock are confined in camp, thus reducing the size of and amount of disturbance in confinement area. More confinement can generally be equated to more impact because it concentrates impact and contributes to restless behavior (Leave No Trace, 2001).

People would continue to encounter or hear grazing stock, so impacts to opportunities for solitude from stock would continue. People may see stock in meadows, on trails, or near campsites, and may hear the bells used to help locate the herds. These encounters would likely be infrequent, based on the very limited reports of such encounters over the past decade. The 20% increase in service days in the Pasayten, and the 15% increase in the Lake Chelan-Sawtooth, compared to the current levels, would likely cause a noticeable increase in encounters in the areas frequented by the outfitters, but would still comply with the encounter standard and guidelines since the current encounter levels are so far below the standard.

Meeting the Need for Commercial Services
This alternative would fully provide the upper range of the minimum amount of commercial services needed for wilderness recreation and increase the opportunities for primitive and unconfined recreation. Pack and saddle stock wilderness recreation would be accessible to the portion of the population needing the services due to physical limitations, or lack of skill and equipment. Those needing the services of an outfitter would be able to travel into the wilderness and enjoy the opportunities for primitive and unconfined recreation.

Cumulative Impacts of all Alternatives

The spatial boundary for the cumulative effects analysis in the Pasayten Wilderness is the entire Pasayten and the trailheads leading into the wilderness. Similarly, the boundary for the Lake Chelan-Sawtooth Wilderness is the entire Lake Chelan-Sawtooth and the trailheads. The temporal boundary for both areas is from the early 1900s through 2023, when the 10-year permits would expire. At that point, there would be no further direct or indirect effects to wilderness character for pack and saddle stock outfitter-guides, so any cumulative effects would be eliminated.

Past Actions

Past actions that have had influenced and are still impacting wilderness character are described under the Historic Activities section above.

Present Actions

Trail Maintenance

The Forest Service is continuing to maintain between 350 and 500 miles of trail each year in the Pasayten and 85 to 90 miles in the Lake Chelan-Sawtooth. The maintenance is allowing people to access the most popular destinations in each wilderness. Providing maintained trails concentrates use on those trails, but leaves the vast majority of both wilderness areas untouched, creating a beneficial impact on the opportunities for solitude in the wilderness.

Restoration and Education Activities

Restoration and education activities are ongoing in the Pasayten and Lake Chelan-Sawtooth, and are having a beneficial impact on the opportunities for solitude of the wildernesses by improving campsite conditions, educating non-outfitted recreationists about Leave-No-Trace techniques and wilderness ethics, and monitoring levels of use throughout the wilderness areas. . Some ongoing activities are listed below. More details are included in the analysis file.

- Provide up-to-date trail information at Forest Service offices and on the Forest website.
- Discuss camp access trails with outfitters to develop and maintain only one main access trail into camps.
- Work with outfitter who uses Bald Mountain camp to manage stock trails between camp and grazing area.
- Collect use information by permit system, including date, duration, type of use, area, etc. for the Pasayten.
- Evaluate campsites for potential impacts to threatened and endangered species.
- Information about wilderness ethic and resource information, in addition to rules and regulations, is posted at all trailheads, and available to all groups. It is also available at Forest Service Offices.
- Information is provided on Wilderness Permits.
- Wilderness ethics and resource information is included on the Forest Service web site.
- Leave-No-Trace camping techniques are taught by wilderness rangers in the field.
- Handouts detailing Leave-No-Trace camping techniques are available at Forest Service offices, and on Forest Service and outfitter websites.
- Lead wilderness ranger and wilderness stock ranger attended Leave-No-Trace training.

Outfitter-Guide Permit Administration

Outfitter-Guide permit administration is continuing, with an emphasis on ensuring positive working relationships with the outfitters, and compliance with all rules and regulations. This is helping ensure that the outfitters' activities do not grade wilderness character. The following list highlights some of the ongoing work:

- Working to maintain positive relationships with outfitters through annual meetings with individual outfitters to discuss performance, operations, and concerns.
- Hosting annual spring meeting with all outfitters to discuss upcoming Forest Service activities, outfitter concerns, and Forest Service concerns.
- Campsites are discussed with outfitters, and field reviews with Forest Service employees and outfitters help address camp management issues. Campsite conditions are also discussed and evaluated in annual performance evaluation meetings.
- Drop camps are discussed at annual performance evaluation meetings, and drop camps are visited by Forest Service employees to assess camp management, location, and compliance with permits.
- Permit administrators on the Chelan and Methow Valley Ranger Districts are working together in the field, in meetings, and in correspondence with outfitters to provide cross-unit coordination.

Other Outfitters

Four companies: National Outdoor Leadership School (NOLS), Outward Bound, Wilderness Ventures, and YD Adventures operate outfitted and guided backpacking/mountaineer/ wilderness education trips in the Pasayten and Lake Chelan-Sawtooth Wilderness areas. Combined, they have approximately 3,150 service days in the Pasayten, and 1,400 days in the Lake Chelan-Sawtooth. Many of their activities overlap in location and time with the pack and saddle stock outfitter-guides, but some are in portions of the wilderness areas either off-limits to the pack and saddle stock, or in areas not frequented by them.

This type of commercial use has less of an impact on wilderness quality than pack and saddle stock activities. They use some of the same campsites, but since they do not have stock, stock impacts do not occur. Campsites are smaller, most are in compliance with existing standards and guidelines regarding barren core and damaged trees, and most of the activities occur in portions of the wilderness not commonly used by non-outfitted users. Some of the companies occasionally resupply camps using pack and saddle stock, but the rendezvous locations are in existing hardened campsites, and the stock do not stay overnight (unless the distance from the trailhead requires a one night layover).

The activities are having a negligible to minor local impact on the opportunities for solitude.

Non-Outfitted Recreation Use

There are about 16,900 visitor days in the Pasayten and 35,885 in the Lake Chelan-Sawtooth each year independent of outfitter guides (backpacking, mountaineering, wilderness education and pack and saddle stock outfitters). The use is having localized, minor impacts to opportunities for solitude because of established campsites and encounters on trails. The campsites and encounters are diminishing the feeling of remoteness, however encounters are not exceeding Forest Plan standards and guideline levels, the 2009 Wilderness Study found that

the majority of people do not feel crowded in either wilderness. More details are included in the current condition section of this report.

Cabins and Buildings

The wilderness has, and continues to be, essentially without permanent improvements and human occupation. Several buildings are present in these wildernesses. In the Pasayten, there are four cabins used for Forest Service wilderness administration (Spanish Camp, two at Stub Creek, and Pasayten Airport in the Pasayten Wilderness), an unstaffed lookout and radio repeater building at Monument 85 on the international border with Canada, a snow survey cabin along Lightning Creek (visited infrequently by the US Geologic Survey), and four buildings at the abandoned Tungsten Mine not used for administration, but as a recreation destination. In the Lake Chelan-Sawtooth, there is a cabin along War Creek that is a recreation destination, but not used for administration. Other dilapidated trapper cabins are scattered across both wilderness area, but are in varying states of collapse, and are unusable.

The effect of cabins is moderate and local, impacting the undeveloped quality of the wildernesses. They can be an intrusion on a visitor's experience. In some areas, most notably the Spanish Camp and Hidden Lakes, where current visitation is relatively high, and pack and saddle stock outfitter guides is also high, the cumulative effect of the presence of these cabins can diminish experiences of some visitors. However, other visitors may not perceive the presence of cabins as a negative effect on their experience. In fact, their visit may be enhanced by the historic cabins, or not perceived to be in contrast to the environment.

Reasonably Foreseeable Future Actions

Trail Maintenance

Although not reasonably foreseeable future *actions* under NEPA, it is reasonably foreseeable that the Forest Service will annually maintain between 350 and 500 miles of trail in the Pasayten Wilderness, and 85 to 90 miles in the Lake Chelan-Sawtooth. This will keep people concentrated in the currently popular portions of wilderness and minimize impacts to the vast majority of either wilderness area. The pack and saddle stock outfitter guides will use these maintained trails to access campsites.

Restoration Activities

Although not reasonably foreseeable future *actions* under NEPA, it is reasonably foreseeable that restoration activities will continue on existing outfitter and non-outfitter campsites in both wilderness areas. The type and intensity of the restoration will depend on the Forest Service budget, but these activities will continue to have minor, beneficial effects on the opportunities for solitude. It is reasonably foreseeable that the list of restoration activities included in the Present Action section will continue, in addition to new ones initiated to resolve any emerging situations.

Wildfires

Although not reasonably foreseeable future *actions* under NEPA, wildland fires are expected into the future. Fire suppression activities such as fire line and helispot will continue. These will be rehabilitated, but the continued fire suppression will adversely impact the untrammeled and natural qualities of the wilderness.

Recreation Use

There will be increasing demand for recreation in the coming years. The technical report *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation* (Hall et al, 2009), predicts that since the population of Washington will increase, the number of people recreating will also increase, all other factors being even. There will be increases in population in all age groups, and younger people are still showing strong interest in outdoor recreation. The popularity of recreation activities near water is expected to grow, as is the use of popular day use areas. Word-of-mouth recommendations and media exposure will spread interest in these popular areas, and crowding and conflict will likely increase (Hall et al, 2009).

In 2003, the Washington State Recreation and Conservation Office (RCO) completed a report that projected participation rates of nature-based activities in Washington State over a 10-year and 20-year period based on participation data from the 1999-2000 RCO survey (IAC 2003). These projections, shown in **Figure 3.2-21**, took into account NSRE data and projections for the Pacific Northwest Region, demographic trends in Washington State, the local supply of lands available for recreation activities, and other factors.

Figure 3.2-21. RCO Recreation Participation Projections as a Percent of Change in the Number of People Participating in the Future Compared to 1999-2000 Survey Results (IAC 2003)

Activity	Projected % growth in # of participants (2010-2020)
Hiking & Backpacking	+13%
Equestrian	+3%

These projections were used to estimate the number of people who will be recreating in the Pasayten and Lake Chelan-Sawtooth in 2023.

Figure 3.2-22. Current Number of Visitor days by User Group in the Pasayten, Estimated Increase, and Future Number of Visitor Days.

User Group	Current Visitor Days*	Estimated Future Increase	Estimated Number of Visitor Days in 2023
Backpackers	13,090	13%	14,792
Stock Users	5,610	3%	5,778
TOTAL	**18,700**		**20,570**

*Includes current outfitter-guide service days

Figure 3.2-23. Current Number of Visitor days by User Group in the Lake Chelan-Sawtooth, Estimated Increase, and Future Number of Visitor Days.

User Group	Current Visitor Days*	Estimated Future Increase	Estimated Number of Visitor Days in 2023
Backpackers	23,790	13%	26,883
Stock Users	12,810	3%	13,194
TOTAL	**36,600**		**40,077**

*Includes current outfitter-guide service days

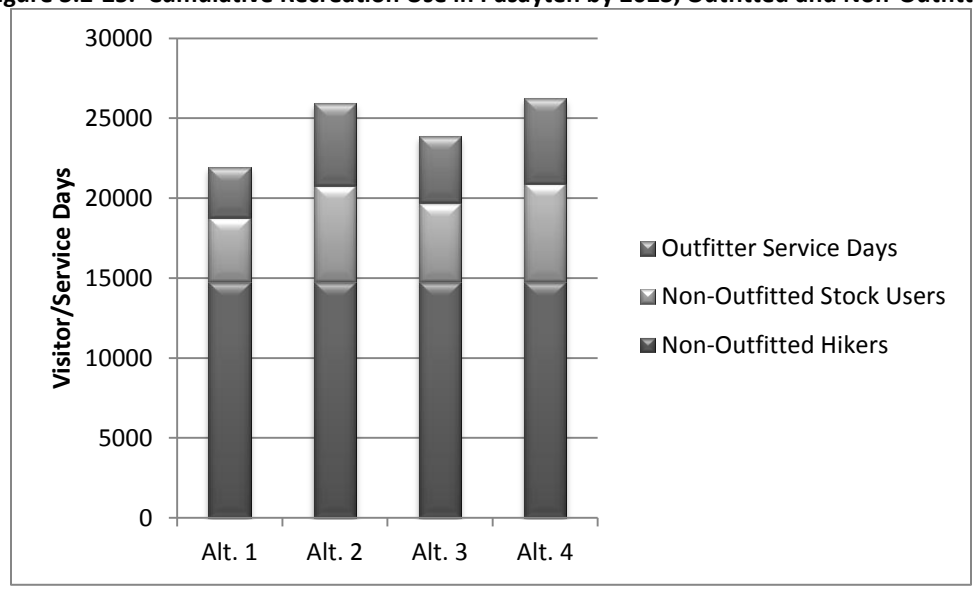
It is reasonably foreseeable that the number of hiking/backpacking outfitter-guide service days will be the number recommended in the 2012 Needs Assessment (USDA Forest Service, 2012). Refer to page B-42 for details. Adding the potential outfitter-guide service days (pack and saddle stock and backpacking) to these totals shows the approximate number of visitor days, what percentage would be outfitted, and the percent changes compared to current levels.

Figure 3.2-24. Cumulative Number of Visitor Days by User Group in the Pasayten in 2023, by Alternative

Current or Alternative	Pack and Saddle Stock Users	Hikers	Total
Current			
Total Visitor Days	5,610	13,090	18,700
Visitor Days Outfitted	1,800	3,150	4,950
Percent of total	32%	24%	26%
Alternative 1			
Total Visitor Days	3,988	14,782	18,770
Visitor Days Outfitted	0	3,150	3,150
Percent of total	0%	21%	17%
Percent Change from Current Total	-29%	+13%	+0.4%
Alternative 2			
Total Visitor Days	5,988	14,782	20,770
Visitor Days Outfitted	2,000	3,150	5,150
Percent of total	33%	21%	25%
Percent Change from Current Total	+7%	+13%	+11%
Alternative 3			
Total Visitor Days	4,924	14,782	19,770
Visitor Days Outfitted	1,000	3,150	4,150
Percent of total	20%	21%	21%
Percent Change from Current Total	-12%	+13%	+6%
Alternative 4			
Total Visitor Days	6,158	14,782	20,940
Visitor Days Outfitted	2,170	3,150	5,320
Percent of total	35%	21%	25%
Percent Change from Current Total	+10%	+13%	+25%

This same information is used in the following graphical display. The outfitter-guide days for pack and saddle stock, and hiking/backpacking are combined into "Outfitter Service Days". The "Stock Users" and "Hikers" are not outfitted.

Figure 3.2-25. Cumulative Recreation Use in Pasayten by 2023, Outfitted and Non-Outfitted



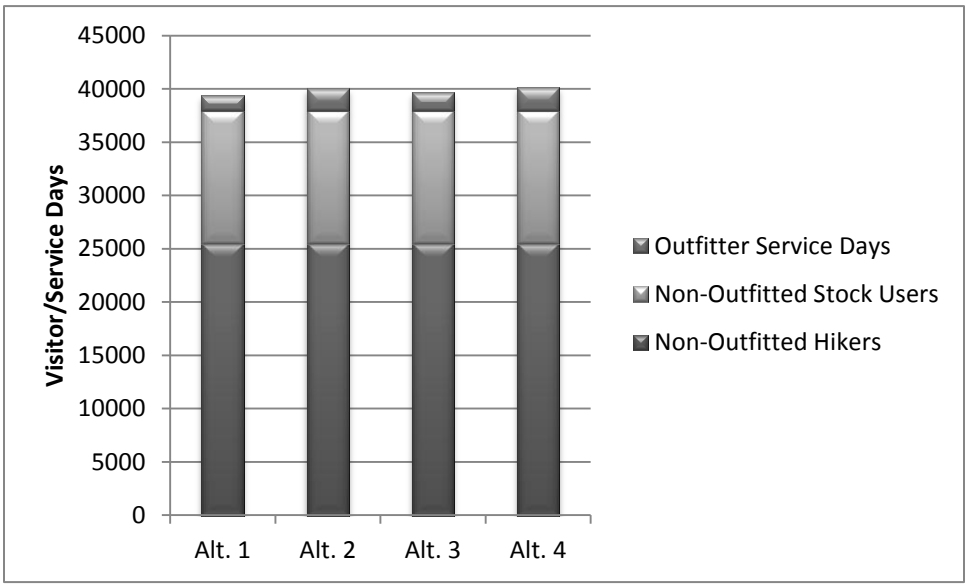
The information for the Lake Chelan-Sawtooth Wilderness is displayed below.

Figure 3.2-26. Number of Visitor Days by User Group in the Lake Chelan-Sawtooth in 2023, by Alternative

Current or Alternative	Pack and Saddle Stock Users	Hikers	Total
Current			
Total Visitor Days	12,810	23,790	36,600
Visitor Days Outfitted	715	0	715
Percent of total	6%	0%	2%
Alternative 1			
Total Visitor Days	12,479	26,883	39,362
Visitor Days Outfitted	0	1,400	1,400
Percent of total	0%	5%	4%
Percent Change from Current Total	-3%	+13%	+8%
Alternative 2			
Total Visitor Days	13,199	26,883	40,082
Visitor Days Outfitted	720	1,400	2,120
Percent of total	5%	5%	5%
Percent Change from Current Total	+3%	+13%	+10%
Alternative 3			
Total Visitor Days	12,799	26,883	39,682
Visitor Days Outfitted	320	1,400	1,720
Percent of total	3%	5%	4%
Percent Change from Current Total	-0.1%	+13%	+8%
Alternative 4			
Total Visitor Days	13,304	26,883	40,187
Visitor Days Outfitted	825	1,400	2,225
Percent of total	6%	5%	5%
Percent Change from Current Total	+3%	+13%	+10%

This same information is used in the following graphical display . The outfitter-guide days for pack and saddle stock, and hiking/backpacking are combined into “Outfitter Service Days”. The “Stock Users” and “Hikers” are not outfitted.

Figure 3.2-27. Cumulative Recreation Use in the Lake Chelan-Sawtooth by 2023, Outfitted and Non-Outfitted



Cumulative Effects on Wilderness Character

Alternatives 1, 2, 3, and 4

Wilderness character is a reflection of the four wilderness qualities discussed throughout this report. Beneficial impacts to one quality may be offset by adverse impacts to another in terms of evaluating overall character. Evaluating the scale and intensity of the impacts comparatively provides the necessary framework for drawing conclusion about the overall effects to the character.

The effects to wilderness character of any of the alternatives when considered cumulatively with all past, present, and reasonably foreseeable future actions, are virtually identical. Overall, the cumulative effects of any of the alternatives to wilderness character would be minor. The untrammeled, undeveloped, and natural qualities have been improving since the elimination of commercial livestock grazing, although are still being affected by wildfire suppression, and fish stocking. The opportunities for solitude or primitive and unconfined recreation would be slightly improved by trail maintenance and campsite restoration projects. On the other hand, the projected increase in overall recreation use in the coming years would have a minor adverse impact to this quality.

The cumulative effect of all past, present, and reasonably foreseeable future actions will be an improving trend in wilderness character.

<u>Untrammeled and Undeveloped Qualities</u>

There are no cumulative effects to the untrammeled and undeveloped qualities of the Pasayten or Lake Chelan-Sawtooth wilderness areas because there would be no direct or indirect effects from any of the alternatives. Some past, present, and reasonably foreseeable future actions are affecting these qualities. Fire suppression and fish stocking would continue to have a negative

impact on the untrammeled quality, but the elimination of commercial livestock grazing is having a major wilderness-wide, beneficial impact on the untrammeled quality as wilderness ecosystems are allowed to function without wide-scale impacts to plant communities and soil properties.

Natural Quality

The cumulative effect of the past, present, and reasonably foreseeable future actions, and any of the alternatives would be a continued improving trend in the natural quality of both the Pasayten and Lake Chelan-Sawtooth wilderness areas. The natural quality of both wilderness areas is continuing on the wide-spread, upward trend that began with the elimination of commercial livestock grazing and party-size controls that have limited the size of recreational stock herds. Grazing by outfitted and non-outfitted pack and saddle recreational livestock would not alter plant communities, or impact vegetation more that could recover within one year. Therefore, the cumulative effect would be a continuing upward trend in vegetative condition. The ongoing trail maintenance will minimize erosion on trails, protecting streambanks and water quality. The outfitter-guide activities in Alternatives 2, 3, or 4 would have localized impacts to the natural quality but the impacts would be minor because the dispersed, loose-grazing stock would not alter plant communities, and would only slightly increase impacts to sensitive or rare plant species. There would continue to be isolated spots of damage to stream banks, but not at a level that would degrade aquatic habitat or water quality.

Opportunities for Solitude or Primitive and Unconfined Recreation

The reasonably foreseeable future increases in non-outfitted recreation use, commercial backpacking/hiking outfitters, and Alternatives 2, 3, or 4 could potentially decrease the opportunities for solitude as popular destinations become more crowded. The cumulative effect of the elimination of pack and saddle stock outfitter-guides under Alternative 1 coupled with the potential increases in non-outfitted recreationists would be virtually no change in the current number of people in the Pasayten, and an 8% increase in the Lake Chelan-Sawtooth. The cumulative effect with Alternative 2 would be an 11% increase in the Pasayten, and a 10% increase in the Lake Chelan-Sawtooth; with Alternative 3, a 6% increase in the Pasayten and an 8% increase in the Lake Chelan-Sawtooth; with Alternative 4, there would be a 25% increase in the Pasayten and a 10% increase in the Lake Chelan-Sawtooth. Considering these small increases and the fact that the majority of people did not find the wilderness areas crowded (Burnes, et al., 2010), the cumulative effect of all actions and any of the alternatives would be a virtually unnoticeable decrease in opportunities for solitude resulting from increased encounters with other people.

Visitor behaviors in the past have left effects upon the landscape that persist and add to the effects of current use. Some areas still show impacts from over 50 years ago, even when current use is not adding to this effect. The outfitter-guide use in Alternatives 2, 3, and 4, in addition to non-outfitted use is a cumulative perpetuation of impacts at some existing sites. This effect is only present in a very small percentage of the landscape and only a small number of visitors are affected.

In the Pasayten, hikers, and pack and saddle stock users would continue to favor different locations. Pack and saddle stock users would be more common in the Spanish Camp/Remmel Lake area, and in the Sheep Mountain/Corral Lake area. The Pasayten Airport would still receive some stock use, but the limited amount of forage, lack of a destination lake would generally

result in light use. The Pasayten River drainage would also receive some stock use, especially at Whistler Camp and at the lakes along the Middle Fork Pasayten. Use here would be much lighter than in Spanish Camp/Remmel Lake, or Sheep Mountain/Corral Lake because forage is somewhat limited. Stock use at Hidden Lakes would be light due to lack of forage. Tatoosh Buttes has ample forage but stock use outside of hunting season would be limited because the trail is difficult, and water supply is limited.

In the Lake Chelan-Sawtooth, hikers and pack and saddle stock users would continue to use the popular destinations in the Lake Chelan-Sawtooth. Day hikes and horseback rides would continue, with the Twisp River Horse Camp providing a hub for non-outfitted pack and saddle stock activity in the Twisp River. The pack and saddle stock outfitters would continue to use the established camps, which would also be used by non-outfitted parties.

The outfitter-guides would be limited in the amount of barren core they could use based on the alternative (5,250 square feet in Alternative 2; 2,800 in Alternative 3) in campsites where the existing amount exceeds that level. In camps with less barren core, the outfitters would be prohibited from creating new barren core, exposing additional roots on trees, or creating new travel routes. In Alternative 4, the outfitters could use all existing barren core, but would be prohibited from creating additional barren core, exposing additional roots on trees, or creating new travel routes.

In the assigned sites (Bald, Beaver Creek, Crow Lake, Sheep Mountain and Whistler camp in Alternatives 2 and 4; Crow Lake, Sheep Mountain, and Whistler in Alternative 3, all in the Pasayten) this would result in slow recovery of excess barren core in Alternatives 2 or 3, or no increase in the amount of barren core. There would also be no increase in the number of trees with exposed roots or user created travel routes. Since these camps would be closed to the public, there would be no cumulative effect with non-outfitted use.

In all other campsites, the cumulative effect of the outfitted and non-outfitted use could be increasing barren core, more damaged trees, and new travel routes, depending on the use pattern of the non-outfitted users. This could result in minor to moderate, localized impacts to the opportunities for solitude if camp conditions degrade, detracting from the remoteness of the areas. Effects of the pack stock use to be permitted under this analysis, when added to past conditions and effects of present and reasonably foreseeable future actions are negligible at the wilderness scale.

Current commercial hiking/backpacking activities in the Pasayten and Lake Chelan-Sawtooth have the potential to cumulatively affect opportunities for solitude where the use overlaps with pack and saddle stock outfitter guides activities. The only areas where overlap occasionally occurs is at Hidden Lakes in the Pasayten and Oval Lakes in the Lake Chelan-Sawtooth, so the cumulative effect on opportunities for solitude are very similar to those described under the current condition. Encounter levels would not exceed Forest Plan standards and guidelines, and there may be times when pack and saddle stock and other outfitter-guides occupy camps in the same vicinity.

At the wilderness scale, the cumulative effects of all past, present, and reasonably foreseeable future actions are not likely to decrease the opportunities for solitude, although there may be site-specific locations where effects are more intense. Management actions such as campsite

restoration, along with education efforts to change visitor practices and improved outfitter-guide permit administration, have maintained an upward trend in wilderness character through the slow correction of past effects, and minimize potential for new effects. Actions in the 2000 Recreation Activity Review such as addressing the network of trails in concentrated use areas, monitoring campsites, improving special use permit administration, increasing leave-no-trace education efforts all support this trend.

Meeting the Need For Commercial Services

The cumulative effect of the present and reasonably foreseeable future commercial backpacking/hiking services and the pack and saddle stock outfitter-guide levels in Alternatives 2 and 4 would fall within the range of the minimum extent necessary to provide for wilderness recreation, as identified in the Needs Assessment (USDA, 2012). The need would be partially met, cumulatively with Alternative 3, and to a lesser degree with Alternative 1, since only hiking/backpacking outfitter-guide services would be available.

CONSISTENCY FINDINGS

Wilderness Act

All four alternatives would comply with the Wilderness Act. All alternatives would help manage pack and saddle stock outfitter-guide activities to protect the wilderness character by allowing only local, minor to moderate impacts to the opportunities for solitude or primitive and unconfined recreation and natural qualities. Impacts would be concentrated, and the vast majority of both the Pasayten and Lake Chelan-Sawtooth would be free from any impacts from outfitter-guide use to these qualities. In Alternatives 2 and 4, the amount of commercial services provided would fall within the range of the minimum extent necessary to provide for wilderness recreation, as identified in the Needs Assessment (USDA, 2012, and Appendix B). Alternative 3 would offer some commercial services, but less than the minimum extent necessary.

Forest Service Manual

All four alternatives would comply with Forest Service Manual 2300, and the Wilderness Management Model. There continues to be an upward trend in the condition natural quality, and in opportunities for solitude and primitive and unconfined recreation. This is moving the condition of the wilderness areas towards a higher level of wilderness character.

Forest Plan Standards and Guidelines

Conditions would still exist in the Pasayten and Lake Chelan-Sawtooth that do not comply with some of the standards and guidelines in the Forest plans but not as a result of authorizing pack and saddle stock operations. Implementation of Alternative 1 would eliminate pack and saddle stock outfitter-guides from wilderness, pack and saddle outfitter-guide activities would not have any effect on standards and guidelines. Alternatives 2, 3, and 4 would amend the Forest Plans, and pack and saddle stock outfitter-guide activities would be fully compliant with the amended plans. As with Alternative 1, conditions would still exist that do not comply with existing standards and guidelines as a result of past actions, but would not be a result of pack and saddle

stock outfitter-guide activities. In fact issuance of the pack and saddle stock outfitter-guide permits would help to restore areas that are currently not meeting the amended Forest Plan standards and guidelines.

Wenatchee Forest Plan

These standards and guidelines apply to the portion of the Lake Chelan-Sawtooth Wilderness on the Chelan Ranger District.

Wilderness Standards and Guidelines
Pristine (pages IV-69 to IV-71): Pack and saddle stock outfitter-guides are not allowed to operate within the Pristine WROS areas, so these standards and guidelines do not apply to their activities.

Some of the standards and guidelines are common to Primitive, Semi-Primitive, and Transition Wilderness Recreation Opportunity Spectrums (WROS). All the standards and guidelines from pages IV-71 to IV-76 are listed below. Ones unique to particular WROS are noted, otherwise the standard and guideline applies to all.

a. Physical-Biological Standards

(1) Vegetation

(a) Primitive: Area of vegetation loss, and compacted bare mineral soil at any campsite should not exceed 400 square feet. Semi-Primitive: Area of vegetation loss, and compacted bare mineral soil at any campsite, should not exceed 625 square feet. Transition: Area of vegetation loss, and compacted bare mineral soil at any campsite, should not exceed 1000 square feet. **These standards would be amended with any of the action alternatives, and outfitter-guide activities would comply with the amended standard. Mitigation measure 1.c and 1.d. require compliance with the amended standard.**

(b) Primitive: There should be no loss of trees at any site and fewer than four trees with exposed roots per impacted site. Semi-Primitive: There should be no loss of trees at any site and only six trees per site with roots exposed or which show signs of human use impact. Transition: There should be no loss of trees at any site and only ten trees per site with roots exposed or which show signs of human use impact. **Mitigation measure 1.e would ensure prohibit outfitters from exposing any additional roots on trees in established wilderness campsites. Mitigation measure 3.b prohibits outfitters from cutting or damaging any trees, including snags.**

(c) Primitive: No noticeable, long-term modification of natural plant succession as a result of livestock grazing or human activity. Semi-Primitive and Transition: There should be no long-term modification of plant succession and only short-term modification due to human activity or livestock grazing that can recover in one growing season. **The botany analysis of the alternatives found that none would have long-term modifications of natural plant succession. Refer to FEIS pages 269.**

(d) Dead trees or dead, woody debris may be utilized for campfires in amounts that can be replaced annually through natural accumulation. **Mitigation measures 3.a and 3.b address firewood; limiting campfires to areas with sufficient down wood and prohibiting cutting dead trees or snags.**

(2) Soils

(a) Displacement and erosion of soil resulting from human activity will be limited to a rate that approximates natural processes. **The soil analysis of the alternatives found that the outfitter-guide activities would comply with this standard. Refer to FEIS pages 168.**

(b) Primitive: Soil compaction should not exceed limits which will prevent natural plant establishment and growth except at well established campsites. Semi-Primitive and Transition: Soil compaction should not exceed limits which will prevent natural plant establishment and growth, except at desired campsites, and in designated trailheads. **The soil analysis of the alternatives found that the outfitter-guide activities would comply with this standard. Refer to FEIS page 3-168.**

(3) Water Quality

There should be no change in water quality except for temporary changes that return to normal when activity ceases. **The water resource analysis found compliance with this standard. Refer to FEIS pages 182.**

(4) Air Quality

Air Quality will not be degraded as a result of campfire smoke, or Forest Service Management activities outside of wilderness in Class I areas. **The air quality analysis found compliance with this standard. Refer to FEIS page 3-376.**

(5) Fish and Wildlife

(a) Visitor use may temporarily displace wildlife, but should not displace wildlife from critical habitat during critical periods**. The Biological Evaluation for aquatic and terrestrial species found the activity "may affect, but will not likely adversely affect" threatened and endangered species. In addition, mitigation measures 12 a-f direct specific outfitter-guide activities to ensure compliance with the standard.**

(b) Semi-Primitive and Transition: Riparian areas should appear to be unchanged by human or livestock use. **Mitigation measures 12 a through g would control outfitter-guide activities in riparian area, and ensure that campsites do not increase in size, and that additional trees are not damaged.**

(c) Semi-Primitive and Transition: Displacement of wildlife due to visitor use may be significant but should be of short duration to assure a natural ecosystem is maintained. Visitor use should not decrease habitat effectiveness for one species more than 20 percent. **Mitigation measure 11.a prohibits feeding, harassing, or disrupting wildlife, ensuring compliance with this standard.**

(6) Scenery

(a) Primitive and Semi-Primitive: Campsites will occasionally be visible from other campsites. Transition: Campsites will be visible at times from other campsites. **Mitigation measure 1.f prohibits outfitters from creating new campsites. The wilderness analysis found the existing condition complies with this standard (FEIS page 3-46) and the mitigation measure ensures outfitter-guide activities will not alter this compliance.**

(b) Primitive and Semi-Primitive: Human activity should remain subordinate in foreground viewing and not recognizable in middle-ground viewing. Transition:

Human activity should remain generally subordinate in foreground viewing and not recognizable in middle-ground viewing. **Mitigation measure 1.f prohibits outfitters from creating new campsites. The wilderness analysis found the existing condition complies with this standard (FEIS page 3-377) and the mitigation measure ensures outfitter-guide activities will not alter this compliance.**

(7) Livestock Allotments

This standard applies to commercial livestock permits, not outfitter-guide special use permits.

b. Social Standards

(1) Encounters

Primitive: There should be an 80 percent probability that not more than either seven parties or seven individuals traveling alone will be encountered per day during the primary use season. Semi-Primitive: There should be an 80 percent probability that not more than either ten parties or ten individuals traveling alone, will be encountered per day during the primary use season. Transition: There should be an 80 percent probability that no more than either 10-20 parties or 10-20 individuals traveling alone, will be encountered per day during the primary use season. Generally encounters should not exceed 10, however, in unique situations, encounters may reach 20 per day. **The encounter analysis showed that all alternatives would comply with this standard. Refer to FEIS pages 3-70, 3-74, and 3-78.**

(2) Party Size

The maximum party size shall not exceed 12 people and 18 animals in the Lake Chelan-Sawtooth Wilderness. **Mitigation measure 9.a specifies that the outfitters will adhere to the party size limitation, with provisions for oversized parties, following specifications on Forest Plan page E-4, item 1.f.**

(3) Campsites

Primitive: There shall be no more than one campsite visible or audible from any campsite, or closer than 500 feet in open country. Semi-Primitive: There shall be no more than two campsites visible or audible from any campsite, or closer than 500 feet in open county. Transition: There shall be no more than three campsites visible or audible from any one campsite, or closer than 500 feet in open country. **Mitigation measure 1.f prohibits outfitters from creating new campsites. The wilderness analysis found the existing condition complies with this standard (FEIS page 3-46) and the mitigation measure ensures outfitter-guide activities will not alter this compliance (3-60).**

(4) Livestock

Primitive: Grazing stock is permitted except in established camp areas. Repeated stock use in cross-country travel by a single route shall be discouraged. Semi-Primitive and Transition: Grazing of stock is permitted except in established camp areas. **Mitigation measures 8. a-g pertain to stock grazing and containment. Mitigation measure 6a requires outfitters to remain on existing trails, and prohibits new trail construction. This would prevent the establishment of new cross-country trails.**

(5) Pets

Primitive and Semi-Primitive: Pets must be under reliable voice control or physical restraint. Pets may be banned from this class for protection of wildlife or to avoid other resource impact. Transition: Pets must be under reliable voice control or physical restraint. Pets may be banned from this class for protection of wildlife or to avoid other biological or social impact. Visitors will be encouraged to leave pets at home in areas of higher visitor use. **Mitigation measure 11g requires outfitters to maintain control of dogs at all times, and not menace or annoy other visitors, stock or wildlife.**

c. Managerial Standards

(1) Regulations and Information

(a) Primitive: Posting of information and regulations regarding this class will be located at trailheads. Semi-Primitive: Posting of information and regulations regarding this class will generally be done at trailheads. Some regulatory signing may be posted at key locations such as lakeshores and campsites to help gain user compliance. Transition: Posting of information and regulations will generally be posted at trailheads but some regulatory signing may be necessary in key impact areas, or areas where there is potential for use conflicts. **These standards do not apply to outfitter-guides.**

(b) Primitive: Formal orders and permits may be required to achieve management objectives. Semi-Primitive and Transition: Formal orders and permits may commonly be used to achieve management objectives in this class. **These standards do not apply to outfitter-guides.**

(c) Ranger patrols and administrative contacts will occur. Personnel involved in project work or monitoring will be present. Management personnel should conform to party size limitations and social standards for this class (refer to Forest Plan for full text of standards and guidelines for Primitive, Semi-Primitive, and Transition). **This standard does not apply to outfitter-guides.**

(d) Primitive: Signs will be kept to the minimum to protect Wilderness resource. No signs will be provided to indicate destinations. **This standard does not apply to outfitter-guides.**

(e) Primitive: Visitor travel routes may be noticeable, but should appear as wildlife trails. **Mitigation measures 6.a & b limit outfitter-guide use to existing trails, prohibiting unauthorized construction or maintenance of trails.**

(2) Trails

Primitive: System trails are present in this class generally at low density. Some user developed trails may exist, but are not encouraged for use and rarely upgraded to system trails. If user-developed trails become well established, management action should be taken to rehabilitate damage and discontinue use. Reroutes of existing trails may be done to protect resources or to meet wilderness objectives. New trail construction in trailless drainages or to new destinations must be considered in the Forest planning process. Semi-Primitive and Transition: The managed trail system should be maintained or constructed toward more and most difficult trail standards. However, trails classified easiest may exist in areas of gentle terrain and valley bottoms. A variety of user

restrictions may be implemented to resolve negative resource impacts. **Outfitter-guides are not allowed to construct trails without authorization, so their activities will not impact trail density. Management of the trail system does not apply to outfitter-guides.**

(3) Resource Protection Facilities

Primitive: Facilities that are essential for resource protection and visitor safety are appropriate in this class. Only native or natural appearing construction materials will be used. There will be no facilities provided for user comfort or convenience. **There are no assigned sites in the portion of the Lake Chelan-Sawtooth Wilderness covered by this standard. Mitigation measure 1g prohibits construction of facilities at non-assigned sites.**

Semi-Primitive and Transition: Facilities will be as natural appearing as possible or will be constructed out of native material. No facilities will be constructed for user convenience or comfort. Facilities will be placed so as to concentrate heavy impact on areas previously impacted and on sites capable of withstanding high impacts. **There are no assigned sites in the portion of the Lake Chelan-Sawtooth Wilderness covered by this standard. Mitigation measure 1g prohibits construction of facilities at non-assigned sites.**

General Wilderness Management (Wenatchee Forest Plan pages IV-227 through IV-232)

Recreation

1. Visual Quality Objective; Preservation, except as authorized by the Wilderness Act. **Outfitter-guides are prohibited from creating new camps, increasing the amount of barren core in campsites, creating new trails, cutting down snags, or damaging trees, all of which could impact the visual quality.**
2. Management activities and work projects will be planned and implemented in accordance with Wilderness Management Standards and Guidelines, and criteria identified in Wilderness Recreation Opportunity Spectrum Classes. **This does not pertain to outfitter-guides.**
3. Forest-wide Standards and Guidelines for Cultural Resources apply. **The outfitter-guide activities would have no impact on cultural resources since there would be no ground disturbing activities. Refer to the Heritage Resources Section, 3.12.**
4. Recreation use related facilities, such as toilets or corrals, established to protect wilderness resources, will be constructed or reconstructed in accordance with Wilderness Recreaiton Opportunity Spectrum (WROS) Class Criteria. **There are no assigned sites in the portion of the Lake Chelan-Sawtooth Wilderness covered by this standard. Mitigation measure 1g prohibits construction of facilities at non-assigned sites.**
5. Facilities and campsites, where appropriate, will be managed to minimize social and biological resources impacts. **The resource and social impact analysis found that campsites used by the outfitters are having minor localized impacts. Refer to resource sections in Chapter 3.**
6. Management actions will be implemented to control or restrict visitor use when user impacts result in a change in biological or social resource conditions that approach limits of acceptable change. **This does not apply to outfitter-guide permitted activities.**

7. Wilderness Ranger contacts with recreation visitors for educational, instructive, and informative purposes will generally be made outside wilderness or in high visitor use areas. **This standard and guideline does not apply to outfitter-guides.**
8. Permits or authorization to providers of commercial recreation opportunities will be issued when appropriate to the goals of wilderness management and where compatible with the WROS class and existing visitor use of an area. **The analysis found the pack and saddle stock outfitter-guide activities are compatible with the WROS classes and would not exceed the wilderness capacity. Refer to Appendix B.**
9. Trail construction and reconstruction will occur to protect biological resource values and to meet wilderness management objectives. **Mitigation measure 6a prohibits outfitters from constructing new trails, so this standard does not apply to their activities.**
10. Trail reconstruction or construction specification will meet trail objectives and conform with specifications of the appropriate WROS class in which the trail is located. **Mitigation measure 6b limits trail maintenance performed by outfitter-guides to system trails, and requires compliance with trail standards, and Forest Service approval prior to work.**
11. The trail system will be maintained and operated as appropriate to trail objectives and the appropriate WROS class for the area accessed by the trial. **This does not apply to outfitter-guide activities.**

Wildlife and Fish
These standards and guidelines do not apply to outfitter-guide activities.

Range
These standards and guidelines do not apply to outfitter-guide activities.

Water
The standards and guidelines that pertain to outfitter-guide activities are the forest-wide standards and guidelines on page IV-94 and IV-95. **The Water analysis found the activities comply with the Clean Water Act (Washington Administrative Code, Chapters 173-201 and 202), and would follow the Best Management Practices (mitigation measures) to protect water quality.**

Soil
These standards do not apply to outfitter-guide activities.

Air
The air quality analysis found compliance with this standard. Refer to FEIS page 3-376.

Minerals and Geology
These standards do not apply to outfitter-guide activities.

Lands
These standards do not apply to outfitter-guide activities.

Additional standards and guidelines for General Wilderness are found in the Wenatchee Forest Plan on pages E-3 through E-23. Those not already address above, and those that apply to

outfitter-guide activities, and listed below. Standards and guidelines not listed do not apply to outfitter-guide activities.

1. If monitoring of on-site conditions indicates that wilderness resource values are being degraded or hanged to a point that limits of acceptable change are being closely approached, management action must be implemented to reverse the declining trends. **The Wilderness analysis found wilderness character is on a stable or improving trend, and that limits of acceptable change are not being approached. The exception is the size of the bare mineral soil area within camps, but the alternatives would comply with the forest plan amendment included in the alternative.**
2. Recreation visitors should not be permitted to cache or store equipment, personal property or supplies in wilderness. **Outfitter-guides must comply with CFR regulations, including prohibitions on caching.**
3. Deviation or waivers from party size limitation may be approved by District Rangers. **Mitigations measure 9a specifies that requests for oversized parties will be evaluated following direction in the Forest Plans.**
4. Care should be taken to avoid the introduction of non-native plant species into wilderness. To minimize the possibility of accidental introduction through saddle and pack animal feed, the use of hay and unprocessed grain will be prohibited. **Mitigation measures 14 a through e address invasive species. Measure 13b prohibits use of non-processed feed.**
5. The areas surrounding campsites should be closely monitored for the presence of a near natural component of dead, deteriorating, wood debris. Area lacking this component will be closed to campfires until natural accumulative recovers and excess wood is available. **Mitigation measure 3a specifies that campfires are allowed only where there is sufficient downed firewood.**
6. Horse and pack animal users should follow, at a minimum, the following practices:
   - avoid picketing or tying animal to feed in one location for a long period of time. Hobble animals or allow them to road free during feeding periods. **Mitigation measure 8a states that loose grazing is the preferred method.**
   - Do not graze, hitch, tether , or hobble any pack or saddle livestock with 200 feet slope distance of the shoreline of any lake. **Mitigation measure 8i prohibits this grazing within 200 feet of lakeshores.**
   - Tie stock on well-placed high lines during periods when not feeding. Feed animals in nose bags or feed bags to avoid littering a site. **Mitigation measure 8j requires these in campsites on the Chelan Ranger District portion of the Lake Chelan-Sawtooth Wilderness.**
7. Horse and pack animals users should generally be encouraged to pack in their basic feed supply for a trip, relying on available forage as a supplement. In heavily used areas and areas where forage is in short supply, the total feed needs of the animals should be packed in. **Mitigation measure 8g requires outfitters to pack in feed when forage conditions do not allow loose grazing.**
8. Human activity should not influence the natural quality of any waters within wilderness beyond temporary changes that return to normal when activity ceases. **The water analysis found that pack and saddle stock outfitter-guide activities would result in short term decreases in water quality, but that natural conditions would return when activities cease.**

9. Areas used by recreation visitors will be closely monitored for evidence of accelerated erosion. Water sources and water bodies near campsites should be observed for evidence of soap, other chemicals, and biological contaminants that may be introduced by human activity. **The Monitoring Plan includes specific monitoring activities for campsites in riparian areas, and for compliance with terms and conditions of special use permits.**
10. Outfitter-guide permits should be issued or continued when there is a demonstrated public need or demand, permitted use is compatible with general public use, and permitted use can occur in an area without exceeding the carrying capacity of an area. The number of permits issued and amount of use should be evaluated periodically to assure an appropriate balance is maintained between general public use and outfitted use. **These were addressed in the 2012 Needs Assessment, Appendix B.**
11. Outfitter-guide camps should be located away from other popular visitor campsites to reduce social resource impact. **The pack and saddle stock outfitter-guides would be restricted to using designated campsites on the Chelan Ranger District portion of the Lake Chelan-Sawtooth Wilderness. This would reduce social resource impacts.**
12. Outfitter-guide permittees should actively assist in the education of wilderness visitors, with the scope of their operations. **This was a criterion in evaluating the need for pack and saddle stock outfitter-guides in Wilderness. Refer to the 2012 Needs Assessment in Appendix B.**
13. Recreation visitors should be encouraged to protect visual and scenic quality by following a few basic principles.
    - Locate campsites away from and out of site of trails, lakeshores, other campsites, and other points of interest.
    - Tie or high line horses and pack animals out of sight of trails, lakeshores, campsites and other pints of interest.
    - Leave no trace or evidence of their visit.
    - Use equipment that is earth tones in color.

    Outfitter-guides are required to use existing campsites, and not increase the size of campsites. Mitigation measures 5 a and b require the outfitters to follow Leave-No-Trace techniques.
14. Facilities and structures built for protection or resource values should be located to the extent practical in areas where visual impact will be minimal. **Mitigation measure 1b specifies that new facilities should be constructed to minimize impacts to visual quality.**

Okanogan Forest Plan Wilderness Standards and Guidelines (MA15B)

These standards and guidelines apply to MA15B in the Pasayten Wilderness and to the portion of the Lake Chelan-Sawtooth Wilderness on the Methow Valley Ranger District. Pack and saddle stock outfitter-guides are not allowed to operate in MA15A, the trailless portion of wilderness.

<u>Planning</u>
MA15B-21A The visual quality objective is preservation. **All alternatives comply. Refer to FEIS page 3-286.**

MA15B-21B Primitive recreation opportunities shall be provided. The outfitter-guides provide primitive recreation opportunities. **All alternatives comply. Refer to FEIS page 1-18.**

MA15B-21C Use of nature and natural materials for facilities shall dominate. Use of dimensional and non-nature material should remain subtle to the wilderness user. **Outfitters are only allowed to construct facilities at assigned sites, and the facilities can only be for resource protection, not for comfort or convenience. Facilities must be constructed of native materials. Mitigation measure 1.b.**

MA15B-21D All human activities shall follow a non-degradation policy. **The Wilderness analysis disclosed the effects of the alternatives on the four components of wilderness character, and found none will degrade wilderness.**

MA15B-21E Use data gathering should emphasize voluntary registration system at trailheads or contacts at offices and trailheads rather than contacts within wilderness. **This standard does not apply to outfitter-guides.**

MA15B-21F Except for emergency orders, Forest orders pertaining to wilderness regulation shall be discussed with concerned publics prior to adoption. **This standard does not apply to outfitter-guides.**

<u>Facilities</u>
MA15B-21G Facilities for visitor use shall only be provided for protection of the wilderness resource and as a last resort, only after trying information and education, indirect management methods, or regulation use. **Outfitters are only allowed to construct facilities at assigned sites, and the facilities can only be for resource protection, not for comfort or convenience. Facilities must be constructed of native materials. Mitigation measure 1b.**

<u>Wilderness Standards and Guidelines: Use Administration</u>
MA15B-21H Minimum impact techniques shall be used. **Mitigation measures 5.a & b require outfitters to follow Leave-No-Trace principles.**

MA15B-21I The number and types of encounters between users should be controlled by limiting trailhead parking, maintaining or increasing the amount of difficult access, or by separating uses. **This does not apply to outfitter-guide activities.**

MA15B-21J Campsites should be located within forested areas on litter, where possible. Sites should be located to take advantage of topographic or vegetative screening. **The outfitters are required to use existing campsites, most of which have existing barren core devoid of litter. Mitigation measure 1.a requires all camp locations to be approved prior to use. Measures 1.c, d, and e specify the amount of barren core that can be used and prohibit increasing the amount of barren core. Measure 1.g prohibits outfitters from creating new campsites.**

MA15B-21K There should be an 80 percent probability of two or fewer campsites being visible or audible from any campsite. **The encounter analysis found all alternatives would comply with this standard and guideline. Refer to FEIS pages 3-44 and 3-60.**

MA15B-21L Campsites should be located at least 200 feet slope distance from meadows, lakes, streams, and key interest areas. Camping may be restricted or prohibited in certain areas to protect wilderness values. **Alternatives 2 and 4 would amend this standard to allow outfitters to use established campsites within these zones. Alternative 3 would allow outfitters to use established campsites within 200 feet of dry meadows but prohibit camping within 200 feet of wetlands, lakes, streams, and key interest areas.**

MA15B-21M Leaving or storing equipment, personal property, or supplies unattended for more than 48 hours shall be prohibited. Written exceptions may be granted by the District Ranger upon request. **Mitigation measure 4.a specifies that the outfitter-guides must comply with all rules and regulations, including 36 CFR 261.57f prohibiting caching. Mitigation measure 1.b allows equipment to be left at assigned camps during the operating season, but required removal at the end of each season.**

MA15B-21N Maximum party size shall be 12 people and 18 head of stock. Written exceptions may be granted when:

1) Application is made to the District Ranger,
2) Campsites and travel routes are capable of physically and socially absorbing such use.
3) Use will not occur during heavy use periods.
4) There will be no more than one oversized party at a time on a trail or popular use route or in a destination area.
5) The oversized group will not occupy most of a destination area.
6) Travel will be in groups not exceeding 12 people or 18 head of stock and separated in time on the same trail.
7) For commercial parties, all oversized groups shall be considered temporary use.

Mitigation measure 4.a specifies that the outfitter-guides must comply with all rules and regulations, including 36 CFR 261.58f prohibiting parties over 12 people and 18 head of stock. Mitigation measures 9 a-c specify the provisions for oversided parties.

MA15B-21O There should be at least an 80 percent probability of not more than seven encounters per day between groups while traveling on trails during all use periods. **Encounter analysis found all alternatives comply with this standard and guideline. Refer to FEIS pages 3-70, 3-74, and 3-78.**

MA15B-21P Pets may be restricted by CFR for the protection of wildlife or to decrease resource impacts. Working stock dogs may be exempt from restrictions**. Mitigation measure 11g requires outfitters to maintain control of dogs at all times to avoid menacing or annoying other visitors, stock or wildlife.**

MA15B-21R Only those camp structures and facilities necessary for the outfitter guide to properly meet their public service in a manner compatible with the wilderness environment shall be authorized. For commercial parties, all oversized groups shall be considered temporary. **Outfitters are only allowed to construct facilities at assigned sites, and the facilities can only be for resource protection, not for comfort or convenience. Facilities must be constructed of native materials. Mitigation measure 1.b.**

MA15B-21S Grazing, hitching, tethering, or hobbling recreation pack and saddle stock within 200 feet slope distance of the shoreline of any lake shall be prohibited. **Mitigation measure 4.a specifies that outfitters will comply with all rules and regulations, including 36 CFR 261.57 a and e: grazing any pack or saddle animals within 200 feet slope distance of any lake, and 36 CFR 261.58a; hitching, tethering, or hobbling any pack or saddle animals within 200 feet slope distance of any lake. This is repeated in mitigation measure 8i.**

MA15B-21T Possessing or transporting unprocessed hay or grain livestock feed shall be prohibited. Written exceptions may be granted by the District Ranger upon request for State or Federally approved weed-free feed. **Mitigation measure 4.a requires compliance with regulation 36 CFR 261.58t; possessing or transporting any livestock feed other than processed grain.**

MA15B-21U All camp structures and facilities shall be temporary in nature and shall be located away from main trails, streams, lakes, key interest features, and non-outfitted public use areas. **Outfitters are only allowed to construct facilities at assigned sites, and the facilities can only be for resource protection, not for comfort or convenience. Facilities must be constructed of native materials. Mitigation measure 1.b.**

MA15B-21V The number and location of reserved (base) camps shall be specified in individual special use authorizations, based on the availability of good camp- sites, the needs of the outfitter guide, and the needs of the non-outfitted public. The special use authorization shall describe allowable structures and facilities, maintenance requirements, and use periods for each reserved camp. **Assigned sites (reserved) are described in the alternative descriptions and evaluated in the Wilderness analysis. In addition, mitigation measure 1.b addresses facilities and excess barren core at these campsites.**

MAl5B-21W All structures and facilities at outfitter camps shall be dismantled at the end of the annual use season. Storage of dismantled structures and facilities may be allowed at locations specified in special use authorizations. **Outfitters are only allowed to construct facilities at assigned sites, and the facilities can only be for resource protection, not for comfort or convenience. Facilities must be constructed of native materials. Mitigation measure 1.b.**

MA15B-21X Spike camps may be authorized under special use authorizations, but shall be unreserved. **Mitigation measure 2.h specifies that non-assigned sites are available on a "first-come, first-served" basis.**

MA15B-21Y Management control necessary to protect the ecological and social elements throughout the area may be evident outside wilderness, particularly at trailheads and boundary portals. **This does not apply to outfitter-guide operations.**

MA15B-21Z Forest Service information services shall be designed to help meet management area objectives rather than to promote use. **This does not apply to outfitter-guide operations.**

MA15B-21AA Periodic to moderate presence of personnel engaged in monitoring or project work may be evident Project work should be scheduled during low use periods where practicable. **This does not apply to outfitter-guide operations.**

Trails

MA15B-21BB Trails shall be constructed, reconstructed, and maintained to the difficulty level appropriate to the target user group. Trails should generally be more difficult to most difficult. **This does not apply to outfitter-guide operations. Mitigation measures 6 a&b prohibit outfitters from constructing, placing or maintaining any trails without authorization.**

MA15B-21CC Trails or trail segments not necessary to meet area objectives shall be allowed to brush in or shall be returned to as near a natural condition as possible. **This does not apply to outfitter-guide operations.**

MA15B-21DD System trails shall not access all attraction features, such as lakes. When trail access is constructed to attraction features, only spur trails shall be constructed. **This does not apply to outfitter-guide operations.**

MA15B-21EE User created travel routes shall not be readily apparent or should appear to be wildlife trails. There shall be no maintenance of user created travel routes. Average user created travel route density shall be less than 0.8 miles per section. **Mitigation measures 6 a&b prohibit outfitters from constructing, placing or maintaining any trails without authorization. User created travel route densities will not change as a result of outfitter-guide activities.**

MA15B-21FF User created travel routes shall not be shown on Forest Service maps or trail guides. **This does not apply to outfitter-guide operations.**

MA158-21GG Bridges shall only be provided or replaced when: I) no other route or crossing is reasonably available, 2) the crossing, during the primary season of public use, cannot be negotiated afoot safely, or cannot be forded by horses safely, 3) unacceptable bank damage will occur from visitors seeking a crossing, or 4) flood waters frequently destroy or damage less sturdy structures. **This does not apply to outfitter-guide operations.**

MA15B-21HH A maximum of two directional signs with a maximum of two route locations per sign may be placed at trail junctions. Distances shall not be provided, except that existing signs meeting this direction may remain until replacement is needed. **This does not apply to outfitter-guide operations.**

Fish and Wildlife Standards and Guidelines

MA15B-6A Fish and wildlife indigenous to the wilderness shall be maintained with emphasis on Threatened and Endangered Species. **This does not apply to outfitter-guide operations.**

MA15B-3A In the Pasayten Wilderness, only the following lakes shall be aerially stocked:

Airview	Eagle	Halfmoon	Ramon
Buckskin	Fawn	Heather	Remmel
Cathedral, Lower	Ferguson	Hidden	Remmel, N.
Cathedral, Upper	Four Point	Hopkin	Sheep
Covial	Fox	Lease	Smith
Cougar	Freds	Peep Sight	Tungsten
Crow	Frosty	Ptarmigan	
Dead	Glory	Quartz	

This does not apply to outfitter-guide operations.

MA15B-3B Cleaning of debris that impedes the migratory movements of fish on primary spawning streams may be permitted. **This does not apply to outfitter-guide operations.**

MA15B-6B Visitor use shall not decrease habitat effectiveness for any species by more than 20 percent. **Mitigation measures 11 a-f restrict outfitter-guide operations to ensure compliance with this standard and guideline.**

MA15B-3C Only those barren waters where scientific and research values will not be eliminated shall be considered for stocking. **This does not apply to outfitter-guide operations.**

MA15B-6C Temporary exclosure structures may be used to determine the impact of wildlife on wilderness values. **This does not apply to outfitter-guide operations.**

MA15B-6D Visitor use shall not displace wildlife from critical areas during critical periods. **Mitigation measure 11.a prohibits outfitters from feeding, harassing, or disrupting wildlife.**

<u>Vegetation Standards and Guidelines</u>
MA15B-22A There should be no long-term modification of natural plant succession as a result of human activities on areas outside campsites, administrative sites, and designated trail tread. Acceptable modifications are those which can recover in one growing season. **The Botany analysis found that none of the alternatives would result in a long-term modification of natural plant succession.**

MA15B-22B Vegetation loss should not exceed 400 square feet (one percent of any acre) at any impacted site. **This standard and guideline would be amended in each alternative. Refer to alternative descriptions on FEIS pages 2-9, 2-12, and 2-15. Outfitter-guide activities would comply with amended standard.**

MA15B-22C There should be no loss of trees from recreation activities. **Mitigation measure 3.b prohibits cutting damaging any standing trees, including live trees and snags.**

MA15B-22D There should be fewer than four trees with exposed roots per impacted sites. **Mitigation measure 1.e prohibits outfitters from creating newly exposed roots at any campsite. Some existing campsites have more than four trees with exposed roots as a result of use prior to implementation of the Forest Plan.**

MA15B-22E Standing snags should be left, except where removal is necessary to protect major bridges and administrative facilities. Removal of snags during fire suppression efforts shall be determined on a case by case basis. **This has limited application to outfitter-guides, however mitigation measure 3.b prohibits outfitters from cutting snags.**

MA15B-22F Vegetative impacts along trails shall be confined to the planned location and to meet individual trail objectives. **This does not apply to outfitter-guide operations.**

MA15B-22G Firewood gathering may be permitted for use on site and shall be limited to dead and down material. Firewood gathering shall be restricted where necessary. Use of small fires and self-contained stoves shall be encouraged. **Mitigation measures 3.a-c regulate outfitter-guide collection, use, and storage of firewood. Mitigation measure 5.a requires outfitters to follow leave-no-trace practices, which address campfires and stoves.**

Range Standards and Guidelines: Planning
MA15B-11A Domestic livestock grazing allotments shall be limited to those allotments under permit at the time of the establishment of the wilderness. **This does not apply to outfitter-guide operations.**

MA15B-11B The forage resource shall be utilized in conformance with all wilderness resource values. **The Range analysis found that outfitter-guide pack stock grazing complies with this standard. Refer to FEIS page 356.**

MA15B-11C AMPs shall document the need for use of motorized vehicles, motorized equipment, or other forms of mechanical transport based on the rule of practical necessity and reasonableness. **This does not apply to outfitter-guide operations.**

Range Standards and Guidelines: Improvements
MA15B-11D New structural and non-structural improvements necessary to protect the range and/or wilderness resource, rather than to increase the number of livestock, may be constructed. **This does not apply to outfitter-guide operations.**

MA15B-11E New or existing improvements shall be of materials which harmonize with the wilderness character of the areas long as the use of such materials does not greatly increase costs to permitees. **This does not apply to outfitter-guide operations.**

MA15B-11F Existing, necessary range improvements may be maintained. Those determined unnecessary shall be phased out. **This does not apply to outfitter-guide operations.**

Noxious Weeds Standards and Guidelines
MA15B-12A Noxious weeds may be controlled when they threaten lands outside wilderness or when they are spreading within wilderness, provided control is possible without causing serious adverse impacts to wilderness values. **Mitigation measures 13.a-e prevent the establishment and spread of noxious weeds as a result of outfitter-guide activities.**

Soil and Water Standards and Guidelines
MA15B-13A Displacement and erosion of soil resulting from human activity shall be limited to a rate that closely approximates the natural process. **The Soil analysis found compliance with this standard and guideline. Refer to FEIS page 3-168.**

MA15B-13B Soil compaction from human activities should not prevent natural plant establishment and growth except at some campsites, administrative facilities, and in designated tread. **The Soil analysis found compliance with this standard and guideline. Refer to FEIS page 3-168.**

MA15B-13C Human activities should not degrade water quality except for temporary changes where water quality returns to its normal level when the activity ceases. **The Water Resources analysis found compliance with this standard. Refer to FEIS page 3-182.**

MA15B-13D The existing level of Big Hidden Lakes shall be retained by maintaining the upper diversion ditch and middle diversion dam, using primitive hand methods. No repairs shall be made on the lower dam. **This does not apply to outfitter guides.**

Minerals Standards and Guidelines

MA15B-15A Access to existing valid claims and/or leases shall be by methods which create the least lasting impact on the wilderness resource, while still meeting the needs of the claimant and staying within applicable laws and regulations. **This does not apply to outfitter guides.**

Lands Standards and Guidelines

MA15B-16A The USDI, Geological Survey stream gauging station at Andrews Creek shall be removed. **This does not apply to outfitter guides.**

Facilities Standards and Guidelines

MA15B-18A The War Creek Administrative Site shall not be retained for administrative purposes. Management of the War Creek Site shall be determined following a cultural resource evaluation. **This does not apply to outfitter guides.**

MA158-18B The Spanish Camp, Stub Creek, Big Home, and Pasayten Airport Administrative Sites shall be retained for administrative purposes. Site plans shall be developed and only necessary structures shall be retained. **This does not apply to outfitter guides.**

MA15B-18C The Pasayten Airstrip shall remain closed to aircraft use The Federal Aviation Association shall be encouraged to remove the airstrip from aircraft charts. The airstrip shall be allowed to revegetate naturally. **This does not apply to outfitter guides.**

MA15B-18D Monument 83 and Slate Peak Lookouts should be retained. Additional lookouts shall not be constructed. **This does not apply to outfitter guides.**

MA15B-18E Permanent communication facilities should be retained at Monument 83. Additional permanent communication facilities shall not be installed. **This does not apply to outfitter guides.**

MA15B-18F Existing inventoried helispots shall not be improved or maintained and shall be allowed to revegetate naturally. **This does not apply to outfitter guides.**

MA15B-18G Remote automated weather stations shall not be installed. **This does not apply to outfitter guides.**

Protection Standards and Guidelines: Fire and Fuels

MA15B-19A The preferred suppression strategy for lightning caused wildfires is confinement The Appropriate Suppression Response Implementation Plan shall be used to confirm that confinement is a viable option. A contain or control strategy should be used if wildfires: 1) threaten significant cultural resources or capital investments, 2) have the potential to cross the

U S/Canadian border, 3) threaten Management Areas with more restrictive fire management direction, or4) will result in unacceptable off site impacts. **This does not apply to outfitter guides.**

MA15B-19B When containment or control action is the selected fire management strategy, wilderness suppression guidelines shall be applied. **This does not apply to outfitter guides.**

MA15B-19C Planned ignition shall not be used to initiate prescribed fire in wilder- ness areas. **This does not apply to outfitter guides.**

MA15B-19D Prescribed fire ignited by lightning may be used to meet wilderness fire management objectives of: 1) reducing the risks and consequences of wild- fire within the wilderness or escaping from the wilderness, and 2) permitting lightning caused fires to play, as nearly as possible, their natural ecological role within wilderness. **This does not apply to outfitter guides.**

MA15B-19E A prescribed fire plan shall be approved prior to the use of prescribed fire in the wilderness. Decisions to declare any lightning fire in the Pasayten Wilderness a prescribed natural fire will follow the direction in the Pasayten Wilderness Prescribed Natural Fire Plan. A prescribed fire plan shall be approved prior to the use of prescribed fire in the Lake Chelan-Sawtooth Wilderness. **This does not apply to outfitter guides.**

Protection Standards and Guidelines: Insect and Disease
MA15B-19F Insect or disease outbreaks shall not be artificially controlled unless it is necessary to prevent unacceptable resource damage to resources on adjacent lands or an unnatural loss to the wilderness resource. If control becomes necessary, it shall be carried out by measures that have the least adverse impact on the wilderness resource and are compatible with wilderness Objectives. **This does not apply to outfitter guides.**

3.3 RECREATION

The section below is a summary of the Recreation Report which is available in the project analysis file (Zbyszewski, 2012c).

REGULATORY FRAMEWORK

Wilderness regulations and analysis are discussed in section 3.2 of this chapter. For areas outside of wilderness, both the Okanogan and Wenatchee Forest Plans (USDA Forest Service 1989b and 1990) contain other recreation goals and standards and guidelines. A general goal is to encourage, establish, and sustain a diverse and balanced spectrum of quality recreation opportunities, services, and facilities. Forest-wide standards and guidelines in the Okanogan Forest Plan specifically applying to outfitter-guides are:

- 8-10 Annual review of recreation special use authorizations shall emphasize health, safety, and resource protection (page 4-38).

- 8-11 Recreation special use authorizations shall conform with the goals of the Management Area (page 4-39).

- 8-12 Give priority to authorizations needed to provide public service.

The Wenatchee Forest Plan has no forest-wide standards and guidelines specific to outfitter-guides, but does give specific direction for outfitter-guides in wilderness. These are included in the Wilderness section of Chapter 3

The Northwest Forest Plan and PACFISH, which amended both the Okanogan and Wenatchee Forest Plans, include standards and guidelines addressing outfitter-guide activities. The standards and guidelines for riparian reserves and riparian conservation areas are discussed in the Aquatics section. Those for late successional reserves are discussed in the Terrestrial Wildlife section, and those for survey and manage species in Aquatics, Terrestrial Wildlife, and Botany.

Specific regulatory frameworks by management area are discussed below by the five recreation subsections below.

ANALYSIS METHODS AND DATA SOURCES

The analysis area is divided into seven sub-sections:
- Pasayten Wilderness
- Lake Chelan-Sawtooth Wilderness
- North Cascades
- Sawtooth Backcountry
- Bear/Ramsey/Volstead
- Middle Methow and
- Alta Lake

The Pasayten and Lake Chelan-Sawtooth Wilderness Areas are analyzed in the wilderness section of this FEIS; this section focuses on the other portions of the analysis area.

This section analyzes and discloses the effects pack and saddle stock activities have on recreation opportunities in each sub-section. Since the outfitter-guides are only a portion of overall recreation use (3% off all use and 15% of pack and saddle stock use), the environmental effects of all recreation use, and how those effects change with the alternatives, are included in the cumulative effects section.

Pack and Stock Outfitter-Guide Activities
Pack and saddle stock outfitter-guide activities are constantly monitored as part of the special use permit administration process (see outfitter-guide monitoring information in the analysis file). This process generates information about compliance with permit terms and conditions, camp conditions, use patterns, grazing practices, and other permit and resource information. This information was used to evaluate effects on recreation, and for compliance with Forest Plan standards and guidelines.

Total Recreation Use Levels
Visitor days used for this analysis were obtained from the National Visitor Use Monitoring Results for Okanogan National Forest, (USDA Forest Service 2001d) for the North Cascades, Upper Methow, Middle Methow, and Alta Lake. The visitor day estimates for the Sawtooth Backcountry are based on trailhead registration and visitor counts. This area was not adequately sampled in the National Visitor Use Monitoring Program in 2000, so the use estimates were substantially lower than field observations. Refer to the registration and observation in the analysis file.

All these areas were sampled again in the 2005 and 2010 National Visitor Use Monitoring Program. These data was not disaggregated to give use estimates for the specific sub-sections in this analysis, so the 2000 data were used.

Service Days
Use data has been compiled using the most accurate data available. The number of service days in the existing pack and saddle stock outfitter-guide permits plus the number of days in the priority use pool are used as the current service days. The number of service days actually used varies from year to year. Reliable records are available for the past 10 to 20 years. Some data gaps and margins of error exist due to data interpretations. Reports of use provided by the outfitters occasionally recorded vague or unknown destination locations. The data is the best information available, and has a level of accuracy that is more than adequate for this analysis. More detailed use data, or data that goes back farther in time, is not essential and is not critical to the analysis of recreation attributes. Any improvements to recreation that may be unknown as a result of not having more precise data, or data that goes farther back in time, are not likely to affect the decision making process. Current conditions and future uses are the most relevant factors to consider.

Comparisons of Outfitted and Non-outfitted Use
The number of service days in the existing pack and saddle stock outfitter-guide permits plus the number of days in the priority use pool and the total recreation use information from the 2000 NVUM survey (USDA, 2001d) were used to calculate the comparisons of outfitted to non-outfitted use. The number of service days varies from year to year, as does the total number of recreationists (outfitter and non-outfitted), so these percentages are merely estimates, and do not represent an exact reflection of the relationship between outfitted and non-outfitted use in any given year. This is the best available data, however, since the Forest Service calculates overall use numbers once every five years. More accurate percentage calculations are not essential or critical to the analysis of recreation attributes. Any impacts to recreation that may be unknown as a result of not having more precise data are not likely to affect the decision making process because they would be localized and minor in context of impacts from overall use. Current conditions and future uses are the most relevant factors to consider.

Future Estimates of Recreation Use Levels
The number of visitor days expected in the future was calculated using projected changes included in the Washington State Comprehensive Outdoor Recreation Planning (SCORP) publication "*Estimates of Future Participation in Outdoor Recreation in Washington State*" (Interagency Committee for Outdoor Recreation 2003). These projected changes were for the 10-year period between 2004 and 2014. These same figures were applied to the current visitor days to generate the anticipated number in 2023.

Best Available Science
The best available science was used for this analysis, including the methodology and data sources described above, to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on resources and people.

NORTH CASCADES

Regulatory Framework

This area includes Management Areas 4, 5, 7, 10, 17, and 25, in addition to Late Successional Reserves, Administratively Withdrawn, and Riparian Reserves, from the Okanogan Forest Plan, as amended by the Northwest Forest Plan.

The goal for Management Area 4 is to: [p]rovide semi-primitive non-motorized recreation opportunities during summer and fall seasons (4-61).

The goal for MA 5 is to: [p]rovide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective of retention or partial retention (4-65).

The goal for MA 7 is to: [p]reserve the high quality scenic setting within the North Cascades Scenic Highway, while providing recreational opportunities (4- 70).

The goal for MA 10 is to: [o]ptimize habitat condition and perpetuate a healthy mountain goat population (4-76).

The goal for MA 17 is to: [p]rovide a variety of developed recreation opportunities in a roaded setting (4-98).

The goal for MA 25 is to: [i]ntensively manage the timber and range resources using both even-aged and uneven-aged silvicultural practices (4-103).

Management Area specific standards and guidelines that apply to outfitter guides are:

- MA4-8E The numbers and types of encounters between users shall be controlled.
- MA7-8F Easy Pass, Rainy Lake, Lake Ann, Blue Lake, and Washington Pass Trails shall be closed to horse use.
- MA7-11A Recreation livestock grazing shall be permitted except for the meadows at Rainy Lake turnoff and Whistler Basin.

There are no specific standards and guidelines pertaining to outfitter-guides in management areas 5, 10, 17, or 25.

Affected Environment

The North Cascades portion of the analysis area includes the area adjacent to the Pasayten Wilderness to the south and west, and to the north of the Lake Chelan-Sawtooth Wilderness. It includes the North Cascades Scenic Highway Corridor and the Harts Pass area, in addition to others. There are about 72,500 visitor days in this area each year; 45% are hiking, 35% are driving for pleasure, 5% are riding mountain bikes, and 15% are using pack animals.

Historic Activities

The following past actions have effects that are continuing, and overlapping effects from the pack and saddle stock outfitter-guides.

State Route 20
The highway was completed in the early 1970s. Construction of the highway facilitated development of recreation in this area, including the use by outfitter-guides permitted here. Several recreation sites were constructed shortly after highway completion: six trailheads (Canyon Creek, East Creek, Easy Pass, Rainy Pass, Bridge Creek, and Cutthroat Lake); two campgrounds (Klipchuck and Lone Fir); the Rainy Pass picnic area; and Washington Pass Overlook. Each trailhead has an outhouse, parking area, and bulletin boards. Trails were also constructed from these trailheads, or, in some cases, the trailheads tied into existing trails. The campgrounds have restrooms, water systems, and campsites with picnic tables and fire grates.

The Washington State Department of Transportation (WSDOT) has maintained the highway since it was completed. Maintenance activities have included plowing snow, cleaning ditches, maintaining culverts, removing hazard trees, maintaining the road surface, and other ongoing highway maintenance activities.

Trails and Trail maintenance
The trails in this area were established by people traveling to popular destinations, such as lakes, miners accessing claims, and cattle and sheep grazers and their livestock. The Pacific Crest Trail was designated in 1968, and quickly became a popular route. The trails in the area have been maintained for decades, and have created this popular recreation area.

Mining
The area, particularly the Harts Pass portion, has a rich history of mining. In the early 1900s, gold was discovered in the Slate Creek area, and the towns of Barron and Chancellor were established. The gold rush faded within a few years, and the towns were abandoned. Mining activity continued, with relatively large exploration and mining activity occurring in the Indiana and Allen Basins, and at the Azurite Mine. Small mining operations on placer mines, and surface claims also continued. These activities kept roads and trails open that are still used by hikers, mountain bike riders, and pack and saddle stock users.

Timber harvest/road construction
Timber harvest and associated road construction has occurred in the Goat Creek area since the mid-1900s. The roads provided access for people looking for opportunities to drive, collect firewood, mountain bike, and other road-related recreation activities.

Grazing
Sheep and cattle were grazed in livestock grazing allotments starting in the early 1900s. The allotments included Harts Pass Sheep Allotment, Goat Cattle Allotment, and Boulder Allotment. The Harts Pass allotment was waived back to the Forest Service in 2000, but the other allotments are still active. There are residual and continuing effects to vegetation from grazing scattered through the sub-unit, but only area where these effects overlap with current pack and saddle stock outfitter guide activities is near the Harts Pass Trailhead.

Current Conditions

Recreation in the North Cascades Area
The North Cascades area can be divided into six major recreation areas. **Map 3.3-1** shows the location of these areas.

- North Cascades Scenic Highway
  The North Cascades Scenic Highway (State Highway 20) passes through the Methow Valley Ranger District for about 40 miles. It is a major travel route between the Methow Valley and northern portion of the greater Seattle area during the late spring, summer and early fall. The Scenic Corridor includes the slopes on either side of the highway, bounded by the upper-most ridges as seen from the highway, and includes 89,545 acres. The highway is not plowed in the winter, and is typically open to wheeled vehicles from April 30 to December 1. The Department of Transportation stops plowing the North Cascades Scenic Highway around the first of December, and usually reopens the highway in time for the opening day of fishing season at the end of April. Dates vary from year to year depending on the weather and snowpack.

  Trails and trailheads along the highway corridor are crowded, especially on weekends and holidays from the time the snow melts in early June to early July, until late fall. Encounters between groups on trails are frequent. The existing amount of parking at trailheads is usually adequate to meet the demand, although it is not uncommon for some parking lots to fill to capacity at times. The Blue Lake trailhead is often full on weekends and holidays, with parking overflowing onto the shoulders of the highway. The Cutthroat Creek trailhead is also full from time-to-time, but the long access road between the highway and the trailhead (approximately one mile) allows people to park along the access road, and avoid parking on the highway shoulders. The other trailhead parking areas are large enough to accommodate current use.

- Cedar Creek/Early Winters
  Cedar Creek/Early Winters is situated west of Highway 20 and east of the highway corridor. The Cedar Creek Trail, and trails and roads around the Early Winters Campground and the nearby Freestone Inn receive the most use. A current outfitter-guide offers day rides in this sub-area that begin and end on private land, but travel onto National Forest System land for a portion of the ride.

- West Fork Methow
  The West Fork Methow area is north of the scenic corridor. The West Fork Methow trail is popular for hikers, mountain bikers, and horseback riders. The trail intersects with the Pacific Crest Trail about nine miles from the trailhead.

- Harts Pass
  Harts Pass is one of the most popular and frequently visited areas on the Methow Valley Ranger District. Over half of the people who visit Harts Pass are driving for pleasure. Hiking is also a popular activity. There are two trailheads that access the Pacific Crest Trail, and a trail to the Slate Peak Lookout. The trailheads in are frequently filled beyond capacity on weekend days in July and August, resulting in parking overflowing onto the road.

- Goat Creek
  Goat Creek is located northeast of the Methow River. The most popular recreation destination is the Goat Peak Lookout, which is located at the end of a 2 ½ trail. There are no other trails or trailheads in the area.

- Chewuch
  A small sliver of land in the Chewuch watershed, adjacent to wilderness is included in this area. Several trailheads are located in this section, but use associated with these is within the Pasayten. Effects of the alternatives are evaluated and included in the wilderness section of this analysis.

Pack and Saddle Stock Outfitter-Guide Activities

Pack and saddle stock outfitter-guides have used the North Cascades area regularly, with 733 service days. Of these, approximately 168 are overnight pack trips, and 605 are day rides that originate from an outfitter's property.

Figure 3.3-1. Current Number of Visitor Days by User Group in North Cascades and Number of Pack and Saddle Stock Outfitter-Guide Service days.

User Group	Total Visitor days	Outfitter-guide service days	% of Total Visitor Days
Hikers	54,465	0	0%
Driving For Pleasure*	10,675	0	0
Pack and Saddle Stock Overnight Use		*168*	
Saddle Stock Day Rides		*605*	
Total Pack and Saddle Stock Use	5,415	773	14%
Mountain Bikers	1,945	0	0%
Total	72,500	773	1%

*This figure does not include those driving across the North Cascades Scenic Highway without stopping at a trailhead.

Outfitter Camps including Base Camps

Appendix A includes a list of campsites used by pack and saddle stock outfitter guides in this area, and a map showing their locations. Outfitters may use other camps but tend to return to the same sites. Outfitter-guides currently operate two base camps in the North Cascades, one near the Andrews Creek trailhead and one near the Billygoat trailhead. Both camps have corrals, unloading ramps, hitch rails, and watering troughs. Though used throughout the season, camps are primarily used during the high hunt to house stock being used to service drop camps, or as a staging area for multiple groups heading into the Pasayten Wilderness.

Environmental Consequences

Direct and Indirect Effects

The following figure shows the number of visitor days and pack and saddle stock outfitter-guide days by alternative in the North Cascades Sub-Area. Overall use days, even though they are not part of the pack and saddle outfitter-guide effects, are shown to provide context.

Figure 3.3-2. Number of Visitor Days in the North Cascade by Alternative.

Current or Alternative	Pack and Saddle Stock Users	Hikers	Driving For Pleasure	Mountain Biker Riders	Total
Current					
Total Visitor Days	5,415	54,465	10,675	1,945	72,500
Pack and Saddle Stock OG Service Days	773 (168 overnight 605 day rides)	0	0	0	773
Percent of total	14%	0%	0%	0%	1%
Alternative 1					
Total Visitor Days	4,642	54,465	10,675	1,945	71,727
Pack and Saddle Stock OG Service Days	0	0	0	0	0
Percent of total	0%	0%	0%	0%	0%
Percent Change From Current Total	-14%	0%	0%	0%	-1%
Percent Change From Current Service Days	-100%				
Alternative 2					
Total Visitor Days	5,292	54,465	10,675	1,945	72,377
Pack and Saddle Stock OG Service Days	650 (200 overnight 450 day rides)	0	0	0	650
Percent of total	12%	0%	0%	0%	1%
Percent Change From Current Total	-2%	0%	0%	0%	+0.2%
Percent Change From Current Service Days	-16%				
Alternative 3					
Total Visitor Days	5,182	54,465	10,675	1,945	72,267
Pack and Saddle Stock OG Service Days	540 (180 overnight 360 day rides)	0	0	0	540
Percent of total	10%	0%	0%	0%	1%
Percent Change From Current Total	-4%	0%	0%	0%	-0.3%
Percent Change from Current Service Days	-30%				
Alternative 4					
Total Visitor Days	5,992	54,465	10,675	1,945	73,077
Pack and Saddle Stock OG Service Days	1,350 (200 overnight 1,150 day rides)	0	0	0	1,350
Percent of total	19%	0%	0%	0%	2%
Percent Change From Current Total	+11%	0%	0%	0%	+1%
Percent Change From Current Service Days	+75%				

Alternatives 1, 2, 3, and 4

There would be virtually no effect on non-outfitted recreationists, or any noticeable difference in the effects of any of the alternatives on recreation. Approximately 66 to 85% of all the pack and saddle stock outfitter-guide service days in this sub-section would be for day rides that begin and end on private land, and occur on trails seldom used by the non-outfitted public. The slight changes in overall use or pack and saddle stock use aside from the day rides associated with each alternative would likely go unnoticed by non-outfitted recreationists since the changes in use would range from minus 1% to plus 1%. Trails and trailheads would still be crowded, especially on weekends and holidays from the time the snow melts in early June to early July, until fall. Parking capacity at the trailheads would continue to meet the demand, except for occasional days, or time periods. The likelihood that not enough parking would be available to meet demand would be greatest in the Harts Pass area.

Outfitted stock would be prohibited on the Easy Pass, Rainy Lake, Lake Ann, Blue Lake, and Washington Pass trails, eliminating conflict with non-stock users (mitigation measure 6.c).

Outfitted stock would be prohibited from grazing in the meadows by the Rainy Lake turnoff and in Whistler basin, eliminating impacts to vegetation in these meadows (mitigation measure 8h).

Cumulative Effects

The geographic boundary for cumulative effects is the sub-unit boundary, with effects considered up to 2023, the length of time of the proposed permits and recreation effects from the permits under this analysis would cease. Past actions with effects still overlapping pack and saddle stock outfitter-guide use are discussed under Current Conditions. All present, and reasonably foreseeable future actions listed at the beginning of this chapter were considered in this cumulative effects analysis. Those that overlap pack and saddle stock outfitter-guide effects are discussed below.

<u>Present Actions</u>

Road Maintenance

WSDOT maintenance activities include plowing snow, cleaning ditches, maintaining culverts, removing hazard trees, maintaining the road surface, and other highway maintenance duties. The highway maintenance allows the continued use of the area by recreationists, including the outfitter-guides permitted under this analysis, usually from late April until early December.

Trail and Trailhead Maintenance

The Forest Service maintains about 66 miles of trail within the scenic corridor. The trailheads for these trails are also maintained in snow-free months. These trails provide access to some of the most spectacular scenery in Washington State. The trails also concentrate human use, leaving most of the corridor unaltered by human activities.

Campground Maintenance

The Lone Fir, Klipchuck, and Early Winters campgrounds are operated and maintained in snow-free months. The campgrounds have 86 campsites, providing camping for approximately 430 people. These campgrounds help support the corridor as a destination.

Outfitter-Guides
There are currently ten additional outfitter-guide special use permit holders operating in the sub-unit in the summer season. Over the past 5 years, there has been an average of 450 service days from these outfitter-guides, for a cumulative total of 1,223 service days when added to the outfitter-guide permits being analyzed in this document. This represents approximately 2% of the overall visitor days in this sub-unit. Refer to Figure 3.0-1 on pages 3-4 through 3-6 for specific information.

Non-outfitted Recreation Use
About 71,727 visitor days occur in this area each year, independent of the pack and saddle stock outfitter-guides, not including visitors who do not stop on their way along the highway. Non-outfitted recreational activities included driving for pleasure, hiking, and mountain biking.

Mining
Small mining operations on placer mines and surface claims continue to exist, but have very little effect on recreation activities.

Grazing
The Goat and Boulder Allotments are still active, but there are few trails or established campsites within the allotments, so there are no cumulative effects to recreation opportunities.

Reasonably Foreseeable Future Actions

Road Maintenance
WSDOT will continue to maintain the highway, including plowing snow, cleaning ditches, maintaining culverts, removing hazard trees, maintaining the road surface, and other ongoing highway maintenance duties. This will continue to provide access to recreationists, including the outfitter-guides that would be permitted through this analysis.

Trail and Trailhead Maintenance
The Forest Service will continue to maintain approximately 75 miles of trail within the highway sub-unit. The trails concentrate human use, leaving most of the area unaltered by human activities.

Campground Maintenance
The Lone Fir, Klipchuck, Early Winters, Harts Pass, and Meadows campgrounds will be operated and maintained in snow-free months, providing camping for 525 people at one time.

Outfitter Guides
Existing non-pack and saddle stock outfitter-guides are likely to continue to operate in the future, providing hiking, rock climbing, backcountry skills, and other recreational opportunities.

Non-outfitted Recreation Use
The number of people recreating in the scenic corridor is expected to increase approximately 100% over the next 10 years, based on the rapid increase between 1992 and 2004. The use in the rest of the sub-area is expected to increase at the rate projected in the report by the Interagency Committee on Outdoor Recreation (Interagency Committee for Outdoor Recreation, 2003). The following table displays the approximate number of people expected to be

recreating in the sub-unit in 2023, when the outfitter-guide permits being analyzed in this analysis would expire.

Figure 3.3-3. Number of Non-Pack and Saddle Stock Outfitted Visitor Days in the North Cascades Currently and Anticipated in 2023

User Group	Approximate Current Number of Visitor Days	% Increase by 2022	Estimated Number of – Visitor Days in 2023
Hikers in Scenic Corridor*	41,925	+100%	83,850
Hikers in Remainder of North Cascades*	12,540	+13%	14,170
People w/Pack Animals	4,642	+3%	4,781
Driving for Pleasure	10,675	+10%	11,743
Mountain Bike Riders	1,945	+10%	2,140
Total	**72,500**		**116,684**

Alternatives 1, 2, and 3

None of the alternatives would have a noticeable or measurable effect on recreation in the North Cascades, since the anticipated change in the overall number of people recreating in there would be so small (1%). Therefore, there would be no cumulative effect on recreation with implementation of Alternative 1, 2, 3, or 4, when considering the past, present, and reasonably foreseeable future actions.

