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 consider 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, similar resources cannot always be directly compared.

The effects resulting from each action are described in terms of their context, intensity, and duration. These activities, occurring in the same area over time, under certain circumstances, may be incremental and produce cumulative effects. It is sometimes necessary to look beyond the defined project area to determine the cumulative effects on certain resources. The effects disclosed have considered the past, present, and reasonably foreseeable actions outlined 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 and other sources for each resource.
- Analysis Method details how the analysis of each resource was conducted. It also identifies the analysis area, which may be larger than the project area.
- Affected Environment describes the environment of the area to be affected by the alternatives, that is, the baseline environment. 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 Forest Plan and other management direction.

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 Project Record [40 CFR 1502.21]. 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 Project Record. 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 or 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 cumulative 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 DEIS 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 decisionmaking. (40 CFR 1508.7)"*

For these reasons, the analysis of past actions in this section is based on current environmental conditions.

Present Actions

Livestock Grazing

Grazing will continue on all active allotments described above. No commercial livestock grazing is occurring in the Pasayten or Lake Chelan-Sawtooth Wilderness, or in the Sawtooth Backcountry.

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 campground and trailheads are maintained and cleaned throughout the snow-free seasons. Maintenance activities include repair and maintenance of picnic table, 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 these holders are included in this list because they change from year-to-year. 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.

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)

Outfitter	Type of Activity	Area of Operation	Season of Operation	Type of Permit
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		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, 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 221,922 visitor days in the analysis area each year, not including pack and saddle stock outfitter-guide visitor days. The Tonasket, Methow Valley, and Chelan Ranger Districts conducted National Visitor Use Monitoring in 2001 and 2002, and again in 2005. This survey generated statistically valid estimates for the number of people recreating and the type of activity being done. Copies of the reports are included 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	51,758
Lake Chelan-Sawtooth Wilderness	55,814
North Cascades	70,908
Sawtooth Backcountry	13,710
Bear/Ramsey/Volstead	978
Middle Methow	15,000
Alta Lake	9,671
TOTAL	221,922

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.

All the known new invader noxious weed sites in and adjacent to the project area will be prioritized for integrated weed management for project year 2011. 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 to 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 with emphasis on early detection of new infestations, rapid treatment response, and prompt revegetation. The combination of herbicide, manual, and cultural treatment together will provide effective control of small populations. Treatments will be conducted by the District Weed program with herbicide treatments authorized under the1997 and 2000 Okanogan National Forest Integrated Weed Management Decision Notices (USDA Forest Service1997e and 2000d) and the 2003 Crupina Integrated Weed Management Project EIS Record of Decision (USDA Forest Service 2003b).

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.

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

Developed Recreation Sites
The existing campgrounds and trailheads will be maintained into the future. It is reasonably foreseeable that the parking areas at Harts Pass will be enlarged and improved to provide safe parking off the roadways.

Special Use Permits
It is reasonably foreseeable that all existing outfitter-guide permits will continue. Additional temporary use permits will 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 people recreating on the Tonasket, Methow Valley, and Chelan Ranger Districts is expected to increase over the next ten years, based on projections included the publication "Estimates of Future Participation in Outdoor Recreation in Washington State" (Interagency Committee for Outdoor Recreation, 2003). There will be a 5% increase in the number of people backpacking and horseback riding. There are also projections for increases in hiking (10%), nature activities (23%), bicycle riding (19%), and off-road vehicle riding (10%). While these other activities do occur in the analysis area, the majority of overlap between non-outfitted recreationists and outfitter and guides involve backpacking and horseback riding, so a 5% overall increase was assumed. 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 10 years.

The following figure lists current non-outfitted recreationists in each section of the analysis area, and the foreseeable number in 2020.

Figure 3.0-3. Current Number of Non-Outfitted Visitor Days and Estimated Number in 2020

Area	Non-Outfitted Visitor Days	Estimated Non-Outfitted Visitor Days in 2020
Pasayten Wilderness	51,758	58,027
Lake Chelan-Sawtooth Wilderness	55,814	62,276
North Cascades Scenic Highway Corridor	70,908	115,604
Sawtooth Backcountry	13,710	15,369
Bear/Ramsey/Volstead	978	856
Middle Methow	15,000	16,606
Alta Lake	9,671	10,591
TOTAL	221,922	279,329

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

Invasive Plants
A Forest-Wide Integrated Weed Management EA is scheduled for completion in 2011, and covers a majority of the project area that is not currently covered by a decision document for herbicide treatments. The actions allowed by the new EA will 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 3.9 Invasive Plants.

Transportation System
Routine road maintenance will continue; periodic danger tree felling will continue as part of routine maintenance along forest roads.

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

3.1 WILDERNESS

The section below is a summary of the Wilderness Report which is available in the project analysis file (Zbyszewski 2010).

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, 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.

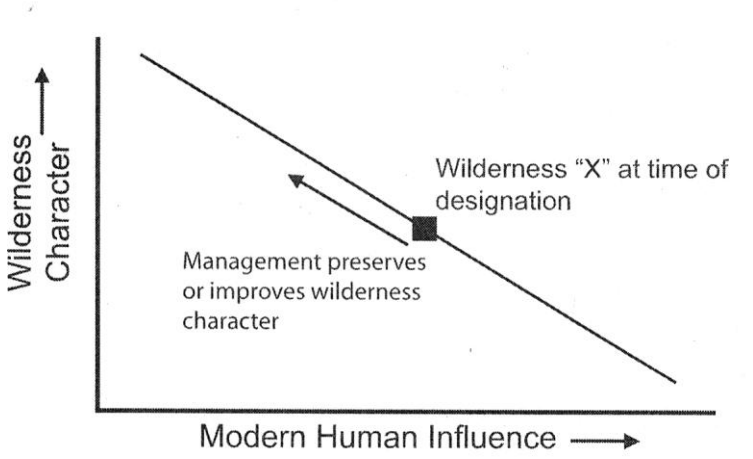
Forest Service Manual

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 direction.

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 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.

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).

Needs Assessment and Minimum 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 paper is referred to as the "Needs Assessment" in this document.

The analysis 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 conservations about wilderness, and indirectly through demonstrating how to travel and stay in the wilderness without modern conveniences. Pack and saddle stock outfitter-guides 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 to the public. 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 of 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. 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). The current recreation use, including the outfitter-guides complies with nearly all the existing Forest Plan standards and guidelines.

The Forest Service has a need for commercial pack and saddle stock outfitter-guides in order to provide for wilderness appropriate recreation, based on the analysis of need discussed above. Approximately 12% of the pack and saddle stock users in the Pasayten Wilderness have been outfitted annually, over the past 10 years; with approximately 3% in the Lake Chelan-Sawtooth Wilderness. This is the minimum extent necessary for these commercial services. This number is at or very near the minimum number required for businesses to stay in operation. If the level was reduced, there is a high likelihood that some businesses would fail. This would create a high probability of unpredictable changes in the types of services available, and a risk to the Forest Service's ability to meet the identified needs.

The use levels in both wildernesses is within the social and biophysical capacity, and allocating 12% of the anticipated 2020 use pack and saddle stock use levels in the Pasayten and 3% of the use in the Lake Chelan-Sawtooth will not exceed capacity. Therefore, the minimum number of service days needed for pack and saddle stock outfitter guides is 2,000 in the Pasayten and 720 in the Lake Chelan-Sawtooth.

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. **Maps 1-4 and 1-5 in the Map Section** of this document show the wilderness areas and management areas.

Management Areas

Okanogan Forest Plan

In an effort to provide a spectrum of recreation opportunities appropriate in wilderness, the Okanogan National Forest Plan established two wilderness recreation opportunity spectrum areas. These areas are Trailed (MA 15B) and Trail-less (MA 15A). 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 Trail-less 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 National Forest Land and Resource Management Plan, 1990. The Wenatchee Forest Plan divided the Wildernesses into four opportunity spectrums: Pristine, Primitive, Semi-Primitive, and Transition. Pack and saddle stock outfitter-guides are allowed to operate in all areas, although they are limited to travel only through Pristine areas.

Pristine: This area is characterized as an extensive, unmodified, natural environment. Natural processes and conditions have not been measurable 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.

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. System trails and campsites 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 pres3ent 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 direction.

The standards and guidelines frame the management direction to protect wilderness character. Those pertaining to pack and saddle stock outfitter-guide activities address the undeveloped and natural qualities of wilderness, and the opportunities for solitude or primitive and unconfined recreation. Refer to the Wilderness Report in the analysis file for a list of standards and guidelines (Zbyszewski, 2010).

ANALYSIS METHOD

This section analyzes and discloses the effects pack and saddle stock activities have on wilderness character. Since the outfitter-guides are such a small percentage of overall recreation use (2% of all use and 5% of pack and saddle stock use in the Pasayten, and 1% of overall use and 3% of stock use in the Lake Chelan-Sawtooth), and since the effects of outfitted verses non-outfitted recreationists are virtually impossible to differentiate, the analysis is on the effect of all pack and saddle stock users, and how the effects would change with the slight variation in the total number of users with implementation of the alternatives.

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 provides a basis for significant 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." (Wilderness Act, 1964).

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 (USDA Forest Service, 2008). Impacts from the trail system are included in the cumulative effects section of this analysis.

Applying the Concept of Wilderness Character to National Forest Planning, Monitoring, and Management (Landres, et. al, 2008) describes the technique of using these qualities in evaluating effects to wilderness character. In this approach, wilderness character is the primary administrative responsibility mandated by the Wilderness Act, but it is not defined by the Act. Wilderness character is also 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. Developed recreational sites, such as campgrounds and recreational facilities, exist in many locations adjacent to 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 are 10 to 20 years.

Type of effect: Impacts were evaluated in terms of whether they would be beneficial or adverse to wilderness character. **Beneficial** effects would enhance one or more of the qualities of wilderness character. **Adverse** effects would harm one or more of the qualities of wilderness character.

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. 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. Pack and saddle stock outfitter guides use is measured by the number and type of trips and the people and stock used to reach each destination. 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. Any improvements to wilderness character 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.

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.

Encounter Data
A voluntary 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.

Total Recreation Use Levels
Monitoring was completed in 2005 to gather information about the number of people recreating in the wilderness areas. The National Visitor Use Monitoring Results for the Okanogan National Forest, September 2006 (USDA, 2006c), and Wenatchee National Forest, 2006 (USDA, 2006d) generated information on the number and type of visitor days in the areas. These overall numbers were used throughout the analysis to display the amount of pack and saddle stock outfitter-guide use compared to non-outfitted recreationists. 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, 2006c). This is the best available information concerning use levels.

Comparisons of Outfitted and Non-outfitted Use

The actual number of service days reported for 2005 by the outfitter-guides was used to calculate the current percentage of overall use outfitter, since the overall use numbers were also from 2005. 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 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 (2010) to generate the anticipated number in 2020.

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. This document is called the "2009 Wilderness Use Study" throughout this docment.

Best Available Science

Throughout this analysis, the best available 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

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. 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 affects of these past activities are still evident today.

Commercial livestock grazing was eliminated after designation in both wilderness areas. This, coupled with recreation party size controls and other standards and guidelines from the forest plans, began, and is perpetuating the upward trend in the untrammeled, natural, and undeveloped qualities of the wilderness character. No large-scale mining activities have occurred, which has also had a beneficial impact on the undeveloped quality, especially in the vicinity of the Tungsten Mine in the Pasayten Wilderness.

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. Many camps used by 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 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 Land Management 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.

Untrammeled Quality

The current recreation use, including the 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 (US Forest Service, 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 both wilderness areas has been on an upward trend since designation due to the elimination of commercial livestock grazing and 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 (US Forest Service, 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.

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 (US Forest Service, 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 proposed 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 DEIS, 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. Each analysis found local, minor 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 DEIS, 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 having limited, localized impacts to 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 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 (US Forest Service, 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, 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 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 2% of total use and 5% of the pack and saddle stock use. In the Lake Chelan-Sawtooth, outfitter-guide clients are about 1% of the total use and 3% of the pack and saddle stock use. It is impossible to differentiate the effects of pack and saddle stock outfitter-guide activities from non-outfitted pack and saddle stock use.

Non-outfitted groups tend to be smaller than some outfitted groups. Outfitter-guides occasionally have groups with 12 people and 18 head of stock, 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. Also, non-outfitted groups tend to spend fewer days in wilderness compared to outfitter-guide full-service and drop camps.

In terms of evaluating the effect of pack and saddle stock outfitter-guides on the wilderness, the most meaningful analysis considers the effect of all recreation activities on wilderness. This analysis then focused on pack and saddle stock use, recognizing that most of the activity and effects are a result of non-outfitted use. The following sections discuss the use levels in each wilderness.

Pasayten Wilderness

The 531,541-acre Pasayten Wilderness spans the Methow Valley and Tonasket Ranger Districts. There are about 52,600 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 (USDA, 2006c). The number of annual visits was 31,000, 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 31,000 visits to 52,600 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 actual number of service days reported for 2005 by the outfitter-guides operating that year was 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[1]. Approximately 5% of the pack and saddle stock users are outfitted. Overall, outfitter-guide service days represent 2% of the visitor days in the Pasayten.

[1] There are commercial hiking/backpacking companies operating in the wildernesses. Refer to

Figure 3.1-2. Number of Visitor days by User Group in the Pasayten, and Number of Outfitter-Guide Service Days in 2005.

User Group	Total Visitor days	Pack and Saddle Stock Outfitter-guide Service Days	% of Total Visitor Days
Hikers	36,820	0	0%
Pack and Saddle Stock Users	15,780	842	5%
TOTAL	**52,600**	**842**	**2%**

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. **Map 1-4 in the Map Section** of this document shows these trails and trailheads.

There are areas in the Pasayten where use is higher; specifically the lakes in the vicinity of Harts Pass and the Pacific Crest Trail, Hidden Lakes, Crow and Corral Lakes, Sheep Mountain, Spanish Camp, and Black Lake. 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. Approximately one-quarter of the use at Hidden Lakes is 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, Ferguson Lake, 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. 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

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the cumulative effects analysis for this information, and how the use cumulatively affects wilderness character.

National Forest in 2005 to visitor days. 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 actual number of service days reported for 2005 by the outfitter-guides operating that year was used to calculate the current percentage of overall use outfitter. As in the Pasayten, none of the hikers included in the total visitor days are pack and saddle stock outfitter-guide clients[2]. Approximately 3% 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 3.1-3. Current number of Visitor days by User Group in the Lake Chelan-Sawtooth, and Number of Outfitter-Guide Visitor days in 2005.

User Group	Total Visitor days	Pack and Saddle Stock Outfitter-guide Service Days	% of Total Visitor Days
Hikers	36,616	0	0%
Pack and Saddle Stock Users	19,716	508	3%
TOTAL	**56,332**	**508**	**1%**

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 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. **Map 1-5 in the Map Section** of this document shows these trails and trailheads.

As in the Pasayten, some areas in the Lake Chelan-Sawtooth have higher levels of use. The Lake Chelan-Sawtooth spans the geographic mountain divide between the Methow and Chelan watersheds. The destination lakes in the Chelan watershed are clustered near the divide in an area characterized by south-facing slopes, with scattered clumps of trees among large open meadows. The portion of the wilderness in the Methow watershed is roughly divided between north and south facing slopes, with more deeply incised drainages (compared to the upper elevation destinations on the Chelan side) around the tributaries to the Twisp River.

[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 charater.

Many of the destination lakes are located in small basins with limited flat ground and graze, and accessed by one-way trails offering no loop opportunities to other areas. In comparison, there is more graze for stock animals, and more flat, open areas for campsites on the upper slopes of the Chelan side than in the Twisp River drainage. Since nearly all the trails into the wilderness begin along the Twisp River from roadways, use is more highly concentrated in this area than from the Lake Chelan boat-in trailheads. The specific areas of higher use include Oval Lakes, North Lake, Twisp Pass, Louis and Williams Lakes, and Star, Tuckaway, Bernice, and Surprise Lakes.

The Twisp River Horse Camp was constructed in the early 1990s and provides 13 campsites for people with horses or other pack animals. The camp also has an outhouse, feeding mangers, hitch rails, high lines, and watering troughs. It is filled 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, 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 Use Study gathered information on people's perception of the opportunity for solitude by asking about crowding. 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).

When asked if other people increased the enjoyment of the trip, visitors were nearly evenly divided between feeling other increased their enjoyment, feeling neutral about others, and feeling others decreased their enjoyment. In the Pasayten, 45% of the visitors were neutral, 29% agreed or strongly agreed with the statement, and 26% disagreed or strongly disagreed. In the Lake Chelan-Sawtooth, the split was similar, with 32% feeling neutral, 34% agreeing or strongly agreeing, and 34% disagreeing or strongly disagreeing.

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).

The Forest Service has also been gathering encounter data, and found that there is a 96% probability of encountering not more than seven parties on trail in the Pasayten on any given day, and a 98% probability in the Lake Chelan-Sawtooth. This was determined using the average number of groups leaving trailheads, as reported on trailhead permits for the years 2001 thru 2004 in the Pasayten, and 2003 and 2004 in the Lake Chelan-Sawtooth, in addition to the outfitter guide use for those years. With an assumption that 50% of wilderness visitors register, days with four or more groups leaving a particular trailhead were assumed to have the potential to have eight or more groups on that trail for that day. This could create the possibility that any one group would encounter seven more during that day.

There are portions of each wilderness that are more popular, and the number of people has a minor effect on the opportunity for solitude. The following section describes these areas for each wilderness.

Pasayten

In the Pasayten, the highest encounter rates occurred on the Billy Goat, Irongate, Pacific Crest Trail, and Buckskin Ridge trails, where the probability of encountering not more than seven other parties was 88% to 89%. 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. The Billy Goat and Buckskin Ridge trails access two trails within a short distance of the trailhead and the encounter rates drop as people disperse between the two trails.

There are many factors influencing 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.