Figure 3.3-4. Cumulative Effect on Visitor Days in the North Cascades Sub-Area with Each Alternative, Compared to Current, Projected to 2023 for all Recreation Uses

Current or Alternative	Pack and Saddle Stock Users	Hikers	Driving for Pleasure	Mountain Bike Riders	Total
Current					
Total Visitor Days	5,415	54,465	10,675	1,945	72,500
Visitor Days Outfitted	773	450	0	0	1,223
Percent of total	11%	0.1%	0%	0%	9%
Alternative 1					
Total Visitor Days	4,781	98,020	11,743	2,140	116,684
Visitor Days Outfitted	0	450	0	0	450
Percent of total	0%	0.5%	0%	0%	0.4%
Percent Change from Current	-11%	+80%	10%	10%	+61%
Alternative 2					
Total Visitor Days	5,431 *(4,781+650=5,431)*	98,020	11,743	2,140	117,334
Visitor Days Outfitted	650	450	0	0	1,100
Percent of total	12%	0.5%	0%	0%	1%
Percent Change from Current	+0.1%	+80%	10%	10%	+62%
Alternative 3					
Total Visitor Days	5,321 *(4,781+540=5,321)*	98,020	11,743	2,140	117,224
Visitor Days Outfitted	540	450	0	0	990
Percent of total	10%	0.5%	0%	0%	0.1%
Percent Change from Current	+1%	+80%	10%	10%	+62%
Alternative 4					
Total Visitor Days	6,671 *(4,781+1,350=6,671)*	98,020	11,743	2,140	118,034
Visitor Days Outfitted	1,350	450	0	0	1,600
Percent of total	20%	0.5%	0%	0%	1%
Percent Change from Current	+24%	+80%	10%	10%	+63%

Consistency Findings

All alternatives would be consistent with the standards and guidelines that are unique to the North Cascades sub-unit, and with those that are applicable to all areas. The unique standards and guidelines are address below. The ones applicable to all areas are discussed at the end of the Recreation section.

MA4-8E: The numbers and types of encounters between users shall be controlled.
The number of service days in this sub-unit would be limited to the numbers disclosed in Figures 2-1, 2-2, and 2-3, controlling the number of outfitted pack and saddle stock outfitter-guide clients and the permitted activities.

MA7-8F: Easy Pass, Rainy Lake, Lake Ann, Blue Lake, and Washington Pass Trails shall be closed to horse use.
Mitigation measure 6 c prohibits pack and saddle stock outfitter-guide activities on these trails.

MA7-11A: Recreation livestock grazing shall be permitted except for the meadows at Rainy Lake turnoff and Whistler Basin.
Mitigation measure 8 h prohibits outfitter-guide stock grazing in these meadows.

SAWTOOTH BACKCOUNTRY

Regulatory Framework

The Sawtooth Backcountry includes Management Area 4M on the Methow Valley District (Okanogan Forest Plan), and Management Area RE2a on the Chelan District (Wenatchee Forest Plan), as amended by the Northwest Forest Plan.

The Okanogan Forest Plan goals for MA 4M are to: [p]rovide year-round semi-primitive motorized recreational opportunities (4-63). The following standard and guidelines applies to outfitter-guide use:

MA4M-8E: The numbers and types of encounters between users should be controlled.

The Wenatchee Forest Plan states that the goals of RE2a are to: [p]rovide dispersed, unroaded recreation in a semi-primitive motorized recreation opportunity setting (IV-165). The Wenatchee Forest Plan has no management area specific management direction for outfitter-guides.

Affected Environment

The Sawtooth Backcountry is adjacent to the Lake Chelan-Sawtooth Wilderness and is split between the Methow Valley and Chelan Districts. It covers 35,149 acres, and includes several high-elevation lakes. It receives about 14,000 visitor days annually. There is a mix of motorized and non-motorized trail use originating at the Crater Creek or Foggy Dew trailheads on the Methow side, and the South Navarre, Safety Harbor Creek, and Summer Blossom trailheads on the Chelan side (see **Map 1-7**).

Use distribution is about 39% (5,460 visitor days) hiking, 18% (2,520 visitor days) use of pack and saddle stock (of which 16% has currently outfitted), 33% (4,620 visitor days) riding motorized trail bikes, and 10% (1,400 visitor days) riding mountain bikes. None of the hikers, trail bike riders, or mountain bike riders are clients of the pack and saddle stock outfitters included in this

analysis. Of the people who use pack and saddle stock in this area about 20% (800 visitor days) are outfitter-guide clients.

Historic Activities

The following past actions have effects that are continuing, and overlapping effects from the pack and saddle stock outfitter-guides.

Grazing

The Sawtooth Backcountry was included in commercial sheep and cattle grazing allotments beginning in the early 1900s. Large bands of sheep grazed the area annually. Many of the existing, large camps were established by the sheep herders. Some stock driveways and trails became popular hiking and riding trails.

Recreation and Trail Maintenance

People have been hiking and riding horses or motorcycles into this area for decades. The recreation use, combined with commercial grazing, established trails to the lakes and scenic destination points in the area. Some of these trails were identified as system trails, and have been maintained by the public and Forest Service.

Current Condition

Recreation Activities

The motorized bike trail system is a popular destination. Most people stay in or near the Foggy Dew campground and ride on loop trails that include the Foggy Dew trail, the Martin Creek trail to the Crater Creek trailhead, and the Forest Service road designated for dual use to bring riders back to the Foggy Dew campground. Most motorized bike use is day use.

The Crater Creek trailhead is often filled to capacity on weekends and holidays between Memorial Day and Labor Day. Encounters between groups along the trail network and destination locations are common. The most popular destination spots are the high elevation lakes in the area. It is a popular area for big groups since there are no party-size limitations. Some of the existing camps are large, but there are no standards and guidelines pertaining to the size or condition of these campsites, which are outside of wilderness.

Outfitter-Guide Activities

This area is regularly used by the pack and saddle stock outfitter guides, with 394 service days in the current permits and priority use pool.

Figure 3.3-5. Current Number of Visitor Days by User Group in the Sawtooth Backcountry, and Number of Pack and Saddle Stock Outfitter-Guide Visitor days.

Use Group	Total Visitor Days	Outfitter-guide Service Days	Portion of Total
Hikers	5,460	0	0%
Use with Pack Animals	2,520	394	16%
Trail Bike Riders	4,620	0	0
Mountain Bikers	1,400	0	0
Total	14,000	394	3%

Environmental Consequences

Direct and Indirect Effects

The following figure shows the number of visitor days, and pack and saddle stock outfitter-guide days by alternative in the Sawtooth Backcountry Sub-Area. Overall use days, even though they are not part of the pack and saddle outfitter-guide effects, are shown to provide context.

Figure 3.3-6. Number of Visitor Days and Service Days in the Sawtooth Backcountry Currently and by Alternative.

Current or Alternative	Pack and Saddle Stock Users	Hikers	Trail Bike Riders	Mountain Biker Riders	Total
Current					
Total Visitor Days	2,520	5,460	4,620	1,400	14,000
Pack and Saddle Stock OG Service Days	394	0	0	0	394
Percent of total	16%	0%	0%	0%	3%
Alternative 1					
Total Visitor Days	2,126	5,460	4,620	1,400	13,606
Pack and Saddle Stock OG Service Days	0	0	0	0	0
Percent of total	0%	0%	0%	0%	0%
Percent Change From Current Total	-16%	0%	0%	0%	-3%
Percent Change From Current Service Days	0%				
Alternative 2					
Total Visitor Days	2,526	5,460	4,620	1,400	14,006
Pack and Saddle Stock OG Service Days	400	0	0	0	400
Percent of total	16%	0%	0%	0%	3%
Percent Change From Current Total	0.2%	0%	0%	0%	0%
Percent Change From Current Service Days	+2%				
Alternative 3					
Total Visitor Days	2,286	5,460	4,620	1,400	13,766
Pack and Saddle Stock OG Service Days	160	0	0	0	160
Percent of total	7%	0%	0%	0%	1%
Percent Change From Current Total	-9%	0%	0%	0%	-1%
Percent Change From Current Service Days	-59%				
Alternative 4					
Total Visitor Days	2,931	5,460	4,620	1,400	14,441
Pack and Saddle Stock OG Service Days	805	0	0	0	805
Percent of total	27%	0%	0%	0%	6%
Percent Change From Current Total	+16%	0%	0%	0%	+3%
Percent Change From Current Service Days	+104%				

Alternative 1

With implementation of Alternative 1, there would be no pack and saddle stock outfitter-guide activity in the Sawtooth Backcountry, reducing current use by 394 visitor/service days. This would result in a 16% reduction in pack and saddle stock use from current conditions, which may be noticed by some non-outfitted recreationists, but since the overall recreational use reduction is only 5%, fewer encounters on trails and at popular destinations may go unnoticed.

Pack and Saddle Outfitter-Guides would no longer have any effects at camps, and all camps would be open and available to non-outfitted recreationists.

Alternative 2

This alternative would basically maintain the existing number of people in the Sawtooth Backcountry, slightly increasing permitted use by 1% over the currently permitted use (14,006 as opposed to the existing 14,000). There would be 400 service days for pack and saddle stock outfitter-guides in the Sawtooth Backcountry.

The pack and saddle stock outfitter-guides would continue to operate in the area, and non-outfitted recreationists would likely encounter them at the established campsites and along the trails leading to the campsites. Peoples' opportunity to experience isolation on the trails and at destination spots would remain similar to the current condition. The number of encounters with outfitters would be controlled since the number of service days would be limited to 400 service days annually. The outfitter-guides would likely cause little change in campsite conditions because the number of service days would be very close to the current allowed use. However, since there are no restrictions on camps and camps sizes in the Sawtooth Backcountry, outfitted use may result in an increase in size, and new camps may be developed in the future.

Alternative 3

Alternative 3 would decrease permitted use in the Sawtooth Backcountry to 160 days, a decrease of 59% from the current permitted use. In context of total use, there would be a 9% reduction in pack and saddle stock use (outfitted and non-outfitted) in the area, and an overall reduction in visitor days of approximately 1%.

Non-outfitted recreationists would have fewer encounters with outfitted groups because of the decline in service days compared to the current condition, or compared with Alternatives 2 and 4. Outfitters would continue to use established campsites, but would likely not increase the size of existing sites, or create new ones. Non-outfitted recreationists would have more chance of experiencing isolation on trails and at popular destinations compared to the current condition, or Alternatives 2 or 4. The number of encounters with outfitters would be controlled since the number of service days would be limited to 160 service days annually.

Alternative 4

Alternative 4 would increase permitted use in the Sawtooth Backcountry to 805 days of permitted use, an increase of 104% over current permitted use. Comparing this to current conditions, this would result in a 16% increase in pack and saddle stock use, and a 3% increase in

all visitor days. Even though overall increases in encounter rates would most likely not be noticed, people would encounter more stock parties with this alternative compared to the existing condition.

As with Alternatives 2 and 3, the pack and saddle stock outfitter-guides would continue to operate in this area. Non-outfitted recreationists would have a noticeable increase in encounters with outfitted parties on trails and at destination locations compared to the current condition, or with Alternatives 2 or 3. There would be a decrease in the possibility of experiencing isolation on trails and popular destinations. The existing camps would continue to be used by the outfitters. Since there are no restrictions on camps and camp sizes in the Sawtooth Backcountry, outfitted use may result in an increase in size, and new camps may be developed in the future.

Cumulative Effects

The spatial boundary for this recreation analysis is the entire Sawtooth Backcountry and the trails and trailheads leading into the Sawtooth Backcountry. The temporal boundary was from the early 1900s through 2023, when the 10-year permits would expire and all recreation effects from the permits would cease. Past actions with effects still overlapping pack and saddle stock outfitter-guide use are discussed under Current Conditions. All present and reasonably foreseeable future actions listed at the beginning of this chapter were considered in this cumulative effects analysis. Those that affect recreation are discussed below.

Present Actions

Trail Maintenance
The Forest Service maintains approximately 60 miles of trail in the Sawtooth Backcountry annually. This is allowing trail users to continue accessing the destination spots throughout the area.

Non-outfitted Recreation Use
Approximately 13,606 visitor days occur in the Sawtooth Backcountry each year, not including the pack and saddle stock outfitter-guides.

Outfitter-guides
National Outdoor Leadership School operates in the Sawtooth Backcountry under an outfitter-guide special use permit. They guide clients on hiking/backpacking trips. An additional 200 service days are available for temporary outfitter-guide use. In recent years, these days have been allocated to a mountain bike outfitter guide, additional hiking/backpacking guides, and trail running.

Reasonably Foreseeable Future Actions

Trail Maintenance
It is reasonably foreseeable that the Forest Service will continue maintaining approximately 60 miles of system trails throughout the area. This keep access open to the destination spots in the area.

Non-outfitted Recreation Use

The number of people recreating in the Sawtooth Backcountry is expected to increase 12% by 2022, when the outfitter-guide permits would expire. This is the rate projected in the report by the Interagency Committee on Outdoor Recreation (Interagency Committee for Outdoor Recreation, 2003).

Figure 3.3-7 lists the current number of non-outfitted pack and saddle stock-outfitted recreationists and the estimated number for 2023.

Figure 3.3-7. Number of Non-Pack and Saddle Stock-Outfitted Visitor Days in Sawtooth Backcountry Currently and in 2023.

User Group	Approximate Current Number of Non Outfitted Visitor Days	% Increase by 2022*	Estimated Number of Non Pack and Saddle Stock – Outfitted Visitor Days in 2023
Hikers	5,460	+13%	6170
People w/Pack Animals	2,520	+3%	2,596
Trail Bike Riders	4,620	+10%	5,082
Mountain Bike Riders	1,400	+10%	1,540
Total	**13,606**	**+11**	**15,388**

*Interagency Committee for Outdoor Recreation 2003

The following figure displays the cumulative effect on visitor days for each alternative.

Figure 3.3-8. Cumulative Effect on Visitor Days in the Sawtooth Backcountry Sub-Area with Each Alternative, Compared to Current, Projected to 2023 for all Recreation Uses

Current or Alternative	Pack and Saddle Stock Users	Hikers	Trail Bike Riders	Mountain Bike Riders	Total
Current					
Total Visitor Days	2,520	5,460	4,620	1,400	14,000
Pack and Saddle Stock OG Service Days	394	0	0	0	394
Percent of total	16%	0%	0%	0%	3%
Alternative 1					
Total Visitor Days	2,202	6,170	5,082	1,540	14,994
Visitor Days Outfitted	0	0	0	0	0
Percent of total	0%	0%	0%	0%	0%
Percent Change from Current	-13%	+13%	10%	10%	+7%
Alternative 2					
Total Visitor Days	2,602 *(2,202+400=2,602)*	6,170	5,082	1,540	15,394
Visitor Days Outfitted	400	0	0	0	400
Percent of total	15%	0%	0%	0%	3%
Percent Change from Current	+3%	+13%	10%	10%	+10%
Alternative 3					
Total Visitor Days	2,362 *(2,202+160=2,362)*	6,170	5,082	1,540	15,154
Visitor Days Outfitted	160	0	0	0	160
Percent of total	7%	0%	0%	0%	1%
Percent Change from Current	-6%	+13%	10%	10%	+8%
Alternative 4					
Total Visitor Days	3,007 *(2,202+805=3,007)*	6,170	5,082	1,540	15,799
Visitor Days Outfitted	805	0	0	0	805
Percent of total	27%	0%	0%	0%	6%
Percent Change from Current	+22%	+13%	10%	10%	+13%

Alternative 1

The cumulative effect of past, present, and reasonably foreseeable future actions on recreation activities would be a 7% increase in the overall number of people recreating, but an 13% decrease in the number of pack and saddle stock use. The overall increase would likely not be noticed by the people recreating there, but people may notice fewer stock parties. People would still encounter large pack and saddle stock groups on the trails and at destination spots. The camps would remain at the existing size, or possibly increase over time as a result of projected general increases in recreation.

Alternative 2

The cumulative effect Alternative 2 and the past, present, and reasonably foreseeable future actions on recreation activities would be a 10% increase in the overall number of people recreating in the area, including a 3% increase in pack and saddle outfitter-guide use. The increase would be larger than with Alternative 1, and people may encounter more groups in the area compared to the existing condition. This would make the area feel more crowded compared to the existing condition.

The effect of this amount of use on the Sawtooth Backcountry would be that people would have a moderate chance of experiencing isolation on the trails and at popular destinations. Use would be concentrated on trails, and generally in established campsites. The existing camps would continue to be used by outfitters and outfitted recreationists. The conditions in these camps may change because there are no restrictions on camps and camp sizes in the Sawtooth Backcountry, outfitted use may result in an increase in size, and new camps may be developed in the future.

Alternative 3

The cumulative effect Alternative 3 and the past, present, and reasonably foreseeable future actions on recreation activities would be an 8% increase in the overall number of people recreating in the area, but a 6% decrease in the number of pack and saddle stock users in the area. People may not notice the small changes in overall recreation use, so the current recreation experience and opportunities would not change.

People would have a reduced chance of seeing pack and saddle stock groups, but since the overall increase in use would be 8%, the chance of experiencing isolation on the trails and at popular destinations would change little from current conditions. Use would be concentrated on trails and generally in established campsites. Existing camps would continue to be used by outfitters and outfitted recreationists. The conditions in these camps may change because there are no restrictions on camps and camp sizes in the Sawtooth Backcountry, outfitted use at these camps may increase their size and new camps may be developed in the future.

Alternative 4

The cumulative effect of Alternative 4 and the past, present, and reasonably foreseeable future actions on recreation activities would be the largest increase in recreation use of any alternative because of the incremental effect of additional pack and saddle outfitter-guide use on top of projected increases in recreational use of this area over time. There would be approximately

13% more people overall, and 19% more stock users. This would be a noticeable change for most users.

The effect of this amount of permitted use on the Sawtooth Backcountry would be that people would have a moderate chance of experiencing isolation on the trails and at popular destinations. Use would be concentrated on trails, and generally in established campsites. The existing camps would continue to be used by outfitted and non-outfitted recreationists. The conditions in these camps could increase in size, and new camps may be developed in the future.

Consistency Finding

All alternatives would be consistent with the standards and guidelines that are unique to the Sawtooth Backcountry sub-unit, and with those that are applicable to all areas. The unique standards and guidelines are address below. The ones applicable to all areas are discussed at the end of the Recreation section.

MA4M-8E: The numbers and types of encounters between users should be controlled.
The number of service days in this sub-unit would be limited to the numbers disclosed in Figures 2-1, 2-2, and 2-3, controlling the number of outfitted pack and saddle stock outfitter-guide clients and the permitted activities.

BEAR/RAMSEY/VOLSTEAD

Regulatory Framework

This area includes Okanogan Forest Plan Management Areas 14, 25, and 26, as amended by PACFISH (see Aquatics section for PACFISH regulatory framework). The goal for MA 14 is to: [p]rovide a diversity of wildlife habitat, including deer winter range, while growing and producing merchantable wood fiber (4-83).

The goal for MA 25 is to: [i]ntensively manage the timber and range resources using both even-aged and uneven-aged silvicultural practices (4-103).

The goal for MA 26 is to: [m]anage deer winter range and fawning habitats to provide conditions which can sustain optimal numbers of deer indefinitely, without degrading habitat characteristics such as forage, cover, and soil (4-107).

The Okanogan Forest Plan has no management area specific standards and guidelines for recreation applicable to outfitter-guides in theBear/Ramsey/Volstead sub-area.

PACFISH has a standard and guideline that applies to recreation, which is analyzed in the Aquatics section of Chapter 3.

Affected Environment

The Bear/Ramsey/Volstead area is located east of the Methow River. There are about 1,000 annual visitor days in this portion of the analysis area. There are no developed trailheads or trails used by pack and saddle stock outfitter-guides in this area.

Historic Activities
The following past actions have effects that are continuing, and overlapping effects from the pack and saddle stock outfitter-guides.

Timber sales/road construction
There have been numerous timber sales in the area over the past several decades. The roads constructed for these sales created opportunities that still exist for people to drive for pleasure, hunt, collect firewood, ride bikes, access hiking trails, and camp in undeveloped areas.

Current Condition
About 90% of recreation takes place during hunting season, with hunters hiking along the seasonally-closed road system or across hillsides. Although there are no developed recreation sites, some hunters set up dispersed camps in areas before roads are closed on October 1st of each year, or camp just outside the motorized closure area (about 70% of the use). About 20% pack camps into the motorized closure area, hiking or using pack and saddle stock. The remaining 10% of the annual use is people driving for pleasure in the area outside hunting season.

Dividing the visitor days between the types of recreation, there are 700 camping visitor days outside the motorized closure area, or having driven and set up a campsite prior to the closure. An additional 200 visitor days are people who pack camps into the motorized closure area either hiking or using pack and saddle stock. The remaining 100 people are driving for pleasure outside hunting season. Of the 200 who pack in camps, 48 visitor days have been associated with pack and saddle stock outfitter-guides.

Outfitter-Guide Activities
Pack and saddle stock outfitter-guide use in this area has been during the mule deer general firearm season each October. Outfitter-guides pack clients to camps in areas closed to motorized recreation during hunting season. These are all drop camps, with the outfitter-guides returning to pack the clients out at the end of the trip. There were 48 pack and saddle stock outfitter-guide service days in the Bear/Ramsey/Volsted area.

Figure 3.3-9. Current number of Visitor Days in Bear/Ramsey/Volstead by Use Group, and Number of Pack and Saddle Stock Outfitter-Guide Visitor days.

Use Group	Total Visitor days	Outfitter-Guide Service Days	% of Total
Hunters camping outside closed area, or setting up camps early	700	0	0%
Hunters packing in camps using pack animals or hiking	200	48	24%
People driving for pleasure	100	0	0
TOTAL	1,000	48	5%

The Lightning Creek dispersed drop camp has been used during the general hunting season; it is one of the known camps used by pack and saddle stock outfitter guides in the Bear/Ramsey/Volstead area. There is also an established dispersed campsite in the Volstead Creek area. Outfitters may have used other camps periodically, but tended to return to these two sites.

Environmental Consequences

Direct and Indirect Effects

The following figure shows the number of visitor days, and pack and saddle stock outfitter-guide days by alternative in the Bear/Ramsey/Volstead Sub-Area. Overall use days, even though they are not part of the pack and saddle outfitter-guide effects, are shown to provide context.

Figure 3.3-10. Number of Visitor days in Bear/Ramsey/Volstead area by Alternative.

Current or Alternative	Hunters Packing in Camps with Pack and Saddle Stock or Hiking	Hunters Camping Outside Closure or Setting Up Camp Prior to Closure	Driving for Pleasure	Total
Current				
Total Visitor Days	200	700	100	1,000
Pack and Saddle Stock OG Service Days	48	0	0	48
Percent of total	24%	0%	0%	3%
Alternative 1				
Total Visitor Days	152	700	100	952
Pack and Saddle Stock OG Service Days	0	0	0	0
Percent of total	0%	0%	0%	0%
Percent Change From Current Total	-24%	0%	0%	-5%
Percent Change from Current Service Days	-100%			
Alternative 2				
Total Visitor Days	252	700	100	1,052
Pack and Saddle Stock OG Service Days	100	0	0	100
Percent of total	40%	0%	0%	10%
Percent Change From Current Total	26%	0%	0%	5%
Percent Change From Current Service Days	+108%			
Alternative 3				
Total Visitor Days	202	700	100	1,002
Pack and Saddle Stock OG Service Days	50	0	0	50
Percent of total	25%	0%	0%	5%
Percent Change From Current Total	0%	0%	0%	0%
Percent Change From Current Service Days	+4%			
Alternative 4				
Total Visitor Days	252	700	100	1,052
Pack and Saddle Stock OG Service Days	100	0	0	100
Percent of total	40%	0%	0%	10%
Percent Change From Current Total	26%	0%	0%	5%
Percent Change From Current Service Days	108%			

Alternative 1

Non-outfitted hunters could notice a reduction in the number of camps packed into the motorized closure area with implementation of Alternative 1 since there would be no pack and saddle stock outfitter-guide activity and 48 fewer visitor days than the existing condition. Outfitter-guides would have no effect on the recreational experience of this area, although this alternative would eliminate use by hunters who do not have the ability to hike or pack themselves into the area.

Alternatives 2 and 4

Alternatives 2 and 4 would both permit 100 visitor days, increasing pack and saddle stock outfitter-guide permitted use by 52 days, an increase of over 100% from the existing condition. This would allow outfitters to meet demand for recreationists either needing or desiring packing services to access this non-motorized hunting area. This additional use by outfitters may lead to the creation of new camps, and increased encounters between groups, but would not likely impact the quality of hunting because the overall increase is so small (see cumulative effects).

Alternative 3

Alternative 3 would increase permitted use by 2 days from the existing, essentially resulting in no change. The number of people in the area, and the number packed into camps in the non-motorized area would not change from the existing condition. Established camps would still be available, and very few new ones would be established.

Cumulative Effects

The spatial boundary for this analysis is the entire Bear/Ramsey/Volstead area. The temporal boundary was from the early 1900s through 2023, when the 10-year permits would expire, and the effects of the permits would cease.

Past actions with effects still overlapping pack and saddle stock outfitter-guide use are discussed under Current Conditions. All present and reasonably foreseeable future actions listed at the beginning of this chapter were considered in this cumulative effects analysis. Those that affect recreation are discussed below.

Present Actions

Timber sales/road maintenance

There are no active timber sales in this area. Maintenance of the existing roads is ongoing, and keeping the existing recreation activities available.

Seasonal closures

This area is closed to motorized access from October 1 to March 31 to protect mule deer in the fall and, as a result it provides a non-motorized hunting area. This eliminates motorized hunting activities, and provides opportunities for pack and saddle stock outfitter-guides to provide services to clients who want to camp in the non-motorized area.

Non-outfitted Recreation Use
Approximately 952 visitor days occur in the Bear/Ramsey/Volstead area each year, independent of the pack and saddle stock outfitter-guides. This use, combined with the pack and saddle stock outfitter-guide clients, makes up the total current recreation visitor days in the sub-unit. This use overlaps the pack and saddle stock outfitter-guide activities, but the cumulative use is very light, and is not degrading the quality of recreation opportunities in the area.

Grazing
The Ramsey and Beaver Horse and Cattle allotments are active and currently grazed. There Currently 110 cow/calf pairs graze the Volstead unit from late June to early August with a total of 186 AUMs. There are currently 322 AUMs in this area under a new AMP completed in 2007.

Reasonably Foreseeable Future Actions
Timber sales/road maintenance
There are no reasonably foreseeable timber sales in the area, however road maintenance will continue. This will maintain the existing recreation activities.

Grazing
The Ramsey and Beaver allotments will continue to be grazed at the current stocking level. Since the pack and saddle stock outfitter-guides do not loose graze their stock in this area, there would be no overlap of effects to forage utilization.

Non-outfitted Recreation Use
The number of people recreating in the Bear/Ramsey/Volstead area is expected to decrease 15% by 2022, dropping to approximately 834 visitor days per year, as projected by the Interagency Committee on Outdoor Recreation (Interagency Committee for Outdoor Recreation, 2003).

The following figure lists the current number of non-pack and saddle stock-outfitted recreationists, and the number that will likely be there in 2023.

Figure 3.3-11. Number of Non-Pack and Saddle Stock-Outfitted Visitor Days in Bear/Ramsey/Volstead Currently and in 2023.

User Group	Approximate Current Number of Non Pack and Saddle Stock-Outfitted Visitor Days	% Change by 2022*	Estimated Number of Non Pack and Saddle Stock –Outfitted Visitor Days in 2023
Hunters camping outside closed area, or setting up camps early	700	-6%	658
Hunters packing in camps using pack animals or hiking	152	-6%	143
People Driving for Pleasure	100	+10%	110
TOTAL	1,000		**911**

*Interagency Committee for Outdoor Recreation 2003

The following figure shows the cumulative effect on the number of people recreating in this sub-unit, by alternative.

Figure 3.3-12. Cumulative Effect Number of Visitor days in Bear/Ramsey/Volstead area by Alternative.

Current or Alternative	Hunters Packing in Camps with Pack and Saddle Stock or Hiking	Hunters Camping Outside Closure or Setting Up Camp Prior to Closure	Driving for Pleasure	Total
Current				
Total Visitor Days	200	700	100	1,000
Pack and Saddle Stock OG Service Days	48	0	0	48
Percent of total	24%	0%	0%	3%
Alternative 1				
Total Visitor Days	140	658	110	908
Pack and Saddle Stock OG Service Days	0	0	0	0
Percent of total	0%	0%	0%	0%
Percent Change From Current Total	-30%	-6%	+10%	-9%
Alternative 2				
Total Visitor Days	240	658	110	1,008
Pack and Saddle Stock OG Service Days	100	0	0	100
Percent of total	42%	0%	0%	10%
Percent Change From Current Total	20%	-6%	+10%	+0.1%
Alternative 3				
Total Visitor Days	190	658	110	958
Pack and Saddle Stock OG Service Days	50	0	0	50
Percent of total	26%	0%	0%	5%
Percent Change From Current Total	-5%	-6%	+10%	-4%
Alternative 4				
Total Visitor Days	240	658	110	1,008
Pack and Saddle Stock OG Service Days	100	0	0	100
Percent of total	42%	0%	0%	10%
Percent Change From Current Total	20%	-6%	+10%	+0.1%

Alternative 1

The cumulative effect of Alternative 1 and the past, present, and reasonably foreseeable future actions would a 9% reduction in the number of people recreating in the area. This reduction would mostly occur during hunting season. The area would likely seem less crowded to the hunters, making camping spots easier to find, potentially fewer encounters with other hunters, and may improve the hunting experience.

Alternatives 2 and 4

The cumulative effect of Alternatives 2 and 4, and the past, present, and reasonably foreseeable future actions would be virtually no change in the number of people recreating in the area compared to the current condition. There would be a 20% increase in outfitter-guide service days, therefore an increase in the number of people being packed into hunting camps in the non-motorized hunting area. The number of people hunting and camping in the area would still be small, and hunters and camps would be dispersed across hillsides and along roads, so the area would not feel crowded. The small increase may lead to creation of new camps, and the encounters between groups may increase.

Alternative 3

The cumulative effect of Alternative 3 would also be a 4% reduction in the number of people recreating in the area. This would likely be unnoticed by most people. The number of outfitter-guide service days would be increased by 2 over the current condition, so there would be virtually no change in the number of people being packed into hunting camps. The area would remain uncrowded with a high quality hunting experience

Consistency Findings

Other than the Forest-wide findings at the end of this recreation section, no management area specific findings are required because the management areas in the Bear/Ramsey/Volstead Sub-Area contain no standards and guidelines specific to recreational use.

MIDDLE METHOW

Regulatory Framework

This subsection is divided between Management Areas 5, 10, and 25, in the Okanogan Forest Plan, as amended by the Northwest Forest Plan. These Management Areas are shown **Map 1-9**.

The goal for MA 5 is to: [p]rovide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective of retention or partial retention (4-65).

The goal for MA 10 is to: [o]ptimize habitat condition and perpetuate a healthy mountain goat population (4-76).

The goal for Management Area 25 is to: [i]ntensively manage the timber and range resources using both even-aged and uneven-aged Silvicultural practices (4-103).

Okanogan Forest Plan has no management area specific recreation standards and guidelines that apply to outfitter-guides.

Affected Environment

The Middle Methow portion of the analysis area includes the area east of the Lake Chelan-Sawtooth Wilderness and east of the Sawtooth Backcountry. There are about 15,000 annual visitor days in this area. About 10% are hiking, 80% are driving for pleasure, 5% are riding mountain bikes, and 5% are using pack animals.

There are two major recreation areas in the Middle Methow. These are shown on **Map 3.3-2.**

- The Twisp River corridor is surrounded by the Lake Chelan-Sawtooth Wilderness. Nearly all the trails that begin at trailheads in the corridor enter wilderness within one mile. Use on these trails is included in the use estimates for the Lake Chelan-Sawtooth Wilderness. The Twisp River Horse Camp is a popular campground specifically designed for people with horses and mules. This area also includes several campgrounds, and the Twisp River Trail, which goes from War Creek Campground to Gilbert Trailhead. None of the use in the horse camp, campgrounds, or on the Twisp River trail is outfitted. There is an outfitter base camp at the Slate Creek Trailhead. The only improvement is a corral, which is closed to non-outfitted recreationists.
- The Libby Creek and Gold Creek areas are located east of the Lake Chelan-Sawtooth and the Sawtooth Backcountry. The Libby Creek trail begins in the Middle Methow portion and enters wilderness about two miles from the trailhead. The Crater Creek and the Foggy Dew trailheads are located in the Gold Creek portion of the analysis area. Both these trails enter the Sawtooth Backcountry less than a mile from the trailheads. The use of these trails in included in the Sawtooth Backcountry descriptions. There is an assigned outfitter camp located near the Crater Creek trailhead. The outfitter takes clients into the Sawtooth Backcountry from this camp.

There are no service days for outfitters within the Middle Methow area. Outfitters use the trailheads to access the Lake Chelan-Sawtooth Wilderness and the Sawtooth Backcountry, but none of the use is considered to be in the Middle Methow. The effect of the alternatives from outfitter-guide activities in the Lake Chelan-Sawtooth Wilderness are discussed in the Wilderness section of Chapter 3. The effects on the Sawtooth Backcountry are discussed earlier in this section.

Outfitter Activities

Service days are assigned to areas where outfitter-guide parties camp, so there are no outfitter-guide service days in the Middle Methow area. The only outfitter activities in this area have been trips beginning at the trailheads, and the base camps at Slate and Crater Creek Trailheads. The camp at Slate Creek has a corral and access road. The Crater Creek camp has an access road, unloading ramp, hitch rails, watering trough, corrals, and parking area. Non-outfitted recreationists are not allowed to use these facilities. Only one of the pack and saddle stock outfitters uses the Crater Creek base camp – the other outfitters park in the Crater Creek Trailhead parking area.

Figure 3.3-13. Current number of Visitor Days by Use Group in the Middle Methow Area, and Number of Pack and Saddle Stock Outfitter-Guide Service days.

Use Group	Total Visitor days	Outfitter-guide Service and Visitor Days	% of Total
Hikers	1,500	0	0%
Driving for Pleasure	12,000	0	0%
Use w/Pack and Saddle Stock	750	0	0%
Mountain Bike Riders	750	0	0%
TOTAL	15,000	0	0%

Environmental Consequences

Direct and Indirect Effects

There would be no pack and saddle stock outfitter-guide service days in the Middle Methow with any alternative; current use would not change.

Alternative 1

With Alternative 1,no permits would be issued and the outfitter-guides would cease operating. Although the pack and saddle stock outfitter-guides do not have any service days in this sub-unit, people recreating in this area would likely notice a reduction in use at the trailheads and the number of pack and saddle stock on the trails.

Alternatives 2

The pack and saddle stock outfitter-guides would continue to use the trailheads and trails leading into the Sawtooth Backcountry and the Lake Chelan-Sawtooth Wilderness with implementation of Alternative 2. There would be some changes in the amount of use (2% increase in the Sawtooth Backcountry, and a 0.7% increase in the Lake Chelan-Sawtooth), but these are small enough to likely not be noticed by the non-outfitted recreationists. The effects of these changes in the two areas are discussed in those specific sections of this chapter.

The base camps at the Slate Creek Trailhead and Crater Creek Trailhead would still be used by the outfitters, but would remained closed to the public.

Alternative 3

Alternative 3 would result in less outfitter-guide activities at the trailheads and along the trails leading into the Sawtooth Backcountry and Lake Chelan-Sawtooth Wilderness compared to the current condition, or to Alternative 2 or 4. There would be a 59% reduction in service days in the Sawtooth Backcountry and a 55% decrease in the Lake Chelan-Sawtooth.

Pack and saddle stock outfitter-guides would park at trailheads less frequently, so there would be more parking at popular trailheads, especially at the Crater Creek trailhead. People would encounter fewer outfitted pack stock parties on the trails, so may experience more of a feeling of isolation. There would also be a decrease in traffic on the road leading to the Crater Creek trailhead.

Alternative 4

Alternative 4 would increase use in the Sawtooth Backcountry and Lake Chelan-Sawtooth Wilderness. The number of service days in the Sawtooth Backcountry would increase 123%, so non-outfitted users would notice a substantial increase in pack and saddle stock outfitter-guide use at the Crater Creek Trailhead, and on the trails leading into the Backcountry. The base camp at Crater Creek would likely be used more frequently by the outfitter assigned to that camp, but this would not impact the public since it is not open to public use now. There would also be a noticeable increase in traffic leading to the trailhead.

The number of service days in the Lake Chelan-Sawtooth would increase by 6%. This small increase would likely go unnoticed by non-outfitted recreationists. There would be some increase in outfitter-guide use of the trailheads and encounters on the trails leading into the wilderness. The base camp at Slate Creek Trailhead would continue to be used by the outfitter, but closed to public use.

Cumulative Effects

The spatial boundary for this analysis is the entire Middle Methow area. The temporal boundary is from the early 1900s through 2023, when the 10-year permits would expire, and effects of the permits would cease.

Present Actions

Non-outfitted Recreation Use

There are approximately 15,000 visitor days in the Middle Methow sub-unit, none of which are associated with the pack and saddle stock outfitter-guides. The following figure displays the number of visitor days by activity.

Figure 3.3-14 . Current number of Visitor Days by Use Group in the Middle Methow Area

User Group	Total Visitor days
Hikers	1,500
Driving for Pleasure	12,000
Use w/Pack and Saddle Stock	750
Mountain Bike Riders	750
TOTAL	15,000

Outfitter-guides

Other outfitter-guides travel through the Middle Methow sub-unit on their way into the Sawtooth Backcountry and Lake Chelan-Sawtooth wilderness. The trailheads are located in the sub-unit, so these outfitter-guides contribute to traffic on the roads, use parking spaces at trailheads, and guide clients on the trails.

Reasonably Foreseeable Future Actions

Non-outfitted Recreation
It is reasonably foreseeable that the number of non-outfitted recreationists would increase in the sub-unit. Using the projections from the Interagency Committee on Outdoor Recreation (Interagency Committee for Outdoor Recreation, 2003), the approximate number of visitor days in the area in 2022 are included in the following figure.

Figure 3.3-15. Number of Non-Pack and Saddle Stock-Outfitted Visitor Days in Middle Methow Currently and in 2023

User Group	Approximate Current Number of Non Outfitted Visitor Days	% Increase by 2022*	Estimated Number of Non Pack and Saddle Stock – Outfitted Visitor Days in 2023
Hikers	1,500	+13%	1,695
Driving for Pleasure	12,000	+10%	13,200
Pack and Saddle Stock Users	750	+3%	773
Mountain Bike Riders	750	+10%	825
Total	**15,000**	**+10**	**16,493**

(Interagency Committee on Outdoor Recreation, 2003)

Outfitter-guides
It is reasonably foreseeable that the current non-pack and saddle stock outfitter-guide activity and recreation events would continue in the future.

Alternatives 1

The cumulative effect of Alternative 1 and the past, present, and reasonably foreseeable future actions would be a 10% increase in the number of visitor days in the Middle Methow sub-unit. There would be approximately 8% more people using trailheads and trails leading into the Sawtooth Backcountry and Lake Chelan-Sawtooth Wilderness, and driving on the roads to the trailheads. Parking could still be limited at times at the most popular trailheads, such as Crater Creek, but generally there would be adequate room for all users.

Alternative 2

The cumulative effect of Alternative 2 with the past, present, and reasonably foreseeable future actions would be approximately 10% more people recreating in the Middle Methow, and approximately 10% more use at trailheads and along trails, and in traffic on roads leading to trailheads. Parking could still be limited at times at the most popular trailheads, such as Crater Creek, but generally there would be adequate room for all users.

Alternative 3

The cumulative effect of Alternative 3 and the past, present, and reasonably foreseeable future actions would be an increase of approximately 8% in use at trailheads and on trails, coupled with the 10% increase in recreation use in the Middle Methow. As with Alternatives 1 and 2, parking could be limited at times, but generally there would be adequate room for all users. The amount of traffic leading to the trailheads would also increase.

Alternative 4

Alternative 4 would result in the largest cumulative effect as compared to the other alternatives. The cumulative effect would be as with Alternative 2, since there would be approximately 10% more people at the trailheads leading into leading into the Lake Chelan-Sawtooth Wilderness, and on the trails. Parking at trailheads leading into the wilderness could be limited at times, however there would be adequate room on most occasions. The cumulative increase in use into the Sawtooth Backcountry, approximately 13%, would increase crowding at trailheads, especially at the Crater Creek Trailhead. The cumulative effect of this 13% increase, and the anticipated 10% increase in recreation within the Middle Methow sub-unit would increase traffic on roads leading to the trailheads.

Consistency Findings

Other than the Forest-wide findings at the end of this recreation section, no management area specific findings are required because the management areas in the Middle-Methow Sub-Area contain no standards and guidelines specific to recreational use.

Alta Lake

Regulatory Framework

This subsection is divided between Management Areas 5 and 14 in the Okanogan Forest Plan, as amended by the Northwest Forest Plan.

The goal for MA 5 is to: [p]rovide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective of retention or partial retention (4-65).

The goal for MA 14 is to: [p]rovide a diversity of wildlife habitat, including deer winter range, while growing and producing merchantable wood fiber (4-83).

Okanogan Forest Plan has no management area specific recreation standards and guidelines that apply to outfitter-guides.

Affected Environment

The Alta Lake portion of the analysis area includes the National Forest System Land surrounding and near Alta Lake. In 1900, Mr. Heinz, from Wilbur, Washington was mining in the area and finding the lake without a name called it “Alta” after his daughter, Alta Heinz. Alta Lake is about two miles long and a half mile wide. Alta Lake State Park Campground is located on the north shore of the lake and lines about ¾ miles of shoreline. Alta Lake State Park is described as “a camping park where the mountainous pine forests meet the desert.” The remaining shoreline ownership is split between private and National Forest lands; each owning about 50% of the remaining lands adjacent to the shoreline. Alta Lake is a 10 minute drive from Pateros and 40 minutes from Chelan.

Historic Activities

The following past actions have effects that are continuing, and overlapping effects from the pack and saddle stock outfitter-guides.

Grazing
Cattle grazing occurred in Alta Lake area for decades. Some stock driveways and trails became part of the developed trails around Alta Lake and coulee. There is an area of bare soil about 2000 square feet in size, and several weed species near the popular Alta Pond destination along the developed trail resulting primarily from a combination of past cattle, some saddle stock grazing and concentration of use.

Timber harvest/road construction
The greater Alta Lake area is partially forested with ponderosa pine and Douglas-fir trees but much of the area is non-forested. Due to the open forest structure and scenic lake surrounded by steep mountains and cliffs, timber harvest has been limited to small sales accessed by the main road leading into and out of the area.

Other than the original "Alta Coulee Road", roads were minimal in this area due to the steep terrain beyond the valley flats. The Alta Coulee Road between Antoine Creek and State Highway 153 was the main connection road between Chelan and Okanogan counties until the construction of Highway 97. It was constructed for commerce, residents and recreation travel rather than for timber harvest.

Recreation and Trail Maintenance
People have been riding horses, hiking and mountain biking into this area for decades. The cow paths developed into riding trails and have been maintained as needed by the outfitter to provide for day rides.

Alta Lake State Park
The City of Pateros donated lands it owned just north of Alta Lake to the state of Washington, and "Alta Lake State Park" was constructed in 1951. The park has attracted thousands of boaters, anglers, campers, picnickers and swimming enthusiasts to the Alta Lake area for over 50 years.

Current Condition

Recreation Activities
There have been approximately 10,500 visitor days on National Forest lands in this area based on Forest Service employee observations. Most of these days (80%) are visitors driving for pleasure or access through a ¼ mile section across National Forest lands on the only road accessing the south end of Alta Lake. Whisperin' Pines Ranch, owned by one of the current outfitters, lies at the southernmost end of Alta Lake. It contains a private campground and provides day horseback riding opportunities. Day riding trails circle Alta Lake and wind through State Park, private, Bureau of Land Management (BLM) and National Forest lands and include a total of about 17 miles of trail. About five miles of this trail system lies on National Forest lands, and about 3¼ miles of this total lies on roads located on National Forest near the lake (¼ mile), and south of the lake in Alta Coulee (about 3 miles).

The horseback day rides include an outfitter-guide employee leading the ride, but the service days are very close to the actual number of visitor days since there is usually just one employee, and there are no drop camps involved. Therefore, the number of service day-day rides equals the number of visitor day-day rides.

On National Forest land surrounding Alta Lake there are no constructed recreation sites other than trails used primarily for day rides. The trail portions on National Forest land are part of Chelan Ranger District trail system. All other activity on National Forest lands near Alta Lake is dispersed recreation accessed by trail, road and/or lake.
Adjacent to National Forest lands are state and private lands with developed public and private recreation opportunities. Alta Lake State Park provides tent and RV camping, two boat launches, picnic sites, a swim area; and hiking and mountain biking opportunities on two miles of designated trails. Whisperin' Pines Ranch has a campground that provides tent and RV sites, rental cabins, and row boat rentals. Alta Lake public golf course lies nearby, and private docks and other types of recreation facilities are located on private lands interspersed around the lake.

Outfitter Guide Activities

Guided horseback day rides are provided on trails developed around Alta Lake and trail loops further south of the lake. Customers can choose trips of one, two, four hours duration, or a full day of horseback riding. There are currently 730 service days in this area.

Figure 3.3-16. Current number of Visitor Days in Alta Lake Area, by User Group, and Number of Saddle Stock Outfitter-Guide Service Days

User Group	Total Visitor Days	Outfitter-guide Service & Visitor Days	Percent of Total
Hikers	355	0	0%
Driving for Pleasure	8,445	0	0%
Pack and Saddle Stock	1,575	730	46%
Mountain Bike Riders	125	0	0
Total	**10,500**	**730**	**7%**

Environmental Consequences

Direct/Indirect Effects

The following figure shows the number of visitor days, and pack and saddle stock outfitter-guide days by alternative in the Alta Lake Sub-Area. Overall use days, even though they are not part of the pack and saddle outfitter-guide effects, are shown to provide context.

Figure 3.3.17. Number of Visitor days in the Alta Lake area by Alternative.

Current or Alternative	Pack and Saddle Stock Users	Hikers	Driving for Pleasure	Mountain Bike Riders	Total
Current					
Total Visitor Days	1,575	355	8,445	125	10,500
Pack and Saddle Stock OG Service Days	730	0	0	0	730
Percent of total	0%	0%	0%	0%	3%
Alternative 1					
Total Visitor Days	845	355	8,445	125	9,770
Pack and Saddle Stock OG Service Days	0	0	0	0	0
Percent of total	0%	0%	0%	0%	0%
Percent Change From Current Total	-46%	0%	0%	0%	-7%
Percent Change from Current Service Days	-100%				
Alternative 2					
Total Visitor Days	1,595	355	8,445	125	10,520
Pack and Saddle Stock OG Service Days	750	0	0	0	750
Percent of total	47%	0%	0%	0%	7%
Percent Change From Current Total	+1%	0%	0%	0%	+0.2%
Percent Change from Current Service Days	+3%				
Alternative 3					
Total Visitor Days	1,435	355	8,445	125	10,360
Pack and Saddle Stock OG Service Days	590	0	0	0	590
Percent of total	41%	0%	0%	0%	6%
Percent Change From Current Total	-9%	0%	0%	0%	-1%
Percent Change from Current Service Days	-18%				
Alternative 4					
Total Visitor Days	2,295	355	8,445	125	11,220
Pack and Saddle Stock OG Service Days	1,450	0	0	0	1,450
Percent of total	63%	0%	0%	0%	13%
Percent Change From Current Total	+46%	0%	0%	0%	7%
Percent Change from Current Service Days	101%				

Alternative 1

There would be no saddle stock outfitter-guide clients or employees in the Alta Lake area in Alternative 1. The reduction would likely be unnoticed by most non-outfitted recreationists because of the small reduction in overall recreational use (see cumulative effects). However, the considerable reduction in the number of saddle stock users) would reduce the frequency of encounters between all other user groups and riding stock users, and eliminate these rides on NFS lands.

Alternative 2

Alternative 2 would increase pack and saddle stock outfitter guide visitor days by 1% (+20 days), essentially maintaining the existing number of people in the Alta Lake area. There would be about 750 saddle stock outfitter guide visitor days. People would continue to be able to take guided horseback riding trips on the trails in the area.

The effect of this amount of use on the Alta Lake trails would be that people would have a moderate chance of experiencing isolation on the trails and at popular viewpoints. Use would be concentrated on developed trails.

Alternative 3

Alternative 3 would decrease permitted use by 140 days. Five hundred and ninety saddle stock outfitter guide visitor days would be provided, reducing use by 19% from current numbers. Fewer people would be able to be guided on horseback rides along the trails.

People would have a reduced chance of seeing saddle groups compared to the current condition, or Alternatives 2 or 4. Use would continue to be concentrated on developed trails. People would have a slightly reduced chance of seeing saddle stock groups. Use would be concentrated on developed trails.

Alternative 4

Alternative 4 would almost double the number of pack and saddle stock outfitter-guide service days in the Alta Lake area, allowing more people the chance to ride horses along the trails in the area.

The trails and viewpoints would be more crowded, and isolation on trails would be reduced from the current levels.

Cumulative Effects

The spatial boundary for this analysis was the entire Alta Lake area. The temporal boundary was from the early 1900s through 2023, when the 10-year permits would expire and the effects of the permits would cease. Past actions with effects overlapping effects of pack and saddle stock outfitter-guides are described in the Past Actions section above.

Present Actions

Grazing
Twenty-five cow/calf pairs are currently permitted to graze the Alta Coulee Allotment from June 1 through September 30 for a total of 102 Animal Unit Months (AUMs). Cattle tend to graze only the coulee bottom even though the boundary of the allotment is much larger. Grazing is having no effect on existing recreation activities other than isolated encounters with cattle on roads or trails.

Road maintenance
The Alta Lake County Road #1517 is managed and maintained by Okanogan County from its intersection with State Highway 153 to the Whisperin' Pines Ranch at the south end of Alta Lake. It is paved through the State Park and graveled south of the park. Beyond the ranch the Alta Coulee Road (Forest Road 8141) extends approximately 2 ½ miles to private land south of the sub-unit.

Alta Lake State Park
Alta Lake State Park currently is 181 acres in size and has a developed campground containing 168 tent sites, 32 sites with hook-ups, restrooms, showers, two boat launches, picnic sites, a swim area; and two miles of designated trails. It attracts many people to the Alta Lake area where they then discover other recreation attractions available such as day rides available on the National Forest.

Reasonably Foreseeable Future Actions

Grazing
It is reasonably foreseeable that the Alta Coulee Allotment cattle grazing will continue in the area, and that it will have little effect on recreation activities.

Road maintenance
Road maintenance is expected to continue at its current levels. This will maintain the existing recreation activities.

Alta Lake State Park
Recreation use at Alta Lake State Park is expected to increase over the next 10 years for all activities except fishing as projected in the Interagency Committee for Outdoor Recreation *Estimates of Future Participation in Outdoor Recreation in Washington State* (Interagency Committee for Outdoor Recreation 2003) Addendum to the State Comprehensive Recreation Planning (SCORP) publication. This increase of recreation users will also increase the amount of overall use on National Forest lands at Alta Lake.

Non-outfitted Recreation Use
The number of people recreating in the greater Alta Lake area is expected to increase by about 10% overall by 2023, according to the Interagency Committee on Outdoor Recreation (Interagency Committee for Outdoor Recreation, 2003).

The following table lists the current number of non-pack and saddle stock-outfitted recreationists, and the number that will likely be there in 2022.

Figure 3.3-18. Current Number of Visitor Days in Alta Lake Area and Estimated Number in 2023

User Group	Current Number of Non-Outfitted Visitor Days	% Change by 2022*	Estimated Number of Non-Outfitted Visitor Days in 2022
Hikers	335	+ 13%	379
Driving for Pleasure	8,445	+10%	9,290
Pack and Saddle Stock Users	1,575	+3%	1,622
Mountain Bikers	125	+10%	138
Total	**9,671**	+10%	**11,429**

(*Interagency Committee for Outdoor Recreation, 2003)

The following figure displays the cumulative effect on visitor days for each alternative.

Figure 3.3-19. Cumulative Effect on Visitor Days in Alta Lake with Each Alternative, Compared to Current, Projected to 2023 for all Recreation Uses

Current or Alternative	Pack and Saddle Stock Users	Hikers	Driving for Pleasure	Mountain Bike Riders	Total
Current					
Total Visitor Days	1,575	355	8,445	125	10,500
Pack and Saddle Stock OG Service Days	730	0	0	0	730
Percent of total	46%	0%	0%	0%	3%
Alternative 1					
Total Visitor Days	892	379	9,290	138	10,699
Service Days	0	0	0	0	0
Percent of total	0%	0%	0%	0%	0%
Percent Change from Current	-43%	+7%	10%	10%	+2%
Alternative 2					
Total Visitor Days	1,642 *(892+750=1,642)*	379	9,290	138	11,449
Service Days	750	0	0	0	750
Percent of total	46%	0%	0%	0%	7%
Percent Change from Current	+4%	+7%	10%	10%	+9%
Alternative 3					
Total Visitor Days	1,482 *(892+590=1,482)*	379	9,290	138	11,289
Service Days	590	0	0	0	590
Percent of total	40%	0%	0%	0%	5%
Percent Change from Current	-6%	+7%	10%	10%	+7%
Alternative 4					
Total Visitor Days	2,342 *(892+1,450=2,342)*	379	9,290	138	12,149
Service Days	1,450	0	0	0	1,450
Percent of total	62%	0%	0%	0%	12%
Percent Change from Current	+49%	+7%	10%	10%	+16%

Alternative 1

There would be no cumulative effect on recreation in the Alta Lake area with Alternative 1 and the past, present, and reasonably foreseeable future actions since the overall number of recreationists would be nearly unchanged. No pack and saddle outfitter-guide permits would be issued which would result in a reduction of 730 use days from the recently permitted numbers (3% of current use). There would be a 50% reduction in the number of pack and saddle stock

users, so those riding horses would see fewer other riders. Trails and roads would still be available, so the distribution of people would change very little. The overall decrease would likely not be noticed by the people recreating there, but the number of encounters between and with saddle stock users would be noticeably smaller.

Alternative 2

The cumulative effect of this alternative when added to past, present, and reasonably foreseeable future actions on recreation activities in the Alta Lake area would be an increase in the overall number of people recreating (about 9%), with pack and saddle stock use decreasing by 4%. Trails and roads would still be available, so the distribution of people would change very little. The overall increase would not likely be noticed by the people recreating there.

Alternative 3

The cumulative effect of this alternative when added to past, present, and reasonably foreseeable future actions on recreation activities in the Alta Lake area would be a 7% increase in the overall number of people recreating, but a 6% decrease in the number of saddle stock uses over the next decade. Trails and roads would still be available, so the distribution of people would change very little. The overall increase would be unnoticeable by the people recreating there, but the number of encounters between and with saddle stock users would be smaller.

Alternative 4

The cumulative effect of Alternative 4 and the past, present, and reasonably foreseeable future actions would be the largest increase in overall recreation use, compared to Alternatives 1, 2 or 3. There would be approximately 16% more visitor days in the entire area, and 49% more pack and saddle stock riders. The increase in the number of riders would make the trails and viewpoints more crowded, but the overall use would be distributed on the roads and trails. The anticipated overall increase in visitor days would likely be noticed since it would be concentrated on the roads and trails in the sub-unit.

Consistency Findings

Other than the Forest-wide findings at the end of this recreation section, no management area specific findings are required because the management areas in the Alta Lake Sub-Area contain no standards and guidelines specific to recreational use.

CONSISTENCY FINDINGS

All alternatives would be consistent with the Forest Plan standards and guidelines for the respective management areas. Standards and guidelines specific to particular sub-units are discussed at the end of each section. The standards and guidelines pertaining to all sub-units are discussed below.

8-10: Annual review of recreation special use authorizations shall emphasize health, safety, and resource protection (page 4-38).
Annual performance evaluations are conducted with all pack and saddle stock outfitter-guides. A copy of the evaluation form is in the analysis file. Refer to the discussion of outfitter evaluation in section 3.1 Outfitter-Guides (page 3-15).

8-11: Recreation special use authorizations shall conform with the goals of the Management Area (page 4-39).
As discussed in the discussion of each sub-unit, all alternatives comply with management area-specific standards and guidelines. Complying with the standards and guidelines ensures conformation with the management area goals.

8-12: Give priority to authorizations needed to provide public service.
The continued demand for pack and saddle stock outfitter-guide services demonstrates the public service the outfitters provide.

3.4 SOIL RESOURCES

The section below is a summary of the Soils Report which is available in the project analysis file (Davis 2012).

REGULATORY FRAMEWORK

Regional soil quality standards were developed to provide a consistent approach to monitor and identify detrimental soil disturbance (USDA Forest Service 1996d, updated1998). Although these standards were developed specifically to monitor disturbance from timber harvest activities, the concepts and principles can be applied to other activities such as outfitter-guide operations. The units of measures necessary to determine the level of soil effects are as follows:

- soil compaction—acres of compacted bare mineral soil;
- soil displacement—acres of "off-site" eroded soil material (eroded soil material buries grass or shrub root crowns);
- grazing practices trigger soil erosion—ocular evidence of surface and overland flow ;
- soil effects at stream crossings— ocular analysis of denuded stream banks and evidence of loss of riparian stream bank vegetation.
- soil erosion from livestock watering areas –- ocular evidence of trampling and surface runoff.

Standards and guidelines from the forest plans give the management direction for soils.

<u>Okanogan Forest Plan:</u>

Forest-wide standard and guideline that can pertain to impacts from pack and saddle stock outfitter-guide activities:

- 13-7 Rehabilitate soil productivity, water quality, and land following any management activities that result in long-term site degradation to meet the goals of the Management Area.

Management Area 15B has the following standards and guidelines pertaining to soils:

- MA 15B-13A Displacement and erosion of soil resulting from human activity shall be limited to a rate that closely approximates the natural processes.

- MA 15B-13B Soil compaction from human activities should not prevent natural plant establishment and growth except at some campsites, administrative facilities, and in designated tread.

- MA 15B-22B Vegetation loss should not exceed 400 square feet (one percent of any acre) at any impacted site.

Wenatchee Forest Plan

No forest-wide standards and guidelines on soils pertain to outfitter-guide activities. The following standards and guidelines pertain to Wilderness Recreation Opportunity Spectrums where the pack and saddle stock outfitter-guides operate:

Primitive

- Area of vegetation loss, and compacted bare mineral soil at any campsite should not exceed 400 square feet.

- Displacement and erosion of soil resulting from human activity will be limited to a rate that approximates natural processes.

- Soil compaction should not exceed limits which will prevent natural plant establishment and growth except at well established campsites.

Semi-Primitive

- Area of vegetation loss, and compacted bare mineral soil at any campsite, should not exceed 625 square feet.

- Displacement and erosion of soil resulting from human activity will be limited to a rate that approximates natural processes.

- Soil compaction should not exceed limits which will prevent natural plant establishment and growth, except at desired campsites, and in designated trail treads.

Transition

- Area of vegetation loss, and compacted bare mineral soil at any campsite, should not exceed 1000 square feet.

- Displacement and erosion of soil resulting from human activity will be limited to a rate that approximates natural processes.

- Soil compaction should not exceed limits which will prevent natural plant establishment and growth, except at desired campsites, and on designated trail treads.

ANALYSIS METHODS

Soil conditions were evaluated in terms of soil compaction and displacement, grazing practices that trigger detrimental soil erosion, soil effects at stream crossings, and soil erosion at pack and saddle stock watering areas. A combination of qualitative and quantitative methods were used. The soil scientist visited a sampling of impacted areas, and conducted compaction surveys, and gathered qualitative information about the soil condition.

The methodology described above is the best available to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on the soil resource.

AFFECTED ENVIRONMENT

Historical Disturbance Factors

The volcanic ash soils in the analysis area have moderately high level of resiliency, yet with prolonged or intense disturbance to surface vegetation, detrimental soil compaction, displacement, and erosion can occur. Current soil conditions are a result of those past or current events that have hindered the vigor of surface vegetation. The two principal disturbance elements that have had a great influence on soils and surface vegetation are historic livestock grazing and natural wildland or human-caused fires. Historic sheep grazing effects on soils are most noticeable in upper subalpine and alpine meadows while the effects of wildland fires can be observed across the analysis area.

Grazing Effects

Historic livestock grazing, in particular by sheep, altered soil condition throughout the analysis area. Sheep bands grazing through the Pasayten and Lake Chelan-Sawtooth Wilderness Areas and in the Sawtooth Backcountry and the associated herder activities resulted in compacted, unvegetated livestock driveways and herder camps. The effect of these early grazing practices on soils continues to be noticeable.

To support the sheep operations, numerous mountain trails were built. Many of these trails exist today as Forest Service system trails. Other trails were constructed to provide access to sheepherder camps and grazing sites. These camps were severely hardened by use. Many of these camps continue to be used today by the recreating public and outfitters. Due to the level of historic and continuing use, these hardened campsites are still devoid of vegetation cover. Most of the camp areas predate the current Forest Plans and exceed current plan standards for compacted bare mineral soil and vegetation loss (barren core) for camp areas. Numerous sheep

driveways were constructed to enable sheep bands to access key use grazing areas. Often these driveways provided the most direct route to key use areas and were steep. Concentrated surface runoff normally occurs on these steep driveways, segments which are still devoid of vegetation.

Much of the historic sheep grazing effects occurred prior to the formation of formal Forest Service grazing allotments. Hence, much of this historic sheep grazing was unregulated and predated land management planning and current standards. Early grazing practices often started as soon as the snow melted and continued until snowfall. The volcanic ash soils were just too soft during the early seasons to support repeated hoove action. Due to the vast numbers and timing of historic sheep grazing, trailing patterns and a terraced landscape are prominent in some subalpine and alpine meadows. Vegetation recovery on these areas has been slow due to harsh climatic conditions. Some localized meadow sites are still in poor vegetative health with severely pedestalled plants and exposed mineral soil (USDA Forest Service 1980 and 1998c). Two such areas of degraded adverse vegetation and soil conditions include the cirque basin containing Bernice Lake in the Lake Chelan-Sawtooth Wilderness and the cirque basin on the south side of Amphitheater Mountain in the Pasayten Wilderness. Terraces in these locations are continuing to enlarge and unravel. Current vegetation cover is not adequate to retard surface soil erosion in these two locations. Detrimental soil displacement is readily apparent in these locations. Wildlife continues to use these paths and terraces but not outfitter-guide pack and saddle stock; it is likely these features remain as permanent fixtures in meadows but not as a result of permitted pack and saddle stock use.

With the elimination of grazing in these historic sheep grazing allotments, plant communities have been recovering. Vegetation recovery has reduced soil effects from overland flow and raindrop impacts. With new emerging vegetation, with exception of the most severe locations at the highest elevations, eroded material is stabilized close to the source. The historic hardened campsites are still void of vegetation because of the constant recreation use, including permitted pack and saddle stock use. However, these sites are nearly flat and surrounded by vegetative cover which traps and stabilizes any eroded material. Watershed scale detrimental soil disturbances are essentially immeasurable.

Most of the historic trails that became system trails and are still used today have improved drainage features which have essentially eliminated detrimental soil erosion. Typically there is enough trail side vegetation to trap and stabilize eroded material close to the trails. Off-site sedimentation to streams is extremely low.

Some livestock grazing occurs in the lower elevations of the analysis area outside wilderness. These operations are relatively recent and are small scale. Grazing is closely monitored as required by allotment management plans and little detrimental soil disturbance has been observed.

Presently no commercial grazing is authorized in the historic sheep ranges. All of the grazing allotments within the Pasayten and Lake Chelan-Sawtooth Wilderness Areas are vacant, closed, or going through the closure process. This means that the Forest Service will no longer consider large scale permitted livestock operations in these areas.

Wildland Fire Effects

Wildland fires in the analysis area are a natural process and have occurred at predicted intervals for centuries (USDA Forest Service 2004b). Since 1919, most of the analysis area has experienced wildland fires (USDA Forest Service 2003a). Some areas have actually re-burned. Wildland fires have had a pronounced influence on vegetation structure and some effect on soil conditions. According to Burned Area Emergency Reports (BAER), adverse soil effects from recent wildland fires are limited to high and some moderate severity burns (USDA Forest Service 2001e, 2002 and 2003a). Typically high and moderate severity burns occurred in the mid-elevation ranges of the analysis area which is usually dominated by dense seral stands of lodgepole pine.

Though over 380,000 acres have burned in the last 5 years, only a portion burned with moderate to high severity. Most of these areas occurred in the Andrews and Farewell drainages of the Pasayten Wilderness. High severity fires caused 100 percent mortality and surface fire temperatures were more than enough to remove fine litter duff and volatize organic matter and nutrients at the soil surface (USDA Forest Service 2003a and Hungerford et al. 1991). The decline in organic matter content in soils has a long-term effect of reducing the nutrient capital for at least 30 years.

Nevertheless, even high severity fire areas typically have understory vegetation recovery within five years (USDA Forest Service 2004b). The critical period for adverse sheet erosion effects occurs within the first three years following high severity fires. During this period, concentrated runoff can trigger sheet erosion and even debris slides. Debris slide risk can continue for ten years following high severity fires, often associated with loss of root strength and tree wind throw. Isolated areas of sheet erosion and debris slides have occurred in burned areas across the analysis area over time.

Pack and Saddle Stock Outfitter-Guides

The current pack and saddle stock outfitter-guides are having minor, isolated impacts on soil conditions in campsites, trails, and at stock watering and grazing locations, as described below. These areas, with the exception of the assigned campsites and base camps, are also used by non-outfitted recreationists.

Soil Compaction and Displacement

Soil compaction has occurred from historic sheep grazing. Old sheep driveways, trails, and camps have detrimentally compacted bare mineral soils. Nearly all wilderness campsites used by pack and stock users still exceed the standard for barren core. The average amount of barren core at established campsites used by the pack and saddle stock outfitter-guides is 1,663 square feet in the Pasayten and 602 in the Lake Chelan-Sawtooth. There is no barren core limitation at campsites outside wilderness.

The following table shows analysis for barren core based on the recreation site inventory completed in 2011 and 2012. Approximately 344 sites without any barren core were excluded from this analysis. These were un-established trace sites and sites that have fully recovered.

Figure 3-4-1. Percent of Established Campsites Exceeding 400 and 1,000 Square Feet of Barren Core and With More than Four Damaged Trees in Pasayten and Lake Chelan-Sawtooth Wildernesses

	Pasayten Wilderness		Lake Chelan-Sawtooth Wilderness	
	All sites	Sites Used by Pack and Saddle Stock Outfitter-guides	All sites	Sites Used by Pack and Saddle Stock Outfitter-guides
Sites exceeding 400 sq. feet	46%	68%	41%	27%
Sites exceeding 1,000 sq. feet	23%	40%	16%	25%
Average Barren Core	775	1,663	630	602

The campsites most frequently used by the pack and saddle stock outfitter-guides are the largest, although campsite monitoring completed in the 2011 and 2012 seasons show a reduction in barren core at several sites. The following tables show the campsites in the Pasayten and Lake Chelan-Wilderness areas which exceeded 2,800 square feet. Where data exist, the change in the amount of barren core at each site recorded between 1989 and 2002 is compared to the most current data. Many of the sites had not been surveyed prior to the monitoring completed in 2011 and 2012. The information for campsites with less than 2,800 square feet of barren core is included in the analysis file. Appendix A includes a complete list of campsites consistently used by the outfitters, and the amount of barren core in each.

Figure 3.4-2. Established Camps in the Pasayten Used by Outfitter Guides With Over 2800 Square Feet of Barren Core.

Camp Name	Square Feet of Barren Core (from monitoring completed from 1989 to 2002)	Square Feet of Barren Core (from monitoring completed in 2011 and 2012)	Comments
3 Fools	No Data	2,800	Used occasionally by outfitters for full-service and drop camps
Bald Mountain*	No Data	3,900	Used by outfitters for full-service and drop camps
Beaver Creek*	8,038	6,747	Used by outfitters as full-service camp site.
Charlie Brown	15,239	1,870	Used by outfitters for full-service and drop camps
Chandler	9,181	60	Used by outfitters as a drop camp
Chewuch	No Data	3,000	Used by outfitters as a drop camp
Corral Lake	No Data	3,500	Used by outfitters as a drop camp
Cougar Lake	No Data	2,916	Used regularly by the general public as well as outfitters.
Crow Lake*	No Data	9,610	Used by outfitters as full-service camp site.
Crow Lake 2	No Data	7,000	Recreation camp, not used regularly by outfitters
Fred's Lake	No Data	5,400	Used occasionally by outfitters for full-service and drop camps
Goat Lakes Basin 2	2,650	3,000	Used occasionally by outfitters for drop camps
Peeve Meadow	5,500	5,640	Used occasionally by outfitters for drop camps
Sheep Mountain*	19,368	8,879	Used by outfitters as full-service camp site.
Spanish Creek	6,000	60	Recreation camp, not used regularly by outfitters
Tatoosh	3,316	900	Used by outfitters as full-service camp site
WhistlerBasin	No Data	4,020	Used occasionally by outfitters for full-service and drop camps
Whistler Camp*	9,906	3,254	Used by outfitters as full-service camp site

Figure 3.4-3. Established Camps in Lake Chelan-Sawtooth used by Outfitter Guides with over 2800 square feet of Barren Core

Camp Name	Square Feet of Barren Core (from monitoring completed from 1989 to 2002)	Square Feet of Barren Core (from monitoring completed in 2011 and 2012)	Comments
Bike West	No Data	2,900	Used occasionally by outfitters for full-service and drop camps
Cascade Creek	21,000	NA	Unable to locate the site, as the area burned very hot in early 2000's. No longer accessible to stock.
Muleshoe 2	9,134	3,000	Used occasionally by outfitters for full-service and drop camps
Muleshoe North	No Data	4,200	Used occasionally by outfitters for full-service and drop camps
Prince 4 Mile	5,600	0	Historically used by outfitters for full-service camps. Burned in 2003. Little to no recent use
Surprise	No Data	3,500	Used occasionally by outfitters for full-service and drop camps
Twin Springs 1	12,245	3,071	Used occasionally by outfitters for full-service and drop camps

All campsites are nearly flat with fairly dense adjoining understory or ground vegetation. Little evidence of surface runoff or eroded soil was readily apparent, so no additional soil displacement would be expected. Surrounding vegetation would trap and stabilize any eroded material that did occur.

In the Pasayten Wilderness, there are approximately 117,694 square feet collectively in all the campsites consistently used by the pack and saddle stock outfitter-guides (Appendix A). This converts to approximately 2.7 acres. There are approximately 798 miles of system trail in the Pasayten, which converts to approximately 376 acres. Adding these together, outfitter-guides use approximately 378.7 acres of bare, compacted soil in the Pasayten Wilderness., or 0.07% of the total area.

In the Lake Chelan-Sawtooth Wilderness, there are approximately 48,534 square feet of barren core in the outfitter camps, or 1.1 acre (**Appendix A**). There are approximately 152 miles of system trail, which converts to approximately 71.6 acres. Adding these together, outfitter-guides use approximately 72.7 acres of bare, compacted soil in the Lake Chelan-Sawtooth Wilderness, or 0.05% of the total area.

Outfitter-guides also use barren core areas in campsites and trails in the other portions of the analysis area. There is no field data about campsite barren core outside wilderness since there is no standard and guideline limiting the amount. Having the exact information is not necessary to determine the effects of pack and saddle stock outfitter-guides because the amount of area because it no foreseeable significant impacts exist from the pack and saddle stock outfitter-guide activities. The information is not essential to a reasoned choice among alternatives since there is no difference in the amount of barren core the outfitter-guides would use in the

alternatives. The total amount of barren core in campsites is a very small percentage of the each sub-area. Since campsites are located on flat, or nearly flat ground, and surrounded by ground vegetation, very little soil would erode from the barren areas. Any that does would be trapped by the vegetation before reaching waterways, or be quickly dissipated by flowing water. The estimates of barren core calculated with the specific barren core information from the wilderness campsites are adequate to make this determination. More precise data concerning barren core outside wilderness is not necessary.

Pack and saddle stock outfitter-guides use existing system trails to access campsites, and local social trails in and around the camps. Pack and saddle stock compact and displace soil in the trail tread as they move along the trails. The trails are designed to minimize erosion, and drainage structures are constructed and maintained to channel water off the tread into surrounding vegetation before it damages the trail, or reaches waterways. The stock also create braided trails when they leave the established tread to avoid wet areas or obstacles in the trail. These isolated spots are addressed through trail rerouting or trail structure construction as funding allows.

The average amount of barren core in full-service campsites in the Pasayten and Lake Chelan-Sawtooth wildernesses is 1,640 square feet and the average size in drop camps is 888 square feet. Applying these averages to the campsites consistently used by the pack and saddle stock outfitter-guides in the other sub-units generates an estimate of the number of acres of campsite barren core. The actual amount of barren core could be larges since there is no party size limitation outside wilderness. Refer to Appendix A for a list of campsites in each sub-area.

There are 15 drop camps and 1 full service camp in the North Cascades, which calculates to approximately 14,960 square feet, or 0.3 acres of barren core. There are approximately 150 miles of system trail in this area, or approximately 70.6 acres. This is approximately 0.06% of the total sub-area.

In the Sawtooth Backcountry, there are 9 drop camps and 8 full service camps, with approximately 21,112 square feet, or 0.5 acres of barren core. There are approximately 60 miles of trail in this area, or approximately 28.3 acres. The total of these is approximately 0.08% of the Backcountry.

There are no established campsites in the Middle Methow. The outfitter-guides do use the trails leading from the trailheads into the Lake Chelan-Sawtooth Wilderness or Sawtooth Backcountry. There is one established campsite in the Bear/Ramsey/Volstead area used as a drop camp, but no system trails used by the outfitter-guides. The Alta Lake area does not have any established campsites, but the outfitter-guide uses approximately 17 miles of trail, totaling approximately 8 acres, or 0.2% of this sub-area.

Detrimental compaction of bare mineral soil in either wilderness from the other permit activities, such as areas where stock are allowed to loose graze, is essentially immeasurable and hence not identified.

When compared to the acreage of the entire area, the detrimental soil compaction of camp areas, trails, and meadows is not consequential; normal watershed hydrologic functions have not been impaired. The small amount of soil erosion occurring from these areas approximates

natural processes since it is isolated, and either captured by surrounding ground vegetation, or quickly dissipated by flowing water in streams.

Grazing Practices Triggering Soil Erosion

The outfitter-guides use two methods for caring for stock on overnight trips into wilderness and the backcountry; stock containment and loose grazing. Stock containment refers to tying stock to trees for short durations, tying to hitch rails or high lines, picketing stock, or holding them in a corral. Loose grazing is a technique where the stock are let loose to graze.

Soil in stock containment areas are typically devoid of vegetation, compacted, and displaced. Stock also use these areas to take dust baths by rolling, contributing to bare ground. Long periods of containment can generally be equated to more impacts because it concentrates impact and contributes to restless behavior (Leave No Trace, 2001). These containment areas are located within camps, and counted as part of the camp's barren core. Very little to no off-site erosion occurs from these containment areas because they are usually flat and surrounded by ground vegetation that captures soil movement (McClaran and Cole 1993).

Loose grazing is often the method used by outfitters in camps they frequent, such as the assigned sites. The outfitter identifies areas with sufficient graze typically within one to two miles of camp, depending on the location of the camp. These areas are carefully selected to move stock well away from other campsites and private stock. Horses and mules stay together in the grazing areas, although they graze in a dispersed pattern. Stock spend most their time in continuous movement across the land, eating grasses as they go (Ransom and Cade 2009). The stock form a loose herd, always nearby each other, but not tightly congregated.

When water is readily available as it is in most places in the wilderness, horses do not gather at specific sites to drink as in desert environments (Salter and Hudson 1979). Typically free-ranging horses move rapidly to and from water sources with very little feeding or loafing activities near drinking areas (Ganskopp and Vavra 1986). They prefer open areas and elevated terrain away from water and thick brush to get away from insects (Keiper and Berger 1982) and to be able to assess potential threats from predators (Ganskopp and Vavra 1986). They avoid muddy areas because they instinctually do not want to be mired in mud, and simply because they prefer to keep their feet dry.

Soil disturbance is greater in areas where pack stock are confined than in larger areas where stock area allowed to graze freely (McClaran and Cole 1993). The loose grazing pattern results in very little soil disturbance. When the animals move from the campsite to the grazing area, they do create trails where the soil is compacted. Once the animals reach the grazing area, they spread out and disperse. The animals are not concentrated in small areas, such as the stock containment areas described above. Loose grazing results in fewer impacts to the soil and vegetation than other methods of grazing stock such as picketing or electric fences (McClaran and Cole 1993). The constant movement of the animals prevents concentrated soil disturbance.

The animals also spend most of their time on dry, well vegetated hillsides, away from muddy areas and water. Dry, well drained soils with continuous vegetative cover are less susceptible to soil compaction and shearing (Warren et al. 1986), so there are virtually no long term impacts to the soil as a result of loose grazing.

Soil Effects at Stream Crossings
Trail stream crossings are spots where soil compaction and displacement occurs, and where erosion can impact water quality. Current pack and saddle stock outfitter-guides use trails to access campsites, so contribute to impacts at these crossings. These crossings occur infrequently along streams, and any sediment entering the water is quickly dispersed, with water quality returning to normal once the animal or person exits the water.

According to the Recreation Activity Review (**Appendix F**), most stream banks in the area are well-vegetated, stable, and meet Plan standards and guidelines. One exception is the stream flowing into Remmel Lake where a large camp has resulted in trampled riparian vegetation. An approximately 6 foot section of the bank on either side of the creek (12 feet total) was disturbed near the trail crossing. The stream gradient is low at this site, and this trail crossing is often boggy throughout the season. Stock try to avoid the mud at this location, resulting in a larger disturbed area than the typical width of a trail. However, impacts are isolated to the immediate 12 foot area near the trail crossing. The streambank above and below this area is in pristine condition, with no disturbance to the bank or vegetation along the creek.

Soil Effects at Stock Watering Locations
Some soil erosion is occurring at watering locations for outfitter-guide stock. Outfitted pack and saddle stock disturb streambanks and riparian areas at watering spots near trail crossing areas and campsites. Unavoidable trampling occurs at these spots, exposing bare soil and causing alternations of the stream banks. Areas above and below these disturbance areas are in pristine condition, with no sign of human or stock use, intact streambanks, and established vegetation (refer to stream survey reports in the analysis file). This erosion is not affecting water quality beyond the isolated, local areas due to relative small size and infrequent occurrence.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

There would be no pack and saddle stock outfitter-guides with implementation of Alternative 1, so outfitters would no longer have any impact on soils, including soil compaction, displacement, from grazing, at stream crossings, or at stock watering locations.

Soil Compaction
Soil Compaction and displacement at established campsites would continue because non-outfitted recreationists would continue to use the campsites. The size of the barren core areas shown in Figures 3.4-2 and 3.4-3 could decrease due to the overall decrease in total use and more specifically, pack and saddle stock use. This would reduce the total amount of compacted

and displaced soil associated with campsites. The amount of compacted soil in trails would not change.

Grazing Practices Triggering Soil Erosion

Outfitter-guide pack and saddle stock would not cause any soil erosion within stock containment areas in campsites, and would have no impacts to soil from loose grazing. There could be a slight reduction in impacts from grazing, both in stock containment areas within camps, and in areas currently used by loose grazing outfitted stock, because of the reduction in the number of pack and saddle stock across the analysis area. The change would be immeasurably small, however, since the current impacts are so slight. There would continue to be virtually no erosion from stock containment areas because they are generally flat and surrounded by ground vegetation that traps soil eroding from the bare areas. There are no impacts from loose grazing by outfitted stock, so there would be no change from the current condition in those grazing areas.

Soil Effects at Stream Crossings

Erosion at trail stream crossings would continue, but would decrease from the current condition because of the 15% reduction in the number of pack and saddle stock using the trail system. .

Soil Erosion from Pack and Saddle Stock Watering Areas

Soil erosion from public pack and saddle stock use would continue. This erosion would not affect water quality beyond the isolated, local area due to relative small size and infrequent occurrence.

Alternatives 2, 3, and 4

Mitigation Measures

Some of the mitigation measures listed in Chapter 2 would avoid or reduce impacts to soil. They would be effective since they would all be included in the annual operating plans for the pack and saddle stock outfitter guides. Compliance would be addressed through permit administration. These are discussed below.

- 1b. Developing Camp Management Plans for the assigned sites would reduce potential impacts to soil by tracking existing barren core, and ensuring no additional barren core is forming. Identifying unneeded barren core would allow these areas to revegetate, reducing overall soil impact. There is a high likelihood that this would prevent additional soil damage, and allow some recovery of compacted areas.

- 1c&d. Limiting the amount of barren core that the outfitters could use in established campsites would reduce impacts to soil by allowing excess barren core to revegetate. The Camp Management Plans for these larger sites would help track barren core and ensure compliance with limitations. This mitigation would be effective in controlling pack and saddle stock outfitter-guide impacts to soil, but since these camps are also used by the public, impacts could continue because of non-outfitted use patterns.

- 1e. Prohibiting pack and saddle stock outfitter-guides from increasing the amount of barren core in any campsite would eliminate the possibility of addition soil impacts. This mitigation would be effective

- 1g. Prohibiting outfitters from creating new campsites would eliminate the possibility of additional soil damage at currently undisturbed sites.

- 6a&b. Limiting pack and saddle stock outfitter-guides to using only existing trails with well-established tread, and prohibiting the construction or maintenance of unauthorized trails would eliminate the potential for new soil displacement and compaction from new trails

- 8a. Encouraging loose grazing for stock would reduce impacts to soil in stock containment areas in campsites by limiting the amount of time the stock are contained. This would be only be moderately effective in reducing soil impacts since soil impacts in containment areas would still occur.

- 8b. Locating stock containment facilities (corrals, hitch rails, high lines) in areas where off-site impacts to soil would be minimized would prevent soil additional soil damage, compacting, and displacement

- 8d. Prohibiting overnight picketing of stock in subalpine meadows would allow stock to move freely, avoiding any impacts to soil caused by stock staying in one spot and by dispersing the animals.

- 10a. Prohibiting the cutting or removing of green trees and other live vegetation, and requiring efforts to minimize trampling or damaging vegetation would prevent soil damage that would occur if an area becomes devegetated.

- 10b. Requiring soils displaced by activities such as latrine construction or pawing by stock to be replaced or smoothed out would be moderately effective in repairing soil damage. Potential benefits would be limited to areas where the disturbance does not occur again.

- 10c. Establishing stock travel routes through wetlands would minimize soil compaction and displacement that would occur with braided trails or widening tread to avoid water. This would by minimally effective since stock are typically unsupervised when traveling to grazing areas, and could easily get off established trails.

Soil Compaction

The level of soil compaction in any of these alternatives would be similar to Alternative 1. Forest Plan amendments included in Alternatives 2, 3, and 4 concerning the allowable amount of bare mineral soil in outfitter-guide camps in the Pasayten Wilderness and Lake Chelan-Sawtooth Wilderness, in conjunction with camp management mitigation measures, would result in a reduction in the amount of compacted bare mineral soil associated with existing outfitter camps in Alternatives 2 and 3, and would result in no increase with Alternative 4. It is expected that over time, unused areas under Alternatives 2 and 3 would recover with protective vegetation cover. The amount of time for the recovery would depend on the microclimate at the campsite location and use by non-outfitted recreationists.

The Forest Plan amendment concerning the use of campsites within 200 feet of meadows, streams, lakes, and key interest areas would be nearly consistent among the alternatives. In Alternatives 2 and 4, the pack and saddle stock outfitter-guides would be allowed to use existing campsites within this zone, so the existing condition and amount of soil compaction would not change except that the size of the camps within 200 feet would be limited. In Alternative 3, the outfitters would be prohibited from using campsites within 200 feet of wetlands, streams, lakes, or key interest areas so would not have camping impacts within these areas.

The total amount of compacted bare mineral soil in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas would be somewhat reduced from the current condition. **Figure 3.4-4** lists the campsites with over 2,800 square feet of barren core, and the amount that would be used by the outfitters in the three alternatives. Overall, the amount of barren core the outfitters could use in the Pasayten would be 105,571 square feet, or 2.4 acres in Alternative 2; 38,029 square feet, or 0.9 acres in Alternative 3; and 117,694 square feet or 2.7 acres in Alternative 4 (Appendix A). In the Lake Chelan-Sawtooth, the amount of barren core used would be the same in Alternatives 2 and 4 since no campsite has over 5,250 square feet of barren core. The outfitters could use a total of 48,534 square feet, or 1.1 acres in 2 and 4; and 30,660 square feet, or 0.7 acres in Alternative 3 (Appendix A). All existing barren core in campsites with less than 2,800 square feet currently would be used by the outfitters in each alternative. The current amount of compacted and displaced soil in trails would not change with any alternative, nor would the amount of barren core in campsites outside wilderness, since there would be no limitation on barren core in these campsites. When compared to the acreage of the analysis area, camp areas and trails would be inconsequential; normal hydrologic functions would not be impaired.

Figure 3.4-4. Established Camps in the Pasayten used by Outfitter Guides with over 2800 square feet of Barren Core Existing, Compared to Amount Available to Outfitters in Alternatives.

Camp Name	Existing Square Feet of Barren Core	Square Feet of Barren Core Outfitters Could Use		
		Alternative 2	Alternative 3	Alternative 4
3 Fools	2,800	2,800	No OG Use	2,800
Bald Mountain	3,900	3,900	No OG Use	3,900
Beaver Creek	6,747	5,250	No OG Use	6,747
Chewuch	3,000	3,000	No OG Use	3,000
Corral Lake	3,500	3,500	2,800	3,500
Cougar Lake	2,916	2,916	2,800	2,916
Crow Lake	9,610	5,250	2,800	9,610
Crow Lake 2	7,000	5,250	2,800	7,000
Fred's Lake	5,400	5,250	No OG Use	5,400
Goat Lakes Basin 2	3,000	3,000	2,800	3,000
Peeve Meadow	5,640	5,250	No OG Use	5,640
Sheep Mountain	8,879	5,250	2,800	8,879
Whistler Basin	4,020	4,020	No OG Use	4,020
Whistler	3,254	3,254	2,800	3,254

Figure 3.4-5. Established Camps in the Lake Chelan-Sawtooth used by Outfitter Guides with over 2800 square feet of Barren Core Existing, Compared to Amount Available to Outfitters in Alternatives.

Camp Name	Existing Square Feet of Barren Core	Square Feet of Barren Core Outfitters Could Use		
		Alternative 2	Alternative 3	Alternative 4
Bike West	2,900	2,900	2,800	2,900
Twin Springs 1	3,071	3,071	2,800	3,071
Muleshoe 2	3,000	3,000	2,800	3,000
Muleshoe North	4,200	4,200	2,800	4,200
Silver Lake	4,540	4,540	No OG Use	4,540
Surprise	3,500	3,500	No OG Use	3,500

Soil Displacement

Most of the soil displacement in the analysis area is a result of past grazing and wildfires. This displacement is slowing stabilizing with emerging vegetation on stock driveways and burned areas. The pack and saddle stock outfitter-guide operations included in Alternatives 2, 3, and 4 would result in little, if any soil displacement. Nearly all displacement that occurs in camps, at stock watering areas, or along trails would be trapped by surrounding understory vegetation.