Lake Chelan – Sawtooth

The Lake Chelan-Sawtooth receives more day use than the Pasayten. Gilbert and South trails are the two most popular routes for day rides. North Lake and Louis Lake are the most popular destinations. The use figures are most likely higher than indicated in the chart for these two trailheads as there were a number of groups riding from horse camp that did not designate specific trails or destinations on the register. However, the Gilbert trailhead accesses two separate trails, Twisp Pass and North Lake Trail, so the encounter rate may be less than indicated by the trailhead figures. The highest likelihood of more than eight encounters generally occurs on weekends and holidays in July, August and September.

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, isolated alterations in plant communities, 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 have had an effect on ecological conditions, resulting in localized degradation of the undeveloped quality of the wilderness character. 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 enlarging the camps. Since the areas were designated as wilderness, new campsites have been created by both the outfitted and non-outfitted public. The effects to the undeveloped character are localized, 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.

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 the Forest Plans, wilderness managers have been monitoring and rehabilitating campsites to the extent allowed by budgets and working to bring sites into compliance with all standards and guidelines. Correction of these problems will take decades of rehabilitation, which can be undone in a matter of days if a camping party does not practice leave-no-trace camping techniques.

Campsite monitoring for impacts related to Forest Plan standards including barren core, number of trees damaged and roots exposed, has been done on 109 campsites in the Lake Chelan-Sawtooth and 76 in the Pasayten. In the Lake Chelan-Sawtooth, barren core and other lineal measurements were measured with a tape. Pasayten measurements taken prior to 1995 were estimated, measurements after 1995 were taken with a tape. Although observers receive consistent training and standard procedures for monitoring, differences in interpretation of impacts can occur. Thus data from the monitoring shows approximate sizes and conditions of camps.

Monitoring has shown that some of the campsites frequented by pack and stock campsites exceed the standard for vegetation loss and have more than the allowed number of trees with exposed roots per site. This is true for camps that are used primarily by outfitters and camps that are used primarily by non-outfitted stock users.

There are approximately 500 established campsites scattered across the Pasayten. Seventy-six of these have been inventoried and monitored to document size and condition. The sizes

vary based of the type of use and establishment date. Overall, the average size of the barren core areas measured was 2,028 square feet. The following chart shows the largest of the camps, and the amount of barren core.

Figure 3.1-4. Square Feet of the Largest Established Camps in the Pasayten

Camp Name	Square Feet of Barren Corel	Comments
Beaver Creek 1	8,038	Used by outfitter as full-service camp site.
Sheep Mountain 1	19,368	Used by outfitter as full-service camp site.
Spanish Camp 1	9,181	Recreation camp, not used regularly by outfitters
Spanish Camp 2	15,239	Recreation camp, not used regularly by outfitters
Spanish Creek 1	6,000	Recreation camp, not used regularly by outfitters
Whistler 1	9,906	Used by outfitter as full-service camp site.

Overall, 38% of the monitored camps have a barren core of less than 400 square feet; 28% range from 401 to 1,500 square feet; 25% have core areas ranging from 1,501 to 5,000 square feet; and 9% exceed 5,001 square feet. All campsites with a barren core of over 400 square feet (62% of all camps) are assumed to be used by pack and saddle stock users.

There are approximately 135 established campsites scattered across the Lake Chelan-Sawtooth. One hundred and nine of these have been inventoried and monitored to document size and condition. The sizes vary based of the type of use and establishment date. There are 27 campsites located in the Primitive Recreation Opportunity Spectrum, 29 in Semi-Primitive, and 1 in Transition. The average size of the barren core in the sites in Primitive is 1,994 square feet, and the average size in Semi-Primitive is 3,414 square feet.

The following chart shows the largest of the camps, and the amount of barren core.

Figure 3.1-5. Square Feet of Largest Established Camps in the Lake Chelan-Sawtooth

Camp Name	Square Feet of Vegetation loss and compacted, bare mineral soil	Comments
North Fork Shelter	30,000	Used occasionally by outfitter for drop camp
Cascade Creek	21,000	Used occasionally by outfitter for drop camp
Twin Springs 1	12,245	Used occasionally by outfitter for full-service and drop camps
Muleshoe 2	9,134	Used occasionally by outfitter for full-service and drop camps
Prince 4 Mile	5,600	Used occasionally by outfitter for full-service camp

Overall, 34% of the monitored camps have barren cores less than 400 square feet. Approximately 20% have a core ranging from 401 to 1,500 square feet; 31% have core areas

ranging from 1,501 to 5,000 square feet; and 17% exceed 5,001 square feet. All campsites with a barren core of over 400 square feet (66% of all camps) are assumed to be used by pack and saddle stock users.

Stock campsites often consist of a camping area and one or more stock containment areas. The area of barren core and number of trees with exposed roots are generally greater in campsites frequently used by stock than campsites never or rarely used by stock. There is also a grazing area associated with each campsite, where stock is turned out loose to graze. Generally speaking, the stock graze up to two miles away from campsites, but most grazing is concentrated within approximately 5 acres around each campsite. Beyond this point, grazing is dispersed across a large area, and any evidence or effects are minimized.

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 bole trees. While this has decreased damage to tree roots, it has resulted in a change at stock camps with highlines being used outside the traditional stock containment areas where a highline could not be properly installed. These highline areas increased vegetation loss at some horse camps.

Campsites that are used primarily by hikers generally have a camping area and a smaller or non-existent 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.

Pack and Saddle Stock Outfitter-guide Camps

Pack and saddle stock outfitter guides use a combination of assigned camps (Bald Mountain, Sheep Mountain, Corral Lake, and Beaver Creek), 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 E includes a list of all established, regularly used campsites. The campsites are shown on **Map 3.1-1 and Map 3.1-2 in the Map Section** of this document.

Across both wildernesses, totaling approximately 685,000 acres, there are approximately 120 known stock camps and of these, less than 15 percent (those used regularly for full-service camps) see unacceptable impacts (refer to Appendix E). Unacceptable impacts include large barren cores, excessive number of trees with exposed roots, social trails, and other impacts.

The campsites that have the most affect on the undeveloped character are the assigned sites and the non-assigned sites used for full-service camps. The 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, 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.

Campsites where outfitters drop clients and do not remain at the site with stock have fewer effects. The drop camps may have evidence of an impacted area where the loading and unloading takes place with stock. Sometimes this occurs in the midst of a campsite's "kitchen" or "sleeping" area. When this occurs, there can be some observed effects of camping with some direct impacts of stock (manure, urine, and disturbed soils). These effects are relatively contained but can cause some expansion of the site if the party does not want to sleep or eat in the same area where the stock has been briefly held.

Some drop camps have short-use trails that may show varying levels of impact. The overall scale or intensity of this type of impact is minor to negligible at the Wilderness Scale. Many times drop camps are located on the trail where very little impact is noticeable from their use. The effects are minor and, although they may persist from year to year, it is generally more acceptable to have fewer moderate to heavy impacted sites than more light to moderate impacts.

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.

Outfitter Camps - Pasayten

Pack and saddle stock outfitter-guide activity occurs in the areas most popular with non-outfitted pack and saddle stock users. The Bald Mountain and Sheep Mountain assigned sites are in the Spanish Camp/Remmel Lake and Sheep Mountain/Corral Lake areas, respectively. Assigned sites are the only ones where non-outfitted use is prohibited. Other sites regularly used by outfitters for camps include Crow Lake, Beaver Camp, Tatoosh Buttes, and Whistler. Each of these campsites is described below.

- The Bald Mountain Camp has been used for approximately 15 years. **It has a barren core area of approximately 3,655 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 corral, 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 Sheep Mountain Camp has been an outfitter camp for approximately 35 to 40 years. **It has a barren core area of approximately 19,368 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 tend to 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 campsite for approximately 10 years. **It has a barren core area of approximately 3,621 square feet, and 33 trees with exposed roots.** It was an established non-outfitter camp prior to the outfitter use. There are no constructed facilities 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 graze north of the camp in a basin and along a ridge.

- The Beaver Creek Camp, in the Spanish Camp/Remmel Lake area, has also been used as a campsite for approximately 40 years. **It has a barren core area of approximately 8,038 square feet 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 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 operation season.

- Whistler Camp was a herders camp, used until sheep grazing was eliminated in the mid-1900s. It has 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 9,906 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 is let loose to graze, mostly in an avalanche chute to the east of camp.

- Tatoosh Buttes Camp has been used for approximately 20 years. **It has a barren core area of approximately 3,316 square feet, and 18 trees with exposed roots.** It was developed by the outfitter who currently uses the camp. It is located off the main trail. Stock graze in the surrounding buttes where there is ample forage, even during the fall hunting season. A plastic pipe is installed in a spring for drinking water, and removed at the end of each season. There are no other facilities at the camp.

The outfitters also use other camp locations for progressive and drop camps, and occasionally for full-service camps. There are approximately 70 of these established camps. Refer to **Appendix E** for a table that lists the majority of the camps regularly used by the pack and saddle stock outfitter-guides, and **Map 3.1-1 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.

Outfitter Camps – 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 location of these camps is shown **Map 3.1-2 in the Map Section** of this document.

- Mule Shoe "1" Camp has been established since the 1930s and is normally used by outfitters as a full-service camp each year. **It has a barren core area of approximately 1125 square feet, and 4 trees with exposed roots.** It has no constructed features. It is located along the Summit Trail directly opposite from a hiker camp. The surrounding area provides good grazing for stock. Some small seasonal springs provide drinking water nearby but later in the season water is about ¼ mile away in the nearest draw.

- Mule Shoe "2" Camp has been used by an outfitter for approximately 7 years as a full-service camp. This camp was originally established as a shepherd's camp. **It has a barren core area of approximately 9,134 square feet, and 10 trees with exposed roots.** It is located approximately ½ mile off the Summit Trail along an established side trail. The camp is located beneath a small, unnamed spring and just below a ridgeline. There are three constructed ten pads. There are two established horse highline areas. Although there is little grazing opportunity available at this high elevation site, there is grass available within a ¼ mile. Plastic sheeting and a pipe are installed in the spring for drinking water. The pipe is removed at the end of the operating season.

- Twin Springs Camp was established at least 60 years ago by outfitters and this site includes a Wallowa-style toilet constructed and maintained by the Forest Service. **It has a barren core area of approximately 12,245 square feet, and over 10 trees with exposed roots.** Outfitters utilize it for full-service camps one to three times a year. Twin Springs is also popular with the non-outfitted public. This scenic camp is located between two running springs with one horse highline area established between the springs; and a second highline area established about 50 feet before the first spring. A plastic pipe is installed in the spring for drinking water. The pipe is removed when camp breaks. Grazing commonly occurs in a meadow just beyond the camp.

- Middle Chipmunk Camp is the largest of the three established camps utilized for full-service and hunter drop camps in the Dry Lakes Basin. It is commonly used for full-service and hunting drop camps. **It has a barren core area of approximately 5,400 square feet, and 13 trees with exposed roots.** Dry Lake Basin experienced heavy sheep grazing decades ago but the impacts are still very evident. There are no constructed features. Drinking water comes from nearby seasonal springs. Plastic pipes are installed in the springs for drinking water and removed when camp breaks. Grazing is plentiful in Dry Springs Basin.

- Blue Grouse is commonly used as a full-service and hunting drop camp by outfitters. **It has a barren core area of approximately 5,000 square feet, and 12 trees with exposed roots.** It is located about 1000 feet from the Summit Trail and the camp is over 300 feet away from drinking water. Good forage is available in the surrounding Blue Grouse Basin meadow. There are no constructed features.

- North Fork Shelter Camp is located along the Summit Trail about 600 feet away from the North Fork of Prince Creek. It was a sheep camp before a CCC shelter was constructed on the site in the 1930s. The shelter still exists but it has been greatly modified over the years. **It has a barren core area of approximately 30,000 square feet.** Although this camp has the largest area of vegetation loss and bare compacted soil in the Sawtooth Wilderness, it is only occasionally used as outfitter camp. This area was heavily grazed by sheep beginning in the early 1900s and the effects of grazing are still visibly evident. This site is used by the public with their stock. Other than the shelter there are no other constructed features. The forage supply is fair in the surrounding area.

- Surprise Lake has been a popular location for full-service outfitter trips and the general public since at least the 1930s. Before it was designated as wilderness the public commonly accessed Surprise Lake by floatplane and motorbike. It is an especially scenic location. Although this area has a few established camping areas; the largest camp (two smaller camps that merged into one) is located on the edge of a meadow about 800 feet Surprise Lake is commonly used for full-service camps. **This horse camp has a barren core area of approximately 4,200 square feet, and 6 trees with exposed roots.** The vegetation loss and bare soil area is primarily found around the two hitch posts and highline areas. The hitch posts are the only constructed feature on this site. There is plentiful forage in this small meadow and in the large meadow about one mile along the trail above the lake.

The outfitters also use other camp locations for progressive and drop camps, and occasionally for full-service camps. There are approximately 63 of these established camps. Refer to **Appendix E** for a table of the camps, and Map 3.1-2 in the Map Section of this document shows their locations. 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 are not limited to these on the Methow Valley Ranger District, but tend to return to these established spots year after year.

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 3.1-6. Comparison of Alternative Components by Alternative

Wilderness	Alternative Component	Alternative 1	Alternative 2	Alternative 3
Pasayten	Number of Service Days	0	2,000	1,000
Lake Chelan-Sawtooth	Number of Service Days	0	720	320
Common to both wilderness areas	Amount of Barren Core (Forest Plan Amendment*)	No amendment	5,250 square feet	2,800 square feet
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)

*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 4. A0 on page 2-11 for criteria.

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 overall numbers, since pack and saddle stock outfitter guides would be eliminated. Alternatives 2 and 3 would slightly increase the number. The following table includes the number of visitor days, outfitted and non-outfitted by alternative, in the Pasayten.

Figure 3.1-7. Total Visitor Days and Outfitted Days in the Pasayten, Comparing Current to Alternatives

User Group	Current			Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	36,820	0	0%	36,820	0	0%	36,820	0	0%	36,820	0	0%
People w/Pack Animals	15,780	842	5%	14,938	0	0%	16,938	2,000	12%	15,938	1,000	6%
TOTAL	**52,600**	**842**	**2%**	**51,758**	**0**	**0%**	**53,758**	**2,000**	**4%**	**52,758**	**1,000**	**2%**

The following figures display this information in graph form.

Figure 3.1-8. Total Visitor Days in Pasayten, by Alternative

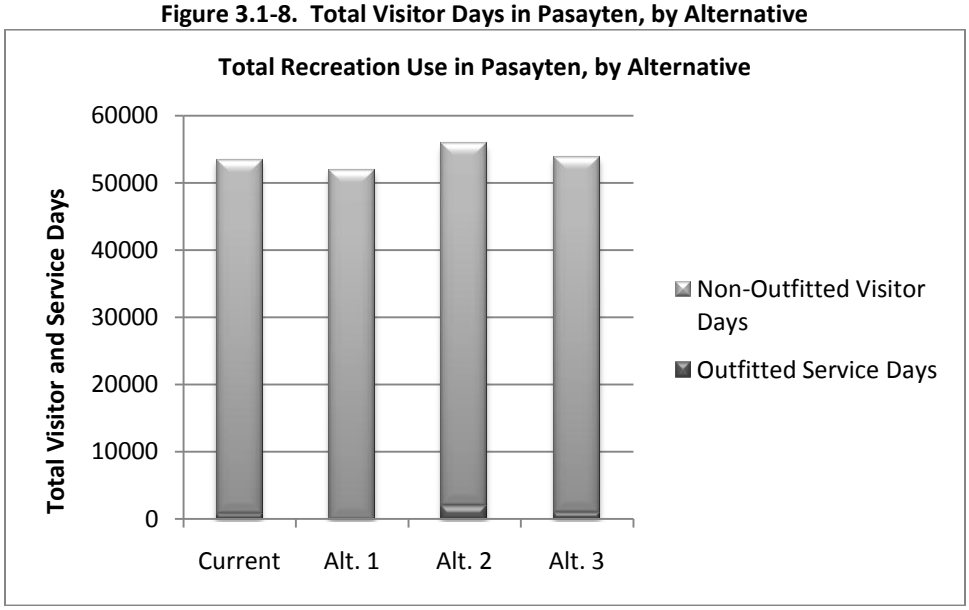
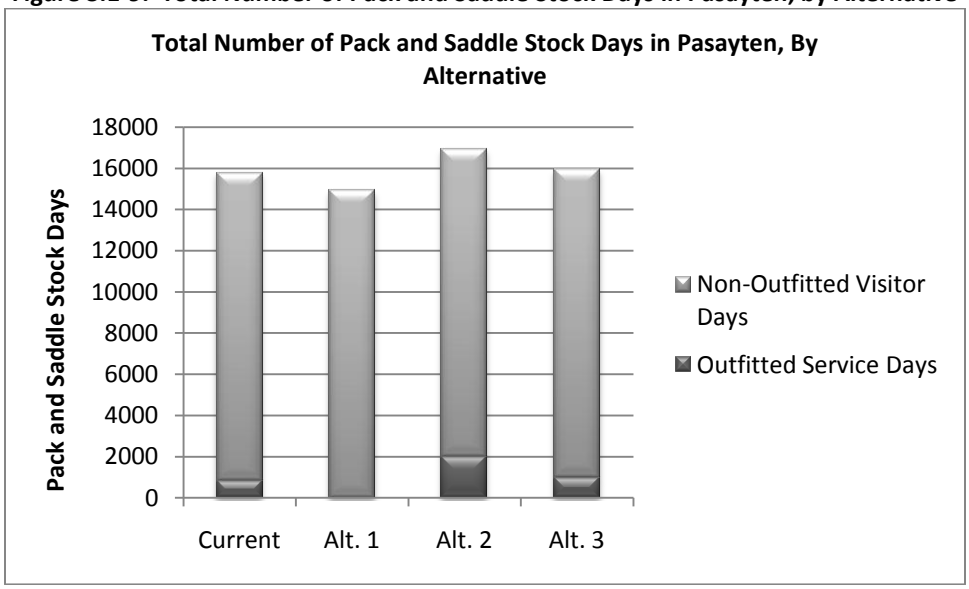


Figure 3.1-9. Total Number of Pack and Saddle Stock Days in Pasayten, by Alternative



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

Figure 3.1-10. Total Visitor Days and Outfitted Days in the Lake Chelan-Sawtooth, Comparing Current to Alternatives

User Group	Current			Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	36,616	0	0%	36,616	0	0%	36,616	0	0%	36,616	0	0%
People w/Pack Animals	19,716	508	3%	19,208	0	0%	19,928	720	4%	19,528	320	2%
TOTAL	**56,332**	**508**	**1%**	**55,824**	**0**	**0%**	**56,544**	**720**	**1%**	**56,144**	**320**	**1%**

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

Figure 3.1-11. Total Recreation Use in Lake Chelan-Sawtooth, by Alternative

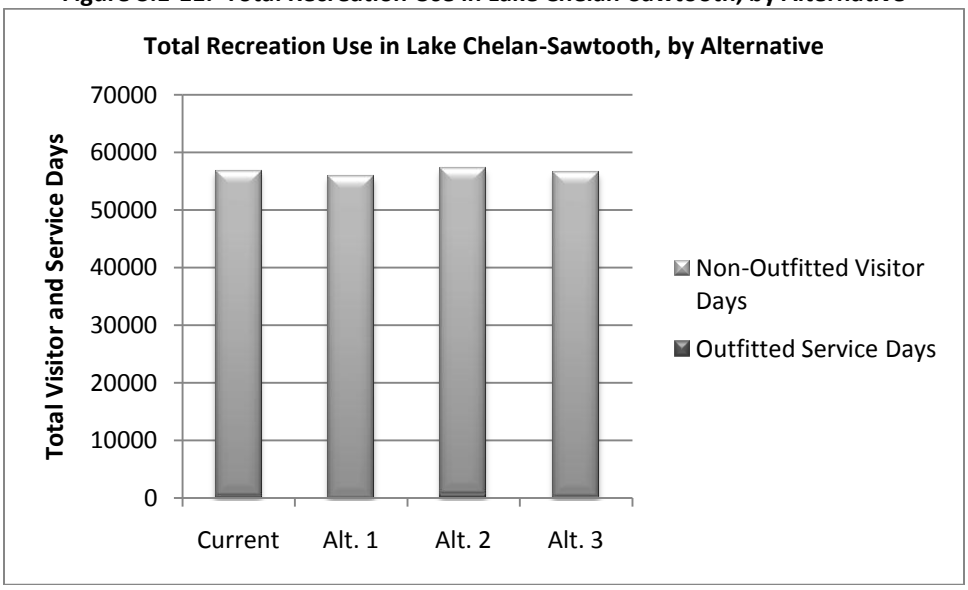
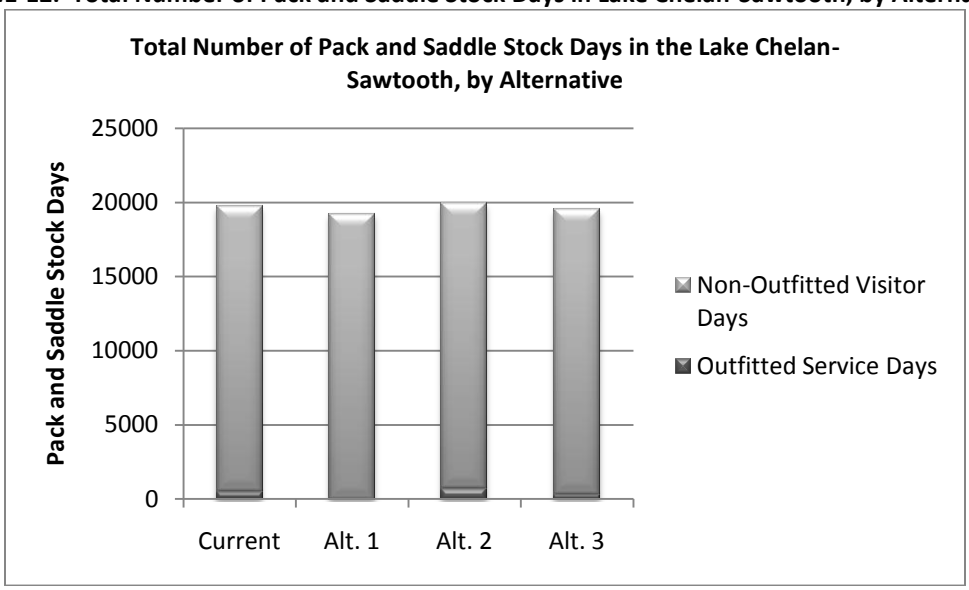


Figure 3.1-12. Total Number of Pack and Saddle Stock Days in Lake Chelan-Sawtooth, by Alternative



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 continued or new effects would be a result of non-outfitted use. Alternative 2 would limit outfitters to not increasing the amount of barren core, and using more than 5,250 square feet in larger camps, and assign five campsites to exclusive use by outfitters. Restricting non-outfitter use in assigned sites may help 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 but only designate three assigned sites. Additional sites could be assigned in the future to help with managing impacts. The following table shows each of the largest sites 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 camp is included in the alternative descriptions below.

Figure 3.1-13. Existing Amount of Barren Core in Established Camps and Amount That Could Be Used by Outfitters in Each Alternative.

Camp (Wilderness)	Existing amount of Barren Core	Alternative 1		Alternative 2		Alternative 3	
		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?
Bald Mountain (Pasayten)	3,655 sq ft	n/a	n	3,655 sq ft	y	2,800 sq ft	y
Sheep Mountain (Pasayten)	19,368 sq ft	n/a	n	5,250 sq ft	y	2,800 sq ft	y
Crow Lake (Pasayten)	3,621 sq ft	n/a	n	3,621 sq ft	y	2,800 sq ft	n
Beaver Creek (Pasayten)	8,038 sq ft	n/a	n	5,250 sq ft	y	2,800 sq ft	y
Whistler (Pasayten)	9,906 sq ft	n/a	n	5,250 sq ft	y	2,800 sq ft	n
Tatoosh Buttes (Pasayten)	3,316 sq ft	n/a	n	3,316 sq ft	n	2,800 sq ft	n
Mule Shoe 1 (LCS*)	1,125 sq ft	n/a	n	1,125 sq ft	n	1,125 sq ft	n
Mule Shoe 2 (LCS*)	9,134 sq ft	n/a	n	5,250 sq ft	n	2,800 sq ft	n
Twin Springs (LCS*)	12,245 sq ft	n/a	n	5,250 sq ft	n	2,800 sq ft	n
Middle Chipmunk (LCS*)	5,400 sq ft	n/a	n	5,250 sq ft	n	2,800 sq ft	n
Blue Grouse (LCS)	5,000 sq ft	n/a	n	5,000 sq ft	n	2,800 sq ft	n
North Fork Shelter (LCS*)	30,000 sq ft	n/a	n	5,250 sq ft	n	2,800 sq ft	n
Surprise Lake (LCS*)	4,200 sq ft	n/a	n	4,200 sq ft	n	2,800 sq ft	n

*Lake Chelan-Sawtooth Wilderness

Effects Common to All Alternatives

Untrammeled and Undeveloped Qualities

None of the alternatives would have any 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 actions have affected these qualities.

Alternative 1

Alternative 1 would result in a slight improvement in wilderness character, but 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. Impacts would be reduced at some established campsites, resulting in some localized, beneficial changes to the opportunities for solitude. Opportunities for solitude or primitive and unconfined recreation would also slightly 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.

Natural Quality

The slight reduction (5% in the Pasayten and 3% 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. There would be no animal unit months allotted to pack and saddle stock outfitter-guides. 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 slight reduction in use (5% in the Pasayten and 3% in the Lake Chelan-Sawtooth) could improve this wilderness quality for some. The number of encounters on trails would be reduced, but so slightly that it likely go unnoticed by most users. The reduction would be slightly more 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.

Campsite Size and Condition

Pack and saddle stock users would continue to use the existing campsites discussed in the Affected Environment section, however the use would be less frequent and for shorter durations. This, coupled with potentially smaller average party sizes, could slightly increase the rate of recovery, and give the most beneficial improvement to the undeveloped and natural character of both wildernesses compared to Alternatives 2 and 3. 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 slightly accelerating the speed of recovery . Full recovery of these areas would 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 on 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 pack and saddle stock users. The Pasayten Airport would still receive some stock use, but there is a limited amount of forage there, and there is no destination lake, so use would be generally light. 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 outside of hunting season would be limited because the trail is difficult, and water supply is limited.

The effects of Alternative 1 on the conditions of the camps currently used by most frequently outfitters are described below.

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 increase in size. The use should 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 increase in size, and the use should be confined to the existing area.

- Tatoosh Buttes Camp would receive little use, since it is not near the main trail, and is difficult to locate. 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.

Lake Chelan-Sawtooth

As in the Pasayten, people would continue to use 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.

Outfitter Camps

- The Mule Shoe "1" Camp would still receive pack and saddle stock use since it is located on the main Summit Trail. Average party size and duration of use would be less than current use and the camp use would likely be confined to the existing area.

- Mule Shoe "2" Camp would likely receive little non-outfitted use as it is located approximately ½ mile off the Summit Trail and is situated just under a high elevation windy ridge top. This site would have a higher potential for recovery as it would likely receive little use.

- Twin Springs Camp would still receive use from pack and saddle stock and hikers since it is located on the Summit Trail and is currently popular with non-outfitted recreationists. It would not increase in size, and use would likely be confined to the existing area.

- Middle Chipmunk Camp would likely receive much less use as the Dry Lake Basin area currently does not receive much non-outfitted use. These camps are off the main trail and more difficult to find than other camps. The site would have a higher potential for recovery since the number of people and the stock at the campsite would be reduced.

- Blue Grouse Camp would still receive pack and saddle stock and hiker use since it is located near a main trail. Average party size and duration of use would be less than current use. This camp would not increase in size and use would likely be confined to the existing area.

- North Fork Shelter Camp would still attract occasional pack and saddle stock and hiker use as it is on the Summit Trail. Average party size and duration of use would be less than current use. Camp use would likely be confined a smaller portion of the existing area.

- Surprise Lake Camp would continue to receive similar pack and saddle stock and hiker use. Average party size and duration of use would be less than current use. Camp use would likely be confined to the existing area.

The other campsites listed in **Appendix E** would continue to be used. As with the sites discussed above, the sites could have a higher potential for recovery since the number of

people and the stock at the campsite over a season would be reduced. However, some of the largest campsites in the Pasayten are not used regularly by outfitters, so conditions would not change with the implementation of Alternative 1.

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.

Alternative 2

Alternative 2 would have a minor effect on wilderness quality. The forest plan amendment 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 may have a minor adverse impact on solitude due to the very small increase in the number of pack and saddle stock users in the wilderness compared to the existing condition. This alternative would fully provide the minimum extent of commercial services needed to provide for pack and saddle stock wilderness recreation.

Natural Quality

The natural quality of the Pasayten and Lake Chelan-Sawtooth wilderness areas could receive minor, localized impacts due to the increase in the number of pack and saddle stock service days. The 7% increase in the Pasayten and 1% increase in the Lake Chelan-Sawtooth in the number of people using pack and saddle stock could increase grazing pressure on plant communities, and increase the risk of introduction and spread of invasive species. There would be 270 animal unit months of grazing authorized. 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 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

There would be a small increase in the number of people using pack and saddle stock with this alternative (7% in the Pasayten and 1% in the Lake Chelan-Sawtooth) compared to the existing condition, so for other users, the opportunities for solitude could decrease. Most users would likely not notice the increase in use or number of encounters, but those who travel to areas frequented by pack and saddle stock outfitter-guides may notice more people on the trails, and more occupied campsites.

Campsite Size and Condition

The existing campsites would continue to be used by the outfitter-guides. Reserved sites would be designated at Bald Mountain, Sheep Mountain, Beaver Creek, Crow Lake, and Whistler. 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 **Appendix E** 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 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 reuse the same portion each time. The mitigation measures listed on pages 2-8 through 2-10 would control outfitter-guide activities, and ensure compliance with these new standards.

The effect of the amendment and controls on outfitter-guide activities could be a minor beneficial improvement in the large, existing campsites used by outfitter-guides. There could be some slow improvements at sites with barren cores exceeding 5,250 square feet as the unused portion begin to revegetate. The revegetation at many camps would be too slow to measure in the next decade because of the short, harsh growing season, and the possibility that non-outfitted users would continue to use the area. The undeveloped and natural qualities would be further protected by the mitigation measures prohibiting pack and saddle stock outfitters from creating new camps, travel routes, or exposed roots on trees.

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 there is a limited amount of forage there, and there is no destination lake, so use would be generally light. The Pasayten River drainage also receives 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 outside of hunting season would be limited because the trail is difficult, and water supply is limited.

The effects of Alternative 2 on the conditions of the camps currently used by outfitters are described below.

Outfitter Camps

- The Bald Mountain Camp would continue to have a barren core of approximately 3,655 square feet. A camp management plan would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of 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 19,368 square feet. A camp management plan would be developed and followed, identifying approximately 5,250 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 14,000 square feet of barren core would begin to recover.

- The Crow Lake Camp, located in the Sheep Mountain/Corral Lake area, would continue to have a barren core of approximately 3,621 square feet. As with the other reserved camps, a camp management plan would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes. The camp would be closed to public use, so further degradation should not occur.

- The Beaver Creek Camp has an existing barren core of approximately 8,038 square feet. A camp management plan would be developed and followed, identifying approximately 5,250 square feet of barren core area the outfitter-guide 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 2,788 square feet of barren core would begin to recover.

- Whistler Camp has an existing barren core of approximately 9,906 square feet. A camp management plan would be developed and followed, identifying approximately 5,250 square feet of barren core area the outfitter-guide 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 4,656 square feet of barren core would begin to recover.

Lake Chelan-Sawtooth

Hikers and pack and saddle stock users would continue to use the popular destinations in the Lake Chelan-Sawtooth. Day hike and horseback rides would continue, with the Twisp River Horsecamp 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.

Outfitter Camps

- Mule Shoe "1" Camp would continue to have a barren core of approximately 1,125 square feet. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes.

- Mule Shoe "2" Camp has an existing barren core of approximately 9,134 square feet. Approximately 5,250 square feet would be identified for the outfitter to use. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes. This camp would not be closed to the public, so the

recovery of the additional 3,884 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- Twin Springs has an existing barren core of approximately 12,245 square feet. Approximately 5,250 square feet would be identified for the outfitter to use. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes. This camp would not be closed to the public, so the recovery of the additional 3,884 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- Middle Chipmunk Camp has approximately 5,400 square feet of barren core. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes. Approximately 5,250 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 150 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

- Blue Grouse Camp has approximately 5,000 square feet of barren core. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes.

- North Fork Shelter Camp has approximately 30,000 square feet of barren core. Approximately 5,250 square feet would be identified for the outfitter to use. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes. This camp would not be closed to the public, so the recovery of the additional 24,750 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

- Surprise Lake has about 4,200 square feet of barren core. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes.

The camps listed in **Appendix E** would continue to be used by the outfitters for progressive and drop camps, and occasionally for full-service camps. The mitigation measures listed on pages 2-8 through 2-16 would regulate outfitter-guide activities to meet the amended standards and guidelines. Since these camps would not be closed to non-outfitted use, camping practices of private pack and saddle stock uses and hikers could affect the rate of recovery.

Meeting the Need for Commercial Services

This alternative would fully provide 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.

Alternative 3

Alternative 3 would have a minor beneficial effect on wilderness quality. The forest plan amendment restricting outfitters to use the same 2,800 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 beneficial impact to the undeveloped and natural qualities of the wilderness. The opportunities for solitude may have a beneficial impact from this alternative with the reduction in outfitter-guide party sizes. The opportunities for primitive and unconfined recreation would be reduced since roughly half the minimum extent needed would be provided.

Natural Quality

The natural quality of the Pasayten and Lake Chelan-Sawtooth wilderness areas would be unchanged from the existing condition with this alternative. The 1% increase in the number of people using pack and saddle stock in the Pasayten, and 1% decrease in the Lake Chelan-Sawtooth would not change current conditions. There would be 150 animal unit months assigned to the outfitters. 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. Invasive species may be introduced and spread by pack and saddle stock. 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 virtually unchanged from the existing condition with this alternative (1% increase in the Pasayten, and a 1% decrease in the Lake Chelan-Sawtooth). There would be no change in the opportunity for solitude compared to the current condition in terms of 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. Since outfitted parties tend to be larger than non-outfitted parties, limiting the size of outfitted parties to 12 would eliminate most of the parties that approach or meet the existing size limit of 12 people and 18 head of stock. 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. This could increase the number of encounters between outfitted and non-outfitted groups on trails.

Campsite Size and Condition

The existing campsites would continue to be used by the outfitter-guides. Reserved sites would be designated at Bald Mountain and Sheep Mountain. These campsites would be closed to the public, and use would be closely monitored and controlled to accelerate their recovery. No other reserved camps would be designated. The other existing campsites listed in **Appendix E** 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 reuse the same portion each time. The mitigation measures listed on pages 2-8 through 2-16 would control outfitter-guide activities, and ensure compliance with these new standards.

The effect of the amendments and controls on outfitter-guide activities would be a beneficial, minor improvement to the undeveloped and natural qualities of both wilderness areas. There would be some slow improvements at sites with barren cores exceeding 2,800 square feet as the unused portions begin to revegetate. The revegetation at many camps would be too slow to measure in the next decade because of the short, harsh growing season, and the possibility that non-outfitted users would continue to use the area. No new camps, travel routes, or exposed roots on trees would be created by outfitters, so the overall amount of Wilderness affected by outfitter-guides would not increase.

The intensity for a beneficial impact to the undeveloped and natural qualities could be higher with this alternative compared to Alternative 2, since more existing barren core would be unused by outfitter, potentially increasing vegetation cover at existing campsites. The difference between the alternatives would be negligible at the wilderness scale, and minor at the local level.

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 there is a limited amount of forage there, and there is no destination lake, so use would be generally light. The Pasayten River drainage also receives 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 outside of hunting season would be limited because the trail is difficult, and water supply is limited.