Grazing Practices Triggering Soil Erosion

The pack and saddle stock outfitter-guides would continue to use a combination of loose grazing and stock containment in Alternatives 2, 3, and 4, and the effects would be similar to the existing condition. Soil in stock containment areas within camps would be compacted and displaced, but there would be little to no erosion from these areas because they are relatively flat and surrounded by ground vegetation that would capture any eroding soil. Areas where the stock loose graze would have virtually no soil impacts because of the dry soil and vegetative cover. Stock traveling through wetlands to reach grazing areas would compact and displace the soil within the trails, but impacts to soils would be reduced somewhat by the requirement to establish the travel routes. Stock could still travel outside the established routes, so some soil damage could occur. These impacts would be too small and isolated to change conditions on the ground, and would approximate natural processes. The grazing would not prevent plant establishment or growth outside the stock containment areas.

Recovery from historic sheep operations would be a slow process due to the level of past disturbance and locally harsh climatic conditions. Hence, there is no discernible difference for grazing practices that trigger soil erosion between any alternative.

Soil Effects at Stream Crossings

Soil effects at trail stream crossings would be similar to current conditions. . Most stream banks are well-vegetated, stable, and meet Forest Plan standards and guidelines. Alternatives 2, 3, and 4 would not further degrade stream banks at existing stream crossings or channel bedding characteristics since pack and saddle stock outfitter-guides would be restricted to using existing campsites and existing trails. At most stream crossings, banks already lay back and are at least six feet wide. These crossing are common and were likely the travel routes of historic sheep bands. The continued use of these stream crossings would not degrade stream reaches. The crossing areas are not expected to expand as a result of pack and saddle stock outfitter-guides since the current number of recreation visitor days associated with pack and saddle stock would only increase slightly with Alternative 2, decrease by 6% in Alternative 3, and increase by 8% in

Alternative 4, compared to the existing levels. The changes are simply not big enough to change the conditions on the ground.

Soil Erosion from Pack and Saddle Stock Watering Areas
The overall level of soil effects at stock watering areas would be similar to the current condition and Alternative 1. There could be slight changes in the collective size of the stock watering areas, because of the variations in stock days with the various alternatives. The number of stock watering at one time is the biggest influence on the amount of disturbed area at stock watering locations. Therefore, Alternative 3 would have the potential for the most reduction because of the reduced party size. The mitigation measure requiring camp management plans for assigned pack and saddle stock outfitter-guide camps would specifically address operations in pack and saddle stock watering areas. In addition, travel routes between camps and loose grazing areas would be managed to minimize the number of trails. This measure would s reduce soil trampling damage resulting from pack and saddle stock outfitter-guide activities at watering areas and from camps to watering areas.

Some soil erosion from pack and saddle stock use would continue, so soil erosion would occur at some of these wet soil/meadow watering areas. The erosion would not affect water quality beyond the isolated, localized areas due to their relative small size and infrequent occurrence.

Cumulative Effects

The spatial boundary for this cumulative effects analysis is the entire analysis area; soils don't generally move from the general area (although transportation by water is covered in the water section below). The temporal boundary is from the early 1900s through approximately 2123, 50 to 100 years after the expiration of the 10 year permits, when any soil damage caused by the pack and saddle stock outfitter-guides, and not perpetuated by other activities, would have recovered by natural processes.

Reasonably Foreseeable Future Actions
Public use and other outfitter-guide activities would continue in camp areas and user trails, consequently the total square feet of compacted bare mineral soil in camps, trails, and driveways would continue. There would be an increase of approximately 30% in overall, non-outfitted recreation use in the analysis area, however the number of people using pack and saddle stock is expected to decline (IAC Committee on Outdoor Recreation, 2003). This increase would perpetuate soil damage at existing recreation sites, and could lead to more impacted areas. Use on trails would also increase, and soil compaction and displacement from other trail users (hikers, horseback riders, trail bike riders, and mountain bikers) would increase slightly. The soil damage to trails in the Sawtooth Backcountry would be on a landscape scale, the increases will be minor because they would still be small and localized, and any soil disturbance would approximate natural processes.

The stream crossing near a large non-outfitted Remmel camp area will also continue to be void of vegetation due to continued use. The same would be true for other stream crossings in the analysis area. Due to the isolated nature, soil erosion at stream crossing would not cause degraded water quality beyond the immediate vicinity. Any erosion would not affect water quality beyond the isolated, local area due to relative small size and infrequent occurrence. Minor soil impacts in moist meadow areas is also expected to continue, but would not affect the

overall conditions due to the fact that use is isolated, and impacts only affect a small portion of the meadow area.

Trail maintenance would continue, including cleaning and reconstructing drainage structures as needed to minimize erosion and water channeling on trails.

Some livestock grazing would continue in the lower elevations of the analysis area. Grazing would be closely monitored as required by allotment management plans and little detrimental soil disturbance would occur. Permits would be managed to comply with Forest Plan standards and guides, including those pertaining to soils.

Non-outfitted pack and saddle stock use would have limited measurable effect on displacement since the areas that continue to pose a risk for accelerated surface erosion are associated with historic grazing sites or fire line construction. Grazing from permitted horse use would also be monitored to insure that grazing utilization does not exceed Forest Plan Standards. With the amount of subalpine and alpine meadows there are ample foraging areas for recreation livestock. Typically grazing use by recreation livestock would not be concentrated for any length of time.

Prescribed landscape burning would also continue. These prescribed burns would be designed and implemented with low fire severity and no detrimental soil disturbance effects are expected.

Wildland fires would occur in the future. High severity fires in some landform groups could increase debris slides events and flooding. This hydrologic response following wildland fires is a natural process that is well within the range of expected responses (USDA Forest Service 2003a). Fire suppression activities such as fire line construction with mechanized equipment would also continue. The firelines would be rehabilitated, but some erosion would occur before the vegetation recovers and the litter cover reestablishes. Adjoining vegetation communities trap and stabilize eroded material close to the source from these fire lines. Mitigation measures would be implemented for fire suppression activities. Based on this adverse “off-site” sedimentation is not expected from these fire lines.

There are no other reasonably foreseeable future actions that would have overlapping effects with the pack and saddle stock outfitter-guides.

Summary for Alternatives 1, 2, 3, and 4

The cumulative soil effects of Alternative 1, 2, 3, and 4, with all past, present, and reasonably foreseeable future actions are essentially the same. The cumulative differences between these four alternatives are so slight that the magnitude of difference is immeasurable. Hence, all four alternatives are evaluated together.

The cumulative effects of any of the four alternatives and all past, present, and reasonably foreseeable future actions would be that the total soil disturbance from trails, camps, stream crossings, wildland fires, and grazing areas would minor and scattered across the analysis area. The effects to soil from past grazing would continue to diminish over time, and the cumulative

impact of all reasonably foreseeable future actions, the alternatives, and the continuing recovery from grazing would be an improvement in soil conditions.

Wildfires could damage soil, but there would be no cumulative on-site soil disturbances from recreation or management actions that would adversely impact natural nutrient or hydrologic cycles that could lead to off-site effects. On-site nutrient cycles would not be altered to the point that the vigor of adjoining vegetation communities would be reduced. In addition, on-site soil compaction, displacement, or erosion would not alter natural soil hydrologic process and lead to accelerated erosion and sedimentation into streams since effects from recreation and the outfitter-guides would be small and isolated, and management actions would be designed with soil protection measures. The level of detrimental soil disturbance evaluated at the watershed scale is immeasurable.

CONSISTENCY FINDINGS

All alternatives would be consistent with Regional policy and Forest Plan standards and guidelines for achieving soil objectives.

The amount of soil compaction would be less that 0.1% of the total analysis area, and virtually no soil displacement or erosion would occur in campsites. Grazing practices would not trigger erosion. Soil erosion from stock containment areas would be captured by surrounding ground vegetation. Loose grazing would cause some soil trampling in travel routes through isolated wetlands leading to grazing areas, but these would not lead to surface or overland flow. Trail stream crossing would result in some erosion into waterways, but the sediment would be quickly dissipated by flowing stream water. There would be some erosion and evidence of trampling at stock watering locations, but these would not impact water quality because they would be isolated.
All alternatives would also comply with the Forest Plan standards and guidelines, as amended by the alternatives.

The standards and guidelines pertaining to vegetation loss, and compacted bare mineral soil would be amended with each alternative, and the corresponding alternative would comply with the amended standard.

<u>Okanogan Forest Plan:</u>

- 13-7 Rehabilitate soil productivity, water quality, and land following any management activities that result in long-term site degradation to meet the goals of the Management Area.
  The alternatives would not lead to long-term degradation of soil quality, with the exception of the barren core in campsites and along trails. These areas represent such a small portion of the overall landscape that soil productivity would not be impacted. No rehabilitation would be needed.

Okanogan and Wenatchee Forest Plans

- Displacement and erosion of soil resulting from human activity will be limited to a rate that approximates natural processes.
  None of the alternatives would cause displacement or soil erosion at rates greater than natural processes. Soil displacement would be limited to campsites, but any soil eroding from these relatively flat areas would be captured by the surrounding ground vegetation. There would be erosion at trail stream crossing, stock watering locations, and in stock trails leading across wetlands to reach grazing areas, but these would be isolated, and any sediment reaching waterways would be quickly dissipated by the flowing water.

- Soil compaction should not exceed limits which will prevent natural plant establishment and growth, except at desired campsites, and in designated trail treads.
  None of the alternatives would lead to soil compaction that would prevent natural plant establishment and growth away from campsites and trails. Outfitter-guide activities would be limited to loose grazing by pack stock, which would be dispersed and would not prevent plant establishment or growth.

3.5 HYDROLOGY

The section below is a summary of the Hydrology specialist reports which are available in the project analysis file (Garrigues 2012).

REGULATORY FRAMEWORK

Both the Okanogan and Wenatchee Forest Plans (USDA Forest Service 1989b and 1990) provide direction for the actions. The Record of Decision and Environmental Impact Statement for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (Northwest Forest Plan, USDA and USDI 1994); and Decision Notice and Environmental Assessment for the Interim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH, USDA and USDI 1995) amended the Forest Plans.

The Okanogan Forest Plan desired condition for water (page 4-5) includes:
- Areas allocated to Wilderness will remain essentially unchanged, modified only by natural processes.
- Forest soil productivity will be maintained. Water yield and quality will be substantially the same.

The Wenatchee Forest Plan desired condition for water resource management (page IV-57) includes:
- Maintain favorable conditions of streamflow in regards to water quality, quantity, and timing of flows.
- Meet or exceed Federal and Washington State water quality standards.

All the design criteria and mitigation measures for water quality protection described in Chapter 2 are considered Best Management Practices (BMP, 40 CFR 130.2, EPA Water Quality Standards Regulation). Additional scientific guidance and background information is available within various Watershed Assessments, General Water Quality Best Management Practices (USDA 1988) and National Best Management Practices for Water Quality Management on National Forest Lands (USDA 2012c). The forest-wide standards and guidelines that apply to this project include:

Okanogan Forest Plan, Soil and Water (page 4-45)

13-2 All activities shall comply with state requirements for the protection of waters through planning, application, and monitoring of BMPs.

13-3 In cooperation with the state, the Forest shall use the following process:

1. Select and design BMPs based on site-specific conditions, technical, economic, and institutional feasibility, and the water quality standards for those waters potentially impacted.
2. Implement and enforce BMPs.
3. Monitor to ensure that practices are correctly applied as designed.
4. Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.
5. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected.
6. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.

In wilderness areas:

- MA15B-13A (page 4-96) Soil compaction from human activities should not prevent natural plant establishment and growth except at some campsites, administrative facilities, and in designated tread.

- MA15B-13B (page 4-96) Human activities should not degrade water quality except for temporary changes where water quality returns to its normal level when the activity ceases.

None of the management areas outside wilderness have management area specific standards and guidelines for water.

Wenatchee Forest Plan, Water (page IV-94)

Protection of water quality through planning, application, and monitoring of BMP's (see above Okanogan Forest Standard and Guideline 13-3, items 1 through 6).

In wilderness areas:

Figure 3.5-1. Physical-Biological Standards for Water in Wilderness areas

Wilderness Recreation Opportunity Spectrum	Physical-Biological Standards for Water
Primitive	There should be no change in water quality except for temporary changes that return to normal when activity ceases.
Semi-Primitive and Transition	There should be no change in water quality except for temporary changes that return to normal when activity ceases.

The portion of the Sawtooth Backcountry on the Chelan Ranger District is allocated to RE-1 (developed recreation). Neither of these management prescriptions have management prescription specific standards and guidelines for water that apply to issuance of outfitter-guide permits.

The Clean Water Act, as amended in 1977, 1982, and 1987

The primary objective of this Act is to restore and maintain the integrity of the nation's waters. The Clean Water Act requires each state to develop water quality standards. Water bodies that do not meet established standards are identified in the 303(d) list. This FEIS uses the 2012 version of this list. Each state also prepares a non-degradation policy for all waters that exceed standards. This policy protects these waters from any further degradation.

The Forest Service responsibilities under the Clean Water Act are defined in a November, 2000 Memorandum of Understanding (MOU) between the Department of Ecology and the Forest Service. The MOU designates the Forest Service as the management agency for the State on National Forest System lands. This means that the Forest Service is responsible for defining and implementing appropriate Best Management Practices (BMP) for National Forest System land. Mitigation measures were developed by the IDT for this project and incorporate BMPs. Mitigation measures are identified in Chapter 2. All analysis below is with mitigation in place.

ANALYSIS METHOD

Information used to establish baseline conditions and desired future conditions for hydrology, erosion rates, and runoff came from several sources. These sources include field observations, stream inventories, watershed assessments, stream flow data, and an erosion prediction model. Throughout this analysis, the best available information and science was incorporated to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on resources and people.

AFFECTED ENVIRONMENT

Hydrology

Annual runoff is related to precipitation. Much of the annual precipitation in the analysis area falls as snow, although rain falls sporadically May through September. Peak runoff generally follows snowmelt patterns. Snow accumulates in the late fall, winter and early spring. The accumulated snow usually peaks in April. It melts rapidly in late May or early June and

generates peak stream flows. Overland surface flow from uplands, meadows, and riparian areas only occurs during spring melt which is prior to the summer period when wilderness areas become accessible to the public. Base flows from groundwater become part of the stream flow in July, increasing in percentage of the flow until it is most or all of the surface flow through the fall and winter. Base flows are supplied by shallow ground water moving into streams. Winter rain-on-snow floods could increase late fall or winter stream flow, however these events have a low risk of occurrence. Temperatures of wintertime snowstorms rarely increase to above freezing, which is necessary for rain-on-snow events. Lower elevation sites like Alta Lake and the Bear/Ramsey/Volstead area have less seasonal snowfall and earlier snowmelt, generating lower peak flows and less base flow. Many streams in these units are intermittent.

Stream reaches in much of the analysis area are slightly or moderately entrenched in deep glacial-fluvial outwash or glacial till plastered on steep hillsides. Some hillsides have little glacial till and streams flow primarily on exposed bedrock. Residual rounded rocks are common in the largest streams. Sediment is moved quickly through steep reaches during high flow periods. Late season flow is supplied by subsurface flow through the riparian areas associated with each stream. The larger, downstream channels have organic debris in the stream composed of small trees and other woody debris. Woody material may be partially or almost entirely buried or captured in wood debris jams. Some of this surface material moves downstream with each large flood, eventually reaching river systems.

Stream flow from steep gradient streams is seasonal, peaking in the spring snowmelt and drying July through September. Riparian areas along these intermittent channels are relatively narrow, and do not sustain extended periods of stream flow. These streams are high energy due to high stream gradient, and may be associated with debris avalanches or failures. Large amounts of sediment move through these systems.

Other upper reaches in thicker glacial till have stream channels that are slightly to moderately entrenched. Stream gradients are low and riparian areas are wider with sustained stream flow throughout the year. This stream flow is sustained by ground water from areas next to streams, and seeps and springs not necessarily adjacent to streams. Sediment is readily stored in stream channels and lower stream energy limits sediment movement. Smaller streams in low elevation sites like Alta Lake and the Bear/Ramsey/Volstead area have narrow to almost non-existent riparian areas, so these streams have little to no base flow entering the stream. As a result these intermittent streams are dry most of the year.

Sedimentation

Natural fire is an integral process in sediment movement to the stream and can influence how sediment is transported in the stream channel. Fire changes vegetation characteristics and reduces soil cover in the short term, increasing the rate of erosion that contributes to the sediment loads in the stream. Sediment delivery is increased by higher rates of debris failures and surface erosion, so more sediment enters the streams and rivers, especially in wilderness and North Cascade areas. Fires also kill trees adjacent to stream, and some of the trees fall into the stream where individual trees or groups of trees raise the stream base level and sediment deposition occurs.

Stream reaches with low stream gradients, low flows, and stream energy, as at Alta Lake and Bear/Ramsey/Volstead areas, store hillside sediments which move slowly through the stream

reaches. Vegetation is scarce and no large woody debris occurs in these streams. In these areas, lower precipitation and higher temperatures influence the frequency and intensity of wildfires. Natural fire return intervals are shorter and fires normally burn with lower intensity because under natural conditions, fuel loads were low. This results in lower levels of increased erosion and sediments entering surface water following wildfires.

Large fires burned in the 1920s and again over the last ten years. The Rex and Deer Point Fires burned over 100,000 acres of the Chelan side of the Sawtooth Range in 2001 and 2002. The Thirtymile Fire also burned in 2001 into the lower portion of the Pasayten area. In 2003 the Farewell Creek fire burned over 80,000 acres, in parts of the Pasayten and North Cascades areas. Most of the Bear/Ramsey/Volstead area burned with the Tripod Fire in 2006. In fire areas, erosion rates are higher where past intense sheep grazing occurred. In higher elevations and wetter areas of the watersheds, fire intervals are longer than fire suppression has occurred, so sediment depositional rates are probably within their historic range of occurrence.

Water Temperature

None of the water resources in the permit area are listed as impaired for temperature on the 2012 Washington State 303(d) list which is the most current listing. Downstream of the analysis area, water temperature is listed for the Chewuch River and the Methow River. The impaired segment on the Chewuch River is near the forest boundary and is several miles downstream from the proposed action activities. The impaired water segment on the Methow River is near Pateros and the closest activities in the proposed action would be several miles away near Alta Lake.

Grazing History

Sheep grazing and bedding patterns from the first half of the twentieth century continue to impact streams, riparian areas, and adjacent slopes in the Pasayten, Lake Chelan-Sawtooth, and North Cascades areas. Limited wet areas, associated with streams, lakes or seeps were compacted and vegetative composition was changed on some locations where heavy grazing occurred. Streambanks along wet area and ponds in the Pasayten still show the impact of heavy sheep grazing. In undisturbed conditions, banks and vegetation root masses generally overhung the water. When large numbers of sheep accessed water, streambanks were trampled and became void of vegetation. The annual rising and falling water levels, along with the harsh weather conditions contributed to the degraded situation. Overhanging vegetation will likely take many decades to re-establish, because growing seasons are harsh and short.

In the mid-1950s, the type of livestock grazed changed from sheep to cattle. Herding was not as intense, cattle numbers were lower than previous sheep numbers, and the type of grazing changed resulting in more vegetation being left. The larger cattle did generate more impacts in the wettest areas because cattle have larger hooves and weigh more than sheep.

Effects of Current Pack and Saddle Stock Activities

Domestic livestock and recreational livestock grazing, including pack and saddle stock outfitter-guide activities, have caused small scale localized changes to streams and wetlands. At trail-stream crossings without culverts or bridges, stream banks are broken down because traffic is concentrated at an isolated location. Since these trails are also used by hikers and in some limited areas, trail bikes, some of the impact is due to those other uses and it is difficult to allocate the level of disturbance due to the various uses. Overall the visitor use days by

permitted outfitter guides is approximately 3 % of the total use by hikers, and permitted or personal use stock.

There may be a slight increase in stream sedimentation at some of these locations, but the sedimentation contribution from the damaged section of stream banks is not detectable compared to background in-stream bank erosion. Higher levels of stream sedimentation may come from trail erosion as water drains down the trail during high intensity rainstorms and empties into the stream at crossings if not diverted by water bars or crossdrains.

Loose Grazing and Stock Containment

Outfitter guides use either loose grazing or containment as described in Section 3.1 Outfitter-Guides, to care for stock on overnight wilderness and back country trips. Loose grazing results in greater dispersal and reduction in site impacts. While this allows free access to riparian areas and water sources, typically pack animals spend most of their time grazing on dryer non-riparian areas where grasses are more prevalent. Where containment methods are used, locations are chosen away from riparian areas to confine stock. Monitoring during permit administration has shown that these stock management techniques have reduced impacts to riparian areas and reduced risk of water contamination because the wider dispersal of use lessens micro site disturbance. Overland flow which could transport fecal material or sediment into surface waters normally only occurs during snowmelt conditions which are earlier in the season before wilderness areas are accessible to recreation users. Bacterial do not remain viable for extended periods in dry fecal material so levels will not accumulate over the longterm.

Fecal Coliform and Other Nutrients

None of the water resources in the analysis area are designated water quality limited category 5 for fecal coliform on the 2012 Washington State 303(d) list which is the most recent currently available listing.

Coliform is a naturally occurring bacteria common in streams and lakes. Feces of wild and domestic animals, and humans contain coliform, so when animals or people defecate in or near waterways or lakes, the fecal coliform is introduced into the water. If ingested in high enough concentrations, the bacteria can cause a number of intestinal maladies, such as gastritis. Generally speaking, wild and domestic animals are typically unaffected by ingested fecal coliform, but humans tend to be more sensitive to the bacteria, especially if the contamination is from human feces.

Fecal coliform is used as an indicator of bacterial stream contamination because it is relatively easier to analyze for than other potentially harmful species such as giardia or cryptosporidium. These other pathogens can be identified by spores but presence does not necessarily correlate with viability of the organism.

Waters within the analysis area have been designated by the State Department of Ecology with the water contact recreation bacteria criteria category of “extraordinary primary contact recreation”. The standard for this category states that fecal coliform organism levels must not exceed a geometric mean value of 50 colonies per 100 milliliter sample. This is for direct contact such as swimming in surface waters and lakes.

None of the lakes or waterways in the analysis area are designated as domestic water sources. The State Department of Health regulates domestic water supplies and the bacteria standard is to not exceed one colony per 100 milliliter sample. This level is essentially impossible to meet from surface water sources due to natural background levels. Thus the state requires that surface water which is diverted for domestic use to be treated by some method. The Forest Service recommends that wilderness users treat all water collected for drinking or food preparation.

Water testing for bacteria is problematic from wilderness and backcountry areas because samples must be delivered to the analysis laboratory within 24 hours of collection, and must be kept cold prior to testing. Most of the outfitter guide camp areas are more than a days ride or hike from the trailheads, which are several hours drive to the nearest testing laboratories. Extensive and repetitive testing of background levels of fecal coliform, followed by testing when pack and saddle stock outfitter-guide stock and clients are in the area, would be required to determine the precise effect. For this reason, quantifiable bacteria data for the analysis area is non-existent. 40 CFR 1502.22 specifies the process to follow when there is incomplete or unavailable information. Information about the effect of pack and saddle stock outfitter-guides on fecal coliform levels is not relevant to determining effects simply because the number of outfitted stock in the analysis area is too small to significantly increase fecal coliform levels over background levels. The contribution of outfitter guided use is approximately three percent of the overall visitor use days for the analysis area. No reasonably foreseeable adverse impacts exist.

Recreational pack stock, including pack and saddle stock of the outfitter-guides along with human users do introduce fecal coliform into waterways, adding to the background level from wildlife. Waterways in the vicinity of stock camps, at trail crossings and stock watering sites may have locally higher levels of the bacteria during some periods of time but no documented sampling has been conducted. Any increases are only occurring on a limited basis compared to the analysis area as a whole due to the fact that these campsites, trail crossings and stock watering sites are isolated and infrequent across the landscape. Fecal coliform levels near trail crossings and at stock watering sites may be elevated during snowmelt and rainstorms as animal manure is washed down trails or overland into the streams at crossings if not diverted by water bars or crossdrains, or into lakes. Along streams, however, dilution by streamflow keeps fecal coliform levels well below the state water quality standard. Coliform bacteria also have a limited time of viability when dried and exposed to sunlight, as occurs in grazing areas away from water. This further reduces the risk of surface water contamination.

Other nutrients which can affect water quality are phosphorus and nitrogen, neither of which have numeric state water standards been established by Washington State Department of Ecology. Sources of phosphorus are typically from domestic sewage leaching or industrial outfalls and not resulting from livestock pollution. Nitrogen levels can be high in livestock, wildlife, and human feces or urine. Introduced levels of nitrogen to surface waters from these sources in the wilderness are dispersed in time and space and no elevated levels have been documented in the analysis area. Micro site effects to vegetation from high concentrations of nitrogen have not been observed.

Stream Flow
Pack and saddle stock have also changed the character of some wetlands. Wetlands occur in many areas within the permitted area. Only those in direct continuity to navigable waters are protected under the Clean Water Act. Trails passing though wetlands are usually compacted and water tends to migrate to the slightly lower elevation of the trail. This occurs even during some drying periods where the trail is lower than the wetland surface. The amount of water in the trail during much of the use period often leads to a muddy situation where livestock and hikers may have difficulty getting through the wetland. When users re-negotiate the wettest areas, they create other user-made trails that increase the impacted area. Users may also widen and deepen the impacted area. Water may begin to flow as a stream through the wetland, where the water previously infiltrated into the soil. The net effect is that water leaves small areas adjacent to trails in wetland faster than before. Since these wetlands contribute to late season flows in down slope streams, the change in the wetland may reduce late season flows in nearby downstream locations. The relative impact on the wetlands in all the areas is low because the affected wetlands are a small portion of the total wetlands, and impacts in any given wetland would be isolated to areas directly adjacent to trails. The contribution of outfitter guided use is most likely very small since their total is approximately three percent of the overall visitor use days for the analysis area.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

Under the No Action Alternative, the existing levels of non-permitted personal stock use and hiking would continue throughout the analysis area. Existing trails and all existing camps would be available to the general public as they are now. Alternative 1 would result in a 15 percent reduction in total stock use over current conditions with permitted outfitter guides and a 3 percent reduction in total visitor days (hikers plus stock users).

Stream Sedimentation
The slight decrease in total stock use (15 percent reduction) would slightly reduce the risk of sedimentation at trail stream crossings without bridges or culverts, access points for watering and erosion from campsites. Because of the small level of reduction in use, the change in stream sedimentation and erosion would not be detectable or measurable compared to natural background inputs from ongoing channel and hill-slope erosion.

State 303(d) Listings Temperature
Shading along riparian areas and streams would not change with this alternative because of the relatively small reduction in use levels at existing crossings and riparian areas. As a result, there would be no measureable change in stream water temperatures within the analysis area or further downstream in 303(d) listed segments.

Fecal Coliform and Other Nutrients
With the slight reduction in stock use there would be a corresponding slight decrease in the risk of animal waste and associated fecal coliform or urine entering surface waters. This change

from current conditions is not expected to be detectable or measureable within the analysis area or downstream.

Streamflow

With the No Action Alternative, any changes in streamflow are not expected to be measurable or detectable within the current available accuracy of measurement techniques (5 to 10 percent). With the slight reduction in stock use levels in this alternative, there would be a corresponding slight decrease in compacted soil area in riparian areas. This could lead to improved water storage and timing of streamflow but these changes are not expected to be measurable.

Alternatives 2, 3, and 4

Stream Sedimentation

Outfitted pack and saddle stock would continue to slightly increase the risk of sedimentation when animals cross streams on trails without bridges or culverts or access streams for water and from soil erosion at campsites. Changes would not be detectable compared to ongoing channel and hill slope erosion, except at the point of disturbance in the stream channel during the time of traffic crossing in water. There would be no detectable difference in stream sedimentation between alternatives across the analysis area. Stream turbidity is not expected to change under any of the alternatives, because the suspended sediment would not change by measurable levels.

State 303(d) List Implications (water temperature)

No new created openings would occur in riparian or other areas in any alternative nor any measurable reduction in stream shading, so water temperature in any stream in the analysis area would not be raised as a result of pack and saddle stock outfitter-guide activities. Therefore, water temperature within the analysis area or further downstream in 303(d) listed segments would not change from current levels with any alternative.

Fecal Coliform and Other Nutrients

The slight changes in use levels with the action alternatives would not result in measurable or detectable changes from the current conditions for the risk of animal waste and associated fecal coliform or urine entering surface waters.

Stream Flow

No measurable changes in stream flow would occur in any alternative from pack and saddle stock activities. Outfitted pack and saddle stock use could result in reduced late-season water flow through portions of impacted wetlands if water flows down compacted trails and through the wetland more rapidly than in non-impacted wetlands but any changes are not expected to be measurable at the current accuracy level of streamflow measurement techniques (5 to 10 percent accuracy) There are very few trails passing through wetlands anywhere in the analysis area, so any changes in late season flows as a result of this would be well within the natural variation in stream flow levels from year to year. Refer to the Botany section, beginning on page 3-48 for a detailed analysis of the impacts to wetlands.

Best Management Practices

Alternatives 2, 3, and 4 include Best Management Practices (BMPs), to prevent non-point source water pollution and ensure compliance with the Clean Water Act and Washington Administrative Code Chapters 173-201 and 202. BMPs are included in the Mitigation Measures, which begin on page 2-19 of this FEIS, and would be part of the annual operation plans.

- The campsite BMPs would help reduce soil disturbance and compaction in campsites. This would reduce the risk any decrease in water quality from increased sedimentation from soil erosion. (Mitigation measures 1 a-g)

- The trail BMPs would reduce the potential of decreased water quality from erosion from trails. (Mitigation measures 6 a-c)

- The sanitation BMPs would help reduce the risk of fecal matter in waterways, helping to protect water quality by reducing introduction of fecal coliform. (Mitigation measures 7 a-e)

- The stock containment and grazing BMPs would help reduce the risk of impacts to water quality from sedimentation and fecal coliform at trail crossings, watering spots, and campsites. (Mitigation measures 8 a-j)

- The vegetation and soil BMPs would help reduce the risk of water quality impacts by minimizing damage to vegetation, wet soils and meadows, and by restoring areas of soil damage to reduce erosion potential. (Mitigation measures 10 a-c)

- The aquatic resources BMPs would help protect riparian areas, and reduce the risk of impacts to water quality from increased sedimentation, reduced shade, and hazardous materials. (Mitigation measures 12 a-g)

Because BMPs are expected to be fully implemented, water quality standards and the anti-degradation policy (Chapter 173-201A WAC) are expected to be met with all alternatives. None of the alternatives would substantially alter the water quality. Full implementation of BMPs has been shown to be an effective method (90 percent or greater) in preventing and controlling nonpoint source water pollution (Rashin, 2006), (USDA Forest Service, 2007a). Monitoring would be conducted during the project in order to validate implementation and effectiveness of BMPs and assure compliance with the Clean Water Act, State water quality regulations and forest plan standards.

Alternative 2

Alternative 2 would permit 4,620 visitor days for pack and saddle stock outfitter-guides. This amount of use is only slightly higher than the recently permitted numbers (4% higher) and only 0.6% higher total pack and saddle use, so all the effects described above under Current Condition would likely continue. The risk of fecal coliform entering surface waters may slightly increase from background natural levels due to permitted stock use but any changes would not be meaningful. With this alternative, at outfitter assigned sites and other high use areas, there would continue to be areas where stock use might result in locally higher fecal coliform levels.

This would occur on a limited basis compared to the analysis area as a whole. Along streams, dilution by streamflow would keep fecal coliform levels well below the state water quality standard based on the isolated and localized nature of campsite, trail crossings, and stock watering sites across the analysis area.

The Forest Plan amendment to limit the amount of barren core area pack and saddle stock outfitter-guides could use (5,250 square feet) would reduce the risk of impairment to water resources by limiting camp impact areas. The Best Management Practices would also provide water resource protection. They would be effective since they would be included in the operating plan, with compliance required by the special use permit and yearly monitoring. Because background levels currently do not exceed detrimental fecal coliform levels, these BMPs would ensure that fecal coliform bacteria would not be raised to detrimental levels as a result of pack and saddle stock outfitter-guide activities.

The Forest Plan amendment to allow outfitter-guides to use existing campsites within 200 feet of meadows, streams, lakes, or key interest areas would not change the current effects to water quality described in the affected environment above, since the outfitter-guides and the public have been using these campsites for decades and no new sites would be allowed.

Alternative 3

Alternative 3 would permit 2,660 visitor days for pack and saddle stock outfitter-guides. This would be a 40% decrease in the number of recently permitted number of pack and saddle stock users and 6 percent decrease in total pack and saddle use levels. This small decrease would result in virtually no change from the current conditions described above, or with Alternatives 2 or 4. Fecal coliform levels may decrease slightly from permitted stock use and background but any changes would not be meaningful. The reduced party size in the Forest Plan amendment with this alternative could also slightly reduce the introduction of fecal coliform simply because there would be fewer stock in each party. The risk of fecal coliform entering surface waters would be less than Alternative 2 but greater than Alternative 1; however the difference would be slight and not likely to be measurable. With this alternative, at outfitter assigned sites and other high use camps, there would continue to be areas where stock use might result in locally higher fecal coliform levels. Along streams, dilution by streamflow would keep fecal coliform levels well below the state water quality standard based on the isolated and localized nature of campsite, trail crossings, and stock watering sites being dispersed across the analysis area.

The Forest Plan amendment to limit the amount of barren core pack and saddle stock outfitter-guides are allowed to use, and the amendment to reduce the party size would reduce the risk of impairment to water resources by limiting camp impact areas, to a greater degree than Alternatives 2 or 4. The Best Management Practices listed above would also provide water resource protection. They would be effective since they would be included in the operating plan, with compliance required by the special use permit and annual monitoring. Because of background levels currently do not exceed detrimental fecal coliform levels, these BMPs would ensure that fecal coliform bacteria would not be raised to detrimental levels as a result of pack and saddle stock outfitter-guide activities.

The Forest Plan amendment to prohibit pack and saddle stock outfitter-guides from using existing campsites within 200 feet of wetlands, streams, lakes, and key interest areas would

eliminate any impacts to water quality caused by pack and saddle stock outfitter-guides in the vicinity of these camps. The current impacts described above would continue however, since the camps would still be used by the non-outfitted public. The slight reduction in use in these campsites may slightly reduce the current impacts to water quality, but the overall effects would remain constant.

Alternative 4

Alternative 4 would permit 6,700 visitor days for pack and saddle stock outfitter-guides. This would be a 50% increase over the current number of pack and saddle stock users and 8% increase in total pack and saddle use levels. This increase would be small enough to not change the current conditions described above at meaningful or quantifiable levels. As with Alternatives 2 and 3 described above, fecal coliform levels would be from both permitted and non-permitted stock use and background sources. At assigned sites (outfitters only) and other high use camps (outfitters and public), there would continue to be areas where stock use might result in locally higher fecal coliform levels. This would occur on a limited basis compared to the analysis area as a whole. Along streams, dilution by streamflow would keep fecal coliform levels well below the state water quality standard based on the isolated and localized nature of campsite, trail crossings, and stock watering sites being dispersed across the analysis area.

The Forest Plan amendment to allow outfitter-guides to use the existing barren core in established campsites but not increase the amount of barren core would reduce the risk of impairment to water resources by limiting camp impact areas, but to a lesser degree than Alternatives 2 or 3. The Best Management Practices would also provide water resource protection. They would be effective since they would be included in the operating plan, with compliance required by the special use permit and annual monitoring. Because of background levels currently do not exceed detrimental fecal coliform levels, these BMPs would ensure that fecal coliform bacteria would not be raised to detrimental levels as a result of pack and saddle stock outfitter-guide activities.

The Forest Plan amendment to allow outfitter-guides to use existing campsites within 200 feet of meadows, streams, lakes, or key interest areas would not change the current effects to water quality described above, since the outfitter-guides and the public have been using these campsites for decades.

Cumulative Effects

Past, present, and foreseeable future actions in or near the analysis area are listed at the beginning of this chapter The spatial boundary for this cumulative effects analysis is the entire Methow and Lake Chelan watersheds. The temporal boundary is the early 1900s through approximately 2033, 10 years after the proposed 10 year special use permits would expire and any effects would cease. Those past, present, and reasonably foreseeable future actions that continue to affect hydrology are summarized below. All other actions would not contribute to cumulative effects.

Past, Present, and Reasonably Foreseeable Future Actions

Grazing
Residual effect from livestock grazing throughout the twentieth century continue to impact streams, riparian areas, and adjacent slopes in the Pasayten, Lake Chelan-Sawtooth, and Upper Methow areas. Limited wet areas, associated with streams, lakes or seeps were compacted and vegetative composition was changed on some locations where heavy grazing occurred. Streambanks along wet area/ponds in the Pasayten still show the impact of heavy sheep grazing. In undisturbed conditions, banks and vegetation root masses generally overhung the water. When large numbers of sheep accessed water, streambanks were trampled and became void of vegetation leading to increased rates of surface erosion and input of fine sediment to surface water. Overhanging vegetation will likely take many decades to re-establish, because growing seasons are harsh and short. The shift to cattle in the 1940s impacted more wetlands since cattle tend to congregate in riparian areas and have larger hooves and weigh more than sheep.

Fire
Past fires over the analysis area have increased surface erosion rates and input of fine sediment to stream channels. In general, the moister streamside riparian areas do not burn as hot as uplands and thus sediment transport to surface water is reduced.

Trail Conditions and Use
Commercial livestock and non-outfitted recreational livestock grazing may be causing small site specific local changes to streams and wetlands on a limited basis. At trail-stream crossings, stream banks are broken down because of the traffic at a single location. These damaged crossings may cause a slight increase in stream sedimentation, but the sedimentation contribution from the damaged section of stream banks is not detectable compared to in-stream bank erosion. More noticeable stream sedimentation may come from trail erosion as water drains down the trail during high intensity rainstorms and empties into the stream at crossings. Fecal coliform levels near these crossings may be elevated during snowmelt and rainstorms as horse manure is washed down the trail and into the stream but higher streamflows at these times increase the dilution factors.

Non-outfitted Recreation Use
The amount of recreation use on the Tonasket, Methow Valley, and Chelan Ranger Districts is expected to increase over the next ten years. The projected increases in use may contribute to higher fecal coliform levels or stream sedimentation in local areas where the use is the highest, but use is so dispersed any effect is expected to be localized and still meet water quality standards.

Other Actions
Trail maintenance and construction will continue at levels similar to the past five years. Developed campgrounds in the analysis area would remain open, with facilities maintained. Campground maintenance activities, such as building maintenance, cleaning, water system maintenance, hazard tree removal, and road maintenance would continue. These activities will not increase fecal coliform bacteria or stream sedimentation.

Grazing in the Bear/Ramsey/Volstead area would continue at current levels and may cause localized increases in fecal coliforms and stream sedimentation, but the water quality standard for fecal coliform is expected to be met. No other livestock grazing is anticipated in the Pasayten or Lake Chelan-Sawtooth Wilderness Areas, the Sawtooth Backcountry, or the North Cascades Scenic Highway corridor. These activities will not increase fecal coliform bacteria or stream sedimentation.

Wildfires may also occur throughout any of the analysis areas, but would not increase the fecal coliform bacteria level in stream flow or wetlands. Fire suppression activities such as fire line construction would likely occur with a wild fire. Rehabilitation occurs to divert surface water off the constructed firelines. These activities will not increase fecal coliform bacteria or stream sedimentation because transport to surface water is reduced.

Alternatives 1, 2, 3, and 4

There would be no cumulative effect on fecal coliform levels from all past, present, and reasonably foreseeable future actions and any of the alternatives considered in this analysis since none of the alternatives would raise levels except at isolated stream sections near camps, trail crossings, or stock watering spots. There are no current 303(d) listings in the Methow River watershed for fecal coliform, and this would not change as a result of the cumulative effects of past, present, and reasonable foreseeable actions and the alternatives analyzed in this document. Additionally, none of the proposed actions or alternatives would have a cumulative effect on water temperature since none would result in loss of riparian vegetation that would result in increases in water temperatures in streams. Therefore, there would be no effect on the existing 303(d) temperature listing for the Chewuch River and the Methow River at Pateros, Washington.

CONSISTENCY FINDINGS

The Best Management Practices listed above and shown as mitigation measures in Chapter 2 when implemented will ensure that all of the alternatives are consistent with the Okanogan and Wenatchee Forest Plans as amended by the Northwest Forest Plan and PACFISH. Based on the findings in this analysis, this project complies with the standards and guidelines listed above for the Okanogan and Wenatchee National Forests. The proposed Forest Plan amendments for Alternatives 2, 3, or 4 would provide water resource protection by implementing the BMP's for camp management listed in Chapter 2.

<u>Okanogan Forest Plan, Soil and Water (page 4-45) and Wenatchee Forest Plan (page IV-94)</u>
The alternatives would include Best Management Practices to ensure protection of water quality and meet the intent of the Clean Water Act and Washington Administrative Code Chapters 173-201 and 202. Water quality would be monitored as part of the riparian campsite monitoring described in Chapter 2.

<u>Okanogan Forest Plan MA15B-13A (page 4-96)</u>
Soil compaction from human activities should not prevent natural plant establishment and growth except at some campsites, administrative facilities, and in designated tread.
None of the alternatives would prevent natural plant establishment or growth. Refer to section 3.4 Soil.

Okanogan Forest Plan MA15B-13B (page 4-96) and Wenatchee Forest Plan
Human activities should not degrade water quality except for temporary changes where water quality returns to its normal level when the activity ceases.
Pack and saddle stock outfitter-guide activities would not degrade water quality except for temporary changes at trail stream crossings or stock watering areas. Water quality would return to background conditions once the outfitter-guide activities cease.

Clean Water Act

A segment the Chewuch River near the forest boundary and a segment of the Methow River near Pateros are listed on the 303(d) list as impaired for water temperature. The impaired segments of both rivers are well downstream of most of the analysis area. Alta Lake is the closest area to the impaired segment of the Methow River with a predominance of day use that is three miles from Pateros. Issuance of outfitter-guide special use permits would not have an effect on stream temperature on either of these localized reaches or at the 6th or 5th HUC scale. Therefore, this project would be consistent with the Clean Water Act.

Although the project may result in some localized increases in fecal coliform levels, dilution and cold temperatures that kill these bacteria would ensure bacteria levels are not raised to detrimental levels or would exceed the state water quality standard.

3.6 AQUATIC RESOURCES

The section below is a summary of the Aquatic Resources Report which is available in the project analysis file (Shull, 2012).

REGULATORY FRAMEWORK

The original Okanogan and Wenatchee Forest Plans provides direction for the outfitter-guide analysis area (USDA Forest Service 1989b and 1990). The desired condition is for habitat that supports fish rearing, spawning, and migration to be in an improved state (Okanogan Plan USDA Forest Service 1989b page 4-5) and to maintain excellent water quality and provide the structural stream components necessary for diverse, high quality aquatic habitat for native anadromous and resident fish species (Wenatchee Plan USDA Forest Service 1990:IV-9). Fish habitat management objectives that apply to this project are: to maintain and improve fish habitat capability, and integrate fish and riparian habitat management into other multiple use activities. Pertinent goals to the proposed activity under the Okanogan Plan are for fish habitat to be managed to maintain or enhance its biological, chemical, and physical qualities. The structural and functional properties of aquatic systems will be managed to promote bank and channel stability and riparian areas will be managed to provide a continuing supply of large wood for fish habitat (USDA Forest Service 1989b page 4-2). Under the Wenatchee Plan, the goals include fish habitat, quantity and quality, be at least maintained at existing levels and both the availability and quality of habitat should show an improving trend. The primary objective for riparian areas is to maintain and enhance long-term productivity to provide for riparian dependent resources including water quality and fish (USDA Forest Service 1990: IV-40 & 41).

Okanogan and Wenatchee Forest Plan Standards and Guidelines that apply to this project include: 1)maintain low fine sediment levels (<20% surface fines); 2) manage activities to not result in exceeding current Washington State water quality standards (Washington State 2006); 3) maintain wood levels >100 large pieces/mile (USDA Forest Service 1989b pg 4-30 -32 & 1990:IV-84 to IV-88).

The Northwest Forest Plan (NWFP) amended the Forest Plan in 1994 (USDA and USDI 1994). The NWFP includes an Aquatic Conservation Strategy (ACS) with four components: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. In addition the ACS includes nine objectives to direct management of National Forest System lands at the site/project and watershed scale that focus on maintaining and/or improving conditions and processes associated with streams and adjacent riparian areas. Standard and Guidelines in the NWFP for Riparian Reserves of particular relevance to the outfitter-guide project include:

- adjust or eliminate grazing [pack animals] practices to eliminate impacts that reduce or prevent attainment of ACS objectives;
- ensure existing livestock [packstock] facilities inside Riparian Reserves meet ACS objectives;
- limit livestock [pack animals] trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure ACS objectives are met; and
- adjust or eliminate dispersed recreation practices that reduce or prevent attainment of ACS objectives and where adjustment measures are not effective, eliminate the practice or occupancy (USDA and USDI 1994:C-31 to C-33).

A detailed discussion of each aquatic conservation strategy objective is included at the end of this section, under Consistency.

Watershed analyses were completed for all project area watersheds except for the Pasayten and Ashnola. Because these watersheds are not Key Watersheds, watershed analyses are not required. Natural resources are generally in excellent condition and human disturbance is limited to backcountry recreation and occasional fire suppression. All the watershed analyses available were reviewed for resource issues associated with commercial outfitter-guide services and none in the NWFP area identified concerns over the effects of existing outfitter-guide activity. Riparian and aquatic impacts from backcountry hiking, camping, and stock animals are minor and limited to primarily to trails and campsites that enter Riparian Reserves or Riparian Habitat Conservation Areas (RHCAs). Wilderness is managed for potential natural conditions with little impacts from humans. The Pasayten and Ashnola watersheds do not contain ESA listed fish and are not designated Key Watersheds. Due to this and the direction of managing wilderness to preserve 'untrammeled' natural character, it was decided Watershed Analyses were not warranted for these two watersheds.

The Decision Notice and Environmental Assessment for the Interim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH, USDA and USDI 1995) amended the Okanogan Forest Plan in 1995. PACFISH includes five components directing management of riparian areas: Riparian Habitat Conservation Areas (RHCAs), Riparian Goals, Riparian Management Objectives (RMOs), Key Watersheds, and Watershed Analysis. The RMOs include eight objectives to guide management of National Forest System lands at the watershed scale that focus on maintaining and/or improving conditions and processes associated with streams and adjacent riparian. Standard and

Guidelines in the PACFISH area for RHCAs of particular relevance to the outfitter-guide project include:

- Limiting livestock [packstock] trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not reduce or prevent attainment of RMOs or adversely affect listed anadromous fish;
- Prohibit fuel wood cutting in Riparian Habitat Conservation Areas;
- Operate recreation facilities, including trails and dispersed sites, in a manner that does not reduce or prevent attainment of the RMOs and avoids adverse effects on listed anadromous fish;
- Adjust dispersed and developed recreation a practices that reduce or prevent attainment of RMOs and adverse effects to listed anadromous fish; and
- Address attainment of RMOs and potential effects on listed anadromous fish and designated critical habitat in wild and scenic rivers, wilderness, and other recreation management plans.

All the completed watershed analyses for the analysis area were reviewed to determine if any commercial outfitter use included as part of this project was mentioned as a concern. Only one area had a documented concern about outfitter-guide activities, specifically along Toats Coulee Creek in the Sinlahekin Creek 5th field watershed (See Fisheries report for details).

As part of the overall ACS and the PACFISH strategy, Key Watersheds were established to act as refugia and provide high quality habitat for aquatic species. Priorities within these Key Watersheds include maintaining and recovering at-risk fish stocks (USDA and USDI 1994: B-19 and USDA and USDI 1995 C-19). The analysis area lies within the NWFP's Upper Chewuch, Lower Chewuch, Upper Methow, Middle Methow, Lower Methow, Twisp, and Lost River 5th field Tier 1 key watersheds, in addition to the Lightning, Lower Lake Chelan, Pasayten, Ross Lake, Ruby, and Stehekin watersheds which are not designated as key watersheds. In the PACFISH boundary, the analysis area includes four 5th field Hydrologic Unit Code (HUC) key watersheds: Upper Chewuch River, Lower Chewuch River, Middle Methow River, Lower Methow River, Salmon Creek, and Lower Silkameen River. Additionally, the Ashnola and Sinlahekin watersheds are within the PACFISH management area, but not designated as key watersheds. These watersheds contain fish species listed under the Endangered Species Act (ESA) and are considered to be PACFISH Key Watersheds. All of these Key Watersheds contribute directly to the conservation of at-risk anadromous salmonids, bull trout, and resident fish species (See fish report in the analysis file for more details).

The Endangered Species Act, amended Okanogan and Wenatchee Forest Plan direction, and the Magnuson-Stevens Fishery Conservation and Management Act require that consultation be completed with respect to effects of proposed activities on Endangered, Threatened, Critical Habitat, and Essential Fish Habitat. The NFMA directs the Forest Service to analyze effects of projects on Management Indicator Species identified in the Forest Plan, and to maintain viable populations of all species identified by the Regional Forester. The species and habitat of concern in the outfitter-guide project are described later in this section. Consultation was completed with the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Letters of concurrence were received on November 13, 2012 from NMFS, and on January 28, 2013 from the USFWS. The letters are included in **Appendix M**.

ANALYSIS METHODS

Information used to establish the baseline conditions for aquatic and riparian habitat, fish population trends, and their distribution came from several sources including field observation, stream and lake surveys, and watershed analyses/assessments. Most information is from the last decade. Through this analysis, the best available information and science was considered.

The analysis area has an estimated 3,200 miles of stream within the project area that covers over one million acres. Information is lacking on streams in these watersheds. Habitat surveys have been completed for most of the major fish bearing streams (23 streams) in most of the 5th field watersheds included in the analysis area. The process for addressing incomplete or unavailable information is found in 40 CFR 1502.22. The analysis of the alternatives did not find any reasonably foreseeable significant adverse impacts to aquatic habitat. Most of the streams are in steep mountainous terrain with steep gradients, rocky channels, and are resistant to disturbances from bank alteration associated with livestock use. Limited data for streams in wilderness and roadless areas suggests streams are generally in good condition due to the lack of human influence. The degree and area of scale of impacts would not compromise the overall high quality streams, lakes, or occupied fish habitat. Therefore, collecting data on most or all of the streams and wetlands in the project area is not important for analyzing overall project effects. See the Aquatic Specialist report in the analysis file for more details on the condition of streams in the project area and similar undeveloped areas and why data collection is not necessary practical for making conclusions on the existing conditions or effects from the proposed action.

Okanogan Forest Plan standards (USDA Forest Service 1989b:4-30 to 4-32), Wenatchee Forest Plan standards (USDA Forest Service 1990: IV 83 to 96), Northwest Forest Plan standards (USDA and USDI 1994: C-30 to C-38), and PACFISH goals and RMOs (USDA and USDI 1995:C-3) and standards pertinent to the desired conditions at the 5th field HUC watershed scale were tracked through the analysis.

Aquatic habitat was evaluated at different spatial scales in order to assess project effects, as related to the ACS Objectives (USDA and USDI 1994: B-11) and RMOs (USDA and USDI 1995:C-4 to C-6), at the watershed 5th field HUC scale. Site scale impacts were analyzed individually and then reanalyzed collectively to determine whether or not there is an effect to species or their habiat at the 6th field sub-watershed scale.

Relevant ACS Objectives and RMOs are water temperature, large woody debris, water quality as affected by fine sediment, and riparian habitat.

The analysis area lies within the nineteen 5th field watersheds and sixty-six 6th field sub-watersheds listed in **Appendix H,** which includes the Pasayten, Skagit, Ashnola, and Similkameen watersheds. These areas define the area of direct effects analysis is located within the analysis area. Indirect effects can occur downstream and will be further analyzed at the sub-watershed 6th and watershed 5th HUC scales.

AFFECTED ENVIRONMENT

The analysis area occurs along some streams and lakes containing ESA listed fish species. All of the 5th field watersheds in the Methow sub-basin and the ones on the Skagit side have listed fish species present.

Streams

The analysis area has an estimated 3,200 miles of stream. **Figure 3.6-1** below breaks them down by 5th field watersheds that are within the analysis area units. Most streams are characterized by being moderate to high gradient with multiple springs throughout the entire analysis area. Generally, there is little human manipulation or disturbance of streams due to the remoteness and difficult access.

Figure 3.6-1. Streams by 5th and 6th field watersheds and by Analysis Area.

5th Field Watershed	Perennial Stream (mi)	Intermittent (mi)	Total Streams (mi)
ASHNOLA RIVER*	50.0	65.8	115.8
LIGHTNING CREEK	34.5	76.4	111.0
LOST RIVER	38.5	118.2	156.7
LOWER CHEWUCH RIVER	85.7	227.8	313.5
LOWER METHOW RIVER	83.9	172.6	256.5
LOWER SIMILKAMEEN RIVER	18.3	24.9	43.2
MIDDLE METHOW RIVER	97.5	241.0	338.5
PASAYTEN RIVER*	105.0	239.0	344.0
ROSS LAKE	14.4	34.8	49.2
RUBY CREEK	40.9	154.0	194.9
SALMON CREEK	56.7	44.5	101.2
SINLAHEKIN CREEK	117.9	96.4	214.3
TWISP RIVER	76.1	164.7	240.8
UPPER CHEWUCH RIVER	50.3	144.3	194.7
UPPER COLUMBIA-SWAMP CREEK*	Not Available		
UPPER METHOW RIVER	47.5	178.1	225.5
UPPER LAKE CHELAN	Not Available		68.0
STEHEKIN	Not Available		123.3
LOWER LAKE CHELAN	Not Available		109.1
Total in Lake Chelan Watershed	**556.7**	**1189.1**	**3200.0**

*Stream flow character data was not available for the Chelan portion, the Columbia –Swamp Creek, Pasayten, and Ashnola River Watersheds. Information is lacking on streams in these watersheds. Most of the streams are in steep mountainous terrain with steep gradients, rocky channels, and are resistant to disturbances from bank alteration associated with livestock use. Limited data for streams in wilderness and roadless areas suggests streams are generally in good condition due to the lack of human influence. The spatial scale of impacts would not compromise the overall high quality fish habitat. Therefore, collecting data on most or all of the streams and wetlands in the project area is not important for analyzing overall project effects.

Existing conditions of 24 major fish bearing streams in the analysis area for aquatic and riparian habitat has been inventoried, dating back to 1995. Aquatic inventories were completed on the following streams in the analysis area (full survey reports are available in the analysis file):

Figure 3.6-2. Stream Surveys within Analysis Area

Watershed	Survey Year	Stream
LIGHTNING CREEK	2002	Lightning Creek
PASAYTEN RIVER	1998	Pasayten River
LOST RIVER	2000	Lost River
UPPER CHEWUCH RIVER	2001/2008	Chewuch River
	2003	Lake Creek
	2005	Andrews Creek
RUBY CREEK	2001	Ruby Creek
	1999	Granite Creek
	1998	Slate Creek
	1998	Canyon Creek
UPPER METHOW RIVER	2003	WF Methow River
	2003	Robinson Creek
Lower Methow River	1997	Foggy Dew Creek (upper reach in roadless area)
	1997	Crater Creek
TWISP RIVER	2001	Twisp River
	1995	East Fork Buttermilk Creek (in Wilderness)
	1995	West Fork Buttermilk Creek (in Wilderness)
Middle Methow River	2005	Wolf Creek
	2007	Blue Buck Creek
	2000	Goat Creek (roads and timber harvest in drainage)
	2004/ 2007	Blue Buck Creek (before and after 2006 fire, drainage has roads and past timber harvest)
UPPER LAKE CHELAN	2000	Prince Creek
LOWER LAKE CHELAN	2000	Safety Harbor Creek

The majority of disturbances along streams and lakes are localized where camps and day use areas are close to lakes and streams and stream-trail crossings. Trail crossings typically create localized disturbances to stream banks of about 10 feet on each side of the crossing. Streamside campsites used by outfitter-guides are present at low densities with 24 campsites along 3,200 miles of streams. Projects to reduce water routing down trails that cause sediment delivery to adjacent streams have been implemented on most system trails across the analysis area. For example, water bars are a standard practice during trail design and are maintained through trail maintenance.

The Remmel Lake/Spanish Camp area is an area frequently visited by outfitted and non-outfitted pack and saddle stock users. Data on stream and riparian conditions in the Remmel Lake/Spanish Camp area of the Pasayten collected, during a 2000 survey, shows that overall

PACFISH standard and guidelines are being met with the exception of two small reaches that are on an improving trend since the end of historic sheep grazing and unlimited recreational party sizes. All stream reaches inspected were well-vegetated, most had undercut banks, and bank erosion was generally limited to trail crossings.

Stream habitat indicators potentially affected by the proposed project are temperature, sediment, stream banks stability, large wood levels, and riparian habitat.

Appendix G shows the aquatic habitat parameters for major fish bearing streams within the analysis area. The stream surveys are included in the analysis file. The data are summarized below.

Temperature

Stream temperatures are generally good in the streams at higher elevations and are higher at the lower elevations, ranging from functioning at risk to not properly functioning based on ESA standards. Natural climatic conditions as well as recent fires that removed streamside canopy cover are likely major factors in the higher temperatures. A portion of the Chewuch River and Methow River are on the Washington State 303d list for high summer temperatures several miles downstream of the analysis area, but not actually in the analysis area. No 303d listed streams are located in the analysis area (WA DOE 2008). Surveys done on streams in wilderness or roadless areas during the Aquatic and Riparian Effectiveness Monitoring Program[4] (AREMP) surveys found stream temperatures to be within properly functioning ranges, suggesting their riparian canopies are intact, as a result of lack of past management activities. Therefore, the Forest Service estimates streams in the project have similar high functioning riparian areas. Exceptions are the Chewuch River and Lake Creek, where fires recently burned. The Chewuch likely has naturally higher stream temperatures due to its north/south orientation and naturally high width:depth ratio (average channel width divided by the average max depth) that creates high solar exposure. Lake Creek water that leaves Black Lake comes off the top where it also receives high solar exposure and tends to be warmer. Overall, temperatures are considered functioning at risk but not due to recreation use because riparian canopies are generally in good condition. The stream surveys are located in the analysis file.

The primary mechanism by which stream temperature would affect by outfitter-guides is the removal of shade producing vegetation.

Current outfitter-guide activities are having little to no impact on stream shade or impact to stream temperature. Outfitter-guide use occurs mostly on existing trails and campsites. Some minor vegetation loss occurs where trails and camps occur near water, but these sites are small in size and represent a small fraction of the total stream miles and lakes across the project area. Loose grazing occurs on ridge tops mostly with little access to streams and riparian areas. In general, horses and mules prefer grass to shrubs and trees, which would not affect the vegetative canopy providing stream shading. Based on the low frequency of use and the little time spent at the camp, outfitter-guide impacts to water temperature are inconsequential. Data for streams in wilderness areas with trails and stock use across available, north central

[4] AREMP characterizes the ecological condition of watersheds and aquatic ecosystems to whether the Northwest Forest Plan (NWFP) is maintaining or restoring aquatic and riparian ecosystems to desired conditions on federal lands in the Forest Plan area.

Washington, shows riparian areas are functioning for providing adequate shade and temperatures are not impacted.

Sediment

Stream sediment levels are generally low across the analysis area. Roads are considered one of the greatest sources of fine sediment for streams. Most streams across the analysis area are in wilderness or roadless areas, where there are few to no roads. Between 1995 and 2008, the Forest Service took fine sediment measurements in 14 streams within the project area that are within wilderness or roadless areas. The average fine sediment levels (<2mm) was 6.8% with a range of 2.5-12% of the total channel substrates. The AREMP program took fine sediment measurements in mid and north-central Washington, also within roadless or wilderness areas and found the average fine sediment to be less than 4%. Fine sediments in most streams within the project area likely similarly low because there is little human influence. Exceptions are areas with naturally high erosive soils and naturally have higher fine sediment levels such as the Chewuch, Sinlahekin, and Chelan watersheds (USDA 1994 & USDA 2000b), or where recent fires occurred. Based on the field observations of stream surveys in the analysis area (See stream surveys listed in analysis file) and the observations from the AREMP Surveys, fine sediment are estimated to be low and properly functioning.

Excessive bank erosion can lead to high sediment levels. Most of the land in the project boundary is steep, mountainous terrain. Streams have mostly steep gradients (4- >10%) and are characterized by larger sized rocks in the channel and streambanks. These channels are consistent with Montgomery and Buffington's (1997) definition of cascade and step-pool morphology channels, which occur on steep slopes, confined valleys, and cobble and boulder substrates. These channel types tend to be very stable that are resistant to bank erosion and channel incision due to the coarse bed and bank material. The 2000 field survey of streams in the Remmel/Spanish Camp (in **Appendix G**) areas found mostly low bank erosion. Low bank erosion rates observed at most sites indicates the stream banks are receiving little bank disturbance and the channels likely have natural fine sediment levels. The higher width:depth ratios can indicate higher fine sediment levels and can be a sign of poor conditions, but the low bank erosion rates suggest it may be natural.

Based on the past stream surveys in the project area and data from other surveys within wilderness and roadless areas described above, the fine sediment levels are estimated to be low and properly functioning for the entire project area.

Large Wood

Large wood levels were found to meet or exceed ESA standards for 16 out of 23 surveyed streams in the analysis area, but not the Okanogan and Wenatchee Forest Plan standards. The Forest Plan standards for wood are much higher then set by NMFS, U.S. Fish and Wildlife Service, and PACFISH, which are 20 pieces greater than 12 inches diameter and 35 feet or longer per mile compared to 106 pieces per mile under the Forest Plans. A recent publication looked at natural wood levels in undisturbed rivers in eastern Washington and found 33 pieces of large wood per mile to be properly functioning (Fox and Bolton 2007). Areas with lower wood levels were noted as being a natural condition due to the channel gradient and valley type. One exception was Granite Creek, which is right next to Highway 20, the construction of which was completed in 1964, removed a substantial portion of the wood source. Width:depth ratios can be an indicator of wood levels as large wood can promote scour and low ratios. Most ratios

were low during the 2000 survey in the Pasayten (refer to analysis file), suggesting channel structure such as wood are adequate. Since timber harvest is prohibited by management direction along most streams in the analysis area, wood levels and recruitment are likely at or near natural levels. Therefore the existing wood levels are considered to be functioning appropriately for the analysis area as a whole.

Current outfitter-guide activities are having no impact on instream-large wood levels. They are prohibited from removing wood from streams or cutting down standing trees. An exception is hazardous snags, but this effect would be too inconsequential to affect wood levels.

Riparian Reserves/Riparian Habitat Conservation Areas

With little to no human disturbance across most the analysis area, it is likely nearly all riparian areas are intact and properly functioning. There are 28 camps within the Riparian Reserves/Riparian Habitat Conservation Areas for streams and lakes. Forested streams in the project, which represent nearly all streams, are well protected from human disturbance by downed wood and dense forest and are considered to be functioning at natural capability. Minor riparian canopy modification has occurred in localized areas, especially in riparian areas more open such as non-forested streams. There have been substantial reductions in sheep and cattle grazing across the entire analysis area (and entirely within the Pasayten and Lake Chelan-Sawtooth Wildernesses), resulting in riparian and stream function improving as seen in the 2000 Remmel/Spanish Camp field survey. Overall, riparian areas are functioning appropriately at the reach, 6th and 5th field scale (See stream surveys and field repots listed in analysis file).

Lakes

There are 530 lakes within the analysis area (see **Figure 3.1-2**). Existing conditions of lakes in the analysis area for aquatic and riparian habitat has been inventoried, dating back to 1994. High lake aquatic inventories were completed on the following lakes in the analysis area (full survey reports are available in the analysis file):

- Swamp, Cabinet, Jerry (1-4), Lewis, Wing, Subzero, and Freeze-out Lakes within the Skagit River basin which is within the Lake Chelan - Sawtooth Wilderness and Sawtooth backcountry, North Cascades Scenic Highway, and Pasayten Wilderness in 1998.
- Cougar Lake, First Hidden Lake, Big Hidden Lake, and Middle Hidden Lake within the Pasayten Wilderness in 1995.
- Cub Lake, Boiling, Bernice Lake, and Surprise Lake in the Chelan Sawtooth Wilderness in 2000 (Entiat Ranger District).
- Remmel, Cornell, and Lower Cathedral lakes in the Spanish Camp area of the Pasayten Wilderness in 2001.
- Crow, Corral, Sheep, Quartz, and Ramon Lakes within the Pasayten Wilderness in 2002.

Figure 3.6-3. Number of Lakes in the Analysis Area.

Location	Number of Lakes
Bear/Ramsey/Volstead	21
Sawtooth Backcountry/Chelan	10
Sawtooth Backcountry/Methow	25
Middle Methow	9
North Cascades	57
Pasayten Wilderness/Methow	283
Pasayten Wilderness/Tonasket	51
Lake Chelan-Sawtooth/ Chelan	16
Lake Chelan-Sawtooth/Methow	53

Seventeen lakes in the analysis area have been surveyed, and six had frequent human use. Detailed results of the lake surveys are included in the analysis file. Observations made during lake surveys shows that lakes used by the stock have moderate to high impacts, but most lakes used by the outfitter-guides are for drop camps or for day use and the stock do not stay there more than a few hours. Outfitter-guide stock are generally controlled and are considered to contribute a small fraction of the overall stock effects that includes the general public. The majority of the use is considered from the general public stock use.

Water quality data is shown in Figure 3.1-3 for lakes on the Chelan District portion of the analysis area. Water quality for the Methow Valley Ranger District is not available for lakes. Similar data has been collected for 16 Methow Valley lakes with no water quality problems identified. Fecal Coliform data, which is a bacterium that originates in feces, has not been collected for lakes in the Methow Valley. Fecal coliform levels in lakes could be elevated if loose grazing stock congregate on the lake shore. Snowmelt and rainstorms could wash manure into lakes, however coliform bacteria have a limited time of viability when dried and exposed to sunlight which reduces the risk of surface water contamination. Refer to the Water Resources section for more information about fecal coliform.

Lake Chelan and its tributaries are subject to State Lake Class and Class AA (extraordinary) water quality standards as determined by Washington State Department of Ecology (DOE) using parameters defined by the Clean Water Act (CWA) 303(d) regulations. In the analysis area there are no CWA 303(d) listed water bodies (although see stream information above – there are some downstream listings), although lower Lake Chelan is listed for DDT and PCBs likely caused by orchard spraying. The four alpine lakes within the analysis area were surveyed and sampled in August 2000. Sampling results are presented in **Figure 3.1-3** with US EPA (1987) median reference values of surveyed lakes in the Pacific Northwest.

The parameter values for year 2000 samples show these lakes to have low primary productivity (from low nutrient contents) with high water quality, low nutrient inputs, and low organic production. Overall water analysis compares favorably to median reference values. The parameters with the greatest departure from the median reference values are due to the mineral characteristics of the Oval Peak Batholith that consists of tonalite and tonalite gneiss (igneous type rock). The most important indicator of contamination by humans and mammals, total coliform, was low (<1.1 colonies/100ml of sample volume) in Cub and Boiling Lakes analyzed for this parameter. These two lakes receive the greatest recreational usage of the four lakes measured.

Figure 3.6-4. Results of Water Analysis for Lakes Within the Lake Chelan-Sawtooth Wilderness on the Chelan Ranger District

Parameter	Cub	Boiling	Bernice	Surprise	Reference value
Sodium (mg/L)	1.12	0.92	0.62	†	0.425
Potassium (mg/L)	0.45	0.39	0.20	†	0.339
Calcium (mg/L)	2.53	1.69	0.68	†	1.958
Magnesium (mg/L)	0.38	0.24	0.08	†	0.203
Nitrate (mg/L-N)	0.00	0.00	0.00	†	0.006
Ammonia (mg/L)	0.11	0.15	0.12	†	0.00
Chloride (mg/L)	0.1	0.10	0.08	†	0.124
Sulfate (mg/L)	1.0	2.23	2.07	†	1.144
Total Phosphorus (mg P/L)	0.020	0.048	0.017	0.022	0.0035
Total Coliform (col/100ml)	<1.1	<1.1	†	†	<50 col/100ml WA State DOE
pH	7.0	6.7	6.2	7.6	7.0
Conductivity (µS/cm)	19.6	14.8	8.27	†	13.6
ANC (µEQ/L)	185.5	95.4	20.9	†	89.5
Alkalinity (mg/L)	194.34	104.71	27.75	†	>20
Chlorophyll *a* (µg/L)	0.7	1.5	0.5	1.0	1.9

† = no data

(Full reports available in analysis file).

Figure 3.6-5. Results of Water Analysis for Lakes on the Methow Valley Ranger District

Lake Name	Total –P in mg/L	NO3+NO2 in mg/L	Sulfate in mg/L	Chloride in mg/L	Calcium in mg/L	Magnesium in mg/L	Potassium in mg/L	Sodium in mg/L	Chlorophyll a in ug/L	pH	Conductivity umho/per cm	Alkalinity CaC03 ueq/L
Crow	**0.01**	**<0.010**	**<1.00**	**0.8**	**4.8**	**1.32**	**<0.500**	<0.500	1.2			
Corral	0.008	<0.010	<1.00	0.6	1.32	0.343	<0.500	<0.500	0.2			
Sheep	0.006	<0.010	1.81	0.6	2.3	0.429	<0.500	<0.500	<0.1			
Quartz	0.006	<0.010	<0.010	0.6	4.41	1.32	<0.500	<0.500	<0.1			
Ramon	0.016	<0.010	<0.010	0.6	2.42	0.424	<0.500	<0.500	1.1			
Cooney	0.009	0.002			0.86	0.143	0.25	0.78				
Swamp	0	0.001	0.09	0.12	2.1	0.301	0.08	0.61		7.2	17	166.93
Cabinet	0.002	0.001	0.25	0.22	5.97	0.466	0.18	0.78		7.6	38.6	386.19
Jerry 1	0.001	0.004	0.19	0.15	3.14	0.388	0.06	0.32		7.4	22.5	224.33
Jerry 2	0.002	0.01	0.18	0.15	3.28	0.421	0.07	0.34		7.5	28.5	234.53
Jerry 3	0.001	0.004	0.19	0.2	3.33	0.375	0.07	0.33		7.4	23.3	236.57
Jerry 4	0.001	0	0.09	0.16	0.95	0.175	0.04	0.19		6.8	7.7	87.69
Lewis	0.004	0	0.11	0.15	2.56	0.316	0.14	0.26		7.3	18.4	200.89
Wing	0.003	0	0.12	0.29	1.98	0.326	0.09	0.32		7.2	15.4	159.89
Subzero	0.002	0	0.82	0.17	4.59	0.117	0.17	0.45		7.4	28.6	239.4
Freez-out	0.003	0	0.86	0.2	6.9	0.391	0.12	0.64		7.6	43.7	385.47
Reference value	***0.0035***	***0.006***	***1.144***	***0.124***	***1.958***	***0.203***	***0.339***	**0.425**	**1.9**	**7**	**13.6**	**>20**

(Full reports available in analysis file).

Fish

The analysis area contains or is adjacent habitat for fish species listed under the ESA, Management Indicator Species (MIS), and species for which Essential Fish Habitat (EFH) has been designated under the Magnuson-Stevens Fishery Conservation and Management Act. EFH in the Methow and around the project area is designated where Chinook and coho are present. Since Chinook have higher distribution, the Forest Service uses Chinook's distribution for a surrogate of EFH because they have similar habitat preferences. Regional Forester's Sensitive Species, which include pygmy whitefish, Umatilla dace, and river lamprey are not found within the project area boundary or within the effects analysis area and thus will not be discussed further. Under the 2008 Regional Forester's Sensitive species list, westslope cutthroat trout and inland redband trout were listed. These species were dropped for the 2011 updated list, but this aquatics analysis will include specific analysis for these species. See **Figure 3.1-4** below for ESA listed, sensitive, MIS, and EFH.

Figure 3.6-6. Fish Species by Category Present in or adjacent to the Analysis area.

ESA	Sensitive	MIS	EFH
Spring Chinook (Endangered)	Pygmy Whitefish	Spring Chinook	Chinook
		Westslope Cutthroat	
Summer Steelhead (Threatened)	Umatilla Dace	Inland redband Rainbow	
Bull Trout (Threatened)	River Lamprey	Steelhead	Coho
		Bull Trout	
		Eastern Brook Trout	
		Sockeye	
		Summer Chinook	

Bull Trout

The U.S. Fish and Wildlife Service (FWS) listed the Columbia River population of bull trout (*Salvelinus confluentus*) as threatened on 06/10/1998 (63 FR 31647). The FWS designated critical habitat for Columbia River Bull Trout throughout their U.S. range on September 30, 2010 (75 FR 63897). The entire Chewuch River from its confluence with the Methow River to Chewuch Falls at about River Mile (RM) 34 is designated critical habitat for the species. Other critical habitat streams in the project area include the lower Lightning Creek system and Canyon Creek in the Ross Lake drainage portion of the Pasayten; Lost River and upper reaches of Lake Creek and the Chewuch River the Pasayten; Goat Creek, the upper Methow River, Trout Creek, and Early Winters Creek in the Upper Methow area; Blue Buck Creek and upper Beaver Creek in the Bear/Ramsey/Volstead area; the upper Twisp River and Buttermilk drainage in the Sawtooth Wilderness and Middle Methow areas; and parts of upper Gold Creek and Foggy Dew Creek in the Sawtooth Backcountry area (Figure 3.1-5).

The Upper Chewuch River Watershed is estimated to support between 5% and 25% of the migratory type bull trout spawning in the Methow Sub-basin, based on incomplete data from 1995 to 2008. Bull trout production appears to not have been reduced by the Farewell and Thirtymile Fires and may have been improved, based on an increase in redd (spawning nest) counts since before the fires.

One of the most important habitat requirements for bull trout is cold water because of their requirement for cold water for spawning and rearing. Generally, bull trout use is limited in streams when temperatures exceed 59D Fahrenheit (Reiman and McIntyre 1993). During the summer, water temperatures in the lower 15 to 20 miles of the Chewuch are considered to be too warm for ideal bull trout rearing and foraging habitat, except for the area near the confluence with Eightmile Creek, which provides a cold water influence to the mainstem river. Bull trout foraging and rearing are believed to increase in the lower mainstem during the spring, fall, and winter when temperatures are more favorable. Fluvial bull trout redds and individuals have been documented in Eightmile Creek below a suspected barrier at RM 1.6.

Spring Chinook

Upper Columbia River (UCR) Spring-run Chinook salmon (*Oncorhynchus tshawytscha)* were listed as an endangered species on March 24, 1999 (64 FR 14308) and their endangered status was reaffirmed on June 28, 2005 (70 FR 37160). The National Marine Fisheries Service (NMFS) designated Critical Habitat on September 2, 2005 (70 FR 52630).

Designated spring Chinook critical habitat in the analysis area includes the Chewuch River from its confluence with the Methow River to the barrier falls at RM 36.6, as well as short reaches of several tributaries including lower Eightmile, lower Cub, lower Boulder and Lake Creeks; the upper Methow/West Fork Methow to about Trout Creek, Lost River from its confluence with the Methow River to about Monument Creek; Early Winters Creek; lower Wolf Creek just below the project area; the Twisp River from its confluence with the Methow River to Road's End campground; Beaver Creek to the confluence of Middle Fork Beaver Creek; Gold Creek from its confluence with the Methow River to just below Foggy Dew Creek (the project area boundary) (Figure 3.1-5).

The most recent NMFS UCR spring-run Chinook salmon status review was in 2005 (Good et al. 2005) and describes the population level, as a whole, on a downward trend for the last 40 years. Since 1958, the entire Methow Sub-basin spawning population trend has been on a declining rate of 6.3% per year.

Steelhead

UCR steelhead were listed as an endangered species on August 18, 1997 (62 FR 43937) and their status was downgraded to threatened on January 5, 2006 (71 FR 834). NMFS designated Critical Habitat for UCR steelhead on September 2, 2005 (70 FR 52630).

Designated critical habitat in the analysis area includes the Chewuch River from its confluence with the Methow River to the barrier falls at RM 36.6, as well as Lake Creek from its confluence with the Chewuch River to Black Lake, and short reaches of several tributaries to the Chewuch River including lower Andrews, Twentymile, Eightmile, Cub, and Boulder creeks; the upper Methow/West Fork Methow to about Robinson Creek, Lost River from its confluence with the

Methow River to about Monument Creek; lower Early Winters Creek; lower Wolf Creek; the Twisp River from its confluence with the Methow River to Road's End campground, as well as its lower South, War, and Buttermilk creeks tributaries; and Gold Creek from its confluence with the Methow River to just beyond and into Foggy Dew Creek (Figure 3.1-5).

In the latest status review (Good et al. 2005), abundance for the entire UCR population was noted to be on the increase, though the run continues to be composed of a high proportion of hatchery origin fish, still well below the interim recovery levels identified for the population. Adult steelhead returns to the Methow Sub-basin, the primary natural reproduction area above Wells Dam, has been on an upward trend since the mid-1990s.

Inland Redband Trout

Inland redband rainbow trout (*O. mykiss*) are the native form of rainbow trout in the interior Columbia River basin and are native to the Methow Sub-basin. Redband trout are the resident form of rainbow trout while steelhead are the anadromous form. They contain the genetic and physical ability to change to steelhead, which largely depends on environmental conditions such as temperature. Mullan et al. (1992), speculated that colder temperatures in headwater streams leads to rainbow trout remaining in streams as 'resident' fish versus going out to sea as steelhead.

Redband rainbow trout is an Okanogan National Forest Management Indicator Species, which are ecological indicators for the effects of management activities on other species of selected major biological communities or on water quality. Redband trout are found throughout the Methow Valley sub-basin in streams with barriers below and streams connected with anadromous streams.

Non-native rainbow trout were historically stocked throughout the Methow sub-basin; stocking has since been restricted to isolated lakes, though many stream and lake subpopulations have likely experienced interbreeding between native and non-native trout. Despite this, relatively pure populations continue to exist in isolated locations around the sub-basin (Proebstel et al. 1998). Rainbow trout from the Lower Chewuch Watershed show signs of hybridization with coastal rainbow trout and, in some locations, with cutthroat trout (Proebstel et al. 1998) though some level of natural hybridization has likely occurred. O. mykiss specimens sampled from several locations along Eightmile Creek were determined by Proebstel et al. to be derived from or influenced by coastal rainbow trout. Genetically pure populations are found in pockets including Little Bridge Creek (Twisp), Goat Creek, Buttermilk Creek, and potentially more remote stream such as those in the Ashnola and Pasayten drainages; however distribution and genetics data on these populations are unavailable. Population trend data for the Methow Valley Sub-basin or the analysis area are not available, but the general distribution and population trend is considered depressed from historical ranges and population numbers (Thurow et al. 1997).

Westslope Cutthroat Trout (WCT)

Westslope cutthroat trout (*O. clarki lewisi*) are native to the Methow and Chelan Sub-basins and are Okanogan and Wenatchee Forest Plan MIS species. Their populations are generally found in isolated areas in the upper elevations of the sub-basin, distributed above rainbow trout populations, often with a hybrid-zone between. Streams within the analysis area with westslope cutthroat include upper Eightmile Creek and the Chewuch River. Washington State Department of Fish and Wildlife has stocked lakes extensively with this species across the

project area into high mountain lakes over the last 80 years and their distribution is thought to be artificially expanded due to colonization downstream from some of these lakes. Washington State Department of Fish and Wildlife continues to stock many mountain lakes in the sub-basin with westslope cutthroat trout outside of the Methow Sub-basin.

In the Methow River watershed, westslope cutthroat trout presence is known or predicted in 43 HUCs and known absent in 18 out of the total sub-watersheds. Westslope cutthroat trout status is known or predicted strong in 27 HUCs and known or predicted depressed in two. However, most of the WCT in these HUCs (roughly 20) have been introduced and are believed to exist outside their historic range. In the Lake Chelan watershed, WCT presence is known or predicted in 31 HUCs and absent in one. Westslope cutthroat trout status is known or predicted strong in 15 HUCs, and known or predicted depressed in nine HUCs. Overall, the stocking of non-native trout and loss of habitat are believed to result in depressed population status within the Methow and Chelan sub-basins (USDI 1999).

Sockeye

Sockeye are a MIS species on the Wenatchee Forest, but are not present in the analysis area. Kokanee, which are the landlocked form of sockeye salmon, have been stocked in Lake Chelan since around 1917. They are not native to the lake or tributaries and do not have sensitive species status. Sockeye are not discussed further in this analysis.

Umatilla Dace

Wydoski and Whitney (2003) report that Umatilla dace are benthic fish found in relatively productive, low–elevation streams. They inhabit streams with clean substrates of rock, boulders and cobble where water velocity is strong enough to prevent siltation from embedding interspaces. Umatilla dace reach 7–10 cm (3–4 in) in length. Mature fish probably spawn in July to early August. Diet is unknown but likely to consist of small aquatic insects. This species have been documented in the lower Twisp River and the Methow River. None have been found in the project analysis area.

Pygmy Whitefish

This species is not found within the Methow Valley Sub-basin. Pygmy whitefish are indigenous to Lake Chelan. The only documented pygmy whitefish is Lake Chelan was during deep water netting in 1996. No other individuals have been detected in the basin. Very little is known about abundance and locations during various life stages. They typically reside in deep, cold, oligotrophic lakes and will use streams of mountainous areas to spawn. Spawning surveys for pygmy whitefish indicate that the majority of the spawning occurs in December (Barnett and Paige 2012). The Forest Service and US Fish and Wildlife Service conducted three fish surveys on Fish Creek (surveys available in analysis file) and one on NF Fish Creek and four on Prince Creek and found no pygmy whitefish. It is possible some use may occur in these streams that were undetected, but their use would be low if at all.

Summer-Run Chinook

Summer-run Chinook salmon are a management indicator species on the Wenatchee National Forest, but are not present in the Lake Chelan or in the Methow Sub-watersheds where project effects would occur and are only found outside of the analysis area. Therefore they will not be discussed further in this analysis.

Fish Distribution

Most pack and saddle stock outfitter-guide activities occur miles above habitat occupied by fish listed under the ESA. Historically all high elevation lakes and streams above natural barriers did not support fish until stocking began in high lakes and some streams in the early 1920s. Fish soon colonized streams downstream of the stocked lakes and today the distribution of fish in the analysis area is greater than 80 years ago (Jennifer Molesworth personal communication). All lakes in the area except Cougar, the Hiddens, Black, and possibly Lower Cathedral, were historically fish-free. Planted fish are from stocks that are not native to the Methow, Pasayten, or Ashnola watersheds. Introduced fish have greatly, but not completely, diluted native genetic stocks of westslope cutthroat and redband rainbow trout unique to this area. Today many of the lakes are stocked on a 10 year rotation by the WDFW, with the exception of lakes that have established spawning populations of trout. The WDFW is responsible for fish stocking and management of fish populations; they coordinate fish stocking in wilderness lakes to address concerns over effects to native species and human use patterns in wilderness.

Fish stocking can lead to impacts at lakes because the presence of fish is a major attraction to people visiting the area. The high elevation of the lakes and short growing season makes high lake riparian areas vulnerable to over use. For the most part the smaller streams within the analysis area are well protected with vegetation, difficult to access and receive little fishing traffic while fish bearing lakes have fishing trails around them and usually a camp or two somewhere around the lake, usually near the outlet. High lake survey data show that this occurs at lakes accessed not only by foot traffic, but also at lakes accessed by horse users. Lakes accessed by horse users tend to have bigger impact areas. Non-native fish can compete or interbreed with native species, resulting in reduced survival. An example is introduced eastern brook trout is considered one of the major threats to the persistence of bull trout due to interbreeding and competition for habitat (Kanda et al. 2002). Brook trout historically, were stocked in most high mountain lakes and many streams on the Methow Valley Ranger District.

Natural fish bearing streams in the analysis area include the Chewuch River, Lake Creek, lower Andrews Creek, the Ashnola River including possibly Cathedral Creek and Spanish Creek, the Lost River, the Pasayten River, the West Fork of the Methow River, Granite and Canyon Creek, Early Winters Creek, the mainstem of the Twisp River, Wolf Creek, Goat Creek, Beaver Creek, Libby Creek, and Gold Creek (including Foggy Dew Creek and lower Crater Creek).

Fish species listed under ESA, on the Regional Forester's Sensitive Species list, Forest Plan Management Indicator Species, and species for which Essential Fish Habitat has been designated under the Magnuson-Stevens Fishery Conservation and Management Act in the analysis area are identified in **Figures 3.1-5** and **3.1-5** (see below and on maps in the analysis file). Fish presence/absence is based on stream and fish distribution inventories for the analysis area (included in analysis file). Generally, sensitive fish species are below the OG analysis area except for a few areas.

Figure 3.6-7. Presence of listed fish species by 5th field watershed.

Watershed (5th Field)	Listed Fish Species	Regional Forester Sensitive Species and Management Indicator Species	Essential Fish Habitat
Ashnola River	None	WC, RB	None
Sinlakekin Creek	None	None	None
Lower Similkameen	None	None	CH*
Pasayten River	None	WC, RB	None
Ross Lake	BT	BT	None
Ruby Creek	BT	BT, RB	None
Lightning Creek	BT	BT, WC, RB	None
Salmon Creek	ST	ST	None
Twisp River	CH, ST, BT	CH, ST, BT, WC, RB	CH
Middle Methow River	CH, ST, BT	CH, ST, BT, WC, RB	CH
Upper Chewuch River	CH, ST, BT	CH, ST, BT, WC, RB,	CH
Lost River	CH, ST, BT	CH, ST, BT, WC, RB,	CH
Lower Chewuch River	CH, ST, BT	CH, ST, BT, WC, RB	CH
Lower Methow River	CH, ST, BT	CH, ST, BT, WC, RB	CH
Upper Methow River	CH, ST, BT	CH, ST, BT, WC, RB	CH
Upper Columbia - Swamp Creek	CH, ST, BT	CH, ST, BT, WC, RB	CH
Upper Lake Chelan	None	WC, RB	None
Lower Lake Chelan	None	WC, RB	None
Stehekin	None	WC, RB	None

CH –Spring Chinook
ST – Steelhead
BT – Bull Trout
WC – Westslope Cutthroat Trout
RB – Rainbow Trout/Redband Rainbow Trout
*CH Summer Chinook

Bull trout is the only ESA listed species that extends well into the analysis area. The upper Lost River and Wolf Creek are the only areas with outfitter-guide camps adjacent to streams with bull trout. Four of the lakes have bull trout: Black, Cougar (Pasayten), First Hidden, and Middle Hidden Lakes.

Most ESA listed fish use occurs well downstream. **Figure 3.1-6** describes the camps within the Riparian Reserve of sensitive fish streams, fish species, and the use in the area. All other camps are more than 300 feet off of sensitive fish streams.

Figure 3.6-8. Outfitter-guide campsites along sensitive fish streams.