Outfitter Camps

- The Bald Mountain Camp has approximately 3,655 square feet of barren core. A camp management plan would be developed and followed, identifying

approximately 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 855 square feet of barren core would begin to recover.

- The Sheep Mountain Camp has an existing barren core of 19,368 square feet. A camp management plan would be developed and followed, identifying approximately 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 16,568 square feet of barren core would begin to recover.

- The Crow Lake Camp has approximately 3,621 square feet of barren core. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 821 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- The Beaver Creek Camp has an existing barren core of approximately 8,038 square feet. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 5,238 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- Whistler Camp has an existing barren core of approximately 9,906 square feet. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 7,106 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

Lake Chelan-Sawtooth

Hikers and pack and saddle stock users would continue to use the popular destinations in the Lake Chelan-Sawtooth. Day hike and horseback rides would continue, with the Twisp River Horsecamp 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.

Outfitter Camps

- Mule Shoe “1” Camp would continue to have a barren core of approximately 1125 square feet. A camp management plan for outfitters would be developed and followed to prevent creation of additional barren core, exposing more roots on trees, and creation of travel routes.

- Mule Shoe “2” has an existing barren core of approximately 9,134 square feet. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 6,334

would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- Twin Springs has an existing barren core of approximately 12,245 square feet. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 9,445 would depend on the activities on non-outfitted pack and saddle stock users and hikers.

- Middle Chipmunk Camp has approximately 5,400 square feet of barren core. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 2,600 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

- Blue Grouse Camp has about 5000 square feet of barren core. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 2,200 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

- North Fork Shelter Camp has approximately 30,000 square feet of barren core. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 27,200 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

- Surprise Lake has about 4,200 square feet of barren core. Approximately 2,800 square feet would be identified for the outfitter to use. This camp would not be closed to the public, so the recovery of the additional 1,400 square feet would depend on the activities of the non-outfitted pack and saddle stock users and hikers.

The camps listed in **Appendix E** would continue to be used by the outfitters for progressive and drop camps, and occasionally for full-service camps. The mitigation measures listed on pages 2-8 through 2-10 would regulate outfitter-guide activities to meet the amended standards and guidelines. Since these camps would not be closed to non-outfitted use, camping practices of private pack and saddle stock uses and hikers could affect the rate of recovery.

Meeting the Need for Commercial Services

This alternative would provide about half of the minimum amount of commercial services needed for wilderness recreation. Pack and saddle stock wilderness recreation would be accessible to some of the population needing the services due to physical limitations, or lack of skill and equipment, but fewer people would have the opportunity to experience the primitive and unconfined recreation offered.

Cumulative Impacts of all Alternatives

The spatial boundary for the cumulative effects analysis in the Pasayten Wilderness is the entire Pasayten. Similarly, the boundary for the Lake Chelan-Sawtooth Wilderness is the entire Lake Chelan-Sawtooth. The temporal boundary for both areas is from current time through 2020, 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.

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, 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 past, present, and reasonably foreseeable future actions that may impact wilderness character are described below. This is followed by a more detailed discussion of the cumulative effects on each wilderness quality.

Past Actions

Past actions that have had the largest influence on wilderness condition, and the distribution of people, are grazing and wildfires.

Grazing

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 untouched by human activities. The 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 400 feet of barren core), 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. Wildfires have been suppressed in the past when they are near the boundary of the wilderness, or threaten to move into Canada. This has changed the disturbance cycle of the ecosystem, leaving much of the wilderness areas with high levels of down material, increased mortality from insects and disease, and higher density stands.

Some of the lower elevations surrounding the western slopes of the Lake Chelan-Sawtooth have burned in the last 5 years. This burn pattern reduces the probability of fires burning upslope from Lake Chelan to spread fire into the wilderness. Over 200,000 acres have burned in the Pasayten in the last 10 years. Areas burned by high severity fire in Andrews and Farewell Creeks 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 stopped, and trails were repaired to allow access.

The wildfire suppression has had a major, adverse impact to the wilderness wide, untrammeled and natural qualities of the areas.

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; use is in compliance with standards and guidelines.

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, adverse impacts to the undeveloped and natural qualities in the immediate vicinities. The impact is lessening over time as the buildings and mine shafts decay. The Tungsten mine is having the most lasting impact because of the recreation attraction and use.

Pack and Saddle Stock Use

People have been traveling in the areas that became the Pasayten and Lake Chelan-Sawtooth wilderness areas for nearly a century. Pack and saddle stock outfitter-guides began taking people into these areas for decades; before Congressional designation and before the Forest Plans set standards and guidelines for human activities in wilderness. As described under the Historic Uses section earlier in this report, the effects of these activities perpetuated conditions that were initially caused by livestock grazing activities, and still exist today. Party size limitations and other controls specified by standards and guidelines helped stabilize the conditions at existing campsites, but the local, long-term, adverse impacts to the opportunities for solitude are still present.

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 annual to between 350 and 500 in the Pasayten, and 85 to 90 in the Lake Chelan-Sawtooth. This reduction concentrated people on the maintained trails.

The 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.

The following list includes some of the restoration activities that have taken place over the past ten years. These have had beneficial impacts to the opportunities for solitude by restoring impacted sites, controlling and limiting use, and constructing facilities at campsites to reduce further damage to vegetation and soil. Other past restoration activities are in the 2000-2006 Accomplishment Reports. Refer to the Recreation Activity Review in **Appendix C.**

- Installed signs at confusing junctions to identify system trails.
- A CFR closure has been issued to keep stock away from the shores of Oval Lakes.
- Signed sensitive plant habitat area below Amphitheater to keep riders on trails.
- Two deeply rutted trails in the Spanish Camp area have been receiving ongoing restoration efforts in the form of check dams, drainage, and closures by the Spanish Camp ranger and volunteers.

- Installed hitch rails at Hidden Lake and Bald Mountain, repaired hitch rail at Upper Cathedral.
- Limit of two outfitted parties at a time in the Hidden Lakes area.
- Enacted a CFR restriction at Black Lake to eliminate stock camping within ½ mile of the lake shore, and hiker camping within 200 feet.
- A campsite near the shoreline of Williams Lake was closed, scarified, and re-planted in the fall of 2005. This campsite had been identified as a priority for restoration due to the proximity of the lake and the availability of alternate campsites in the area. This campsite was used primarily by the non-outfitted public.
- Two campsites in wet areas near Remmel Lake were closed via signage and removal of a hitchrail in recent years. One site has recovered with vegetation filling in the vegetation loss and compacted, bare mineral soil and is no longer identifiable as a campsite. Recovery at the other site is slower but progressing. These campsites were used primarily by the non-outfitted public.
- Most of the permanent improvements at the Sheep Mountain camp were removed in 2002. The corral was retained, but the materials were changed – old wire was removed and live trees are no longer used as posts.
- An outfitter camp at Corral Lake was closed to outfitter use, partially scarified and the access trail was blocked. Pioneering species were allowed to become established on the recommendation of the Methow Valley Ranger District Botanist.
- Highline areas were established at the Crow Lake camp so stock would not be tied to trees.
- Highline areas were also established at Beaver Creek to replace an ineffective highline.

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. There is a cabin and barn located next to the runway. The Forest Service uses the cabin as housing for wilderness rangers or a base camp for trail maintenance. This is a destination spot for some pack and saddle stock users because it is one of the few places with graze for stock.

The airport continues to have a moderate, local impact to the undeveloped quality of the immediate area.

<u>Present Actions</u>

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. Use is concentrated leaving the vast majority of both areas untouched, creating a beneficial impact on the opportunities for solitude of the wilderness.

Restoration 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. A partial list is included. Some ongoing activities are listed below.

- Implementation of the Remmel Lake Trail Management Plan began in the summer of 2006. A trail above Remmel Lake will be rerouted to access established camping areas.
- 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.
- 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 the Visitor Center and 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 have 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. 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 have been 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 Alpine Assents 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. Some of their activities overlap in location and time with the pack and saddle stock outfitter-guides, but most 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. Campsites are smaller, most in compliance with existing standards and guidelines about 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 one overnight).

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

Non-Outfitted Recreation Use
There are about 48,608 visitor days in the Pasayten and 54,424 in the Lake Chelan-Sawtooth each year independent of outfitter guides (backpacking and pack and saddle stock outfitters). The effects of these are disclosed 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. Eleven buildings exist on the landscape. In the Pasayten, there are three cabins used for Forest Service wilderness administration (Spanish Camp, Stub Creek, and Pasayten Airport in the Pasayten Wilderness), an unstaffed lookout, ground house, 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.

<u>Reasonably Foreseeable Future Actions</u>

Trail Maintenance
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.

It is also reasonably foreseeable that trail management activities will be completed in the Remmel Lake area. Some trails will be relocated, and the abandoned sections will be obliterated. This will reduce erosion and impacts to vegetation, and improve the aesthetics of the area.

Restoration Activities

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

Wildland fires are expected into the future. Fire suppression activities such as fire line construction with mechanized equipment will also continue. These firelines will be rehabilitated, but the continued fire suppression will adversely impact the untrammeled quality 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 is expected to 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). Washington State's Interagency Committee on Outdoor Recreation estimated that there will be a 15% increase in the number of people hiking and backing, and a 5% 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 following lists the current number of non-outfitted visitor days, by type, in each Wilderness, and the number that will likely be there in 2020.

Figure 3.1-14. Number of Non-Outfitted Visitor days in Pasayten Currently and in 2020.

User Group	Current Non-Outfitted Visitor days	% Change by 2020*	Estimated Non-Outfitted Visitor days in 2020
Hikers	33,670	+15%	38,721
Pack and Saddle Stock Users	14,938	+5%	15,684
TOTAL	**48,608**		**54,405**

*Interagency Committee for Outdoor Recreation, Washington State 2003

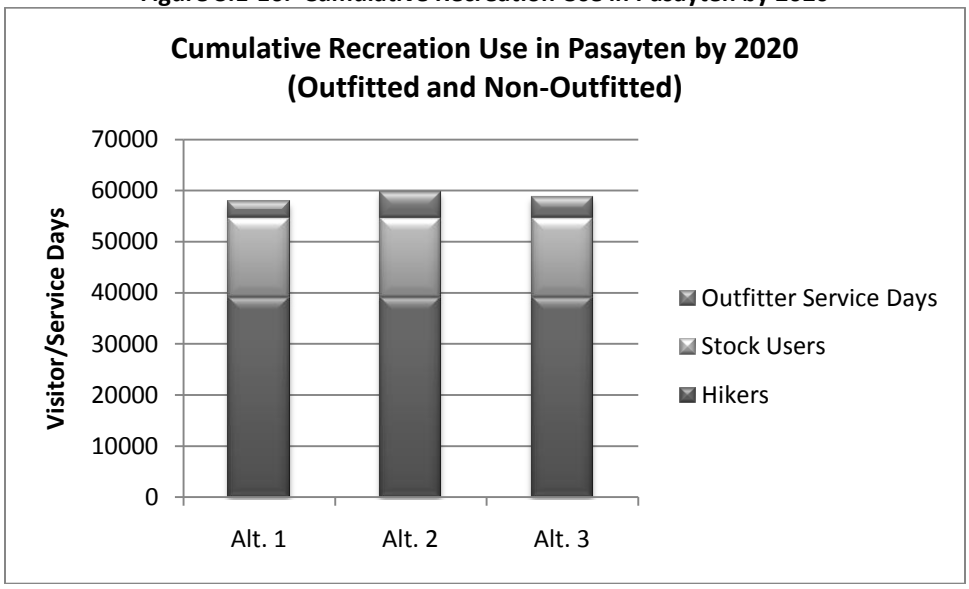
It is reasonably foreseeable that the backpacking outfitters will continue to operate at the existing levels. Adding the potential outfitter-guide service days (pack and saddle stock and backpacking) to these totals shows the likely relationship between the amount of outfitted and non-outfitted use in the future.

Figure 3.1-15. Number of Visitor Days by User Group in the Pasayten in 2020, by Alternative

User Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	42,343	3,150	7%	42,343	3,150	7%	42,343	3,150	7%
People w/Pack Animals	15,684	0	0%	17,684	2,000	11%	16,684	1,000	6%
TOTAL	**58,027**	**3,150**	**5%**	**60,027**	**5,150**	**9%**	**59,027**	**4,150**	**7%**

This information is displayed in the following figure. 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 3.1-16. Cumulative Recreation Use in Pasayten by 2020



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

Figure 3.1-17. Non-Outfitted Visitor days in Lake Chelan-Sawtooth Currently and in 2020.

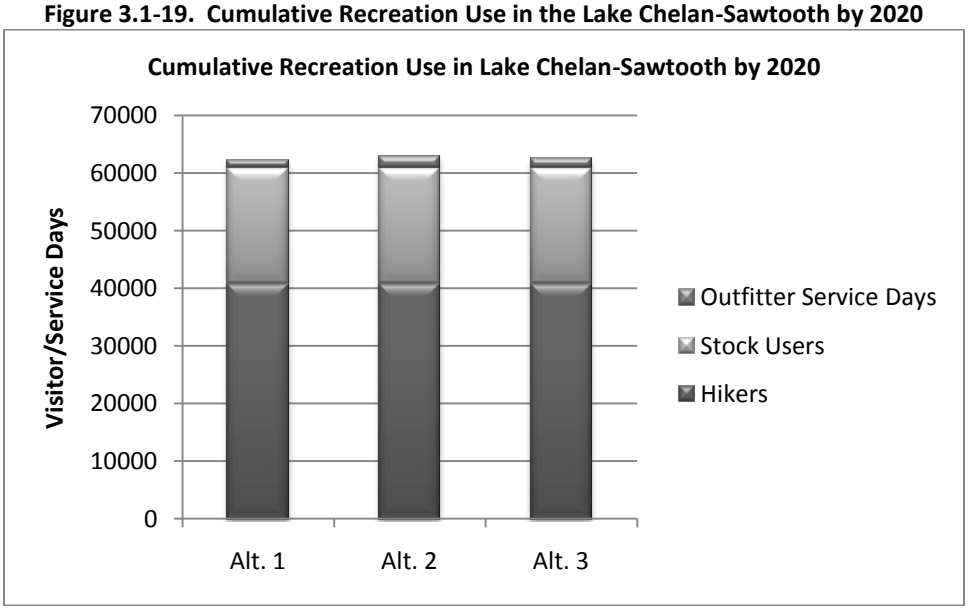
User Group	Current Non-Outfitted Visitor days	% Change by 2020*	Estimated Non-Outfitted Visitor days in 2020
Hikers	36,216	+15%	42,498
Pack and Saddle Stock Users	19,208	+5%	20,168
TOTAL	**55,424**		**62,666**

Figure 3.1-18. Number of Visitor Days by User Group in the Lake Chelan-Sawtooth in 2020, by Alternative

User Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	42,108	1,400	3%	42,108	1,400	3%	42,108	1,400	3%
People w/Pack Animals	20,168	0	0%	20,888	720	3%	20,488	320	2%
TOTAL	**62,276**	**0**	**0%**	**62,996**	**2,120**	**3%**	**62,596**	**1,720**	**3%**

This information is displayed in the following figure. 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 3.1-19. Cumulative Recreation Use in the Lake Chelan-Sawtooth by 2020



Cumulative Effects on Wilderness Character

Alternatives 1, 2, and 3

Wilderness character is made 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 judging the overall effects to the character.

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

Untrammeled and Undeveloped Qualities

There are no cumulative effects to the untrammeled and undeveloped qualities of the Pasayten or Lake Chelan-Sawtooth 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 will 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 natural quality of both wilderness areas has been improved by the elimination of commercial livestock grazing, and party-size controls that have limited the size of recreational stock herds. This has reduced impacts to streambanks, soil, and 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 or 3 could potentially decrease the opportunities for solitude as popular destinations become more crowded. Considering the small increase estimated in non-outfitted use (approximately 10%) 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. Calling this impact adverse or beneficial would vary from person to person.

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 areas of overlap between the two types of commercial use is very small since much of the commercial hiking/backpacking occurs in the trailless portions of the wilderness where pack and saddle stock outfitter guides activities are not allowed, and use by the non-outfitted public is low.

The opportunities for solitude have been beneficially impacted by restoration activities, visitor education of leave-no-trace camping techniques, trail management, and outfitter-guide administration. There will be a cumulative adverse impact on solitude from past and future recreation use, both from non-outfitted recreationists, including the pack and saddle stock outfitter guide activities Alternatives 2 and 3. Effects of current pack stock use, when added to these past conditions and effects of reasonably foreseeable future actions are negligible at the wilderness scale.

Visitor behaviors in the past have left effects upon the landscape that persist and add to the effects of current use. Some areas show these impacts from over 50 years ago, even when current use is not adding to this effect. The outfitter-guide use in Alternatives 2 and 3, in addition to non-outfitted use is 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.

At the wilderness scale, these effects are not likely to affect 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, have maintained a trend of a slow improvement in wilderness character through the slow correction of past effects, and reduction of 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 Alternative 2 would fully meet the minimum extent needed to provide for wilderness recreation, as identified in the Needs Assessment (USDA, 2010). The need would be partially met, cumulatively with Alternative 3, and to a lesser degree with Alternative 1.

CONSISTENCY FINDINGS

Wilderness Act

All three 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 undeveloped 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-guides to these qualities. In Alternatives 2 and 3, opportunities for solitude or primitive and unconfined recreation would be beneficially impacted by providing some level of commercial pack and saddle stock services for those needing it to experience the wilderness.

Forest Service Manual

All three alternatives would comply with Forest Service Manual 2300, and the Wilderness Management Model. The condition improvements in some campsites in each alternative would narrow move the condition of the wilderness 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. Implementation of Alternative 1 would eliminate pack and saddle stock outfitter-guides from wilderness, so any question about outfitter-guide activities complying would be moot. Alternatives 2 and 3 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, but would not be within the scope of this analysis or decision.

3.2 RECREATION & OUTFITTER GUIDES

The information below is a summary of the Recreation and Outfitter-guide Reports which are available in the project analysis file (Zbyszewski 2008b and 2008c). This section contains two parts. Part one covers general recreational activities including outfitter-guides over the various

portions of the analysis area. Part two provides additional information and analysis on the pack and saddle stock outfitter-guides that are seeking ten-year term permits.