Campsite	Stream	Species	Fish Use
Horse Heaven	WF Methow River	WC	Spawning/Rearing
Cedar Creek	Cedar Creek	WC	Spawning/Rearing
Gardner Meadows	Wolf Creek	WC	Spawning/Rearing
South Fork	Wolf Creek	WC	Spawning/Rearing
Little Fish Camp	Wolf Creek	BT, WC, RB	Spawning/Rearing
Chewuch	Chewuch River	WC, RB	Spawning/Rearing
Lost River	Lost River	BT, WC, RB	Spawning/Rearing

Current known fish species in the Chelan portion of the analysis area consists of native Westslope cutthroat trout, introduced Yellowstone cutthroat trout, introduced rainbow trout, and introduced kokanee (**Figure 3.1-7**). Most of the streams in the analysis area have natural barriers (waterfalls within 1000 feet of Lake Chelan) that prevent lake resident fish from ascending streams. No streams in this portion of the analysis area support anadromous fish as a result of both natural barriers and the dam on the Chelan River (R2 and IA 2000). Introduced rainbow trout, Yellowstone cutthroat trout, and kokanee have no special status (sensitive, management indicator, proposed, listed, or otherwise). Bull trout are not present in the Lake Chelan portion of the analysis area.

Figure 3.6-9. Chelan Ranger District portion of the Analysis Area Stream/Lake Fish distribution.

Stream/Lake Name	Survey	Year(s) Surveyed	Fish Species Present in order of relative abundance
Safety Harbor Creek	1,060 feet.	1993, 2001, 2003	hybrid swarm of westslope-Yellowstone cutthroat, rainbow, kokanee
Canoe Creek	~50 feet.	2001	None
Prince Creek	1,584 ft.	1992, 2003	cutthroat, rainbow, kokanee
Rex Creek		2001	None
Pioneer Creek		2001	None
Cascade Creek	450 feet.	1983	cutthroat, rainbow
Meadow Creek	unknown	1983	unknown
Fish Creek	1,312 ft.	1998, 2003	cutthroat, rainbow, kokanee, suckers, cyprinids
Boiling Lake		1990, 2000	cutthroat & rainbow hybrids, cutthroat
Cub Lake		1990, 2000	cutthroat
Bernice Lake		1990, 2000	cutthroat & rainbow hybrids
Surprise Lake		1990, 2000	cutthroat

<u>Current Outfitter-guide Use and Effects to Streams and Lakes</u>

Pack and saddle stock outfitter-guide use in the project area represents only three percent of the total annual visitor days and 15 percent of the total pack and saddle visitor days. Therefore, overall use from the commercial outfitter-guides accounts for a minority of total use and logically, would account for only a small proportion of recreational impacts.

Outfitter-guides use a total of 24 campsites within Riparian Reserves or Riparian Habitat Conservation Areas, 4 campsites, and 35 near wetlands (refer to **Appendix I** for campsites within

500 feet of wetlands). The Forest Service completed campsite inventories on the 14 riparian camps located in the Pasayten and Lake Chelan-Sawtooth Wilderness. Measurements included barren core, number of trees with exposed roots, number of mutilated trees, and number of access trails. Additionally, field personnel reviewed physical streambank and streamside vegetation disturbances at access points and looked for evidence of firewood collection near streams. Each site has photos taken and a lineal estimates of streambank and vegetation disturbance.

Most of the land in the project boundary is steep, mountainous terrain. Streams have mostly steep gradients (4 to >10%) and are characterized by larger sized rocks in the channel and streambanks. Stream bank vegetation consists of conifers, alders, willows, dogwoods, and coarse substrates. These channel types are consistent with Montgomery and Buffington's (1997) definition of cascade and step-pool morphology channels, which occur on steep slopes, confined valleys, and cobble and boulder substrates and tend to be very stable that are resistant to bank erosion and channel incision due to the coarse bed and bank material (Montgomery and Buffington's 1997). The limited stream survey data available for the project area, located in wilderness or roadless areas (19 streams), indicates bank stability are excellent with higher than 90% bank stability throughout (See survey reports in analysis file more details). Most lakes receive little or no use throughout the year due to their remoteness. Many of the lakes are lined with rocky slopes and shores where human impacts are little to none. Lake surveys completed on the 17 lakes in the project area found recreation impacts to be mostly minor with the greatest impacts at the campsites. Trails often run around the lakes, but this often occurs on rocky slopes without vegetation naturally. From the survey reports, conditions such as lake shores, water quality, and vegetation are found in good to excellent conditions. Refer to lake surveys in the analysis file for more information.

Current commercial outfitter-guide activities do cause small, localized disturbances to lake shores, stream channels, and riparian areas across the project area with more concentrated impacts at campsites and day use areas close to wet areas. Where stock is allowed to loose graze, some localized impacts to streambanks, streamside vegetation, lake shores, wetlands, and riparian vegetation occurs. When stock are contained at camps or in pack-strings, impacts are limited to stock containment areas at riparian camps, trail-stream crossings, and watering areas. Field review of a subset of streams, wetlands, and lakes across the analysis area identified general recreational impacts occurring as streambank and lake shore trampling and riparian vegetation loss from browse (stock) and trampling (Laurie Dowie personal communication). However, the areas disturbed are small and represent only a small fraction of the high quality resources across the entire analysis area. It is important to note the current conditions reflect all recreational use in the backcountry and pack and saddle stock outfitter-guides stock use is only a small portion of the total use.

To assess disturbance to riparian vegetation associated with camps used by the outfitter-guides in Riparian Reserves or RHCAs (riparian camps), this analysis relies on field review of a subset of the riparian camps. Fourteen of the twenty-four Riparian campsites used by the commercial outfitter-guides, within the Pasayten and Lake Chelan-Sawtooth Wilderness, were inventoried over the last few years to measure the amount of barren core and camp area impacts to vegetation. Disturbances to vegetation ranged from nearly full vegetation loss in the barren core area to reduced densities and damage to existing trees and shrubs. Campsites averages from these sites were used to estimate sizes for the other 10 sites. Campsite vegetation

disturbances ranged from 20 square feet to over 10,000 square feet at the largest site. The average was about 2,700 square feet or a 52-foot diameter circle area. Barren core area, the area void of ground cover, ranged from 0 to 5,400 square feet with an average of about 1,140 square feet or a 30-foot diameter circle area. Using GIS, an estimated total of 86 acres of riparian vegetation are within this 52 foot radius of camps. The total estimated acres of designated Riparian Reserves and RHCAs across the project area are 173,527 acres. This amount of disturbance at the riparian campsites amounts to a range of 1% to less than 0.01% for a given 5th field watershed. This represents a small fraction of the total riparian areas associated with streams, lakes, and wetlands within the analysis area. Vegetation and ground disturbance outside of these areas was not present, except for trails to streams and lakes with some disturbance around them as discussed below.

Most streams across the project area are considered to be in pristine or near pristine condition with little human influence. Streambanks are well armored with dense vegetation and/or coarse rocks and receive little to no human use. Where stream surveys exist within the project area (See survey reports in the analysis file), bank stability is over 95% and considered excellent. Field observations of several other smaller streams suggest they have a similar high level of bank stability. This is considered optimal bank stability according to Cowley (2002), who reviewed several studies looking at bank stability over several hundred miles of different stream types through the western United States. Information is lacking on most streams in the project area. Most of the streams are in steep mountainous terrain with steep gradients, rocky channels, and are resistant to disturbances from bank alteration associated with livestock use as described above under analysis methods. Limited data for streams in wilderness and roadless areas suggests streams are generally in good condition due to the lack of human influence. There is limited or incomplete data for most streams, but the extent of project effects are small and the spatial scale of impacts would not compromise the overall high quality fish habitat. Therefore, collecting data on most or all of the streams and wetlands in the project area is not important for analyzing overall project effects.

Field review of some stream channels near camps and trails indicates current recreation impacts to streambank stability and streamside vegetation are minor. At riparian campsites, typically there were about 2-10 feet of disturbed streambank observed at trails from the campsites to streams and about 5-10 feet where trails cross streams. Vegetation browse was observed at the campsites, but little to none was observed along streambanks. Within the project area, there are 24 camps within riparian areas along streams. There is an estimated 3,200 miles of streams in the analysis area. Based on a distance of 10 feet of disturbed stream banks near camps and 10 feet along trails, 0.25 miles total or less than 0.001% of disturbed stream banks associated with camps.

Disturbances also occur where existing trails cross stream channels. Based on GIS analysis there are 709 stream crossings on trails in the analysis area. Field observations indicated that there is approximately 10 square feet of channel disturbance per stream crossing, which amounts to about 1.3 miles total of bank disturbance out of the 3,200 miles total or less than 0.001% disturbance. Furthermore, these crossings are dispersed across the analysis area and are not all used by outfitters.

There are 525 lakes in or bordering the entire analysis area, within the Northwest Forest Plan area. These lakes have an estimated combined distance of 137 miles of lake shore. Much of the

lake shores around these lakes are rocky slopes, which are highly resistant to recreational impacts. Based on lake surveys of human use, the campsites are the biggest impacts around lakes. Most campsites are positioned sufficient distance from the shores and none of the surveys found more than minor impacts to lake shores. Lakes used by pack and saddle stock outfitter-guides include Cooney Lake in the Sawtooth Backcountry and Crow, Corral, Sheep, Quartz, Ramon, Remmel, Upper Cathedral, Cougar, First Hidden, Middle Hidden, and Big Hidden lakes in the Pasayten Wilderness. Outfitters also use Sheep, Quartz, Upper Cathedral, Cougar, Remmel, Crow, and Ramon Lakes for day use and/or drop camps. Each of these lakes has been surveyed over the years (surveys in the analysis file). Based on lake surveys of human use from trails and campsite access from a handful of lakes in the project area (surveys in the analysis file), it assumed at lakes that have nearby campsites that are within Riparian Reserves or RHCAs will have approximately 25 feet of disturbed lakeshore. This equals a combined lakeshore disturbance distance of 0.1miles or less than 0.001% disturbed total lakeshores across the project area.

Impacts to lakes from current outfitter-guide trips are minimal because when pack stock are at lakes, they are tethered at least 200 feet away and spend no more than a few hours at the sites as explained below (L Dowie – personal communication). Cooney Lake in the Sawtooth Backcountry has a full service campsite but it is over a mile from the lake. There is a drop camp at the lake but the outfitter-guides and packstock do not stay at the lake. Recreation impacts at these popular lakes are primarily from the general public (hikers and non-outfitted stock users) using the backcountry. Commercial pack and saddle stock outfitters cause a negligible portion of the impacts, as their use only accounts for approximately 3% of total use. There is a full service campsite near First Hidden Lake where the outfitters camp with clients but it is over 200 feet from the lake. Pack stock are mostly grazed up at Stub Creek, 11.2 miles from the lake, or are tethered to hitch rails or highlines at least 200 feet from the lake (tethered rope to tie stock on). The outfitters do not camp along the other two Hidden lakes and the impacts there are primarily from the general public users.

Pasayten Wilderness

The major tributaries draining out of the Pasayten Wilderness portion of the analysis area are the Pasayten, Ashnola, and Chewuch Rivers, and Lake and Andrews Creeks. Fires in the last 30 years burned about 112,300 acres in this analysis unit and the fire effects to streams have produced favorable habitat conditions for fish and productivity. Bull trout redd counts increased after debris torrents from the 2001 Thirtymile Fire and 2003 Farwell Fires (USDA 2008). Fire is considered a natural habitat forming process and all habitat indicators are considered to be functioning at natural potential.

Up until 1995, cattle and sheep grazed on the Remmel allotment, which includes the Remmel Lake/Spanish Camp area. Sheep and cattle grazed these areas for nearly 100 years but use declined over the century and there has been no grazing since 1995. In early 2000, the permit for the Remmel allotment was waived back to the Forest Service and has been vacated and is proposed for closing. This represents a large decrease in domestic grazing in this area. The past grazing that occurred in some of these areas, makes it more difficult to determine the possible long term effects dispersed recreation or outfitter-guide use may have on riparian and aquatic habitat; but an overall movement towards restoration is anticipated with the removal of cow and sheep grazing. Stream channel data collected in the Remmel Lake and Spanish Camp area in late July 2000 show that meadow-type channels in the area were, at one time, beginning to

widen and show signs of deterioration but are now assumed to be recovering from the past cattle and sheep use. With the change from cattle and horses to generally just horses/mules, overall grazing use may be shifting to higher and drier meadows above the streams; cattle are more likely to use wet areas adjacent to streams while horses tend to avoid boggy areas, preferring drier, and upland forage areas.

With the exception of Cougar Lake, Hidden Lakes, the Thirtymile trailhead, the Andrews creek corral, Eightmile Creek, and Lake Creek (the specifics of which are all discussed below), the back country areas used by recreationists and outfitter-guides in the Chewuch watershed are miles upstream from fish species listed under the ESA. MIS are found in streams throughout this project area sub-unit. The level of disturbance caused by pack stock in the most heavily used areas of the Pasayten is generally confined to stream crossings and is not great enough to cause downstream effects. A handful of heavily used stream crossings have been inventoried and the effects include minor sedimentation of the channel and loss of streamside vegetation at the immediate area around the trail crossings.

Habitat conditions in the upper Lost River are functioning properly and considered in pristine condition. Bank stability of 90% or greater is considered optimal bank stability and representative of undisturbed sites (Cowley 2002). Streambanks along the upper Lost River are at or exceed 90% stability in all mainstem reaches surveyed, with most reaches exceeding 95% stable. One reach showed the highest proportion of eroding banks at 10.6%, which was attributed to recent (recent at the time of survey in 2000) wildfire activity that had resulted in streambank vegetation and tree loss . This amount of erosion (10.6%) and stability (89.4%) is just below what is considered optimal bank stability.

On the upper Lost River, near Lost River Camp, there is a trail down to the water's edge and some other minor bank trampling, amounting to about 15 feet on both sides. During rain events, these disturbed areas would likely deliver extra fine sediment to the river. No other human caused sediment sources were observed along the river near the campsites. Based on this one location with minimal disturbance and the low frequency of outfitter-guide access, it is unlikely sediment or streambank levels would result in measurable changes at the site scale and definitely not at the watershed scale. The effects to bull trout habitat from current use are insignificant.

The trail access to the Hidden Lakes is in the Lost River watershed and most of the trails are located far away from stream channels except at stream crossings and at Cougar Lake and the Hidden Lakes. Outfitters and the public frequently use the trail to Hidden Lakes, especially early in the season, but use at the lakes is limited to short stops or short duration stays of one to two days. Effects include some lake shore trampling and sediment delivery. The relocation of hitching rails in away from Stub Creek and First and Middle Hidden Lakes is reducing stock impacts to this area. Tying or grazing of stock is not allowed within 200 feet of the lakes.

With little to no human disturbance across the upper Lost River area, nearly all riparian areas are intact and properly functioning. The only areas where outfitter-guide activity, specifically pack animals and clients, would disturb lakeshores, stream channels, and riparian areas are at campsites and day use areas close to lakes and streams and at stream crossings on trails. There are 4 camps within the Riparian Reserves for streams and lakes in the Lost River Watershed. Nearly all streams in the project area are well protected from recreational disturbance by

downed wood and dense forest and are considered to be functioning naturally. Minor riparian canopy modification has occurred in localized areas, especially in areas where camps are within the Riparian Reserve.

Outfitter-guide use at the Thirtymile trailhead and Andrews Creek Base Camp occurs only a handful of times per year. The Thirtymile Trailhead (#510) is at the end of the road at Thirtymile where outfitter-guides start into the Pasayten Wilderness. Use of this trail is minimal. Trips can occur between July and late September. Normally, there is one trip on this trail in mid- to late-September, coinciding with the High Buck Hunt in the Pasayten Wilderness, which runs from September 15 to September 25 each year. All camps are several miles up the river drainage and distant from critical habitat. There is a new trail bridge at the trailhead that immediately crosses the river, and then parallels it for several miles. The bridge design is such that a small proportion of stock heading up the trail will not cross the bridge due to its narrow width and height of the side railing. Based on our own pack stock use and observations on past outfitter-guide use, we estimate about 20% of the stock animals will not cross the bridge (Rogers 2011, personal communication). In these cases, most of the stock use the bridge and the few animals that will not are led across the river. The ford site is rocky and the potential for sediment input is minor.

A small amount of sediment probably enters the river, but it would not compromise fish habitat because the amount would be immeasurable. Effects to fish would be inconsequential.

The Andrews Base Camp is an existing site near the confluence of Andrews Creek and the Chewuch Riparian Reserve. The site includes a corral that extends down near a small high water side channel at a distance of about 10 feet. A water trough exists in the corral, along the edge of the side channel. The water trough is fed by a ~ 1-inch pipe from the Chewuch River. The pipe is gravity fed with a small wooden box at the end with a small mesh screen to prevent fish from entering it. Mitigation measure 13f would require the fish screen on the pipe to meet NMFS approved criteria. The volume of water used by the trough is estimated at 0.0003 cfs. This is based on 2009 flow rates measured for gravity fed water developments on our grazing allotments using 1 inch. Water withdrawal of this volume would have no measurable to fish

habitat. Outfitter-guide use at this campsite is about 10 days a year and they normally stay overnight. Stock do not access the Chewuch River or Andrews Creek and therefore, there is no potential for sediment delivery to the river. The area of the camp has modified riparian vegetation, but it is far enough from the river to not influence stream shade and temperature or large wood recruitment. The effect to aquatic habitat in the river in minor and would not affect the quality of fish habitat.

Trails that access camping and loose grazing areas are used by the general public and outfitter-guides. Trails generally follow valley bottoms and are located on the outer edge or completely outside of Riparian Reserves and RHCAs. Trails are maintained to control erosion. The main routes into the Pasayten have little to no effect on stream channels except at stream crossings and a few localized segments where a trail may come close to a stream. An example is where the Andrews Creek trail is close to the stream as it approaches Andrews Pass. Trail location is locally affecting stream quality between Amphitheater and Upper Cathedral Lake, between lower Cathedral area and upper Beaver Creek, and the trail segments between Spanish Camp and Remmel Lake by adding excess fine sediment. A drift fence was constructed to prevent stock from going back on the trail. Stock presence at this site is infrequent as they don't usually go there. The effects are localized and do not cause impacts to aquatic or riparian habitat at the reach scale or at the watershed scale because the fine sediment delivery is small such that it does not increase measurable fine sediment levels.

In the Sheep Mountain area stream channels drain east towards the Ashnola River or west towards the Hidden Lakes and the Lost River. Main trails are located well away from streams so the trail network has little to no effect on channels. Streams in the Sheep Mountain area were also grazed by sheep and cattle in the past, which are recovering with increased bank stability and vegetation.

Trails that begin near Harts Pass and access the Pasayten River watershed are located away from stream channels except at crossings and are having little to no effect on stream habitat. Minor volumes of sediment, estimated at <0.1 cubic yard per year, is delivered to the river. Most of the past outfitter use in this area has been in the fall during hunting season, when fish are out of their redds and free swimming. Impacts to fish and their habitat would be minor as disturbance levels are few and short-term.

There is a corral within the Riparian Reserve of Eightmile Creek at the Billygoat Basecamp. Stock are staged at this corral before taking clients to the Pasayten Wilderness. There is a road that provides access from the corral to trailhead and the stock are never loose grazed at this location. Therefore, it is a discountable probability there would be any disturbance to streambanks or sediment from the activity in the drainage. There is a small water pipe taking water from a tributary stream to a trough in the corral. The amount of water removed would be an estimated 0.003 cfs. For Eightmile Creek, the estimated low flow is 1.2 cfs and with a measured a flow of 3.1 cfs in September of 1992. Using the lower amount, we estimate the water development use amounts to less than 0.3% of flows in Eightmile Creek. The small amount of water used for this water development combined with low number of days used per year (<14), would have a trivial effect to stream flow in Eightmile Creek and the Chewuch River. Therefore, the overall effect in upper Eightmile Creek would be minor and would not compromise the existing aquatic or riparian habitat.

Habitat conditions on Lake Creek are currently recovering from a large wildfire. Prior to the fire, bank stability exceeded 95% and fine sediment levels averaged 10%. Riparian conditions were found to be properly functioning with dense riparian forests and streambank vegetation. These conditions suggest the outfitter-guide use was having little impact on the aquatic and riparian conditions. The camps used by the outfitters are near the top of the watershed, miles above listed fish habitat and outside of riparian reserves. Overall impacts to aquatic and riparian habitat conditions are minor.

Virtually all of the use in the Lake Creek watershed has been from private parties. The trail from Black Lake to Ashnola Pass and the Pasayten has not been maintained for several years and is no longer passable to horses; horse use through the area is declining especially following the 2003 Farewell Fire. The number of bull trout redds counted in upper Lake Creek from 1995 to 1999 dropped from 22 to zero in 1999; the reason for this apparent decline is not known. In 2004, following the fire, six bull trout redds were counted in upper Lake Creek and in 2005 there were 24 redds; the highest number since counting began in 1995. Lake Creek and Black Lake were closed to the public from the start of the June 2003 Farewell fire until mid-summer 2005. It is unknown if the higher redd counts are due to three years of reduced angling pressure, improved post-fire habitat conditions, or natural population cycles unrelated to fire and fishing pressure. Although it is not permitted to retain bull trout the main threats to this population are fishing pressure and incidental catch by people that are unaware of the fishing regulations, choose to ignore them, or do not know how to identify a bull trout, or damage done during catch and release.

There are approximately ten drift gates in the Pasayten and Lake Chelan-Sawtooth Wildernesses. These gates are located where topography or terrain, in addition to the drift gate, helps prevent loose grazing stock from moving out of an area. None of the gates, including the ones on the Andrews Creek and Chewuch trails, are causing stock to trample riparian areas or wetlands because the gates are located in dry upland areas. Wetlands and streams in the vicinity of the gates are not being trampled by the occasional outfitted stock that may be stopped by the gate.

Middle Methow

There are no outfitter-guide client days or RVDs in the Middle Methow area. The only outfitter activities in this area are the assigned sites at Slate and Crater Creek basecamps. The camp at Slate Creek has a corral and access road. The Crater Creek camp has an access road, unloading ramp, hitch rails, watering trough, corrals, and parking area. In the middle Methow portion of the analysis area, back country and wilderness recreation, including stock based outfitter-guide use, is trail-based and takes place away from roads in areas not accessible to listed fish.

North Cascades

The Pacific Crest Trail (PCT) traverses the West Fork of the Methow watershed from near Cutthroat Pass to Harts Pass. The 4 to 5 miles of the Methow River that the trail follows is above Brush Creek and is not inhabited by ESA listed fish or sensitive species, but does have MIS present. There is one large camp used by pack and saddle stock outfitter-guides at Horse Heaven above Brush Creek. This camp is within 100-feet of the river and has several trails accessing the river, but is 2 miles upstream of a natural barrier and the upper limit of ESA listed fish. MIS are found in the West Fork Methow River. Most popular are the easy day hikes out and back from Harts Pass, where on a peak day in summer over a hundred people will use these

trails. The peak season of use is short, usually limited to the months of July and August. Due to popularity, the PCT is maintained annually to the highest standards. ESA listed fish are too far downstream to have fine sediment effects, but MIS are present and some recreation induced sediment occurs at minor levels where the trail crosses tributaries. The level of effects would be small enough to fall within natural background levels.

The West Fork of the Methow River trail parallels the Methow River from Rattlesnake Creek to Brush Creek where it joins the PCT. This area was burned in the 2003 Needles fire and the trail was reopened to mountain bikes, horses, and hikers in 2004. It is used by commercial horse packers for day rides and to access the high country. There are no camps along the trail that are regularly used by commercial outfitters except for Horse Heaven camp located on the PCT upstream of Brush Creek (see above). The camp does not affect aquatic and riparian habitat indicators at the reach scale; effects at the site scale are localized. The West Fork trail is located in the Riparian Reserve for the Methow River in a number of places. Access for bull trout and steelhead is blocked at the falls just below the confluence with Brush Creek, 2.4 miles downstream. This trail parallels habitat occupied by bull trout, but is sufficient distance away to that sediment effects would fall within natural background levels.

In the Upper Methow watershed, outfitter-guides use established trails and roads. Pack and saddle stock outfitter-guides also use Little Boulder Creek during the hunting season. The stream channel is steep and protected by steep valley walls; hunting takes place in the uplands. There is no recreational use along the stream and therefore, no aquatic effects.

Outfitter-guide activities along the North Cascades Highway are limited to Cedar Creek, Cutthroat Creek, and the Pacific Crest Trail, with an average of less than two trips per year. Trips have historically been taken by the outfitters using burros or llamas. Cedar Creek and Cutthroat Creek habitat observations by field biologists were reported as being excellent with low fine sediment and good wood levels (Hopkins – personal communication), and so these effects are apparently not affecting fish or their habitat.

Lake Chelan-Sawtooth Wilderness and Sawtooth Backcountry

Most of the access into the Lake Chelan-Sawtooth Wilderness originates at trailheads in the Twisp River drainage. Two trails, Fish Creek and Prince Creek, begin on the shores of Lake Chelan.

The Sawtooth Backcountry is most commonly accessed by the Crater Creek and Foggy Dew trails in the Methow watershed. These trail systems are generally located outside of riparian reserves except at stream crossings and have virtually no effect on stream habitat indicators or on fish. Listed fish are not adjacent to any of these trails or in the areas used by outfitters, but MIS are present throughout much of the streams.

The Wolf Creek trail accesses the Mount Gardner area in the Lake Chelan-Sawtooth Wilderness. Listed bull trout and native cutthroat and redband rainbow trout are present in Wolf Creek. Use by outfitters in this area is a small percentage of overall use. Outfitters use Wolf Creek mainly for drop camps during hunting season and use is little to none before this, suggesting overall use during the year is limited to a trip or two. This does coincide with bull trout spawning in the upper Wolf Creek. Annual spawning surveys have not seen channel impacts or any signs of redds being disturbed by outfitter-guide use. The Wolf creek watershed was grazed by cattle until

about 2001 when the permit was purchased and waived back to the Forest Service; as a result, use on the trail has declined dramatically. The Wolf Creek trail is located away from riparian reserves for most of its length except at the Fish Camp area near the confluence with the North Fork of Wolf Creek. Fish Camp is a bull trout spawning area and outfitters are not allowed to ford the mainstem of Wolf Creek during bull trout spawning season to avoid trampling spawning areas since 2007.

Current outfitter-guide impacts are mainly a result of trail or campsite location. Destinations of outfitter-guides include the Oval Lakes, Scatter Lake, Slate Lake, and the Lake Chelan National Recreation Area via trails in the Reynolds Creek, War Creek, and Eagle Creek sub-drainages. Outfitter-guide activities have not had direct effects on listed fish because the activity takes place miles above habitat occupied by listed fish on existing trails, but may have had some minor direct effects to MIS species when accessing streams.

There are roughly 140 miles of trail in the Twisp River watershed. Many of the tributary drainages in the watershed have trails that parallel the drainage but are generally located out of riparian reserves. Trails are usually less than two or three feet wide and do not deliver measurable sediment to habitat occupied by listed or MIS fish.

Trails are maintained to keep a clear pathway, to minimize erosion, and to protect water quality. Specific projects that have been completed to address erosion or water quality concerns in the Twisp River watershed include work done in 1999 on the West Fork Buttermilk Creek trail, and work done in 2007 on the Twisp River trail to relocate a large segment of the trail in the upper part of the drainage out of a wetland area. Another section that was eroding and adding sediment to the stream just above the trailhead was re-contoured. In addition, one mile of the trail on the North Creek alluvial fan where bull trout spawn was moved off the fan. These projects reduced recreation caused fine sediment delivery to fish habitat, thereby having a beneficial effect.

Bear Ramsey/Volstead

Much of the Bear Ramsey/Volstead area burned in the 2006 Tripod Fire. Bull trout are present next to some trails used, but not the one camp used. MIS, westslope cutthroat trout, and redband trout are present throughout some of the streams in this unit.

Three campsites in the area are used by pack and saddle stock outfitter-guides as drop camps during hunting season. Fish are more capable to avoid disturbances during this time of year. In the past, outfitter-guide use in this area has been virtually nonexistent and there have been no observed overlaps with outfitter use in this area and fish bearing streams. The upper Beaver Creek watershed had a fragile population of bull trout that is vulnerable to human disturbance prior to the Tripod Fire of 2006. Since then, fish surveys have found no bull trout. Bull trout either were killed from the fire or moved out. There are no outfitter-guide dispersed campsites in this area.

Alta Lake
The only outfitter use in this unit is day rides. Alta Lake and a small pond are the only water bodies in the unit. There were no visible effects from outfitter-guide use along these water bodies.

Loose Grazing
When loose grazing, horses and mules generally stick together and are constantly moving across the land, eating grass as they move. Typically free-ranging horses move rapidly to and from water sources with very little feeding or loafing activities near drinking areas (Ganskopp and Vavra 1986). They may travel to lakes for water, and may graze near them for short periods of time, but tend to not linger along lakeshores. They prefer open areas and elevated terrain away from water and thick brush to get away from insects (Keiper and Berger 1982) and to be able to assess potential threats from predators (Ganskopp and Vavra 1986). They prefer to avoid muddy areas because they instinctively do not want to be mired in mud, and simply because they prefer to keep their feet dry. Grasses are the preferred browse over riparian species like sedges and shrubs (Salter and Hudson 1980, Hansen et al. 1977). Horses and mules will disturb wet areas, streambanks, and some vegetation from their grazing, but they do not prefer wet areas for grazing and spend a minority of their time in these areas. Dispersal of horses and mules across a loose grazing area tends to minimize impacts to sensitive riparian areas (Ganskopp and Vavra 1986).

The number of trips per trail and management area varies by drainage, ranging from multiple per month to a few per month. Stock numbers per trip vary but are not more than 18 head, except for pre-approved oversize parties. Many of trips involve stock spending only one night in the backcountry to bring clients in and one night to bring them back, but some trips do involve stock staying in the backcountry for up to a week in the backcountry. Stock density when loose grazing would mostly be up to 18 head over about 5 acres or about four animals per acre. This level of density coupled with their behavior of preferring open meadows, limits the effects to riparian areas associated with streams, wetlands, and lakes to minor habitat effects. Streams, wetlands, and lakes reviewed near camps where the use is the highest indicate disturbance is minor. Difficult access as a result of steep terrain and dense vegetation limit disturbance to most streams, wetlands, and riparian specific vegetation.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

Pack and saddle stock outfitter-guides would have no impact on aquatic resources, since no permits would be issued. The existing non-outfitted stock use and hiking would continue throughout the analysis area. Current outfitter-guide use amounts to about 3 percent of the total visitor days and about 15% of the total pack and saddle stock use. Existing trails would be maintained and all existing camps would be available to the general public. Alternative 1 would result in a 3 percent reduction in total visitor days and a 15 percent reduction in stock use days on trails and at camps.

There would be an insignificant positive effect to fish species under this alternative, because reduction in stock use would be 15% and overall use would be a 3% reduction. This small decrease in use would not meaningfully change existing aquatic habitat conditions.

Some of the creek crossings in the most frequently used areas, such as Spanish Camp, would possibly become a bit smaller in size because there would be less stock crossing and watering at these areas. Since the existing trail network would be maintained at current levels and existing levels of public use would continue, the effects of Alternative 1 would not cause a measurable change in effect to any stream habitat indicators.

Effects from campsites and fishing trails at lakes created by the non-outfitted public would continue under Alternative 1. Riparian conditions at lakes that are most frequently visited by stock outfitters and clients may improve slightly due to less lake shore trampling and less human disturbances. This would be most notable at Cornwell, Airview, and Remmel Lakes in the Spanish Camp/Remmel area, and at Quartz, Crow, Corral, Sheep and Ramon Lakes in the Sheep Mountain area, within the Ashnola Watershed.

In the Lake Chelan-Sawtooth and Sawtooth Backcountry, riparian conditions may improve slightly around Cub, Boiling, Bernice, and Surprise Lakes with less overall recreational use, but public use would continue at existing levels. Areas that currently receive infrequent use by outfitters (Wolf Creek, Early Winters, Cutthroat, West Fork Methow, Libby, Bear/Ramsey/Volstead) would remain unchanged from the existing condition. With Alternative 1 there would be “no effect” to ESA listed fish species or habitat.

Alternatives 2, 3, and 4

The pertinent differences between Alternatives 2, 3, and 4, relating to impacts to aquatic and riparian resources, include visitor/stock use days, party size, riparian campsite barren core area, and campsite locations. Through field review and surveys, the existing impacts to lakes, wetlands, and streams from all back country recreation are mostly minor (See survey reports in analysis file). This coupled with the slight differences in use levels between alternatives and the small proportion of pack and saddle stock outfitter-guide visitor and stock use compared to total use, would result in such small differences in resource effects that they would not be meaningfully measurable and would be inconsequential between alternatives. The following points discuss how the alternatives would have similar effects.

- Service Days and Visitor Days.
  The number of pack and saddle stock service days would increase 4% with Alternative 2, decrease 40% with Alternative 3, or increase 50% with Alternative 4. When considered in context of overall use, Alternative 2 would increase pack and saddle stock use by 0.6%, Alternative 3 would decrease use by 6%, and Alternative 4 would increase it by 8%.

  This difference between alternatives would not result in a measurable change in resource impacts to lakes, streams, or wetlands because the differences in use between alternatives is small, the same protective mitigation measures would apply to each alternative, and overall, the pack and saddle stock outfitter-guides use is a small a fraction of the total visitor days. Thus, it’s logical that the proportion of impacts to

aquatic resources would follow the same proportions where the general public use would cause a majority of the impacts and the commercial pack and saddle stock outfitters would account to for a minority of impacts. There may be slight differences in effects to streambanks, riparian vegetation, lake shores, and wetlands, but the differences would too small to be measureable or detectible between alternatives.

- Party size.
  Alternatives 2 and 4 have identical party sizes and would have identical resource impacts. Alternative 3 would have reduced number of stock and people present on trips. This alternative would have a slight reduction in aquatic and riparian impacts due to less stock and people, but this would be too small to detect differences from the other two alternatives. Again, because the outfitter-guide use accounts for such a small proportion of overall recreational use the larger general public use and associated impacts would mask any differences from Alternative 3 to 2 and 4. Additionally, the current level of use and associated impacts to aquatic and riparian resources are minor and immeasurable on resources that are at or near pristine condition. With only slight increases in use, the additional impacts would not increase the magnitude of effects to a measurable level.

- Barren core within riparian campsites.
  Outfitter-guides use 21 riparian campsites within the backcountry. Of these, only two sites are larger than 2,800 square feet and only one over 5,250 square feet. Alternative 2 would limit the amount of barren core area pack and saddle stock outfitter-guides could use to 5,250 square feet. Only one campsite exceeds this amount by 150 square feet, which would be revegetated under this alternative. This would result in such a small benefit, it would be meaningless. Alternative 3 would limit barren core to 2,800 square feet and only two sites exceed this amount. The total restored area would equal less than one tenth of an acre under this alternative. Similarly, the benefit of restoring these small areas would not result in any meaningful benefit to aquatic resources. Alternative 4 would allow the outfitter-guides to use the existing barren core at campsites, but prohibited from any increasing their size. There would be slightly more barren core under Alternative 4, but it would be less than one tenth of an acre. Therefore, Alternatives 2 and 3 would have trivial benefits to aquatic resources and Alternative 4 would have slightly more barren core overall, but it too would be meaningless. With no measurable difference in impacts between alternatives, the effects of each would essentially be the same. Additionally, the general public would continue to use the existing sites, which proportionally amounts to approximately all the use (>95% of the use across the project area). Hence, differentiating the effects would not be possible.

- Camp locations and access routes.
  Alternatives 2 and 4 are identical where existing camps within 200 feet of wetlands, lakes, and streams could be used by outfitter-guides. There are 26 campsites within 200 feet of these areas across the project area. Alternative 3 would prohibit using camps within 200 feet of wetlands, lakes, and streams. Prohibiting outfitter-guide use of these campsites would not change the current effects to aquatic habitat for two reasons. First, the outfitter-guides and the public have been using these campsites for decades and the impacts to aquatic resources have been found to be small and inconsequential. Second, these campsites would continue to be used by the general public, which accounts to >95

percent of the total people use and 85 percent of the total stock use. Therefore, use at these sites would continue at levels close to what they are currently and the impacts to aquatic/riparian resources would be the same. The trail use to these sites would remain essentially the same, so the difference in impacts to aquatic resources would remain immeasurable between alternatives.

Other than less overall use, the direct and indirect effects to ESA listed, MIS, pygmy whitefish, westslope cutthroat, and redband trout species, aquatic habitat, and riparian habitat would be essentially the same between alternatives. The overall use, including the general public, would continue to mostly be the same at these campsites. The slight reduction in use under Alternative 3 would result in slightly less effects to wetlands, lakes, and streams, but the reduction of effects would be too small to change habitat conditions and the risk for aquatic and riparian effects would be essentially the same between alternatives. Effects to temperature, sediment, streambanks, lake shores, and riparian vegetation would be minor and indistinguishable between alternatives. Overall, it is expected that the effects to streams, lakes, and wetland resources should be similar to each alternative in most places. Each alternative has the same aquatic/riparian management objective and mitigation measures and therefore, the effects from all activities would be essentially the same to fish and aquatic habitat.

Direct Effects

There is potential for direct effects to fish present in streams accessed by outfitter-guides. Species with potential for direct effects include pygmy whitefish, westslope cutthroat, redband rainbow trout, bull trout, steelhead, and Chinook. Direct effects could involve trampling redds, disturbing spawning adults, or displacing individual fish from hiding cover making them vulnerable to predation. Areas with potential direct effects to ESA species include Wolf Creek, upper Lost River, and the upper Chewuch River drainages.

Within Wolf Creek, bull trout occupy up to RM 7.4 on the mainstem and the lower 1/2 mile on North Fork Wolf Creek. Redd surveys have been done since 1995 and the number of redds range from 8 to 29 per year. No spawning has been observed in NF Wolf Creek. Most of the spawning reach is well away from the trail and not accessed by the pack and saddle stock outfitter-guides. An access point to the spawning reach occurs at the Little Fish Camp, which is about a half mile above North Fork Wolf Creek. The camp would be closed to commercial pack and saddle stock outfitter-guides after September 1 each year, which would eliminate outfitter-guides from crossing Wolf Creek in spawning habitat. The only access to occupied habitat would be on the main existing trail that fords North Fork Wolf Creek. It's very unlikely a bull trout would spawn at the short piece where the trail crosses because the habitat is not suitable. To further reduce the probability, the outfitter-guides will be trained to identify bull trout redds or spawning activity so they could avoid walking on them. Therefore, the probability of a redd being trampled or spawning fish disturbed to be considered negligible. It is possible stock or people would cross North Fork Wolf or mainstem Wolf Creek prior to September 1 and may disturb individual fish. Access to bull trout habitat is limited, due to steep terrain and dense vegetation, so this would occur only a few places. Temporary disturbance or displacement of a few bull trout is not likely to physically harm or disturb feeding or sheltering of fish to the extent of causing injury. Pack and saddle stock outfitter-guides would not access steelhead or Chinook habitat, so there is no potential for direct effects. The closest point for these species is at least a mile downstream from any creek access. All other camps are well above the presence of bull trout.

The risk of direct effects to bull trout from outfitter-guide stock, guides, or clients in the Lost River drainage is low. The access trail to all the camps never crosses the river and the stock animals stay on the trail except when loose grazing or dropping off clients at campsites. Stock animals water at tributary stream crossings on the trail. Loose grazing occurs at the Tatoosh Butte deluxe campsite, which is six miles upslope from the river. The only time the animals are by the river is on the trail or at camps when bringing gear or people in and out. When not on the trail or dropping off gear or clients, they are kept up on Tatoosh Butte.

Of the seven drop camps in the upper Lost River area, only two are within 500 feet of the river and the others are over 1/2 mile from the river. The most likely spot for river access and potential for bull trout redd trampling is at Drop Camp G, which is near the Lost River where spawning does occur. In order to prevent disturbance to spawning, all outfitter-guide activity would be prohibited from using Drop Camp G and from crossing the river at any location after September 1. These measures would prevent redds and pre-spawning adults from being disturbed.

Prior to September 1, outfitters and clients would be allowed to access and cross Lost River. Some disturbance to juvenile and adult bull trout is expected. Access to bull trout habitat is limited, due to steep terrain and dense vegetation, so this would occur only a few times per year where fish would be disturbed. Temporary disturbance or displacement of a few bull trout is not likely to physically harm or disturb feeding or sheltering of fish to the extent of causing injury. Commercial outfitters would not access steelhead or Chinook habitat because the closest point for these species is several miles downstream from any creek access. There would be no potential for direct effects.

The ford across the Chewuch River presents a potential location for redd trampling or disturbing individual Chinook and steelhead; however, the probability is expected to be extremely low. The ford site is located right above the Thirtymile trail bridge. The frequency of ford events would be low, up to two times or four river crossings each year. Use could occur during any time of the summer or fall; however, use is typically limited to one group during the month of September, coinciding with the High Buck Hunt. Channel conditions at the ford site are not suitable for spawning. Substrate composition is too large for spawning sized gravels (see photo), which needs to be golf ball to tennis ball sized rocks. By limiting river access to the ford site, the project would minimize the amount of habitat accessed. Due to the channel conditions, there would be no spawning at this ford site, so no potential for redd trampling Chinook, steelhead, or bull trout.

When stock cross the river, some direct effects could occur to individual steelhead, Chinook, and bull trout. Adults would likely be in deeper water with cover, away from the ford or on spawning grounds upstream or downstream. Similarly, the channel gradient at the ford is not preferred rearing habitat. Therefore, the likelihood of encountering an adult or juveniles would be low compared to other low gradient habitat sections. Because of low frequency and duration of use at the ford, stock entering the river is likely to be so infrequent as to be of insignificant magnitude via disturbance/ temporary displacement only. There may be some short (minutes) behavioral changes of individual adult or juvenile fish but it will not lead to anything more than the fish swimming away from the pack animal. In addition, no crossing will occur near an ESA listed fish redd because stock will be prohibited from crossing critical habitat or limited to a

location with no spawning habitat (Thirtymile Ford). Direct effects to steelhead, bull trout, and Chinook would be minor and not cause any harm or effects to the local population.

There is no for direct effects to the Umatilla dace because their closest point to the project area is at least 10 stream miles downstream and pygmy whitefish are not found in the Methow Valley. Redband and cutthroat trout are found throughout the project area. These two species spawn in the spring and can remain in their redds until mid-August. Outfitter-guide trips generally start in mid-July, but can start earlier with lower snowpack years. Redband and cutthroat trout typically spawn in smaller pockets of habitat in remote reaches where access is very low. Access occurs at trail crossings and occasionally when stock cross fish bearing streams. Because of the limited overlap in timing of outfitter-guide activities when redds are present and limited access to spawning habitat, the probability of redds being trampled is considered to be very low.

Pygmy whitefish are indigenous to Lake Chelan. Very little is known about abundance and locations during various life stages. They typically reside in deep, cold, oligotrophic lakes and use streams for spawning. Spawning surveys for pygmy whitefish indicate that the majority of the spawning occurs in December (Barnett and Paige 2012). Three surveys have been done in Fish Creek, one in NF Fish Creek, and four in Prince Creek. These are the largest streams in the project area that drain into Lake Chelan. If pygmy whitefish use these streams, it is likely their use is infrequent as compared to redband and cutthroat trout. However, it is possible for some whitefish to be present and they may be disturbed from outfitter-guides. Any disturbance would be infrequent and short-lived (minutes). It is unlikely this level of disturbance would result in any harm to individual species and no effect to the local population.

The most likely direct effect to redband and cutthroat trout is temporary disturbance (minutes) when stock or people access streams. Access to fish habitat is limited where these species exist, due to steep terrain and dense vegetation, so this would occur only a few times per year on a handful of streams across the entire project area. Temporary disturbance or displacement of a few fish is not likely to physically harm or disturb feeding or sheltering of fish to the extent of causing injury. Therefore, the effects would be not affect local populations.

Indirect Effects

Temperature

Outfitters would be prohibited from removing vegetation without prior Forest Service approval and if approved, any removal would be required to maintain existing shade levels. There would be no newly created openings. Therefore, no changes to stream temperatures would be expected and there would be no effects to the existing high quality temperature conditions associated with sensitive fish habitats. Existing high quality stream temperatures on site or downstream, where fish are present, would remain.

Sediment

Some sediment would be generated into streams and fish habitat when clients and stock access streams at trails and when loose grazing occurs. Disturbance to streambanks, in the form of tramping from stock or humans, is the most likely mechanism for generating sediment to fish habitat. Field review of major fish streams, which have the greatest disturbance, show streambank alteration and disturbance, is very low. Streambanks are well armored (>95%) with vegetation and coarse rocks. Small sediment inputs across the analysis area would not be

measurable and would not diminish the existing high quality habitat. Existing high quality sediment levels on site or downstream, where fish are present, would remain.

Large Wood

Outfitters would be prohibited from cutting down any live vegetation without specific authorization from the Forest Service. On rare occasions, standing trees or snags may be cut if an immediate, unavoidable safety hazard is posed. If authorized, any tree removal would be designed to not reduce natural wood recruitment. Downed firewood would be collected at sites, but gathering and using downed wood greater than 12 inches in diameter would be prohibited within 200 feet of streams. This would provide for adequate coarse wood in areas with connected floodplain where streams may flood and this wood could provide high water fish habitat. Because of the very small proportional length of the river's riparian reserves occupied by camps, the overall effects to instream wood levels would be zero. Existing high quality large wood levels on site or downstream, where fish are present, would remain.

Riparian Reserves/Riparian Habitat Conservation Areas

With little to no human disturbance across most of the project area, most riparian areas are intact and properly functioning. The only areas where outfitter-guide activity, specifically pack animals and clients, would disturb lakeshores, stream channels, and riparian areas are at campsites and day use areas close to lakes and streams and at stream crossings on trails. There are 28 camps within the Riparian Reserves or RHCAs surrounding streams and lakes in the analysis area. Nearly all streams in the project area are well protected from recreational disturbance by downed wood and dense forest and are considered to be functioning naturally. In all cases the camp sizes will be maintained at existing levels and impacts would not increase over existing conditions.

Effects of packstock on riparian vegetation would not be measurable because the project does not propose new trails or campsites. Most of the Riparian Reserves across the project area are not accessed by the outfitters or for any other recreational activity. Some localized impacts (reduced ground vegetation, soil compaction, and potential surface erosion) are expected inside Riparian Reserves and RHCAs along some streams near camps and trail/stream crossings and may be negative at the site level, but are expected to be insignificant at the sub-watershed and watershed levels due to the small scale of the impact. Anticipated effects from continued use include alteration to riparian function in the form of changes to microclimate conditions, slightly higher fine sediment delivery to channels, and slightly less large wood recruitment. As with other indicators affected by browsing and vegetation trampling, effects to Riparian Reserves and RHCAs are not expected to be measurable and will have a neutral effect on the Riparian Reserve and RHCA indicator on site or downstream.

Aquatic habitat conditions where EFH is designated would remain unchanged over the existing conditions. EFH is limited to where Chinook and coho salmon are present, which are miles downstream except at the Thirtymile ford. A few stock crossings at this location would add minor sediment to the river, but would be immeasurable and have no impact on the existing high quality habitat that currently exists. Therefore, project effects to EFH would be inconsequential or no effect across the entire project area.

Lakes

There are 530 lakes within the analysis area. Based on field review and GIS analysis, less than 1% of the total lake shores across the analysis area are estimated to be impacted by recreation use and the existing pack and saddle stock outfitter-guides analyzed in this document only accounts for only 2-4% of that total use across the entire analysis area. Therefore, the alternatives would account for only a small fraction of impacts to lakes. Pack and saddle stock outfitter-guide would be prohibited from grazing within 200 feet of lake shores, so would have little effect on the existing lake ecosystems across the analysis area. For example, stock impacts from trampling would be limited to a controlled area over 200 feet from lakes with only occasional trampling from access for water. Effects to fish would non-existent because in-lake habitat would not be altered.

By establishing tighter controls, the mitigation measures would eliminate future development of outfitter created trails and stream crossings. The forest plan amendments would control the amount of barren core allowed in campsites, possibly slightly improving aquatic habitat by reducing impacts to riparian vegetation. There would be less barren core under Alternative 3 than 2 & 4; however, the general public would continue to use these sites and they likely would remain the same.

Small-scale, localized habitat impacts could temporarily alter some individual trout behavior when people or stock cross streams and generate some localized turbidity, but the extent would be minor. Observed fish habitat effects from the outfitter-guide project is limited to a few dispersed access points where minor bank trampling or vegetation disturbance occurs. Fish habitat is generally optimal or near optimal across the entire project area. Minor habitat disturbances would not degrade the high quality habitat available to redband and cutthroat trout. Overall, the habitat effects would be immeasurable and minor to aquatic and riparian habitat. The existing high quality habitat for ESA listed fish, MIS, westslope cutthroat, and redband trout would remain and the indirect effects the outfitter-guide activities would be insignificant.

In summary, the pack and saddle stock outfitter-guide activities would have small and localized insignificant effects to aquatic and riparian habitats across the project area. A few individual fish may be exposed to some stress from stock or humans causing displacement or altering their behavior or indirect disturbance from small, localized impacts to habitat. These effects would be infrequent and minor and would not affect local population levels. In the long term (years to decades), ESA, MIS, and redband and cutthroat trout habitat features are expected to continue to provide high quality habitat conditions.

Summary of Effects to Region 6 Sensitive Species and Management Indicator Fish Species

Under each alternative, there is potential for some direct effects to individual MIS, including redband and cutthroat trout, and pygmy whitefish. Indirect impacts through outfitter-guide caused sediment delivery and reduction in riparian vegetation that would reduce habitat quality in small, localized areas. Due to the distance from sensitive species (several miles), there would be no direct or indirect effects to Umatilla dace. Direct impacts would be in the form of disturbance and possibly displacement to adjacent habitat. This level of impact would not result in harm to individuals and no effect to local populations. The small-scale, localized habitat impacts could result in disturbance to individual trout listed as MIS. These would be few in number across the project area due to limited access and short-duration of stock or people

presence along fish bearing streams. The overall habitat conditions, which are good to excellent, would remain as a result of the proposed project's design and mitigation measures. Impacts to native trout habitat would minimal and not sufficient to decrease each species' viability within the project area.

Overall, some minor direct and indirect habitat effects may occur to MIS, but at very low frequency and intensity that would not affect survival or reproduction of local populations. The combination of good to excellent habitat conditions, light impact of current outfitter-guide activities on aquatic resources, and development of a good riparian monitoring strategy to ensure resource objectives are met, the project effects for each alternative would be minor and would not degrade or diminish local populations or their habitat.

Summary Effects to ESA Listed Fish Species and to Essential Fish Habitat

Informal consultation on the project with FWS and NMFS was completed in accordance with the regulations implementing the ESA, 50 CFR 402.14(b)(1). The regulatory agencies responded with letters of concurrence dated November 13, 2012 (NMFS) and January 28, 2013 (USFWS) to the insignificance of any effects to the species, their critical habitat, or Essential Fish Habitat. The letters are included in Appendix M.

The potential for direct effects to steelhead is limited to the ford on the upper Chewuch River, at the Thirtymile Trailhead. There would be up to two trips crossing the river per year, for a total of 4 times fording the river. The channel condition at the ford site is a cobble/boulder riffle and steelhead redds are not likely to be present at this location due to the large rock sizes. Furthermore, outfitter-guides would be limited to crossing the river twice during the year. Therefore, the probability of a redd being trampled was deemed discountable. Disturbance of juveniles and adults may occur, but is likely to be low and minor. Disturbances are expected to be infrequent and minor, not rising to the level of harassment. As discussed above and in great detail in the project Aquatics Biological Assessment, aquatic habitat effects from each alternative would be minor at this site and for the project area above. All other steelhead streams would not be affected because the proposed activity occurs well above their distribution. Therefore, the proposed activity results in a "*may affect, not likely to adversely affect*" determination for steelhead and their critical habitat.

The potential for direct effects to Chinook is limited to the ford on the upper Chewuch River, at Thirtymile Trailhead. The channel condition at the ford site is a cobble/boulder riffle and Chinook redds are not likely to be present at this location due to the large rock sizes. The closest documented redd was about 600 feet downstream. Therefore, the probability of a redd being trampled was deemed discountable. Disturbance of juveniles and adults may occur, but is likely to be low and minor. Snorkel surveys found low densities of juvenile Chinook at this location so the risk of disturbing young Chinook would slight and their exposure would be very infrequent. Therefore any disturbance is expected to be infrequent and minor, not rising to the level of harassment. Habitat effects would be minor at this site and for the project area above, where there is no access to Chinook habitat. Some fine sediment would be generated when stock ford the river, but the ford is mostly large rock with little fine sediment to generate. Any sediment delivered to the river would be too small to have any impact on redds downstream. All other Chinook streams would not be affected because the proposed activities occur well above their distribution. Therefore, the proposed activities result in a "*may affect, not likely to adversely affect*" determination for spring Chinook and their critical habitat.

Access to bull trout habitat occurs in the Upper Chewuch, Lower Chewuch, Lost River, Upper Methow, and Middle Methow watersheds. By prohibiting these outfitter-guides from accessing spawning streams in the fall, no direct effects would occur to any life stages. Indirect effects from habitat disturbances were concluded as neutral to insignificant/discountable. Therefore, the proposed activity results in a "*may affect, not likely to adversely affect*" determination for bull trout and their critical habitat.

The extent of original coho salmon habitat in the Methow Sub-basin is not known and current reintroduction efforts have not found any known spawning adults or juveniles in any project area streams. All Chinook salmon habitat, except the ford across the Chewuch River at Thirtymile, is well downstream from pack and saddle stock outfitter-guide activities. Impacts to combined steelhead and spring Chinook critical habitat, as a rough coho surrogate, are considered unsubstantial, based on the Aquatics Biological Assessment in the analysis file. No adverse impacts to EFH are expected.

Mitigation Measures

Alternatives 2, 3, and 4 include Mitigation Measures that would be implemented in order to minimize impacts to various resources. These mitigations also serve as Best Management Practices (BMPs), as required by the Clean Water Act. The following list is included in the Mitigation Measures. *The following measures would help the proposed project to meet the ACS and RMOs and comply with the Forest Plan's aquatic and riparian Standards & Guidelines.*

Campsites

Campsite mitigation measures (1 a-g and 2a-h)would prevent an increase in the existing barren core size which minimizes the potential for vegetation loss and erosion, thereby reducing potential for an increase in overland flow and sedimentation to nearby streams. Minimizing erosion and sedimentation mitigate potential impacts to water quality that may impact fish habitat.

Stream surveys completed on the upper Lost River, Chewuch River, Lake Creek, and Wolf Creek found fine sediment and bank erosion to be at low or optimal levels along the existing camps (surveys in analysis file). Suggesting, the existing campsite sizes have minimal to no erosion and sedimentation to adjacent streams.

Trails

Trail mitigations (6 a-c) would reduce the potential of decreased water quality from erosion from trails by limiting the establishment of new trails and ensuring that existing trails are maintained so as to prevent erosion.

Stream surveys completed on the multiple streams adjacent to trails in the project area found fine sediment levels to be at low or optimal levels (surveys in analysis file) suggesting, the trails had minimal to no erosion and sedimentation to adjacent streams.

Sanitation
Sanitation mitigations (7 a-e) would help reduce the amount of fecal matter and other contaminants in waterways, helping to protect water quality. Proper disposal of waste away from water minimizes potential that contaminants are deposited directly in water and the potential for contaminants to wash into water during rain events.

From the project hydrology report, fecal coliform levels from existing outfitter-guide use are not degrading water quality, suggesting human and stock fecal matter are not of a magnitude to alter the current high water quality. The proposed mitigation is similar to what has occurred for several years and it's expected to have the same minor impact to water quality.

Stock Containment and Grazing
Stock containment and grazing mitigations (8 a-j) would help reduce impacts to water quality from sedimentation at trail crossings, watering spots, and campsites. Loose grazing disperses stock across large areas, minimizing impacts to water quality and riparian areas. This helps to ensure that there is not an increase in erosion or sedimentation. Grazing stock away from water reduces the likelihood that lakeshores will be heavily impacted and eroded and the risk of contaminants such as fecal coliform impacting water quality.

Vegetation and Soil
Vegetation and soil mitigations (10 a-c) would help reduce water quality impacts by minimizing damage to vegetation, wet soils and meadows, and by restoring areas of soil damage to reduce erosion potential. Vegetation helps to reduce overland flow, a mechanism by which sediment can be deposited in streams and lakes, by absorbing water and slowing the rate at which it reaches water.

Stream buffers, with vegetative cover, are effective at mitigating sediment delivery to streams (Rashin et al. 2006; Liquori et al. 2008).

Aquatic Resources
Aquatic habitat, riparian reserve and riparian habitat conservation area mitigations (12 a-g) would help protect riparian areas, and reduce impacts to water quality from increased sedimentation, reduced shade, and hazardous materials. Closing camps during spawning season eliminates the potential that outfitter-guide use would result in trampling of redds. Educating guests and outfitters about bull trout and fishing regulations reduces the risk that clients accidently take a listed fish species. Storing hazardous materials away from water reduces the likelihood of water contamination in the event of a spill.

Prohibiting outfitters from using camps adjacent to bull trout spawning in the fall and from crossing spawning habitat (mitigation measure13 c and d) would be effective in preventing disturbances to this critical life stage. By preventing hazardous material from being handled or stored with Riparian Reserves or RHCAS, this would be effective in reducing the risk for spillage or contamination.

Allowing only drop camps at Black Lake, and not allowing outfitter-guide camps on weekends or holidays between Memorial Day and Labor Day (mitigation measure 2c) would minimize potential effects to bull trout by protecting lake side habitat, and reducing fishing pressure.

Cumulative Effects

The geographic area for cumulative effects is the Methow River and Chelan watersheds because any aquatic effects from the permitted use under the alternatives would not be felt beyond these watersheds. The temporal timeframe is the early 1900s through 2023, when the 10-year permits would expire and no additional effects would occur. This period is also includes reasonably foreseeable future actions listed at the beginning of this chapter for consideration in this cumulative effects analysis.

Past, Present, and Reasonably Foreseeable Future Actions

Past actions that are still impacting aquatic habitat are discussed in the Current Condition section above. The effects of past, present and reasonably foreseeable future actions that would overlap impacts from pack and saddle stock outfitter-guide are summarized below.

Grazing

Throughout the analysis area cattle and sheep grazing has slowly declined from peak levels in the early 1900s. In the last 10 years sheep grazing has been discontinued in the Hart's Pass area and in the Lake Chelan-Sawtooth and Sawtooth Backcountry. Cattle grazing has also been discontinued in the Wolf Creek watershed and across the Pasayten Wilderness. Today there is no livestock grazing in any of the wilderness areas and the number of domestic animals grazing from recreational activities in these areas is substantially lower than it has been for the last 80 to 100 years. Livestock grazing would continue within the Bear/Ramsey/Volstead area. The elimination of livestock grazing in wilderness and the Sawtooth Backcountry combined with a continuation of pack and saddle stock grazing would result in fewer domestic animals grazing in the analysis area than under past conditions even though recreational pack and saddle stock grazing may increase by up to 5% in the future (IAC, 2003). In the Bear/Ramsey/Volstead area livestock grazing would be rested for at least another year to allow the burned during the 2006 Tripod fire area to recover after which livestock grazing will continue with monitoring and annual review. The addition of a small amount of commercial recreational outfitter stock use combined with the existing livestock grazing permit is not expected to result in any noticeable changes to aquatic or riparian habitat in the Bear/Ramsey/Volstead area.

Recreation use

Non-outfitted recreation use by hikers and stock users is expected to increase by about 30% over the next 10 years (Refer to Reasonably Foreseeable Future actions in introduction of Chapter 3). A 5% increase in non-commercial pack and saddle stock recreation use combined with commercially outfitted pack and saddle stock use at levels that are similar to past levels (Alternative 2) or slightly less than past levels (Alternative 3) would result in conditions that are similar to the current condition because management of use in riparian areas would be the same under each alternative. Use on trails and at lakes would increase by about 35% over current conditions.

Trail maintenance would continue as it does now and drainage structures will be maintained on trail treads and any expansion of the existing trail network will be discouraged. Outfitter-guides will be prohibited from expanding the existing trail network and thus will add no incremental cumulative effects.

It is expected that the Washington State Department of Fish and Wildlife will continue fish stocking of wilderness lakes depending on future budgets and recreational use levels. The Forest Service will continue to work with the agency to provide information about fishing activity and to provide information to anglers about fishing regulations and species identification where listed bull trout are present in the analysis area. Commercial outfitters would help with this effort by ensuring that their clients are knowledgeable about fishing regulations and species identification.

Alternative 1

Under Alternative 1, eliminating the outfitter-guides would reduce impacts to aquatic and riparian resources at the few localized areas accessed. However, these areas will continue to be used by the general public and only a few impacted areas would likely have slight improvements. Therefore, eliminating the existing outfitter-guide use would not be measurable or detectable and would have little to no cumulative benefit.

Alternatives 2, 3 or 4

Alternatives 2, 3, and 4 would continue outfitter use with essentially the same effects to aquatic and riparian resources. Impacts would continue to occur to localized areas that are well dispersed and represent a small fraction of the entire analysis area. Additionally, ongoing use from private stock parties, hikers and other users would continue.

There have been substantial reductions in sheep and cattle grazing across the entire analysis area, resulting in a positive cumulative effect to riparian and stream functions, as seen in the 2000 stream surveys. Aquatic and riparian conditions in areas previously grazed by cattle and sheep would continue to improve without pressure from this type of grazing.

Overall, aquatic and riparian conditions would continue to maintain high quality conditions at the reach, 6th and 5th field scales in wilderness and roadless areas given the minimal management activities that take place in these areas. Aquatic and riparian conditions are considered properly functioning across the analysis area and continuing the outfitter-guide activity would not meaningfully retard or prevent their functions. Given the large size of the analysis area, over one million acres, compared to the small amount of impacted area, cumulative impacts would too small to meaningfully measure or detect.

CONSISTENCY FINDINGS

The design criteria and mitigation measures listed in Chapter 2 were used to ensure that all of the alternatives are consistent with the Forest Plans as amended by the Northwest Forest Plan and PACFISH. Specifically, the measures listed under mitigation measures would be effective in mitigating any potential effects because pack stock would be kept 200 feet away from water, riparian camps would not grow in size, and vegetation along streams and riparian camps would be protected. They would be part of the operating plans, with compliance required by the special use permit. Failure to comply with the terms and condition of their permits and operating plans would result in administration action would be taken as described above. All Alternatives would meet management objectives to maintain conditions in Riparian Reserves and RHCAs, maintain stream temperatures, prevent chemical contamination, maintain large

wood within channels, and provide for long term woody debris input. They would also meet Forest Plan standards and objectives (given the riparian buffers) as amended by each alternative and Aquatic Conservation Strategy and PACFISH objectives at the 6th and 5th field watershed scale (see specifics below and in Appendices K and L).

Standards and Guidelines

The aquatic and riparian Standard and Guidelines are met as follows:

Fisheries

- Forest Plan 3-1 is met through current conditions and prohibiting live vegetation and non-hazardous snags from being cut, following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, minimizing trampling of live vegetation, and designated travel ways in meadows or wet areas.
- Forest Plan 3-4 and 3-5 are met through current conditions and prohibiting live vegetation and non-hazardous snags from being cut, following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, and minimizing trampling of live vegetation.
- Forest Plan 3-6 is addressed by current conditions and prohibiting live vegetation and non-hazardous snags from being cut, following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, and minimizing trampling of live vegetation.

PACFISH

- GM-3 is addressed through current conditions, alternative design, and following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, minimizing trampling of live vegetation, and designated travel ways in meadows or wet areas.
- RM-1 through RM-3 are addressed by current conditions, alternative design, and prohibiting live vegetation and non-hazardous snags from being cut, using designated campsites, prohibiting any measurable increase in barren core at riparian campsites, following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, minimizing trampling of live vegetation, and designated travel ways in meadows or wet areas.
- LH-3 is addressed through current conditions and alternative design.

Northwest Forest Plan

- GM-1, GM-2, and GM-3 are addressed through current conditions, alternative design, and following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, minimizing trampling of live vegetation, and designated travel ways in meadows or wet areas.
- RM-1 and RM-2 current conditions, alternative design, and prohibiting live vegetation and non-hazardous snags from being cut, using designated campsites, prohibiting any measurable increase in barren core at riparian campsites, following Leave-No-Trace practices, using existing trails, loose versus concentrated grazing in designated areas away from streams, minimizing trampling of live vegetation, and designated travel ways in meadows or wet areas.

PACFISH Riparian Management Objectives

All the alternatives would be consistent with the PACFISH Riparian Management Objectives. To assess consistency with the RMOs, the proposed project was assessed for maintenance or restoration of healthy and functioning aquatic and riparian resources.

The following table depicts the expected effects of the No Action and the Action alternatives to the Riparian Management Objectives (RMOs) found in PACFISH and INFISH for streams.

The RMOs are an integral part of the 1995 PACFISH (USDA and USDI 1995) that was developed to restore and/or maintain the ecological health of watersheds and aquatic ecosystems within public lands. Design criteria and mitigation measures for the proposed pack and saddle stock outfitter-guide project are designed so the project would be consistent with the RMOs at sub-watershed and watershed scales. The RMOs provide criteria against which attainment or progress toward attainment, of the riparian goals for watershed health is measured. There are specific numeric RMOs to which managers aim for during resource management. Design criteria and mitigation measures for the proposed pack and saddle stock outfitter-guide project are designed so the project would be consistent with the RMOs at sub-watershed and watershed scales.

The RMOs most pertinent to the desired conditions and riparian management objectives within the project area, and that were tracked through the analysis are as follows:

- Pool Frequency – varies by channel width (see PACFISH 1995)
- Water Temperature – No measurable increase in maximum temperature
- Large Woody Debris - > 20 pieces per mile; >12 inch diameter; >35 foot length
- Width:Depth Ratio - <10, mean wetted width divided by mean depth

Figure 3.6-10. Alternative comparison of each of the RMOs.

Riparian Management Objective (RMO)	Alternative One-No Action	Alternative 2, 4, and 4
Pool Frequency > 96 pools per mile in streams <10' wide	Would remain the same. Most streams are in wilderness or roadless areas with little management. Most pool frequencies are considered properly functioning. The slight reduction in stock and human use would not change the existing high quality pool habitat across the project area.	Would remain the same. Factors that influence pool frequency are fine sediment loads and instream wood. From the aquatics analysis, it was determined each different alternative would produce only small, insignificant amounts of fine sediment to the stream network. This impact would not be enough to fill in pools in streams, which have very low fine sediment levels already. All large wood in channels, standing live trees, and non-hazardous snags would remain. Therefore, each of the alternatives would maintain the existing high quality pool habitat across the project area.

Riparian Management Objective (RMO)	Alternative One-No Action	Alternative 2, 4, and 4
Water Temperature 60° F. or less	About 1/3 of the streams surveyed in the analysis area currently exceed this temperature. Natural causes like wildfires, aspect, and ground water influence are largely responsible for stream temperatures. No increase is expected, under this alternative.	With no removal of live vegetation along streams, stream temperatures would remain the same.
Large Woody Debris (LWD) > 20 pieces per mile, 12" diameter at the small end and >35 feet in length*	Most streams have sufficient LWD levels. Areas with lower levels are not due to human factors, rather wood levels natural fluctuate and vary depending on recruitment and deposition areas. Conditions would remain unchanged under this alternative.	With no removal of live vegetation along streams, non-hazardous snags, or downed wood >12 inches in diameter, each alternative would protect instream wood levels.
Width to Depth Ratio < 10 (mean wetted width divided by mean depth)	Currently some reaches of streams in the analysis area not are within the 10:1 ratio, these are due mostly natural conditions since little to no human influence occurs at or above these streams. No increase is expected, under this alternative.	Use along streambanks is limited due to steep terrain and dense vegetation. Additionally, stock would be on designated trails, controlled at camps, or freegrazing away from streams. Existing width to depth ratios would remain under each alternative.
Bank Stability (non-forested systems) >80% stable	Bank stability is high across the project area (>95% in most cases). Conditions would be unchanged under this alternative.	Measures such as requiring stock to use existing trails, be tethered 200 feet from streams, and loose grazing in designated areas away from streams, would protect the existing high quality streambank conditions across the allotments for each alternative.

Riparian Management Objective (RMO)	Alternative One-No Action	Alternative 2, 4, and 4
Lower Bank Angle > 75% of banks with <90o angle (i.e.: Undercut) (non-forested systems)	This metric has not been monitored across the project area. Most of the streams are in steep mountainous terrain with steep gradients, rocky channels, and streambanks are resistant to disturbances from bank alteration associated with livestock use. Limited data for streams in wilderness and roadless areas suggests streambanks are in stable condition due to the lack of human influence. The spatial scale of impacts would not compromise the overall high quality fish habitat. Therefore, collecting data on most or all of the streams and wetlands in the project area is not important for analyzing overall project effects. Existing bank angles would not change under this alternative.	Measures such as requiring stock to use existing trails, be tethered 200 feet from streams, and loose grazing in designated areas away from streams, would protect the existing high quality streambank conditions across the allotments for each alternative. Additionally, the probability of grazing within 200 feet of streams is low.

Summary of Effects

All the campsites are within wilderness or other roadless areas where the main disturbances are natural disturbances such as fire, avalanches, floods, etc., therefore the RMOs are in all likelihood being met. All alternatives would be consistent with the Forest Plan as amended by PACFISH because they would be unlikely to hinder the attainment of the RMOs in the long-term. The pool frequency RMO will be unaffected since sediment inputs from possible bank trampling would be marginal. The large woody debris RMO would be maintained in all streams. The water temperature RMO would be maintained because this project would essentially not reduce stream shading. The width-to-depth ratio RMOs would be maintained because the camps do not occur on a large enough scale to reduce the canopy and cause significant stream channel widening.

Some localized impacts would occur across the project area. However, the PSSO activity would have marginal effects at the site scale and virtually no effect at the reach, sub-watershed, or watershed scale. Natural upland and instream processes would remain in a highly functional condition and the few negative localized effects would have an immeasurable effect on these RMO objectives.

<u>Aquatic Conservation Strategy Objectives</u>

All the alternatives would be consistent with the Aquatic Conservation Strategy Objectives. The rationale for this determination is as follows:

1. **Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.**

At individual site scales, stock animals can modify features in the riparian areas and in upland areas. Within riparian areas associated with campsites and where trails cross streams, animals can reduce riparian vegetation and destabilize stream banks. However, these areas are not continuous and are less than 1% of riparian areas across the landscape. The few impacts would be unnoticeable at the project and 5th field watershed scale. Therefore, issuing the permits for 10 years to pack and saddle outfitter-guides would not prevent maintaining or restoring the distribution, diversity, and complexity of watershed and landscape-scale features sufficient for a healthy ecosystem.

2. Maintain and restore spatial and temporal connectivity within and between watersheds.

No part of the project effects would change the existing connectivity between watersheds. The very small fraction of effects at the site scale would not prevent riparian or aquatic dependent species from making normal migration patterns. This objective would be maintained.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Most of the land in the project boundary is steep, mountainous terrain. Streams have mostly steep gradients (4 to >10%) and are characterized by larger sized rocks in the channel and streambanks. Stream bank vegetation consists of conifers, alders, willows, dogwoods, and coarse substrates. These channel types are consistent with Montgomery and Buffington's (1997) definition of cascade and step-pool morphology channels, which occur on steep slopes, confined valleys, and cobble and boulder substrates and tend to be very stable that are resistant to bank erosion and channel incision due to the coarse bed and bank material (Montgomery and Buffington's 1997). Lakes vary from having wet meadows adjacent to rocky talus type slopes along the margins. Human impacts range from none to some areas with heavy localized impacts at campsites. Recreational impacts consist generally of campsites, trails around the lake, some lake shore trampling. Some lakes have multiple campsites while others have a few or just one. Impacts from recreation are generally light on lakes, especially outside of the campsites.

The areas where outfitter-guide activity, pack animals and clients, could potentially disturb shorelines, banks, and bottom configurations are at lakes, wetlands, and streams adjacent to campsites, day use areas, and stream crossings on trails. Field review of a subset of streams, wetlands, and lakes across the analysis area identified human caused impacts occurring in the form of bank and vegetation disturbance where trails cross streams, where campsites are close to water, and where stock access wet meadows and wetlands (surveys are included in the analysis file).

Field review of streams near camps and trails indicates current impacts to streambank stability and streamside vegetation are minor. At riparian campsites, typically there are about 2-10 feet of disturbed streambank and about 5-10 feet where trails cross streams. Vegetation browse was observed at the campsites, but little to none was observed

along streambanks. Within the Northwest Forest Plan project area, there are 21 riparian camps. There is an estimated 2,609 miles of streams in the analysis area, under jurisdiction of the Northwest Forest Plan. Based on a distance of 10 feet of disturbed stream banks near camps and 10 feet along trails, 0.25 miles total or less than 0.001% of disturbed stream banks associated with camps.

There are 306 lakes in or bordering the entire analysis area, within the Northwest Forest Plan area. These lakes have an estimated combined distance of 78 miles of lake shore. Much of the lake shores around these lakes are rocky slopes, which are highly resistant to recreational impacts. Based on lake surveys of human use, the campsites are the biggest impacts around lakes. Most campsites are positioned sufficient distance from the shores and none of the surveys found more than minor impacts to lake shores. Lakes used by pack and saddle stock outfitter-guides include Cooney Lake in the Sawtooth Backcountry and Crow, Corral, Sheep, Quartz, Ramon, Remmel, Upper Cathedral, Cougar, First Hidden, Middle Hidden, and Big Hidden lakes in the Pasayten Wilderness. Outfitters also use Sheep, Quartz, Upper Cathedral, Cougar, Remmel, Crow, and Ramon Lakes for day use and/or drop camps. Each of these lakes has been surveyed over the years. Based on lake surveys of human use from trails and campsite access from a handful of lakes in the project are, lakes that have nearby campsites that are within Riparian Reserves or RHCAs will have approximately 25 feet of disturbed lakeshore. This equals a combined lakeshore disturbance distance of 0.1miles or less than 0.001% disturbed total lakeshores across the project area. Pack and saddle stock outfitter-guides have requirements on how close they can camp and how close stock can be staged to lakes, which will minimize impacts to lake shores and lake ecology.

Based on the small proportion of lake shores and stream banks impacted by outfitter-guide activity in the past, anticipated impacts at the project, 6th field, and 5th field watershed scales would be inconsequential. Additionally, current outfitter guide use accounts for 3% of the total use in the analysis area. Under the different action alternatives, outfitter guide use would stay the same, decrease by one percent, or increase by one percent. With the small use under each alternative, a one percent change is use would not have any difference in effects over current usage levels. Therefore, issuing the permits for a 10 year term would not prevent maintaining or restoring the physical integrity of lake and stream channel features sufficient for a healthy ecosystem.

4. **Maintain and restore water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.**

   The project proposes to issue permits to outfitter-guides that use a combined area of 880,000 acres in the portion of the analysis area under the jurisdiction of the Northwest Forest Plan. The party size limitation would be 12 people and 18 head of stock in Alternatives 2 & 4 or 12 heartbeats in Alternative 3. Occasionally, oversized parties would be allowed, but with the same requirements to meet resource objectives. No part

of the proposed activities would create openings next to or over streams or lakes; therefore, the project would have no effect to water temperature.

In areas where pack stock cross streams and drink, fecal contamination may occur. This could lead to increased nutrient levels at the site scale, but it would be quickly diluted and not detectable. Loose grazing would minimize impacts to riparian areas, wetlands, and water quality by dispersing stock. Stock would only enter water to drink and when crossing streams on trails. Otherwise, stock would graze in the uplands so the amount of time in water would be minimal. Stock containment areas within camps would be located away from streams and lakeshores. Flat terrain and surrounding ground vegetation would trap eroding soil and protect water quality. Outfitter-guides will also review and practice minimum-impact travel and camping practices with clients, including those at drop camps. The following pamphlets will be used as the standard: "Rocky Mountain Leave No Trace Skills and Ethics", "North American Leave No Trace Skills and Ethics", and “Horse Use Leave No Trace Skills and Ethics" (Leave-No-Trace 2001a and 2001b). These measures would reduce the effect of any change in nutrient levels to negligible levels and levels would be quickly diluted at the site scale. Some increase in nutrient level may occur at the site scale but would be quickly diluted and have no effect on aquatic resources. There would be no effects at the 6th and 5th field watershed scales.

Fecal coliform levels at lakes and streams may be elevated where livestock access the water. Fresh water would quickly dilute the bacteria as water is constantly flowing down streams, through wetlands, and circulating in lakes. There are no known detrimental fecal coliform bacterial levels for the project area. There are no water bodies in the project area listed on the 2012 Washington State 303(d) list for fecal coliform. Based on the minimal effects at the site scale, there would be no effects to natural fecal coliform levels at the 6th and 5th field watershed scales.

In summary, there would be no effects to temperature and insignificant effects to nutrient and fecal coliform levels at the site scale. No changes to nutrients and fecal coliform would occur at the 6th or 5th field watershed scales. Therefore, issuing outfitter-guide permits for 10 years would not prevent maintaining or restoring water quality.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

The primary source of sediment from outfitter-guide activity is bank trampling when pack animals drink and to a lesser degree at stream crossings. From these disturbances sediment delivery to lakes and streams would be insignificant. The only time livestock would access lake shores and stream banks is to water. All other times, outfitters either loose-graze stock in the uplands, or keep stock confined by tethering them to a highline, hobbling, or corralling. Some drift may occur to lakes and streams, but it would be minimal. Therefore, the amount of time spent at any water body would be short and the associated disturbance and sediment delivery minimal. Based on these factors, the

amount of sediment generated when pack animals drink or cross streams would be inconsequential.

The small effects to sediment at the site scale would not translate to any effect at the 6th or 5th field watershed scale. Since most streams are in either wilderness or areas with few roads, wood levels are generally good to excellent (surveys in analysis file), and capable of trapping and sorting any small increase in sediment resulting in no effects downstream. Therefore, issuing the permits for 10 years would not prevent maintaining or restoring the sediment regime of lake and stream channel features sufficient for a healthy ecosystem.

Wildfires which burned in the early to mid-2000s in and around the Pasayten have caused an increase in sediment in several of the creeks and rivers. Substrates in Lake Creek were low in fine sediment levels prior to the Farewell Fire (2003). A 1995 stream survey report (in analysis file) noted cobbles and small boulders were the most common substrates in Lake Creek prior to the fire, but found fine sediment in natural flat areas (depositional). The amount of fine sediment was considered natural and properly functioning.

Similarly in the upper Chewuch River, prior to the effects of the 2001 Thirtymile Fire, fine sediment levels were mostly low (8, 11, and 25%). Fine sediment deposits occur naturally in a flat reach in the upper Chewuch. Andrews Creek had low fine sediment levels prior to the Farewell Fire in 2003 (<10%). Following the fires, the fine sediment increased substantially in these streams. These were natural disturbances that brought large quantities of wood and spawning gravels into the creeks and rivers. Fish habitat conditions have improved substantially because of the increased habitat complexity created by the wood and gravel.

Habitat conditions were possibly at risk for sediment following the fires; however the fires were a natural disturbance, so these elevated levels are within the natural disturbance regime. Prior to the fires, fine sediment conditions were good overall.

Recreation activities, including pack and saddle stock outfitter-guides, have occurred in these areas for close to a century and the pre-fire sediment data demonstrates the activities have had little to no effect on channel substrate conditions. Years after the fire, current fine sediment levels are likely close to pre-fire levels. Habitat conditions in rivers and streams have shown to improve following fires in areas with little or no human influence, such as the case with burned areas in the Pasayten (Gresswell 1999).

The primary source of sediment from outfitter-guide activity is bank trampling when pack animals drink and to a lesser degree at stream crossings. From these disturbances sediment delivery to lakes and streams would be insignificant. The only time livestock would access lake shores and stream banks is to water. All other times, outfitters either loose-graze stock in the uplands, or keep stock confined by tethering them to a highline, hobbling, or corralling. Some drift may occur to lakes and streams, but it would be minimal. Therefore, the amount of time spent at any water body would be short and the associated disturbance and sediment delivery minimal. Based on these factors, the

amount of sediment generated when pack animals drink or cross streams would be inconsequential.

The small effects to sediment at the site scale would not translate to any effect at the 6th or 5th field watershed scale. Since most streams are in either wilderness or areas with few roads, wood levels are generally good to excellent (see surveys in project file), and capable of trapping and sorting any small increase in sediment resulting in no effects downstream. Therefore, issuing the permits for 10 years would not prevent maintaining or restoring the sediment regime of lake and stream channel features sufficient for a healthy ecosystem.

6. **Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.**

   Instream flows are unlikely to be affected by the outfitter-guide alternatives. There would be no measurable effects to stream flow from this project. Please see the Hydrology report for details.

7. **Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.**

   Pack and saddle stock outfitter-guide activity would not create open areas that would result in increased snow-depth and rapid melt-off. Therefore, the alternatives would not result in any changes to stream flows.

   Water tables in wetlands may be impacted at a few areas on trails and when animals loose herd graze. Users that do stay on trails may also widen and deepen impacted areas. Water may begin to flow as a stream through the wetland, where the water originally infiltrated into the soil within the wetland. The net effect is that water could leave the portion of the wetland directly adjacent to trails faster than before. Since these wetlands contribute to late season flows in down slope streams, any changes in the wetlands may reduce late season flows in nearby downstream locations. However, the relative impact on the wetlands in all the areas would be low because the impacts would be isolated to areas adjacent to trails, and the affected wetlands are approximately 1% of the total wetlands. Any subsequent changes to late season flows would be minor and immeasurable. Across the analysis area, previous and current pack stock (outfitted and non-outfitted) have accessed only a small fraction of all the wetlands. By following the mitigation measures, effects to water tables would be minimal at the site scale and would have no effects at the 6th and 5th field watershed scales.

8. **Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.**

Minor impacts to riparian vegetation will occur when pack stock access water to drink and at stream crossings on occasion. Impacts to riparian vegetation would be limited to areas near camps, day use areas, and along trails at stream crossings; this would be a small proportion of all riparian resources across the analysis area.

Outfitter-guide pack and saddle stock will be allowed to loose graze in the analysis area, including in wetlands. This dispersed grazing technique minimizes concentrated effects to wetlands. Some soil compaction and displacement occurs, but the relatively small number of stock in any given group (maximum party size is 18 head of stock) and the short amount of time pack and saddle stock outfitter-guides are operating (typically early July through mid-October), minimizes impacts to soil and plant communities in the wetlands. The occasional oversized party would not increase the amount of compaction because they would be rare, and the number of stock would not be allowed to increase to the point of causing additional impacts. In addition, the vast majority of wetlands in the analysis area (approximately 99%) are over 500 feet from established campsites, and the wetlands are spread across the 1.1 million-acre analysis area. This results in most wetlands never being affected by pack and saddle stock grazing, and existing in a pristine condition.

The few impacts to riparian dependent vegetation would have a slight negative effect to bank stability by reducing vegetative cover, but not to the extent that surface and bank erosion and channel migration would change. Because much of the area is in wilderness and areas with few roads, the riparian forest has more than enough trees to supply large wood to streams. All fire wood collection in riparian areas would be limited to pieces less than 12 inches in diameter. The proposed outfitter-guide activity would not change conditions at any spatial scale. Therefore, the existing activity and alternatives would not prevent maintaining or restoring species composition and structural diversity of plants capable of providing the above protection and complexity at the site, 6th field, or 5th field watershed scales.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

At the site scale, pack stock have some negative impacts to riparian vegetation and habitat associated with lakes and streams when drinking water from trampling banks, browsing vegetation, and disturbing wet areas. The few areas along streams and lakes impacted when pack stock access water is only a fraction of all water bodies across the project area. There are an estimated 306 lakes and 2,609 miles of streams in the analysis area covered by the Northwest Forest Plan and there are only 11 camps within the Riparian Reserves of lakes and 21 camps in Riparian Reserves of streams. The impacted area would represent less than 0.001% of all lake shores and stream bank miles. Therefore, the area of riparian habitat impacted currently and the impacts from issuance of 10 year permits, with the associated mitigation measures listed in Chapter 2, would be inconsequential at the site scale and no effects at the 6th field or 5th field scales.

Summary of Effects

The ACS acknowledges that disturbance events, such as wildfire, landslides, and floods, maintained the long-term productivity of aquatic ecosystems in the NWFP area. These events resulted in pulses of materials (i.e. sediment and wood) being delivered to stream channels. Consequently, there was a wide variation in conditions at the site and watershed scale over time (Naiman et al. 1992, Benda et al. 1997) that were often resulting in periods of degraded conditions. The result was a mosaic of conditions in watersheds and sub-watersheds that shifted across the landscape with time. Reeves et al. (1995) and Rieman & McIntyre (1993) argued that Pacific salmon (Oncorhynchus spp.) and bull trout had life-history attributes that allowed them to persist in such an environment.

The ACS is designed to maintain aquatic ecosystems within the range of variability at the sites and small sub-watershed scale and the larger sub-watershed and watershed scale to provide for acceptable populations of anadromous salmonids and other targeted organisms. It may be expressed as the frequency distribution of productive and non-productive sites and sub-watersheds in a sub-watershed or watershed scale, respectively (Benda et al. 1997). When the current distribution of habitat conditions are within the acceptable range of variability for the watershed or sub-watershed, then the area is in compliance with the ACS. The presence of degraded conditions at individual sites or degraded sub-watersheds are not always be interpreted as failure to comply with the ACS. Natural events such as floods or wildfires can degrade streams reaches or entire drainages, while other areas in a watershed are in properly functioning condition. This is natural for landscapes within the Pacific Northwest, where ecosystems are dynamic as a result of the physical characteristics, natural disturbance events, and climatic features of the region (Reeves 1999).

Watersheds across the analysis area, within the NWFP, continue to provide a high level of properly functioning habitat conditions at the site, sub-watershed, and watershed scale. Natural disturbances continue to occur, albeit at a different frequency than historically, but occur and function to provide a mosaic of habitat conditions. The extent of aquatic and riparian habitat effects from the proposed outfitter guide activity does present small, localized habitat disturbances but not sufficient to degrade habitat function or process. At the sub-watershed scale and larger, the project has virtually no effect.

Determining consistency with the ACS at the site or small sub-watershed is not as simple as assuming that all sites or small sub-watersheds need to be in "good" condition at all times and that any actions that may "degrade" a site or small sub-watershed violates the ACS. Conditions at the small sub-watershed may range from very favorable to unfavorable for fish over time. The ACS aims to allow for the expression of these variable conditions at a site or small sub-watershed. However, it is not possible to evaluate consistency with the ACS at the site scale by simply looking at the individual sites alone. The ACS was designed to maintain and restore this variability or some desired range of variability similar to the natural range of watersheds that will support acceptable levels of fish populations.

Some localized impacts will occur across the project area. However, the proposed activity would have negligible effects at the site scale and virtually no effect at the reach, sub-watershed, or watershed scales. Natural upland and instream processes would remain in a highly functional condition and the few negative localized effects would have an immeasurable effect on these ACS objectives. The ACS objectives would be maintained under each of the action alternatives.