RECREATION

REGULATORY FRAMEWORK

Wilderness regulations are discussed in section 3.1 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.

ANALYSIS METHODS AND DATA SOURCES

The analysis area is divided into eight 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 section 3.1 of this chapter; 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 such a small percentage of overall recreation use (2% of all use and 9% of pack and saddle stock), and since the effects of outfitted verses non-outfitted recreationists are virtually impossible to differentiate, the analysis is on the effect of all pack and saddle stock users, and how the effects would change with the slight variation in the total number of users with implementation of the alternatives.

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. 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. This information was validated by field

observations by Forest Service employees. 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.

All these areas were sampled again in the 2005 National Visitor Use Monitoring Program. This data has not been disaggregated to give use estimates for the specific sub-sections in this analysis, so the 2001 data were used.

Service Days

Use data has been compiled using the most accurate data available. Pack and saddle stock outfitter guides use is measured by the number and type of trips and the people and stock used to reach each destination. 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 recreation. Any impacts to recreation activities 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 actual number of service days reported for 2000 by the outfitter-guides was used to calculate the current percentage of overall use outfitter, since the overall use numbers were also from 2000. 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 activities. 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 (2008) to generate the anticipated number in 2020.

Best Available Science

Throughout this analysis, the best available 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.

NORTH CASCADES

Regulatory Framework

This area includes Management Areas 4, 5, 7, 10, 17, and 25 in 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 MA4 is to:

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 MA7 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).

Okanogan Forest-wide standards and guidelines for recreation applicable to the proposed actions include:

8-1 Recreation and trail opportunities for a variety of recreation activities, including winter recreation, shall be provided consistent with the goals and recreation opportunity setting for the Management Area (4-38).

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

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

Map 1-6 in the Map Section of this document shows the sub-section boundary and management areas.

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 Lake Chelan-Sawtooth Wilderness to the north. 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.

Recreation in the North Cascades Area

The Upper Methow area can be divided into six major recreation areas. **Map 3.2-1 in the Map Section** of this document 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. 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 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.

  Annual Scenic Highway use is about 42,000 visitor days (one person for one day). Trailheads in the corridor include Cutthroat, Blue Lake, Rainy Pass Picnic Area, Rainy Pass, Bridge Creek, East Creek, Easy Pass, and Canyon Creek. The majority of use is hiking (97%) however there is some pack animal (2%) and mountain biker (1%) use. Annual use visitor day distribution includes about 40,740 hikers, 840 pack animal users, and 420 mountain bikers. None of the hikers or mountain bikers are clients of outfitters included in this analysis[3]. Of the pack animals use, about 100 (6%) are outfitted. Overall, outfitter-guide service days make up 0.1% of the visitor days.

  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.

[3] Some clients of pack and saddle stock outfitter-guides hike, and the outfitter packs their gear. These people are counted as clients of the outfitter-guide.

- 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.

- 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 mile non-motorized 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 use the North Cascades area regularly. There are about 2,360 service days annually. Of these, approximately 1,360 are overnight pack trips, and 1,000 are day rides that originate from an outfitter's property.

Figure 3.2-1. 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
Use with Pack Animals (including day-rides)	5,415	1,592	29%
Mountain Bikers	1,945	0	0%
Total	72,500	1,592	2%

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

Outfitter Camps including Assigned Sites

Appendix E includes a list of campsites used by pack and saddle stock outfitter guides in this area. The locations are shown on **Map 1-6 in the Map Section** of this document. Outfitters may use other camps but tend to return to the same sites. Outfitter-guides currently operate two assigned sites 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 table shows the number of visitor days and pack and saddle stock outfitter-guide days by alternative.

Figure 3.2- 2. Number of Visitor Days in the North Cascade Scenic Corridor by Alternative.

Use Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	54,465	0	0%	54,465	0	0%	54,465	0	0%
Driving for Pleasure	10,675	0	0%	10,675	0	0%	10,675	0	0%
Use w/Pack Animals	3,823	0	0%	4,473	650	15%	4,363	540	12%
Mountain Bikers	1,945	0	0%	1,945	0	0%	1,945	0	0%
TOTAL	70,908	0	0%	71,558	650	1%	71,448	540	1%

Alternatives 1, 2, and 3

There would be virtually no affect on non-outfitted recreationists, or any difference in the affects of any of the alternatives. Approximately 60% 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 since the changes would range from 1 to 4%. 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 of over-capacity parking would be greatest at Blue Lake and in the Harts Pass area.

Cumulative Effects

The geographic boundary for cumulative effects is the scenic corridor, with effects considered up to 2020, the length of time of the proposed permits. All past, present, and reasonably foreseeable future actions were considered in this cumulative effects analysis. Those that affect recreation are discussed below.

Past Actions

State Route 20

The highway was completed in the early 1970s. Prior to that, no recreation or other management activities occurred in the area. 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 grazing. 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 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.

Present Actions

Road Maintenance

WSDOT maintenance activities include plowing snow, cleaning ditches, maintaining culverts, removing hazard trees, maintaining the road surface, and other highway maintenance duties.

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 scenic corridor. Refer to **Figure 3.0-1** on pages 3-4 through 3-6 for specific information. Over the past five years, there have been an average of 1,030 service days each year, or 2% of the overall visitor days in this subsection.

Non-outfitted Recreation Use
About 41,900 visitor days occur in the highway corridor each year, independent of the pack and saddle stock outfitter-guides.

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

Non-outfitted Recreation Use
Approximately 26,780 visitor days occur in the Upper Methow area each year, independent of the pack and saddle stock outfitter-guides.

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.

Trail and Trailhead Maintenance
The Forest Service will continue to maintain 66 miles of trail within the highway corridor. The trails concentrate human use, leaving most of the corridor unaltered by human activities.

Campground Maintenance
The Lone Fir, Klipchuck, and Early Winters campgrounds will be operated and maintained in snow-free months, providing camping for 430 people at one time.

Outfitter Guides
Existing non-pack and saddle stock outfitter-guides will continue to operate in the future. **Refer to Figure 3.0-1 on pages 3-4 through 3-6** for information about these permits.

Non-outfitted Recreation Use

The number of people recreating in the scenic corridor increased 147% from 1992 to 2004; from 17,000 visits to 41,925 visits. This rate of increase is expected to continue and a 100% increase to about 83,850 visitor days is assumed for the number of people recreating in the corridor in 2020. 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 tables list current and foreseeable visitor days of non-pack and saddle stock-outfitted recreationists in the corridor by alternative.

Figure 3.2- 3. Current Non-Outfitted Visitor Days by Use Type, Compared to Estimated Number in 2020 and Foreseeable Visitor days with Alternative 1.

Use Group	Current Condition	Estimated Number of Non-Outfitted Recreationists by 2020, and Foreseeable Alt. 1	Percent Change
Hikers	54,465	97,192	78%
Driving for Pleasure	10,675	11,743	10%
Use w/Pack Animals	3,823	4,014	5%
Mountain Bikers	1,945	2,655	37%
TOTAL	70,908	115,604	63%

Figure 3.2-4. Current Visitor Days by User Type, Compared to Foreseeable Visitor days with Alternative 2.

Use Group	Current Condition	Foreseeable Alt. 2	Change
Hikers	54,465	97,192	78%
Driving for Pleasure	10,675	11,743	10%
Use w/Pack Animals	3,823	4,664	22%
Mountain Bikers	1,945	2,655	37%
TOTAL	70,908	116,254	64%

Figure 3.2-5. Current Visitor Days by User Type, Compared to Foreseeable Visitor Days with Alterative 3.

Use Group	Current Condition	Foreseeable Alt. 3	Change
Hikers	54,465	97,192	78%
Driving for Pleasure	10,675	11,743	10%
Use w/Pack Animals	3,823	4,554	19%
Mountain Bikers	1,945	2,655	37%
TOTAL	70,908	116,144	64%

Alternatives 1, 2, and 3

None of the alternatives would have a noticeable or measurable effect on recreation in the scenic corridor, 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, or 3, when considering the past, present, and reasonably foreseeable future actions.

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).

Okanogan Forest-wide standards and guidelines for recreation applicable to the proposed actions include:

8-1 Recreation and trail opportunities for a variety of recreation activities, including winter recreation, shall be provided consistent with the goals and recreation opportunity setting for the Management Area (4-38).

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

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

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).

Map 1-7 in the Map Section of this document shows the boundary of the sub-section, the management areas, and the established outfitter-guide camps. A list of these camps in included in **Appendix E**.

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 1-5**).

Use distribution is about 39% (5,460 visitor days) hiking, 18% (2,520 visitor days) use of pack and saddle stock, 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.

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 campsites.

Outfitter-Guide Activities

This area is regularly used by the pack and saddle stock outfitter guides. There were 290 pack and saddle stock outfitter-guide days in the Sawtooth Backcountry in 2000. This number was used to compare with total visitor days, and to calculate the percentage of use in this sub-section that is outfitted.

Figure 3.2-6. 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	290	12%
Trail Bike Riders	4,620	0	0
Mountain Bikers	1,400	0	0
Total	14,000	290	2%

Environmental Consequences

Direct and Indirect Effects

Figure 3.2-7. Number of Visitor days in the Sawtooth Backcountry by Alternative.

Use Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	5,460	0	0%	5,460	0	0%	5,460	0	0%
Use w/Pack Animals	2,230	0	0%	2,630	400	15%	2,390	160	7%
Trail Bike Riders	4,620	0	0%	4,620	0	0%	4,620	0	0%
Mountain Bike Riders	1,400	0	0%	1,400	0	0%	1,400	0	0%
Total	13,710	0	0%	14,110	400	3%	13,870	160	1%

Alternative 1

With implementation of Alternative 1, there would be no pack and saddle stock outfitter-guide activity in the Sawtooth Backcountry. There would be about 2,230 pack and saddle stock Visitor days in the Sawtooth Backcountry each year, and 13,710 visitor days overall. The 15% reduction in pack and saddle stock use may be noticed by some non-outfitted recreationists, but since the overall reduction is only 3%, fewer encounters on trails and at popular destinations may go unnoticed.

The camps currently used by pack and saddle stock outfitter-guides would still be open and available to non-outfitted recreationists, so conditions would change minimally. Large pack and saddle stock groups would still visit these spots, since the ability to take large groups into this area would still attract users. The camps would remain at the existing size, or possibly increase.

Alternative 2

This alternative would basically maintain the existing number of people in the Sawtooth Backcountry (14,000 existing, compared to 14,110 with Alternative 2). There would be 400 service days for pack and saddle stock outfitter-guides, representing 15% of the pack and saddle stock use, and 3% of use overall.

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 outfitted and non-outfitted recreationists. The conditions in these camps would likely change little, however they may increase in size, and new camps may be developed in the future.

Alternative 3

Alternative 3 would slightly decrease permit use in the Sawtooth Backcountry. The total number would decrease from the current 14,000 to approximately 13,870 – a 1% reduction. There would be 160 service days for pack and saddle stock outfitter-guide, representing 7% of the pack and saddle stock use, and 3% of use overall.

The effect of this decrease in permit use would be indistinguishable from the effects of Alternative 2. People would have a slightly reduced chance of seeing pack and saddle stock groups, but since the overall reduction in use would be 1%, the chance of experiencing isolation on the trails and at popular destinations would changed little from current conditions. Use would be concentrated on trails and generally in established campsites. Existing camps would continue to be used by outfitted and non-outfitted recreationists. The conditions in these camps would not change, however camps may increase in size; new camps may be developed in the future.

Cumulative Effects

The spatial boundary for the analysis was the entire Sawtooth Backcountry. The temporal boundary was from the early 1900s through 2020, when the 10-year permits would expire. All past, present, and reasonably foreseeable future actions were considered in this cumulative effects analysis. Those that affect recreation are discussed below.

Past Actions

Grazing

The Sawtooth Backcountry was included in 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 the grazing, established trails to the lakes and scenic destination points in the area. These trails were maintained by the public and Forest Service.

Present Actions

Non-outfitted Recreation Use

Approximately 13,710 visitor days occur in the Sawtooth Backcountry each year, independent of the pack and saddle stock outfitter-guides.

Reasonably Foreseeable Future Actions

Non-outfitted Recreation Use

The number of people recreating in the Sawtooth Backcountry is expected to increase 12% by 2020.

Figure 3.2-8 lists the current number of non pack and saddle stock-outfitted recreationists and the estimated number for 2020.

Figure 3.2-8. Number of Non-Pack and Saddle Stock-Outfitted Visitor Days in Sawtooth Backcountry Currently and in 2020.

User Group	Approximate Current Number of Non Pack and Saddle Stock-Outfitted Visitor Days	% Increase by 2020*	Estimated Number of Non Pack and Saddle Stock – Outfitted Visitor Days in 2020
Hikers	5,460	+15%	6,279
People w/Pack Animals	2,230	+5%	2,342
Trail Bike Riders	4,620	+10%	5,082
Mountain Bike Riders	1,400	+19%	1,666
Total	**13,710**		**15,369**

*Washington State Interagency Committee for Outdoor Recreation 2003

Alternative 1

The cumulative effect of past, present, and reasonably foreseeable future actions on recreation activities would be a slight increase in the overall number of people recreating, but a decrease in the number of pack and saddle stock use. The overall increase would likely not be noticed by the people recreating there, since it is so small, and the recreation experience and opportunities would not change from the current condition.

Figure 3.2-9. Current Number of Visitor Days by Use Group, Compared to the Foreseeable Number with Alternative 1.

Use Group	Current Condition	Foreseeable Alternative 1	Change
Hikers	5,460	6,279	15%
Use w/Pack Animals	2,520	2,342	-7%
Trail Bike Riders	4,620	5,082	10%
Mountain Bike Riders	1,400	1,666	19%
Total	14,000	**15,369**	10%

Alternative 2

The cumulative effect Alternative 2 and the past, present, and reasonably foreseeable future actions on recreation activities would be a slight increase in the overall number of people recreating in the area. The increase would be larger than with Alternative 1 but would likely not be noticed by the people recreating there. The recreation experience and opportunities would not change from the current condition.

Figure 3.2-10. Current Number of Visitor Days by Use Group, Compared to the Foreseeable Number with Alternative 2.

Use Group	Current Condition	Foreseeable with Alt. 2	Change
Hikers	5,460	6,279	15%
Use w/Pack Animals	2,520	2,742	9%
Trail Bike Riders	4,620	5,082	10%
Mountain Bike Riders	1,400	1,666	19%
Total	14,000	15,769	13%

Alternative 3

The cumulative effect Alternative 3 and the past, present, and reasonably foreseeable future actions on recreation activities would be a slight increase in the overall number of people

recreating in the area. The overall increase would be larger than with Alternative 1, but would likely not be noticed by the people recreating there. The recreation experience and opportunities would not change from the current condition.

Figure 3.2-11. Current Number of Visitor days by Use Group, Compared to the Foreseeable Number with Alternative 3.

User Group	Current Condition	Foreseeable Alternative 3	Change
Hikers	5,460	6,279	15%
Use w/Pack Animals	2,520	2,502	-1%
Trail Bike Riders	4,620	5,082	10%
Mountain Bike Riders	1,400	1,666	19%
Total	14,000	**15,529**	11%

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).

Okanogan Forest-wide standards and guidelines for recreation applicable to the proposed actions include:

8-1 Recreation and trail opportunities for a variety of recreation activities, including winter recreation, shall be provided consistent with the goals and recreation opportunity setting for the Management Area (4-38).

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

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

Map 1-8 in the Map Section of this document shows the boundary of this sub-section, the management areas, and the outfitter-guide camps. The camps are listed on Appendix E.

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. Most activity takes place during the general firearm mule deer season in October. There are no developed trailheads or trails used by pack and saddle stock outfitter-guides in this area.

About 90% of recreation takes place during hunting season, with hunters hiking along the seasonally-closed road system or across hillsides. Some hunters set up 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 to 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, 22 visitor days are associated with pack and saddle stock outfitter-guides.

Outfitter-Guide Activities

Pack and saddle stock outfitter-guide use in this area is 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 22 pack and saddle stock outfitter-guide days in the Sawtooth Backcountry in 2000. This number was used to compare with total visitor days, and to calculate the percentage of use in this sub-section that is outfitted.

Figure 3.2-12. 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	22	11%
People driving for pleasure	100	0	0
TOTAL	1,000	22	2%

The Lightning Creek drop camp is 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. Outfitters may use other camps periodically, but tend to return to this site.

Environmental Consequences

Direct and Indirect Effects

Figure 3.2-13. Number of Visitor days in Bear/Ramsey/Volstead area by Alternative.

Use Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor Days Outfitted	% of Total	Total Visitor days	Visitor Days Outfitted	% of Total	Total Visitor days	Visitor Days Outfitted	% of Total
Hunters camping outside closed area, or setting up camps early	700	0	0%	700	0	0%	700	0	0%
Hunters packing in camps using pack animals or hiking	178	0	0%	278	100	34%	228	50	22%
People Driving for Pleasure	100	0	0%	100	0	0%	100	0	0%
TOTAL	978	0	0%	1,078	100	9%	1,028	50	5%

Alternative 1

Non-outfitted recreationists 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. The overall reduction in the number of people recreating in the area would be small enough to have no virtually effect on quality of the recreation experience of the non-outfitted public.

Alternative 2

Alternative 2 would cause an 8% increase in the number of people in the 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 impact on non-outfitted recreationists would be minor. The small increase may lead to creation of new camps, and the encounters between groups may increase.

Alternative 3

Alternative 3 would basically result in no change from the existing condition. There would be approximately 3% more people in the area, but this will likely be unnoticed by the non-outfitted public because it is so small. Established camps would still be available, and very few new ones would be established.

Cumulative Effects

The spatial boundary for this analysis was the entire Bear/Ramsey/Volstead area. The temporal boundary was from the early 1900s through 2020, when the 10-year permits would expire.

All past, present, and reasonably foreseeable future actions were considered in this cumulative effects analysis. Those that affect recreation are discussed below.