3.7 BOTANY

Below is a summary of the Botanical Evaluation for the Pack and Saddle Outfitter-Guide Permit Renewal Project which is available in the project analysis file (Baraibar and Ohlson 2012).

REGULATORY FRAMEWORK

The broad objective of Forest Service Manual (FSM) 2620.2 habitat planning and evaluation is to provide habitats to meet goals and objectives for wildlife and fish, including endangered, threatened, and sensitive animal and plant species set forth in land and resource management plans. Specific to this objective is to: 1) Integrate habitat planning into land management and project plans to meet National, Regional, and local objectives for wildlife and fish, including threatened, and endangered and sensitive animal and plant species; 2) Provide a sound base of information to support management decision-making affecting wildlife and fish, including endangered, threatened, and sensitive animal and plant species, and their habitats; 3) Identify opportunities and management strategies to maintain and improve habitats throughout the National Forest System.

Managing for biological diversity and species viability is also outlined in the Forest Service Manual (FSM) 2620. The FSM requires a project to consider the distribution and abundance of plant and animal species, and their community requirements in order to meet the overall multiple-use objectives and to provide a sound base of information to support management decision-making. Managing for species viability requires habitat that must provide for the number and distribution of reproductive individuals to ensure the continued existence of a species throughout its geographic range.

Specific management for Sensitive species follows Forest Service Region 6 Sensitive Species policy as identified in Section 2670 of the Forest Service Manual (FSM). Sensitive Species are defined as those plants and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by substantial current or predicted downward trends in population numbers or density and habitat capability that would reduce a species' existing distribution (FSM 2670.5). Management of sensitive species "must not result in a loss of species viability or create significant trends toward federal listing" (FSM 2670.32). The Biological Evaluation (BE) in the analysis file is a summary that assesses the effects of the proposed action and alternatives on Sensitive and Federally listed plant resources and unique habitats within the permitted area of the outfitters and guides included in this analysis as required by the Forest Service Policy outlined in Section 2670 of the Forest Service Manual.

Survey and Manage Species (S/M)

On December 17, 2009, the U.S. District Court for the Western District of Washington issued an order in *Conservation Northwest, et al. v. Sherman, et al.*, No. 08-1067-JCC (W.D. Wash.), granting Plaintiffs' motion for partial summary judgment and finding NEPA violations in the *Final Supplemental to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (USDA and USDI, June 2007). In response, parties entered into settlement negotiations in April 2010, and the Court filed approval of the resulting

Settlement Agreement on July 6, 2011. Projects that are within the range of the northern spotted owl are subject to the survey and management standards and guidelines in the 2001 ROD, as modified by the 2011 Settlement Agreement (USDA and USDI 2011).

The Pack and Saddle Outfitter Guide Permit is consistent with the Methow Valley Ranger District Resource Management Plan/Forest Land and Resource Management Plan as amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI 2001), as modified by the 2011 Settlement Agreement.

The 2011 Settlement Agreement states:

> *"For projects with signed Records of Decision, Decision Notices, or Decision Memoranda from December 17, 2009, through September 30, 2012, the Agencies will use either of the following Survey and Manage species lists:*
>
> *a. The list of Survey and Manage species in the 2001 ROD (Table 1-1, Standards and Guidelines, pages 41-51).*
>
> *b. The list of Survey and Manage species and associated species mitigation, Attachment 1 to the Settlement Agreement."*

Project Consistency: The Pack and Saddle Outfitter Guide Permit applies the Survey and Manage species list in the 2011 Settlement Agreement (Table, Settlement Agreement Attachment 1) and thus meets the provisions of the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, as modified by the 2011 Settlement Agreement. A Survey and Manage Species Tracking Form (See **Appendix L**) summarizes how this project is meeting Standards and Guides.

Forest Plans

The Okanogan and Wenatchee Forest Plans, as amended, have standards and guidelines that pertain to vegetation. Some are forest-wide, and others are specific to particular management areas.

In the Okanogan Forest Plan, the following standards and guidelines apply to this project in Management Area 15B (page 4-95; outfitter-guides are allowed to operate in this MA, but not the other wilderness management area: MA15A):

- MA15B-21L Campsites should be located at least 200 feet slope distance from meadows, lakes, streams, and key interest areas. Camping may be restricted or prohibited in certain areas to protect wilderness values.

- MA 15B-22A There should be no long-term modification of natural plant succession as a result of human activities on areas outside campsites, administrative sites, and designated trail tread. Acceptable modifications are those which can recover in one growing season.

- MA 15B-22B Vegetation loss should not exceed 400 square feet (one percent of any acre) at any impacted site.

- MA15B-22C There should be no loss of trees from recreation activities.

- MA 15B-22D There should be fewer than four trees with exposed roots per impacted site.

- MA 15B-22E Standing snags should be left, except where removal is necessary to protect major bridges and administrative facilities. Removal of snags during fire suppression efforts shall be determined on a case by case basis. However, standing snags can also be removed if they pose a safety risk to outfitters using the camps.

- MA 15B-22F Vegetative impacts along trails shall be confined to the planned location and to meet individual trail objectives.

- MA 15B-22G Firewood gathering may be permitted for use on site and shall be limited to dead and down material. Firewood gathering shall be restricted where necessary. Use of small fires and self-contained stoves shall be encouraged.

In the Wenatchee Forest Plan, the following standards and guidelines apply to this project: Wilderness, Semi-Primitive, a. (1) Vegetation (page IV-73)

- Area of vegetation loss, and compacted bare mineral soil at any campsite, should not exceed 625 square feet.

- There should be no loss of trees at any site and only six trees per site with roots exposed or which show signs of human use impact.

- There should be no long-term modification of plant succession and only short-term modification due to human activity or livestock grazing that can recover in one growing season.

Dead trees or dead, woody debris may be utilized for campfire wood in amounts that can be replaced annually through natural accumulation.

<u>ROD for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl</u>

The Standard and Guidelines for Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl in the ROD listed above, contains several Aquatic Conservation Strategy Objectives. Below is a list of objectives that apply to this project listed in order as they appear in the ROD:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species populations and communities are uniquely adapted.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

ANALYSIS METHOD

The plant analysis for this project covers species on the 2011 Regional Forester's Special Status Species Lists, which includes the Federally Threatened, Endangered, and Proposed Species (TE&P) and Sensitive Species List, provided under the Interagency Special Status & Sensitive Species Program (ISSSP). As mentioned above, this analysis will use the 2011 Survey and Manage (S/M) list. In the course of writing this document, the S/M species list has changed. Species lists were compared to assess changes and additional habitat assessments were conducted for changes in the list. The complete list for both Survey and Manage and R6 Special Status species can be found in **Appendix F**.

Multiple years of observations of outfitter use patterns, knowledge of Sensitive plant species and special habitats, across the Chelan, Tonasket, and Methow Districts by District Botanists and Wilderness specialists was integral in assessing the effect of outfitter use on Threatened, Endangered, and Sensitive plant populations as well as Survey and Manage plant populations. Due to the fact this analysis area is over a million acres and use can be requested throughout the area by any permitted outfitter, a risk assessment to resources was made using Geographical Information Systems (GIS). Field visits were made where necessary, but not all the area was sufficiently inventoried during the appropriate season to confirm presence or absence of all of the species of concern listed in **Appendix F**. Field and survey notes taken during survey efforts are located in the analysis file. There is a small band of non-wilderness land along the north shore of Lake Chelan, for the sake of this analysis; it is being included in the Lake Chelan Sawtooth Wilderness subunit. The Fish Creek Base Camp is located in this portion of non-wilderness; however it is part of the Chelan Inventoried roadless area.

The wetland analysis was based on a GIS layer derived from the U.S. Department of Interior and Fish and Wildlife Service publication "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin and others 1979). This is the best available information on wetland locations and types. This publication provided sufficiently accurate information for the analysis of impacts to wetlands from outfitter-guide activities. This wetland classification combines information from mapping, aerial photography, plant, soil and other ecological factors to designate wetlands. These wetland classifications, of course, are very broad and are being used in conjunction with the unique habitat requirements for the various species included in this

analysis (**Appendix J**) and local knowledge of camp sites and use areas. The Forest Service Manual provides the regulatory framework for the legality of wetland inventory, which the FSM mandates be done in Forest Planning. The Department of Interior's publication is the standard delineation used by the Forest Service and meets Forest Service Manual direction.

Survey and Manage (S/M) Strategic Surveys were also completed by Regional taxa experts and District personnel between 1999 and 2003 throughout the Methow Valley RD Field and survey notes taken during survey efforts are located in the analysis file. These surveys centered on high probability habitat mainly found west of Washington Pass in the North Cascades Scenic Highway Corridor and portions of the Pasayten and Lake-Chelan Sawtooth Wildernesses. Due to the large scale of the analysis area, surveying high probability habitats was the best strategy for locating and managing Survey and Manage S/M populations.

The Pasayten, Spanish Camp and Sheep Mountain areas were inventoried for Survey and Manage species in 2002 and 2003. Field and survey notes taken during survey efforts are located in the analysis file. Inventory crews included Regional Office non-vascular taxa experts and their crew. The most extensive inventory efforts centered around Spanish Camp and the Sheep Mountain areas and were conducted at the same time as the Sensitive plant surveys.

Other Strategic Surveys were conducted by Regional Office fungi taxa crews in the Hidden Lakes area and other portions of the Pasayten, Methow side of the Lake Chelan Wilderness, and North Cascades Scenic Corridor between 1999 and 2001. Additional bryophyte surveys were conducted by a Regional taxa expert and District Botanists along the North Cascades Scenic Corridor, Pasayten, Methow side of the Lake Chelan Wilderness, and the Falls Creek Drainage. High probability habitats were targeted during these survey efforts.

The best available science was used for this analysis, including the methodology and data sources described above, to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on vegetation. In addition, GIS data was used to perform the analysis on all Alternatives. The GIS data was gathered from on the ground surveys and describe an array of habitats.

AFFECTED ENVIRONMENT

Loose Grazing

Loose grazing is frequently referenced in the following discussions regarding the existing conditions of plant communities as a result from stock use. Loose grazing refers to allowing stock to disperse at will to areas they find to be the best suited for their dietary needs. Free ranging animals rarely over graze an area as they can move on to another area after they have grazed a plant or spent time in an area. Free roaming animals have less of a tendency to over graze an area because they don't travel over the same ground repeatedly. Plant communities are able to recover from the light grazing and trailing pressure without long-term modification to the plant biodiversity or community structure (natural plant succession). Sites with large bare areas are highly problematic, since re-establishment of vegetation is often difficult (Spildie et al., 2000). Since pack and saddle stock are allowed to loose graze they may travel through some wetland habitats as they access upland grazing areas.

Hummocks

In the north east portion of the Pasayten Wilderness hummock pattern ground can be found. Earth hummocks are a type of patterned ground occurring in subarctic and alpine environments that form in groups, are three-dimensional knoblike shapes covered with vegetation about 14 inches) tall, and up to 3 feet across. These topographic features are not considered wetland habitats. Hummock formation is associated with the fine-grained frost susceptible soils that are made up mainly of Mt. Mazama ash. In the Pasayten, hummock origin is speculative at best. Earth hummocks in the North America arctic and subarctic regions are mainly associated with permafrost, which is the key element in driving the frost heaving process that forms and maintains them. Another theory suggests they are relic or fossil formations formed when permafrost was once common in the area and the hummocks are now being maintained by seasonal frost heaving action. Other hummocks are found in non-permafrost environments and are considered fossil topographic formations or are still actively forming during freeze thaw periods (Washburn 1956, Zoltai & Scotter 1982).

In the Pasayten, hummocks are found in the transition zones between open wetlands and the drier uplands where the transition from wetland to upland is gradual and in small depressions. Elsewhere, hummocks form on gentle slopes, less than 30% (20^0), in small depressions and basins were volcanic ash is deposited. In these areas the volcanic ash is thought to have eroded from surrounding slopes settling in these basins and small ponds resulting in deep deposits, often greater than 50 cm (Zoltai & Scotter 1982, McKay 1980). Although this study was not specific to the Pasayten hummocks, the hummocks in the study bare the same characteristics.

In areas with permafrost, in early summer the ice lenses in the surface thaw and soil moisture in the hummock migrates downwards to grow more ice lenses near the still frozen permafrost. As these ice lenses grow they create an uplift of moisture through the center of the hummock. When the moisture reaches the top of the hummock it then cycles out and back toward the permafrost zone creating the similar marbled mix of ash, mineral soil, and organic matter as found in non-permafrost formed hummocks (McKay 1980). As mentioned above, although this study was not specific to the Pasayten hummocks, the hummocks in the study bare the same characteristics.

In the Pasayten, the suspicion is that there is no permafrost layer driving this process and that these hummocks are either actively forming or were formed at a time when permafrost was present and are now being maintained by seasonal freeze thaw cycles. In non-permafrost hummocks, the transition between volcanic ash and lacustrine silt is distinct, not distorted, indicating the lower parts of the soil remain stable. Radiocarbon dating of the layers within a hummock found the lower stable layer to be about 3000 years with the active layers within the top 9.84 inches (25 cm) to be between 2600 and 1680 years with the youngest material found near the apex of the hummock (Zoltai & Scotter 1982).

Since hummock development is slow, plant communities have evolved with the uplifting action that are unique to these mounds. One R6 Sensitive plant that seems to favor hummock habitat in the Pasayten is *Gentiana glauca* (glaucous gentian). Glaucous gentian is a tundra species that grows in moist subalpine and alpine environments that are regularly disrupted by frost heaving. In the Pasayten it is near or above timberline and above 7,000' in elevation. The plant

communities in the troughs between the hummocks and the mounds themselves are distinctly different. On the top of the mounds, crustose lichens (lichens that are paint-like or flat), and mosses such as *Cetraria ericetorum* (cetraria lichen), *Thamnolia vermicularis* (whiteworm lichen), and *Cetraria nivalis*, frequently cover nearly 80% of the mound surface, with *Vaccinium caespitosum* (dwarf bilberry) and *Phyllodoce empetriformis* (pink mountain heath) being the dominant vascular plants. In the troughs, vascular plants dominate with *Lupinus wyethii* (Wyeth's lupine), *Antenaria lanata* (wooly pussytoes), *Kalmia microphylla* (alpine laura), *Sibbaldia procumbens* (creeping sibbaldia), *Luzula* species (woodrushes), *Veronica cusickii* (Cusick's speedwell), *Castilleja parviflora* (mountain Indian paintbrush), *Carex nigricans* (black alpine sedge) *Phyllodoce empetriformis,* and *Vaccinium caespitosum* being common associates. Glaucous gentian is an R6 Sensitive species; none of the other species listed in this paragraph are classified as R6 Sensitive or Survey and Manage.

In some places in the analysis area, such as Bald Mountain, Beaver Creek, Tungsten Mine, and other isolated locations, the hummock topography that supports glaucous gentian has been trampled as a result of past sheep grazing and pack and saddle stock activities. Populations are showing signs of lost vigor. Since hummocks provide a micro-habitat for glaucous gentian, disturbance could cause a loss of species viability in these areas. However, the areas of hummocks being disturbed by pack and saddle stock are small relative to the total amount of the hummock topography and glaucous gentian within the Pasayten. Although some damage to hummocks and glaucous gentian within the analysis area is occurring, there is enough hummock topography and glaucous gentian in the Pasayten to ensure that loss of individuals would not likely result in a loss of population or species viability. Since the majority of the hummock patterned ground is beyond any area currently used by outfitters, the change in the condition of this unique pattern ground is insignificant relative to the area that is currently unaffected by activities in the Pasayten Wilderness.

Wetlands

A wetland is characterized as a distinct ecosystem that is saturated with water, either permanently or seasonally. The primary factor that distinguishes wetlands from other land forms is the characteristic vegetation that is adapted to its unique soil conditions: Wetlands provide important plant habitat throughout the analysis area. Plant species diversity is generally greatest in association with moist meadow and wetland habitats compared to the surrounding upland ecosystems. They also support many species of sensitive plants.

There are 8,357 acres of mapped wetlands and open water habitats in the analysis area; this is 0.8% of the analysis area. These numbers were derived from the Wetland GIS layer for the Okanogan-Wenatchee National Forests. Mapped wetlands, excluding open water habitats, make up 0.6% of the analysis area. These habitats are rare throughout the analysis area, with highest concentration (67.3% or 5,621 ac) of mapped wetlands and open water habitats occurring in the Pasayten Wilderness. Within the Pasayten these habitats are concentrated in the northeast portion of the Pasayten, north of Andrews Pass in the vicinity of Bald Mountain, Cathedral Peak, Amphitheater Mountain and then east into Horseshoe Basin. **Map 3.7-1** in the Map Section shows the wetland locations across the analysis area.

Affiliation of Sensitive plants with wetland habitat and wetland edge habitat is high. Emergent wetlands, particularly the transition zone between open water and upland habitats, are

important habitat for many of the sensitive *Carex* (sedge) species and *Eriophorum viridicarinatum* (green-keeled cottongrass). This transition zone in the north east portion of the Pasayten Wilderness is also where the hummock pattern ground is found. The shrub wetlands, typically represented by willow plant communities are important habitats for the sensitive *Salix* species as well as many of the *Carex* species on the list. *Geum rivale* (purple avens) is an R-6 Sensitive species that is also a wetland dependant found in open forested wetlands. The vast majority of the Sensitive plants identified in this analysis are dependent on wetland or habitats maintained by the water supplied by these wetlands (**Appendix G**).

The wetlands most impacted by pack and saddle stock outfitter-guide activities are those in close proximity to camps. Outfitters often let their stock loose graze to reduce impact to soil and vegetation that can be caused by corralling or tying stock for extended periods. Stock travel approximately two miles from camps, but generally stay closer. The amount of impacts decreases as the distance from a camp increase because the stock disperse across larger areas. Concentrated impacts at campsites have the most impact on vegetation and wetlands, as stock containment increases barren core and habitat disturbance. Once stock are allowed to travel away from camps, the disturbances disperse to the point of inconsequential impacts. The distance where there is no impacts to vegetation and wetland habitats is generally about a 500 foot radius from camps, however loose grazing stock do pass through wetlands on occasion. As discussed earlier, loose grazing stock tend to avoid areas with wet soil, such as wetlands. Any impacts, such as vegetation trampling, grazing, soil compaction, or plant morality from urine, to wetlands in loose grazing areas is dispersed, rather than concentrated because of the nature of the herding stock, therefore not interfering with the functioning of the wetland or causing unacceptable damage to wetland plants. Loose grazing areas are monitored, as described on page 2-27.

Outfitter guide camp locations were given a 500 foot radius buffer in order to identify potential wetland habitats or Sensitive plant populations that may be affected by outfitter activities. The greater the distance the outfitter camps were from the wetlands, the smaller probability of the wetlands being disturbed. This also is used as a tool to compare the diversity and amount of wetland habitat in proximity to campsites, potential effects of stock use on wetland habitats, and Sensitive plant resources. It is not intended to infer stock use has occurred throughout the wetlands within the 500 foot buffer radius.

There are 86 acres of wetland identified within 500 foot radius of 35 outfitter camps, excluding open water wetland habitats, as R6 Sensitive and S&M plant species would not typically be associated with this type of habitat at higher elevations. This is 1% of all the wetlands in the analysis area. The rest of the wetlands are over 500 feet from established outfitter camps and receive little to no use by pack and saddle outfitters, therefore, impacts to them are negligible. Of the 35 camps, 25 are in the Pasayten Wilderness and comprise 73.9 acres within 500 foot radius of wetlands. An additional ten outfitter camps are in the Lake Chelan-Sawtooth Wilderness and comprise 12.1 acres within 500 foot radius of wetlands. The Beaver Creek Camp, Bald Mountain, and Sheep Mountain assigned sites have identified wetlands nearby. The two other assigned sites, Crow Lake and Whistler Camps, do not have mapped wetlands within 500 feet of camp. Refer to **Appendix I** for a list of mapped wetlands within a 500 foot radius of campsites.

Standards and guidelines for the portions of the analysis area within the Pasayten and portions of the Lake Chelan-Sawtooth wilderness that is on the Methow Valley Ranger District state that "campsites should be located at least 200 feet slope distance from meadows, lakes, streams, and key interest areas." Applying a 200 foot linear distance to the camps in wilderness shows that there are 64 campsites within 200 feet of meadows, lakes, streams, and key interest areas and 22 of those campsites are within 200 feet of wetlands. Twenty of these 22 campsites are in the Pasayten Wilderness and 2 campsites are within the Lake Chelan-Sawtooth Wilderness.

Two of the 22 sites near wetland habitat also have a Sensitive plant population known to occur within 200' of wetlands. These are Horseshoe Creek and Sheep Mountain camps, both have *Carex heteroneura var epapillosa* (different-nerve sedge) populations. This species appears to have tolerated the light level of grazing pressure at Horseshoe Creek. At Sheep Mountain the species is found in the highest concentrated use area within the campsite and has persisted in a camp that had been in use for over 50 years.

Not all the wetlands listed in **Appendix H** have been impacted by pack and saddle stock use. Stock use associated with these affected wetlands areas were typically small and isolated incidences. Because of the small scale of the disturbance, wetland ecosystem function across the analysis area has not being affected. The majority of wetlands are unaltered and most are not near trails or campsites and therefore receive little to no stock use. Since stock are allowed to loose graze, they may pass through wetlands to access upland grazing areas but do not linger. Some trails are created in these wetland habitats from stock movement. The compacted soil in these trails creates pathways for water flow to out of the very small portion of the wetland directly adjacent to the trail. This can affect wetland habitat by drying the soil and killing some vegetation in scattered pockets. The impact to individual wetlands is minor because there are not enough trails to drain entire wetlands. The overall impact to wetland habitat is inconsequential because such a small percentage of wetland habitat is involved.

Special Status Species

Federally Listed Threatened and Endangered

There are no Federally-listed *Howellia aquatilis* (water howellia), *Hackelia venusta* (lesser showy stickseed), *Sidalcea oregano var. calva* (Wenatchee Mountains checker- mallow), or *Spiranthes diluvialis* (Ute lady's tresses) populations known to occur in the analysis area. None of these species were found during any of the surveys conducted for this project. There is no suitable habitat for any of these species known where outfitter activities are occurring.

R6 Special Status Species

Given the size of the analysis area, sensitive plant surveys of every potential site of pack and saddle stock outfitter-guide activity was not practical. The analysis of the effects on sensitive plants was done by combining the data from sensitive plant surveys that have been completed, assessment of sensitive plant habitats known to occur in the analysis area, abundance of wetland habitat, and the likelihood of outfitter activities occurring in or near known sites or potential habitat. Sensitive species and their habitats are listed in **Appendix J**.

Survey and Manage Plant Species

Between the 1999 and 2003 inventory seasons, three Survey and Manage (S/M) species were located during pre-disturbance surveys. These include *Schistostega pennat*a, *Cudonia*

monticola, and *Gyromitra californica*. *Ramaria amyloide* and *Dermaticarpon meiophyllizum* are known Survey and Manage sites from previous surveys.

None of the Survey and Manage species listed above would be affected by outfitter guide activities, as they are outside of any use area.

Sensitive Plant Habitat for R6 Special Status and S/M Species

Of the 54 R6 Special Status and Survey and Manage plant populations found during surveys or that have potential habitat within the analysis area (see Appendix F), the Pasayten Wilderness, which includes both the Methow and Tonasket Ranger District portions, supports the greatest diversity of these species (37 species) followed by the North Cascades area (20 species). The greatest number of site locations is also associated with the Pasayten Wilderness, primarily because wetlands are in the highest concentration there and many of the sensitive species are wetland associates. The higher density of wetland habitat and more northern latitude provides habitat for a greater number of species more commonly associated with the boreal forest region to the north. A boreal forest region is defined as the forest areas of the northern North Temperate Zone, dominated by coniferous trees such as spruce, fir, and pine. These species are typically at the southern-most extent of their range. One example is glaucous gentian, an arctic tundra plant. It is at the southern-most extent of its range where it is found just south of the Canadian border in Washington and Montana. This species appears to be sensitive to the effects of warming temperatures and may prove to be an important species in gauging the health of other arctic plants that have found a niche in this area (Lesica and McCune 2004). In Washington, glaucous gentian is most abundant east of the Ashnola River in close proximity to the Canadian border. Only one site is known to occur west of the Ashnola River and all the known populations are within the Pasayten Wilderness. The state range is from just west of the Ashnola River east to Chopaka Mountain on Department of Natural Resources land**.**

A unique topographic feature that supports arctic tundra plant habitat is the pattern ground or hummock features which are most abundant in the northeast portion of the Pasayten, east of the Ashnola River. Glaucous gentian grows in moist subalpine and alpine environments that are regularly disrupted by frost heaving and frequently associated with hummock topography near or above timberline, typically above 7,000 feet in elevation.

Glaucous gentian is apparently secure globally but is Imperiled in Washington and Critically Imperiled in Montana. It is considered Vulnerable in Alberta and Apparently Secure in Alaska and British Columbia. (Natureserve 2010). Over the next ten years, if global temperatures continue to warm, glaucous gentian populations will likely begin to show signs of decline, since studies have demonstrated its sensitivity to warming temperatures. This is not unexpected since it is an arctic tundra plant at the southern extent of its range. This may mean any further loss of individuals, populations or habitat could result in a need to reconsider changes in the Federal and State listings.

For Survey and Manage species, the highest probability habitat and most of the known sites are found west of Washington Pass, in the North Cascades subunit of this analysis, where the habitat begins to transition into the wetter west side plant communities where mountain hemlock, Pacific silver fir, and western hemlock become dominant.

In a very general sense, the 54 species found during surveys can be classified by their associations with five types of habitat. These are wetland, riparian, and wet to mesic meadow habitats; talus and mountain top scree habitats; tree dwelling species; soil substrates; and open habitats and dry meadows.

Wetland, Riparian and Wet to Mesic Meadow Habitats
Seventeen species (16 R6 Special Status Species and 1 S/M species) are associated with wetlands, riparian areas, and wet to mesic meadows. *Dermatocarpon meiophyllizum* (S/M) is an aquatic lichen found in streams and is included in with the riparian species. The 17 species typically associated with wetlands, riparian areas, and wet to mesic meadow habitats have the greatest overlap with outfitter and public pack and saddle stock. Populations and habitats for several of these species are within areas used by outfitters.

The 17 species (16 R6 Special Status Species and 1 S/M species) are: *Agrostis mertensii* (northern bentgrass), *Spiranthes porrifolia* (Ute's lady's tresses), *Botrychium ascendens* (trianglelobe moonwort), *Carex magellanica spp. irrigua* (poor sedge), *Botrychium hesperium* (western moonwort), *Carex atrosquama* (lesser blackscale sedge), *Carex heteroneura var.* epapillosa (different-nerve sedge), *Carex media* (intermediate sedge), *Gentiana glauca* (glaucous gentian), *Geum rivale* (purple avens), *Salix glauca ssp. glauca var. villosa* (glaucous willow), *Botrychium paradoxum* (peculiar moonwort), *Gentianella tenalla* (Dane's dwarf gentian), *Carex gynocrates* (northern bog sedge), *Sanicula marlandica* (Maryland sanicle), *Eriophorum viridicarinatum* (green-keeled cottongrass), and *Dermatocarpon meiophyllizum* (S/M).

Of the R6 Special Status Species that occur within a 500 foot radius of outfitter guide campsites, four are found in the riparian, wetland and mesic to wet meadow habitats. These are: different-nerve sedge, glaucous gentian, green-keeled cottongrass, and poor sedge. The Horseshoe Creek and Sheep Mountain camps both have different-nerve sedge populations within a 200 foot linear distance that was applied to campsites in wilderness.

Talus and Mountain Top Scree Habitats
There are 12 R6 Special Status Species found in talus and mountain top scree habitats. These species are: *Carex scripoidea var. scirpoidea* (northern singlespike sedge), *Cryptogramma stelleri* (fragile rockbrake), *Draba aurea* (golden draba), *Draba cana* (lance-leafed draba), *Erigeron salishii* (salish fleabane), *Eritrichium nanum var. elongatum* (pale alpine for-get-me-not), *Luzula arcuata ssp. unalaschcensis* (curved woodrush), *Mimulus suksdorfii* (Suksdorf's mimulus), *Parnassia kotzebuei* (Kobzebue's grass-of-Parnassus), *Polemonium viscosum* (skunk polemonium), *Potentilla nivea* (snow cinquefoil), and *Saxifraga cernua* (nodding saxifrage). Given the talus and mountain top scree habitats are not hospitable for camp locations and are typically very rocky sites that lack much forage opportunity, there is little likelihood these species or their habitats are being affected by outfitter activities.

Of the R6 Special Status Species that occur within a 500 foot radius of outfitter guide campsites, only three of these are found in the talus and mountain top scree habitats. These three are: snow cinquefoil, northern singlespike sedge and skunk polemonium.

Tree Canopy Habitats
The S/M moss species that can be found growing on trees or woody substrates (live and dead) is: *Schistostega pennata*(S/M). This species may be disturbed in association with wood

gathering activities. Implementation of current Forest Plan standards and guidelines outlined above in the Regulatory Framework section, pertaining to wood gathering and snag removal have reduced or eliminated the risk of loss to any of these species.

None of these tree canopy habitat dependent species are known to occur within a 500 foot radius of any camp.

Soil Substrate Habitats
There are three S/M species of fungi that are found on or in soil substrates. The fungi *Cudonia monticola, Gyromitra californica* and *Ramaria amyloidea* are found in association with well-rotted wood and duff on the forest floor. These fungi occur in forested habitats not suitable for grazing. None of these soil substrate habitat dependent species are known to occur within a 500 foot radius of any camp.

Open and Dry Meadow Habitats
There are two R6 Special Status Species typically associated with open habitats and dry meadows. They are: *Carex proposita* (Great Smoky Mountain sedge), and *Pellaea brachyptera*. These species are typically not found where stock have likely grazed or outfitted activities occurred.

<u>R6 Special Status Species Plant Populations by Campsite</u>

There are 19 campsites that have known populations of Sensitive R6 Special Status plants or potentially occupied habitat within a 500' radius of a camp. All but two of them are in the Pasayten. Nine are located in a relatively small area east of the Ashnola River to Cathedral Peak and north of Andrews Pass. These are: Bald Mountain, Charlie Brown, Old Miller Camp, Pasayten Hilton, Beaver Creek, Beaver Creek Drop Camp, Bob Creek, Cathedral Camp, and Ptarmigan Creek. West of the Ashnola River are the Sheep Mountain and Timberwolf 1 camps. East of Cathedral Peak are Horseshoe Creek and Horseshoe Basin camps. All 13 of these camps are near the Canadian Border. In the southern half of the Pasayten and north of Harts Pass there are Silver Lake, Ferguson Lake, Drop Camps B and C campsites. Two camps, Bernice 3(E) and Fish Creek Base Camp, are on the Chelan side of the Lake Chelan-Sawtooth Wilderness.

Assigned sites receive the greatest amount of use on an annual basis, since tents are set up and limited supplies are kept at the site season long. Current assigned sites are Bald Mountain, Beaver Creek and Sheep Mountain. In addition to providing the full-service camping experience, these camps are used as base camps for outfitters to work out of after dropping clients in the area. These sites have the greatest amount of ground disturbance associated with stock containment, grazing, firewood gathering, and trampling of vegetation in and around the camps by both stock and humans.

These camps are set up for the client's needs and are situated for handling and turning stock out to loose graze away from camp. The better distribution of stock grazing that occurs away from the assigned camps helped to reduce the potential for over grazing.

For this analysis, the non-assigned full-service camps are those camps where overnight use occurred with outfitter stock. They are the sites associated with the second greatest potential for disturbance, compared to assigned sites because full-service camps typically have larger

parties compared to drop camps, and the stock are kept with the party for the duration of the trip.

A substantial amount of pack and saddle stock outfitter-guide activity had been during the fall hunting season when soils are dry and vegetation has gone dormant for the season. Fall use had the least potential to affect plant recovery during the following growing year.

Appendix K includes a list of camps used by outfitter-guides that are within 500 feet of sensitive plants. A description of each camp follows.

- *Bald Mountain Camp – Assigned Site, Full-service, drop*
- The Bald Mountain assigned site is located near 5 acres of emergent wetland that is temporarily or seasonally flooded. The sedge dominated wetlands are located on a bench approximately ¼ of a mile above the camp to the south and west. To the south, the horses access drinking water from the camp in a small stream that feeds the sedge wetland on the other side. Horses cross there and head through the wetland and up the hill. The different-nerve sedge site is located to the west, and the habitat for this species borders the wet sedge meadow. This stringer of wetlands is located along the travel route the pack stock use to reach their main loose grazing area to the west.

  An R6 Sensitive population of different-nerve sedge near the Bald Mountain camp has been part of the occasionally used grazing area associated with this full-service assigned campsite. This area has not been the primary graze area but one that has been used for short visits with a few animals or when outfitters have chosen to keep the animals close and do not turn them out onto the open upland area on the west side of Bald Mountain overnight. No grazing was observed in this wet sedge meadow in 2011 or 2012.

  When stock are turned out onto Bald Mountain to graze they travel through the above mentioned wetlands on the old boundary trail to access the drier *Danthonia intermedia* (timber oatgrass) and *Festuca viridula* (green fescue) meadow habitat up on the northwest flank of Bald Mountain where the majority of the suitable graze is located. The trail drainage structures are no longer being maintained and stock have created multiple braided trails in association with this old trail as they pick their way through the wet areas and down timber. In addition, this old trail has been used by other outfitters, hikers, and private parties with stock. It is a known short cut across to the Ashnola River and into the Sheep Mountain area. Springs along the north slope of Bald Mountain associated with the trail have been sheared from hoof action and traffic along the trail allowing for a more rapid dewatering of spring and slope erosion.

  Glaucous gentian is found on the hummocks above these springs. Horses travel through the area and trample this population and the perennially moist springs which results in a loss of viability to this specific population. However, there are many other unaffected populations that insure species viability. Hoof tracks often sink into the soil 4” to 6” and the spring flow is being diverted down the old boundary trail causing soil erosion.

  Once pack and saddle stock reach the upland grazing area, there is better forage opportunities so they disperse. Dispersed loose grazing reduces long term ecosystem impacts. Although some species loss may occur to different-nerve sedge and glaucous

gentian, there are many other unaffected populations that ensure species viability. Detailed information taken at this site indicates the area is currently in good ecological condition. Past use has not resulted in any long-term modification of the natural plant communities.

The description of the Bald Mountain camp and impacts to nearby wetlands were updated in this FEIS using new monitoring information. The DEIS stated that the camp was "problematic". Further analysis of the wetland near the camp determined that the impacts to the wetland habitat and species there are in fact inconsequential to overall wetland habitat and species viability because the vast majority of habitat is unaffected by outfitter-guide activities.

- *Beaver Creek Camp – Full-service, Assigned Site*
  Beaver Creek assigned site has two R6 Sensitive plants within 500 feet of camp. These are: glaucous gentian and different-nerve sedge. This camp also is in association with the largest amount of designated wetland. There are 9.7 acres of willow wetland that are temporarily or seasonally flooded within 500 feet of the campsite. Most of this wetland area is directly west of the camp. Horses do not graze in this wetland but they travel through it to access grazing areas above and to the north. Stock have been well dispersed when travelling through this area and there is no evidence that long-term modification of the wetland habitat has been occurring. To the north of the campsite there are some small open water wetlands surrounded by hummocks that support glaucous gentian. This is a relatively large area in good ecological condition because stock are allowed to loose graze. Horses travel to and from night grazing areas just to the northwest of this hummock ground and wetlands. There is little evidence, if any, that horses spend time in this area. Current stock use has not altered the integrity of this population or habitat.

  Glaucous gentian is also found to the east behind the campsite, in small openings between the trees and often in association with depressions that appear to be old remnant hummocks that have possibly been destroyed from past trampling or grazing. The trail to Border Ridge goes through this area. Current stock use and human use in the area may have resulted in loss of a few individuals. Loss of individuals would not likely result in a loss of population or species viability because of the species wide distribution in the analysis area and the relatively small amount of total area being disturbed.

  Just above this *Salix planifolia* (diamondleaf willow) dominated community, vegetation grades into a green fescue meadow with inclusions of timber oatgrass and pockets of moist forbs with an abundance of *Trollius* (globeflower) and *Caltha* (marsh marigold) species. Within the moist forb inclusions R6 Special Status Species, different-nerve sedge, is found. Stock use of this area has been light and there is no detectible evidence that the level of use is threatening the viability of these Sensitive plants or their habitat.

  On the south side of the camp, within 100 feet of the tent site, there is a small wetland surrounded by hummocks. Additional field data was gathered after the DEIS was published to assess this area. The DEIS incorrectly stated that *C. saxatillis* is present in this wetland. The updated field data showed that the outfitted stock do not regularly

mingle around the camp in this wetland. The area has been grazed by commercial and recreational livestock since the early 1990s, and despite this, the sensitive plant populations are still viable and hummock structures are still functioning. The pack and saddle stock outfitter guide activities are not impacting the species viability of Gentiana glauca nor causing unacceptable impacts to the hummocks. The stock are loose grazed around this camp, and therefore do not stay in the wetland or hummock area because their preferred forage species do not grow there.

Beaver Creek Camp has been used by outfitters for over 15 years. Despite the ecological diversity and complexity of sensitive plant and wetland issues at this camp, impacts to vegetation has been moderate and most of the area is in fair to good ecological condition. Most of the damage has been occurring close to camp, such as in the 100 feet from the south side of the camp as described in the paragraph above. Aside from this spot, stock are well-dispersed from camp, this contributes to the moderate to low trampling damaging to the surrounding vegetation and wetlands.

- *Beaver Creek Drop Camp – Drop Camp*
  Beaver Creek Drop has one R6 Sensitive species associated with the camp; the species, green-keeled cottongrass, has suitable habitat within 500 feet. This species has not been documented in the actual camp area. There is no suitable habitat for green-keeled cottongrass in the immediate vicinity of camp. Given this camp is used primarily as a drop camp during the hunting season and stock do not reside at the site for any length of time, it is unlikely that green-keeled cottongrass is being affected by current use.

- *Bob Creek, Cathedral Camp, Bernice 3(E), Drop Camp B, and Drop Camp C – Drop Camps*
  Bernice 3(E), Bob Creek, and Cathedral camps are used primarily during the fall hunt season as drop camps. No effect to wetlands or sensitive plants has occurred from current use at these camps. Drop camps B and C have been used as drop camps, but outfitter stock have not been kept in camp or turned out to graze in any of these areas, so no identifiable alteration of sensitive plant resources or wetland habitats has occurred.

- *Charlie Brown and Pasayten Hilton – Drop Camps*
  Charlie Brown and Pasayten Hilton camps are both very wet sites, but there is little impact to vegetation because they are drop camps. Stock are not kept overnight at drop camps, so grazing is not an issue. Both sites have poor sedge in close proximity. These sites are in locations that would more likely be damaged by humans walking along the edge of waterways and boggy pond margins to gather water for camp use or washing. This is the situation at Charlie Brown. This site is also popular with private parties season long. The situation is similar at Pasayten Hilton campsite, which is also popular with private parties. Neither of these drop camps has been used often by the outfitters nor have they used them overnight. The poor sedge associated with these two camps are secure at this time and outfitter-guide activities are not affecting population viability.

  Of the two camps, Charlie Brown is the most popular with private parties. The grazing area below the camp is in a moist meadow where there are historic records of a population of a non R6 Sensitive species, *Botrychium simplex*. During inventory efforts

in 2001 *Botrychiums* were found in the area but identification was not confirmed. There were no samples taken to confirm identity. A photo was taken and identification could not be determined. Suitable habitat for different-nerve sedge is identified in the grazing area associated with this camp.

- *Ferguson Lake, Silver Lake, and Ptarmigan Creek – Ferguson Lake and Ptarmigan are past drop Camps; Silver Lake is a progressive camp.*
  Of the other camps listed in **Appendix H**, Ferguson Lake, Silver Lake, and Ptarmigan Creek do not have suitable habitat in any of the camp use areas. Use in these camps has not had any effect on the Sensitive species thought to be in the area because the habitats for R6 Sensitive species are far enough from the camps to be affected by use. Silver Lake is not well suited to stock use due to the wet and boggy nature of the site late into the season. Due to the lack of suitable Sensitive species habitat, the type of camp use and the unsuitable conditions for stock use at Sliver Lake outfitter use has not likely had any effect on Sensitive plant or wetland resources at these camps.

- *Old Miller Camp – Drop Camp*
  The different-nerve sedge populations near Old Miller Camp are within a nearby moist meadow. The camp is used as a drop camp by the pack and saddle outfitter guides. Outfitters have not affected the population since stock are not grazed at the camp.

- *Sheep Mountain – Assigned Site*
  Sheep Mountain is located in the vicinity of a confirmed population of different-nerve sedge. There are 0.3 acres of willow wetland that is temporarily or seasonally flooded located across the creek from camp. There has been no stock or human use associated with this willow wetland.

  Field inspections (see the analysis file for field notes taken at the site) at Sheep Mountain camp indicate that the different-nerve sedge population south of the camp is in a high traffic area this has been actively grazed. The population is between the camp site and water source for both the stock and camp. This population is in an area that has been regularly grazed as part of this camp for at least 60 years. There is still adequate vegetative cover to protect soil resources, however, the community composition is altered compared to other similar sites and is now dominated by non R6 Sensitive species, *Phleum alpinum* (alpine timothy) with an abundance of low growing forbs such as *Antennaria* (pussy toes)*, Fragaria* (strawberry), and *Potentilla* (cinquefoil) species. The individual populations of the R6 Sensitive species, different-nerve sedge, are struggling in this area due to the high use it has been receiving to the point that they are at risk of loss. However, despite rarity of this species further south, it appears to be rather widespread throughout the Sheep Mountain and Spanish Camp areas.

  These changes in community composition have occurred long before pack and saddle outfitter guides used this camp. Past sheep grazing in this area contributed to a majority of the shift in plant composition. Compared to past sheep grazing activities, vegetative recover is on an upward trend.

There is another wet meadow nearby that stock travel through to reach from night grazing areas. Other than the trail going through this area, the site has not been grazed or seen any other disturbance.

- *Timberwolf 1 –Drop Camp*
  Timberwolf 1 camp is surrounded to the north and west by wet to mesic willow and sedge dominated meadows where the R6 Sensitive species, different-nerve sedge, is located. These are the areas of concern. This camp has only been used as a drop camp in the past so stock have not resided there. There is some evidence of stock use in the area from private parties, however, the campsite received little use overall and the pasture area was in moderate to good ecological condition. This population is likely secure given the current low volume of use by the public and occasional use as a drop camp site by outfitters.

- *Horseshoe Basin and Horseshoe Creek – Overnight Camp*
  Horseshoe Basin and Horseshoe Creek campsites both support moist meadow habitats where R6 Sensitive species, different-nerve sedge, is suspected to occur. The species has not been confirmed within the 500 foot buffer area around these camps. Horseshoe Creek also includes emergent wetland habitat. At both sites, outfitters overnight with stock. These sites have been used infrequently by outfitters because of remote access and location relative to the other campsites which are accessible from within the Methow River drainage. Grazing behavior and preferences of stock in this area are likely similar to those seen in Spanish Camp.

- *Fish Creek Base Camp – Base Camp*
  At Fish Creek Base Camp stock are kept in the corrals and feed is brought in on the barge. Stock have not been turned out to graze and disturbance to Special Status Species would be from trampling, mainly by humans.

- *Crow Lake – Assigned Site, drop, full-service*
  Crow Lake is an assigned site that is not in close proximity (500') of any known wetlands or Sensitive plant populations. It is located in a small grove of *Larix lyalii* (larch) in the overstory with *Vaccinium scoparium* (grouse whortleberry) and *Luzula hitchockii* (Hitchcock's smooth woodrush) as the dominant understory species. Once out of the barren core area of camp, stock disperse well. A population of R6 Sensitive species, different-nerve sedge, was found in a narrow stringer meadow dominated by globeflower and marsh marigold within the area stock was grazing north of camp. The grazing by stock showed minimal trampling in August when the inventory was made (see field notes in the analysis file). This demonstrates resiliency of the moist forb meadow communities. This community shows only mild signs of reduction in cover of the key species such as green fescue, American globeflower , and white marshmarigold.

  The steep south slope facing into Gabril Creek is a green fescue community. There are still signs of terracing across the slope from past sheep grazing that contribute to its overall condition. It does not appear that stock are using this area or the stinger of wet tall forb meadows, and springs associated with the mature *Picea engelmannii* (Engelmann spruce) below. The surrounding area showed only minor amounts of trampling damage to communities and most areas were in at least fair or good

condition, with the except of the steep south slope noted above. Past outfitter camp activities at this site only appear to be having minor effects to botanical resources (Kovalchik 2003).

- *Whistler Camp – Assigned Site*
  Whistler Camp is often approved for extended use. This was an old sheep camp during the height of past sheep grazing. The landscape is wide open and gentle. There are no known sensitive plant populations or wetlands within the 500' radius of camp. Past records (see field notes in the analysis file), indicate overgrazing by sheep changed much of the dominant native species in the community and has been replaced by short herbaceous species such as *Antenaria lanata* (woolly pussytoe) and cinquefoil. A short tufted grass is the dominant grass species, but site records do not provide a species name.

  Whistler Camp is in an area with low to moderate potential for post disturbance recovery. Dominance of grouse whortleberry in the area would indicate the resiliency to be low while a dominance of moister, herbaceous plant species would indicate a higher resiliency. Past grazing practices and use as a sheep camp has left this area highly altered. Since outfitter guide activities are contributing only a minimal amount of disturbance compared to past sheep grazing activities, vegetation is being allowed to recover.

Natural Plant Succession

In the late 1800's large bands of sheep first were first introduced into the area later designated as the Lake Chelan Sawtooth and Pasayten Wildernesses, Sawtooth Backcountry, up the Methow Drainage and into the Harts Pass area. Past commercial grazing numbers appear to have peaked between 1925 and 1950 for both cattle and sheep. There was a general trend to shift from sheep to cattle in the 1940's which changed the dynamics where overgrazing was occurring. Overgrazing shifted from bedding areas associated with sheep grazing to increased use in riparian areas with cattle. Vegetation began to recover when switched from sheep to cattle grazing. Past grazing practices likely delayed plant recovery in these fire areas since there were few grazing utilization standards in place.

Past livestock grazing resulted in changes in natural plant succession over much of the Pasayten and Lake Chelan-Sawtooth Wildernesses. Large numbers of pack and saddle stock used by outfitter-guides and members of the public prior to the current Forest Plans also affected this succession. Elimination of commercial grazing and establishment of party size controls in wilderness as part of the Forest Plans allowed the areas to begin to recover; the overall ecological condition has been improving ever since (see survey notes in the analysis file). Pack and saddle stock use in popular areas in the recent past has been slowing the recovery in and around campsites, however, the trend is still upward (see survey notes in the analysis file). The use in the recent past has been consistent with Forest Plan standards and guidelines that speak to natural plant succession. Loose grazing in these areas contributes to light intensity and low impacts to vegetation which allows for recovery which complies with Forest Plan standard and guide 15B-22A.

In general, plant communities showing the greatest resilience and over-winter recovery are in the warmer, moister environments with longer growing seasons and the greatest composition of grasses. Those showing the least resiliency are those in colder environments subject to frequent frost and are typically low shrub dominated communities. At the lower trampling intensities (less than 100 passes/year) vegetation loss did not increase substantially after the first season. The effect of multiple seasons of use appears to be more important than the number of days within the season trampling occurred. Even in the most resilient communities, the greater the number of years of use the less resilient is the community (Cole 1987).

The two primary plant communities associated with the majority of grazing throughout the analysis area are the green fescue and timber oatgrass meadows. Green fescue meadows are more often associated with mid-slopes or flats and concave micro-topography on upper slopes where finer textured soils accumulate and usually at lower elevations than the timber oat grass meadow type. Timber oatgrass meadows are typically found on the shallow coarser textured soils on the upper slopes and ridges, typically at higher elevations than the green fescue meadow type.

Timber oatgrass meadows are slower to recover from past overgrazing due to the harsher sites inhabited. Overgrazing of green fescue meadows was common during the height of sheep grazing. In one 50 year study in the Wallow Mountains, recovery of overgrazed green fescue meadows, where soils were intact, required at least 20 years. On moister sites, with intact soils, green fescue was able to re-colonize sites within 13 to 14 years. Where loss of most of the topsoil had occurred forming rocky erosion pavement or remaining soils were rocky, well drained, and shallow after 50 years the plant cover was sparse (10%-30%) with little green fescue in the composition (Reid et al. 1991).

Sheep and cattle grazing had been eliminated over much of the analysis area in the mid-1900's for sheep and 15 years for cattle. Even the most resilient sites likely have not yet fully recovered. The amount of stock grazing associated with the outfitters and private parties has been in localized, small areas relative to the extent of past livestock grazing, and not affecting natural plant succession. The end result is an overall trend toward improvement in the current ecological condition of plant resources.

In the Pasayten, most of the disturbance is associated with pack and saddle outfitter guide stock traveling through wet areas to reach preferred grazing sites. Most of the grazing is occurring in timber oatgrass, green fescue and to a lesser extent mesic forb meadows. Stock use was well distributed at the grazing sites inventoried and they were typically in fair to good ecological condition (Kovalchik 2002 and 2003). This is attributed in part to the higher precipitation levels and available moister associated with the Pasayten and the large expansive gentle open rolling meadow terrain, which allows for better stock distribution.

In the Lake Chelan-Sawtooth Wilderness and Sawtooth Backcountry, environments are drier and less resilient to grazing pressure or trampling. Terrain is steeper and open grazing ground is less expansive or abundant. Green fescue dominated meadows provide the greatest forage base. Loss of green fescue is evident in Mid Oval SW horse camp on the Methow side of the Sawtooth (Ohlson, personal observation). As a result of the sheep herder camps, the productive green fescue is being replaced by less palatable species such as pussy toes and cinquefoil by past and recent past use. Portions of this area consist of alpine heather communities which are generally

intolerant of even moderate levels of trampling. Impacts to these communities are often long lasting.

Wildfires are a natural part of the successional dynamics of the plant communities. During the 2006 Tripod fire, 67% of this subunit burned over. The camps in the Bear/Ramsey/Volstead sub-section (outside of the Wilderness boundary), are used as drop camps and there is no impact from grazing livestock.

In the 2001 Rex Creek fire, along the north shore of Lake Chelan, 10 campsites were identified within the fire perimeter that was within the Lake Chelan-Sawtooth Wilderness. In the 2003 Farewell/Needles fire, four campsites were burned over in the Andrews Creek drainage, Pasayten Wilderness subunit and one in Middle Fork Methow drainage, North Cascades subunit. The fires in 2006 burned over three campsites within the Pasayten Wilderness subunit. One, Horseshoe Creek camp, has suitable habitat for R6 Sensitive species, different-nerve sedge. This species is associated with wet rich forb meadows and both this species and its habitat are expected to respond favorably to fire disturbance.

Figure 3.7-1: Fire History Highlights from circa 1900 thru 2006.

Analysis Area Subunits	1917 thru 1919	1926	1929	1970	1984 thru 1986	Since 2000	Total Ac Burned since 1900
Bear/Ramsey/Volsted	6,951	2,359		509	339	38,648	49,387
Sawtooth Backcountry	5,265			3,530		3,638	12,870
Middle Methow	686		1,206	62		1	4,061
North Cascades	246	169		96	690	29,745	38,371
Pasayten Wilderness	13,153	19,286	47,708	605	3,199	131,451	250,413
Sawtooth Wilderness	169	2,930	1,885	603	4,522	36,107	49,070

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

There would be no pack and saddle stock outfitters in the analysis area with implementation of this alternative. This would result in a 15% reduction in the expected number of pack and saddle stock use across the area. The remaining non-outfitted pack and saddle stock use by the general public would continue to trample vegetation in and around the campsites. Many camps with barren core areas and number of damaged trees exceeding standards and guidelines would continue to exist and be used by the general public. The disturbance at continually used camps would continue to a slightly lesser degree. There would be no assigned sites to pack and saddle outfitter-guides.

Wetlands

Most of the existing campsites would continue to be used by private pack and saddle stock users. Campsites within 200 feet of meadows, lakes, streams and key interest areas would continue to be used by the general public. As a result, the impacts to nearby wetlands would

continue, but the overall 15% reduction in the number of pack and saddle stock would also reduce the amount of vegetation trampling, selective grazing, and soil damage. Damage in some wetlands not being used may begin to recover. Approximately 0.01% of the wetland habitats in the analysis area that are within a 500 foot buffer of campsites would continue to be impacted by private pack and saddle stock use. The remaining 99% of the wetlands would remain in good ecological condition or would continue to recover from effects of past commercial livestock grazing.

Federally Listed Threatened and Endangered

There are no Federally listed water howellia, lesser showy stickseed, Wenatchee Mountains checker- mallow, or Ute lady's tresses populations known to occur in the analysis area. This alternative would have "no effect" on any of these species or their habitats.

R6 Special Status Species

Pack and saddle stock outfitter guides would have no impacts on R6 Special Status Species. Non-outfitted pack and saddle stock may continue to affect some sensitive plant species by trampling and a loss of some populations or individuals may occur where species are in close proximity to established camps and use patterns are known to overlap habitat. Overall, there would be less risk of damage than is currently occurring due to the decreased numbers of animals. These camps and associated species are described in **Appendix K**. The species that may be affected are: different-nerve sedge, poor sedge and glaucous gentian.

Where different-nerve sedge and glaucous gentian occur, populations are widely dispersed but concentrated in a small geographical area. Loss of individuals, where non-outfitted use overlaps occupied habitat, would not likely result in a loss of population or species viability because of the species wide distribution and the relatively small amount of habitat being affected

R6 Sensitive species, Poor sedge, is a riparian and wetland species and may be affected by private stock trailing through wetland habitats. Since private use is unregulated, use mat not comply with Forest Plan standards and guides.

Of the 54 R6 Special Status Species and Survey and Manage plant species found during surveys or that have potential habitat within the analysis area, and their nearly 360 populations that occur within the analysis boundary, the risk to these species is low. This is due to the small amount of area being impacted by private use relative to the large amount of area in the Wilderness where sensitive and Survey and Manage species and their habitats are not impacted. There is no outfitter guide use associated with this alternative. This alternative would not result in a trend toward further listing of any species considered.

Natural Plant Succession

There would be less overall grazing pressure on plant communities due to the reduced number of stock. Except for the assigned Beaver Creek, Bald Mountain, Whistler Camp, Sheep Mountain, and Crow Lake camps, campsite use by stock would change very little. The general public may shift part of their use to the assigned sites since these sites would not be occupied by outfitters. Private stock users are less likely to turn their animals out to graze any distance from camp, which may result in smaller isolated and concentrated grazing areas close to the campsites that are no longer being used as assigned sites for outfitted use. Some private parties use electric fencing and staking, in addition to highlines to keep stock close to camp. This results

in more concentrated disturbance to vegetation around camps and may result in a shift of grazing use associated with some camps. It is the timing and concentration of use on a given piece of ground that drives recovery more than the overall number of animals using an area. And since private parties are less likely to loose graze their animals, the shift in animal use occurring closer to camps would likely result in isolated overgrazing near these campsites. Use patterns at these camps were established decades ago, often in association with past commercial livestock grazing, so much of the plant community alteration has already occurred. With overall fewer stock numbers, plant communities would continue to recover throughout the analysis area.

The rate of recovery would be dependent on the soil condition and vegetative community involved. Where non-outfitted associated grazing is occurring in moist, forb rich meadows, the risk of soil displacement or compaction is increased. This would create isolated areas with slow post-grazing recovery. However, these communities are the most resilient to trampling and are expected to recover within a growing season following most types of use. Grass dominated meadow systems will be intermediate in post-grazing recovery if excessively trampled or overgrazed, but would be expected to recovery sufficiently if the excessive use is not recurring annually. Low shrub dominated communities are not expected to recover rapidly from human or stock use and one season of use can require decades for an area to recover. Past use has already altered these communities; continued use will not affect the overall recovery rate in assigned camps.

Hummocks

The Beaver Creek camp would remain open for public use. If the general public shifts part of their use to assigned camps, such as Beaver Creek, public users are less likely to turn their animals out to graze any distance from camp, which may result in smaller isolated and concentrated grazing areas close to the campsites. The extensive, intact hummock community to the north of camp would become vulnerable to trampling since private users are more likely to keep stock close to camp , versus loose grazing used by outfitters. Visitors may try to water their stock in the small open water ponds associated with the hummocks near camp. The area around the small hummock community near the existing camp would be used by private parties and the effects to this little wetland would not change.

The Bald Mountain camp would be open to public use. Non-outfitted stock would likely be kept closer in to camp increasing the grazing pressure in the wet meadows near camp where the R6 Sensitive species, different-nerve sedge, is found. However, there would likely be reduced trampling of the glaucous gentian (R6 Sensitive) site associated with the hummocks and spring seep that the past permitted outfitter stock traveled through to access their night graze on Bald Mountain As a result, some recovery of this area would be expected with the removal of outfitter stock use. Loss of individuals, where camp use overlaps occupied habitat, would not likely result in a loss of population or species viability because of the species wide distribution in the analysis area and the relatively small amount of total area being used by outfitters.

Since the majority of the hummock patterned ground is beyond any area recently used by outfitters, the change in the condition of this unique pattern ground would be insignificant relative to the area that is currently unaffected by activities in the Pasayten Wilderness.

Effects Common to Alternatives 2, 3, and 4

Federally Listed Threatened and Endangered and R6 Special Status Species

There are no Federally listed water howellia, lesser showy stickseed, Wenatchee Mountains checker- mallow, or Ute lady's tresses populations known to occur in the analysis area. Alternatives 2,3 and 4 would have "no effect" on any of these species or their habitats.

R6 Special Status Species

Poor sedge is a riparian and wetland species. Where these species occur, the Standards and Guidelines in the Okanogan and Wenatchee Forest Plans for Aquatic Resources (see Aquatic Resources 3.1) are in place regulating activities in order to minimize disturbance in these sensitive wetland habitats and any sensitive species would also benefit from these regulations.

Outfitter pack and saddle stock may affect some R6 Sensitive plant species by trampling and a loss of some populations or individuals may occur where species are in close proximity to established camps and use patterns are known to overlap habitat. Currently, there is less risk of population loss compared to the past commercial livestock grazing era, and the sensitive plant resources as a whole would continue to improve under these alternatives. The decreased numbers of animals and the small isolated areas where stock use occurs would minimize or eliminate risk of population loss or loss of species viability. Implementation of mitigation measures in Chapter 2 would further ensure species viability is not compromised across the analysis area.

- 1c states that outfitters would not be allowed to use more than the specified amount of barren core, and that Camp Management Plans would be developed for these sites with the specific area of allowed use identified in the plan. This mitigation would ensure that outfitters don't increase the amount of disturbance in the camps and holds outfitters accountable for their actions.
- 4 speaks to the rules and regulations that outfitters must follow, these rules and regulations help ensure that other mitigations in Chapter 2 would protect sensitive plants and their habitats.
- 8d would prohibit overnight picketing of stock in subalpine meadows, which would be effective in protecting sensitive plant habitats from stock use.
- 8e and g would limit outfitter-guide stock grazing to suitable grazing areas, and require outfitters to pack in all necessary feed when range conditions do not allow loose grazing. These mitigations would be effective at avoiding overgrazing in areas where range or vegetation conditions cannot support livestock grazing.
- 10a would be effective at avoiding damage to vegetation that could be caused by unapproved trail maintenance, cutting green trees or other live vegetation, or trampling vegetation beyond those impacts likely to recover within one growing season.
- 10c would be somewhat effective at minimizing impacts to wetlands and wet meadows as stock travel between campsites and grazing areas. Concentrating stock on a minimum number of trails through these areas, damage to soil and vegetation would be reduced.

In addition, monitoring (see Chapter 2 for a more detailed information) of assigned sites as part of special use permit administration would ensure that use either maintains or increase the ecological integrity of the area. This would be accomplished by monitoring a representative

sample of outfitter-guide camps seasonally for compliance with the terms of the permit, operating plan, and applicable laws and regulations. The filed inspection forms used to monitor include seven items, one of which addresses resource protection. Assigned sites are the most heavily used sites; information gained from monitoring these sites would be of value for predicting ecological trends at similar sites in the analysis area.

Natural Plant Succession

The overall ecological recovery of the plant resources within the analysis area is expected to improve with the implementation of any of the action alternatives. This is because past commercial livestock use has had a substantially greater effect on the existing plant community composition and recovery than the level of recreational and outfitter stock has or would have in the future.

Plant communities would continue to recover throughout the analysis area because of reduced stock use compared to historic use. The pattern of use at these camps was established decades ago often in association with past commercial livestock grazing, so much of the plant community alteration has already occurred. Use within the campsites would continue to result in some additional disturbance, but this use is small relative to the size of the analysis area. Monitoring (see Chapter 2 for a more detailed information) of assigned sites as part of special use permit administration would ensure that use either maintains or increase the ecological integrity of the area. This would be accomplished by monitoring a representative sample of outfitter-guide camps seasonally for compliance with the terms of the permit, operating plan, and applicable laws and regulations. The field inspection forms used to monitor include seven items, one of which addresses resource protection. Assigned sites are the most heavily used sites; information gained from monitoring these sites would be of value for predicting ecological trends at similar sites in the analysis area. In addition, limiting the transport of noxious weeds through awareness and camp surveillance would also ensure vegetation recovery.

The rate of recovery would be dependent on the soil condition and vegetative community involved. Recent past use in moist forb rich meadow communities are the most resilient to trampling and are expected to recover within a growing season following most types of use. Grass dominated meadow systems would be intermediate in post-grazing recovery if trampled or overgrazed, but would be expected to recover sufficiently if excessive use is not recurring annually. Low shrub dominated communities are not expected to recover rapidly from human or stock use and one season of use can require decades for an area to recover. Use patterns at these camps were established decades ago, often in association with past commercial livestock grazing, so much of the plant community alteration has already occurred.

Forest Plan use standards would continue to regulate activities that maintain or enhance plant community recovery. Alternatives 2, 3, and 4 are complying with Forest Plan standard and guideline 15B-22A which addresses modification of natural plant succession and recovery. Outfitter pack and saddle stock grazing in and around campsites would not result in further landscape modification of natural plant succession due to the limited amount of area where the animals graze and the small number of animals compared to past use, and other current use by the public.

Alternative 2

In Alternative 2 there would be 4,620 service days available for use by permitted outfitters. The party size would continue to be 12 people and 18 head of stock. There would be five assigned sites (Sheep Mountain, Beaver Creek, Bald Mountain, Crow Lake, and Whistler Camp) for full-service trips and five sites near trailheads for use as base camps (Andrews Creek, Billygoat, Slate Creek, Fish Creek, and Crater Creek). Additional sites could be assigned in the future following the mitigation measure number 1.g in Chapter 2. There are no new campsites, trails, or other ground disturbing activities permitted in this alternative. If an assigned site has to be closed to protect resources, additional site may be designated and approved by the Forest Service.

There are two Forest Plan amendments associated with this alternative. One amendment would allow pack and saddle stock outfitter camps to use up to 5,250 square feet of barren core in camps where the existing amount exceeds that level. All outfitters would be required to use the same 5,250 square feet on successive trips, allowing the remaining barren core the potential to recover. The other amendment would allow pack and saddle stock outfitter-guides to use existing campsites within 200 feet of meadows, lakes, streams and key interest areas in the Pasayten and Lake Chelan-Sawtooth wilderness areas to avoid degradation of wilderness character and resources.

The assigned sites would result in monitoring and regulating outfitter activities in regularly used sites. These sites are used by outfitters already, and would not be open for the general public. This would allow better management opportunities for ensuring ongoing resolution of resource issues. These sites would continue to receive the highest levels of use of the outfitter camps. As stated above, this alternative would amend Forest Plans; camps that are smaller than 5,250 square feet of barren core would remain at their current size. Outfitters would not be permitted to create additional barren core. At assigned sites, the amount of barren core would be reduced over time, since they would be closed to use by the general public and barren core would be limited to 5,250 square feet within these larger sites, which would allow recovery to begin in the area not permitted for use by pack and saddle outfitter-guides. At all other camps used by outfitter, the amount of barren core the outfitters could use would be limited to 5,250 square feet, but continued use by the general public would likely perpetuate the existing amount of barren core.

The mitigation measures in Chapter 2 would also prohibit the outfitters from creating new travel routes (10.c), establishing new camps (1.g), increasing the amount of bare mineral soil in established camps (1.e), and exposing roots on any more trees at existing campsites (1.f). Measures 8 a- j would minimize impacts to vegetation from grazing. These would be effective since they would be part of the operating plans for the outfitters, so compliance would be required. Outfitter-guides are required under their permit to comply with the terms and conditions of their permit, including adherence to their operating plan. Outfitters who do not comply with terms and conditions will be issued a letter of non-compliance. Continued failure to meet terms and conditions can result in suspension or revocation of the permit.

The forest plan amendment regarding campsite location would allow outfitters to continue to use the approximate 98 established campsites within 200 feet of meadows, lakes, streams, and special interest areas. Current affects to wetlands would continue and still comply with Forest Plan standard and guidelines.

Wetlands

The existing campsites would continue to be used by pack and saddle stock outfitter-guides, potentially impacting approximately 86 acres of wetlands. The impacts caused by recent past use to nearby wetlands would continue, resulting in small, isolated areas of vegetative trampling, selective grazing, and soil damage in approximately 1% of the wetland habitats in the analysis area that are within a 500 foot buffer of campsites. The remaining 99% of the wetlands would remain in good ecological condition or would continue to recover from effects of past commercial livestock grazing.

The existing campsites would continue to be used by pack and saddle stock outfitter-guides, potentially impacting approximately 86 acres of wetlands. The impacts caused by recent past use to nearby wetlands would continue, resulting in small, isolated areas of vegetative trampling, selective grazing, and soil damage in approximately 1% of the wetland habitats in the analysis area that are within a 500 foot buffer of campsites. The remaining 99% of the wetlands would remain in good ecological condition or would continue to recover from effects of past commercial livestock grazing.

Mitigation measure 10c would require that stock travel routes through wetlands and wet meadows be managed to concentrate stock on a minimum number of pathways by placing obstacles in braided trail areas a way to minimize trails and damage to vegetation and soil. This would be moderately effective at reducing impacts to wetlands by minimizing the amount of soil compaction and erosion.

R6 Special Status Species

Outfitter pack and saddle stock may affect some R6 Sensitive plant species by trampling. Some populations or individual loss could occur where species are in close proximity to established camps and use patterns are known to overlap habitat at Bald Mountain, Beaver Creek, Old Miller Camp, Sheep Mountain, Timberwolf 1, and Crow Lake. Currently, there is less risk of population loss compared to the past livestock grazing era and the sensitive plant resources as a whole are expected to continue to improve with this alternative over the larger area. The number of outfitted stock and the small isolated areas where stock use occurs, relative to the size of the analysis area, would not contribute to the risk of population loss or loss of species viability. Implementation of mitigation measures in Chapter 2 would further ensure species viability is not compromised. Specifically, measures included in Chapter 2, would mitigate potential effects to sensitive species and wetland habitat by encouraging loose grazing, prohibiting overnight picketing of stock in meadows, requiring use of approved handling facilities, minimizing trampling and removal of greenery, plus limiting the transport of noxious weeds through awareness and camp surveillance. These would be effective since they would be part of the operating plans for the outfitters, areas of concern would be identified, and compliance would be required through the special use permit. As mentioned above, outfitter-guides are required under their permit to comply with the terms and conditions of their permit, including adherence to their operating plan.

Camps where outfitter stock overnight that may affect individuals or populations are: Bald Mountain: blackened sedge, different-nerve sedge, and glaucous gentian; Beaver Creek:

different-nerve sedge, and glaucous gentian; Sheep Mountain: different-nerve sedge; Horseshoe Basin: different-nerve sedge; and at Horseshoe Creek: different-nerve sedge.

Where different-nerve sedge and glaucous gentian occur populations are widely dispersed but concentrated in a small geographical area. In areas where camps overlap with occupied habitat, some individuals may be damaged or killed. This would not likely result in a total loss of population or species viability, due to the wide distribution of the species and the relatively small area of use by outfitters.

Of the 54 R6 Special Status and Survey and Manage species found during surveys or that have potential habitat within the analysis area and their nearly 360 populations that occur within the analysis boundary, the risk to these species is very low. Since the pattern of use would not change with the implementation of this alternative, the risk to sensitive plants is not expected to increase. Use associated with Alternative 2 may result in the loss of some individuals at the Bald Mountain and Beaver Creek camps, but would not result in loss of species or population viability. Implementation of Alternative 2 would not result in a trend toward further listing of any species considered. There would be slightly more pack and saddle stock in the analysis area with this alternative compared to Alternative 3 and slightly less compared to Alternative 4. This alternative would have the same use as the existing condition of recent past use explained in the Affected Environment, but would increase over time. Use associated with Alternative 2 may result in the loss of some individuals but would not result in loss of species or population viability since there are enough populations in the analysis to ensure species viability. Implementation of Alternative 2 will not result in a trend toward further listing of any species considered.

Natural Plant Succession

Alternative 2 would continue to allow plant community recovery across the analysis area. The pattern of use at these camps was established decades ago often in association with past livestock grazing, so much of the plant community alteration has already occurred. Use around the campsites would continue to result in some disturbance, but this use is small relative to the size of the analysis area. Alternatives 2 complies with Forest Plan standard and guideline 15B-22A which addresses modification of natural plant succession and recovery.

Hummocks

By continuing to use Beaver Creek camp as an assigned site, the large intact hummock community to the north of camp would remain in good ecological condition because when the stock are turned out to graze they are well dispersed and avoid this area.

Use of the Bald Mountain site would still result in some expected use of the hummocks and spring seep the stock travel through to reach their night graze. There would still be potential for trampling of the hummocks and glaucous gentian population in this travel route which may result in the loss of this population. However, enough populations of glaucous gentian remain to ensure species viability; use would not result in a loss of species viability, even though there is potential for a loss of individuals with continued use of the camp

Since the majority of the hummock patterned ground is beyond any recently permitted outfitted use, and would remain so in this alternative, the disturbance at the Bald Mountain camp would be insignificant relative to the area where it is found in the Pasayten Wilderness.

Alternative 3

In Alternative 3, the number of service days would be reduced to 2,660. There would be three assigned sites (Sheep Mountain, Crow Lake, and Whistler Camp) for full-service trips and five sites near trailheads for use as base camps (Andrews Creek, Billygoat, Slate Creek, Fish Creek, and Crater Creek), but pack and saddle outfitter-guides would be prohibited from using the Bald Mountain and Beaver Creek Camps because of their proximity to wetlands. The assigned base camps at the Andrews Creek, Billygoat, Slate Creek, Fish Creek, and Crater Creek trailheads would be permitted. Other than designating new assigned sites to replace the Bald Mountain and Beaver Creek sites, no new campsites, trails, or other ground disturbing activities would be permitted in this alternative.

This alternative would amend the Okanogan and Wenatchee Forest Plan standards and guidelines in wilderness, allowing pack and saddle stock outfitter-guide camps to use up to 2,800 square feet of barren core in camps where the existing amount exceeds that level. All outfitters would be required to use the same 2,800 square feet on successive trips, allowing the remaining barren core the potential to recover. Camps that are smaller than 2,800 square feet of barren core would remain at their current size. Outfitters would not be permitted to create additional barren core.

The plan would also be amended to reduce party size for pack and saddle stock outfitter-guides to 12 heartbeats (people and stock). The mitigation measures in Chapter 2 would also prohibit the outfitters from creating new travel routes (10.c), establishing new camps (1.g), increasing the amount of bare mineral soil in established camps (1.e), and exposing roots on any more trees at existing campsites (1.f). Measures 8 a- j would minimize impacts to vegetation from grazing These would be effective since they would be part of the operating plans for the outfitters, so compliance would be required. Outfitter-guides are required under their permit to comply with the terms and conditions of their permit, including adherence to their operating plan. Outfitters who do not comply with terms and conditions will be issued a letter of non-compliance. Continued failure to meet terms and conditions can result in suspension or revocation of the permit.

This alternative would amend the Okanogan Forest Plan to prohibit outfitters from using established camps within 200 feet of wetlands, lakes, streams, or key interest areas in wilderness. This language allows outfitters to use dry meadow habitats for grazing their stock while in the backcountry. Applying the 200 linear foot distance to the camps in wilderness shows that there are 98 campsites with 200 feet of meadows, lakes, streams, and key interest areas and 18 of those campsites are within 200 feet of wetlands. Forty-six of the 153 established wilderness campsites consistently used by outfitter-guides in this analysis area would no longer be available to them. Included in these 46 camps are two previously assigned sites: Bald Mountain and Beaver Creek. There would be no further impact from outfitter-guide activities to the wetlands near these camps, but impacts from stock could likely continue to some degree since the campsites may still be used by the public.

Assigned sites under this alternative would not be open to public use, which allows better monitoring of resource impacts caused by outfitter activities. These sites would continue to receive the highest levels of use of all the outfitter camps. At assigned sites, the amount of

barren core would be reduced over time, since they would be closed to use by the general public and pack and saddle outfitter-guides would be restricted to 2,800 feet of these assigned sites.

The smaller party size could result in outfitters needing to make multiple trips to a site in order to accommodate clients as a result of the reduced party size, thus increasing stock use over a season Grazing duration might also increase, as stock would graze when the clients are at the site and on the potential additional trips. This increased stock grazing would be expected particularly at assigned and full-service camp sites where stock use is already the highest. If the outfitters instead adjust to the reduced party size by reducing the number of stock used instead of taking additional trips, the impacts from grazing would be reduced.

Approximately 6% fewer pack and saddle stock would be in the analysis area compared to recently permitted numbers that resulted in the existing condition. Campsite use would remain the same compared with Alternative 2 and 4, with the exception of those campsites within 200 feet of wetlands, which would be closed to outfitter use as noted above. Since these campsites would still be used by the public, there is not expected to be any difference in vegetative recovery compared with Alternative 2 and 4.

Wetlands

Since pack and saddle outfitter-guides would not be permitted to use existing campsites within 200 feet of wetlands, the impacts to wetlands near these camps caused by recent past use by the pack and saddle outfitters would cease. Due to the non-use of campsites within 200 feet of wetlands by outfitter-guides, the number of wetland acres within a 500 foot buffer of campsites that could continue to be disturbed by pack and saddle stock would drop to 25.2. This equates to 0.003% of the wetland habitats in the analysis area that are within a 500 foot buffer of campsites which is a decrease from 86 acres or 1% of wetland habitats in Alternatives 2 and 4. There would be less vegetation trampling, selective grazing, and soil damage in wetland habitat in the analysis area. Where there are isolated cases of impacts to wetlands from stock use, recovery would occur relatively quickly, as wet habitats tend to be more resilient (Cole, D.N. 1995a, 1995b). Wetlands would continue to recover from historic livestock use.

The Forest Plan amendment prohibiting campsites within 200 feet of wetlands could result in a higher concentration of use from outfitters across available sites. There could be more damage to vegetation as a result of concentrating grazing in areas that are the least resilient to grazing pressure, such as dry meadows and low shrub communities dominated by heather and huckleberry species. Mitigation measure 10c would reduce impacts as described on 3-260.

R6 Special Status Species

Outfitter pack and saddle stock may affect some R6 Sensitive plant species by trampling and a loss of some populations or individuals may occur where species are in close proximity to established camps and use patterns are known to overlap habitat. Currently, there is less risk of population loss compared to the past commercial livestock grazing era, and the sensitive plant resources as a whole would continue to improve under this alternative. The decreased numbers of animals and the small isolated areas where stock use occurs would minimize or eliminate risk of population loss or loss of species viability. Implementation of mitigation measures in Chapter 2 would further ensure species viability is not compromised across the analysis area.

Camps where outfitter stock currently overnight within 200 feet of wetlands would no longer be permitted for use by the pack and saddle outfitter-guides. The potential for individuals or populations to be impacted by pack and saddle outfitter-guides would be eliminated at those sites. The campsites and species that may continue to be impacted by outfitter use are; Horseshoe Basin: different-nerve sedge and Horseshoe Creek: different-nerve sedge. The species has not been confirmed within the 500 foot buffer area around these camps. Horseshoe Creek also includes emergent wetland habitat.

Where different-nerve sedge and glaucous gentian occur at Old Miller, Sheep Mountain, Timberwolf 1, and Crow Lake, populations are widely dispersed but concentrated in a small geographical area. In areas where camps overlap with occupied habitat, some species may be damaged or killed. This would not likely result in a total loss of population or species viability, due to the wide distribution of the species and the relatively small area of use by outfitters. Even with outfitter use of campsites within 200 feet of wetlands being eliminated, stock use would likely overlap with suitable habitat for these species.

Of the 54 Special Status and Survey and Manage species found during surveys or that have potential habitat within the analysis area and their nearly 360 populations that occur within the analysis boundary, the risk to these species is very low. Alternative 3 proposes the greatest reduction in use days and is the most restrictive on allowable barren core. Plant community recovery following a season of use may be slightly better than Alternative 2 and Alternative 4, respectively, but the use patterns are not expected to change the overall ecological condition or effects to any Sensitive plant populations or habitat within the analysis area. Use associated with Alternative 3 may result in the loss of some individuals but would not result in loss of species or population viability since there are enough populations in the analysis to ensure species viability. Implementation of Alternative 3 will not result in a trend toward further listing of any species considered.

Natural Plant Succession

There would be less overall grazing pressure on plant communities with Alternative 3 relative to existing conditions. Alternative 3 is the most restrictive, the expected change in vegetative response from use at these sites would have more of an upward trend when compared with Alternatives 2 and 4 except in locations where campsites are closed and use shifts to drier, less resilient areas.

The general public may shift part of their use to the assigned sites since these sites would not be occupied by outfitters. Private stock users are less likely to turn their animals out to graze any distance from camp, which may result in smaller isolated and concentrated grazing areas close to the campsites that are no longer being used as assigned sites for outfitted use. Some private parties use electric fencing and staking, in addition to highlines to keep stock close to camp. This results in more concentrated disturbance to vegetation around camps and may result in a shift of grazing use associated with some camps. It is the timing and concentration of use on a given piece of ground that drives recovery more than the overall number of animals using an area. And since private parties are less likely to loose graze their animals, the shift in animal use occurring closer to camps could likely result in increased grazing near these campsites. Use patterns at these camps were established decades ago, often in association with past commercial livestock grazing, so much of the plant community alteration has already occurred.

Alternatives 3 complies with Forest Plan standard and guideline 15B-22A since there would be no long term modifications to natural plant succession as a result of pack and saddle stock outfitter-guide activities, and any impacts to vegetation would recover in one growing season.

Hummocks

Beaver Creek and Bald Mountain camps would no longer be permitted for these outfitters to use, so impacts from stock traveling through the nearby hummocks would be reduced. The large intact hummock community to the north of the Beaver Creek camp would remain in good ecological condition because when the stock is turned out to graze they are well dispersed and avoid this area.

Impacts from outfitters to the hummocks near the Bald Mountain camps would cease. Since the majority of the hummock patterned ground is beyond any current outfitted use, the change in the condition of this unique pattern ground would be insignificant relative to the area where it is found in the Pasayten Wilderness.

Alternative 4

In Alternative 4 there would be 6,700 service days available for use by permitted outfitters. The party size would continue to be 12 people and 18 head of stock. There would be five assigned sites (Sheep Mountain, Beaver Creek, Bald Mountain, Crow Lake, and Whistler Camp) for full-service trips and five sites near trailheads for use as base camps (Andrews Creek, Billygoat, Slate Creek, Fish Creek, and Crater Creek).

This alternative would amend the Okanogan Forest Plan by stating that outfitters could use existing barren core in campsites but not create more barren core. All campsites with more than 5,250 square feet of barren core would have a Camp Management Plan to track the barren core and ensure it is not increasing. This amendment would continue the overall trend of non-degradation of wilderness conditions, specifically related to campsite conditions. The area of potential recovery at some sites would be reduced from Alternatives 2 and 3. This increase would not result in a substantial change in the overall ecological condition of the plant resources across the analysis area compared to Alternative 2 or Alternative 3 because the impacts already exist on the ground and are likely to persist because the rest of the area would still be open to the non-outfitted public.

The mitigation measures in Chapter 2 would also restrict the outfitters from creating new travel routes (10.c) to minimize the impacts to wet soils and meadow areas, establishing new camps (except where the Forest Service may designate new camps as a result of closing existing campsites for resource protection), increasing the amount of bare mineral soil in established camps (1.d), and exposing roots on any more trees at existing campsites (1.f). Measures 8 a- j would minimize impacts to vegetation from grazing.

This alternative would also amend the Okanogan Forest Plan to allow outfitter guides and their stock to use established campsites within 200 feet of meadows, lakes and streams in wilderness. There are 64 campsites which have been noted to have meadows, lakes and streams within 200' of the camp. Outfitters would continue to use these established campsites. There would still be small isolated areas where impacts are occurring, but these would not interfere with the natural ecological processes at the scale of the analysis area. Overall, the ecological integrity of the

plant resources across the analysis area are in an upward, recovering, trend since the removal of commercial livestock grazing. Therefore, implementing Alternative 4 would not result in any increase in native plant community alteration.

The assigned sites would allow better opportunity to monitor and regulate outfitter activities in regularly used sites. These sites have been used exclusively used by outfitters already, and would not be open for the general public. This would allow better management opportunities for ensuring ongoing resolution of resource issues. These sites would continue to receive the highest levels of use of all the outfitter camps. At assigned sites, the amount of barren core would not increase, since they would be closed to use by the general public and Pack and saddle stock outfitter-guides would not be allowed to increase the existing amount of barren core (bare, mineral soil) in established campsites.

Monitoring (see Chapter 2) of assigned sites as part of special use permit administration would ensure that use either maintains or increases the ecological integrity of the area. Since assigned sites are the most heavily used sites, information gained from monitoring these sites would be of value for predicting ecological trends at similar sites in the analysis area.

As stated above, outfitters would not be permitted to increase the size of barren core in campsites. These would be effective since they would be part of the operating plans for the outfitters, so compliance would be required. Outfitter-guides are required under their permit to comply with the terms and conditions of their permit, including adherence to their operating plan. Outfitters would be required to comply with the terms and conditions of the permits.

Wetlands

The existing campsites would continue to be used by pack and saddle stock outfitter-guides, potentially impacting approximately 86 acres of wetlands. The impacts caused by recent past use to nearby wetlands would continue, resulting in small, isolated areas of vegetative trampling, selective grazing, and soil damage in approximately 1% of the wetland habitats in the analysis area that are within a 500 foot buffer of campsites. The remaining 99% of the wetlands would remain in good ecological condition or would continue to recover from effects of past commercial livestock grazing. Mitigation measure 10c would reduce impacts as described on 3-260.

R6 Special Status Species

Outfitter pack and saddle stock may affect some R6 Sensitive plant species by trampling and a loss of some populations or individuals may occur where species are in close proximity to established camps and use patterns are known to overlap habitat. Currently, there is less risk of population loss compared to the past commercial livestock grazing era and the sensitive plant resources as a whole are expected to continue to improve with this alternative. The decreased numbers of animals and the small isolated areas where stock use occurs that overlaps with past commercial grazing impacts, would minimize or eliminate risk of population loss or loss of species viability. Implementation of mitigation measures in Chapter 2 would further ensure species viability is not compromised. Specifically, measures included in numbers 6, 8, 10, and 14, would mitigate potential effects to sensitive species and wetland habitat (the effects of these mitigations for alternatives is discussed in the Effects Common to all Alternatives section). They would be effective since they would be part of the operating plans for the outfitters, and compliance would be required through the special use permit.

Camps where outfitter stock overnight that may affect individuals or populations are: Bald Mountain: blackend sedge, different-nerve sedge, and glaucous gentian; Beaver Creek: different-nerve sedge and glaucous gentian; Sheep Mountain: different-nerve sedge; Horseshoe Basin: different-nerve sedge; and Horseshoe Creek: different-nerve sedge.

Where different-nerve sedge and glaucous gentian occur populations are widely dispersed but concentrated in a small geographical area. In these areas where camps overlap with occupied habitat, some species may be damaged or killed. This would not likely result in a total loss of population or species viability, due to the wide distribution of the species and the relatively small area of use by outfitters.

Of the 54 R6 Special Status and Survey and Manage found during surveys or that have potential habitat within the analysis area and their nearly 360 populations that occur within the analysis boundary, the risk to these species is very low under Alternative 4. Use associated with Alternative 4 proposes the greatest number of service days and the most allowable amount of barren core compared to Alternatives 2 and 3. Use associated with Alternative 4 may result in the loss of some individuals but would not result in loss of species or population viability since there are enough populations in the analysis area to ensure species viability. The number of outfitted stock and the small isolated areas where stock use occurs, relative to the size of the analysis area, would not contribute to the risk of population loss or loss of species viability. Plant community recovery following a season of use may be slightly slower than Alternative 2 and Alternative 3 but the use patterns are not expected to change the overall ecological condition or effects to any Sensitive plant populations or habitat within the analysis area.

Natural Plant Succession

Increasing the use days to 6,700 and permitting existing campsite barren core size would allow more barren core to be used in campsites compared to Alternative 2 and Alternative 3. The barren core would not expand out beyond what is already being used. The increased number of service days could reduce the potential annual recovery of associated graze areas. The overall ecological recovery of the plant resources within the analysis area is expected to improve with the implementation of any of the action alternatives. This is because past commercial livestock use has had a substantially greater effect on the existing plant community composition and recovery than the level of recreational and outfitter stock has or would have in the future. Alternatives 4 complies with Forest Plan standard and guideline 15B-22A which addresses modification of natural plant succession and recovery.

Hummocks

The large intact hummock community to the north of the Beaver Creek assigned site would remain in good ecological condition because when the stock are turned out to graze they are well dispersed and avoid this area.

Use of the Bald Mountain site would still result in some expected use of the hummocks and spring seep the stock travel through to reach their night graze. There would still be potential for trampling of the hummocks and glaucous gentian population in this travel route which may result in the loss of this population. However, enough populations of glaucous gentian remain to ensure species viability; use would not result in a loss of species viability, even though there is potential for a loss of individuals with continued use of the camp.

Since the majority of the hummock patterned ground is not within areas used by pack and saddle outfitter guide use, and would remain so in this alternative, the disturbance at the Bald Mountain camp would be insignificant relative to the area where it is found in the Pasayten Wilderness.

Cumulative Effects

The spatial boundary for this cumulative effects analysis is the analysis area. The temporal boundary is from the early 1900s through 2024, when the 10-year permits would expire and effects associated with the permits would cease. Past actions with continuing effects overlapping effects of the pack and saddle stock outfitter-guides are included in the Current Condition section.

Present and Reasonably Foreseeable Future Actions

Present Actions
Grazing is permitted in the lower elevation habitats in all but the wilderness sub-sections, upper reaches of the Methow drainage in the North Cascades subunit, and the Sawtooth Backcountry subunit. This use does not interface with outfitter activities and has no effect on any actions associated with is analysis. Outfitters and permitees don't use the same areas, so the disturbance doesn't occur in the same place and at the same time.