Past Actions

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.

Trail Maintenance

There are system and non-system trails in the sub-unit. They are used primarily by mountain bike and trail bike riders.

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.

Trail Maintenance

The trails in this area are primarily maintained by the users. None of the trails are used by the pack and saddle stock outfitter-guides, so there are no overlapping effects.

Seasonal closures

This area is closed to motorized access from October 1 to March 31 to provide a non-motorized hunting area and to protect mule deer winter range. This eliminates motorized hunting activities.

Non-outfitted Recreation Use

Approximately 978 Visitor days occur in the Bear/Ramsey/Volstead area each year, independent of the pack and saddle stock outfitter-guides.

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.

Non-outfitted Recreation Use

The number of people recreating in the Bear/Ramsey/Volstead area is expected to decrease 14% by 2020, dropping to approximately 856 visitor days per year.

The following figure lists the current number of non pack and saddle stock-outfitted recreationists, and the number that will likely be there in 2020.

Figure 3.2-14. Number of Non-Pack and Saddle Stock-Outfitted Visitor Days in Bear/Ramsey/Volstead Currently and in 2020.

User Group	Approximate Current Number of Non Pack and Saddle Stock-Outfitted Visitor Days	% Change by 2020*	Estimated Number of Non Pack and Saddle Stock –Outfitted Visitor Days in 2020
Hunters camping outside closed area, or setting up camps early	700	-15%	595
Hunters packing in camps using pack animals or hiking	178	-15%	151
People Driving for Pleasure	100	+10%	110
TOTAL	978		**856**

*Washington State Interagency Committee for Outdoor Recreation 2003

Alternative 1

The cumulative effect of Alternative 1 and the past, present, and reasonably foreseeable future actions would a 14% 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, and potentially fewer encounters with other hunters.

Alternative 2

The cumulative effect of Alternative 2 and the past, present, and reasonably foreseeable future actions would be a slight reduction in the number of people recreating in the area, down from the current 1,000 to approximately 956. This 4% reduction may be noticed, but is small enough to not change the existing recreation opportunities or experience.

Alternative 3

The cumulative effect of Alternative 3 would also be a reduction in the number of people recreating in the area. The 6% reduction may be noticed by some, especially if vacant camping spots are easier to find. There may be fewer encounters between people, but the overall recreation experience would likely seem unchanged to most return and new visitors.

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 in the Map Section** of this document.

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-wide standards and guidelines for recreation applicable to the proposed actions include:

8-1 Recreation and trail opportunities for a variety of recreation activities, including winter recreation, shall be provided consistent with the goals and recreation opportunity setting for the Management Area (4-38).

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

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

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 **in the Map 3.2-3 in the Map Section** of this document.

- 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 assigned outfitter corral at the Slate Creek trailhead.
- 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 outfitters on different alternatives are included in the discussion of the Lake Chelan-Sawtooth and Sawtooth Backcountry areas.

Outfitter Activities

There are no outfitter-guide service days or visitor days in the Middle Methow area. The only outfitter activities in this area are the assigned sites 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.

Figure 3.2- 15. Current number of Visitor Days by Use Group in the Middle Methow Area, and Number of Pack and Saddle Stock Outfitter-Guide Visitor 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 or visitor days in the Middle Methow with any alternative; current use would not change.

Alternative 1

With Alternative 1, the corral at the Slate Creek trailhead would be removed, however this alternative would have no effect on recreation in this area.

Alternatives 2 and 3

Neither Alternative 2 nor 3 would have any effect on recreation in this area. The corral at Slate Creek Trailhead would be used and maintained with either of these alternatives. This would give non-outfitted pack and saddle stock users a place to keep stock when the outfitter is not present.

The outfitter-guide would continue to use the base camp near the Crater Creek Trailhead. This site would be managed to avoid unacceptable impacts to other resource. The parking area provided for the clients would leave the trailhead available for non-outfitted recreationists.

Cumulative Effects

The spatial boundary for this analysis is the entire Middle Methow area. The temporal boundary is from the early 1900s through 2020, when the 10-year permits would expire.

Alternatives 1, 2, and 3

Since none of the alternatives would have an effect on recreation in the Middle Methow area, there would be no cumulative effects with any past, present, or reasonably foreseeable future actions.

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-wide standards and guidelines for recreation applicable to the proposed actions include:

8-1 Recreation and trail opportunities for a variety of recreation activities, including winter recreation, shall be provided consistent with the goals and recreation opportunity setting for the Management Area (4-38).

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

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

Map 1-10 in the Map Section of this document shows the area boundary and management areas.

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.

Recreation Activities

There are 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 were 829 pack and saddle stock outfitter-guide days in the Alta Lake sub-section in 2000. This number was used to compare with total visitor days, and to calculate the percentage of use in this sub-section that is outfitted.

Figure 3.2-16 Current number of Visitor Days by User Group in the Alta Lake area, and Number of Saddle Stock Outfitter-Guide Visitor Days

User Group	Total Visitor Days	Outfitter-guide Service & Visitor Days
Hikers	355	0
Driving for Pleasure	8,445	0
Saddle Stock	1,575	829
Mountain Bike Riders	125	0
Total	**10,500**	**829**

Environmental Consequences
Direct/Indirect Effects

Figure 3.2-17 Number of Visitor days in the Alta Lake area by Alternative.

User Group	Alternative 1			Alternative 2			Alternative 3		
	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total	Total Visitor days	Visitor days Outfitted	% of Total
Hikers	335	0	0%	**335**	**0**	**0%**	**335**	**0**	**0%**
Driving for Pleasure	8,445	0	0%	**8,445**	**0**	**0%**	**8,445**	**0**	**0%**
Saddle Stock	746	0	0%	**1,476**	**750**	**51%**	**1,336**	**590**	**44%**
Mountain Bike Riders	125	0	0%	**125**	**0**	**0%**	**125**	**0**	**0%**
Total	**9,671**	**0**	**0%**	**10,381**	**750**	**7%**	**10,241**	**590**	**6%**

Alternative 1

There would be no saddle stock outfitter-guide clients or employees in the Alta Lake area in Alternative 1. The reduction in the overall number of visitor days in the area (-9%) would likely be unnoticed by most non-outfitted recreationists. 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.

Alternative 2

Alternative 2 would basically maintain the existing number of people in the Alta Lake area. There would be about 750 saddle stock outfitter guide visitor days, representing 51% of the saddle stock use, and about 7% of use overall.

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. Existing non-outfitter horseback riding and other trails use levels would continue.

Alternative 3

Alternative 3 would slightly decrease the number of people in the Alta Lake areas (10,500 compared to 10,241). There would be approximately 590 saddle stock outfitter guide visitor days, representing 44% of the saddle stock use, and 6% of use overall.

The effect of this amount of use in the Alta Lake area would be indistinguishable from the effects of Alternative 2. People would have a slightly reduced chance of seeing saddle stock groups, but since the overall reduction in use would be only 2%, the chance of experiencing isolation on the trails and popular viewpoints would remain unchanged from current conditions. Use would be concentrated on developed trails. Existing non-outfitter horseback riding and other trail use levels would continue. All activities would be consistent with the standards and guidelines in the Forest Plans.

Cumulative Effects

The spatial boundary for this analysis was the entire Alta Lake area. The temporal boundary was from the early 1900s through 2020, when the 10-year permits would expire.

Past Actions

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 and 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, some timber harvest has occurred over the years on an as needed basis by locals, but no heavy harvest of trees likely occurred at any one time. 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. 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 providing 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 established in 1951. The park has attracted thousands of boaters, anglers, campers, picnickers and swimming enthusiasts to the Alta Lake area for over 50 years.

Present Actions

Grazing

Twenty-five cow/calf pairs graze the Alta Coulee Allotment. They are permitted to graze from June 1 through September 30 for a total of 102 Animal Unit Months (AUMs). The permittee typically uses only about two months of the permitted four month period. 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 Road 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. A road extends from the County Road through private lands on native surface and is owned and maintained by

Whisperin' Pines Ranch as needed. Beyond the ranch the Alta Coulee Road (Forest Road 8141) connects to the private road and extends about 2 ½ miles on National Forest lands. It is gated at both points entering National Forest. This section is not maintained.

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 2020.

The following table lists the current number of non pack and saddle stock-outfitted recreationists, and the number that will likely be there in 2020.

Figure 3.2-18 Current Number of Non-Outfitted Visitor Days in the Alta Lake Area and Estimated Number in 2020

User Group	Current Number of Non-Outfitted Visitor Days	% Change by 2020*	Estimated Number of Non-Outfitted Visitor Days in 2020
Hikers	335	+ 10%	369
Driving for Pleasure	8,445	+10%	9,290
Saddle Stock	746	+5%	783
Mountain Bikers	125	+19%	149
Total	**9,671**	+10%	**10,591**

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. 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. Whether this would be a positive or negative effect on recreationists would depend on personal opinion.

Figure 3.2-19. Current Number of Visitor days by User Type in the Alta Lake Area, Compared to the Cumulative Number with Alternative 1

User Group	Current Condition	Cumulative, With Alt. 1	Percent Change
Hikers	**335**	369	10%
Driving for Pleasure	**8,445**	9,290	10%
Saddle Stock Users	**1,575**	783	-50%
Mountain Bikers	**125**	149	19%
Total	**10,500**	**10,591**	**1%**

Alternative 2

The cumulative effect of 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 7%), with pack and saddle stock use decreasing 3%. 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. Whether this would be a positive or negative effect on recreationists would depend on personal opinion.

Figure 3.2-20. Current Number of Visitor days by User Type in the Alta Lake Area, Compared to the Cumulative Number with Alternative 2.

User Group	Current Condition	Cumulative, With Alt. 2	Percent Change
Hikers	**335**	369	10%
Driving for Pleasure	**8,445**	9,290	10%
Saddle Stock Users	**1,575**	1,533	-3%
Mountain Bikers	**125**	149	19%
Total	**10,500**	**11,341**	**7%**

Alternative 3

The cumulative effect of past, present, and reasonably foreseeable future actions on recreation activities in the Alta Lake area would be a 6% increase in the overall number of people recreating, but a 13% 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. Whether this would be a positive or negative effect on recreationists would depend on personal opinion.

Figure 3.2-21. Current Number of Visitor days by User Type in the Alta Lake Area, Compared to the Cumulative Number with Alternative 3.

User Group	Current Condition	Cumulative, With Alt. 3	Percent Change
Hikers	**335**	369	10%
Driving for Pleasure	**8,445**	9,290	10%
Saddle Stock Users	**1,575**	1,373	-13%
Mountain Bikers	**125**	149	19%
Total	**10,500**	**11,181**	**6%**

CONSISTENCY STATEMENTS

All alternatives would be consistent with the Forest Plan standards and guidelines for the respective management areas. None of these management areas have standards and guidelines specific to pack and saddle stock outfitter-guide activities. Standards and guidelines pertaining to general recreation activities would be met with any of the alternatives. Standards and guidelines are listed in the Okanogan and Wenatchee Forest Plans.

OUTFITTER-GUIDES

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. Forest-wide standards and guidelines for special uses are found on pages 4-38 and 4-39 in the Okanogan Forest Plan. The Wenatchee Forest Plan does not have Forest-wide standards and guidelines specific to outfitter-guides. The management areas included in the analysis area have standards and guidelines pertaining to resource conditions and management activities. Those pertaining to wilderness are discussed in detail in the Wilderness Report. This report includes information about the management areas outside wilderness.

The Forest Service Handbook 2709.11 gives agency-wide direction in the administration of outfitter-guide permits (USDA Forest Service, 2004a).

ANALYSIS METHOD

Alternatives are evaluated by the findings in *the 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). Each existing pack and saddle stock outfitter-guide is described and the effect of the alternatives, including Forest Plan amendments, on outfitter-guides is described.

AFFECTED ENVIRONMENT

Need for Outfitter-Guides

The Forest Service found that there is a need for pack and saddle stock outfitter-guide operations in the analysis area to meet recreational purposes. This analysis is documented in the *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). The Assessment used a criteria-based perspective to determine the need for outfitter-guides. An essential point in this process was to define the role of outfitter-guides on public lands. From the Forest Service's perspective, a partnership with outfitter-guides is needed to provide certain recreation services. This partnership is an effort to jointly ensure that quality recreation services are provided on public lands to those segments of the public that require outfitter-guide services, while wilderness character is preserved, and other resource protection and management needs are met. The assessment found that pack stock trips and drop camps, including those for big game hunting, rated high in each evaluation criteria. The Needs Assessment provides more information and is available in the analysis file.

Demographics

The demographics of the population of people coming to the analysis area helps determine the need for pack and saddle stock outfitter-guides. 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 pack and saddle stock outfitter guides. Having outfitter-guides for pack and saddle stock would help make backcountry trips more feasible for these age groups.

Demographic information about visitors to the district was gathered and compiled in the 2006 NVUM report (USDA Forest Service 2006). The report divided visits into age ranges from "under 16", "16 to 19", "20 to 29", "30 to 39", and so forth. The highest percentage of visits (26.4%) fell in the "50 to 59" age range, with the lowest percentages in the "under 16" and "16 to 19" age range (4% and 4.2% respectively). The number of visits was roughly split between people up to the age of 49 (46%), and those over 50 (54%).

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. There is a projected increase in the number of people in every age group in the state of Washington through 2020, but the most growth will occur in those over 50 years old (IAC, 2003). The number of people in the 50-64 age range will increase approximately 35%, and those in the 65 and older range will more than double (133% increase) between 2005 and 2020 (Washington State Office Fiscal Management, 2007). This indicates that there will be an increase in the number of people and the percentage of visitors who are physically incapable of hiking or backpacking into the backcountry, and that the need for pack and saddle stock outfitter-guides will increase in the coming years.

Another demographic factor to consider is how far people travel to reach the area. People who live in communities near the analysis area may be more likely to have the skills, equipment, and knowledge to travel into the wilderness without an outfitter-guide. Those who come from outside the area may have a greater need for an outfitter since it is less likely that they would transport stock to this area, or have sufficient knowledge of the area to travel independently on horseback.

The Methow Valley, Tonasket and Chelan ranger districts receive a mix of people who live locally, and those who travel here from out of the area. Approximately 15% of the visits were by people who live in the communities near the districts (in Okanogan County), while the remaining 85% are from other areas. Most of these are from the greater Seattle area, and 5.3% are from foreign countries.

The Washington State Office of Fiscal Management projects that the overall population of Washington will increase 36% by 2020, whereas the population of Okanogan County will increase 17.5% (Washington State Office Fiscal Management, 2007). Since the population of the state is projected to grow more rapidly than the population of Okanogan County, it is safe to assume that the percentage of visits to the Methow Valley, Tonasket and Chelan ranger districts from people who live nearby will decrease, and the percentage of those from outside the area will increase. Keeping with the assumption that those who travel longer distances to recreate in the analysis area are more likely to require the services of an outfitter-guide, the amount of commercial services needed will increase in the coming decade and beyond.

Pack and Saddle Stock Outfitter-Guides

Pack and saddle stock outfitter-guides have been taking people into the analysis area for decades. 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. Ownership of some of the companies has changed, and two are currently not operating. The amount of actual use varies from year to year, but has been relatively steady for the past twenty to thirty years.

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 Assessment. There would be no partnership between the pack and saddle stock outfitter-guides and the Forest Service to provide quality recreation services on public land. 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.

Current pack and saddle stock outfitter-guide permit holders would likely go out of business, since they rely on authorization and access to use National Forest System land. Impacts to the

individual permit holders would be substantial, though impacts to the local economy as a whole would be less noticeable.

Alternative 2

Alternative 2 would issue pack and saddle stock outfitter-guide permits to existing outfitters, or qualified applicants. This would meet the need for pack and saddle stock outfitting-guiding identified in the Needs Assessment. The partnership between the pack and saddle stock outfitter-guides and the Forest Service would provide quality recreation services on public land. This would result in a continuation of 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 include enough service days to allow the existing holders, or future applicants, to operate viable businesses and respond to a small amount of increase in demand.

The Forest Plan amendments to wilderness standards and guidelines would not allow the outfitters to establish new camps without authorization or increase the size of existing camps; it would require camps to not exceed 5,250 square feet of barren core or expose roots on trees. These conditions would be restorative in nature and may limit some outfitters activities in wilderness, but the outfitters would be able to comply with these conditions without financial burden or affecting the types of trips offered.

Alternative 3

Alternative 3 would also issue pack and saddle stock outfitter-guide permits; it would meet partially the need for pack and saddle stock outfitting-guiding identified in the Needs Assessment. As with Alternative 2, the partnership between the pack and saddle stock outfitter-guides and the Forest Service would provide quality recreation services on public land. This would result in a continuation of 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. There would be 44% fewer service days offered to the outfitters compared with Alternative 2. This would mean that 44% of the people looking for pack and saddle stock trips would not be able to go.

Alternative 3 would have a substantial impact on the viability of the outfitters due to the reduction in allowable service days. The reduction would result in a corresponding 44% decrease in gross profits generated. The outfitters could off-set this decrease by increasing fees charged for trips, but such a large increase would likely result in a substantial decrease in demand.

The Forest Plan amendment to reduce party size to twelve in wilderness with this alternative would have a financial impact on the outfitters. Reduced party size would increase operating costs. Most outfitters would need to 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. The reverse would be true at the end of the trips. For progressive camps, the outfitter would either need to reduce the number of clients per trip to about four. Most parties would likely consist of one packer/cook, four clients, five riding horses, and two pack animals. 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. The increased operating costs would further reduce the net profit for these businesses, and some may go out of business.

The Plan amendments to use only 2,800 square feet of barren core, not establish new camps or increase the size of existing camps, and not allow roots to be exposed on trees would have lesser effect since party sizes would already be reduced.

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 and the temporal timeframe is from the early 1900s through 2020. 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 all activities besides pack and saddle stock, identified in the Needs Assessment.

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.

Alternative 1

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 1 would be a partial meeting of the need for outfitting and guiding. There would be no outfitter-guides for the pack and saddle stock clients, so the existing clientele would lose the opportunity for this type of activity.