As discussed in the affected environment section where R6 Sensitive plant populations are associated with outfitter camp sites pack stock activities are part of the use. Occasionally, clients will ride their own stock in and will care for them while in the area and hire the outfitters to haul gear. Most of the camps are drop camps and typically not used overnight for pack and saddle stock. In these situations, grazing use is from private stock, not outfitter stock.

Reasonably Foreseeable Future Actions
Reasonably foreseeable future actions in the analysis area that may affect R6 Sensitive and Survey and Manage plant species, such as wetland and meadow habitats, are a continuation of the present actions. Use of the analysis area, especially the North Cascades Highway Corridor, by private recreationists is predicted to increase. Managing wildfire for resource benefits would continue to be an option in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas and may become an option in non-wilderness portions of the analysis area. Meadow enlargement, creation, or enhancement from wildfires is more likely to occur in the future than it was in the past.

The cumulative effects of any of the alternatives with the present and reasonably foreseeable future actions discussed at the beginning of Chapter 3 would have no impacts on R6 Sensitive and Survey and Mange plant species habitat or species viability. The cumulative effects would not contribute to a downward trend or further listing of R6 Sensitive and Survey and Mange plant species. The cumulative effects of any of the alternatives with the present and reasonably foreseeable future actions would not contribute to long-term modification of natural plant succession or recovery.

Alternatives 1, 2, 3, and 4

The large fires in the 2000s combined with the past high density of commercial livestock grazing in these areas modified the natural plant succession across much of the analysis area, especially in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas. Given the short growing seasons, post-grazing recovery to plant communities takes decades. As a result the majority of grazing effects seen across the analysis area are tied to past commercial livestock grazing practices and not the result of pack and saddle stock outfitter-guide or private party stock use. Recent past stock use by both pack and saddle outfitter-guides and private parties is slowing the recovery in small, localized areas by favoring less palatable species, or where wetlands are being trampled. Given the size of the analysis area, the effects of past grazing practices, and past fire history, the effects of pack and saddle outfitter-guide use across the landscape are inconsequential.

The general public would be not allowed to use assigned camps. In all other camps used by outfitter-guides, continued use by the general public would likely perpetuate the existing amount of barren core.

Campsites within 200 feet of wetlands in Alternatives 1 or 3 would not be permitted for use by pack and saddle outfitter-guides. However, the private stock parties would still be allowed to use these areas. Although impacts by outfitters to wetlands near these camps would cease, use by private stock parties would still be have an effect on wetlands near camps. Private stock would still trample wetland vegetation, selectively graze, and cause soil damage to the wetlands habitat in the analysis area.

As mentioned above in the direct/indirect effects of Alternative 3, there would be less overall grazing pressure on plant communities relative to existing conditions except around some popular private stock camps where confinement stock grazing is likely to occur. Existing campsites would continue to be used by private parties and would involve use of some wetland and wet meadow habitat and small isolated areas of trampling would continue unchanged.

Some of the alterations in plant communities are still evident on the landscape, particularly in the drier habitats where sheep regularly bedded and trailed. However, these areas are slowly showing signs of recovery since commercial livestock have been removed. Since the removal of cattle grazing, there has been a rapid and visible recovery of riparian and wetland habitats in the Spanish Camp area in the Pasayten Wilderness (Kovalchik 2002). The Chelan side of the Lake Chelan-Sawtooth Wilderness and Sawtooth Backcountry has the most campsites that will likely exhibit the longest recovery period from past commercial grazing due to drier conditions.

The cumulative effect of any of the alternatives and the other past, present, and reasonably foreseeable future actions would result in an upward trend in vegetation condition, a slow return to natural, unmodified plant communities and succession. Areas would continue to recover from past overgrazing and the effects of wildfires. Isolated spots across the analysis area would see be slower to recover as a result of permitting pack and saddle stock grazing, but this would be inconsequential.

CONSISTENCY FINDINGS

Based on the findings in this analysis, this project complies with the provisions outlined in the Forest Service direction which requires activities not result in loss of species viability across their range nor will it result in a species becoming Threatened, Endangered, or create trends toward Federal listing. All action alternatives would reduce the potential loss of individual plants and population viability except in a small isolated area at the Bald Mountain Camp. However, with the isolated disturbance at Bald Mountain compared to the large scale of the analysis area all action alternatives would not contribute to a downward trend of Federally Listed Threatened or Endangered, R6 Special Status or Survey and Manage species across the analysis area.

All alternatives would be consistent with the Forest Plan, as amended.

- There would be no long-term modification of natural plant succession (MA 15B-22A), Okanogan Forest Plan; Wilderness, 2. a. (1) (c) and Wilderness, 3. a. (1) (c), Wenatchee Forest Plan).
- Alternatives would be consistent with all Forest Plan standards and guidelines pertaining to soil conditions (see Soils Resources section). In all alternatives, non-outfitted pack and saddle stock users, in addition to all recreationists would continue to use camps with barren cores and number of trees with exposed roots that exceed standards and guidelines. Forest Plan amendments would restrict outfitters to 5,250 square feet of barren core in Alternative 2, in Alternative 3 to 2,800 square feet, and no more than the existing amount of barren core for Alternative 4 and would include a Camp Management Plan to track the barren core when it is larger than 5,250 square feet to ensure it is not increasing.
- Party size restrictions apply only to Alternative 3, where party size would be limited to 12 heartbeats. In Alternatives 2 and 4 the party size limit remains at 12 people and 18 head of stock. Outfitter-guides would continue to use existing campsites within 200' of lakes, streams, wetlands, and other unique habitats. In Alternative 3 pack and saddle outfitter-guides would be prohibited from using camps within 200 feet of wetlands.
- Mitigation measures apply to all three action alternatives and would prohibit outfitters from creating new travel routes (10.c), establishing new camps (1.g), and not exposing roots on trees at existing camps (1.f). These mitigation measures ensure that pack and saddle stock outfitter guide activities are consistent with Forest Plan.

3.8 TERRESTRIAL WILDLIFE

The section below is a summary of the Wildlife Report and Biological Assessment which are available in the record (Rohrer 2012). This section is organized to include the following: Management Indicator Species, Landbirds, Late-Successional Habitat, and Endangered, Threatened, and Sensitive Wildlife.

REGULATORY FRAMEWORK

Regulatory requirements vary for many of the species considered and are addressed in the report subsections that deal with individual wildlife groups and species that follow.

ANALYSIS METHOD FOR ALL SPECIES

Field surveys for this project include personal observations made on numerous trips to portions of the analysis area from 1991 through 2009. Most of these trips were associated with other projects. In late August 2000 this included participation in a review team that traveled to part of the Pasayten Wilderness specifically to observe and review effects of pack and saddle outfitter-guide use.

Literature was reviewed to determine what research had shown for effects of similar activities in similar habitats. Forest Service GIS layers were used to determine the acreage of high elevation meadows and wetlands in the study area.

Digitized maps of forest roads and trails were used to analyze effects on grizzly bear core areas, and security habitat for all wide-ranging carnivores. Bear management units (BMU) were the scale used for reporting grizzly bear core area percentages.

During this analysis process, the best available science was incorporated to describe the ecological conditions within the analysis area and the potential effects of the proposed activities on terrestrial wildlife species and habitat.

MANAGEMENT INDICATOR SPECIES

In 2011 a status review was completed for Management Indicator Species (MIS) for the Okanogan-Wenatchee National Forest (Status of Management Indicator Species on the Okanogan and Wenatchee National Forests, April 2011, Unpublished document, 78pp). These species and their habitats are listed in **Figure 3.8-1**. This analysis used viability outcomes to describe the probability of the planning unit (National Forest) to support a population of each MIS based on current habitat and risk factors. It also included an estimate of the amount of habitat available at the Forest scale. Figure 3.8-1 includes the viability outcome for each MIS and a description of those viability outcomes.

Figure 3.8-1. Summary of Management Indicator Species (MIS) for the Okanogan and Wenatchee National Forest Plans (USFS 1989:II-131 – 134, III-76 – 83; USFS 1990:III-48)

MIS		Habitat Description	Habitat Present in Project Area	Species Present in Project Area	Forest Level Viability Outcome[1]	Acres of Habitat on Okanogan-Wenatchee National Forest
Northern spotted owl		Mature and old-growth conifer	Yes	Documented	E	703,221
Barred owl (Oka NF only)		Mature and old-growth conifer	Yes	Documented	A	170,799
Pileated woodpecker		Mature and old-growth conifer	Yes	Documented	C	125,098
Three-toed woodpecker		Mature and old-growth conifer	Yes	Documented	B/C	1,756,49
American marten		Mature and old-growth conifer	Yes	Documented	B/C	196,572
Mountain Goat (Wen NF only)		Rockland, alpine, high elevation old-growth conifer	Yes	Documented	B	218,446
Mule deer		Winter range	Yes	Documented	A	321,775
Rocky Mountain elk (Wen NF only)		Winter range shrub, grass, and cover	Yes	Documented	A	152,581
Beaver (Wen NF only)		Riparian with deciduous	Yes	Documented	B/C	177,118
Ruffed grouse		Riparian and deciduous	Yes	Documented	A	193,891
Canada lynx (Oka NF only)		Lodgepole pine	Yes	Documented	B	63,847
Primary Cavity Excavators	Pileated woodpecker	Dead and defective trees	Yes	Documented	C	
	Three-toed woodpecker	Dead and defective trees	Yes	Documented	B/C	
	Black-backed woodpecker	Dead and defective trees	Yes	Documented	B/C	
	Downy woodpecker	Dead and defective trees	Yes	Documented	A	
	Hairy woodpecker	Dead and defective trees	Yes	Documented	A	
	Lewis' woodpecker	Dead and defective trees	Yes	Documented	C	
	White-headed woodpecker	Dead and defective trees	Yes	Documented	C	
	Williamson's sapsucker	Dead and defective trees	Yes	Documented	B/C	
	Red-naped sapsucker*	Dead and defective trees	Yes	Documented	B	
	Northern Flicker	Dead and defective trees	Yes	Documented	A	

*The yellow-bellied sapsucker listed in the Okanogan Forest Plan (USFS 1989:III-78), was taxonomically split into three species in 1983: red-naped, red-breasted, and yellow-bellied sapsuckers (AOU 1983, Walters et al. 2002); only the red-naped sapsucker occurs in Eastern Washington.

[1]**Outcome A** – Suitable environments are broadly distributed and of high abundance. The combination of distribution and abundance of environmental conditions provides opportunity for continuous or nearly continuous intra-specific interactions for the MIS species. MIS species with this outcome are likely well-distributed throughout the planning area.

Outcome B - Suitable environments are broadly distributed and of high abundance, but there are gaps where suitable environments are absent or only present in low abundance. However, the disjunct areas of suitable environments are typically large enough and close enough to permit dispersal among subpopulations and to allow the species to potentially interact as a metapopulation. Species with this outcome are likely well-distributed throughout most of the planning area.

Outcome C – Suitable environments are distributed frequently as patches and/or exist at low abundance. Gaps where suitable environments are either absent or present in low abundance are large enough such that some subpopulations are isolated, limiting opportunity for intra-specific interactions. There is opportunity for subpopulations in most of the planning area to interact, but some subpopulations are so disjunct or of such low density that they are essentially isolated from other populations. For species for which this is not the historical condition, reduction in the species' range in the planning area may have resulted. Species with this outcome are likely well-distributed in only a portion of the planning area.

Outcome D – Suitable environments are frequently isolated and/or exist at very low abundance. While some of the subpopulations associated with these environments may be self-sustaining, there is limited opportunity for population interactions among many of the suitable environmental patches. For species for which this is not the historical condition, reduction in species' range in the planning area may have resulted. These species are likely not well-distributed in the planning area.

Outcome E – Suitable environments are highly isolated and exist at very low abundance, with little or no possibility of population interactions among suitable environmental patches, resulting in strong potential for extirpations within many of the patches, and little likelihood of recolonization of such patches. There has likely been a reduction in the species' range from historical conditions, except for some rare, local endemics that may have persisted in this condition since the historical time period. Species with this outcome are not well-distributed throughout much of the planning area.

Primary Cavity Excavators

Regulatory Framework

Primary cavity excavators are forest dwelling birds specialized for nesting and foraging in dead and dying trees and downed logs. The Okanogan Forest Plan identifies the Lewis's, pileated, three-toed, black-backed, downy, hairy, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; and Northern flicker as management indicator species for dead and defective tree habitat. The Wenatchee Forest Plan identifies primary cavity excavators as management indicator species for dead and defective tree habitat. Details on habitat use, ecology, and viability on the Forest are in the Wildlife MIS Status Report (2011). Both of the Forest Plans have standards and guidelines for maintaining minimal levels of dead and defective trees and downed logs, although these were amended by the Northwest Forest Plan and PACFISH.

Affected Environment

Dead and defective tree habitat is abundant in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas, the North Cascades, Sawtooth Backcountry, and most of the Middle Methow portions of the analysis area. Due to the relative lack of past management activities the majority of these areas have dead and defective tree habitat occurring at natural levels. Much of these areas are high elevation forest of subalpine fir, Engelmann spruce, lodgepole pine, and Douglas-fir, though there are a few areas with ponderosa pine. Recent forest insect and disease activity has resulted in an abundance of dead and defective tree habitat in some areas. Pine beetle activity has killed large numbers of mature lodgepole pine trees and root-rots have killed many pockets of Douglas-fir. Recent large wildfires in the analysis area have consumed some dead and defective tree habitat, but have also created many new snags.

Snags and downed logs have been used for camp firewood by overnight users of the analysis area, including outfitter-guides and clients, though most collected wood is small in diameter. Firewood collection predominantly occurs in and adjacent to camp sites. Wood is cut with an axe or saw and carried or dragged to the camp. At most camps firewood is collected from within a 200-300 foot radius of camp (3-6 acres). At a few of the more regularly used camps, such as those in the Spanish Camp area of the Pasayten wilderness, wood had been collected from further distances and the evidence of years of firewood collection is apparent from the number of sawed stumps and branches. However recent forest insect and disease activity has resulted in an abundance of new snags near these and other camps in the analysis area.

There are 148 campsites that have been used in the recent past by outfitter-guides. If, on average at each camp, most snags have been removed from an area within a 300 foot radius of the camp (6 acres), then 1,116 acres of the analysis area have been impacted by past use. **Figure 3.8-2** shows number of outfitter camps and estimated percent of area impacted by firewood collection by administrative area:

Figure 3.8-2. Percent of Area Impacted by Outfitter-Guide Camps.

Sub-Area	Sub-Area Acres	Outfitter Camps	Acres Impacted	Area Impacted
Pasayten Wilderness	531,541	75	444	0.08%
Lake Chelan-Sawtooth Wilderness	153,129	78	468	0.3%
North Cascades	270,435	16	96	0.03%
Sawtooth Backcountry	35,149	17	102	0.3%
Middle Methow	50,550	0	0	0
Bear/Ramsey/Volstead	58,114	1	6	0.01%
Alta Lake	3958	0	0	0
Total	**1,102,876**	**149**	**1,116**	**0.1%**

Dead and defective tree habitat is not as abundant in the Bear/Ramsey/Volstead area as other portions of the analysis area. Recent timber harvest in portions of this area has resulted in lower numbers of snags. Snags are scarce in areas immediately adjacent to open roads due to firewood cutting. Much of the area is a mid-elevation forest of Douglas-fir and ponderosa pine, though there are a few areas with lodgepole pine, subalpine fir, and Engelmann spruce. The

Tripod fire burned through much of this area creating pockets of dead and defective tree habitat.

The Alta Lake area is largely unforested but there are scattered ponderosa pine and small isolated stands of ponderosa pine and Douglas-fir. These stands have dead and defective tree habitat occurring at natural levels. In addition, outfitter-guides do not gather wood for campfires in the Alta Lake area. They only use that area for day rides.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

Outfitter-guide permits would not be issued, so outfitter-guides would not use existing camp sites. However, most, if not all, of the camps would continue to be used by the public. Snags and downed logs would continue to be used for camp firewood, but by fewer users than in the past. There would be 24,420 pack and saddle stock visitor days in the analysis area (all non-outfitted), which would be 15% less than the existing number. Less than one tenth of 1% of the analysis area has been affected by past snag-felling for firewood. New snags would continue to be created by insects, disease, wildfire, and drought. These snags would eventually fall over, creating a supply of downed wood. There would be some additional loss of habitat around recreation camps, but abundant habitat exists away from these isolated spots, so primary cavity excavator populations as a whole would be largely unaffected. Alternative 1 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for primary cavity excavator populations.

Alternative 2

In addition to the public, outfitter-guides and clients would use camps and collect firewood from surrounding areas. There would be 29,040 pack and saddle stock visitor days in the analysis area (4,620 outfitted), which would be 0.6% more than the existing number. Less than one tenth of 1% of the analysis area has been affected by past snag-felling or downed wood gathering for firewood. New snags would continue to be created by insects, disease, wildfire, and drought. These snags would eventually fall over, creating a supply of downed wood.

This alternative includes mitigation measures that would prohibit outfitter-guides from establishing new camps (1.g) and not allow cutting snags for firewood (3.c). These would be effective in mitigating potential effects since they would be part of the operating plans, and compliance would be required by the special use permits. Non-compliance may result in permit action. There would be some loss of habitat around camps used by outfitters, since downed wood could be used for firewood, but abundant habitat exists away from these isolated spots, so primary cavity excavator populations as a whole would be largely unaffected. Alternative 2 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for primary cavity excavator populations.

Alternative 3

In addition to the public, outfitter-guides and clients would use camps and collect firewood from surrounding areas. There would be 27,080 pack and saddle stock visitor days in the analysis area (2,660 outfitted), which would be 6% less than the existing number. Less than 0.1% of the analysis area has been affected by past snag-felling or downed wood gathering for firewood. New snags would continue to be created by insects, disease, wildfire, and drought. These snags would eventually fall over, creating a supply of downed wood.

This alternative includes mitigation measures that would prohibit outfitter-guides from establishing new camps (1.g) and not allow cutting snags for firewood (3.c). These would be effective in mitigating potential effects since they would be part of the operating plans, and compliance would be required by the special use permits. Non-compliance may result in permit action. There would be some loss of habitat around camps used by outfitters, since downed wood could be used for firewood, but abundant habitat exists away from these isolated spots, so primary cavity excavator populations as a whole would be largely unaffected. Alternative 3 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for primary cavity excavator populations.

Alternative 4

In addition to the public, outfitter-guides and clients would use camps and collect firewood from surrounding areas. There would be 31,136 pack and saddle stock visitor days in the analysis area (6,700 outfitted), which would be 8% more than the existing number. Less than one tenth of 1% of the analysis area has been affected by past snag-felling or downed wood gathering for firewood. New snags would continue to be created by insects, disease, wildfire, and drought. These snags would eventually fall over, creating a supply of downed wood.

In spite of the potential for more user days, the effect to snag habitat should not increase because this proposal includes mitigation measures that would prohibit outfitter-guides from establishing new camps (1.g) and not allow cutting snags for firewood (3.c). These would be effective in mitigating potential effects since they would be part of the operating plans, and compliance would be required by the special use permits. Non-compliance may result in permit action. There would be some loss of habitat around camps used by outfitters, since downed wood could be used for firewood, but abundant habitat exists away from these isolated spots, so primary cavity excavator populations as a whole would be largely unaffected. Alternative 4 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for primary cavity excavator populations.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire.

Past Actions

Past activities in the analysis area that affected primary cavity excavators include snag-felling for camp firewood by outfitter-guides, by non-outfitted users, and by sheepherders. In addition, wildfires, wildfire suppression, and timber management have affected primary cavity excavator habitat. Wildfires have consumed some dead and defective tree habitat in the analysis area but also created many new snags and habitat for primary cavity excavators. Nearly 20% of the analysis area has been affected by wildfires in the last 5 years. Wildfire suppression has also affected snag habitat. Wildfire suppression began in the 1920s and slowly changed forest structure, especially in lower elevations of the analysis area. Snags on ridge-tops were often felled in the name of fire prevention. The reduction in wildfires, due to suppression, created dense stands of small diameter trees. These denser stands were more susceptible to insects and diseases which resulted in an increase in snag habitat. In the Bear/Ramsey/Volstead area, dead and defective tree habitat has also been impacted by snag-felling near roads for firewood, timber management projects, and prescribed fires. Timber management projects have generally reduced the amount of snag habitat, though maintaining minimum levels prescribed in the forest plans in 1989 and 1990. Prescribed fires have both removed some existing snags and created new ones.

Present Actions

Present activities in the analysis area that may affect primary cavity excavators include snag-felling for camp firewood by other non-pack and saddle outfitter-guides, and by private, non-outfitted users. In the Bear/Ramsey/Volstead area, snag-felling for firewood by the general public occurs near open roads.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future activities in the analysis area that may affect primary cavity excavators are a continuation of the present actions. Use of the analysis area, especially the North Cascades Highway Corridor, by private recreationists is predicted to increase in the future.

Alternatives 1, 2, 3, and 4

When considered in conjunction with other activities affecting dead and defective tree habitat, each of the four alternatives would have little cumulative effect on primary cavity excavators. Snags may continue to diminish around camps due to private party use and other permitted activities, but not as a result of pack and saddle outfitter-guides because this proposal prohibits snag felling by these outfitter-guides (mitigation measure 3.c). Abundant habitat would exist away from these sites, so primary cavity excavator populations as a whole would be largely unaffected.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plan standards and guidelines for primary cavity excavators. Based on the analysis above this project would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for the pileated, three-toed, black-backed, downy, hairy, Lewis' and white-headed woodpeckers; red-naped and Williamson's sapsuckers; and Northern flicker.

Marten, Pileated Woodpecker, Three-toed Woodpecker, Northern Spotted Owl and Barred Owl

Regulatory Framework

The Okanogan Forest Plan identifies the American marten (mis-identified in the Forest Plans as "pine" marten), pileated woodpecker, three-toed woodpecker, northern spotted owl and the barred owl as management indicator species for mature or old growth habitats in mixed conifer, lodgepole pine, and/or subalpine fir forest types. The Wenatchee Forest Plan identifies the American marten, pileated woodpecker and three-toed woodpecker and northern spotted owl as management indicator species for mature and old growth habitats. The Okanogan Forest Plan has standards and guidelines for maintaining old growth habitat; specifically that no old growth that meets the definition in the Forest Plan be removed. Both the Okanogan and Wenatchee Forest Plans also have management requirement (MR) standards for marten, pileated woodpecker, three-toed woodpecker and the northern spotted owl. These MRs were replaced by the Northwest Forest Plan in 1994 within the range of the northern spotted owl. The analysis area for this project extends east of the range of the northern spotted owl and these MRs apply in the eastern most part of the analysis area. The Wenatchee Forest Plan has forest management objectives for old growth habitat. In addition, for the portions of the analysis area within Late-Successional Reserves (LSR) of the Northwest Forest Plan there are standards and guidelines to ensure all projects have a neutral or beneficial effect on late-successional habitats in late successional reserves. Although only applicable to timber sales, Regional Forester Amendment #2 also ensures the maintenance of adequate late-successional habitat.

Affected Environment

The American marten is a small forest carnivore that inhabits mature/old growth habitats, especially those with an abundance of downed woody debris. The pileated woodpecker inhabits mixed conifer stands and the three-toed woodpecker inhabits lodgepole pine and subalpine fir forest types. Northern spotted and barred owls are management indicator species for mixed conifer old growth and mature habitats. The northern spotted owl is discussed in the biological assessment below. Details on habitat use, ecology, and amount of habitat on the forest for each of these species are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest for each of these species is also listed in Figure 3.8-1, as is the viability outcome from the 2010 Status Report.

Mature and old growth habitat in mixed conifer, lodgepole pine, and subalpine fir forest types is abundant in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas, the North Cascades, Sawtooth Backcountry, and most of the Middle Methow portions of the analysis area. Due to the relative lack of management activities the majority of these areas have mature and old growth habitat occurring at natural levels. However, these habitats in the portion of the analysis area on the Chelan Ranger District were reduced by the Rex Creek Fire of 2001 and the Safety Harbor Fire of 1968. Additionally, mature and old growth habitat is not as abundant in the Bear/Ramsey/Volstead area as in the others. Much of the area is mid-elevation forest of Douglas-fir and ponderosa pine, though there are a few areas with lodgepole pine, subalpine fir, and Engelmann spruce. Past timber management activities have resulted in lower amounts of

mature and old growth habitat than would naturally occur. The Alta Lake area does not contain any mature/old growth habitat in mixed conifer, lodgepole pine, and subalpine fir forest types.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Outfitter-guide activities do not alter forest stands except for the removal of snags and downed logs which are used for camp firewood when on overnight trips. Firewood collection predominantly occurs in and adjacent to camp sites. See the section above on primary cavity excavators for the discussion on effects to snags and downed logs.

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the effects to late successional habitat would cease.

Alternatives 1, 2, 3, and 4

None of these alternatives would alter forest stands with the exception of firewood use in and around campsites. Abundant habitat exists away from the campsites, so American marten, pileated woodpecker, three-toed woodpecker, and barred owl populations as a whole would be largely unaffected. They would not change the viability outcomes listed in Figure 3.8-1. This minor effect to old-growth or mature stands would not have any effect on the character of any management requirement areas for the pileated woodpecker, marten, three toed woodpecker, or northern spotted owl.

None of the alternatives in this project would contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for marten, pileated woodpecker, three-toed woodpecker, northern spotted owl, or barred owl.

Consistency Findings

The above analysis shows that each of the four alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plans (as amended by the Northwest Forest Plan and PACFISH) for mature, late-successional and old growth habitats.

Ruffed Grouse and Beaver

Regulatory Framework

The Okanogan Forest Plan identifies the ruffed grouse as the management indicator species of deciduous and riparian habitats. The Wenatchee Forest Plan identifies the beaver and the ruffed grouse as management indicator species for riparian habitats. In the Okanogan Forest Plan standard and guideline 6-13 addresses perpetuating hardwood stands (deciduous trees). Both Forest Plans have several standards and guidelines regarding riparian habitat management. In addition, each Forest Plan has been amended by the Northwest Forest Plan which includes the aquatic conservation strategy, and the Okanogan Plan was amended by PACFISH outside the

range of the northern spotted owl; PACFISH includes riparian management objectives and standards and guidelines require that special use permits avoid adverse effects to listed fish.

Ruffed grouse are primarily associated with habitats that contain dense stands of aspen trees or other deciduous trees and shrubs along streams. The beaver is a semi-aquatic mammal that lives in streams and ponds and requires deciduous trees and shrubs for food and for lodge and dam building materials. Details on habitat use, ecology, and amount of habitat on the Forest for ruffed grouse and beaver are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest for each of these species is also listed in Figure 3.8-1, as is the viability determination.

More impacts to riparian habitat and standards and guidelines can be found in the Aquatics section of this Chapter.

Affected Environment

Deciduous and riparian habitats occur throughout the analysis area. Due to the relative lack of management activities in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas, the North Cascades, Sawtooth Backcountry, and most of the Middle Methow portion of the analysis area, these areas have essentially the same deciduous and riparian habitat that occurs under natural conditions. Some of the deciduous and riparian habitat in the Bear/Ramsey/Volstead area has been cut and removed by timber management activities and road construction, although the Forest now plans timber sales to perpetuate aspen and protect or enhance riparian habitat under current management direction. The Alta Lake area has a limited amount of deciduous and riparian habitats. They have been impacted in the recent past by cattle grazing and drought.

Forested riparian habitats in the analysis area generally receive little, if any, impact from humans or livestock and are functioning properly (Recreation Activity Review, **Appendix C**). Streams that flow through high elevation meadows are more easily accessed by humans and their grazing livestock and are very susceptible to impacts from heavy grazing and trampling. Pack and saddle stock grazing associated with outfitter-guide activities has impacted isolated spots of the grass/forb components of non-forested riparian habitats (see also Botany section of this chapter).

High elevation wetlands are similar to other riparian habitats; the importance to wildlife is disproportionately greater than availability on the landscape (Kauffman et al. 2001). These areas provide a predictable water source, favorable microclimate, a high diversity of plants that offer various structures for nesting and security, and a diverse forage supply. Long-toed salamanders and spotted frogs reproduce, deposit eggs, and spend the larval stage and most of the adult stage of life in wetlands. Lincoln's sparrows forage in shrubs and nest on the ground around high elevation wetlands (Degraaf et al. 1991). Water voles and northern bog lemmings utilize the grass/forb layer for food and cover (O'Neil et al. 2001). High elevation wetlands are distributed throughout the analysis area. There are about 8,200 acres of high elevation wetlands in the analysis area. A notable concentration occurs in the Ashnola River watershed of the Pasayten Wilderness. The wetlands of Sheep Mountain, Bald Mountain, Beaver Creek, Bob Creek, and the Spanish Camp area are included in this concentration.

Most of the high elevation meadows and wetlands in the analysis area were heavily grazed by domestic sheep in the early 1900s (for details see Range section of this chapter) which affected riparian habitat by removal of vegetation and trampling of banks. From 1995 to present, domestic livestock grazing in this area has been limited to that of recreational users including outfitter-guide activities.

In August 2000, a Forest Service administrative review team found that riparian areas in the Spanish Camp area were well-vegetated and stable with a few localized exceptions associated with trail crossings and stock watering sites (Recreation Activity Review, Spanish Camp and Remmel Lake Area, Pasayten Wilderness, USDA Forest Service 2000c). Some sites appeared to still be recovering from heavy impacts of historical grazing by sheep and cattle. The findings of this report are summarized in **Appendix F**. A field trip to the same areas in August 2011 resulted in similar findings (J. Rohrer, field notes, August 2011, analysis file).

Many outfitter-guide camps are located near high elevation meadows and wetlands. The abundant grasses and forbs in meadows provide forage for outfitter horses, mules, burros, or llamas. During wildlife habitat reviews in the Spanish Camp area of the Pasayten Wilderness in August 2000 and August 2011, it was found that the existing amount of recreational grazing use was, with a few notable exceptions, not substantially altering the structure or function of the high elevation meadows and wetlands as food and cover for wildlife (J.Rohrer, field notes, analysis file). Popular camp areas, such as the immediate areas around Spanish Camp cabin and Remmel Lake, had been grazed enough to reduce the cover value for ground nesting birds and small mammals. There are riparian and wetland areas where stock regularly travel across or come to water. These sites are trampled and unvegetated and offer little as wildlife habitat. However, outside of these impacted sites and away from trails, wetlands were in good to excellent shape and showed little, if any, evidence of livestock grazing. Grasses and forbs provide both food and cover. Amphibian larvae are common in small wetland ponds on Bald Mountain and along Bob and Beaver Creeks. In addition, there are numerous wetlands in the analysis area that are not accessible to livestock. Most areas on the Chelan portion of the analysis area show minimal evidence of long-term stock use, with some exceptions of limited areas at frequently used sites.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

Outfitter-guides would not use the trails and camps, though use would continue by the public. The existing trail crossings of streams and stock watering sites would likely continue to be used, but by fewer stock than in the past. This alternative includes 24,420 pack and saddle stock visitor days, which would be 15% lower than the current level. Some sites might partially revegetate with the lower amount of use. This alternative would result in a slight decrease in the amount of riparian habitat trampled by livestock compared to the existing condition. Abundant ruffed grouse and beaver habitat exists away from these trail crossings and stock watering sites, so populations as a whole would be largely unaffected. Alternative 1 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for ruffed grouse or beaver.

Alternative 2

Outfitter-guides and livestock would continue to use trails and camps and impact nearby riparian areas. There would be a total of 29,040 pack and saddle stock visitor days in the analysis area, and 4,620, or 16% would be associated with outfitter-guides. This would be a 4% increase from the current permitted pack and saddle outfitter-guide use and a 0.6% increase from the current total pack and saddle stock use. Existing trail crossings and watering sites would continue to be trampled and unvegetated. As stated above these impacts are limited to a few heavily used sites and are only occurring on a small portion of the landscape.

This alternative includes an amendment that would allow the use of established campsites that are within 200 feet of meadows, lakes, and streams in the Pasayten and Lake Chelan-Sawtooth wilderness areas.

This alternative includes mitigation to limit use in wilderness to existing trails (6.a), minimize use of wet soil and meadow areas (10.c), and ensure that riparian protection occurs (12 a-g). These mitigation items should result in improved riparian habitat conditions. Abundant ruffed grouse and beaver habitat exists away from these trail crossings and stock watering sites, so ruffed grouse and beaver populations as a whole would be largely unaffected. Alternative 2 would not change the viability outcomes listed in Table 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for ruffed grouse or beaver.

Alternative 3

Outfitter-guides and livestock would use trails and camps and impact nearby riparian areas. The number of permitted pack and saddle stock visitor days would be reduced by 40% from current levels and the total number of pack and saddle stock visitor days would be reduced by 6% from its current level. Existing trail crossings and watering sites would likely continue to be trampled and unvegetated. Alternative 3 includes a Forest Plan amendment that would limit existing barren core areas to 2,800 square feet. It includes a Forest Plan amendment that would reduce the wilderness party size to 12 people and stock combined. It includes a Forest Plan amendment that would allow outfitter-guides to use existing campsites within 200 feet of dry wetlands, but prohibit camping within 200 feet of wetlands, lakes streams and key interest areas in the Pasayten and Lake Chelan-Sawtooth wilderness areas. These amendments in conjunction with a slightly lower amount of use than proposed in Alternative 2 and less use than in the recent past, would create improvements at some of existing stream/trail crossings and watering sites.

As stated above these impacts are limited to a few heavily used sites and are only occurring on a small portion of the landscape.

This alternative also includes mitigation to limit use in wilderness to existing trails (6.a), minimize use wet soil and meadow areas (10.c), and ensure that riparian protection occurs (12 a-g). Abundant ruffed grouse and beaver habitat exists away from these trail crossings and stock watering sites, so populations as a whole would be largely unaffected. Alternative 3 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for ruffed grouse or beaver.

Alternative 4

Outfitter-guides and livestock would continue to use trails and camps and impact nearby riparian areas. There could be a total of 31,136 pack and saddle stock visitor days in the analysis area, and 6700 or 14% would be associated with outfitter-guides. This would be an 8% increase in total pack and saddle stock days over the current and a 50% increase in the permitted pack and saddle stock days. Existing trail crossings and watering sites would continue to be trampled and unvegetated. As stated above these impacts are limited to a few heavily used sites and are only occurring on a small portion of the landscape.

This alternative includes an amendment that would allow the use of established campsites that are within 200 feet of meadows, lakes, and streams in the Pasayten and Lake Chelan-Sawtooth wilderness areas.

This alternative also includes mitigation to limit use in wilderness to existing trails (6.a), minimize use wet soil and meadow areas (10.c), and ensure that riparian protection occurs (12.a-g). Abundant ruffed grouse and beaver habitat exists away from these trail crossings and stock watering sites, so ruffed grouse and beaver populations as a whole would be largely unaffected. Alternative 4 would not change the viability outcomes listed in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for ruffed grouse or beaver.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the effects to beaver and ruffed grouse would cease.

Past, Present, Reasonably Foreseeable Future Actions

Other activities in the analysis area that would affect deciduous and riparian habitat include timber sales, road construction and maintenance, wild fires, prescribed fires, grazing by livestock from non-outfitted users, and commercial livestock grazing. Most recreational livestock use occurs in the same areas used by outfitter-guides, i.e., those accessed by trails. There are several active livestock allotments in the analysis area. The Ramsey C & H (cattle and horse) allotment is in the Bear/Ramsey/Volstead portion of the analysis area. The Alta Coulee C & H allotment is in the Alta Lake portion of the analysis area. Parts of the Goat C & H allotment, parts of the Wolf C & H allotment, and Boulder C & H allotment are in the Upper Methow portion of the analysis area. A portion of the Buttermilk sheep and goat allotment is in the Lake Chelan-Sawtooth Wilderness and Middle Methow portion of the analysis area. Forage utilization by the cattle and sheep on these allotments is closely monitored to not remove more than 45% of current annual growth of grasses/forbs.

Alternatives 1, 2, 3, and 4

The cumulative effect of any of the alternatives and the other past, present, and reasonably foreseeable future actions would be the loss of some riparian habitat due to pack and saddle stock trampling in and around campsites. Although Alternatives 1 and 3 would allow for some recovery of camps within 200 feet of wetlands, streams and lakes, any recovery would likely be offset by non-outfitted use of those campsites. Abundant ruffed grouse and beaver habitat

exists away from these trail crossings and stock watering sites, so ruffed grouse and beaver populations as a whole would be largely unaffected.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plans for managing riparian habitats. The impacts are limited to a few heavily used sites and are only occurring on a small portion of the landscape. This proposal includes mitigation to limit use in wilderness to existing trails (6.a), minimize use of wet soil and meadow areas (10.c), and ensure that riparian protection occurs (12.a and 12.b). These mitigation items should result in improved riparian habitat conditions. Abundant ruffed grouse and beaver habitat exists away from these trail crossings and stock watering sites, so ruffed grouse and beaver populations as a whole would be largely unaffected. They would not change the viability outcomes listed in Figure 3.8-1. They would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for ruffed grouse or beaver.

Mule Deer

Regulatory Framework

The Okanogan identifies mule deer as the management indicator species for winter range (USDA, 1989, page III-77). The Wenatchee Forest Plan identifies mule deer as the management indicators species for shrubs, grass, meadows, thermal and hiding cover (USDA, 1990, page III-48). Both plans have standards and guidelines for managing cover levels on summer and winter ranges. Details on habitat use, ecology, and amount of winter range habitat on the Forest for mule deer are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest is also listed in Figure 3.8-1, as is the Forestwide viability determination.

Affected Environment

Mule deer winter ranges are primarily lower elevation areas where bitterbrush and other shrubs exist along with forest habitat to provide both forage and cover. The Bear/Ramsey/Volstead and Alta Lake portions of the analysis area contain winter range. Mule deer summer ranges are primarily higher elevation areas of forested and alpine habitats. The Pasayten wilderness, Lake Chelan-Sawtooth wilderness, North Cascades, Sawtooth Backcountry, and Middle Methow areas of the analysis area contain summer range.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The proposed outfitter-guide activities would have no effect on thermal or hiding cover levels for deer. Those activities that would occur on winter range in Bear/Ramsey/Volstead or Alta Lake would occur during summer and fall.

During the fall hunting season outfitter-guides take hunters into the analysis area. Deer hunting is regulated by the Washington Department of Fish and Wildlife. Hunting has not been

identified as a limiting factor for deer herds in the analysis area. The proportion of deer hunters in the area that use an outfitter-guide is small.

Some outfitter-guides have placed salt blocks at camps for livestock and also for mule deer. Having salt available keeps deer from chewing on saddles, reins, and other leather items which are salty from sweat. This has resulted in some deer habituating to camps and losing caution around people. Placing salt for deer can change habitat use patterns and can result in deer habituating to people (O'Neil et al. 2001). This is affecting a small number of deer in a limited area.

The alternatives include mitigation to limit establishing new camps (1.g), prohibit feeding wildlife (11.a), require storage of food in a manner that makes it unavailable to wildlife (11.c), and require salt to be applied in such a manner to minimize wildlife attraction (11.f). These measures would greatly reduce the potential for deer to habituate to outfitter camps, though private parties may still continue the practice.

The spatial boundary for the cumulative effects analysis is the Methow River watershed, the portions of the Ashnola, Pasayten and Skagit River watersheds on the Methow Valley Ranger District, and the portion of the Chelan District north of Lake Chelan. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the effects to deer from outfitter-guide use would cease.

Alternatives 1, 2, 3, and 4

The outfitter-guide activities proposed in each of the alternatives would have no effect on mule deer winter range or summer range cover levels. Few of the trails and camps used by outfitter-guides are in mule and white-tailed deer winter range. Those in winter range are not used by the outfitter-guides when deer are there during winter. The project would not affect the health of mule and white-tailed deer populations.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plans for managing mule and white-tailed deer winter range habitats because no habitat would be changed. They would not change the viability outcomes listed in Figure 3.8-1. They would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mule deer or white-tailed deer.

Mountain Goats and High Elevation Meadows

Regulatory Framework

The Wenatchee Forest Plan identifies mountain goats as a management indicator species with standards and guidelines for managing cover levels, roads, and human activities in mountain goat ranges. Details on habitat use, ecology, and amount of habitat on the Forest for mountain goat are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest for this species is also listed in Figure 3.8-1.

Although mountain goats are not an MIS on the Okanogan National Forest, a specific management area prescription from the Forest Plan applies to these animals. All of the mountain goat habitat allocated to this management prescriptions falls within the permit areas for pack and saddle outfitter guides. The only standard and guidelines pertaining to pack and saddle stock use prohibits new trail access that encourages use during the kidding and wintering season.

Affected Environment

Mountain goats use cliff habitats at lower elevations during the winter, and in summer and fall utilize high elevation meadows and peaks. Mountain goats inhabit all portions of the analysis area except the Bear/Ramsey/Volstead and Alta Lake areas. In addition to mountain goats, there are a number of bird and mammal species that rely on high elevation meadows for food and/or cover (O'Neil et al. 2001). The white-tailed ptarmigan, American pipit, and horned lark are examples of birds that feed and nest on the ground in high elevation meadows (Martin 2001). Hoary marmots and pikas are other examples of mammals that forage on the grasses and forbs in high elevation meadows, and, like mountain goats, take refuge on adjacent rock features such as talus and cliffs (Martin 2001). High elevation meadows are distributed throughout the analysis area. The south and east facing slopes of most major ridges have this habitat type. There are 196,444 acres of alpine/subalpine meadows in the analysis area.

Most of the high elevation meadows in the analysis area were grazed by domestic sheep in the early 1900s. Some areas were so heavily grazed that the effects are still evident (Range section of Chapter 3). From 1995 to present, domestic livestock grazing in this area has been limited to recreational users and outfitter-guide activities.

In August 2000 a Forest Service administrative review team found that some meadows in the Spanish Camp area of the Pasayten Wilderness were still recovering from past over-grazing by domestic herds of sheep and cattle (USDA Forest Service 2000c). Evidence of trailing, bedding, and over-grazing was still apparent in some areas. Refer to **Appendix C** for a summary of the review team's findings.

Grazing by domestic livestock shortens the height of the grass/forb layer which decreases vegetative structure. Heavy grazing reduces security and nesting cover and can increase the susceptibility of small mammals and birds to predation. It also reduces the amount of forage, and, if excessive, can result in the establishment of invasive plant species. On the other hand, grazing can stimulate growth of shrubs and small trees and rejuvenate perennial bunchgrasses. The altered grass/forb layer can affect different wildlife species in different ways. A literature review on the effects of livestock grazing on songbirds showed that some bird species respond positively to grazing, some negatively, and for others results were mixed or uncertain (Bock et al. 1993). Ivey (1996) reviewed literature and found the same for the effects of grazing on small mammals. Generally, species considered to be habitat generalists are not negatively impacted by grazing while species that are habitat specialist are more sensitive to impacts. In terms of species that utilize high elevation meadows, the horned lark has shown a positive response to grazing while the Lincoln's sparrow has shown a negative response (Bock et al. 1993). Deer mice respond positively to grazing, while voles and lemmings are dependent on good ground cover and can be negatively affected (Johnson 1981, Kauffman et al. 1981, Oldemeyer and Allen-Johnson 1988).

Most outfitter-guide camps are located near meadows. The abundant grasses and forbs provide forage for the outfitter horses, mules, burros, or llamas. Small meadows surrounded by dense forest are susceptible to overgrazing. This has occurred in the past when stock were kept in these small meadows too long. Loose grazing of pack and saddle recreational stock in recent years has allowed stock to disperse and lessen the impacts.

Some wildlife species would likely not find suitable forage or cover at overused sites or near camps when they are occupied by humans. However, outside of localized sites the majority of these habitats receive little, if any, domestic grazing pressure and retain the structure and ground cover necessary to provide wildlife habitat. During the habitat review in the Spanish Camp area in August 2000 and during a field trip in August 2011 (J. Rohrer, 2011 field notes, analysis file), it was found that the existing amount of recreational grazing use (including outfitter-guide use) was, with a few notable exceptions, not substantially altering the structure or function of the high elevation meadows as food and cover for wildlife. Popular camp areas, such as the immediate areas around Spanish Camp cabin and Remmel Lake, had been grazed enough to reduce the cover value for ground nesting birds and small mammals. However, outside of these small impacted sites and away from trails, meadows were in good to excellent shape and showed little, if any, evidence of livestock grazing. Grasses and forbs provided both food and cover. Currently, the portions of the analysis area that receive the most pack and saddle use are the Spanish Camp/Remmel Lake area and Sheep Mountain area. Grass was measured in August 2010 near an outfitter camp in the Remmel Lake area and it was estimated that utilization was 17.5%. Forest Plan standards and guides for grazing utilization allow 45-55% utilization depending on the meadow type (Chapter 3 Range).

Environmental Consequences

Direct and Indirect Effects

Alternative 1

Outfitter-guide stock would not graze in the analysis area. Use by public stock would continue. The meadows around existing camp sites would likely continue to be used, but by fewer stock than in the past. There would be 24,420 pack and saddle stock visitor days in the analysis, which would be 15% lower than the current level. This alternative would result in a decrease in the amount of meadow habitat being grazed by livestock. Sites still showing evidence of past over-grazing would recover slightly quicker under this alternative. The overall amount of meadow habitat in the analysis area negatively impacted by livestock use would be small, and none of it would be from pack and saddle outfitter guides. Abundant habitat for mountain goats and other meadow-dependent wildlife exists away from these recreation sites, so populations as a whole would be largely unaffected. Alternative 1 would not change the viability outcome listed for mountain goat in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mountain goat.

Alternative 2

Outfitter-guide livestock would continue to graze meadows near camp sites in the analysis area. There would be a total of 29,040 pack and saddle stock visitor days in the analysis area, and 4,620 would be associated with the outfitter-guides, representing a 4% increase in outfitter-guide use and a 0.6% increase in total pack and saddle stock use. Meadows adjacent to existing camps would continue to be grazed at approximately the same intensity as in the recent past. Impacts to meadow habitat would be limited to a few heavily used sites and occurring on a small portion of the landscape. This alternative includes an amendment that would allow the use of established campsites that are within 200 feet of meadows, lakes, and streams in the Pasayten and Lake Chelan-Sawtooth wilderness areas.

Mitigation measures would limit use to existing trails in the wilderness (6.a), and prevent picketing of stock overnight in alpine meadows (8.d), which would be highly effective in limiting impacts in meadows. The amount of outfitter-guide use proposed in Alternative 2 would not substantially impact meadow habitat in the analysis area. A slow recovery of past heavy use by sheep and cattle should continue.

Abundant habitat for mountain goats and other meadow-dependent wildlife is present away from heavily used recreation sites, so populations as a whole would be largely unaffected. Under this alternative, outfitter-guides are restricted to existing trails so no new trail access would be created that encourages use during the winter or kidding season. Alternative 2 would not change the viability outcome listed for mountain goat in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mountain goat or other species dependent on high elevation meadows.

Alternative 3

Outfitter-guide stock would continue to graze meadows near camp sites in the analysis area. There would be a total of 27,080 pack and saddle stock visitor days in the analysis area, and 2,660 would be associated with the outfitter-guides, representing a 40% decrease in outfitter-guide use and a 6% decrease in total pack and saddle stock use.

This alternative includes a Forest Plan amendment that would reduce the wilderness party size to 12 people and stock combined. It includes a Forest Plan amendment that would allow outfitter-guides to use existing campsites within 200 feet of dry wetlands, but prohibit camping within 200 feet of wetlands, lakes streams and key interest areas in the Pasayten and Lake Chelan-Sawtooth wilderness areas. The reduced use and reduction of party size to 12 heartbeats would reduce impacts to a slightly greater degree compared to Alternative 2 and to existing conditions. Meadows adjacent to existing camps would continue to be grazed but at decreased intensity from the recent past. Impacts to meadow habitat would be limited to a few heavily used sites and occurring on a small portion of the landscape.

Mitigation measures would limit use to existing trails in the wilderness (6.a), and prevent picketing of stock overnight in alpine meadows (8.d) which would be highly effective in limiting impacts in meadows.

Abundant habitat for mountain goats and other meadow-dependent wildlife away from heavily used recreation sites is available, so these species as a whole would be largely unaffected. Under this alternative, outfitter-guides are restricted to existing trails so no new trail access would be created that encourages use during the winter or kidding season. Alternative 3 would not change the viability outcome listed for mountain goat in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mountain goat or other species dependent on high elevation meadows.

Alternative 4

Outfitter-guide livestock would continue to graze meadows near camp sites in the analysis area. There would be a total of 31,136 pack and saddle stock visitor days in the analysis area, and 6,700 would be associated with the outfitter-guides, representing a 50% increase in outfitter-guide use and an 8% increase in total pack and saddle stock use. A large portion of the increase would be in day rides in the Alta Lake and North Cascades areas which entails no overnight grazing of stock.

This alternative includes an amendment that would allow the use of established campsites that are within 200 feet of meadows, lakes, and streams in the Pasayten and Lake Chelan-Sawtooth wilderness areas. Meadows adjacent to existing camps would continue to be grazed and at a higher intensity than in the recent past. Impacts to meadow habitat would still be limited to a few heavily used sites. Use at those sites would likely expand to adjacent areas, however even this expanded use would be occurring on a small portion of the landscape.

Mitigation measures would limit outfitter-guide use to existing trails in the wilderness (6.a), and prevent picketing of stock overnight in alpine meadows (8.d) which would be highly effective in limiting impacts to meadows.

The amount of outfitter-guide use proposed in Alternative 4 would not substantially impact meadow habitat in the analysis area. A slow recovery of past heavy use by sheep and cattle should continue. Abundant habitat for mountain goats and other meadow-dependent wildlife is present away from heavily used recreation sites, so populations as a whole would be largely unaffected. Under this alternative, outfitter-guides are restricted to existing trails so no new trail access would be created that encourages use during the winter or kidding season. Alternative 4 would not change the viability outcome listed for mountain goat in Figure 3.8-1. It would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mountain goat or other species dependent on high elevation meadows.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as defined in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the effects from these permits to mountain goats would cease.

Past Actions

Past activities in the analysis area that affected meadow habitats include grazing by outfitter-guide livestock, grazing by general public stock, commercial livestock grazing, wildfire, general recreational use, and wildfire suppression. Effects from historic grazing by sheep and cattle were discussed in the affected environment above and in the Range section of this chapter.

Past wildfire suppression may have reduced the amount of meadow habitat in the analysis area, since periodic fires can keep conifer trees from meadow encroachment. Conversely, some of the recent, large wildfires may have enlarged some meadows by killing encroaching conifers. It is not known how much this has affected meadow habitat in the analysis area.

Present Actions

Present activities in the analysis area that affects meadow habitats include grazing by general public stock, commercial livestock grazing, and wildfire suppression. There are several active, commercial livestock allotments in the analysis area (Chapter 3 Range). Forage utilization by the cattle and sheep on these allotments is closely monitored to not remove more than 45-55% of the current annual growth of grasses/forbs. Meadow enlargement, creation, or enhancement from wildfires is more likely to occur now than it was in the past.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions in the analysis area that may affect meadow habitats are a continuation of the present actions. Use of the analysis area, especially the North Cascades Highway Corridor, by private recreationists is predicted to increase. Managing wildfire for resource benefits would continue to be an option in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas and may become an option in non-wilderness portions of the analysis area. Meadow enlargement, creation, or enhancement from wildfires is more likely to occur in the future than it was in the past.

Alternatives 1, 2, 3, and 4

When considered in conjunction with other activities affecting meadow habitat, each of the alternatives would potentially degrade habitat for mountain goats and other meadow-dependent wildlife in and around campsites. Habitat for mountain goats and other meadow-dependent wildlife is abundant away from these sites, so populations as a whole would be largely unaffected.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with the Wenatchee Forest Plan for managing mountain goat habitats. Cover levels and roads would not be affected by these alternatives, and human use would remain the same since outfitter-guide use would be restricted to existing trails and camps. They are also consistent with the Okanogan Land and Resource Management Plan Mountain Goat management area prescription since no new trails could be created by pack and saddle outfitter-guides. They would not change the viability outcome listed for mountain goat in Table 3.8-1. They would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for mountain goat.

Elk

Regulatory Framework

Elk are a Management Indicator Species in the Wenatchee Forest Plan, however standards and guidelines specify that winter ranges on the portion of the analysis area on the Chelan Ranger District (all Wenatchee National Forest System Lands north of the Wenatchee River) will be

managed for deer, (Wenatchee Forest Plan IV-114). According to the FEIS for the Forest Plan (FEIS III-51), the Washington Department of Wildlife has established management objectives that maintain or increase elk populations south of US. Highway 2, but reduce populations north of the highway. The purpose of the management strategy north of U.S. Highway 2 is to avoid damage to orchards from wintering elk. Elk are rarely present in the portion of the analysis area on the Chelan Ranger District, and are not a management priority there. They will not be addressed further in this analysis.

Consistency Findings

The proposed alternatives would not impact summer cover for elk and because winter ranges on the Wenatchee portion of the National Forest are not managed for elk, all alternatives would be consistent with management direction for elk.

LANDBIRDS

Regulatory Framework

The *Landbird Strategic Plan* (USDA Forest Service 2000a) set goals to provide habitat for sustainable landbird populations. The guidance in the 2000 Plan is to be considered in all Region 6 Forest Service actions. In addition, Executive Order 13186, 66 Fed. Reg. 3853 (2001) *Responsibilities of Federal Agencies to Protect Migratory Birds*, along with the *Memorandum of Understanding between the USDA Forest Service and the US Fish & Wildlife Service to Promote the Conservation of Migratory Birds* (2008) require proposed federal actions to be evaluated for effects on migratory birds.

The Partners in Flight Conservation Strategy for Landbirds of the East-Slope of the Cascades Mountains in Oregon and Washington (Altman 2001) lists priority habitats, habitat attributes, focal species, and management considerations that are appropriate for birds in the analysis area. Landbird habitat attributes that may be impacted by outfitter-guide activities are snags, meadows or forest openings, and wetlands. The impacts to these habitats are addressed above in Primary Cavity Excavators, Ruffed Grouse and Beaver, and Mountain Goat sections.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with the Landbird Strategic Plan, Executive Order 13186, and the 2008 MOU. Migratory bird habitat was evaluated and potential for incidental take was minimized. Habitat for landbirds would be affected in and around camps used by outfitted and non-outfitted pack and saddle stock, through loss of snag and downed wood debris habitat, trampling and loss of vegetation at trail crossings and watering sites, and grazing in meadows. The effects would be limited to a very small percentage of these habitats and abundant habitat would continue to exist away from camps, trails, and grazing areas. Populations as a whole would be largely unaffected.

LATE SUCCESSIONAL RESERVES

Regulatory Framework

The Okanogan and Wenatchee Forest Plans were amended by the Northwest Forest Plan, which included designation of late-successional reserves (LSR) and established standards and guidelines for their management.

Affected Environment

There are 210,025 acres of LSR in the analysis area. This includes portions of the Upper Methow, Twisp River, and Sawtooth LSRs.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Alternatives 1, 2, 3, and 4

None of the alternatives would have any effect on LSRs or habitat since pack and saddle stock recreation would not result in any alteration of forest stands. They would not retard or prevent attainment of LSR objectives.

Consistency Findings

All alternatives would be consistent with the standards and guidelines for LSRs in the amended Forest Plans because the alternatives would have a neutral effect on the LSR.

ENDANGERED, THREATENED AND SENSITIVE SPECIES

The following list of endangered, threatened and sensitive wildlife species are known or suspected to occur on the Okanogan-Wenatchee National Forest.

Endangered or Threatened
gray wolf
lynx
grizzly bear
northern spotted owl
marbled murrelet (project area outside range)

There is designated Critical Habitat for northern spotted owl and lynx within the analysis area.

Sensitive
bald eagle
California mtn. kingsnake
common loon
fisher
gray flycatcher

Sensitive Invertebrate Species
astarte fritillary
meadow fritillary
freija fritillary
Labrador sulphur
lustrous copper

great gray owl
harlequin duck
Lewis' woodpecker
Moose
Mountain goat
northwestern pond turtle
pallid bat
peregrine falcon
sandhill crane
sharptail snake
sharp-tailed grouse
striped whipsnake
Townsend's big-eared bat
Western gray squirrel
white-headed woodpecker
wolverine
melissa arctic
great basin fritillary
tawny-edged skipper
Peck's skipper
zigzag darner
subarctic darner
subarctic bluet

Endangered or Threatened

Gray Wolf

Regulatory Framework

Management guidance for gray wolves and their habitat is found in Forest Service Manual 2670 and the Endangered Species Act, as amended. A biological assessment (BA) is required for all projects planned, funded, executed, or permitted by the USDA Forest Service (FSM 2672.4, USDA Forest Service 2005b). If the BA concludes that the project that may affect an endangered or threatened species, the Forest Service must consult with the U.S. Fish and Wildlife Service. Although the Okanogan Forest Plan requires that recovery plans be followed, no recovery plan has yet been developed for wolves in the state of Washington.

Affected Environment

Gray wolves were Federally listed as an endangered species in 1978. Wolves are wide-ranging predators that can exist in a wide variety of habitat types. They are habitat generalists in terms of terrain and vegetation (Boyd 1999, Oakleaf et al. 2006). They are not wilderness dependent, but their survival depends on the availability of cover and relatively secure areas that allow them to avoid humans and escape persecution (Carroll et al. 2003). To successfully inhabit an area they require a year-round prey base of wild ungulates (Boyd et al. 1994, Fritts and Carbyn 1995). Mule deer are likely the main prey item for wolves in the Methow Valley since they are by far the most abundant ungulate. White-tailed deer, moose, mountain goats, beavers, wild turkeys, marmots, and other small mammals are probably preyed on also.

The basic social unit of a wolf population is a mated pair, and a wolf pack is generally a mated pair along with one or more generations of their offspring (Mech 2000, Mech and Boitani 2003). Pups are born at a natal den in spring (generally mid-to late April) and remain there with their

mother for about 2 months (Mech 1970, Boyd 1999). During this time any disturbance that results in the female leaving the den may expose the pups to predation or inclement weather. The sensitivity of females to human disturbances at den sites varies greatly among individuals (Boyd 1999). From the den the pups are moved to a rendezvous site, where they remain, usually under the care of 1 adult, while other adult members of the pack hunt. Wolf packs vary widely in the number of rendezvous sites they may use in a summer and the amount of time spent at them (Boyd 1999). Frame et al. (2007) tested the response of wolves to human disturbance at both den and rendezvous sites and found that though the wolves may have moved in response to the disturbance, it did not reduce reproductive success nor effect the re-use of the sites in subsequent years. *For more detailed information on gray wolf biology see Mech and Boitani (2003) or the Washington Department of Fish and Wildlife website at http://wdfw.wa.gov/wlm/diversty/soc/gray_wolf/.*

Gray wolves are believed to occur throughout the analysis area, but confirmed sightings were not common until 2008. In early 2008 a series of wolf sightings and photographs resulted in the documentation of the Lookout Pack in the Methow Valley, the first wolf pack known to exist in Washington since the 1930s. To date, this is the only known reproductive wolf pair in the analysis area. The Lookout Pack has inhabited areas during the summer and fall that are within the Middle Methow, Sawtooth Backcountry, and Lake Chelan-Sawtooth wilderness portions of the analysis area.

Environmental Consequences

Potential effects of proposed outfitter-guide activities on wolves include:

- disturbance to a natal den or rendezvous site;
- outfitter-guide hunting client accidentally or intentionally shooting;
- reduction of prey availability due to outfitter-guide deer hunting clients.

Current outfitter-guide activities could disturb a wolf den or rendezvous site. However, disturbance would more likely be caused by use occurring off maintained trails and outside of popular areas since wolves tend to establish den and rendezvous sites in remote areas. There are no known den sites in the analysis area. The known den site for the Lookout Pack and the known rendezvous sites are outside the analysis area.

Coyote hunting is allowed in the analysis area. Hunter misidentification of wolves as coyotes is not known to have happened in the North Cascades, but it is a possibility. Hunting is regulated by the Washington Department of Fish and Wildlife. The annual big game hunting regulation pamphlet contains information on how to distinguish coyotes from wolves.

During the fall hunting season outfitter-guides take hunters into the analysis area. Deer hunting is regulated by the Washington Department of Fish and Wildlife. Hunting has not been identified as a limiting factor for deer herds in the analysis area. The proportion of deer hunters in the area that use an outfitter-guide is small.

Direct and Indirect Effects

Alternative 1

Outfitter-guide stock would not use the analysis area. Use would continue by public stock users. There would be 24,420 pack and saddle stock visitor days in the analysis, which would be 15% lower than the current level. Alternative 1 would have "no effect" on the gray wolf because no pack and saddle outfitter-guide permits would be issued.

Alternative 2

Outfitter-guide livestock would continue to use the analysis area. There would be a total of 29,040 pack and saddle stock visitor days in the analysis area, and 4,620 would be associated with the outfitter-guides, representing a 4% increase in outfitter-guide use and a 0.6% increase in total pack and saddle stock use. This alternative would not result in any increases in motorized access or new trail construction. It would not result in unacceptable reductions to wolf prey species.

The alternative includes mitigation measures that limit outfitter-guides from establishing new camps (1.g) and from creating new travel routes (6.a), so the potential for disturbance to den or rendezvous sites would be low. To reduce the possibility of species misidentification, this alternative includes mitigation (11.b) that would require the outfitter-guides to make clients aware of this issue and the consequences of shooting a wolf. Mitigation measure 6.b would be effective since it would be part of the operation plans, with compliance required by the special use permit; should outfitters be found in non-compliance permit action would be taken. Alternative 2 "may effect, but would not likely adversely affect" the gray wolf.

Alternative 3

Outfitter-guide stock would continue to use the analysis area. There would be a total of 27,080 pack and saddle stock visitor days in the analysis area, and 2,660 would be associated with the outfitter-guides, representing a 40% decrease in outfitter-guide use and a 6% decrease in total pack and saddle stock use. The proposed outfitter-guide activities would not result in any increases in motorized access or new trail construction. They would not result in unacceptable reductions to wolf prey species.

The alternative includes mitigation measures that limit outfitter-guides from establishing new camps (1.g) and from creating new travel routes (6.a), so the potential for disturbance to den or rendezvous sites would be low. To reduce the possibility of species misidentification, this alternative includes mitigation (11.b) that would require the outfitter-guides to make clients aware of this issue and the consequences of shooting a wolf. This mitigation measure, number 11.b would be effective since it would be part of the operation plans, with compliance required by the special use permit. Alternative 3 "may effect, but would not likely adversely affect" the gray wolf.

Alternative 4

Outfitter-guide livestock would continue to use the analysis area. There would be a total of 31,136 pack and saddle stock visitor days in the analysis area, and 6,700 would be associated with the outfitter-guides, representing a 50% increase in outfitter-guide use and an 8% increase in total pack and saddle stock use. This alternative would not result in any increases in

motorized access or new trail construction. It would not result in unacceptable reductions to wolf prey species.

The alternative includes mitigation measures that limit outfitter-guides from establishing new camps (1.g) and from creating new travel routes (6.a) so the potential for disturbance to den or rendezvous sites would be low. To reduce the possibility of species misidentification, this alternative includes mitigation (11.b) that would require the outfitter-guides to make clients aware of this issue and the consequences of shooting a wolf. This mitigation measure, number 11.b would be effective since it would be part of the operation plans, with compliance required by the special use permit. Alternative 4 "may effect, but would not likely adversely affect" the gray wolf.

Cumulative Effects

The spatial boundaries for the cumulative effects analysis are the Bear Management Units described in the grizzly bear analysis below. The temporal boundary is from early 1900s through 2023, when the 10 year permits would expire.

Past Actions

Past actions that affected gray wolves in the analysis area included shooting, trapping, and poisoning individual wolves to the point that they were extirpated from the state of Washington by the 1930s.

Present and Foreseeable Future Actions

Present actions that may affect gray wolves in the analysis area include recreational use that might result in human disturbance to natal den or rendezvous sites, accidental or intentional shooting, permitted grazing by domestic livestock (Chapter 3 Range), and large wildfires that may temporarily reduce wolf prey species.

Alternative 1

Alternative 1 and all past, present, and reasonably foreseeable future actions would have no cumulative effect on gray wolf because no pack and saddle outfitter-guide permits would add incremental effects.

Alternatives 2, 3, and 4

When considered in conjunction with other activities affecting gray wolves, Alternatives 2, 3, and 4 may affect, but would not likely adversely affect gray wolves. Shooting, trapping, and harassing wolves are illegal in Washington. Disturbance to a den or rendezvous site is always a possibility on public lands but there are no known wolf den or rendezvous sites in the analysis area. If a wolf den or rendezvous site was discovered in the analysis area, appropriate actions would be taken in consultation with other wildlife agencies. Domestic grazing allotments are managed to avoid or minimize conflicts between livestock and wolves.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with Forest Service Manual 2670 (USDA Forest Service 2005b) and the Endangered Species Act, as amended because a Biological Assessment has been completed, and consultation with the U.S. Fish & Wildlife Service is forthcoming. No federal recovery plan has yet been developed for the gray wolf in Washington State.

Grizzly Bear

Regulatory Framework

Management guidance for grizzly bears and their habitat is located in the Forest Service Manual 2670 (USDA Forest Service 2005b) and the Endangered Species Act, as amended. The Okanogan Forest Plan additionally requires the Forest to follow any recovery plans. A BA is required to be prepared for all projects that are planned, funded, executed, or permitted by the USDA Forest Service (FSM 2672.4). If the BA concludes that the project that may affect an endangered or threatened species, the Forest Service must consult with the U.S. Fish and Wildlife Service. The Grizzly Bear Recovery Plan (USDI Fish and Wildlife Service 1997) incorporates the Interagency Grizzly Bear Guidelines (USDA Forest Service 1986) which includes specific guidelines for managing grizzly bears and their habitat. Those pertinent to this project include:

a) Proposed outfitter-guide pack and saddle stock grazing areas and camps will be evaluated to determine their compatibility with grizzly bear habitat requirements.
b) For dispersed recreation all human and prepared livestock and pet foods and human refuse will be made unavailable to grizzly bears through proper storage, handling and disposal.

Affected Environment

The analysis area is within the North Cascades Grizzly Bear Recovery Zone. The number of grizzly bears in the 6,473,314 acre recovery zone is estimated to be less than 50, possibly as few as 10-20 (Almack et al. 1993). There have been 5 confirmed reports of grizzly bears on the Methow Valley Ranger District; 2 in the Pasayten Wilderness and 3 in non-wilderness areas. There has been one confirmed report in the Lake Chelan-Sawtooth Wilderness on the Chelan side of the mountains.

The search for food dictates grizzly bear movements and habitat use (USDI 1993). They are omnivorous and opportunistic feeders that will prey, scavenge, or forage on almost any available food including rodents, ungulates, carrion, garbage, grasses/forbs, nuts, roots, berries, bulbs, fungi, and tree cambium. In spring they typically will be in lower elevation areas where they forage on herbaceous plants as new shoots emerge, and through spring and summer follow plant phenology up to higher elevations. Important habitats are riparian areas, deer winter ranges, meadows, avalanche chutes, whitebark pine stands, and areas with berry-producing shrubs. Grizzly bears enter winter dens in late October to November and emerge in late March to early May (IGBC 1987). In the North Cascades, grizzly bear denning habitat is suspected to be high elevation, steep, northerly aspect slopes that accumulate deep snow (Almack et al. 1993). There are no known grizzly bear den sites in the analysis area. Denning habitat was not

identified as a limiting habitat component in the North Cascades recovery zone (Almack et al. 1993).

Hunting of black bears is regulated by the Washington Department of Fish and Wildlife. Hunter misidentification of a grizzly bear as a black bear is not known to have happened in the North Cascades, but it is a possibility. It has occurred in other grizzly bear recovery areas. If it were to occur it would most likely happen during the black bear hunting seasons in the late summer and fall. Several of existing Forest Service outfitter-guides take hunters into the backcountry during the fall hunting seasons.

Current outfitter-guide activity in the analysis area provides potential for a bear/human interaction since camps are in the backcountry. On the Okanogan-Wenatchee National Forest all employees, permittees, contractors, and outfitter-guides are required to properly store all attractants (eg. human food, prepared livestock feed, human garbage) while on the Forest to prevent bears from becoming habituated to human camps and the attractants in them.

The current pack and saddle stock outfitter-guide activities are not resulting in any structural habitat modifications or increases in motorized access. They also are not reducing grizzly bear foods. The potential impact of human disturbance to den sites is discountable due to the fact that the vast majority of outfitter-guide activities occur outside the denning season. The possibility of a hunter accidentally/intentionally shooting a grizzly for a black bear exists, but has been mitigated with educational efforts.

Environmental Consequences

Potential effects of outfitter-guide activities on grizzly bears include:

- Human disturbance to a den or foraging site;
- outfitter-guide hunting client accidentally or intentionally shooting a grizzly bear; and
- bears accessing food or garbage at an outfitter backcountry camp and becoming food conditioned.

Direct and Indirect Effects

Alternative 1

There would be no pack and saddle stock outfitter-guide activity in the analysis area. Alternative 1 would have “no effect” on the grizzly bear.

Alternatives 2 , 3 and 4

None of these alternatives would result in any structural habitat modifications or increases in motorized access. They would not result in unacceptable reductions to bear prey species or forage items (see Ruffed Grouse and Beaver section above for effects to riparian habitat, Mule Deer section for effects to deer, and Mountain Goat section above for effects to high elevation meadow forage). Outfitter-guides would not be permitted to establish new camps or trails. The potential effects of human disturbance to den sites would be insignificant and discountable due to the fact that the outfitter-guide activity would occur outside the den season. Several of the outfitter-guides take hunters into the backcountry during the fall hunting seasons. To reduce the possibility of species misidentification, these alternatives include mitigation (11.b) that

requires the outfitter/guides to make their clients aware of this issue, of the differences between black and grizzly bears, and the consequences of shooting a grizzly bear. Mitigation should be highly effective in preventing accidental or intended shooting of a grizzly bear.

Outfitter-guide activity would provide potential for a bear/human interaction. The proposed permits include backcountry camping. To minimize the potential for bears to access human food, garbage or other attractants, these items are required to be stored in a bear-resistant manner (mitigation measures 11.c). In addition, feeding of any wildlife would be prohibited (11.a) and any negative encounters with bears would be required to be reported to the Forest Service (11.d). The potential for a bear getting into a backcountry camp and becoming food conditioned would be mitigated with the highly effective requirement for proper storage. Alternatives 2, 3 or 4 "may effect, but would not likely adversely affect" the grizzly bear.

Cumulative Effects

The spatial boundaries for the cumulative effects analysis are the Bear Management Units that overlap the analysis area. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and effects of the permits would cease.

Past Actions

Past actions that may have affected grizzly bears in the analysis area include shooting, trapping, or poisoning individual bears, excessive livestock grazing activities, road and trail construction, and displacement from habitat due to human use of roads or trails.

Present Actions

Present actions that may affect grizzly bears include human disturbance to a den or foraging site, accidental or intentional shooting/trapping, timber sale activities, livestock grazing activities, accessing improperly stored food or garbage at camp sites and becoming habituated to human presence and food, and displacement from habitat due to human use of roads or trails. Habitat displacement is measured by calculating the amount of core area in bear management units (BMU).

Core area is any habitat that is more than 500 meters from a road, motorized trail, or high use, nonmotorized trail. High use for nonmotorized trails is defined as greater than 20 parties per week (IGBC 1987). Examples of high use, nonmotorized trails in the study area include but are not limited to the Pacific Crest Trail, Middle Fork Pasayten River, Hidden Lakes, Andrews Creek, and Chewuch River trails. **Figure 3.8-3** indicates the amount of core area and the number of outfiitter-guide camps in each of the BMUs in the analysis area.

A BMU with more than 70% core area is considered to have a low level of human influence, 55 to 70% is considered to have a moderate level, and less than 55% is a high level (Gaines et. al. 2003). Seventy-four percent of the camps are in BMUs with an otherwise low level of human influence.

Figure 3.8-3. Number of Camps in Grizzly Bear Core Area, by BMU.

Bear Management Unit	Acres	% Core Area		# of Camps
		Early Season	Mid/Late Season	
Ashnola	177,945	99	97	35
Granite Creek	148,665	88	84	5
Libby Creek	147,910	49	47	4
Lower Chelan	206,308	84	77	20
Lower Chewuch	194,880	41	41	0
Middle Methow	142,635	18	18	1
Pasayten	183,106	99	98	15
Salmon	73,976	44	34	0
Stehekin	107,289	99	97	0
Upper Chelan	227,250	97	87	21
Upper Chewuch	149,281	93	88	13
Upper Methow	227,353	64	42	20
Upper Toats	111,325	69	66	0
Upper Twisp River	156,966	67	66	14

Reasonably Foreseeable Future Actions

Foreseeable future actions that may affect grizzly bears include human disturbance to a den or foraging site, accidental or intentional shooting/trapping, timber sale activities, livestock grazing activities, accessing improperly stored food or garbage at camp sites by the public, wildfire and wildfire suppression activities, and displacement from habitat due to human use of roads or trails.

Alternative 1

Alternative 1 would have no cumulative effects with past, present, and reasonably foreseeable future actions on grizzly bears because no pack and saddle outfitter-guide permits would have incremental effects.

Alternatives 2, 3, and 4

Alternatives 2, 3, and 4 and all past, present, and foreseeable future actions may affect, but would not likely adversely affect grizzly bears and their habitat. Outfitter-guide use would not change the amount of core area in any of the alternatives. Additional use that could occur under alternatives 2 and 4 would be on trails that are already mapped as high use. Although pack and saddle outfitter-guides may take clients to hunt black bears, shooting and trapping grizzly bears is illegal in Washington and mitigation measures requiring education and warning. Timber sale and grazing activities are regulated and planned to avoid or minimize and mitigate impacts to grizzly bears. There have been no reported incidents of grizzly bears getting into improperly stored food or garbage in the analysis area.

Consistency Findings

Each of the four alternatives considered would be consistent with Forest Service Manual 2670 and the Endangered Species Act, as amended. A Biological Assessment has been completed, and consultation with the U.S. Fish & Wildlife Service is forthcoming. The proposed project would be consistent with the Grizzly Bear Recovery Plan because no core area is reduced,

effects to habitat were analyzed, and mitigation measures are included to prevent bear habituation.

Lynx

Regulatory Framework

Management guidance for lynx and their habitat is in Forest Service Manual 2670 (USDA Forest Sevice 2005b) and the Endangered Species Act, as amended. A BA must be prepared for all projects that are planned, funded, executed, or permitted by the USDA Forest Service (FSM 2672.4). If the BA concludes that the project that may affect an endangered or threatened species, the Forest Service must consult with the U.S. Fish & Wildlife Service. Details on habitat use, ecology, and amount of habitat on the Forest for lynx are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest for this species is also listed in Figure 3.8-1. The Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) includes specific conservation measures for managing lynx and their habitat. Those that may apply to outfitter-guide pack and saddle use are:

1) Manage livestock grazing within riparian areas and willow carrs in lynx habitat to provide conditions for lynx and lynx prey (snowshoe hares).
2) Reduce lynx mortalities related to mistaken identification or illegal shooting.

Affected Environment

Lynx are known to occur on the Methow Valley and Chelan Ranger Districts. Lynx inhabit mesic (moist), coniferous forests that have cold snowy winters and provide a prey base of snowshoe hares (Ruggiero et al. 2000). On the east side of the Cascade Range lynx primarily inhabit subalpine fir, Engelmann spruce, and lodgepole pine forests. They also occur in cool, moist Douglas-fir types where they are interspersed with primary vegetation types (Ruediger et al. 2000). These forest types generally are found above 4,000 feet elevation. Lynx seem to prefer areas of low topographic relief (McKelvey et al. 2000, Apps 2000). Lynx distribution is linked to that of the snowshoe hare which require forests with low, dense, horizontal structure (Ruggiero et al. 2000).

Most of the current pack and saddle stock outfitter-guide activities occur partly in lynx habitats except the Alta Lake portion of the analysis area.

Environmental Consequences

The potential effects of the proposed activities on lynx are the possibility of livestock grazing associated with outfitter-guide activities affecting habitat for lynx or snowshoe hares, and an outfitter-guide client accidentally or intentionally shooting a lynx.

Outfitter-guide stock grazing effects to riparian and meadow habitats were discussed above. Riparian areas in lynx habitat are used by outfitter guide livestock, but impacts are limited primarily to small areas where trail intersect streams. This would be a minor effect to summer foraging habitat for snowshoe hares. However, summer foraging habitat is not a limiting factor

for snowshoe hares (Hodges 2000). Shrub and tree cover in these riparian areas, which is more important for winter snowshoe hare habitat, is altered minimally if at all.

Hunter misidentification of a lynx as a bobcat occurred in October 1999 when a deer hunter shot and killed a lynx near Rainy Pass in the North Cascades Highway Corridor. Bobcat hunting is permitted by the Washington State Department of Wildlife. If accidental or intentional shooting of a lynx were to occur in association with one of the proposed outfitter permits it would most likely happen during big game hunting seasons in the fall. Several of the proposed outfitter-guide permits include taking hunters into the backcountry during the fall hunting seasons.

Effects of human disturbance to lynx have not been studied and are not known, but anecdotal observations recorded by some biologists indicate that lynx are tolerant of human disturbance (Mowat et al. 2000, Ruggiero et al. 2000).

Direct and Indirect Effects

Alternative 1

There would be no pack and saddle stock outfitter-guide activity in the analysis area so Alternative 1 would have "no effect" on lynx.

Alternatives 2, 3, and 4

Neither Alternative 2, 3, nor 4 would result in any structural habitat modifications or increases in motorized access. None of the alternatives would result in reductions to lynx prey species. The possibility of a hunter accidentally/intentionally shooting a lynx for a bobcat would be mitigated with educational efforts (11.b). These alternatives would be consistent with the Lynx Conservation Assessment and Strategy because livestock grazing associated with the alternatives would not alter habitat for lynx or snowshoe hares and the potential for accidental shooting has been mitigated. Alternatives 2, 3, and 4 "may effect, but would not likely adversely affect" lynx. They would not change the viability outcome listed for lynx in Figure 3.8-1. They would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for lynx.

Cumulative Effects

The spatial boundaries for the cumulative effects analysis are the Lynx Management Units. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the effects from the permits would cease.

Past Actions

Past actions that may have affected lynx in the analysis area include shooting/trapping/ poisoning of individual lynx, excessive livestock grazing activities, timber sale activities, fire suppression, and the grooming of snowmobile/ski routes. Past livestock grazing may have negatively impacted snowshoe hares, the primary prey for lynx, by overgrazing of riparian areas (see Range section). Timber sale activities in lynx habitat have removed security cover for lynx and temporarily reduced snowshoe hare habitat. Recent wildfires have created good snowshoe hare habitat and therefore good lynx forage habitat. On the other hand, fire suppression in lynx habitat prevented the development of good lynx/hare habitat that often occurs after wildfires.

The grooming of snowmobile/ski routes has provided easy access into lynx habitat for other carnivores that may predate on or compete with lynx.

Present Actions

Present actions that may affect lynx include accidental shooting of individual lynx, timber sale activities, fire suppression, and the grooming of snowmobile/ski routes. Snowmobile use may impact lynx by providing a compacted snow surface that allows competing predators to access lynx habitat. There are 43 lynx analysis units (LAU) on the Methow Valley Ranger District portion of the analysis area and 40 of them have snowmobile route density of less than 1 mi./sq.mi. This is considered a low level of human influence (Gaines et al. 2003). Present and future management activities are analyzed using the Lynx Conservation Assessment and Strategy (Ruediger et al. 2000).

Reasonably Foreseeable Future Actions

Future foreseeable actions that may affect lynx include accidental shooting of individual lynx, timber sale activities, fire suppression, and the grooming of snowmobile/ski routes with effects as described in past actions above. Present and future management activities are analyzed using the Lynx Conservation Assessment and Strategy (Ruediger et al. 2000).

Alternative 1

Alternative 1 would have no cumulative effects with past, present, and reasonably foreseeable future actions on lynx since no pack and saddle outfitter-guide permits would be issued.

Alternatives 2, 3, and 4

When considered in conjunction with other activities affecting lynx and their habitat, Alternatives 2, 3, and 4 may affect, but would not likely adversely affect lynx.

Consistency Findings

Each of the four alternatives considered in this project would be consistent with Forest Service Manual 2670 (USDA Forest Service 2005b) and the Endangered Species Act, as amended. A Biological Assessment has been completed, and consultation with the U.S. Fish & Wildlife Service is forthcoming. The proposed project would be consistent with the Lynx Conservation and Assessment Strategy because no habitat would be affected and the potential for accidental shooting would be mitigated.

Critical Habitat-Lynx

Some of the proposed outfitter-guide activities would occur in critical habitat for lynx. The activities proposed in the four alternatives would not alter any forested stands and thus would have no effect on proposed critical habitat for lynx.

Marbled Murrelet

Marbled murrelets have never been observed in the analysis area and there is no suitable habitat for them in the analysis area.

Environmental Consequences

Direct/Indirect/Cumulative Effects

Alternatives 1, 2, 3, and 4

Each of the alternatives would have "no effect" on the marbled murrelet.

Designated Critical Habitat-Marbled Murrelet

There is no designated critical habitat for marbled murrelets in the analysis area. All four alternatives would have no effect on marbled murrelet critical habitat.

Northern Spotted Owl

Regulatory Framework

Management guidance for northern spotted owls and their habitat is in Forest Service Manual 2670 (USDA Forest Service 2005b) and the requirements of the Endangered Species Act, as amended. A BA is prepared for all projects that are planned, funded, executed, or permitted by the USDA Forest Service (FSM 2672.4). If the BA contains a conclusion that the project that may affect an endangered or threatened species, the Forest Service consults with the U.S. Fish & Wildlife Service. The northern spotted owl recovery plan (USDI 2011) includes specific guidelines for managing northern spotted owls and their habitat. Although both the Okanogan and Wenatchee Forest Plans had management requirements and standards and guidelines for the northern spotted owl, these were replaced by the Northwest Forest Plan in 1994 (USDA, USDI 1994).

Affected Environment

Northern spotted owls are known to occur on the Methow Valley and Chelan Ranger Districts. Suitable owl habitat in the analysis area is mixed conifer forest below 5,000 feet in elevation with large diameter trees, snags, and downed logs, decadence, high canopy closure, and a large proportion of Douglas-fir. Their nesting period is considered to be March 1 to July 31. The northern spotted owls in this area typically begin nesting in late March and young owls leave the nest by mid June. Details on habitat use, ecology, and amount of habitat on the Forest for northern spotted owl are in Wildlife MIS Status Report (2011). The amount of habitat on the Forest for this species is also listed in Figure 3.8-1.

Environmental Consequences

The Bear/Ramsey/Volstead portion of the analysis area is outside the range of the northern spotted owl. The Alta Lake portion contains no suitable habitat for the northern spotted owl. The only potential effect of the proposed activities on northern spotted owls would be from human disturbance to a nesting pair. None of the known northern spotted owl nest sites have maintained trails through them. In addition, the dense, decadent forested stands that typify spotted owl nesting habitat are not conducive to pack and saddle stock outfitting activities. Outfitter-guides would not be allowed to establish new camps or trails. Most of the outfitter-guide camps are above 5,000 feet in elevation and therefore are not in suitable habitat.

Direct and Indirect Effects

Alternative 1

This alternative would have “no effect” on northern spotted owls.

Alternatives 2, 3, and 4

These alternatives would not alter any vegetation and thus would have no effect on suitable owl habitat or on owl prey species. The proposed activities would occur on existing trails that are not near any known northern spotted owl nest sites.

The alternatives include mitigation measures that limit outfitter-guides from establishing new camps (1.g) and from creating new travel routes (6.a) so the potential for disturbance to nest sites would be low. These three alternatives "may effect, but would not likely adversely affect" the northern spotted owl. They would not change the viability outcome listed for northern spotted owl in Figure 3.8-1. They would not contribute to a negative trend in viability on the Okanogan-Wenatchee National Forest for northern spotted owl.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the portion of the analysis area as described in Chapter 1 that is west of the Chewuch and Methow Rivers. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the impacts of these permits would cease.

Other activities in the analysis area that may affect northern spotted owls include disturbance to a nesting pair by recreationists or management activities, and habitat loss from timber management activities, wildfire, and wildfire suppression.

Alternative 1

This alternative would have no cumulative effect on northern spotted owls because no permits would incrementally add to effects from other projects.

Alternatives 2, 3, and 4

When considered in conjunction with other past, present, and foreseeable future actions, these alternatives may affect, but would not likely adversely affect spotted owls or their habitat. Most recreational activities, including pack and saddle outfitter-guide activities, do not occur in the forest stand types that spotted owls utilize for nesting. Timber and other management activities are planned and implemented to avoid or minimize and mitigate any impacts to northern spotted owls.

Consistency Findings

Each of the alternatives considered would be consistent with Forest Service Manual 2670 and the Endangered Species Act, as amended. A Biological Assessment has been completed, and consultation with the U.S. Fish & Wildlife Service is forthcoming. The proposed project would be consistent with the northern spotted owl recovery plan.

Designated Critical Habitat-Northern Spotted Owl

There are three critical habitat units in the analysis area: WA1, WA2, and WA3. The activities proposed in the four alternatives would not alter any forested stands and thus would have no effect on northern spotted owl critical habitat.

Sensitive Species

Regulatory Framework

Management guidance for all sensitive species and their habitat is in Forest Service Manual 2670 (USDA Forest Service 2005b). A BA must be prepared for all projects that are planned, funded, executed, or permitted by the USDA Forest Service (FSM 2672.4). A determination of the level of impact the project might have on each species listed as sensitive by the Regional Forester must be made. The Wenatchee Forest Plan require that actions not jeopardize the continued existence of sensitive species and the Okanogan Forest Plan requires the protection of sensitive species.

Affected Environment & Environmental Consequences

The proposed outfitter activities would not occur in or adjacent to habitat for California mountain kingsnake, sharp-tailed grouse, harlequin duck, northwestern pond turtle, and sandhill crane. Sandhill cranes may migrate through the area, but there are no large, wet meadow complexes that are known to be used by sandhill cranes. All four alternatives of the proposed project would have "no impact" on any of these sensitive species. Since there would be no direct or indirect effects, there would be no cumulative effects. The proposed outfitter-guide activities could occur in areas inhabited by bald eagles, common loons, fisher, great gray owl, gray flycatcher, Lewis' woodpecker, moose, mountain goat, pallid bat, peregrine falcons, sharptail snake, striped whipsnake, Townsend's big-eared bat, western gray squirrel, white-headed woodpecker, and wolverines.

Bald Eagle

Affected Environment

Bald eagles are known to occur in the Methow Valley and Lake Chelan areas. During winter they occur as individuals or in small groups along the Methow River from Winthrop down to the mouth and along the lower 6-7 miles of the Chewuch River. The eagles tend to congregate in areas with road-killed or winter-killed deer, near livestock calving operations, and along open waters that contain fish. There are communal winter roosting areas on non-Forest lands adjacent to the Columbia River near the mouth of the Methow River and along the lower Methow River. In the last few years, bald eagles have attempted to nest at 3 locations, at least, in the Methow Valley; all on private lands, one on the Methow River near the town of Methow, one on the Methow River near Winthrop, and one near Moccasin Lake, south of Winthrop. In the Lake Chelan area there is a nest on the Stehekin River and two others are suspected to occur south of Lake Chelan. All 3 of these are outside the analysis area.

There are no known or suspected bald eagle nesting or roosting sites on Forest Service lands in the analysis area. The only known bald eagle use on Forest Service lands is on low elevation deer winter ranges where they scavenge on winter- or predator-killed deer remains. None of the proposed outfitter/guide activities would occur in these areas during winter when eagles are present.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the effects of the permits would cease.

Alternatives 1, 2, 3, and 4

The proposed activities would not occur near any known bald eagle use areas. They would have "no impact" on bald eagles.

Common Loon

Affected Environment

Common loons are known to occur in the analysis area. They inhabit freshwater lakes that are large enough to support fish, their primary food. To be suitable habitat for common loons, lakes also must be deep enough for loons to dive underwater to escape predators, and long enough for a loon to take flight (about ¼ mi.) (DeGraaf, et al. 1991). Loons nest on the ground close to the water on shore, on islands, sometimes on floating vegetation or muskrat lodges. Common loons have been observed in the recent past on Black Lake and Hidden Lakes in the Pasayten Wilderness and on Lake Chelan. Successful nesting has not been confirmed at these lakes or anywhere else in the analysis area. Other lakes that may be suitable for loons are Surprise Lake in the Lake Chelan-Sawtooth Wilderness and Cub Lake in the Sawtooth Backcountry, but loons have not been observed at either.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the effects of the permits would cease.

Alternatives 1, 2, 3, and 4

All four of the alternatives would have “no impact” on the common loon. The outfitter-guide activities would not disturb any known nesting sites nor alter any suitable habitat.

Fisher

Affected Environment

Fishers are suspected to occur on the Okanogan-Wenatchee National Forest. There are two trapping records of fishers on the Methow Valley Ranger District from the early 1900s (Stinson and Lewis 1998). In addition, there have been unverified observations of individual fishers or tracks in the snow by Forest recreationists. Based on lack of recent confirmed sightings, the fisher was considered extirpated or reduced to scattered individuals in the state of Washington (USDI 2004). In 2008 fishers were translocated to Olympic National Park in western Washington and that population persists to date (Lofroth et al. 2010).

Fishers historically occurred on both sides of the Cascades mountains in Washington in low to mid elevation forests (USDI 2004). They are opportunistic predators with a diverse diet that includes snowshoe hares, birds, rodents, reptiles, insects, carrion, and fruit. They need forests that provide abundant prey and low vulnerability to predators. They also have specific needs for natal denning and for resting spots (Powell and Zielinski 1994). The forest stand structures that provide these needs include large diameter trees with cavities and/or large platform-type branches, and large hollow logs. Late-successional forests provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey.

Forest stands that would be suitable fisher habitat are present within the analysis area. Outfitter-guide activities do not alter forest stand structure except for the removal of snags and downed logs which are used for camp firewood when on overnight trips. Livestock grazing would not influence forest stand structure or the availability of denning and resting sites for fishers. Grazing could affect the abundance of some small rodent species that make up part of the fishers diet. However, grazing effects on rodents varies; some species respond with an increase while others decrease (Ivey 1996). Since fishers are considered generalized predators (Lofroth et al. 2010) and do not specialize on any certain prey species they would be able to shift to whatever species were available.

Environmental Consequences

Direct and Indirect Effects

Alternatives 1, 2, 3, and 4

There would be no reduction of mature or old growth habitats under any of the four alternatives. Each of the four alternatives would have “no impact” on fishers. See the sections above on primary cavity excavators and LSRs for the discussion on effects to snags and downed logs.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and effects of the permits would cease.

Past actions that may have affected fishers include shooting/trapping/poisoning of individual fisher and timber management that reduced habitat. Some forest management activities reduce habitat for fisher by reducing canopy closure or removing structure needed for denning and resting. Present and reasonably foreseeable future actions in the analysis area that may affect fisher include accidental shooting or trapping and wildfires that reduce suitable habitat.

Alternative 1

This alternative would have no cumulative effect on the fisher because no outfitter-guide permits would be issued.

Alternatives 2, 3, and 4

When considered in conjunction with other activities affecting fishers and their habitat, these alternatives would have no impact on the fisher. Shooting and trapping fisher in Washington is illegal. Body-gripping traps are not allowed for any species in Washington.

Gray Flycatcher

Affected Environment

Gray flycatchers are known to occur in suitable habitats on the Okanogan-Wenatchee National Forest. They inhabit tall sagebrush plains and arid, open pine forests (DeGraaf et al. 1991) and build nests 2 to 5 feet above ground in shrubs or trees (O'Neil et al. 2001). Their diet includes beetles, butterflies, grasshoppers, and moths (O'Neil et al. 2001). Their range in Washington appears to be expanding (O'Neil et al. 2001). There is suitable gray flycatcher habitat within the Bear/Ramsey/Volstead and Alta Lake portions of the analysis area.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Outfitter-guide activities would not alter gray flycatcher nesting habitat or foraging habitat. None of the outfitter-guide camps are in gray flycatcher habitat.

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire.

Alternatives 1, 2, 3, and 4

These four alternatives would have "no impact" on the gray flycatcher.

Great Gray Owl

Affected Environment

Great gray owls are known to occur on the Okanogan-Wenatchee National Forest. Great gray owls commonly nest in mature to old-growth forests that provide nesting structures such as

broken top snags, mistletoe brooms, or abandoned hawk or raven nests (Hayward and Verner 1994). They forage in nearby meadows, bogs, clearcuts, or open forests for voles and pocket gophers (Hayward and Verner 1994). Prey abundance and the availability of existing nest sites appear to regulate great gray owl populations. Human disturbance has not been reported as an impact to great gray owls.

Forest stands and meadows that would be suitable great gray owl habitat occur in the analysis area, especially in the Spanish Camp area of the Pasayten Wilderness. Outfitter-guide activities have not altered forest stand structure other than the removal of some snags around camp sites for firewood (see Primary Cavity Excavators above). Livestock grazing associated with outfitter-guides and their clients may impact habitat for rodents that great gray owls prey upon. Grazing effects on rodents varies with the species, habitat type, and season of grazing (Ivey 1996). Voles and pocket gophers, which are great gray owls preferred prey species, are dependent on good ground cover and can be negatively affected by grazing (Johnson 1981, Kauffman et. al. 1981, Oldemeyer and Allen-Johnson 1988). Excessive grazing removes their security cover and forage.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

This alternative would have "no impact" on the great gray owl because no outfitter-guide permits would be issued.

Alternatives 2, 3, and 4

Under mitigation measure 1.j, pack and saddle outfitter-guides would be prohibited from removing snags for firewood and therefore would have no impact on forest stand structure (see Primary Cavity Excavators above). It is possible that recreational livestock grazing activities conducted by outfitter-guides or their clients near camps could reduce habitat suitability for great gray owl prey species. Some rodents that great gray owls prey upon use the grass/forb layer of vegetation for food and for hiding cover. However, this occurs on such a small portion of the landscape that it is unlikely to be a substantial impact (see Ruffed Grouse and Beaver and Mountain Goat sections above). Due to this potential for minor impacts to rodents, alternatives 2, 3, and 4 "may impact individual great gray owls, but are not likely to cause a trend toward Federal listing or a loss of population viability".

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire, and the permits would cease to have effects.

Past Actions

Past actions in the analysis area that may have affected great gray owls include livestock grazing and timber management. Sheep grazing in the early 1900s in the analysis area may have temporarily impacted great gray owls by reducing habitat for the voles and pocket gophers they prey upon (see Mountain Goats analysis above for effects on high elevation meadows and

species). Some timber management actions can reduce nesting and foraging habitat for great gray owls.

Present and Reasonably Foreseeable Future Actions
Present and reasonably foreseeable future actions in the analysis area that may affect great gray owls include livestock grazing that may impact rodent species.

Alternative 1

This alternative would have no cumulative effect on the great gray owl because no pack and saddle outfitter-guide permits would be issued.

Alternatives 2, 3, and 4

When considered in conjunction with other past, present, and reasonably foreseeable future actions, these three alternatives may impact individual great gray owls, but are not likely to cause a trend toward Federal listing or a loss of population viability as a result of small potential for impacting habitat for prey species from recreational livestock grazing. Timber and other Forest Service permitted management activities are now planned and implemented to avoid or minimize and mitigate impacts to great gray owls.

Lewis' Woodpecker

Affected Environment
The Lewis' woodpecker utilizes dead and defective tree habitat in open Ponderosa pine stands and riparian cottonwood stands. This species and suitable snag habitat exists in the drier forested areas of the analysis area.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Effects to snag habitat are specified above in the MIS section on primary cavity excavators. The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the any effects would cease.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on the Lewis' woodpecker. The proposed outfitter-guide activities would not alter any key features of Lewis' woodpecker habitat.

Moose

Affected Environment
Moose prefer forested habitat where lakes, marshes, and other wetlands provide them with aquatic vegetation and willows. But in less wet areas, like northeast Washington, they also eat the woody browse in early stages of regrowth following disturbances like fires, logging, and clearing. Moose are a pioneering type animal and adapt to a variety of available forage.

Moose are known to occur in the analysis area. Their numbers and distribution seems to be increasing following the large wildfires that have occurred in the area since the mid-1990s. They seem to be observed most often in the upper Chewuch River, Twisp River, and Pasayten River drainages.

Direct/Indirect/Cumulative Effects
Effects to riparian habitat are specified above in the MIS section on ruffed grouse and beaver. The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the any effects would cease.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on moose. The proposed outfitter-guide activities would not alter any key features of moose habitat. Effects to riparian habitats are limited to trail crossings and other small areas near camps. Woody browse that moose prefer are not typically favored by domestic stock and are not limiting in the analysis area.

Mountain Goat

Affected Environment

Mountain goats are associated with open country with steep rocky cliffs, talus slopes, and meadows for foraging (Wilson and Ruff 1999). In the southern portion of its range, they inhabit high alpine and subalpine zones in the mountains. They spend the majority of their time on or directly adjacent to cliffy escape terrain. In the winter, some groups of goats inhabit higher-elevation wind-swept ridges, and others move to lower-elevation steep south-facing slopes. In some areas goats spend the majority of the year in steep shrubland, forests, and grasslands during the long winter (Rice 2010).

Mountain goats are known to occur in the analysis area. Effects of the proposed activities on mountain goats were discussed above in the Management Indicator Species section.

Direct/Indirect/Cumulative Effects

Alternatives 1, 2, 3, and 4.

These alternatives would have no impact on mountain goats.

Pallid Bat

Affected Environment

Pallid bats are known to occur in low elevations of the Methow Valley. Individuals have been documented on several occasions roosting under Highway 153 bridges over the Methow River between Carlton and Pateros. They have not yet been documented on the Methow Valley Ranger District. This species of bat is a large insectivorous, terrestrial forager that inhabits deserts, arid grass and shrublands and dry forests (Chapman et al 1994). They fly low over areas of sparse vegetation searching for large insects, then night roost on nearby Ponderosa pines. Day roosts are usually in fissures in cliff systems.

There is suitable habitat for pallid bats within or adjacent to the analysis area. Areas of sparse vegetation near Ponderosa pine forests exists in the lower elevations of the Alta and Bear/Ramsey areas of the analysis area.

Direct/Indirect/Cumulative Effects

The proposed outfitter-guide pack and saddle stock activities would not impact night roosting habitat or day roosting habitat for pallid bats.

Alternatives 1, 2, 3, and 4

These alternatives would have no impact on the pallid bat.
The proposed project would not alter any bat roosting habitat or affect their prey base.

Peregrine Falcon

Peregrine falcons experienced a dramatic decline in population nationwide, due to the effects of DDT on eggshell thickness. They were Federally listed as an endangered species in 1970, underwent recovery, and were removed from the list in 1999.

Affected Environment

Peregrine falcons are known to occur in the analysis area. There are two known peregrine falcon nesting sites (eyries) on the Methow Valley Ranger District but neither are within the analysis area.

Peregrine falcons are considered a generalist predator, and they prey mainly on other birds, particularly waterfowl and shorebirds (Hayes and Buchanan 2002). Prominent cliffs are the most common characteristic in peregrine territories. They nest on cliff ledges that provide protection from the weather and mammalian predators, and are in close proximity to bodies of water. Their breeding period is March 1 to July 30.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

There are no known peregrine falcon nesting sites in the analysis area. Outfitter-guide pack and saddle stock activities are unlikely to disturb nesting falcons since their nests are on sheer cliffs. The proposed activities would not substantially alter habitat for falcon prey species.

The spatial boundary for the cumulative effects analysis is the analysis area as described in Chapter 1. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and any effects would cease.

Alternatives 1, 2, 3, and 4

All four alternatives would have “no impact” on the peregrine falcon. Pack and saddle stock outfitter-guide activity would not alter peregrine falcon habitat.

Sharptail Snake

Affected Environment

The sharptail snake is suspected to occur on portions of the Chelan Ranger District. They are a small, secretive snake that feed almost exclusively on slugs (Storm and Leonard 1995). They seem to prefer moist habitats and are found at elevations below 2,000 feet. There is only a small area of suitable sharptail snake habitat in the very southern portion of the analysis area.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Lake Chelan Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and any effects would cease.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on the sharptail snake. The proposed alternatives would not alter any sharptail snake habitat. There are no outfitter-guide camps or other activities proposed to occur in sharptail snake habitat.

Striped Whipsnake

Affected Environment

The striped whipsnake is suspected to occur on portions of the Chelan Ranger District. They are long, slender, and fast-moving snakes that are most abundant in areas with a diversity of lizards, their favorite prey (Storm and Leonard 1995). They occur in arid habitats below 2000 feet elevation. There is only a small area of suitable striped whipsnake habitat in the very southern portion of the analysis area.

Environmental Consequences

Direct/Indirect/Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Lake Chelan Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on the striped whipsnake. The proposed alternatives would not alter any striped whipsnake habitat. There are no outfitter-guide camps or other activities proposed to occur in striped whipsnake habitat.

Townsend's Big-eared Bat

Affected Environment

Townsend's big-eared bats are known to occur on the Methow Valley Ranger District. A nursery colony was discovered in a warehouse at the Early Winters Forest Service administrative compound in 1997. About 70 Townsend's big-eared bats were using this building. The colony has been closely monitored and protected from disturbance since then. There are several other known sites being used by Townsend's big-eared bats on private lands in the Methow Valley. This species of bat is known to roost in old buildings, caves, and mines, and underneath bridges (Christy and West 1993). They are not known to roost in foliage, beneath loose bark, in snags, or in rock crevices (Christy and West 1993). They seem to require enough space to be able to hang upside down. They feed primarily on moths, and foraging habitat is open dry forests, meadows, and grasslands. There are no known roost sites in the analysis area. There is suitable foraging habitat within the analysis area and there are potential roosting sites in the form of a few old buildings and mine shafts.

Environmental Consequences

Direct/Indirect/Cumulative Effects
The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire.

Alternatives 1, 2, 3, and 4

Alternative 1 would have no impact on the Townsend's big-eared bat; there would be no change from the existing condition. Alternatives 2, 3, and 4 would have "no impact" on the Townsend's big-eared bat since the project would not alter any bat roosting habitat or affect the prey base.

Western Gray Squirrel

Affected Environment

Western gray squirrels are known to occur on the Methow Valley and Chelan Ranger Districts. There are no known records in the Methow portion of the analysis area however they may occur in the very southern portion of the analysis area on the Chelan District. Western gray squirrels inhabit ponderosa pine forests and oak woodlands and forage on pine nuts, fir seeds, berries, bark, and hypogeous fungi (O'Neil et al. 2001). In the Chelan Basin they are present in areas the have walnut trees or bigleaf maple trees. They are largely arboreal.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the any effects would cease.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on the western gray squirrel. The proposed outfitter-guide activities would not alter any key features of western gray squirrel habitat.

White-headed Woodpecker

Affected Environment

The white-headed woodpecker utilizes dead and defective tree habitat in open Ponderosa pine stands. This species and suitable snag habitat exist in lower elevations of the project area.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

Effects to snag habitat are specified above in the MIS section on primary cavity excavators. The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2023, when the 10 year permits would expire and the any effects would cease.

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on the white-headed woodpecker. The proposed outfitter-guide activities would not alter any key features of white-headed woodpecker habitat.

Wolverine

Affected Environment

Wolverines are known to occur on the Okanogan-Wenatchee National Forest. The northern Cascade Range in Washington represents the southernmost extent of the current range of wolverines along the Pacific coast of North America (Aubry et al. 2007). Wolverines are uncommon inhabitants of subalpine habitats in western mountain ranges in the lower 48 United States (Aubry et al. 2007). Recent research on wolverines in the Rocky Mountains of British Columbia (Krebs et al. 2007) and the United States (Copeland 1996, Copeland et al. 2007, Squires et al. 2007) indicates that wolverines are wide-ranging, inhabit remote areas near timberline, and are sensitive to human disturbance at natal and maternal den sites. They subsist on ungulate carrion and by predating on small to medium sized animals. Wildlife biologists have recently radio-collared 10 wolverines in the analysis area. They have been found to use the Pasayten, North Cascades, Lake Chelan-Sawtooth Wilderness, and Middle Methow areas. In addition, there have been highly reliable sightings from Forest visitors recently reported at several other locations on both the Methow and Chelan portions of the analysis area. In an analysis of wolverine habitat use in central Idaho, Copeland et al. (2007) found no relationship between wolverine presence and maintained trail systems. However, Copeland (1996) found wolverines to be intolerant of human disturbance at maternal den sites. Wolverines give birth in natal dens from late February to March (Magoun and Copeland 1998). Magoun and Copeland

(1998) noted the critical feature of wolverine denning habitat to be the dependability of deep snow throughout the denning period. Copeland (1996) observed two wolverine natal dens in Idaho; both were in subalpine talus habitat on north-facing, steep slopes of cirque basins. The talus consisted of large rocks and boulders that were at least two meters in diameter, and the talus was less than 100 meters across and surrounded by trees. The den was in the interstitial spaces of the large-rock talus. Recent research in southeastern British Columbia has documented wolverine maternal den sites in Englemann spruce/subalpine fir forest types in large woody debris accumulations at the bottom of avalanche chutes (Krebs 1999).

Most of the proposed outfitter activities would occur in areas that may be inhabited by wolverine. Wolverine denning habitat as described by Magoun and Copeland (1998) and Krebs (1999) exists within the analysis area.

Environmental Consequences

The potential effects of the proposed outfitter-guide activities on wolverines are the possibility of human disturbance to a mother with kits. Reproductive den habitats, as described by Magoun and Copeland (1998) are not typically sought out by pack and saddle stock outfitter-guides. In addition, the wolverine reproductive denning season is considered to be February through April (Magoun and Copeland 1998). The proposed outfitter-guide activities would not occur until after this so disturbance is unlikely.

Direct, Indirect and Cumulative Effects

Alternatives 1, 2, 3, and 4

These alternatives would have “no impact” on wolverine. Pack and saddle stock outfitter-guide activities would occur after the reproductive den season so disturbance would be unlikely.

Consistency Findings for Sensitive Species

Each of the four alternatives considered in this project would be consistent with Forest Service Manual 2670 because biological evaluations have been prepared in accordance with Manual policy. None of the alternatives would cause a trend toward Federal listing or a loss of population viability for sensitive species.

Sensitive Invertebrate Species

Affected Environment

The following table lists the sensitive invertebrate species suspected or known to occur on the Okanogan-Wenatchee National Forest along with their preferred habitat and information on nearest documented sightings in relation to the analysis area:

Figure 3.8-4. Sensitive Invertebrate Species on Okanogan-Wenatchee National Forest

Species	Habitat	Nearest documented
Astarte fritillary	Alpine rock slides and windswept ridges	Slate Peak, in analysis area
Meadow fritillary	Open boggy wet meadows	Loup Loup Pass, south of analysis area
Freija fritillary	Alpine, willow bogs, forest meadows	East of analysis area
Labrador sulphur	Alpine scree and tundra	Pasayten wilderness, in analysis area
Lustrous copper	Alpine rock slides and windswept ridges	Slate Peak, in analysis area
Melissa arctic	Alpine rock slides and windswept ridges	Slate Peak, in analysis area
Great Basin fritillary	Montane meadows, forest clearings	East of Okanogan River, east of analysis area
Tawny-edged skipper	Moist to dry grassy areas	Loomis, east of analysis area
Peck's skipper	Mountain meadows, grassy wet meadows	Loomis, east of analysis area
Zigzag darner	Wet sedge meadows, fens, bogs, and very shallow peaty ponds	East of analysis area
Subarctic darner	fens, wet meadows, and bogs with abundant sphagnum and other mosses	Fish Lake, south of analysis area
Subarctic bluet	boreal fens and bogs	Davis Lake, east of analysis area

Environmental Consequences

The only sensitive vertebrate species known to occur within the analysis area are those with alpine rocky areas for habitat. There is potentially suitable habitat for the meadow fritillary, Great Basin fritillary, tawny-edged skipper, and Peck's skipper. Overgrazing by livestock would be an impact to butterflies trying to inhabit these areas.

Direct, Indirect and Cumulative Effects

Alternatives 1, 2, 3, and 4

These alternatives would have "no impact" on sensitive invertebrate species. Pack and saddle stock would not impact alpine rocky habitats. The proposed alternatives would not result in the overgrazing of any suitable habitats.

3.9 INVASIVE PLANTS

The section below is a summary of the Invasive Plant Management Analysis Report which is available in the project analysis file (McFetridge 2012b).

REGULATORY FRAMEWORK

This analysis is required to conform to the requirements of *Pacific Northwest Invasive Plant Program Final Environmental Impact Statement, Record of Decision* (USDA Forest Service 2005a), hereafter referred to as the 2005 PNW ROD, and the Okanogan (1989) and Wenatchee (1990) Forest Plans, each of which require a prevention emphasis, and in the case of the Okanogan, especially in unroaded areas and wilderness, both of which make up the majority of this project's analysis area. The 2005 PNW ROD standards that apply to this project require an emphasis on prevention (ROD-10) and the use only pelletized or certified weed free feed in wilderness and at wilderness trailheads (ROD-12). No treatment of invasive species is included in any of the alternatives. Actual treatment will authorized be under other NEPA documents.

The Okanogan Forest Plan requires that noxious weeds be controlled to the extent practical, new infestations be the first priority for eradication (page 4-45). The Wenatchee Forest Plan requires cooperation with other agencies in identifying, locating and preventing the spread of noxious weeds, inventory and monitoring of noxious weeds, conduct of a risk assessment on weed introduction for ground disturbing activities, and containment, control or eradication of existing populations as budget allows, by priority specific classes and locations of weeds (page IV-89 to IV-92). Each standard and guideline is listed and addressed under the Consistency findings at the end of this section.

Both Service-wide and Pacific Northwest Region Noxious Weed Strategies use the term "noxious weeds" to broadly encompass all invasive, aggressive, or harmful non-indigenous species. The more recent term is "invasive plants", which are defined as non-native plants likely to cause economic harm, environmental harm, or harm to human health (Executive Order 13112, 1999). The terms "invasive plant species", "noxious weeds", and "weeds" are used interchangeably in this document.

Policy Guidance – This analysis is guided by the *National Strategy and Implementation Plan for Invasive Species Management* (USDA Forest Service 2004c). The National Strategy has four elements: Each of these elements is addressed in detail in the Prevention and Management Strategy document in the analysis file (Items 1 - 4 below).

1. Prevention – Stop invasive plants before they arrive.
2. Early detection and rapid response – Find new infestations and eliminate them before they become established.
3. Control and management – Contain and reduce existing infestations.
4. Rehabilitation and restoration – Reclaim native habitats and ecosystems.

ANALYSIS METHODS

Introduction and spread of invasive plants is generally proportional to the area disturbed. For this project, disturbance is mostly associated with trailhead and outfitter-guide camps, although outfitters, their stock, and their clients can spread weeds along trails. The type and size of disturbance is relatively similar between all trailheads and camps. There would be no new disturbance as a result of the proposed action or its alternatives. The spatial boundary used for this resource is the entire analysis area, including all weed sites along roads and off-road areas. Most of the invasive plant populations in this analysis area are on roads within the analysis area and are not directly affected by the outfitter-guide activities at trailheads, on trails, and at camps. The temporal boundary is the time during project activity (a ten-year permit). For the purposes of this analysis, the potential for invasive plant introduction and spread is discussed. The following specific indicators are used to describe the direct, indirect, and cumulative effects of the proposed action and its alternatives:

- Qualitative discussion of existing vegetation within the analysis area relative to the habitat requirements for new invader and potential invader noxious weeds including the number of outfitter-guide camps within each habitat type.
- Number of trail heads with established populations of New Invader noxious weeds and qualitative discussion on potential to spread into the analysis area.
- Acres of current known infestations within the analysis area and discussion of potential to spread into project activity areas.
- Quantitative estimate of number of visitor days as a vector of introduction and spread.
- Analyses of potential invaders occur on lands adjacent to the project area but not within the project area.

This analysis describes the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on resources and people. The best available science was used for this analysis, including the methodology and data sources described above.

AFFECTED ENVIRONMENT

Past Activities

Past commercial livestock grazing introduced and spread invasive plants in the analysis area in the past from private land well outside the project area. Numerous commercial sheep and cattle driveways were constructed to enable livestock to access key use grazing areas. This opened the wilderness and back country area to the potential for weed introduction through dispersal of weed seed on these commercial livestock, and through use by recreationists, and outfitters. Ground disturbance at the sheep camps, and along trails and stock driveways created areas of disturbed soil suitable for weed introduction and establishment.

Logging activity started in the 1950s outside of wilderness areas. Secondary roads were completed in the 1960s and 1970s in conjunction with timber sales through the 1990s. An increase in recreation and permitted commercial cattle grazing followed. Road construction increased motor vehicle and livestock access to the edge of wilderness. Even after the roads

were built, commercial grazing continued to occur in the Pasayten and Lake Chelan Sawtooth wilderness but limited to those areas that were being grazed at the time the wilderness was established.

Past wildfires, including but not limited to the Quartz Mountain Fire in 2000, Thirtymile Fire in 2001, Farewell Fire in 2003, and Tripod and Tatoosh Fires in 2006, and the more recent Slick Creek Fire increased the potential for weed establishment and spread in the analysis area by creating disturbed soils conducive to weed establishment. Burned Area Emergency Response (BAER) plans were completed and implemented for many on these fires. Post fire surveys for invasive plants are always considered under BAER. Invasive plant treatments were conducted for 3 years in Bear/Ramsey/Volstead area as part of the Tripod BAER treatment plan.

The 1997, 1999 and 2001 Noxious Weed Management decisions (USDA Forest Service 1997e, USDA 1999a, and USDA Forest Service 2000d) on the Okanogan portion of the analysis area combined with the Crupina Control EIS on the Chelan portion allowed for 4066 acres of the analysis area to be treated using integrated weed management strategies, including manual, mechanical, biological and chemical methods. These treatments have reduced the spread of noxious weeds, and decreased population sizes.

In 2003, the Forest approved the Crupina Control Analysis file of Decision, which also approved use of the above management strategies in the Lake Chelan Sawtooth Wilderness and the area below the wilderness boundary and above the lakeshore. Treatment began under the decision in 2003 and 600 gross acres have been treated as of 2012 and have been successful in preventing spread outside the known infested area, and reducing the size and density of the infestation.

Surveys for common crupina occur yearly. Common crupina continues to be the highest priority for treatment. The management strategy is to contain and reduce the existing population. Herbicide and manual treatments have been successful and are currently meeting this objective. The Lake Chelan population is the only known crupina infestation in Washington State. The primary habitat is on hot, dry southern slopes in shrub steppe grassland and open ponderosa pine and Douglas fir forest. Associated species include arrowleaf balsamroot, bluebunch wheatgrass, and cheatgrass. Crupina grows from the lake level to approximately 2800 feet in elevation. Because crupina grows in open, dry, hot habitats it is unlikely to invade the cool, shaded subalpine forests, and unlikely to spread into the higher elevation outfitter-guide camp activity areas above 3500 feet.

In 2008, the Forest approved the Blue Buck Hawkweed Decision Notice (USDA 2008b), which approved the use of 3 herbicides to reduce and eliminate the orange hawkweed populations in Blue Buck Creek. As of 2012, 11 acres of these populations have been treated 4 to 5 times each year since treatment began in 2008. These treatments have been very successful in reducing spread but less successful in reducing and eliminating these populations. Population densities are much less than in 2008 and on a steady decline but treatments have not been as effective as expected.

The Washington Department of Transportation (DOT) administers the roadside of Highway 20 through the **North Cascades** sub-project area under their easement. Herbicide treatments are conducted along within the easement on most years in that project area. Recent treatments in

2012 have been very effective in eliminating many of the invasive plants established along the highway.

Current Condition of Invasive Plants

Noxious weed information and analysis for the project area has been conducted through recent Okanogan and Wenatchee National Forests Noxious Weed Environmental Assessments (USDA Forest Service1997, 1999, and 2000) and through more recent inventories. Informal noxious weed surveys are routinely done within the project area by range management personnel and by the livestock grazing permittees. The weed acres in Figure 3.4-5. are from the 2008 inventory. Gross acres describe the general area of land or perimeter in which all the invasive plants are found. Gross acres thus often encompass land that does not actually contain the invasive species. Infested acres on the other hand narrow the perimeter down to the actual area containing the plant, as defined by the invasive species canopy cover.

Status and Classification of Weeds

Invasive plant populations are present in the project area and fall into three primary categories. These categories are used to prioritize invasive species for inventory and treatment. Figure 3.9-1 below displays the established, new and potential invaders found within or adjacent to the analysis area.

1. *Established Invaders* are those species whose population levels and distribution are such that seed production cannot be prevented. State listed Class C or no state listing.
2. *New Invaders* are invasive plant species that occur sporadically on the Forest and that may be controlled by preventing seed production and early treatment. State listed Class A or State listed Class B and C that are locally limited in distribution on National Forest within the project area.
3. *Potential Invaders* are invasive plants that occur on lands adjacent to the project area but have not been documented on lands administrated by the Forest; however, the potential for infestation is imminent. State listed Class A and/or B that are locally limited in distribution.

Figure 3.9-1. Established, New, and Potential Invaders in or adjacent to analysis area.

Established Invaders:	New Invaders:	Potential Invaders:
bull thistle	common crupina	*orange hawkweed
Canada thistle	common tansy	*sulfur cinquefoil
common mullein	dalmatian toadflax	Japanese knotweed
dandelion	diffuse knapweed	yellow hawkweed
cheatgrass	houndstongue	
lambsquarters	oxeye daisy	
tansymustard	Russian knapweed	
dwarf mallow	Scotch broom	
common plantain	spotted knapweed	
white clover	St. Johnswort	
field bindweed	whitetop	
common mullein		
yellow salsify		
crane's bill		
prickly lettuce		
bulbous bluegrass		

*New Invader in Bear/Ramsey/Volstead subunit only

Figure 3.9-2 below displays the characteristics of new invaders, and one potential invader to the analysis area.

Figure 3.9-2. Existing New Invader and Potential Invader Noxious Weed Characteristics.

COMMON NAME OF SPECIES (*scientific name*)	CHARACTERISTICS
common crupina *Crupina vulgaris*	A Washington State Class A Noxious weed; A fall germinating annual, primary habitat is southern slopes in steep canyon grasslands and open forest; reproduces by seed but seeds not persistent in soil; adapted to a wide range of soil and climate conditions; can form solid stands decreasing forage productivity, livestock carrying capacity and replacing native plants.
common tansy *Tanacetum vulgare*	Spreads mainly by seeds, and less commonly from creeping rhizomes, to form dense clumps of stems. An invader of disturbed sites commonly found on roadsides, fence rows, pastures, stream banks and waste areas.
dalmatian toadflax *Linaria dalmatica*	A perennial reproducing by seed and rhizomes; it is aggressive on roadsides and rangeland; difficult to control.
diffuse knapweed *Centaurea diffusa*	An annual or short-lived perennial; highly competitive.
Houndstongue *Cynoglossum officinale*	A biennial; seeds are 4 prickly nutlets (seeds) that attach to people, livestock, vehicles, for easy dispersal; a very strong competitor with desirable forage; generally non-palatable but toxic properties capable of poisoning livestock, shade tolerant and thrives in wetter grasslands.
Japanese knotweed *Polygonum cuspidatum* (Potential Invader)	An escaped ornamental becoming increasingly common along stream corridors and rights-of-way in Washington; a perennial with spreading rhizomes, can reach 8 feet in height and is often shrubby, very aggressive, capable of crowding out all other vegetation, rarely established from seed, primary spread is through mechanical movement of plant parts; several sites in Methow Valley bottom, one on Twisp River.
oxeye daisy *Chrysanthemum leucanthemum*	Aggressive perennial invader of open forest, meadows, and roadsides; strong sprouting from roots with branched rhizomes; reproduces vegetatively along rhizomes and by seed.
orange and yellow (meadow) hawkweed *Hieracium aurantiacum, Hieracium pratense*	A perennial with creeping stolons; forms dense patches and rapidly invades new areas; mostly vegetative reproduction; dispersed by wind, animals, and people, seeds not carried far by the wind - presumably dispersed > 1 km, minute barbs on the seeds stick to fur, clothing and vehicles; suitable habitat well above 5000 ft. in mountain meadows.
Russian knapweed *Acroptilon repens*	A creeping perennial, reproduces from seed and vegetative root buds, toxic to horses, very competitive in heavier soils of bottomlands, invades degraded areas dominating the plant community.
Scotch broom *Cystis scoparius*	An aggressive, deciduous, perennial shrub, Common pest in western WA and OR, very limited infestations east of the Cascades, a prodigious seed producer with seed coats enabling them to survive for up to 80 years.
Spotted knapweed *Centaurea maculosa*	A short-lived perennial; tolerates shade; spread by vehicles, wind, animals; highly competitive.
sulfur cinquefoil *Potentilla recta*	A competitive long-lived perennial; unpalatable to grazing animals reducing forage for livestock and wildlife; adapted to a wide range of environmental conditions; reproduces by seed and uses early emergence to establish.
St. Johnswort *Hypericum perforatum*	A perennial reproducing by seed or short rhizomes; easily established on roadsides; very slow in spreading off of roadside; difficult to control; biological control available.
whitetop *Carderia draba*	A deep rooted perennial reproducing from root segments and seeds; highly competitive with other species once it becomes established; will set seed by early summer.

(Sheley and Petroff, 1999) (Whitson et. al., 1992)

The analysis area contains a moderate potential for spread of potential and new invaders from adjacent private and state lands.

Information currently in the NRIS (Natural Resource Information System) inventory database shows 11 species occurring singly or in combination at 162 sites in the analysis area, for a total of about 4,066 acres. All invasive plant sites in the analysis area were inventoried in the last five years.

Many of the invasive plant sites in the analysis area that occur on the Methow Valley and Chelan Ranger Districts have been approved for herbicide use under the 1997, 1999 and 2001 Integrated Weed Management EA Decision Notices, the 2008 Blue Buck Hawkweed Decision Notice and the 2003 Crupina Integrated Weed Management EIS Record of Decision. Of the total 4066 gross acres of weeds within the project are, 743 acres of herbicide treatment and 263 acres of manual treatment have been constantly accomplished each year over the past 6 years. Overall, treatments have been effective in reducing populations. The larger dalmatian toadflax and diffuse knapweed populations have warranted using bio-control agents.

Figure 3.9-3 Acres of treatment accomplished annually in the analysis area

	Weed acres within Project Area	Herbicide Acres Treated	Manual Acres Treated
Pasayten Wilderness	1		1
Bear/Ramsey/Volstead	925	479	
Middle Methow	661	122	201
Upper Methow	484	141	61
North Cascades Highway	600	1	0.1
Alta Lake	439		
Lake Chelan-Sawtooth and Sawtooth Backcountry	956	50	200
Total	**4066**	**743**	**263**

Existing Vegetation and Habitat Type

The analysis area covers dry ponderosa pine habitat, interspersed with shrub steppe habitat, from 1,100-foot elevation along the north shore of Lake Chelan, to alpine parkland habitats above 6,000-foot elevation in the Pasayten.

There are four general vegetation types identified in the analysis area (summarized from Botany report in the analysis file). Vegetation type and the number of existing outfitter-guide camps that fall within each typed are listed below:

- Hot/dry ponderosa pine/shrub steppe to warm/dry Douglas fir communities, 10 camps
- Cool/moist subalpine fir communities, 60 camps
- Cold/moist alpine parkland communities, 43 camps
- Cool/moist Pacific silver fir and mountain hemlock communities, 3 camps

Invasive plants are competitive in a variety of habitats and prefer disturbed sites such as trailheads, roadsides, trails, wildlife bedding grounds, overgrazed areas, and campgrounds. Of the new invader and potential invader weed species associated with this project, most are native of the Mediterranean climate and are competitive in the dry lower elevation areas that are open or sparsely forested. Some of these are competitive on sunny south slopes and in well-drained soils. These species are typically the most competitive in disturbed soil areas within the shrub steppe and open forest communities. Conversely there are a few weed species that are native of the northern regions of Eurasia that are more adapted to cool, moist, higher elevation habitats and can be competitive in moist meadow environments (Sheley and Petroff 1999).

The analysis area contains a range of habitat types but most of the impacts of recently permitted outfitter-guide activities are at outfitter-guide camps within the cool/moist higher elevation habitat types, and at trailheads which are typically in the transition zone between the warm/dry Douglas fir and the cool/moist subalpine fir plant communities. Of the total number of outfitter-guide camps in the analysis area, 88% are in the cool/moist subalpine fir and alpine cold/moist parkland habitat which is limited as suitable habitat for many of the new invader weeds.

Current Infestations

Current infestation of Established, New, and Potential Invaders are described. Invasive species were likely introduced from private lands mostly by vehicles, but also by recreational livestock and hikers. In the case of common crupina, the likely vector was by boat transported livestock.

New Invaders

These weeds are minimal; there is currently one outfitter-guide camp (1st Hidden Lake) with a new invader noxious weed population (whitetop). There are 17 trailheads in the analysis area with populations of new invader noxious weeds, and there are 5 known new invader sites established along trails into wilderness **(see Figure 3.9-4 below).** The new invader weeds with the highest risk of establishment into the project area are whitetop, oxeye daisy, and orange and yellow hawkweed as all three can invade mountain meadows, and higher elevation forest openings. The areas with the highest potential for new introduction and spread are the lower elevation trails associated with trailheads with established weed populations, as discussed below.

Trailheads

Trailheads are areas of concentrated public use and have a high risk of new invader weed introduction. Diffuse knapweed is present at most all trailheads leading into the analysis area, but population densities are low with the exception of West Fork Methow, Williams Lake, and War Creek trailheads. Whitetop and oxeye daisy are species that are established at many trailheads with some spread up the trail systems. The trailheads of greatest concern are Billygoat and Thirtymile in the Pasayten and the Prince and Fish Creek trailheads in the Lake Chelan-Sawtooth. A large population of oxeye daisy is established at the Billygoat trailhead. The main infestation is along the road between the trailhead and the horse corral (a recently permitted assigned site) but there is a large patch near the corral and plants are scattered through the trailhead area. The 2001 Thirtymile trailhead has become weedy since the Thirtymile Fire with many established invaders, but there are also two small new invader sites of oxeye daisy and Russian knapweed. Common crupina is

near the Fish Creek Base Camp and the Prince and Fish Creek trailheads in the Lake Chelan-Sawtooth Wilderness. Weed surveys and treatment continue to be a priority at trailheads. New invader populations are currently low at trailheads with the exception of the above mentioned areas. Houndstongue has been found at trailheads but only a few individual plants.

Figure 3.9-4. New Invader weeds established at trailheads.

Sub-Area	Trailhead	Weed Species
Pasayten	Andrews Creek	oxeye daisy, spotted knapweed
Pasayten	Thirtymile	russian knapweed, oxeye daisy
Pasayten	Lake Creek	whitetop
Pasayten	Billygoat	oxeye daisy
Middle Methow	Slate Creek	whitetop, st. johnswort
Middle Methow	War Creek	whitetop, diffuse knapweed
Middle Methow	Wolf Creek	whitetop
Middle Methow	West Fork Buttermilk	whitetop
Middle Methow	Williams Lake	diffuse knapweed
Middle Methow	Crater Creek	whitetop
Middle Methow	Gilbert	oxeye daisy
Upper Methow	Harts Pass	dalmatian toadflax, common tansy
Upper Methow	West Fork Methow	diffuse knapweed
North Cascades Hwy	Rainy Pass	common tansy
North Cascades Hwy	Canyon Creek	common tansy
Lake Chelan-Sawtooth	Prince Creek	common crupina
Lake Chelan-Sawtooth	Fish Creek	common crupina

In addition to the list of weeds at trailheads associated with the analysis area that have new invader weed infestations (**Figure 3.9-4)**, noxious weed information and analysis for the following sites has been conducted through the 1997, 1999 and 2000 Weed EAs, the 2003 Crupina EIS, as part of the Blue Buck Hawkweed EA, and through recent inventories for this project. Figure 3.9-5 lists the actual weed species and number of sites found in each of the discrete portions of the analysis area.

Figure 3.9-5. Weed Sites in Analysis Area.

Subunit	Weed Species	Number of Sites	Gross Acres
Pasayten Wilderness	whitetop	1	1
Bear/Ramsey/Volstead	whitetop	3	4
	musk thistle	1	2
	orange hawkweed	4	11
	dalmatian toadflax	15	189
	sulfur cinquefoil	2	27
	Total New Invader	25	233
	*diffuse knapweed	12	692
	Total All	37	925
Middle Methow	whitetop	6	13
	oxeye daisy	7	45
	St. Johnswort	2	4
	dalmatian toadflax	1	2
	houndstongue	1	1
	common Tansy	1	1
	Total New Invader	18	66
	*diffuse knapweed	17	595
	Total All	35	661
Upper Methow	whitetop	7	19
	spotted knapweed	1	3
	Russian knapweed	1	8
	oxeye daisy	8	42
	dalmatian toadflax	3	30
	sulfur cinquefoil	2	2
	tansy ragwort	1	77
	common tansy	10	21
	Total New Invader	33	202
	*diffuse knapweed	10	282
	Total All	43	484
North Cascades Highway	many species	Numerous roadside	600+
Alta Lake	Russian knapweed	2	3
	dalmatian toadflax	4	436
	Total New Invader	6	439
Lake Chelan-Sawtooth and Sawtooth Backcountry	common crupina	Mostly continuous with ½ of total acres on private land	600
	Scotch broom spotted knapweed diffuse knapweed oxeye daisy	Scattered populations	356
	Total		956

*Diffuse knapweed populations are extensive along roads and not included in the new invader total for each subunit.

Bear/Ramsey/Volstead

There are 15 known sites of dalmatian toadflax for a total of 189 acres within the open bunchgrass habitat on the south facing slopes of Ramsey, Pearrygin, Bear, and Cougar Creeks. Most roads have populations of diffuse knapweed with 690 acres total. There are 2 small roadside sulfur cinquefoil sites and there are 4 closely associated small populations of orange hawkweed in old timber harvest units on the south slopes and in the bottom of upper Blue Buck Creek. These sites have not been affected by recently permitted outfitter-guide activities (see below under Potential Invaders) because there is no overlap of actual areas used. The higher elevation areas with few roads and north facing slopes within this area are less suitable for weed establishment due to the dense conifer overstory and/or the understory dominated by pinegrass, a competitive native. The orange hawkweed and Dalmatian toadflax has been a priority for herbicide treatment with consistent and effective control. An average of 20 person days have been needed to control the 11 acres of orange hawkweed since treatment began in 2008. All 189 acres of dalmatian toadflax has been greatly reduced in population densities are currently very low.

Pasayten Wilderness

Currently the only known new invader weed populations in the Pasayten are whitetop sites at Black Lake and Hidden Lakes. The Black Lake site was buried by the debris of a mud slide after the Farewell fire of 2003; it is not likely to re-establish. The Hidden Lake site continues to be pulled by FS wilderness personnel. There are three known new invader sites on trail systems between the trailheads and the wilderness. The highest risk of spread is the relatively large oxeye daisy population at the Billygoat trailhead (see discussion under Trailheads above). Otherwise, the Farewell Fire of 2003 increased the potential for weed establishment and spread within burned areas, however recent monitoring of trails has not detected any new establishment.

Lake Chelan-Sawtooth Wilderness and Sawtooth Backcountry

The only population of common crupina (*Crupina vulgaris)* in Washington occurs along the north shore of Lake Chelan, near the Fish Creek Base Camp and the Prince and Fish Creek trailheads. Common crupina is a Washington State Class A noxious weed. The infestation is on both public and private land, between Prince Creek and the uplake side of Hunts Bluff, from the lake level to around 3,500 feet elevation, and was likely introduced by early livestock grazing . No plants have been found over 3,500 feet elevation. The Lakeshore Trail cuts though some of the densest populations. Since the 2001 Rex Creek fire, and to some extent since 1988, crupina infestations along the trail were treated to prevent accidental spread by trail users. Treatment objectives have been a containment strategy and include hand-pulling where populations are sparse and herbicide spraying in the dense patches. The treatments have been mostly along the Lake Shore trail from Prince Creek to Hunts Bluff and have been effective in containing the spread. In 2003, the Forest Service issued the Crupina Control Record of Decision, and began treatments under this decision, however the state of Washington did a lot of treatment prior to this after it was first discovered. Between 2003 and 2011, 600 acres of crupina have been treated with herbicides, and treatments have been effective.

The following Class B noxious weeds are present at trailheads or along trails: Scotch broom (*Cystis scoparius*), spotted knapweed (*Centaurea biebersteinii),* and diffuse knapweed

(*Centaurea diffusa*). Oxeye daisy was found and pulled at one outfitter camp in the Fish Creek drainage. Knapweeds are pulled or sprayed at the Moore Point and Prince Creek trailheads as administrative sites, and along the Fish Creek and Lakeshore trails. There are 944 gross acres of new invader weeds within this subunit and all are below 3,500' elevation in relatively close proximity to the lake.

There are 12 acres of new invader weeds in the Sawtooth Backcountry.

Middle Methow

The Twisp River road system has established populations of new invader noxious weeds including one population of a potential invader (Japanese knotweed) on private land. Diffuse knapweed has been a problem in the Twisp River area with dense populations along roads and in trailheads and campgrounds established in the 1990s. There is a total of 595 acres of diffuse knapweed within the Middle Methow. Recent treatments under the 2001 Okanogan Forestwide EA have greatly reduced weed densities. Small infestations of oxeye daisy, whitetop, and St. Johnswort are also present along roads. The area of greatest concern is the 3.5 acre whitetop site at the Slate Creek trailhead and associated outfitter-guide base camp with a well-established population of whitetop inside the corral. Treatments have been effective in reducing the corral site population to a few scattered plants, but the trailhead still has low to moderate densities. In addition to diffuse knapweed, there are 18 sites and 66 gross acres of new invader weeds within this area.

North Cascades

The Washington Department of Transportation administers the roadside of Highway 20 under their easement; the area has well-established populations of noxious weeds. Common tansy, oxeye daisy, St. Johnswort , spotted knapweed, and dalmatian toadflax are common and can be present at most junctions with trailhead access roads. Rainy Pass and Canyon Creek are the two trailheads with known weeds on Forest Service administered land and have received some treatment as administration sites. St. Johnswort is common along the highway east of Rainy Pass and is scattered in patches. Common tansy is scattered evenly along the highway west of Rainy Pass to the Forest boundary. The weed populations are scattered extensively along the highway with the area of infestation exceeding 600 acres.

Alta Lake

Dalmatian toadflax is found throughout this area with some widely scattered and a few dense patches. There are two populations of Russian knapweed in the bottom of Alta Coulee. One patch is along the horse trail near between Alta Ponds. The Russian knapweed sites have been effectively treated with herbicide under the 1998 Wenatchee Forestwide EA. The dalmatian toadflax is currently being treated under the Wenatchee Forestwide EA through a containment strategy in the Alta Pond area, but is too widespread and is under biological control elsewhere in the Coulee. There is a relatively large disturbed soil area in the Alta Coulee bottom near Alta Pond where public saddle stock continue to maintain the bare soil; weed densities are high along the perimeter of the impacted area. There is a high density of diffuse knapweed, in addition to Russian knapweed. There are three acres of Russian knapweed and 436 acres of dalmatian toadflax.

Established Invaders

Lower-priority established invaders occur throughout the analysis area. These weeds are found Forest-wide and generally not site-specifically inventoried because they are so prevalent; however they are inventoried in wilderness.

Pasayten Wilderness

The following established invaders were detected in an around disturbed camp sites in the Sheep Mountain and Spanish Camp areas above 6,000' elevation: lambsquarters (*Chenopodium album)*, orchardgrass (*Dactylis glomerata*), tansymustard *(Descurainia species)*, dwarf mallow (*Malva neglecta)*, black medic *(Medicago lupulina)*, common plantain (*Plantago major)*, knotweed *(Polygonum species);* red sandspurry *(Spergularia rubra)*, northern starwort *(Stellaria calycantha)*, longstalk starwort *(Stellaria longipes)*, and white clover *(Trifolium repens*). These species are currently restricted to the most hardened and disturbed sites, but their potential for persistence and spread is not understood in these high elevation environments.

Lake Chelan-Sawtooth Wilderness and Alta Lake

Established Invaders include Canada thistle (Cirsium arvense) field bindweed (*Convolvulus arvensis)*, and common mullein (*Verbascum thapsus*). Many non-native, undesirable species can be found along trails generally associated with the more open dry sites: dandelion (*Taraxacum officinalis),* yellow salsify (*Tragopogon dubius*), crane's bill (*Erodium cicutarium)*, orchard grass (*Dactylis glomerata)*, bull thistle (*Cirsium vulgare)*, horse-tail fern (*Equisetum arvense),* and prickly lettuce (*Lactuca serriola).* Non-native annual grasses including cheatgrass (*Bromus tectorum)*, bulbous bluegrass (*Bromus bulbosa)*, and slender fescue (*Festuca vulpia)* are also present.

Potential Invaders

Several sites outside the analysis area have potential to spread. In the Bear/Ramsey/Volstead area, there are four closely associated sites of orange hawkweed in timber harvest units on the south slopes and in the bottom of upper Blue Buck Creek. These are not affected by recently permitted outfitter-guide activities. As these small sites are isolated from most of the analysis area, they are classified as potential invaders. These sites have been surveyed and mapped. Yellow hawkweed is common along the highway west of the Forest boundary just inside the North Cascades National Park; it has potential to spread to trails along the North Cascades Highway. Several population of Japanese knotweed are in the Methow Valley Bottom, including the Chuwuch river valley bottom, and the Twisp River valley bottom. Sulfur cinquefoil is well established in the Cub Creek and lower Eightmile Creek areas with the potential to spread into the project area.

Current Practices

Prevention and Management Strategy

The current strategy for invasive species management has four elements (USDA 2004b):

- Prevention – Stop invasive plants before arrival.
- Early detection and rapid response – Find new infestations and eliminate them before they become established.

- Control and management – Contain and reduce existing infestations.
- Rehabilitation and restoration – Reclaim native habitats and ecosystems.

Each of these prevention and management strategy elements is addressed in detail in the analysis file, and the effects of this strategy are discussed in the cumulative effects analysis below.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

This alternative would result in no issuance of pack and saddle outfitter guide permits. As a result, there would be 2% less pack and saddle stock traffic in the analysis area with this alternative compared to the current condition. Outfitters would not be permitted to use corrals or assigned sites. Introduction and spread of noxious weeds by pack and saddle outfitter-guide and associated vehicles would not occur. The trailheads, corrals, trails, and camp sites would still be used by the general public and non-pack and saddle outfitter guides, but by less vehicle traffic, stock and people than in the past. There would be a lower rate of weed spread and introduction expected, however less outfitter-guide presence and less recreation administrative activities would reduce the degree of new weed recognition and reporting. This would result in longer time frames for weeds to establish before being discovered, resulting in larger infestation sizes prior to initial treatment

With fewer stock and people using an area, some vegetation recovery is expected. However, the general public and non-pack and saddle outfitter guides would continue to use these areas, so disturbance at these sites would continue. Elimination of pack and saddle outfitter guide services in these areas may result in more inexperienced stock and stock handlers from the general public entering the analysis area. Inexperienced stock or stock handlers could result in greater resource damage by disturbing more ground and creating more seed bed in the analysis area than would occur with a more experienced outfitter-guide. The risk of invasive introductions would continue with the general public and non-pack and saddle outfitter-guide use, but to a lesser degree because of fewer overall stock and people using the trails and campsites; this would likely result in a lower rate of spread and introduction.

Alternatives 2, 3, and 4

Introduction and movement of invasive species transported by animals would continue. Stock have the potential to further spread weed species into wilderness and elsewhere where suitable habitat exists. The mitigation measures specific to invasive species would mitigate potential effects by minimizing the potential establishment and spread of noxious weeds in the analysis area and are analyzed below.

- 13a. Outfitter-guides and clients would be required to prevent the introduction and spread of noxious weeds on National Forest System land by removing any plant material attached to vehicles, shoes, clothing, or the bodies of pack and saddle stock. Compliance to this mitigation would be effective in the reduction of spread of plant material that is readily visible. As invasive plant seeds are often small and difficult to see, many seeds may attach

to vehicles, shoes, clothing, or pack and saddle stock without being detected. The effectiveness of this mitigation is proportional to the visibility of the plant material and the compliance of the outfitter-guides and their clients.

- 13b. Outfitter-guides would be required to use only certified weed-free feed, commercially processed feed, or weed-free certified processed hay cubes on all National Forest System Land. This would be very effective in reducing the potential for establishment and spread as forage and mulch products sometimes contain seed or reproductive parts from non-native, invasive and noxious weeds. National Forest lands are among the areas most vulnerable to impacts from weeds and are also, in general, where prevention of infestation is most likely to succeed.

- 13c. Outfitters typically use processed hay when feeding stock in the backcountry or alternately, they turn animals out to loose graze native vegetation, reducing the risk of exotic species introduction. However, when stock graze on weedy areas at the home base, there is a risk that viable weed seed would pass through the animal while in the wilderness or backcountry and establish new weed populations unless it is fed certified weed free feed for several days before entering the backcountry. Although the mitigation measures ask pack and saddle outfitter-guides to consider feeding stock certified weed free feed several days prior to their trips, this mitigation has low effectiveness potential because they are not required to do so. It is expected that the potential for new weed introduction and spread through pack and saddle stock manure would be slightly higher in Alternatives 2 and 4 than in the recent past because of the larger number of pack and saddle stock permitted use in the analysis area. Alternative 3 would likely result in a slightly lower risk because of reduced permitted use.

- 13d & e. As mitigation, a noxious weed Identification and mapping program would be designed specifically for pack and saddle stock outfitter-guides. This program would be designed in coordination with the District invasive plant specialist. It is expected that the implementation of this program would increase the number and distribution of people able to recognize potential new invaders, because pack and saddle outfitter-guides would be required to map and report invasive species. Pack and saddle outfitter guides spend a great deal of time in these backcountry and wilderness areas so early detection of newly found weed populations are far more likely than under the existing condition. Actual treatment would be implemented under other NEPA documents. Under the mitigation measures, outfitters would be required to assist in those future treatments.

The Forest Plan amendments included in Alternatives 2, 3, and 4 would also help control the potential spread of invasive plants by limiting the barren core areas that could be used by pack and saddle outfitter-guides at wilderness campsites. Recovery of unused barren core would have no risk of weed establishment by pack and saddle outfitter-guides. Under the action alternatives, this potential for recovery is highest in Alternative 3, followed by Alternatives 2 and 4.

Most of the invasive species and noxious weeds are not expected to establish and spread in the colder subalpine and alpine environments where most outfitter-guide campsites occur. All destination campsites are above 4,000 feet in elevation, which limits the establishment and persistence of most invasive species due to the colder environment. However, nearly all the

entry points into these destination camps start at lower elevations and in habitats suitable for most invasive and noxious weed species. Fish Creek, Andrews Creek, and Slate Creek base camps are below 4,000 feet, and most vulnerable for weed establishment. The primary habitat for common crupina is on hot, dry southern slopes in shrub steppe grassland and open ponderosa pine and Douglas fir forest below 2800 feet in elevation. There are 10 outfitter-guide camps (9%) in this habitat that are susceptible to invasion of this highly invasive plant. Crater Creek and Billygoat Creek base camps are above 4,000 feet but below 4,500 feet, leaving them slightly less vulnerable to most invasive species establishment, but still a concern. In addition, whitetop, oxeye daisy, orange hawkweed, and houndstounge have been found within the project area to do well at elevations above 4,000 feet in colder climates where most outfitter-guide activities occur.

The current outfitter-guides are permitted 4,460 days of use. This number would be increased in Alternative 2 to 4,620, reduced to 2,660 in Alternative 3 (40% reduction from recently permitted level), or increased to 6,700 in Alternative 4 (50% increase). The potential for introduction and spread would range from similar (Alt. 2) to slightly less than (Alt. 3) to slightly more than (Alt. 4) under the recently permitted use, since these changes represent a 1% increase in the number of visitor days in Alternative, 1% decrease in Alternative 3, or a 3% increase in Alternative 4. These changes are too small to affect the overall potential for invasive plant introduction and spread. In Alternatives 2 and 4, outfitter-guides would use existing trails and camps; no new camps or trails would be developed. Alternative 3 would also require pack and saddle outfitter-guides to use existing trails and camps, but additionally would prohibit them from using established camps with 200 feet of wetlands, lakes, and steams. The camps that would be eliminated currently do not have any new invader weeds within them so this prohibition would not likely affect them.

Cumulative Effects

This cumulative effects analysis considers effects of past, present, and reasonably foreseeable future actions within the analysis area. The geographic boundary for the cumulative effects analysis is the entire analysis area and areas where there is a potential for spread from adjacent lands, and the temporal boundary is the period of time from the early 1900s to well into the future. There is a potential for effects of weeds introduced under alternatives 2, 3, and 4 to continue long after permits issued under this document expire.

Reasonably Foreseeable Future Actions

The Forest is currently working on an EIS to permit invasive species treatment forest-wide which would allow treatments with all strategies in areas outside wilderness, and within wilderness treatment areas. This document is expected to be completed and implemented in 2013. The document analyzes new management strategies for controlling weeds, including those in riparian areas. The treatments under this EIS are expected to help control the establishment and spread of noxious weeds in the analysis area.

All new invader sites are authorized for treatment under current NEPA documents for an aggressive treatment strategy to contain, reduce, or eradicate the populations. Herbicides will continue to be used in areas approved under the 1997, 1999 and 2001 Integrated Weed Management EA (USDA Forest Service 1997e, USDA 1999a, and USDA Forest Service 2000d) Decision Notices, the 2003 Crupina Integrated Weed Management FEIS (USDA Forest Service

2003b) Record of Decision, and the 2008 Blue Buck Hawkweed EA and Decision Notice. Trailheads will continue to be a priority for weed surveys and treatment. Integrated weed management will reduce the risk of spread from currently infested areas on access roads, trailheads, and trails into the outfitter-guide activities areas.

All the known new invader noxious weed sites in and adjacent to the analysis area are being prioritized for integrated weed management. Integrated weed management would continue in the new invader weed infestations on recreation access roads, trail heads, trails, corrals, camps and off roads in areas where weeds may spread to impact recreation facilities and activities. Integrated weed management would be accomplished by implementing a combination of all the control methods available with emphasis on early detection of new infestations, rapid treatment response, and prompt revegetation. The combination of herbicide, manual, and cultural treatment together would provide effective control of small populations. District weed treatments with herbicides are authorized under the1997 and 2000 Weed EA Decision Notices and the 2003 Crupina EIS Record of Decision.

All types of recreation will continue to be vectors for disturbance and weed spread in the analysis area, including, but not limited to outfitter-guide packing, hiking, camping, mountain biking, and trail maintenance/rehabilitation.

Commercial livestock grazing can continue to transport weed seeds across the landscape with dispersal into disturbed areas, although only outside wilderness since commercial grazing no longer occurs in wilderess. Given the existing low noxious weed densities in the analysis area, and that there are virtually no areas where outfitter-guide activities occur in commercial livestock (cattle) grazing areas, so the likelihood of outfitter-guide stock to spread weeds introduced by cattle is low.

Alternative 1

The cumulative effects of Alternative 1 and all past, present, and reasonably foreseeable future actions would continue to provide vectors for weed spread although not in conjunction with outfitter-guide activities under this decision. Current disturbances would continue to provide sites suitable for weed establishment. Control of existing weeds would continue to occur under the existing Integrated Weed management decisions which would result in reductions in weed populations. A Forest-wide EIS is planned for completion in 2012; the decision would likely help to control the spread and establishment of invasive plants in the analysis area because additional areas and more effective and less impactful herbicide treatments could be used. The combination of herbicide, manual, and cultural treatments together would provide effective control of small populations. Treatments would be conducted by the District Weed program with herbicide treatments authorized under the 1997, 1999 and 2001 Noxious Weed EA Decision Notices, the 2003 Crupina EIS Record of Decision, and the 2003 Blue Buck Hawkweed Decision.

No cumulative effect would occur because outfitter-guides would not be adding any incremental effects, although short-term increases in amounts of established invaders and slight increases in the amount of new invaders may occur from use by the general public and non-pack and saddle outfitter-guides. Recovery of unused barren core would have no risk of weed establishment by

pack and saddle outfitter-guides, however there is a potential for the public to spread weeds into these areas.

In the long-term, with implementation of weed prevention awareness by recreationists, including on-going weed management, weed populations would be reduced.

Alternatives 2, 3, and 4

The risk of invasive plant introduction and spread would be reduced through an Integrated Weed Management approach, implementation of mitigation measures in this analysis and weed control treatments. A Forest-wide EIS is planned for completion in 2013; the decision would likely help to control the spread and establishment of invasive plants present in the analysis area with more effective, less impactful treatments. The combination of herbicide, manual, biological and cultural treatments together would provide effective control of small populations. Treatments would continue to be conducted by the District Weed program with herbicide treatments authorized under the 1997, 1999 and 2001 Weed EA Decision Notices, the 2003 Crupina EIS Record of Decision, and the 2008 Blue Buck Hawkweed Decision Notice. With implementation of mitigation measures included in Alternatives 2, 3, and 4, and on-going weed management, weed populations would be reduced. The combination of these actions would lessen the threat of invasive plants to native plant communities in the analysis area as a result of outfitter-guide activities, even with increased numbers because of the increase in mapping, reporting and awareness by outfitter guides.

The continued effective control of Crupina would greatly reduce the potential of spread by outfitter-guide activity to other area within its primary habitat. With only 9% of the outfitter-guide camps within habitat that is susceptible to invasion, the likelihood of establishment of seed dispersal by outfitter-guide activities is relative to the limited suitable habitat within the project area.

Implementation of the Prevention and Management Strategy located in the analysis file with emphasis on early detection and rapid response to any new found populations would reduce the likelihood of the establishment of large new invader infestations.

Although the mitigation measures recommend pack and saddle outfitter-guides to consider feeding stock certified weed free feed several days prior to their trips, this mitigation has low effectiveness potential because they are not required to do so.

Summary Statement

The cumulative effects of all past, present, and reasonably foreseeable future actions would be short-term increases in amounts of established invaders and slight increases in the amount of new invaders. In the long-term, with implementation of mitigation measures and an increase in weed prevention awareness by outfitter-guide and recreationists including on-going weed management, weed populations would be reduced.

CONSISTENCY FINDINGS

All alternatives are consistent with the both the Okanogan and Wenatchee Forest Plan, and 2005 PNW Rod standards and guidelines.

Okanogan National Forest Plan Standards and Guidelines

- 12-1: Control noxious weeds to the extent practical.
  Mitigation measures 14 a-e would control noxious weeds potentially spread or introduced by pack and saddle stock outfitter-guide activities to the extent practical.

- 12-2: New infestations of noxious weeds should be the first priority for eradication.
  This standard and guideline does not apply to pack and saddle stock outfitter-guide operations.

- 12-3: Emphasis on noxious weed control shall be on the prevention of infestations, especially into unroaded areas and wilderness.
  Mitigation measures 14 a-e would prevent noxious weed infestations, to the extent practical, by pack and saddle stock outfitter-guides. Nearly all their activity is in unroaded areas and wilderness, so the prevention measures would reduce the risk of introducing weeds into these areas.

Wenatchee National Forest Plan Standards and Guidelines

- Cooperate with the Washington State Noxious Weed Control Board and other state, county and local agencies and organization in the identification, location, prevention and spread of noxious farm weeds.
  This guideline regarding noxious farm weeds does not apply to this project.

- Develop an Action Plan for inventory and monitor populations of noxious weed populations on the Wenatchee National Forest.
  Mitigation measures 14 d and e would require the pack and saddle stock outfitter-guides to monitor for weeds within campsites, and follow a weed identification and mapping program under the direction of the Forest Service. These inventory and monitoring measures would comply with this standard and guideline.

- Conduct a noxious weed assessment for all significant ground disturbing project activities to determine the risk of introducing noxious weeds and develop a plan to prevent introduction on moderate and high risk sites.
  The pack and saddle stock outfitter-guide activities would not cause significant ground disturbance so this standard and guideline does not apply. None-the-less, mitigation measures 14 a-e would reduce the risk of pack and saddle stock outfitter-guide activities introducing noxious weeds.

- Contain, control or eradicate existing populations as budget allows.
  This standard and guideline does not apply to the pack and saddle stock outfitter-guide permits, since treating existing populations is not part of the purpose and need.

2005 PNW Rod Standards and Guidelines
The applicable 2005 PNW ROD (USDA Forest Service 2005a) standards are included in mitigation measures 14a-e and the analysis provided above. These measures would apply to all alternatives, ensuring compliance with these standards and guidelines.

3.10 RANGE RESOURCES

The section below is a summary of the Range Report which is available in the project analysis file (McFetridge 2012a).

REGULATORY FRAMEWORK

The Okanogan National Forest Land and Resource Management Plan (Forest Plan, USDA Forest Service 1989b) established management goals. The objective of range management is to protect resources and continue the management of the affected commercial[5] grazing allotments (designated areas to graze) while providing for recreation opportunities. All active allotments within the project area are managed according to standards and guidelines in the Okanogan Forest Plan.

The following forest-wide standards and guidelines apply to commercial grazing and recreational livestock grazing associated with pack and saddle stock outfitter-guide activities.

11-4 and 11-5: Forage utilization standards outside and inside riparian areas. Refer to tables on pages 4-43 and 4-44 in the Okanogan National Forest Plan.

11-6: Range structural and non-structural improvements and maintenance shall conform with the resource emphasis of the Management Area and shall be specified in the AMP.

11-7: Range improvements and practices shall not be designed to increase livestock use in riparian ecosystems, but should enhance riparian ecosystems.

Some management-area specific standards and guidelines also pertain to the pack and saddle stock outfitter-guides. These are listed by sub-unit below. These Management Areas are shown on the sub-area maps in the Map Section.

[5] Because this analysis discusses two types of grazing, recreational stock grazing by outfitter-guides, and grazing permitted through the allotment management process, the latter is referred to as “commercial” livestock grazing for clarity.

Pasayten Wilderness

The Pasayten Wilderness is divided into Management Area 15A and 15B. Pack and saddle stock outfitter-guides are not permitted to operate or graze recreational livestock in 15A, so none of the standards and guidelines there apply to the outfitters.

Management Area 15B: 15B-11B: The forage resource shall be utilized in conformance with all wilderness resource values.

Lake Chelan-Sawtooth Wilderness

The Lake Chelan-Sawtooth Wilderness is divided into Management Areas 15A and 15B in the portion on the Methow Valley Ranger District (Okanogan Forest Plan) and WI-1 in the portion on the Chelan Ranger District (Wenatchee Forest Plan). Pack and saddle stock outfitter-guides are not permitted to operate or graze recreational livestock in 15A, so none of the standards and guidelines there apply to the outfitters. There are no standards and guidelines for WI-1 that pertain to pack and saddle stock recreational livestock grazing.

Management Area 15B: 15B-11B: The forage resource shall be utilized in conformance with all wilderness resource values.

North Cascades

This area includes Management Areas 4, 5, 7, 10, 17, and 25, in addition to Late Successional Reserves, Administratively Withdrawn, and Riparian Reserves, from the Okanogan Forest Plan, as amended by the Northwest Forest Plan.

There are no standards and guidelines that pertain to recreational stock grazing by pack and saddle stock outfitter-guides in management areas 4, 5, and 25.

Management Area 7: MA7-11A Domestic livestock grazing shall not be permitted. Recreation livestock grazing shall be permitted except for the meadows at Rainy Lake turnoff and Whistler Basin. Users should be encouraged to use weed-free hay.

Management Area 10: MA10-11A Livestock use should not be increased over existing permitted numbers. The goal for Management Area 4 is to: [p]rovide semi-primitive non-motorized recreation opportunities during summer and fall seasons (4-61).

Sawtooth Backcountry

The Sawtooth Backcountry includes Management Area 4M on the Methow Valley District (Okanogan Forest Plan), and Management Area RE2a on the Chelan District (Wenatchee Forest Plan), as amended by the Northwest Forest Plan.

There are no standards and guidelines for Management Area 4M that apply to recreational livestock grazing by pack and saddle stock outfitter-guides. The standards and guidelines for

Management Area RE2a that apply to the outfitter-guides are listed below. The remaining standards and guidelines for that management area do not apply.

Management Area RE2a (page IV-66, Wenatchee Forest Plan)

- Grazing of suitable range by livestock shall emphasize range management practices that favor unroaded, motorized, dispersed recreation.
- Management of the range resource under this prescription will seek full utilization of forage allocated to livestock.
- Control noxious weeds as practical.

Bear/Ramsey/Volstead

This area includes Okanogan Forest Plan Management Areas 14, 25, and 26, as amended by PACFISH (see Aquatics section for PACFISH regulatory framework). There are no standards and guidelines in these management areas that pertain to pack and saddle stock recreational livestock grazing.

Middle Methow

This subsection is divided between Management Areas 5, 10, and 25, in the Okanogan Forest Plan, as amended by the Northwest Forest Plan.

There are no standards and guidelines that pertain to recreational stock grazing by pack and saddle stock outfitter-guides in management areas 5 and 25.

Management Area 10: MA10-11A Livestock use should not be increased over existing permitted numbers. he goal for Management Area 4 is to: [p]rovide semi-primitive non-motorized recreation opportunities during summer and fall seasons (4-61).

Alta Lake

This subsection is divided between Management Areas 5 and 14 in the Okanogan Forest Plan, as amended by the Northwest Forest Plan. There are no standards and guidelines that pertain to pack and saddle stock outfitter-guide recreational livestock grazing for these management areas.

ANALYSIS METHOD

The geographic boundary for range is the analysis area plus the area of all pastures within commercial grazing allotments that overlap outfitter-guide activities (active trailheads, trails, camps). The temporal boundary is the period of time from the 1900s through 2024 because the permits that would be issued under this analysis would expire at that point and impacts from them would cease. Any impacts to vegetation from pack and saddle stock outfitter-guide recreational grazing would recover within a year after grazing ceases.

This analysis assesses the effect of the proposed alternatives on six livestock grazing allotments and the effect of current and historic grazing using the best available science. The following specific indicators are used to describe the direct, indirect and cumulative effects.

- Qualitative and quantitative discussion about the impacts of historic sheep and cattle grazing activities in the project area compared to the level of current impacts.
- The cumulative effects of outfitter-guide pack and saddle stock and commercial livestock (cattle and sheep) grazing, and compliance with Forest Plan standards and guidelines.
- Number of Animal Unit Months (AUM) of forage utilized by outfitter-guide pack and saddle stock compared to the number of historic AUMs of forage utilized in grazing allotments.
- Qualitative discussion of outfitter-guide stock grazing.

AFFECTED ENVIRONMENT

There is currently no permitted commercial livestock (cattle or sheep) grazing in the Pasayten Wilderness, Lake Chelan-Sawtooth Wilderness, or the Sawtooth Backcountry areas. All prior allotments are vacant or closed. Vacant allotments are schedule for NEPA analysis to update the allotment management plan or to close the allotment.

The Bear/Ramsey/Volstead, North Cascades, Middle Methow, and Alta Lake areas have some level of commercial livestock grazing, however there are virtually no areas where outfitter-guide activities, especially pack and saddle stock grazing, occurs in the livestock (cattle or sheep) grazing areas. There are no deluxe or progressive camps or the associated trails or trailheads in permitted livestock grazing areas. The recreation activities that occur within the livestock allotments are typically day use with hiking or saddle horse riding. The only outfitter-guide activity within livestock allotments is taking clients to drop camps with no overnight pack and saddle stock use or passing through the allotment to camps outside the allotment. The day use activities utilize a negligible amount of forage with no measurable impacts on the rangeland resource. The primary foraging areas within commercial livestock grazing allotment are associated with road systems and with the livestock utilizing the transitory range within historic timber harvest units adjacent to roads. The current pack and saddle stock outfitter-guide activities in general are almost exclusively within the areas with no roads. Because of this there is virtually no overlap of livestock grazing and these outfitter-guides activities. There are no areas with range resource impacts of both outfitter-guide stock and livestock (cattle or sheep) in the same area.

Grazing History

The analysis area has a long history of grazing. In the recent past (1960s), there were 6,464 AUMs grazed by livestock. In the early to mid-1900s, there were 15,000 AUMs grazed annually. According to Forest Service records, sheep grazing was first introduced in about 1908, but possibly earlier. During the World War I years, the number of sheep grazing in the area increased dramatically, and then gradually decreased until after Work War II, when most of the sheep allotments were changed to cattle allotments. At their peak, there were many thousands of sheep grazing in the Pasayten and the Lake Chelan-Sawtooth areas. Typically the Forest Service regulated and documented sheep band size based upon the number of mature ewes. The number of lambs were unregulated which would indicate that the total number of sheep documented in the Forest Service records was likely much higher.

To support early livestock operations, numerous mountain trails were built. Many of these trails still exist today as Forest Service system trails. Some trails were constructed to provide access to sheepherder camps and grazing lookout sites. Many of these camps continue to be used today by recreationists and outfitters. Numerous sheep and cattle driveways were constructed to enable livestock to access key use grazing areas but no longer used for commercial grazing.

Allotment records indicate that during 1920 and 1930 many grazing allotments could no longer support the large sheep numbers. Available forage had declined tremendously. Domestic sheep numbers steadily declined through the 1940s, 1950s, until present. The last sheep permit in the Pasayten was converted to cattle in 1949; cattle grazed the area until 1994 then waived back to the Forest Service in 1999.

Compared with sheep, cattle operations are more recent and more closely monitored by the Forest Service. Grazing is closely monitored for forage utilization. Other than localized areas of high use, no detrimental grazing practices have been documented on the currently active allotments.

Sheep camps and trails were established by the sheep grazing operations. Current system trails used by Outfitter-guides are often on the same footprint as the old sheep trails.

The overuse and unsatisfactory management in the early years is still evident. Grazed areas are slowly returning to pre-grazing conditions, however many of the sheep driveways and sheep camps can still be identified by the sparse vegetation and differences in plant species composition compared to areas not grazed. With the closing of the wilderness livestock permits, even with outfitter-guide grazing, the forage use and resource impacts are far below the use and impacts under the old commercial grazing allotment stocking rates.

Pasayten Wilderness

Sheep grazing in the Pasayten peaked in the early 1900s when as many thousands of sheep traveled from Horseshoe Basin to the crest of the Cascades. The high number of sheep began to fall by the mid-1900s until allotments were vacated in the late 1990s. The grazed areas are slowly returning to pre-grazing condition, however many of the sheep driveways and sheep camps can still be identified by the sparse vegetation and differences in plant species composition compared to areas not grazed.

Sheep grazed the Cathedral Allotment from 1909 to 1948 reaching a peak of 5 bands (5000 ewes with lambs) around 1912. By 1921 numbers had been reduced to one band on Beaver Creek, Bob Creek, and Bald Mountain from July 15 to September 15. In 1949 the allotment was converted to cattle with 350 head of yearlings on the Bald Mountain, Beaver Creek, Bob Creek, and Remmel Lake area. From 1949 to 1967 actual use ranged from 340 to 520 head. In 1968 the permit was changed to a 300 cow/calf permit. In 1981 the Cathedral Allotment was converted to the Remmel Mountain Allotment with two units, the Bob Creek unit in the Bald Mountain area and the Coleman Ridge unit in the Remmel Lake area. The Remmel permit was 160 cow/calf pairs from July 15 to September 30 and was waived back to the government in 1999 with the last year of grazing in 1994. There were 528 AUMs in this area.

The Horseshoe Basin Allotment was first used by sheep from 1910 to 1964 with 4 years of non-use between 1948 and 1951. Boundaries of the allotment have changed slightly from time to time but in general the total area has remained the same. The Remmel Lake fire of 1929 and the Toats Coulee fire of 1930 created transitory forage, opening up considerable land to grazing through 1947. During the period when the burns produced lush feed, two bands totaling 2000 sheep were allowed to graze. In 1948, it was thought the allotment was being overused and 4 years of non-use were implemented and numbers were decreased to 1,200 head through 1964. Between 1961 and 1966 economics made it desirable to transition from sheep and convert the entire allotment to cattle. In 1972 the cattle permit was relinquished and by 1976 the allotment was converted back to sheep. Sheep grazing continued on the allotment until 1997 with 1,100-1,200 ewe/lambs from early July to mid-September. The permittee waived the allotment back to the Forest Service in 2000. There were 480 AUMs in this area.

Lake Chelan-Sawtooth Wilderness, Sawtooth Backcountry, and Middle Methow

The grazing history dates back to 1912 with 5400 sheep grazing the Foggy Dew Creek-Merchants Basin portion. Use in the Horsethief Basin area by sheep dates back to 1921. During 1913-1916, records indicate that 5,000 sheep were permitted in the Chelan Summit area, from Sunrise Lake to Surprise Lake. In 1929 several allotments were combined into two major allotments. Crater Creek and Foggy Dew Creek were the Foggy Dew Allotment. East Fork Buttermilk, Fish Creek, and Meadow Creek were the Buttermilk Allotment. From 1929 to 1943 the combined permitted use for the two allotments was 1,200-2,400. In 1944, the two allotments were combined as the Buttermilk Allotment with one band of 1,200 to 2003 – the last year it was grazed. The season of use was May 15 to October 15 then shortened to September 30 in 1946, and in 1951, the most recent season of use was established from June 1 to September 30. There were 975 AUMs in this area.

The Horsethief Allotment (Horsethief Basin area) was grazed by 60 to 70 cow/calf pair until the permit was waived back to the Forest Service in the 1990s. The Lake Chelan side in the Hunter McFarland Allotment from the ridge top to the lake including Safety Harbor Creek east to Mitchell Creek was converted a couple times from sheep to cattle to sheep pending economic, or more recently, resource concerns. The permitted use was 1,200 ewes/lambs or 250 cow/calf pairs. The sheep portion of the permit was waived back to the Forest Service to aid in the introduction of California big horn sheep in 1999. The only active portion of the permit remains on the Methow Valley District side which is all outside the project area. Virtually all of the Sawtooth Backcountry was included under the Sawtooth Recreational Allotment and there was also a permit to graze 30-40 head of horses in the Prince Creek area in the 1980s. There were 1,300 AUMs in this area.

The Wolf Creek area was used by sheep from 1900 to 1930 and heavily used for 20 to 25 years. Records show that the area west of the North Fork of Wolf Creek constituted the area for sheep and the area east of the North Fork to the Forest Boundary was used by cattle. The best range was within the sheep area and it was determined to be overgrazed. In 1930 the entire Wolf Creek drainage was included in the Wolf Creek Cattle Allotment and grazed until the wilderness portion was waived back to the Forest Service in 2000. The numbers fluctuated between 130 and 236 cow/calf pair with the season of use starting at June 1 to October 31 and gradually shortened to June 1 to September 30 by 1960. The permit was reduced to 60 cow/calf pair in 2000 when the wilderness portion of the allotment was waived back to the Forest Service. There were 1,070 AUMs in this area before the permit was reduced in 2000.

Bear/Ramsey/Volstead

The Ramsey Creek Allotment has been used by cattle since about 1900; it includes the Ramsey, Pearrygin, Bear drainages. The area was heavily grazed from 1906 to 1920. This allotment extends along the Forest boundary for 10.5 miles and with large number of homesteaders adjacent to the allotment; trespass was common and early and late grazing was the practice. At peak stocking between 1910 and 1920, 265 head were permitted. At that time there was no boundary fence and the more gentle slopes and natural feed areas extended on into the Forest and there was a high percentage of trespass by unauthorized stock. The greatest damage to the lower portion of the range came from the trespass cattle and horses of the homesteaders. One hundred head of cattle and 300 head of horses roamed the area as late as 1925. This use peaked between 1910 and 1918. Cattle numbers were reduced through shifting permittees to other allotments and because the homesteads were abandoned. The last of the homesteads in this area were purchased in 1943 and 1944, by Washington State. In 1948 a boundary and drift fence was built by the State from Boulder Creek to Beaver Creek. The season of use on the range was changed in 1947 from April 1 to October 30, to June 1 to October 15. The last stocking adjustment was made in 1950 to June 1 to September 30. There are currently 322 AUMs in this area under a new AMP completed in 2007.

The Beaver allotment (Volstead Unit) has been used since 1916. The first year recorded cattle permit was for 53 cow/calf pairs from April 15 to October 15. The highest number of permitted cattle was in 1920 for 319 cow/calf pairs from April 15 to October 15. The allotment was officially converted from sheep to cattle in 1942, however, during the 1950's, there were at least 2 bands of sheep permitted to route through the allotment in addition to the cattle permits. Sheep were typically grazed at the higher elevations until it was later converted to all cattle. In 1964 an allotment management plan (AMP) was written that allowed 128 cow/calf pairs to graze from June 1 to September 30. This included 50 pair on the Beaver Meadows unit from July 1 to September 30 and 78 pair on the rest on the allotment. In 1972 the Cougar Creek area was added to the Beaver allotment and to increase the cattle numbers from 78 to 140 cow/calf pairs. The plan for the Beaver Meadows unit remained at 50 pair from July 1 to September 30. In the late 1980s resource damage became evident in the Beaver Meadows unit and the unit was rested for resource protection in 1992 and was closed to grazing in 2004. Currently 110 cow/calf pairs graze the Volstead unit from late June to early August with a total of 186 AUMs.

North Cascades

The Harts Pass Sheep Allotment and the Goat Cattle Allotment are in the North Cascades area. The last allotment management plan for the Harts Pass was 1985 with 1,200 ewe/lambs grazed in conjunction with the Buttermilk sheep allotment. The Harts Pass allotment was grazed until it was waived back to the Forest Service in 2000. There were 560 AUMs in this area.

The Goat Allotment has been grazed by cattle since 1910. In 1950, the land between Goat Creek and Lost River was designated as the Goat Allotment. Cattle numbers stabilized to 170 cow/calf pair with the season of use June 1 to September 30 from 1965 to the present. There are currently 756 AUMs in this area under the new allotment management plan. Although the Forest Service issued a revised Goat AMP decision on September 25, 2007, it was later withdrawn as a result of NEPA deficiencies and management reverted to the old AMP until the most recent NEPA was completed in 2012 to update the AMP.

The Boulder Allotment was grazed exclusively by sheep from 1923 to 1938 with 500 to 1,900 ewe/lambs. The use by sheep included south slopes and bottom range areas in the first few miles of Early Winters Creek above the confluence with Cedar Creek. The allotment was converted to cattle in 1938 with100 cow/calf pair for 5 months, and then shortened to 4 months in 1949. By 1983 the numbers were reduced to 62 cow/calf pairs from June 15 to September 30 with pastures north of Early Winters Creek and west of Cedar Creek dropped from the allotment. Currently the permitted use is 40 cow/calf pair from June 1 to September 30 every other year. There are 291 AUMs in this area.

Alta Lake

The Alta Coulee Allotment has been grazed by 25 cow/calf pair of cattle for many years. In recent years only the bottom of the coulee has been grazed in conjunction with private land on Antoine Creek; the Alta Pond area has been rested.

Permitted Livestock Grazing within the Project Area

The following are brief descriptions of the livestock grazing allotments that may have the potential to be impacted by outfitter guide activities. Grazing within each of these allotments is currently meeting Forest Plan allowable forage use standards and Streambank Alteration standards (Cowley et al. 2006).

Bear/Ramsey/Volstead

Beaver Allotment is 43,947 acres with four separate pastures (grazing areas) operating under the 2007 Allotment Management Plan (AMP). The grazing system is a deferred-rest rotation. Currently the permit allows 140 cow/calf pairs to graze annually from May 10 to September 30, which equals 887 animal unit months (AUM, the amount of dry forage required by a 1000 pound dry cow for one month – 1 cow/calf pair is 1.32 AUMs see glossary). This system utilizes two early season grazing pastures (Burns Canyon and Cougar) grazed and rested on alternating years, one mid-season unit (Volstead) and one mid-late season unit (Middle Fork). The Loup Loup and Wolf units in the Frazer allotment are grazed in conjunction with the Beaver allotment as needed to allow flexibility in grazing strategies and/or providing for more rest for units in both allotments. The pastures are mainly divided by natural barriers. There is one outfitter-guide drop camp in the Beaver allotment. Both the outfitter-guide stock and commercial livestock use portions of the same access trail to the drop camp with a negligible amount of forage use by outfitter-guide stock occurring.

Ramsey Allotment is 12,312 acres with three pastures. Currently the permit, under the 2008 AMP, allows 63 cow/calf pairs annually from June 1 to September 30, which equals 338 AUMs. Although permitted use dates are June through September, the pastures are used in an early season grazing system to limit use in the hot dry late season which has less water and palatable forage. Typically 76 cow/calf pairs and 14 yearlings graze from June 1 to August 31. The prescribed grazing system is rest-rotation using each pasture (the Ramsey, Pearrygin, and Bear units). Each unit receives a period of early summer grazing, followed by a year of rest, followed by a year of deferment where the unit is grazed in late summer in the third year. Each pasture is grazed for about 45 days. The pastures are mainly divided by natural barriers. There are no pack and saddle stock outfitter-guide camps in this allotment.

North Cascades

Goat Allotment consists of 18,125 acres and is located in Goat (5,208 acres), Upper Methow River (9,626 acres) and the Lost River (3,291 acres) watersheds. There are two grazing permittees on the allotment.

An Environmental Assessment (EA) was completed in 2012 that will allow grazing in the Goat Allotment with a revised allotment management plan (AMP). Recent permits allowed 170 cow/calf pairs to graze from June 1 to September 30 each year, which equaled 900 AUMs. One permittee had a permit for 126 cow/calf pair and the other had a permit for 44 pair. The second permit (44 pair) was vacant for 7 years. Under the revised AMP, the Goat allotment will be grazed with 170 cow/calf pairs but with a reduced season of use. Specifically, 44 cow/calf pairs will graze in the Goat allotment for 47 days and 126 cow/calf pairs will graze for 122 days. The total permitted animal unit months for the allotment will change from 900 AUMs to 756 AUMs. The reduction in the season of use is based on current estimates of forage production.