Alternative 2

The cumulative effect of the past, present, and reasonably foreseeable future actions and Alternative 2 would be that the existing demand for, and type of outfitted-guided activities would be met. The existing pack and saddle stock outfitters, or suitable applicants, would be able to continue to operate.

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 be met, but about 44% of the established pack and saddle stock outfitter-guide clients would not be able to take the trips. The existing pack and saddle stock outfitters may go out of business due to the increased operating costs associated with a party size reduction, and a reduction in the number of service days and revenue generated.

CONSISTENCY STATEMENT

All alternatives would be consistent with the Okanogan and Wenatchee Forest Plans, as amended. 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.

3.3 BOTANY

The section below is a summary of the Botanical Evalustion for the Pack and Saddle Outfitter-Guide Permit Renewal Project which is available in the project analysis file (Ohlson 2010).

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 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 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 significant 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). This Biological Evaluation (BE) assesses the effects of the proposed action 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.

This report constitutes the Biological Evaluation (BE) for Sensitive and Federally listed plant resources and unique habitats within the Outfitter Guide Analysis Area. The result of this BE looks at the consequences of the proposed project activities on Sensitive plant resources and unique habitats. Forest Service Manual direction 2670 requires activities be reviewed in a BE to determine their potential effect on Sensitive species and that activities avoid or minimize impacts to species whose viability has been identified as a concern. It also requires that proposed activities will not result in loss of species viability that will result in a species becoming Threatened, Endangered, or create trends toward Federal listing.

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):

- 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 sites.

- 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.

- 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. Primitive, a. (1) Vegetation (page IV-71)
- Area of vegetation loss, and compacted bare mineral soil at any campsite should not exceed 400 square feet.

- There should be no loss of trees at any site and fewer than four trees with exposed roots per impacted site.

- No noticeable, long-term modification of natural plant succession as a result of livestock grazing or human activity.

- Dead trees or dead, woody debris may be utilized for campfires in amounts that can be replaced annually through natural accumulations.

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.

Other standards and guidelines that apply to vegetation are in each Forest Plan.

ANALYSIS METHOD

The document analysis is based on the R-6 April 2004 Interagency Special Status Sensitive Species Program (ISSSSP) list. In addition the Washington Natural Heritage Program (WNHP) February 2008 was considered and those species known to occur on the Forest, that are not currently on the R-6 list are being listed as other rare or little known species of concern. The complete list 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 Sensitive 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 at the appropriate season to confirm presence or absence of any of the species of concern listed in **Appendix F**. There is a small band of non-wilderness land along the north shore of Lake Chelan, for the sake of this analysis is being included in the Lake Chelan Sawtooth Wilderness subunit. The Fish Creek Base Camp is located in this portion of non-wilderness, and unless otherwise discussed will be treated as wilderness.

In order to equally weigh the risk of outfitter activities on resource values, Landtype Associations were used to categorize habitats and determine those land types that provide habitat for the greatest number of Sensitive species (Davis and others 2004). Another important GIS layer utilized was a wetlands layer based on the US Department of Interior and Fish and Wildlife Service publication “Classification of Wetlands and Deepwater Habitats of the United

States" (Cowardin and others 1979). These of course are very broad classifications and are being used in conjunction with the unique habitat requirements for the various species included in this analysis (**Appendix G**) and local knowledge of camp sites and use areas.

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 resources.

AFFECTED ENVIRONMENT

Wetlands

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 total 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 also 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 3.3-1 in the Map Section of this document** 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* species and *Eriophorum viridicarinatum*. 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* 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 generally let their stock open graze to reduce impact to soil and vegetation that can be caused by corralling or tying stock for extended periods. Stock will travel approximately two miles from camps, but generally stay closer. The amount of impact decreases as the distance from a camp increases and the larger the area is for animals to disperse.

There are 117.2 acres of wetland identified within 500 ft radius of 47 camps. This is 1.4% of all the wetlands in the analysis area. The rest of the wetlands are over 500 feet from established camps. Of these 47 camps, 34 are in the Pasayten Wilderness and comprise 101.4 acres, or 1.7% of wetland habitat within that wilderness. Of the proposed assigned camps, Beaver Creek Camp, Bald Mountain, and Sheep Mountain camps have identified wetlands nearby. Crow Lake

and Whistler Camps and do not have mapped wetlands within 500 ft of camp. Refer to **Appendix H** for a list of mapped wetlands within a 500 foot radius of campsites.

Camp locations were given a 500 ft. radius buffer in an attempt to include potential wetland habitats or Sensitive plant populations that may be affected by outfitter activities. 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 is occurring in these areas at this time.

Not all the wetlands listed in **Appendix H** have been impacted by pack and saddle stock use. Stock use associated with these wetlands effect areas that are typically small and isolated incidences. Because of the small scale of the disturbance, the wetland ecosystem function is not affected. This leaves the majority (98.6%) of wetlands unaltered and most of these are not near trails or campsites, and receive little to no stock use.

Federally Listed Species

Threatened and Endangered

There are no Federally-listed *Howellia aquatilis, Hackelia venusta*, *Sidalcea oregano var. calva,* or *Spiranthes diluvialis* 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.

Sensitive Plants

Given the size of the analysis area, sensitive plant surveys of every potential site of pack and saddle stock outfitter-guide activity was impossible. The analysis of the effects on sensitive plants was done by combining the data from sensitive plants surveys that have been completed, analysis of landtype associations most likely to contain sensitive plant habitat, and abundance of wetland habitat. Sensitive species are listed in **Appendix F**.

Sensitive Plant Populations

Of the 54 species of sensitive and rare or little known species; the Pasayten Wilderness, which includes both the Methow and Tonasket Ranger District portions, supports the greatest species diversity (37 species) followed by the North Cascades (20 species). The greatest number of site locations are also associated with the Pasayten Wilderness, primarily because wetlands are in the highest concentration here and many of the sensitive or rare 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. These species are typically at the southern most extent of their range. One example is *Gentiana glauca*, 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 indicator species of the health of other arctic plants that have found a niche in this area (Lesica and McCune 2004). In Washington, *Gentiana glauca* 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 the state

range is from just west of the Ashnola River east to Chopaka Mountain on Department of Natural Resources land.

Figure 3.3-1. Number of Species in the Analysis Area Subunits that are Species of Concern, tracked by the R6-6 Sensitive Plant list, Regional ISSSSP, or WNHP.

AA Subunits	Species Present	% of Total Species (54
Alta Lake	0	0
Bear/Ramsey/Volstead	2	4.1
Sawtooth Backcountry Chelan	1	2.0
Sawtooth Backcountry Methow	1	2.0
Lake Chelan-Sawtooth Wilderness Chelan	4	8.2
Lake Chelan-Sawtooth Wilderness Methow	7	14.3
Pasayten Wilderness Methow	33	63.3
Pasayten Wilderness Tonasket	13	26.5
North Cascades	20	37.0
Middle Methow	3	6.1

A unique topographic feature that supports artic 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. *Gentiana glauca* 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' in elevation. .
Gentiana glauca is apparently secure globally (G4) but is Imperiled (S2) in Washington and Critically Imperiled (S1) in Montana. It is considered Vulnerable (S3) in Alberta, Apparently Secure (S4) in Alaska and British Columbia. (Natureserve 2010).

In a very general sense, the 54 species included in this analysis can be classified into five types of habitat. These are wetland, riparian, and wet to mesic meadow habitats; talus and mountain top scree habitats; tree dwelling species; soil substraights; and open habitats and dry meadows.

Wetland, Riparian and Wet to Mesic Meadow Habitats
Twenty-five species are associated with wetlands, riparian areas, and wet to mesic meadows. *Dermatacarpon luridum* is an aquatic lichen found in streams and is included in with the riparian species. The 25 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. There is no expected long-term loss of species viability for any of these species given the abundance of sites within a population or the majority of sites, populations and habitats are not within any areas used by outfitters.

These 25 species are: *Agoseris elata, Agoseris borealis, Spiranthes porrifolia, Botrychium ascendens, Carex magellanica ssp. irrigua, Botrychium hesperium, Carex atrosquama, Carex heteroneura var. epapillosa, Carex media, Carex saxitillis var major, Gentiana glauca, Geum rivale, Potentilla quinquefolia, Potentialla diversifolia var perdissecta, Salix glauca, Salix tweedyi, Botrychium paradoxum, Gentianella tenalla, Carex gynocrates, Sanicula marlandica, Dermatacarpon luridum, Potentilla quinquefolia, Utricularia minor, Eriophorum viridicarinatum,* and *Gentianella tenalla*.

Of the 11 Sensitive and rare or little known species that occur within a 500' radius of any campsite, seven of these are found in the riparian, wetland and mesic to wet meadow habitats. These are: *Carex heteroneura* var. *epapillosa*, *Gentiana glauca*, *Agoseris elata*, *Carex saxatillis* var. *major*, *Eriophorum viridicarinatum*, *Carex magellanica* ssp *irrigua*, and *Salix tweedyi.*

Talus and Mountain Top Scree Habitats

There are 19 species found in talus and mountain top scree habitats. These species are: *Carex scripoidea var. scirpoidea, Cryptogramma stelleri, Draba aurea, Draba cana, Erigeron salishii, Eritrichium nanum var. elongatum, Luzula arcuata, Mimulus suksdorfii, Packera porteri, Parnassia kotzebuei, Polemonium viscosum, Potentilla nivea, Ranunculus pygmaeus, Saxifraga cernua,* and *Saxifraga rivularis.* The lichens *Cornicularia normoerica, Umbilicaria cylindrical*, and *Umbilicaria descussata* are found on exposed rocks and boulders at high elevations. *Brodoa oroartica* is found on rocks or soil in alpine or arctic tundra (Brodo and Sharnoff 2001). 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 would be affected by current outfitter activities.

Of the 11 Sensitive and rare or little known species that occur within a 500' radius of any campsite, only three of these are found in the talus and mountain top scree habitats. These three are: *Potentilla nivia, Carex scirpoidea* var. *scirpoidea* and *Polemonium viscossum.*

Tree Canopy Habitats

The four moss, and lichen species found growing on trees or woody substrates (live and dead) are: *Loberia linita, Schistostega pennata*, *Tholurna dissimilis* and occasionally *Alectoria nigricans* (Brodo and Sharnoff 2001). These would be species likely to be disturbed in association with wood gathering activities. Implementation of current Forest Plan standards and guidelines pertaining to wood gathering and snag removal will reduce or eliminate the risk of loss to any of these species.

Soil Substrate Habitats

There are four species of fungi and two lichens that are found on or in soil substrates. The fungi (*Cudonia monticola, Gyromitra californica, Mycena monticola*, and *Ramaria amyloidea*) are found in association with well rotted wood and duff on the forest floor and would not be affected by any proposed use associated with the hardened core area of a camp site. These fungi occur in forested habitats not suitable for grazing plus campsites are already well established and future use will not expand beyond what is currently in use. The only risk to these species would be stock or humans trampling fruiting bodies when traveling through a forested area.

The lichen *Alectoria achroleuca* is an artic-alpine species that grows on soil or rarely in shrubs while *Dactylina ramulosa* is found on soil in artic or alpine tundra habitat. Both these species are associated with barren windswept soils at higher elevations where no stock use would likely occur. None of the outfitter activities would have any effect on these species (Brodo and Sharnoff 2001).

None of these soil substrate habitat dependent species are known to occur within a 500' radius of any camp.

There are 19 campsites that have known populations of Sensitive 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. The camps include: 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 17 of these camps are near the Canadian boarder. In the southern half of the Pasayten and north of Harts Pass; Silver Lake, Ferguson Lake, Drop Camps B and C are located. Two camps, Bernice 3 (E) and Fish Creek Base Camp, are on the Chelan side of the Sawtooth.

Appendix I includes a list of camps used by outfitter-guides that are within 500 feet of sensitive plants. A description of each camp follows.

In all campsites, pack stock activities are part of the use. Most of the camps are drop camps and typically not used overnight for pack and saddle stock. Occasionally, clients will ride their own stock in and will care for them while in the area and hire the outfitters to haul gear. In these situations, grazing use is from private stock, not outfitter stock. Drop camps where no stock remain in camp and those camps used only during the hunting season without stock use are not expected to have any detrimental effect on Sensitive plant populations or sensitive habitats. The exception would be where camp water sources are in close proximity to a Sensitive plant population, which increases the potential for human trampling of that site. Charlie Brown Camp is one such camp.

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. In addition to providing the full-service camping experience, these camps are also used as base camps for outfitters to work out of after dropping clients in the area. These camps are used annually, and experience the most consistent season long use of any of the camps in the analysis area. Thus these sites have the greatest potential for ground disturbance associated with high lining animals, grazing, firewood gathering, trampling of vegetation, and soil compaction in and around the camps by both stock and humans.

Assigned sites are also used as hold over and staging areas for outfitters when dealing with client needs in the area. These camps are set up for the outfitters needs and are better situated for handling and turning stock out to graze large areas away from camp. The better distribution of stock grazing that occurs away from the reserved camps helps to reduce the potential for over grazing.

For this analysis, the non-reserved full-service camps are those camps where overnight use occurs with outfitter stock. These camps make up the smallest percent of the outfitter business. They are, however, the sites associated with the second greatest potential for disturbance, compared to assigned sites.

A substantial amount of pack and saddle stock outfitter-guide activity is during the fall hunting season when soils are dry and vegetation has senesced. Fall use has the least potential to affect plant recovery during the following season.

Where only llama use occurs, there would be no long-term modification of plant communities in grazing areas since there are typically fewer, smaller animals. Llamas have padded feet which reduces the potential for long-term vegetation modification. Accordingly, use of campsites by outfitters with llamas has the least potential to result in over-grazing, trampling, or soil compaction compared to burros, horses, or mules.

- *Bald Mountain Camp*
  The *C. heteroneura* var. epapillosa site near the Bald Mountain camp is part of the regular grazing area used with this full-service assigned campsite. This area is not the primary graze area but one that is used for short visits with few animals or when animals are not turned out overnight and the outfitter wants to keep them close to camp. The long-term viability of the population is unknown. Detailed information taken at this site indicates the area is currently in good ecological condition. Access to this grazing area goes through some very wet sedge meadows and there is more resource damage occurring from stock braiding their way through the wet meadows to avoid sinking deep into the wet soil than is occurring at the *C. heteroneura* var. *epapillosa* site. This causes more damage to the vegetation than the grazing that is occurring at the *Carex heteroneura* site. Stock need to travel through these wetlands to also access the drier *Danthonia intermedia* meadow habitat up on the northwest flank of Bald Mountain where the night graze it located.

  The Bald Mountain assigned site is associated with 5 acres of emergent wetland that is temporarily or seasonally flooded. This appears to be an accurate depiction of the conditions at the camp. The sedge wetlands surround the camp location 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 here and head through the wetland and up the hill. To the west is where the *C. heteroneura* var. *epapillosa* site is located and the habitat, for this species, boarders the wet sedge meadow. This stringer of wetlands extends beyond the 500' radius of the camp and well up the slope where the horses need to travel to reach their main night graze to the west. The travel patterns have resulted in multiple braded trails through these wetlands. Springs along the north slope of Bald Mountain have been sheared open from hoof action allowing for a more rapid dewatering of spring and slope erosion. *Gentiana glauca* is found on the hummocks above these springs. Horses traveling through the area are trampling this population and the perennially moist spring site cannot tolerate trampling. 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. This campsite is problematic in its location given the extensive wetlands associated with it and the fact the horses have to travel through these wetlands to reach suitable graze. Moving camp is a last resort as the large barren core area required to accommodate the level of use associated with this assigned site would be re-established in another place.

  The old boundary trail went through these wetlands and up onto Bald Mountain where the suitable night 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 to avoid sinking in the mud. In addition, this old trail is still being used by other outfitters, hikers, and private parties with stock. It is a known short cut across the Ashnola River and into the Sheep

Mountain area. Bald Mountain is also a popular destination for day rides and hikers who want to enjoy the vista of Cathedral and Amphitheater peaks, Sheep Mountain, Canada, and the Cascades.

- *Beaver Creek Camp*
  Beaver Creek assigned site has four Sensitive plants affected by outfitter use within 500' of camp. These are: *Agoseris elata, Gentiana glauca*, *Carex saxatillis v. major,* and *Carex heteroneura var. epapillosa*. This camp also is in association with the largest amount of designated wetland. There are 9.7 acres of willow wetland that is temporarily or seasonally flooded within 500' 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. Just above this willow (*Salix planifolia*) dominated community it grades into a *Festuca viridula* meadow with inclusions of *Danthonia intermedia* and pockets of moist forbs with an abundance of *Trollius* and *Caltha* species. Within the moist forb inclusions *Agoseris elata* and *Carex heteroneura* var. *epapillosa* are found.

  To the north of the campsite there are some small open water wetlands surrounded by hummocks that support *Gentiana glauca*. This is a relatively large area in good ecological condition. Horses travel to and from night graze areas just to the northwest of this hummock ground and wetlands. There is little evidence, if any that they spend time in this area. Future grazing patterns should not be changed to ensure stock stay out of this ecologically important area. *Gentiana glauca* 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. Human trampling is a concern.

  On the south side of the camp, within 100' of the tent site, there is a small wetland surrounded by hummocks. Both *C. saxatillis v. major* and *Gentiana glauca* are found growing here. This site is also being regularly trampled by stock mingling around camp. The integrity of the habitat and vigor of these populations of sensitive plants are being compromised by this use. There is a possibility that the populations near camp will disappear if use continues unchanged.

  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, resource damage is moderate and most of the area is in fair to good ecological condition. Most of the damage is occurring close to camp. Stock are well-dispersed from camp, which contributes to the moderate to low trampling damaging to the surrounding vegetation and wetlands. If slight management changes occur around the immediate campsite to reduce trampling of sensitive resources, there is no ecological reason this camp should be moved or general use changed.

- *Beaver Creek Drop Camp*
  Beaver Creek Drop has two species associated with the camp; both have suitable habitat within 500'. Neither of these species has been documented in the camp area. There is likely suitable *Agoseris elata* habitat that is occupied given the number of sites in the

immediate vicinity, but there is no suitable habitat for *Eriophorum viridicarinatum* in the vicinity of camp. Given this camp is used primarily as a drop camp during the hunting season, there is little reason to believe *Agoseris elata* would be at risk.