The present rest rotation grazing system utilizes four units, two early summer units, Spokane Gulch and Yellow Jacket, and two late summer units, Black Pine and Whiteface. The early summer units are used on alternate years, and the late summer units are utilized each year with deferment. There are two drop camps in the Yellow Jacket Unit. Both the outfitter-guide stock and commercial livestock use portions of the same access trails to the drop camp with a negligible amount of forage use by outfitter-guide stock occurring.

Boulder/Wolf Allotments are grazed together under one grazing rotation with one permittee. The Boulder allotment consists of 7,801 acres and is located in the Little Boulder Creek, Looney Creek watersheds and portions of the Huckleberry Creek, and Cedar Creek watersheds. The Wolf allotment grazing area is 10,502 acres with three pastures, Rader, Little Wolf, and Falls Creek only the Little Falls Creek pasture in the project area, in the Little Falls Creek watershed. The existing AMPs for both Boulder and Wolf allotments are currently out of date and scheduled to be revised in 2012.

Currently the permit allows 60 cow/calf pairs to graze from June 1 to September 30 every year, which equals 244 cow months or 322 animal unit months (AUM). The grazing strategy is to graze the Boulder allotment and the Falls Creek pasture on even years with 40 cow/calf pairs in Boulder and 20 cow/calf pairs in Little Falls Creek with complete rest on even years where the other pastures of the Wolf allotment are grazed. There are four outfitter drop camps within the Boulder allotment and a drop camp in the Falls Creek pasture. Both the outfitter-guide stock and commercial livestock use portions of the same access trails to the drop camp with a negligible amount of forage use by outfitter-guide stock occurring.

Middle Methow, Sawtooth Backcountry, and Lake Chelan-Sawtooth Wilderness

Buttermilk Sheep Allotment is in the Middle Methow, Sawtooth Backcountry (Methow), and Lake Chelan-Sawtooth Wilderness areas. The 52,974 acre allotment was in non-use between 2000 and 2005, except in 2003, when partial use occurred and has been vacant since 2006 when the last grazing permit expired. The sheep were routed through the allotment with a herder with restrictions on bedding and trailing to reduce resource impacts. This allotment was grazed in conjunction with the Harts Pass allotment that was waived back in 2000. Currently the permit allows 1,200 ewe/lambs from May 1 to July 10. The season can be modified to provide for a later season of use to adjust for loss of the Harts Pass allotment which was grazed in the late

summer. The Crater Creek outfitter-guide base camp (corral) and trail system is in the Buttermilk allotment. Only a negligible amount of forage use is occurring by the outfitter-guide stock occurring.

Alta Lake

The Alta Coulee allotment is 3,249 acres with two pastures. Currently the permit allows 25 cow/calf pairs annually from June 1 to September 30, which equals 102 AUMs. Although permitted use dates are June through September, the pastures are typically used for less time than the permitted season as the permittee keeps the permitted cattle on his private land pasture during the early part of the permitted period of use. The allotment boundary includes several sections of land but only the bottom of the coulee is grazed by the 25 cow/calf pair, in conjunction with the aforementioned private land to the south. There is a fence that divides the Alta Pond area from the south part of the coulee. The pond area is grazed early for two weeks then the cattle are excluded for the remainder of the season. The pond area has been rested voluntarily by the permittee for the past five years as approved by the Forest Service with the benefit of reducing impacts to the pond riparian area. There is a day use recreation trail system within the rested Alta Pond area. It is not likely that the pond area will be grazed in the future but it will remain in the permit if needed. The trail used for day-rides passes through this allotment.

<u>Pack and Saddle Stock Grazing within the Project Area</u>

The pack and saddle stock outfitter-guides have recently been permitted 270 Animal Unit Months (AUM) in the analysis area. This is noticeably lower than the 6,464 AUMs grazed by commercial livestock in the recent past (1960s), and substantially lower than the 15,000 AUMs allotted to the area in the early to mid-1900s.

Outfitter guide stock forage utilization is well within allowable use standards with the exception of localized areas of high use that can be associated with the camps. Forest Service monitoring guidelines specify that monitoring sites should be located outside livestock concentration areas and should be free of compounding use, such as the use directly around outfitter camps (Burton et al. 2011). Monitoring representative areas outside the camp allow cause-and-effect relationships to be established. Outfitter guide stock forage utilization monitored in representative locations as dictated by Forest Service monitoring guidelines is well within allowable use standards. With the closing of the wilderness livestock permits, even with outfitter guide grazing, the forage use and resource impacts are still far below the use and impacts under the old commercial grazing allotment stocking rates. Where and whenever it becomes necessary to restrict or limit the use of native forage by pack and saddle stock for resource protection, the outfitter may be required to pack in and supply all necessary feed. This would further reduce the potential for potential negative impacts for dual use by cattle and outfitterguide stock.

Loose Grazing and Stock Containment

The outfitter-guides use two methods for caring for stock on overnight trips into wilderness and the backcountry; stock containment and loose grazing. Stock containment refers to tying stock to trees for short durations, tying to hitch rails or highlines (a line used to hitch stock to avoid tying directly to trees by tying a rope between two trees, then tying the stock to the rope), picketing stock, or holding them in a corral. Loose grazing is a technique where the stock are let

loose to graze. Drift fences made of natural materials, usually poles and logs, are used in some cases to keep loose stock from incidentally traveling down trails. There are ten drift fences in the Pasayten and Lake Chelan-Sawtooth wilderness areas, including at Andrews Pass and on the Whistler Cutoff trail north of Slate Peak. Loose grazing generally causes the least impact on resources. More confinement can generally be equated to more impact because it concentrates impact and contributes to restless behavior (Leave No Trace, 2001). Loose grazing does not work everywhere, however, so containment methods are also important and appropriate.

Stock confinement methods currently used include hitch rails, corrals, highlines, and pickets. Hitch rails are installed at the Sheep Mountain and Bald Mountain assigned sites. They consist of wooden side posts and a wooden top rail. There is also a corral at Sheep Mountain, constructed with wooden posts and rails. Highlines are used at most camps. Some outfitters occasionally use pickets to anchor stock to one spot to graze, then move the stock to a highline after feeding.

Confined stock must be taken to a grazing area and watering spot, then returned. Processed weed-free feed is often brought for stock that are confined, and to areas where adequate graze is not available near the campsite.

Loose grazing has often been the method used by outfitters in camps they frequent, such as the assigned sites. The outfitter identifies areas with sufficient graze typically within one to two miles of camp, depending on the location of the camp. These areas are carefully selected to move stock well away from other campsites and private stock. The stock are led to the grazing area, or travel there on their own, and left for the night. Bells are often placed on one or two of the stock to help the outfitter locate them if they don't return to camp on their own. Some outfitters hobble selected stock to help confine movement and facilitate catching, although stock can still travel very well with hobbles. In some camps, the stock are led back to camp in the mornings. In others, the stock are trained to return in the morning on their own. One to two horses are usually kept contained near the camp at night, to facilitate catching horses in the morning if needed.

Horses and mules are herd animals, so as they graze, they stay in the same general area but are widely dispersed within that area and the forage use is well distributed. As with all grazing animals, they are constantly moving across the land, eating grasses as they go. Feral free-ranging horses typically spend over half their time feeding, and around 25-35% of their time resting, day and night (Ransom and Cade 2009). Studies with pack stock grazing show horses and mules behave similar to feral free-ranging horses. After daily exercise, they feed for an initial 3-4 hour bout and then continue to graze every hour with a constant rate of movement (Olson-Rutz et al. 1996). When not grazing, pack stock rested more than traveling, similar to wild horses (Olson-Rutz et al. 1996, Ransom and Cade 2009).

The constant movement is a characteristic defensive pattern of grazers against predators. The stock form a loose herd, always nearby each other, but not tightly congregated. When water is readily available as it is in most places in the wilderness, horses do not gather at specific sites to drink as in desert environments (Salter and Hudson 1979). Outfitter-guide stock exhibit similar grazing behavior to that of free-ranging horses. Typically free-ranging horses move rapidly to and from water sources with very little feeding or loafing activities near drinking areas (Ganskopp and Vavra 1986). They prefer open areas and elevated terrain away from water and

thick brush to get away from insects (Keiper and Berger 1982) and to be able to assess potential threats from predators (Ganskopp and Vavra 1986). They avoid muddy areas because they instinctually do not want to be mired in mud, and simply because they prefer to keep their feet dry. During the night, they sleep by dozing off, and upon waking, graze while moving to a different spot.

Feral free-ranging horses typically select for grasses (58-84% of the diet), and secondarily prefer sedges (2-34% of the diet) (Salter and Hudson 1980, Hansen et al. 1977). Research of pack stock yielded similar results, with horses selecting grasses over forbs or browse (Olson-Rutz eat al. 1996). In a subalpine meadow in the Payette National Forest of Central Idaho, grasses composed 78% of pack stock diets, while sedges (*Carex spp.)* and rushes *(Juncus spp.)* composed 20% of the diet. Forbs were a minor component (Krumpe and Schantz 1997). Most outfitter camps in the Pasayten and Sawtooth Wilderness are located near open meadows and bunchgrass hillsides where horses are placed to graze. Key forage species include green fescue *(Festuca viridula)*, timber oatgrass *(Danthonia intermedia)* and sedges *(Carex spp.).*

Pasayten and Lake Chelan-Sawtooth Wilderness Areas

There are no permitted cattle in the wilderness areas. A portion of the vacant Buttermilk Sheep allotment is in the Lake Chelan-Sawtooth Wilderness (see the Buttermilk allotment description under Permitted Livestock Grazing within the Project Area). There are approximately 637 established campsites scattered across the Pasayten Wilderness and 338 in the Lake Chelan-Sawtooth Wilderness. Approximately 12% of the Pasayten campsites are used by pack and saddle stock outfitter-guides, and 23% of those in the Lake Chelan-Sawtooth (refer to section 3.2 Wilderness).

All of the affected area is directly associated with these camps used by people with pack and saddle stock. The outfitter-guide stock is dispersed around the camps to the point that the grazing is having little effect on natural plant succession on grass dominated meadow systems with an overall trend toward improvement in the current ecological condition (see Natural Plant Succession section in botany report). The level of forage use by outfitter-guide stock is highest at the camps and decreases the farther one moves away to the point of no use. Outfitters typically move stock at least ¼ mile from camps to loose graze. Forage use in stock grazing areas is below the forest utilization standards due to light intensity and short duration grazing.

<u>Upland Forage</u> associated with established outfitter campsites is meeting Forest Plan utilization standards on all wilderness range with the exception of a few spots where localized high use is exceeding 60%. These spots are relatively very small and are not a representative sample of a large stratum or scale, such as the general foraging area associated with the outfitter camp. Forest Plan allowable use monitoring is based on the Key Area concept and the Key Area reflects what is happening on a larger area as a result of on-the-ground management actions. These relatively small hot spots are near campsites where the combined effect of trail and camp location, forage and water access, and topography results in virtually unavoidable concentrations of forage utilization.

The Forest Service monitors outfitter-guide stock utilization and impacts to wetlands around campsites and in loose grazing areas away from camps. Two methods are used to monitor outfitter-guide stock grazing. First, ocular estimates are made by wilderness rangers when walking through camp areas and loose grazing areas away from camps. If grazing utilization

appears to be approaching standards, or if wetlands appear impacted, wilderness rangers report the conditions and formal monitoring is scheduled for the area. Formal monitoring is conducted by a modified stubble height utilization method to measure the level of use on key forage species.

Utilization is estimated by a modified residue and height-weight method (Coulloudon et al. 1999), in which stubble height is measured and a simplified clip and balance technique to develop height-weight curves is used. From height-weight curves, utilization can be estimated from the average stubble height measured at each location. Formal monitoring has also been conducted on sites not approaching standards for use as baseline data and to train wilderness rangers. Areas formally monitored for this purpose include Beaver Creek outfitter camp, and Bald Mountain outfitter camp. Forest utilization standards for range allotments allow for 45% use in upland forested areas, 55% use in upland grasslands, and 45% use in riparian meadows.

Forage Utilization Monitoring Results

Utilization data has also been collected at public camp sites and administrative sites as well to provide baseline data for resource conditions.

Current wilderness forage use by outfitter guide stock is well below recent historic use levels permitted within commercial wilderness livestock grazing allotments (see Past Actions), and is well below Forest utilization standards. Results showed utilization of key forage species near outfitter camps was between 0% and 17.5% (**Figure 3.10-1**). Ocular estimates provided by the Forest Service Range Specialist in 2001 and Range Technician in 2010-2012 are provided in **Figure 3-10.2**.

Figure 3.10-1. Forage utilization monitoring results in the Pasayten Wilderness.

DMA Name	Outfitter or Public	Key Species	Utilization (%)			
			2001	2010	2011	2012
Bald Mtn (Ryan Surface)	Outfitter	Sedge			5	0
Remmel Lake Horse Camp	Public	Sedge			39	7.3
Beaver Creek Camp (Darwood)	Outfitter	Green Fescue		17.5	16	<15 *
Border Ridge	Public	Green Fescue			<5*	< 5*
Spanish Camp	FS Cabin	Green Fescue			<15*	<10*
Border Patrol Camp	Border Patrol	Timber Oatgrass			<15*	<10*
Sheep Mtn. (Ryan Surface)	Outfitter	Green Fescue	<30*			<10*

*Ocular estimate of use

Streambank Disturbance Monitoring Results

Wilderness riparian areas are currently meeting Forest Plan allowable use standards including standards for streambank alteration (Cowley et al. 2006). Human or recreational stock disturbances to streambanks and riparian areas are localized near trail crossing areas and campsites in the Pasayten and Sawtooth Wilderness Areas. Areas above and below these disturbance areas are in pristine condition, with no sign of human or stock use, intact streambanks, and established vegetation. These disturbed areas are watering locations near campsites and/or at trail crossings where unavoidable trampling occurs. Trampling exposes

bare soil and causes alteration to the streambank. Some browsing on riparian shrubs and grazing of riparian herbaceous species is also occurring but is well within Forest Plan standards.

Streambank disturbance data was collected near several camps in the Pasayten in 2010 , 2011, and 2012. Streambank disturbance around campsites is measured in linear feet of streambank that is showing disturbance due to camping or stock activities. Characteristics of disturbed banks include compacted soil, bare ground, vegetation loss, trampling, hoof action and a general appearance of human use. Streambank disturbance was used instead of streambank alteration because it requires little training for data collection, does not require any extra equipment for backpacker rangers to carry, and gives an idea of how much riparian area near campsites is being impacted by human activities.

In 2012 Forest Service personnel visited over 50 camps during the High Hunt patrol in September including Crow Lake, Bunker Hill, Sheep Mountain, Remmel Lake, Beaver Creek, Upper and Lower Cathedral Lakes, Glory Lake, Freds Mountain Lake, Spanish Camp, and the areas in-between. The highest streambank disturbance observed in any camp in this area was at the public horse camp at Remmel Lake, with approximately 12 feet of streambank disturbance. The streambank disturbance estimates are displayed in the following table.

Figure 3.10-2. Streambank disturbance monitoring results in the Pasayten Wilderness.

DMA Name	Outfitter or Public	Stream	Streambank Disturbance Estimate (feet)		
			2001	2011	2012
Bald Mtn (Ryan Surface)	Outfitter			6 ft	6 ft
Remmel Lake Horse Camp	Public			10 ft	12 ft
Beaver Creek Camp (Darwood)	Outfitter	Spring	<5 ft	2-3 ft	2ft
Spanish Camp	FS Cabin	Spanish Creek		6 ft	6ft
Border Patrol Camp	Border Patrol			3 ft	3ft
Sheep Mtn. (Ryan Surface)	Outfitter				8ft

Detailed field notes regarding general resource conditions pertaining to grazing in the wilderness were collected by the Forest Service Range Specialist or Range Technician in the Sheep Mountain and greater Spanish camp area in 2001, and again in 2010-2012. Specific monitoring results and ocular estimates from these inspections are displayed in **Figure 3.10-1** and **Figure 3.10-2**. Field notes are summarized below:

- Sheep Mountain outfitter camp- In 2001, light grazing use (<20-30%) was observed in the area around the Sheep Mountain outfitter camp. Little to no grazing use was observed in the benches above the outfitter camp on Sheep Mountain. In 2012, less than 10% utilization was observed in the greater Sheep Mountain area. Use was estimated on two transects, one above the outfitter camp but below the Boundary trail #533, and the other approximately ¼- ½ mile southwest of the camp above Barker Brown Cabin. From 2001 to 2012, grazing use appears to have declined in this area, with the majority of the area receiving very light to no grazing.
- Bald Mountain outfitter camp- In 2011 and 2012, field observations indicated light grazing use. There are two main meadow areas on Bald Mountain. One meadow is located on a

bench approximately 1/8 of a mile above the camp. This is a small wet meadow, and no grazing was observed in this meadow in 2011 or 2012. The main area the outfitter loose grazes horses is about ½ mile above the camp on the shoulder of Bald Mountain. Very light grazing to no grazing was observed in this area. This is a large open, relatively flat bench with plenty of space for pack stock to disperse and graze, resulting in very light grazing and virtually no resource impacts.

- Beaver Creek outfitter camp- In 2001, light grazing was observed in the ridge above the outfitter camp. An old utilization cage was inspected, and no differences were observed between plants inside the cage (excluded from grazing) and outside the cage. Grazing was minimal, with a slight trail to the watering hole in the camp. The watering area was characterized by low growing willow and sedges, with a small site of hoof shear less than five feet across. Observations from 2010-2012 show virtually no change in grazing resource conditions from 2001 in the greater area around the camp. Utilization on the ridges and open areas approximately ¼ mile away from the camp was light, with 15-17.5% utilization. The area of disturbed bank near the watering site was estimated to be 2-3 feet wide. Conditions from 2001-2012 appear to have stayed the same or improved with very light grazing use observed.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

This alternative would have no pack and saddle stock outfitter-guide recreation livestock grazing use in the analysis area. No grazing or browsing of forage by outfitter-guide pack and saddle stock would occur in the analysis area with only forage utilization by wildlife, commercial grazing, and non-outfitted pack and saddle stock. Less grazing would occur resulting in fewer disturbances to vegetation and soil. Vegetation and soil disturbance would be more limited to natural mechanisms (wind, water, wildlife, wildfire), public and administrative activities, and ongoing projects.

Most of the existing campsites would continue to be used by private pack and saddle stock users. Impacts to riparian shrub and herbaceous vegetation would still occur at nearby watering sites and crossing areas but to a lesser degree with an expected increase in density and cover and an increase in stream bank stabilization. Due to the dynamic nature of stream systems and natural hydrologic processes, however, this trend may not remain stable through time.

Alternatives 2, 3, and 4

None of the action alternatives would result in exceeding Forest Plan utilization standards, changing natural plant species composition, or causing impacts to vegetation that will take more than one year to recover. Refer to the Botany section for more information.

Mitigation measures would reduce potential impacts of outfitted pack and saddle stock grazing on wetlands, sensitive plants, water quality, vegetation, and aquatic habitat by limiting grazing

where forage conditions warrant it, and to disperse grazing and reduce impacts to forage from concentrated use.

- 8a. Using loose grazing as the preferred method for outfitter stock would be effective in avoiding over-utilization of forage. Loose grazing stock disperse and their constant movement pattern results in no concentrated grazing areas.

- 8c & g. Outfitters would be required to carry supplemental feed if forage utilization or resource monitoring shows that utilization standards are close to being exceeded. This would be effective in eliminating the possibility of outfitted stock over-grazing areas.

- 8d. Prohibitting picketing of stock in subalpine meadows would be effective in avoiding over-utilization of forage since stock would be able to roam free in the constant movement pattern that avoids over-grazing.

- 8e. Limiting outfitter-guide stock grazing to suitable areas during time of high use would be effective in ensuring that the stock do not over-graze areas where there is a high number of non-outfitted stock, or in areas where forage conditions cannot support stock grazing.

Under Alternatives 2, 3, or 4, only areas where outfitter stock remain at campsites overnight would have grazing impacts to the range resource. There are no permitted cattle in the wilderness or backcountry areas of the analysis area, consequently loose grazing of outfitter-guide stock associated outfitter guide camps would not affect the commercial livestock grazing. The amount of grazing would conform to all Wilderness resource values, as described in each resource section of Chapter 3. Refer to Wilderness, Soil, Hydrology, Aquatics, Wildlife, and Invasive Species sections.

Within the non-wilderness backcountry areas nearly every camp used is a drop camp where there would be no pack and saddle stock grazing impacts because stock would not remain onsite to graze. The 4,620 service days associated with pack and saddle stock outfitter-guides in Alternative 2 would increase the number of pack and saddle stock visitor days by 0.3% compared to the recently permitted levels. Alternative 3 would reduce the outfitter-guide visitor days to 2,660, leading to a 4% reduction in recently permitted level of stock use. Alternative 4 would include 6,700 service days, and would increase stock use by 5% compared to current permitted levels. Alternative 2 would allow 270 AUMs for the outfitter-guide use. Alternative 3 would include 150 AUMs, and Alternative 4 would allow 390 AUMs.

The amount of forage use and resource impacts would be less than or similar to the current condition, and Forest Service grazing utilization standards would continue to be met. In Alternatives 2 and 4, the outfitter-guides would be using all existing trails and camps, and no new camps or trails would be developed. In Alternative 3, outfitters would also be restricted to existing trails and camps but additionally would not be allowed to use campsites within 200 feet of wetlands, streams, lakes, or key interest areas. A negligible amount of the available forage within the livestock grazing allotments would be grazed by the outfitter-guide stock.

Cumulative Effects

This cumulative effects analysis considers effects of past, present, and reasonably foreseeable future actions within the project area. The geographic boundary for this cumulative effects analysis is the entire project area and the entire area of the historic grazing activities associated with the project, and the temporal boundary is the period of time when the activities associated with this project are occurring from the 1900s to 20 years post-project. All of the historic information provided in the following Past Actions section was taken from Forest Service records in the livestock grazing allotment and livestock permit files at the Methow Valley, Tonasket, and Chelan Ranger Districts.

Present Actions

Commercial Grazing Allotments

There are 6 active commercial grazing allotments with the project area as described in detail in the Affected Environment section. Non-outfitted recreation use, other outfitters, general public pack and saddle stock use, trail maintenance, and permit administration use are additional activities that would have a cumulative effect on the proposed actions but would have less of an impact on commercial livestock grazing than pack and saddle stock activities. The impacts of these activities would have a negligible reduction in the forage availability or cumulative physical impacts to streambanks.

Recreational Livestock Grazing

Observations were also made near several private camps. No major resource conditions were identified, with light to no grazing observed in most places. There is evidence of natural recovery from historic livestock grazing, with improved conditions. The Remmel Lake public horse camp had the highest grazing use, with 39% grazing use observed in 2011. However, 2012 results indicated a decline in use, with only 7.3% utilization. This is likely a result of varied amount of public stock use from year to year. This area also had the largest amount of disturbed banks, with approximately 12 feet of bank shear near the trail crossing. Above and below the trail crossing banks were in pristine condition.

Reasonably Foreseeable Future Actions

Commercial Livestock Grazing

All vacant allotments within the Pasayten Wilderness Area, Lake Chelan-Sawtooth Wilderness Area, and the Sawtooth Backcountry project areas are scheduled to be analyzed to be closed or to be made active again. Permitted livestock grazing will continue outside of wilderness. The Wolf, Boulder, Buttermilk and Alta Coulee allotments are scheduled for Allotment Management Plan (AMP) revisions within the next 4 years. The no grazing alternative may be the preferred alternatives for Buttermilk and the Boulder allotments. The Wolf AMP revision will be completed in 2013. Commercial livestock numbers within the project area will remain relatively low and continue to constitute a small amount of the forage overlap with pack and saddle stock with virtually no combined effect of the dual use. Range management techniques such as numbers of commercial livestock turned out, salting, water developments and timing of use, would continue to be used to meet riparian goals, and to obtain uniform distribution of use on

the allotments. Riparian objectives include maintaining and/or increasing bank stability along riparian areas. These objectives would be reached through the continued use of deferred and rest rotation grazing and maintenance of water troughs and fences.

Recreational Livestock Grazing
It is reasonably that non-outfitted pack and saddle stock use will increase in the future approximately 3% over current levels. This increase will not lead to exceeding utilization standards, even when considered cumulatively with pack and saddle stock outfitter-guide recreational livestock grazing.

Cumulative Effects

Alternative 1

This would result in a 2% reduction in the number of pack and saddle stock users in the analysis area. No AUMs would be used by outfitter-guides.

There would be no pack and saddle stock recreation livestock grazing. Camp sites would continue to be used by the general public but likely with fewer stock than in the past. A relatively small portion of the available forage in the livestock grazing allotments would continue to be grazed by the general public pack and saddle stock; the amount of forage in allotments utilized by general public stock would be negligible and have a minor effect on forage availability for permitted livestock grazing.

Alternative 2, 3, and 4

The cumulative effect of any of the alternatives and the past, present, and reasonable foreseeable future actions would be an improving trend in range conditions across the analysis area. There would be no overlap between recreational and commercial livestock grazing, and forest plan utilization standards would be met. Vegetation recovery from past overgrazing would continue. Proper commercial grazing allotment management coupled with the low numbers of recreational livestock and the mitigation measure to reduce impacts from pack and saddle stock outfitter-guide recreational livestock would continue the upward trend.

CONSISTENCY FINDINGS

All alternatives would be consistent with the amended Forest Plans .

11-4 and 11-5: Forage utilization standards outside and inside riparian areas. Refer to tables on pages 4-43 and 4-44 in the Okanogan National Forest Plan.
The pack and saddle stock outfitter-guide recreational pack stock grazing would not exceed forest utilization standards, neither directly, indirectly, nor cumulatively.

11-7: Range improvements and practices shall not be designed to increase livestock use in riparian ecosystems, but should enhance riparian ecosystems.
The number of livestock would be controlled by the special use permit. The range improvements (2 trail bars) would be used to stop loose pack and saddle stock from incidentally traveling back to trail heads. The trail bars are not designed to increase use in

riparian area, however the presence of the fence may result in incidental short duration use in a riparian area by the loose stock.

15B-11B The forage resource shall be utilized in conformance with all wilderness resource values.
Forage use by pack and saddle stock outfitter-guide recreational livestock in wilderness would conform to all wilderness resource values, as discussed in Wilderness, Soil, Hydrology, Aquatics, Wildlife, and Invasive Species sections.

MA7-11A Domestic livestock grazing shall not be permitted. Recreation livestock grazing shall be permitted except for the meadows at Rainy Lake turnoff and Whistler Basin. Users should be encouraged to use weed-free hay.
Mitigation measure 8h would prohibit pack and saddle stock outfitter-guides from grazing livestock in the meadows at Rainy Lake turnoff or Whistler Basin. Mitigation measure 14b would require that only certified weed-free hay be used on National Forest System Land.

MA10-11A Livestock use should not be increased over existing permitted numbers.
There would be no pack and saddle stock outfitter-guide camps in MA10, therefore no pack and saddle stock outfitter-guide recreational livestock permitted.

Management Area RE2a (page IV-66, Wenatchee Forest Plan)

- Grazing of suitable range by livestock shall emphasize range management practices that favor unroaded, motorized, dispersed recreation.
  The pack and saddle stock outfitter-guide recreational livestock grazing would be dispersed, non-motorized recreation in mostly unroaded settings.

- Management of the range resource under this prescription will seek full utilization of forage allocated to livestock.
  This standard and guideline pertains to commercial livestock grazing to assure that good distribution of grazing occurs throughout the areas permitted to graze. Outfitter-guide permits do no allocate forage the same as commercial livestock permits do. Relative to the large wilderness and backcountry forage resource, only a very small portion near camps would be grazed by pack and saddle stock and outfitter-guide recreational livestock grazing would meet all utilization standards.

- Control noxious weeds as practical.
- **Refer to analysis in the Invasive Plant section of this chapter. Mitigation measures 14 a-e would control noxious weed introduction and spread by pack and saddle stock outfitter-guides to the extent practical.**

3.11 ECONOMIC AND SOCIAL ANALYSIS

The section below is a summary of the Economic Analysis (Grinspoon, 2011) and the Social Impact Analysis (Zbyszewski, 2011), both available in the analysis file.

REGULATORY FRAMEWORK

The direction completing economic and social analyses of a proposed action and alternatives is found in the NEPA regulations, and in Forest Service Manual 1900.

Section 1508.14 of the NEPA regulations gives direction in analyzing the effects of proposed actions and alternatives on the human environment.

> *"Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.* (NEPA Regulations, Section 1508.14)

Forest Service Manual 1900, Chapter 1972 describes an economic impact analysis, and gives direction for completing the analysis.

> *Economic impact analyses describe short-term effects that Forest Service activities may have on economic conditions in defined impact areas. Impact analyses help identify those who may be favorably or adversely affected by Forest Service decisions. Economic impact analysis is the basis for evaluating economic contributions by the Forest Service in the impact area. These analyses are used for comprehensive evaluations in forest planning and in other assessments.* (FSM 1900, Chapter 1972)

The Manual also discusses when and how a social analysis should be completed.

> *Social analysis is instrumental in National Forest planning and plan implementation. Social analysis is part of the overall evaluation requirement for decision making. Social impact assessments help identify desired conditions for social, economic, and ecological environments, and the effects of National Forest management activities on social systems within and/or adjacent to the National Forest or project area.* (FSM 1900, Chapter 1973)

This analysis follows the technical guidance and advice for economic and social evaluations found in Forest Service Handbook 1909.17 (USDA 2008).

ANALYSIS METHOD

Except for the recreation areas that charge an entry fee, National Forest recreation is a non-market good. Economic ties between recreation on National Forest lands and local communities

can be estimated, however, by tracking how visitors spend their money in local businesses and by estimating how much those businesses spend on materials and wages in order to provide goods and services to the recreationists. The Forest Service conducts a visitor survey every five years called the National Visitor Use Monitoring Survey, or NVUM.[6] Every fourth interview asks visitors how much they spent in local communities and on what goods and services. The spending information is reported by visitor characteristics such as whether they were local residents or non-locals and whether they were just day users or if they spent the night. These categories have the highest effect on how recreationists spend their money and who in the local economy enjoys the economic benefit.[7]

For the purposes of this analysis, however, NVUM did not supply the information needed to estimate the economic contribution of the outfitter guide industry to local communities. Outfitter-guides are not one of the activities identified in the NVUM survey. There is no information in NVUM about number of visitors hiring outfitter-guides, nor is there expenditure information for that specific activity. To determine the economic ties between the activities of outfitter-guides and local communities, efforts were made to identify analogs to the NVUM data. Four possible analogs to outfitter guide activities were identified:

1) use the generic expenditure profile for high spending recreationists;
2) use the expenditure profile for horseback riding;
3) use the expenditure profile for downhill skiing since those are the highest spending recreationists;
4) use data gathered by the Methow Valley staff to show how income earned by outfitter-guides contributes to the local economy.

The first option was rejected; it lacks specificity for the expenditures of outfitter-guides, which is a unique activity and business. If used, this option would not identify the types of businesses in the area that are impacted. The second option was not chosen because an examination of the data showed that the expenditures were extremely low compared to data independently gathered by the staff of the Methow Valley Ranger District, Okanogan Wenatchee National Forest. This option would fail to demonstrate the economic importance of the outfitter guide activities to local communities. The third option was also rejected. Even though the level of total expenditures was similar for downhill skiers and outfitter guide visitors, the goods and services purchased by skiers and ski area operators are different from those purchased by outfitter guide visitors and businesses.

Since the NVUM data didn't have enough specificity to help with this particular analysis, a fourth method was considered and chosen for the economic analysis. In this method, data gathered by the staff of the Methow Valley Ranger District was used to show how income earned by outfitter-guides operating on Forest Service lands contributes the local economy. The data lack the richness of NVUM data, especially in terms of 'local' versus 'nonlocal' visitors, but there is enough information to show the principal economic effects of demand for outfitter services. It is probable, however, that this method slightly underestimates total effects on employment and income. The method lacks specificity about the characteristics of visitor spending while they are

[6] www.fs.fed.us/recreation/programs/nvum
[7] Stynes, Dan and Eric White. Spending Profiles of National Forest Visitors, Round 2 Update. March, 2010

in the area and only includes the fees paid to outfitter-guides, but this method is considered to be the best one available.

Economics

The economic contribution of the outfitter industry in the Methow Valley was measured by the jobs, labor income, and total sales supported in the local economy.[8] Job, income and sales effects were modeled with "IMPLAN," a software and database package produced by the Minnesota IMPLAN Group[9]. The Forest Service has an agency-wide site license for the IMPLAN package allowing the Forest Service to build models for almost any economy of interest. IMPLAN estimates the change in direct, indirect and induced effects[10] (hereafter, "ripple" effects) resulting from a change in the final demand for goods and services provided by a given sector or sectors of an economy. These effects, as measured by "multipliers," take into account the effects of money leakage from, and imports to, the study area. Leakage occurs when money is spent outside the analysis area in order to fulfill production needs. For example, if a local restaurant requires seafood for production of a dinner, the money spent to import the fish has left the study area and is no longer available for circulation within the local economy. Exports of goods and services, on the other hand, bring new money into the economy. Tourism is classified as an "export" because non-residents bring new money into a local economy, taking away a recreation experience in exchange.

It is important to note that here is a time lag with the IMPLAN county economic data used for modeling. In this case, the most recent dataset available is for 2009, a two year time lag from the current situation. However, inspection of the IMPLAN data for Okanogan County shows that they are a reasonable representation of the existing economy.

For this analysis, the study area is Okanogan County. Although some of the outfitter guide trips travel though Chelan County, all of the trail heads, with the exception of the Fish Creek base camp, are in Okanogan County. All of the outfitter-guides, except one, also live in Okanogan County. Once the guides and clients enter the wilderness, they spend no money. Most of the spending associated with the outfitter guide trips takes place in Okanogan County.

Social Analysis

The social analysis was conducted using demographic information about outfitter-guide clients, and how the alternatives would affect the opportunity for people to participate in pack and saddle stock activities.

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[8] Jobs are expressed as average annual jobs including full, part-time, seasonal and temporary jobs. Labor income is the sum of employee compensation (wages plus the value of benefits) and proprietor's income (self employed).

[9] www.implan.com

[10] Direct impacts are the employment, labor income and sales resulting from the production of goods and services to meet demand. Indirect effects are produced when a sector must purchase supplies and services from other industries in order to produce output sufficient to meet demand. The employment and labor income generated in other industries as a result are referred to as indirect effects. Induced effects are the employment and labor income stimulated as a result of the expenditure of household disposable income generated by direct and indirect employment.

Best Available Science
Throughout this analysis, the best available science was incorporated to describe the economic and social impacts of the existing pack and saddle stock outfitter-guide businesses, and the potential effects of the alternatives considered.

DATA SOURCES

Service Days
The current number of permitted outfitter guide service days is 4,460, which is the number of service days in the existing pack and saddle stock outfitter-guide permits plus the number of days in the priority use pool. Use data has been compiled using the most accurate data available. The number of service days actually used varies from year to year. Reliable records are available for the past 10 to 20 years. Some data gaps and margins of error exist due to data interpretations. The data is the best information available, and has a level of accuracy that is more than adequate for this analysis. More detailed use data, or data that goes back farther in time, is not essential and is not critical to the analysis. Current conditions and future uses are the most relevant factors to consider.

Total Recreation Use Levels
The National Visitor Use Monitoring Results for the Okanogan National Forest (USDA, 2001d and 2006a) generated information on the number and type of visitor days in the areas. Current outfitter-guide service days are included in the totals. The results have an 80% confidence level, which defines the degree of certainty that a range of values contains the true value will be within the range 80% of the time (USDA, 2006d). This is the best available information concerning use levels.

Economic Contribution of Pack and Saddle Stock Outfitter-guides
The money charged for full service trips range from $190 - $200 per person per day. The analysis uses the average of $195. This information was gathered from the existing pack and saddle stock outfitter-guide.

Demographic Information
The information on demographics and age class distribution is from the Washington State Office of Fiscal Management, 2010. The number of visitor days expected in the future was calculated using projected changes included in the Washington State Comprehensive Outdoor Recreation Planning (SCORP) publication "*Estimates of Future Participation in Outdoor Recreation in Washington State*" (Interagency Committee for Outdoor Recreation 2003). These projected changes were for 10 and 20-year periods based on participation data from the 1999-2000 RCO survey (IAC 2003). These projections took into account NSRE data and projections for the Pacific Northwest Region, demographic trends in Washington State, the local supply of lands available for recreation activities, and other factors.

AFFECTED ENVIRONMENT

The total area of Okanogan County is approximately 3.4 million acres, of which about 1.5 million is federally owned. Over 95 percent of the federally owned land is within the jurisdiction of the

Okanogan-Wenatchee National Forest. The 2000 census recorded a population of 39,564 people (Okanogan Country Comprehensive Plan Update, 2005, p. 23-24).

Economics

Agriculture and forestry have historically been and continue to be major economic generators for the County. According to IMPLAN data, approximately 5,280 people work in natural resource-based industries -- agriculture, forestry, fishing, hunting, and mining (IMPLAN, 2009). Government, retail trade, accommodation and food services, and manufacturing are a few of the major employers in the County. Figure 3.11-1 shows the size of various sectors in the local economy.

Figure 3.11-1: Basic economic data for Okanogan County (2009 Data)

Okanogan County Economy (2009 IMPLAN Data)			
Industry Group	**Employment (# Avg Annual Jobs)**	**Labor Income ($2009)**	**Total Sales ($2009)**
Government & Misc.	5,705	$274,654,827	$420,328,029
Ag, Forestry, Fish & Hunting	5,280	$157,224,342	$222,567,555
Retail trade	3,208	$99,805,234	$193,288,389
Other services	1,377	$37,590,533	$73,424,721
Health & social services	1,347	$53,291,839	$97,983,172
Accommodation & food services	1,217	$24,611,691	$74,657,941
Construction	961	$35,607,160	$102,096,126
Finance & insurance	523	$22,166,279	$85,646,061
Professional- scientific & tech svcs	490	$17,511,830	$34,426,439
Real estate & rental	487	$3,894,190	$170,443,458
Wholesale Trade	409	$22,633,065	$61,541,367
Manufacturing	318	$10,288,961	$116,486,101
Administrative & waste services	302	$9,228,150	$24,982,611
Other amusement and recreation svcs	297	$6,215,524	$13,330,139
Transportation & Warehousing	194	$9,171,936	$27,368,507
Mining	151	$9,676,165	$66,896,994
Educational svcs	136	$1,477,726	$3,472,911
Information	119	$5,413,219	$21,455,504
Utilities	38	$2,647,656	$12,016,711
Management of companies	22	$805,809	$2,375,170
TOTAL	**22,581**	**$803,916,135**	**$1,824,787,904**

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Figure3.13- 1 shows that about 297 people are employed in the sector called "Other Amusement and Recreation Services" in Okanogan County. Outfitter-guides are included in this sector as well as an array of other recreation services companies including rafting companies, motorized coach tours, and other Forest Service permitees such as hiking/backpacking guides. The objective of this analysis is to estimate what portion of the economic activity supported by

the Amusement and Recreation sector is attributable to the pack and saddle stock outfitter-guides using stock in the study area.

There are currently 4,460 service days for the pack and saddle stock outfitter-guides. Estimates of jobs and income generated economy-wide associated with this amount of service days gives a baseline against which to compare the other alternatives. Figure 3.11-2 shows the estimates for county-wide employment, income, and sales attributable to current pack and saddle stock outfitter-guides in Okanogan County. The figure shows that around 21 people are employed by pack and saddle stock outfitter-guides while outfitter guide activity supported an additional 4 jobs throughout Okanogan County. The total is approximately 25 jobs economy-wide.[11] Those jobs contribute almost $850,000 in labor income – which includes wages, benefits and proprietor's income – to the Okanogan County economy. Current pack and saddle stock outfitter guide activity also supports more than $1.3 million dollars in sales economy-wide.

Figure 3.11-2. Current Contribution of Pack and Saddle Stock Outfitter-Guides and Total Okanogan County Economy

Impact Type	Employment (# Jobs)	Labor Income ($2011)	Total Sales ($2011)
Direct Effect[12]	22.2	$757,844	$870,042
Indirect Effect[13]	1.1	$33,962	$114,016
Induced Effect[14]	3.3	$98,697	$309,881
Total Effect	**26.6**	**$890,504**	**$1,293,940**
Okanogan County Economy	22,581	$803,916,135	$1,824,787,904

Social Demographics

The demographics of the population of people hiring pack and saddle stock outfitter-guides helps identify potential social impacts to this segment of the recreating public. One statistic to consider is the age of the visitors. Assuming that as people age, they are less able to backpack long distances, an aging visitor population may have an increasing need for stock outfitter-guides. Hiring outfitter-guides for stock help make backcountry trips more feasible for older age groups.

The age class distribution of existing pack and saddle stock outfitter-guide clients shows that the majority of them are over the age of 50, based on actual client age information provided by the pack and saddle stock outfitter-guides.

The following figure shows the age ranges and percent of visits.

[11] It is important to keep in mind that this is average annual employment so that it is not possible to distinguish whether these are 25 permanent, full time, year round jobs, or 50 temporary jobs for 6 months, or some combination of the two.
[12] Direct effects are those directed created by the businesses.
[13] Indirect effects are those created in support of the businesses.
[14] Induced effects are the impact of spending by the people employed by the businesses.

Figure 3.11-3. Percent of Total Wilderness Visits and Outfitter-guide Clients by Age Class

Age Class	Percent of Total Wilderness Visits (NVUM)	Percent of Stock OG Clients
Under 16	<1%	3%
16-19	6%	8%
20-29	33%	1%
30-39	<1%	2%
40-49	13%	12%
50-59	25%	24%
60-69	11%	41%
70+	12%	8%

The Washington State Office of Fiscal Management tracks the population of the state, and how the composition of age classes is shifting over time. The following figure displays the current population distribution across the age classes, compared to the projected distribution in 2020. As is shown, the age class distribution is shifting into the older age classes. The number of people in the 60-69 age range will increase approximately 40%[15], and those 70 years and older will increase 46%[16] (Washington State Office Fiscal Management, 2010) by the year 2020. The Washington State Interagency Committee for Outdoor Recreation discusses projected changes in populations in the 2003 "Estimates of Future Participation in Outdoor Recreation in Washington State" (IAC, 2003). One of the key considerations in projecting changes in the number of people participating in various outdoor recreation activities is age. Physical demands of various activities, such as backpacking, will discourage people from participating as they age (IAC, 2003).

Figure 3.11-4. Percent Change in Number of People in Age Classes in 2010 and 2020

Age Class	Number of People in 2010	Projected Number in 2020	Percent Change
Under 15	1,311,555	1,517,032	16%
15-19	464,155	478,724	3%
20-29	966,978	1,014,958	5%
30-39	883,849	1,098,567	24%
40-49	959,344	935,360	-3%
50-59	947,648	967,301	2%
60-69	643,504	903,726	40%
70+	556,217	809,712	46%
Total	6,733,250	7,725,380	15%

(Washington State Office Fiscal Management, 2010)

As shown in Figure 3.11-3, approximately 73% of stock outfitter-guide clients are 50 years old or older. This age class is more dependent on stock to travel into the wilderness or backcountry and more likely to use an outfitter-guide service due to a combination of physical limitations, more leisure time, and higher income levels. The relatively large predicted increase in the number of people over the age of 50 in Washington state (refer to Figure 3.13-4) indicates that there will likely be a corresponding increase in the number of people and the percentage of visitors who will require the service of stock outfitters guides for trips into the analysis area. The

[15] (903,726 people - 643,504 people)/643,504 people = 0.40, or 40%
[16] (809,712 people - 556,217 people)/ 556,217 people = 0.456, or 46%

largest increases will be in people 60 years old and older. Therefore, the need for stock outfitter-guides will likely increase in the coming years at a faster rate than the general activity increases projected by the Washington State Interagency Committee on Outdoor Recreation, 2003. Although only a small percentage of people over 50 years old actually take trips into the wilderness or backcountry, it is safe to assume that the number of people in that age class that do so could increase at a rate that matches the rates of increase in the general population – approximately 25%[17].

ENVIRONMENTAL CONSEQUENCES

Direct/Indirect Effects

Figure 3.11-5 shows how the current number of service days and the number in each alternative. It also shows in comparative format the economy-wide contributions of each alternative. The service days represent different levels of income for pack and saddle stock outfitter-guides. A portion of the income is spent in the study area and ripples through the local economy.

Figure 3.11-5: Summary of Permitted Days and Economy-Wide Contribution of Current Number of Service Days and By Alternative, Compared to Okanogan County Economy

		Pack and Saddle Stock Outfitter-Guide Economy-wide Contribution		
Current/Alternative	**Service Days**	**Employment (# Jobs)**	**Labor Income ($2011)**	**Total Sales ($2011)**
Current Condition	4,460	26.6	$890,504	$1,293,940
Alternative 1	0	0	0	0
Alternative 2	4,620	27.6	$922,451	$1,340,359
Alternative 3	2,660	15.9	$531,108	$771,722
Alternative 4	6,700	40.0	$1,337,753	$1,943,811
Okanogan County Economy		***22,581***	***$803,916,135***	***$1,824,787,904***

Alternative 1

Economic Impacts

There are no pack and saddle stock outfitter-guide permitted days under Alternative 1 and therefore no economic contribution from these businesses. This would result in approximately 27 fewer jobs in Okanogan County annually, and a reduction of nearly $890,000 in labor income and $1.3 million in total sales, however these loses would only occur if there were no other opportunities for employment and income in the area to substitute for the loss of outfitter guide permits.

Social Impacts

The elimination of pack and saddle stock outfitter-guides under Alternative 1 would have the most impact on people over 50 years of age. This age class is more likely to need the services of

[17] (967,301 + 903,726 + 809,712)–(947,648 + 643,504 + 556,217)/(947,648 + 643,504 + 556,217) = 0.248 or 25%

a pack and saddle stock outfitter-guide to travel into the wilderness or backcountry and enjoy the type of recreation these settings offer. People unfamiliar with the analysis area, or lacking the skill and equipment to use pack and saddle stock would also lose the opportunity for this popular recreation activity.

Alternative 2

Economic Impacts

Figure 3.11-6 shows the economic contribution to Okanogan County from the 4,620 service days authorized in Alternative 2.

Figure 3.11-6. Economic Contribution of Alternative 2 to Okanogan County Compared to Effect of Current Service Days

Impact Type	Employment (# Jobs)	Labor Income ($2011)	Total Sales ($2011)
Direct Effect	23.0	$785,032	$901,254
Indirect Effect	1.1	$35,181	$118,107
Induced Effect	3.4	$102,238	$320,998
Total Effect	**27.6**	**$922,451**	**$1,340,359**
Current Condition	***26.6***	***$890,504***	***$1,293,940***

Alternative 2 would create approximately 1 more job annually compared to the existing condition, and generate roughly $31,947 in additional labor income, and $46,400 in total sales.

Social Impacts

Alternative 2 would slightly increase the number of service days authorized, so the pack and saddle stock outfitter-guides would be available for people who need them. Enough service days would be available to meet the current level of demand, but may fall short of demand in the future because of the projected increases in people over 50 who may need outfitter-guide services.

Alternative 3

Economic Impacts

Figure 3.11-7 shows the economic contribution to Okanogan County from the 2,660 service days authorized in Alternative 3.

Figure 3.11-7. Economic Contribution of Alternative 3 to Okanogan County Compared to Effect of Current Service Days

Impact Type	Employment (# Jobs)	Labor Income ($2011)	Total Sales ($2011)
Direct Effect	13.2	$451,998	$518,904
Indirect Effect	0.6	$20,256	$68,001
Induced Effect	1.9	$58,864	$184,817
Total Effect	**15.9**	**$531,108**	**$771,722**
Current Condition	***26.6***	***$890,504***	***$1,293,940***

Alternative 3 would potentially reduce the number of annual jobs in Okanogan County by roughly 11, labor income by approximately $360,000, and total sales by $522,000. As with Alternative 1, these losses would only occur if there were no other opportunities for employment and income in the area to substitute for the loss of outfitter guide permits.

Social Impacts

Alternative 3 would have a 40% reduction in the number of service days, compared to the permitted numbers under the current condition. This would have the greatest impact on those over 50 years old, since approximately 73% of the pack and saddle stock outfitter-guide clients fall in this age class. There would also be a reduced opportunity for people lacking experience or equipment to enjoy wilderness or backcountry recreation. It is likely that some people seeking this experience would not be able to find outfitter-guide services.

Alternative 4

Economic Impacts

Figure 3.11-8 shows the economic contribution to Okanogan County from the 6,700 service days authorized in Alternative 4.

Figure 3.11-8. Economic Contribution of Alternative 4 to Okanogan County Compared to Effect of Current Service Days

Impact Type	Employment (# Jobs)	Labor Income ($2011)	Total Sales ($2011)
Direct Effect	33.4	$1,138,446	$1,307,014
Indirect Effect	1.6	$51,020	$171,280
Induced Effect	4.9	$148,268	$465,516
Total Effect	**40.0**	**$1,337,753**	**$1,943,811**
Current Condition	***26.6***	***$890,504***	***$1,293,940***

Alternative 4 would have the most positive benefits to the Okanogan economy of any alternative. It would increase the number of jobs generated by pack and saddle stock outfitter-guides by approximately 13 compared to the existing condition. It would also increase labor income by approximately $450,000 and total sales by roughly $650,000.

Social Impacts

Alternative 4 would increase the number of service days by approximately 50% over current levels. This would have a positive impact on people wanting pack and saddle stock recreation activities. As the age class distribution of the population shifts into the older segments, and the number of people traveling to the area increases, there would be enough service days available to meet potential increases in demand.

Cumulative Effects

The geographic boundary for the cumulative effects is Okanogan County, with effects considered from the present to 2023, when the new permits would expire and any economic or social impacts would cease. Economic benefits to Okanogan County also benefit the economy of Washington State, but at that scale, the economic contribution of pack and saddle stock outfitter-guides is too small to measure.

Past Actions

No past actions are currently contributing to the economy or having social impacts.

Present Actions

Outfitter-Guides
There are currently a number of other outfitter-guides and special use permit holders offering a variety of recreation opportunities. Refer to Figure 3.0-1 in the FEIS for a list. These companies are part of the "Other amusement and recreation services" sector of the economy shown in Figure 3.13-1. These companies offer a wide variety of services to all segments of the population and will likely continue to do so under their priority permits throughout the cumulative effects time boundary.

Total Recreation Use
There are approximately 400,000 visits to National Forest Land in Okanogan County each year according to the 2005 NVUM survey (US Forest Service, 2006a). This use contributes to nearly every segment of the Okanogan County economy shown in Figure 3.13-1.

Reasonably Foreseeable Future Actions

Outfitter-Guides
It is reasonably foreseeable that all existing outfitter-guide and special use permit holders will continue to operate in the future.

Total Recreation Use
According to the Interagency Committee on Outdoor Recreation, the number of people recreating is on an upward trend that will likely continue for at least the next 20 years (Interagency Committee on Outdoor Recreation, 2003). This would increase the number of people recreating in Okanogan County, and increase the economic contribution over time.

Demographics
There would be an approximate 25% increase in the number of people over 50 years old by the year 2020 compared to the current population distribution among the classes, according to the Washington State Office for Fiscal Management. The aging population will increase the demand for pack and saddle stock outfitter-guide services.

Alternatives 1, 2, 3, and 4

Economic Impacts
The cumulative effects of all other outfitter-guides and recreation that contributes annually to the "Other amusement and recreation services" category in Figure 13-1, and the alternatives is shown in Figure 3.11-9 below. This category would contribute between twelve and fourteen million dollars annually to the economy of Okanogan County, depending on the alternative.

Figure 3.11-9. Cumulative Other Amusement and Recreation Services Economic Contribution by Alternative

Alternative/ Current	Employment (# Jobs)	% Change from Current	Labor Income ($2011)	% Change from Current	Total Sales ($2011)	% Change from Current
Current	297		$6,215,524		$13,330,139	
Alternative 1	270	-9%	$5,325,020	-14%	$12,036,199	-10%
Alternative 2	298	+0.3%	$6,247,471	+5%	$13,376,558	+0.3%
Alternative 3	286	-4%	$5,856,128	-6%	$12,807,921	-4%
Alternative 4	310	+4%	$6,662,773	+7%	$13,980,010	+5%

As shown in Figure 3.13-1, the total employment in Okanogan County is 22,581 jobs, total labor $803,916,135, and total sales $1,824,787,904. When considered cumulatively with the entire economy of Okanogan County, there is virtually no difference between the four alternatives.

Social Impacts

As stated above, the shift in the age distribution would increase the demand for pack and saddle stock outfitter-guide services in the future. The overall increasing trend in recreation use will also increase demand, albeit at a slower rate, for the other services currently being offered by the pack and saddle outfitter-guides and other recreation special use permit holders.

Alternative 1 would not meet the need for the aging population in terms of pack and saddle stock activities, but the other outfitter-guides would likely meet the demand for other types of recreation. Alternatives 2, 3, and 4 would all offer pack and saddle stock commercial services, so these alternatives added to the other outfitter-guides services being offered would provide access for nearly all segments of the population to more types of recreation experiences on National Forest System land than Alternative 1.

3.12 HERITAGE RESOURCES

The section below is a summary of the information included in the Heritage Program Appendix B Project Documentation Report from the analysis file (Dowie and Lenz 2011).

REGULATORY FRAMEWORK

Heritage resources on the Okanogan-Wenatchee National Forest are districts, sites, buildings, structures, and objects that contain evidence of past human activities. Traditional Cultural Properties (TCP), defined as resources of traditional cultural importance, are also included. Heritage resources are managed in accordance with the National Historic Preservation Act (NHPA) and its implementing regulation (36 CFR 800), the Archaeological Resources Protection Act (ARPA), the American Indian Religious Freedom Act (AIRFA), Native American Graves Protection and Repatriation Act (NAGPRA), and Executive Orders 11593, 13007, and 13175.

Forest Plan Direction

The following forest-wide heritage resources standards and guidelines apply to the project area.

Okanogan Forest Plan Forest-wide Standards and Guidelines (USDA Forest Service 1989b, pages IV-36 to IV-38)

- 7-2--Inventory all areas where ground-disturbing activities are planned in order to discover all reasonably locatable cultural resources, and in accordance with an Inventory Plan as specified in the Programmatic Memorandum of Agreement (PMOA) between Region 6 and the Washington State Historic Preservation Office.
- 7-3--Develop a schedule to evaluate cultural resources based on the criteria for eligibility to the National Register of Historic Places. First priority shall be for those cultural resources that may be affected by project activities.
- 7-5--Protect eligible cultural resources from management activities by making reasonable efforts to avoid adverse impacts to the resource or develop a procedure to conserve the values through proper scientific methods of study.
- 7-14--Coordinate with Native American Tribes regarding cultural resources of suspected prehistoric origin and to identify key native plant gathering areas and species.
- 7-15--Information about planned project activities shall be presented to Native American Tribes for coordination about effects to traditional religious sites.
- 7-16--Consultation with the Washington State Historic Preservation Officer shall follow the procedures in the PMOA between Region 6 and Washington State Office of Archaeology and Historic Preservation.

Wenatchee Forest Plan Forest-wide Standards and Guidelines (USDA Forest Service 1990)

- Conduct cultural resource inventories (survey and site recordation) according to strategies and consultation procedures established on the Forest. Emphasis will be given to all areas where ground disturbing activities are planned, to ensure discovery of all reasonably locatable cultural resources. These inventories should be supervised by a cultural resource professional (page IV-66).
- Evaluate the significance of inventoried sites by applying the criteria for eligibility to the National Register of Historic Places (page IV-66).
- Consider the effects of all Forest Service undertakings on significant cultural resources, and assure the development of measures to avoid or mitigate any adverse effects (IV-66).

Neither Forest Plan has management area specific direction that applies to cultural resources. All management direction is found in the forest-wide standards and guidelines above.

The Forest Service is responsible for the management of heritage resources that are listed or are eligible for listing on the National Register of Historic Places (NRHP). Listed or eligible heritage resources are known as historic properties and they are given consideration in planning for federally licensed, permitted, approved, or funded projects. Heritage resources that are documented but not yet evaluated for nomination or listing on the NRHP, are managed as eligible also. Sites that have been determined ineligible require no further management consideration, although the National Environmental Policy Act requires that the effects to ineligible resources be evaluated by alternative.

<u>Tribal Consultation</u>

Executive Order 13175 and the NHPA require consultation with tribal governments when federal projects have the potential to affect resources of interest to the tribes, tribal rights guaranteed

by treaty or executive order, and the agency's trust responsibility to federally recognized tribal governments. For this project, formal government-to-government letters and maps were mailed to the Yakama Nation and to the Confederated Tribes of the Colville Reservation in June, 2005. The letters described the project, defined the area of potential effect, and outlined how effects to heritage resources would be considered. Neither tribe identified concerns about the proposal.

ANALYSIS METHOD

Area of Analysis

The Area of Potential Effect (APE) for this analysis includes the complete project planning area (**Map 1-1** in the Map Section). The area is extensive and covers portions of the Methow River and many of its subdrainages including the Chewuch River, Twisp River, West Fork Methow and Lost River. It also includes the following: the Ashnola and Pasayten River drainages, Canyon Creek in the western Pasayten Wilderness, which flows into Granite Creek, creeks in the far eastern area of the Pasayten Wilderness that drain into the Sinlahekin River and creeks on the south side of the Sawtooth Ridge that flow into Lake Chelan.

Survey Design

Heritage resource site and report files at Forest Headquarters and at the Methow Valley, Chelan and Tonasket Ranger District offices were reviewed to determine where field inventory had already occurred and where heritage resources associated with those inventories had been documented. Potential effects to cultural resources were assessed by consulting the Forest Heritage GIS site layer and by reviewing pertinent literature, Section 106 project reports, site records and the National Register of Historic Places. Employees with a working knowledge of the landscape were also consulted.

Cultural resource surveys were guided by the site survey model used on both the Okanogan and Wenatchee national forests. The model uses a variety of environmental variables – such as slope, distance to water, and landform type – along with oral and recorded history to predict the likelihood that an area will contain material evidence of past human activity. Sample strategy standards require that intensive, systematic pedestrian survey be applied to no less than 100% of high probability areas, 35% of moderate probability areas, and 5% of low probability areas. With the exception of one site, Hootowl, campsites are all within high probability areas due to location of perennial water and slope of less than 15%. Hootowl is in moderate as it is further than 150 meters to perennial water. Because of the acreage and large number of sites involved, field survey specific to this undertaking was limited to a sample of assigned or primary outfitter campsites located in readily accessible high site probability areas. The objective of the sample reconnaissance is to locate all extant archaeological resources that may reasonably be detected from an inspection of ground surfaces.

AFFECTED ENVIRONMENT

The rich history of prehistoric and historic activities throughout the analysis have left cultural and historic sites scattered across the landscape. Many of the campsites used by outfitter-

guides are associated with historical sheepherding, mining, hunting, trapping, recreation (trail shelters) or fire suppression (former lookout sites). Other than the can dump sites, no previously unknown historic or prehistoric resources were located in any of the camps surveyed for this project.

Completed Inventories

A summary of cultural resource investigations that have been conducted in outfitter-guide camps is described in Heritage Program Appendix B Project Documentation Report in the analysis file (Dowie and Lenz 2008).

Many of the campsites used by outfitter-guides are associated with historical sheepherding, mining, hunting, trapping, recreation (trail shelters) or fire suppression (former lookout sites). Other than the can dumps, no previously unknown historic or prehistoric resources were located in any of the camps surveyed for this project on the Chelan or Methow Valley Ranger Districts.

Past surveys have identified several historic sites within or near existing camps used by outfitters. These sites are usually associated with past trapping, mining, grazing and Forest Service administration activities. Many were cabins, lookouts and mines. None are listed on the National Register of Historic Places, with the exception of the Parson Smith tree, which removed from the analysis area and stored to preserve it.

There are known sites located in the general vicinity of the camps that have been frequented by pack and saddle stock outfitter-guides, but not within the camps. Outfitters may have ridden by or stop and look at such sites but such activity would have no effect on the sites. Historic cabins at the Airport and Hidden Lakes are in close proximity to campsites that have been used by outfitters. These structures are currently maintained as administrative sites, and are pending SHPO concurrence on their eligibility to the National Register of Historic Places. There is also a picnic shelter at First Hidden Lake which is eligible to the National Register of Historic Places. Outfitter use in the vicinity of the Airport and Hidden Lake structures has been confined to adjacent camp areas, non-historic hitchrails, and the picnic shelter. . This is periodically used by outfitters, but the use is not damaging or altering the shelter.

There are no known prehistoric sites in the areas the outfitters are operating.

ENVIRONMENTAL CONSEQUENCES

Direct/Indirect

Alternative 1

Alternative 1 would have no direct or indirect effects on cultural resources from outfitter-guide activities. The potential of damage to cultural resources from non-outfitted recreationists would remain.

Alternatives 2, 3, and 4

Pack and saddle stock outfitter-guide activities would have no effect on cultural resources with implementation of any of these alternatives. They would be required to camp in existing, authorized locations, and would be prohibited from increasing the amount of barren core in any campsite or constructing new trails. This would avoid new ground disturbance. The outfitters would be required to comply with all terms and conditions of their permits, including the following resource protection clause

> *The holder shall immediately notify the authorized officer of any antiquities or other objects of historic or scientific interest, including but not limited to historic or prehistoric ruins, fossils, or artifacts discovered as the result of operations under this permit. The holder shall leave such discoveries intact until authorized to proceed by the authorized officer. Protective and mitigative measures specified by the authorized officer shall be the responsibility of the holder.*

Violations of any term or conditions of the permit could result in notices of non-compliance, or permit action. The permit action could be reducing service days, reducing the permit area, or permit cancellation.

Cumulative Effects

The area considered for heritage resources cumulative effects analysis consists of the Area of Potential Effect (analysis area). The time period considered for cumulative effects analysis includes up to 10 years into the future, the time-period of the proposed outfitter-guide special use permit issuance and any effects from the issuance of these permits would cease. From the list of past, present and reasonably foreseeable future actions at the beginning of this chapter, only ground-disturbing activities were considered in this cumulative effects analysis since these activities have the potential to affect heritage resources.

Alternative

There would be no cumulative effects from this alternative because there would be no pack and saddle stock outfitter guides operating in the analysis area.

Alternatives 2, 3, and 4

There would also be no cumulative effect with Alternatives 2, 3, or 4 since the pack and saddle stock outfitter-guides would not affect or damage cultural resources.

CONSISTENCY FINDINGS

In all action alternatives, the consideration of effects to heritage resources is consistent with Forest Plan standards and guidelines.

Okanogan Forest Plan Forest-Wide Standards and Guidelines

- 7-2--Inventory all areas where ground-disturbing activities are planned in order to discover all reasonably locatable cultural resources, and in accordance with an Inventory Plan as specified in the Programmatic Memorandum of Agreement (PMOA) between Region 6 and the Washington State Historic Preservation Office.
  There would be no new ground disturbing activities associated with any alternative. The pack and saddle stock outfitter-guides would be required to use established campsites, and not increase the amount of barren core at any site (Alternatives 2 and 3 would limit the amount of barren core the outfitters could use at any site). The outfitters would not be allowed to create new campsites or construct new trail.

- 7-3--Develop a schedule to evaluate cultural resources based on the criteria for eligibility to the National Register of Historic Places. First priority shall be for those cultural resources that may be affected by project activities.
  This standard and guideline does not apply to the pack and saddle stock outfitter-guides. They would not be allowed to use any of the cabins, and would have no impact of resources eligible or potentially eligible to the National Register of Historic Places.

- 7-5--Protect eligible cultural resources from management activities by making reasonable efforts to avoid adverse impacts to the resource or develop a procedure to conserve the values through proper scientific methods of study.
  As stated in the discussion of 7-2 above, the pack and saddle stock outfitter guides would not be allowed to disturb new ground since construction of new camps or trails would be prohibited. Adverse impacts to resources would be avoided.

- 7-14--Coordinate with Native American Tribes regarding cultural resources of suspected prehistoric origin and to identify key native plant gathering areas and species.
- 7-15--Information about planned project activities shall be presented to Native American Tribes for coordination about effects to traditional religious sites.
  Consultation with the Yakama Nation and the Confederated Tribes of the Colville Nation was completed. Information about the proposed action was provided, and the request made for information about cultural resources and native plant gathering areas. No responses were received. The government-to-government letters are in the analysis file.

- 7-16--Consultation with the Washington State Historic Preservation Officer shall follow the procedures in the PMOA between Region 6 and Washington State Office of Archaeology and Historic Preservation.
  This project complies with Section 106 of the National Historic Preservation Act, under the terms of the 1997 Programmatic Agreement between ACHP (Advisory Council Historic Preservation), Washington State Heritage Protection Officer (SHPO), and Region 6 of the US Forest Service. The project meets the conditions listed in Appendix B of the Programmatic Agreement and under the programmatic agreement, is excluded from case-by-case review by SHPO. Refer to the Project Documentation report in the analysis file.

Wenatchee Forest Plan Forest-wide Standards and Guidelines

- Conduct cultural resource inventories (survey and site recordation) according to strategies and consultation procedures established on the Forest. Emphasis will be given to all areas where ground disturbing activities are planned, to ensure discovery of all reasonably locatable cultural resources. These inventories should be supervised by a cultural resource professional (page IV-66).
  There would be no new ground disturbing activities associated with any alternative. The pack and saddle stock outfitter-guides would be required to use established campsites, and not increase the amount of barren core at any site (Alternatives 2 and 3 would limit the amount of barren core the outfitters could use at any site). The outfitters would not be allowed to create new campsites or construct new trail.

- Evaluate the significance of inventoried sites by applying the criteria for eligibility to the National Register of Historic Places (page IV-66).
  This standard and guideline does not apply to the pack and saddle stock outfitter-guides. They would not be allowed to use any of the cabins, and would have no impact of resources eligible or potentially eligible to the National Register of Historic Places.

- Consider the effects of all Forest Service undertakings on significant cultural resources, and assure the development of measures to avoid or mitigate any adverse effects (IV-66).
  There would be no new ground disturbing activities associated with any alternative. The pack and saddle stock outfitter-guides would be required to use established campsites, and not increase the amount of barren core at any site (Alternatives 2 and 3 would limit the amount of barren core the outfitters could use at any site). The outfitters would not be allowed to create new campsites or construct new trail.

3.13 SPECIFICALLY REQUIRED DISCLOSURES

This section describes how the action alternatives comply with other Forest Plan standards and guidelines, and applicable state and federal laws, regulations and policies.

The best available science was used for this analysis, including the methodology and data sources described below, to describe the ecological and social conditions within the analysis area, and the potential effects of the proposed outfitter-guide use on resources and people.

INVENTORIED AND UNINVENTORIED ROADLESS AREAS

The analysis area includes portions of, and entire Inventoried Roadless Areas and other unroaded areas. The Okanogan-Wenatchee National Forest has completed a draft Potential Wilderness Area evaluation as part of the Forest Plan revision. None of the alternatives would have any direct, indirect, or cumulative effect on roadless or undeveloped nature of these areas since they would not involve road or trail construction, or vegetation management. This project is consistent with the Roadless Area Conservation Rule (RACR) because, except for personal firewood use, no trees would be cut, sold or removed and no roads would be constructed or reconstructed in inventoried roadless areas. Personal firewood use is a permitted exception to the RACR prohibition on timber cutting, and has been re-delegated back to the local line officers by the Secretary of Agriculture.

VISUAL QUALITY OBJECTIVES

There are a variety of Visual Quality Objectives throughout the analysis area. The most restrictive objective is preservation, which occurs in the wilderness areas, and along the North Cascades Scenic Highway where the objective is retention. All the alternatives would meet the Visual Quality Objectives for any given spot in the analysis area since there would be no vegetation management or permanent structures. Temporary structures would be constructed of materials and design that would meet preservation requirements. There would be no direct, indirect, or cumulative effect on the visual quality throughout the analysis area.

CONSISTENCY WITH NATIONAL ENVIRONMENTAL POLICY ACT, THE NATIONAL FOREST MANAGEMENT ACT, AND THE OKANOGAN AND WENATCHEE FOREST PLANS

This project and this analysis is consistent with the Okanogan and Wenatchee Forest Plans as amended and with the National Forest Management Act, which requires that resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans. The Forest Plans contain direction for each resource area. The discussion of how the alternatives analyzed in this FEIS meet that direction is included in the discussions above in Chapter 3. This analysis was prepared to meet the requirements of the National Environmental Policy Act of 1969 and its implementing regulations and Forest Service Regulations at 36 CFR 220, to inform the public of the proposed action and alternatives and to disclose the effects of implementation.

NATIONAL HISTORIC PRESERVATION ACT

This project complies with Section 106 of the National Historic Preservation Act, under the terms of the 1997 Programmatic Agreement between the Washington State Historic Preservation Officer (SHPO) and Region 6 of the U.S. Forest Service.. The project meets the conditions listed in Appendix B of the Programmatic Agreement and has been excluded from case-by-case review by SHPO as documented in an Appendix A supplement (see 3.12 Heritage section of Chapter 3).

Formal government-to-government letters were mailed to the Yakama Nation and to the Confederated Tribes of the Colville Reservation in June, 2005. Neither tribe identified concerns about the proposal.

ENDANGERED SPECIES ACT AND REGIONAL FORESTER'S SENSITIVE SPECIES

The Endangered Species Act (ESA) rquires protection of all species listed as threatened or endangered by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. The Forest Service maintains a list of species that are proposed for classification and official listing as threatened or endangered under the ESA and maintains lists of Sensitive species that are recognized by the Regional Forester as needing special management to prevent placement on Federal or State threatened or endangered lists. In addition, the Forest Service coordinates with the State on management of species that appear on official State threatened, endangered or sensitive lists. Biological evaluations and assessments have been completed for all threatened, endangered and sensitive plants, aquatic species, and terrestrial wildlife. Determinations were made that the proposed action would not adversely affect threatened or endagered species nor contribute to a trend toward federal listing, or cause a loss of viability to listed or sensitive plant,

fish, and animal populations or species. Details are found in the Aquatic Resources, Botany and Terrestrial Wildlife sections of this chapter and their respective specialist's reports and biological assessments. Consultation with the regulatory agencies was not necessary for plants because no threatened or endangered plants would be affected by the project but has been completed for threatened and endangered fish and wildlife species and critical habitat. USFWS and NOAA-Fishies concurred with the effects determinations in concurrence letters dated January 28, 2013 and November 13, 2012, respectively.

CLEAN AIR ACT

The Clean Air Act (Public Law 95-95, as amended in 1977 and 1990) is a legal mandate designed to protect public human health and welfare from air pollution. The act defines National Ambient Air Quality Standards (NAAQS) as levels of pollutant above which detrimental effects on human health and welfare could occur. Particulate Matter (PM), the major pollutant of concern from wildfires and prescribed fires, includes any airborne finely-divided solid or liquid material with an aerodynamic diameter smaller than 100 micrometers (mictrons).

The Clean Air Act and its amendments define responsibility for air quality. The Environmental Protection Agency (EPA) has the responsibility to develop the NAAQS, while individual states are responsible for developing a Smoke Implementation Plan (SIP), including a smoke management program, in order to meet or exceed these standards. Since 1997, the EPA has standards for levels of PM10 (coarse particles less than 10 microns in size), and PM2.5 (fine particles are less than 2.5 microns in size). The Clean Air Act established Class I air quality designations, where little air quality deterioration over baseline is allowed. Most of the Pasayten Wilderness (that portion designated in 1968) is the only Class I airshed in or near the analysis area.

Smoke from campfires in the Pasayten or Lake Chelan-Sawtooth Wilderness would not violate the Clean Air Act. People camping in the wilderness areas, including clients and employees of pack and saddle stock outfitter-guides are allowed to have campfires. These campfires tend to burn quickly and efficiently, with nearly total consumption of the fuel. They also occur at times, and in locations, where air movement keeps the smoke from settling into a localized area. The outfitter-guides are required by their permits to extinguish all campfires before leaving camp, which further reduces the possibility of a fire smoldering over a long period of time. In addition, the Okanogan-Wenatchee National Forest has a policy and process in place to prohibit campfires if conditions warrant the restriction. Campfires outside of the wildernesses would not reach or affect wilderness for the same reasons.

All alternatives would meet the Clean Air Act standards and would be consistent with the Washington State SIP. Refer to the Air Quality information in the project analysis file.

WILD AND SCENIC RIVER ACT

The Chewuch River section adjacent to Upper Methow area is allocated under the Okanogan National Forest Land and Resource Management Plan to maintain its potential Scenic River classification within one-quarter mile of the river (Forestwide standard and guideline 9-3). One assigned site near Andrews Creek Trailhead is within one-quarter mile of the river, but maintenance of the corral there would not affect future potential designation under the Wild and Scenic River system because the corral is not a permanent structure, and could be removed if the Chewuch River is designated as Wild and Scenic.

FLOODPLAINS AND WETLANDS

Executive Orders 11988 and 11990 direct Federal agencies to avoid, to the extent possible, both short-term and long-term adverse impacts associated with the modifications of floodplains and wetlands. Surveys and research carried out for this EIS indicated that there are designated wetlands within the project area. There are 35 camps within 500 feet of wetlands, and approximately 86 acres of wetlands would be potentially affected by this project. Under Alternatives 2 and 4, these existing campsites would continue to be used by pack and saddle stock outfitter-guides, in addition to private pack and saddle stock users. The current impacts to nearby wetlands would continue, including vegetation trampling, selective grazing, and soil damage in approximately 1% of the wetland habitat in the analysis area. The remaining 99% of the wetlands would be unaffected. Riparian reserves and riparian habitat conservation areas were designated in part to protect floodplain functions. The proposed outfitter-guide activities would meet the Aquatic Conservation Strategy and Riparian Management Objectives. Refer to the Botany section of Chapter 3 (beginning on page 3-235) for detailed information about the existing condition and environmental effects on wetlands. The Aquatic Resources section beginning on page 3-182 includes details concerning floodplains, the Aquatic Conservation Strategy and the Riparian Management Objectives.

PRIME FARMLANDS, RANGELANDS, FORESTLANDS

The Secretary of Agriculture issued Memorandum 1827, which is intended to protect prime farmlands and rangelands. The policy for Prime Forestlands is in Forest Service Handbook 1909.15, 65, 21 (USDA, 2008). The project area does not contain any prime farmlands. These designations generally do not apply to lands within the National Forest System. This project would not convert any prime rangelands or prime forestlands to other uses. National Forest system lands would be managed with consideration of the impacts on adjacent private lands. There would be no direct, indirect, or cumulative adverse effects to these resources.

RESEARCH NATURAL AREAS

No outfitter-guide activities would be allowed in Research Natural Areas, so there would be no direct, indirect, or cumulative effects to these areas.

CIVIL RIGHTS AND ENVIRONMENTAL JUSTICE

Civil Rights

Civil rights would not be affected by any of the alternatives. Under Executive Order 11246, companies with Federal contracts or subcontracts are prohibited from job discrimination on the basis of race, color, religion, sex or national origin. The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. Special Use permits authorizing Outfitting-Guiding contain the following nondiscrimination language:

> *The holder and its employees shall not discriminate against any person on the basis of race, color, sex (in educational activities), national origin, age, or disability or by curtailing or refusing to furnish accommodations, facilities, services, or use*

privileges offered to the public generally. In addition, the holder and its employees shall comply with the provisions of Title VI of the Civil Rights Act of 1964 as amended, Section 504 of the Rehabilitation Act of 1973, as amended, Title IX of the Education Amendments of 1972, as amended, and the Age Discrimination Act of 1975, as amended.

The holder shall include and require compliance with the above nondiscrimination provisions in any third-party agreement made with respect to the operations authorized under this permit.

The Forest Service shall furnish signs setting forth this policy of nondiscrimination. These signs shall be conspicuously displayed at the public entrance to the premises and at other exterior or interior locations, as directed by the Forest Service.

The Forest Service shall have the right to enforce the foregoing nondiscrimination provisions by suit for specific performance or by any other available remedy under the laws of the United States or the State in which the violation occurs.

Environmental Justice

The following discussion is derived from the 2010 census information found at www.census.gov, using queries of the American Fact Finder. Although actual permitted Outfitter-Guide activities will take place on National Forest System lands, approximately 85% (see Economic and Social Section of this chapter) of clients travel from out-of-town to the Outfitter-Guide's base camps, trailheads or other access points, primarily in the Methow Valley or along Lake Chelan. The only potential effects to environmental justice from this project would be increased traffic through high poverty or low income areas on roads travelled by out-of-town Outfitter-Guide clients to the base camps, trailheads or other Forest access points, and the economic viability of Alternative 3. Out-of-town clients are likely to travel through combinations of the following towns in Chelan and Okanogan County: Brewster, Cashmere, Chelan, Chelan Falls, Conconully, Entiat, Leavenworth, Methow, Okanogan, Omak, Oroville, Pateros, Riverside, Tonasket, Twisp, Wenatchee and Winthrop.

Although Chelan County poverty rates are below both Washington State and national averages, Okanogan County exceeds both of those averages by about 52% and 33% respectively. Most of the towns in both counties have poverty levels above the national and state averages; the exceptions are Cashmere and Conconully (both above state average, below national average), and Chelan, Wenatchee and Winthrop (below both). Poverty is especially acute (more than twice the national and state averages) in the town of Oroville, and high (more than 50% above the national average) in Brewster. Measured at the state level, the towns of Brewster, Chelan Falls, Entiat, Okanogan, Omak, Tonasket and Twisp have acute poverty (approximately or more than 50% of the state average).

The 2010 census information reports the percent of white, non-Hispanic populations. Because this language is awkward, the inverse number is used in this report to discuss minority populations (to which the Environmental Justice Executive Order applies). Although Chelan and Okanogan County minority populations are below the national averages for minorities, both exceed Washington State averages by about ten percent. The town of Brewster has a very high minority population (at 72.1%, more than double the national average, and over 2 ½ times the Washington State average). The towns of Chelan Falls, Oroville, and Pateros also all exceed the

national averages; additionally the town of Cashmere and Omak, and City of Wenatchee both slightly exceed the Washington State minority population averages.

Although 85% of the clients come from outside the area, they would be spread across many different routes over the operating season, and they would travel almost exclusively on State Highways, except the last few miles to base camps, trailheads or other access points to the Forest. Clients would be even more dispersed on these local roads because most Outfitter-Guides use different access points to the Forest. Because of this dispersion and the current level of traffic on primarily State Highways, it is extremely unlikely additional traffic from these clients, when added to other traffic already present on these roads, would be noticeable to residents along these routes. For a discussion of the economic benefits from clients passing through these towns and making purchases, see the Socio-Economic section of this Chapter. In order for Outfitter-Guides to remain economically viable under the restricted party size of Alternative 3, it is likely they would have to raise their fees. Although all clients would be charged the same fee regardless of income level, if the fees are raised, it may disproportionally discourage lower income clients from using Outfitter-Guide services.

OTHER JURISDICTIONS

The Okanogan and Wenatchee Forest Plans guide management of National Forest System lands in the analysis area. Information relating to how the project meets Forest Plan standards and guidelines and effects relating to other federal and state laws are also analyzed throughout this chapter. To the extent that State and local laws are applicable to this project, this information is analyzed in the appropriate resource section of this chapter . Implementation of all alternatives would be consistent with State and local laws, land use, and environmental policies.

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of the “relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). The Multiple Use - Sustained Yield Act of 1960 requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish, wildlife, range and watershed). All renewable resources are to be managed in such a way that they are available for future generations.

Soil and water are two key factors in ecosystem productivity, and these resources would be protected through design criteria and mitigation measures as described in Chapter 2. The quality of water from the project area may fluctuate as a result of short-term uses, but no long-term effects to water resources are expected to occur as a result of outfitter-guide activities (See Aquatics and Water Resources sections in this chapter).

All alternatives would provide the fish and wildlife habitat necessary to contribute to the maintenance of viable, well-distributed populations of existing native and non-native species. By managing the habitat of management indicator species, the other species associated with the same habitat would also benefit. The alternatives include amended standards and guidelines, design criteria and mitigation measures for maintaining long-term habitat and species productivity (see Terrestrial Wildlife, Aquatic Resources, Botany, and Water Resouces sections in this chapter).

None of the alternatives would have an effect on the long-term productivity of timber resources.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitment of resources refers to a total loss of future options with non-renewable resources such as through mineral extraction or loss of heritage resources. Under the alternatives, various amounts of fossil fuels would be expended. Fossil fuel energy would be used for this project (vehicular transportation of clients and stock to and from trailheads) and would be an irreversible commitment of the fuel used. However, these energy sources are not currently in short supply, and the amount of fuel used annually would be very small when considered on a local, regional or national scale, and therefore their use would not have an effect upon continued availability of these resources. There would be no other irreversible commitment of resources with any alternative.

Irretrievable commitment of resources refers to losses that cannot be regained, but do not result in total loss of future options. Use of firewood and vegetation loss in campsites (barren core) would be irretrievable. The management of firewood use by the pack and saddle stock outfitter-guides would ensure that ample firewood exists in the present and future. Barren core areas would be perpetuated by pack and saddle stock outfitter-guide activities, so the loss of vegetation would be irretrievable as long as the activity continues. Limitations on the use and size of barren core would prevent expansion.

UNAVOIDABLE IMPACTS

Each section of Chapter 3 documents the unavoidable impacts associated with the project. Figure 3.13-1 summarizes these impacts:

Figure 3.13-1: Unavoidable Impacts

Resource	Impact
Wildlife	**Disturbance and displacement impacts causing wildlife to relocate** • Noise and human activity in and around campsites. **Impacts that constitute habitat losses for species.** • Soil disturbance within campsites, at stock watering locations, and trail crossings (see Soils section of this chapter and report in the analysis file). • Vegetation loss within campsites (see Wilderness and Botany sections earlier in the chapter and reports in the analysis file). • Loss of grass and forb production from invasive species invasion and spread (see Invasive Species section earlier in this chapter and report in the analysis file). • Riparian habitat effects from stock watering and trail crossings (see Aquatics and Water Resources sections earlier in this chapter and reports in the analysis file).
Water/Aquatic Resources	Sediment production and delivery to streams from pack and saddle stock activities could slightly reduce water quality in the vicinity of the disturbance sites. Fecal coliform would be introduced into waterways by outfitter-guide stock and clients (see Aquatics and Water Resources sections earlier in this chapter and reports in the analysis file).

Soil	Soil disturbance within campsites, at stock watering locations, and trail crossings (see Soils section earlier in the chapter and report in the analysis file). Human or recreational stock disturbances to streambanks and riparian areas are localized near trail crossing areas and campsites in the Pasayten and Sawtooth Wilderness Areas. Areas above and below these disturbance areas are in pristine condition, with no sign of human or stock use, intact streambanks, and established vegetation. These disturbed areas are watering locations near campsites and/or at trail crossings where unavoidable trampling occurs. Trampling exposes bare soil and causes alteration to the streambank. This erosion is not affecting water quality beyond the isolated, local areas due to relative small size and infrequent occurrence.
Forest Vegetation	Vegetation loss within campsites (see Wilderness and Botany sections earlier in this chapter and reports in the analysis file).
Plant Communities	No long-term modifications of plant succession or communities would occur. Isolated short-term modifications that can recover in one growing season could occur (see Botany section earlier in this chapter and report in the analysis file).
Invasive Plants	Soil disturbance would create sites for establishment of invasive plants (see Invasive Species section earlier in this chapter and report in the analysis file).
Recreation	Outfitter-guide activities would add to the total number of non-outfitted recreationists in the area. Non-outfitted recreationists would encounter outfitter-guide clients and stock, potentially impacting the recreation experience by decreasing opportunities for solitude (see Wilderness and Recreation sections earlier in this chapter and report in the analysis file).
Air Quality	Smoke from isolated campfires could cause local, short-term changes in air quality. No violations of Clean Air Act (see Air Quality section earlier in this chapter and report in analysis file).
Sensitive Plants	Possible impacts to some individuals, but would not cause a trend toward Federal listing or loss of population viability (see Botany section earlier in this chapter and report in the analysis file).
Wilderness Character	There will be localized impacts to the natural quality of Wilderness by impacts to water quality and vegetation, and to opportunities for solitude because of campsites and encounters on trails (see Wilderness section earlier in this chapter and report in the analysis file).
Wetlands	Approximately 86 acres of wetlands could be impacted by outfitter-guide activities. Impacts could include trampling of plants and soil compaction and displacement. Impacted wetlands would be approximately 1% of all wetlands in the analysis area, so the majority of wetlands would not be affected (see Botany section earlier in this chapter and the report in the analysis file>

TRIBAL INTERESTS

Although the project area lies outside the areas ceded to the United States by the Colville Confederated Tribes and the Yakama Nation, the federal government still has a trust responsibility to manage resources of interest to the tribes in a manner consistent with the rights and privileges secured through treaty or executive order.

The “inherently sovereign” status of federally recognized tribes requires that land management agencies consult with tribes on a government-to-government basis about planned actions that may affect tribal interests. At the early stages of the planning process, the Forest Service initiated government-to-government consultation with the Confederated Colville Tribes and the Yakama Nation (copies of the letters are in the analysis file). Neither Tribe expressed any concerns regarding this project.

ENERGY REQUIREMENTS/NATURAL OR DEPLETABLE RESOURCES AND CONSERVATION

Under the alternatives, various amounts of fossil fuels would be expended to power the vehicles used for transporting clients and stock. Fossil fuel energy would be used for this project and is an irreversible commitment of resources. These energy sources are not currently in short supply, and the amount of fuel used annually would be very small on a local, regional or national scale, therefore their use would not have an effect upon continued availability of these resources.

PUBLIC HEALTH AND SAFETY

Public health and safety would be protected by the mitigaton measures and terms and conditions of the special use permits. Outfitter-guides would be monitored and evaulated on public health and safety.

URBAN QUALITY, HISTORIC AND CULTURAL RESOURCES, AND THE BUILT ENVIRONMENT

No urban or built environment is present in the project area. Field surveys for historic and cultural resources were limited to a sample of outfitter-guide campsites because of the size of the analysis area. Other than the can dumps, no previously unknown historic or prehistoric resources were located in any of the camps surveyed. The outfitter-guide activities would have no effect on any cultural or historic sites.

Past surveys have identified several historic sites within or near existing camps used by outfitters. These sites are usually associated with past trapping, mining, grazing and Forest Service administration activities. Many were cabins, lookouts and mines. None are listed on the National Register of Historic Places, with the exception of the Parson Smith tree which is no longer within the area of potential effect (APE). The tree was cut down and moved to the Forest Service office to prevent decomposition.

Potential for damage to historic or cultural resources would be minimized in both action alternatives based on the surveys and probability analysis conducted and special use permit clause requiring outfitter-guides to protect cultural resources.