- *Bob Creek, Cathedral Camp, Bernice 3(E), Drop Camp B, and Drop Camp C*
  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 is expected with the current use at these camps. Drop camps B and C are potentially used season long as drop camps. But since outfitter stock are not kept in camp or turned out to graze in any of these areas, there is no effect to sensitive plant resources or wetland habitats.

- *Charlie Brown and Pasayten Hilton*
  Charlie Brown and Pasayten Hilton camps both have *Carex magellanica* spp *irrigua* in close proximity. Given the association this species has with sphagnum moss and very wet sites, grazing is not the concern. 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 unknown at Pasayten Hilton campsite, which is also popular with private parties. It is likely similar to the situation at Charlie Brown. Neither of these drop camps is used often by the outfitters. The *Carex magellanica* spp *irrigua* 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 *Botrychium simplex* populations. During inventory efforts in 2001 *Botrychiums* were found in the area but identification was not confirmed. There was no voucher collection made. A photo was taken and identification could not be determined. Suitable habitat for *Agoseris elata* is identified in the grazing area associated with this camp. Occupancy of the habitat is not confirmed at this time.

- *Ferguson Lake, Silver Lake, and Ptarmigan Creek*
  Of the other camps listed in **Figure 3.3-2**, Ferguson Lake, Silver Lake, and Ptarmigan Creek do not have suitable habitat in any of the camp use areas. Use in these camps will not have any effect on the Sensitive species thought to be in the area. Silver Lake is also not well suited to stock use, so outfitter use is likely not having any effect on Sensitive plant or wetland resources at these two camps.

- *Old Miller Camp*
  The *Agoseris elata* and *C. heteroneura* var. *epapillosa* populations near Old Miller Camp are within the moist meadow used for pasturing animals in this camp, but the grazing use in these areas is from private stock or very rarely outfitter stock. This site is used primarily as a drop camp. The meadows appear to be in good ecological condition given the current use based on visits to the site in 2002.

- *Sheep Mountain*
  Sheep Mountain is located in the vicinity of a confirmed population of *Carex heteroneura var. epapillosa*, and one population of *Agoseris elata*. There is 0.3 acres of

willow wetland that is temporarily or seasonally flooded located across the creek from camp. There is no stock or human use associated with this willow wetland. Field inspections at Sheep Mountain camp indicate that the *C. heteroneura var. epapilosa* population south of the camp is in a high traffic area currently being grazed. The population is between the camp site and water source for both the stock and camp. This population is holding on in an area that has been regularly grazed as part of this camp for at least 60 years. This area is in low to fair ecological condition given there is still adequate vegetative cover. However, the community composition appears to be altered compared to other similar sites and is now dominated by *Phleum alpinum* with an abundance of low growing forbs such as *Antennaria, Fragaria*, and *Potentilla* species.

The population is struggling and at risk of loss. Despite rarity of this species further south, it appears to be rather widespread throughout the Sheep Mountain and Spanish Camp areas. If this population were to be lost, it is not expected to diminish the viability of the species as a whole nor contribute to further listing of the species. Changing the use patterns with this campsite may only increase potential for additional trampling damage elsewhere that may prove more detrimental to overall resources in the long run. Given the close proximity (less than 100') to the tent site and corral and the decades of use this site has endured, altering use to allow recovery would not be practical without moving the camp altogether because this is also a high human traffic area. *Agroseris elata* is in a moist meadow to the north of camp. Stock travel through the area to and from night graze areas and do not appear to be disturbing this population in route. Other than a trail going through this area the site is not being grazed or disturbed.

- *Timberwolf 1*
  Timberwolf 1 camp is surrounded to the north and west by wet to mesic willow and sedge dominated meadows where the *C. heteroneura* var. *epapillosa* is located. These are the areas of concern. There is some evidence of stock use in the area from private parties, however, the campsite receives little use overall and the pasture area is 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*
  Horseshoe Basin and Horseshoe Creek campsites both support moist meadow habitats where *Carex heteroneura var. epapillosa* is suspected to occur. The species has not been confirmed within the 500' buffer area around these camps. Horseshoe Creek also includes emergent wetland habitat. It is unknown how much if any trampling, grazing, or human use may be altering the integrity of this wetland. At both sites, outfitters overnight with stock. Grazing behavior and preferences of stock in this area are likely similar to those seen in Spanish Camp. There is some potential for trampling herbaceous vegetation where stock graze, but given the resiliency of these types of sites, long-term ecological changes are not likely.

- *Fish Creek Base Camp*
  At Fish Creek Base Camp stock are kept in the corrals and feed is brought in on the barge. Stock are not turned out to graze and disturbance to Sensitive plant resources would be from trampling, mainly by humans. The population of *Githopsis speculariodes*

associated with this base camp has not been recently relocated and may be extirpated. The cause of this loss is unknown, but is not suspected to be associated with outfitter use but may have resulted from the 2001 Rex Creek fire which also destroyed the corrals.

- *Crow Lake*
  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 Larch (*Larix lyalii*) in the overstory with *Vaccinium scoparium* and *Luzula hitchockii* as the dominant understory species. Once out of the barren core area of camp, stock disperse well and the area as a whole is in fair ecological condition. A population of *Carexheteronuera var. epapillosa* was found in a narrow stringer meadow dominated by *Trollius* and *Caltha* within the area stock were grazing north of camp. This moist meadow was in good ecological condition. The area being grazed by stock showed minimal horse trampling in August when the inventory was made. This demonstrates resiliency of the moist forb meadow communities. This community shows only mild signs of reduction in cover of the key indicator species such as *Festuca viridula*, *Trollius laxus,* and *Caltha leptosepala*.

  The steep south slope facing into Gabril Creek is a *Festuca viridula* community in low to fair ecological condition. 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 Engelmann spruce (*Picea engelmannii*) below. These wetlands and spruce stands are in good ecological condition. The surrounding area showed only minor amounts of trampling damage to communities and most areas were in at least fair or good condition. This site location appears to be well suited for use as an outfitter camp (Kovalchik 2003).

- *Whistler Camp*
  Whistler Camp is often approved for extended use and is under consideration for designation as an assigned site. This was an old sheep camp during the height of the sheep grazing. The landscape is wide open and gentle. There are no known sensitive plant populations or wetlands within the 500' radius of camp. This camp was not inventoried as part of this project. Past records indicate overgrazing by sheep left the area in fair to low ecological condition because much of the dominant native species in the community have been replaced by short herbaceous species such as *Antenaria lanata* and *Potentilla*. A short tufted grass is the dominant grass species, but site records do not provide a species name. A better determination needs to be made as to the potential natural vegetation, grazing capacity, and potential resiliency to use in order to monitor recovery. Whistler Camp is in an area with low to moderate potential for post disturbance recovery. Dominance of *Vaccinium scoparium* 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. In any case, there is limited plant community information about this site to determine if the ecological condition is improving or being maintained with the current use. It is unlikely continued use as an outfitter camp will further deteriorate the ecological condition.

Natural Plant Succession

Pack and saddle stock can influence natural plant succession by physically damaging plants by trampling vegetation and grazing The Okanogan and Wenatchee Forest Plans both have standards and guidelines stating activities should not cause long-term modification of natural plant succession in wilderness. Current pack and saddle stock outfitter-guide activity is not causing long-term modification of any community. However, in isolated spots outfitter activities are slowing the rate of natural succession where current use overlaps areas where past livestock use modified natural communities.

Past livestock grazing resulted in changes in natural plant succession over much of the Pasayten and Lake Chelan-Sawtooth. 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 grazing and party size control allowed the areas to begin to recover. The overall ecological condition has been improving ever since. Continued pack and saddle stock use in popular areas has slowed the recovery on about 0.5% of the Pasayten, and 0.4% of the Lake Chelan-Sawtooth, but the trend is still upward. The existing use is consistent with Forest Plan standards and guidelines that speak to natural plant succession (refer to Wilderness Report and the Botanical Evaluation Report in the Analysis File for more details).

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. In most cases maximum vegetation loss was found to occur after the second season of use; loss was insignificant after the third season. However, at the lower trampling intensities (less than 100 passes/year) vegetation loss did not increase significantly after the first season. The cumulative 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 suggests that only under the lightest trampling intensities of use does annual or multi-year closure appear to be effective, since maximum vegetation loss is experienced so quickly. Under these conditions, this strategy will prevent further deterioration but does not provide adequate recovery between uses (Cole 1987).

The two primary plant communities associated with the majority of grazing throughout the analysis area are the Green Fescue (*Festuca viridula*) and Timber Oatgrass (*Danthonia intemedia*) 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 Oatgrass 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 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 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 over much of the analysis area was eliminated in the last 15 years. Even the most resilient sites likely have not yet fully recovered. The amount of stock grazing associated with the outfitters and private parties is localized to small areas relative to the extent of past livestock grazing. The end result is an overall improvement in the ecological condition of plant resources.

In the Pasayten, most of the disturbance associated with the grazing stock has to do with the stock traveling through wet areas to reach preferred grazing sites. Most of the grazing is occurring in Timber Oat grass (*Danthonia intermedia*), Green fescue (*Festuca viridula*) 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 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 (*Festuca viridula*) 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 (personal observation). The productive green fescue is being replaced by less palatable species such as pussy toes (*Antennaria*) and *Potentilla*.

Invasive Plant Species and Garden Weeds

Invasive plant species and garden weeds can also change native plant communities. Introduction and movement of invasive species transported in by animals is an existing concern. Refer to the Invasive Plant section of this document for more information. The following common garden weeds were detected in and around disturbed camp sites in the Sheep Mountain and Spanish Camp areas in the Pasayten Wilderness above 6000' elevation: *Chenopodium album* (lambsquarters), *Dactylis glomerata* (orchardgrass), *Descurainia species* (tansymustard), *Malva neglecta* (dwarf mallow), *Medicago lupulina* (black medic), *Plantago major* (common plantain), *Polygonum species* (knotweed) *Spergularia rubra* (red sandspurry), *Stellaria calycantha* (northern starwort), *Stellaria longipes* (longstalk starwort), and *Trifolium repens* (white clover). It appears these species are restricted to most hardened and disturbed sites but their persistence and potential for spread is not fully understood in high elevation environments.

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 5% reduction in the expected number of pack and saddle stock used across the area. The remaining pack and saddle stock 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. There would be no assigned sites. Inexperienced stock handlers and stock could result in greater resource damage to an area than would occur with a more experienced outfitter with stock.

Wetlands

Most of the existing campsites would continue to be used by private pack and saddle stock users. The current impacts to nearby wetlands would continue, but the overall 5% 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 may begin to recover. Approximately 1.4% of the wetland habitat would continue to be impacted. The remaining 98.6% of the wetlands would be unaffected.

Federally Listed and Sensitive Species

There are no Federally listed *Howellia aquatilis, Hackelia venusta*, *Sidalcea oregano var. calva,* or *Spiranthes diluvialis* populations known to occur in the analysis area. This alternative would have "no effect" on any of these species or their habitats.

Non-outfitted pack and saddle stock may 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 over lap habitat. Overall, there would be less risk of damage than is currently occurring due to the decreased numbers of animals. These associated camps and species are described in **Figure 3.3-2**. Those species that may be affected are: *Agoseris elata, Carex heteroneaura var. epapillosa, Carex magellanica ssp. irrigua, Gentiana glauca, Githopsis specularioides,* and *Salix tweedyi.*

Where *Agoseris elata, Carex heteroneura* var. *epapillosa*, and *Gentiana glauca* occur populations are widely dispersed but concentrated in a small geographical area. Loss of individuals, where camp use overlaps occupied habitat, would not likely result in a loss of population or species viability.

Carex magellanica ssp*. irrigua* and *Salix tweedyi* are riparian and wetland obligates. Where these species occur, use restrictions are in place regulating stock use in order to minimize disturbance in these habitats and species.

Githopsis specularioides is an early spring flowering annual that completes its life cycle before pack stock use occurs. Light use in and around these populations would not result in a loss of species or population viability.

Of the 54 Sensitive and other rare or little known species and their nearly 360 populations that occur within the analysis area, the risk to these species is low. Use associated with this alternative may result in the loss of some individuals but would not result in loss of species or population viability. This alternative 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 due to the reduced number of stock. Private stock users are less likely to turn their animals out to graze any distance from camp, which may result in smaller isolated grazing areas. 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. Since use patterns at these camps were established decades ago, often in association with past livestock grazing, much of the plant community alteration has already occurred. Plant communities would continue to recover throughout the analysis area and with reduced overall use, vegetation recovery would be expected around the camps as well.

The rate of recovery would be dependent on the soil condition and vegetative community involved. Where associated grazing is occurring in moist forb rich meadows, there is an increased risk of soil displacement or compaction. 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.

Wildfires are a natural part of the successional dynamics of plant communities, but when past livestock grazing and unregulated recreation use followed wildfire events, large scale landscape modification of the natural plant succession occurred. With establishment of Forest Plan use standards, landscapes began to recover when livestock grazing was regulated or eliminated and party sizes controlled. Forest Plan standards will continue to regulate activities that maintain or enhance plant community recovery.

Invasive Plants and Garden Weeds

The corrals at Andrews Creek, Billygoat, Slate Creek, and Crater Creek would no longer be used by outfitter-guides. Noxious weed establishment or spread is less likely to be detected as quickly, when it does occur. The risk of invasive species introduction would be slightly reduced by the reduced number of pack and saddle stock. The requirement for use of only certified weed-free hay or palletized feed in wilderness, wilderness trailheads, and across the analysis area in will further reduce the risk. This will minimize any possible effect on native plant communities.

Alternative 2

This alternative would allow outfitter guides to continue to provide service to the public that otherwise may not be able to access wilderness and backcountry resources. In Alternative 2 there will 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.c on page 2-8. There are no new campsites, trails, or other ground disturbing activities being proposed in this alternative.

This alternative would amend Forest Plans, allowing pack and saddle stock outfitter camps to have 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 mitigation measures in Chapter 2 would also restrict the outfitters from creating new travel routes (1.l), establishing new camps, increasing the amount of bare mineral soil in established camps (1.d), and not exposing roots on any more trees at existing campsites (1.e). These would be effective since they would be part of the operating plans for the outfitters, so compliance would be required.

The assigned sites would allow better opportunity to monitor and regulate outfitter activities in regularly used sites. These sites are nearly 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 nearly 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. 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.

Monitoring (see Chapter 2) of assigned sites as part of special use permit administration would ensure that use either maintains or increase 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.

Wetlands

The 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, resulting in vegetation trampling, selective grazing, and soil damage in approximately 1.4% of the wetland habitat in the analysis area. The remaining 98.6% of the wetlands would be unaffected.

Federally Listed and Sensitive Species

There are no Federally listed *Howellia aquatilis, Hackelia venusta*, *Sidalcea oregano var. calva,* or *Spiranthes diluvialis* populations known to occur within the analysis area. This alternative would have “no effect” on any of these listed species or their habitats.

Outfitter pack and saddle stock may 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. 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. 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. Specifically, measures included in numbers 3, 5, and 8, beginning on page 2-10, would mitigate potential effects to sensitive

species and wetland habitat. 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: *Agoseris elata, Carex atrosquama, Carex heteroneaura (C. epapillosa),* and *Gentiana glauca*; Beaver Creek: *Agoseris elata, Carex heteroneaura (C. epapillosa),* and *Gentiana glauca*; Sheep Mountain: *Agoseris elata* and *Carex heteroneaura (C. epapillosa)*; Horseshoe Basin: *Carex heteroneaura (C. epapillosa)*; Horseshoe Creek: *Carex heteroneaura (C. epapillosa)*; and Fish Creek Base Camp: *Githopsis specularioides*.

Where *Agoseris elata, Carex heteroneura* var. *epapillosa*, and *Gentiana glauca* occur populations are widely dispersed but concentrated in a small geographical area. Loss of individuals, where camp use overlaps occupied habitat, would not likely result in a loss of population or species viability.

Carex magellanica ssp*. irrigua* and *Salix tweedyi* are riparian and wetland obligates. Where these species occur, use restrictions are in place regulating stock use in order to minimize disturbance in these sensitive wetland habitats and any sensitive species would also benefit from these use restrictions.

Githopsis specularioides is an early spring flowering annual that completes its life cycle before pack stock use occurs. Light use in and around these populations would not result in a loss of species or population viability.

Of the 54 Sensitive and other rare or little known species and their nearly 360 populations that occur within the analysis area, the risk to these species is very low. Use associated with either alternative 2 or 3 may result in the loss of some individuals but would not result in loss of species or population viability. Alternative 2 and 3 would not result in a trend toward further listing of any species considered.

Natural Plant Succession

There would be approximately 1% more pack and saddle stock in the analysis area with this alternative. Even with this increase, there would be less overall grazing pressure across the landscape on plant communities due to the reduced number of stock using the area, compared to historic livestock use. 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. The mitigation measures included in #4 on page 2-11 would limit party sizes to help reduce impacts from grazing.

The rate of recovery would be dependent on the soil condition and vegetative community involved. Where associated grazing is occurring in moist forb rich meadows, there is an increased risk of soil displacement or compaction. 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 would 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 would not affect the overall recovery rate.

Wildfires are a natural part of the successional dynamics of the plant communities, but when past livestock grazing and unregulated recreation use followed wildfire events, large scale landscape modification of the natural plant succession occurred. With Forest Plan standards, landscapes began to recover when livestock grazing was regulated or eliminated and party sizes controlled. Forest Plan use standards will continue to regulate activities that maintain or enhance plant community 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.

Invasive Species and Garden Weeds

The risk of invasive species introduction would remain, even though the outfitters would be restricted to feeding only certified weed-free hay at wilderness trailheads and across the analysis area. Mitigation measure 8.d on page 2-13 would require outfitters to notify the Forest Service if invasive species are observed. This would improve the chances that the weed populations or individuals could be treated soon after establishment, controlled, or locally eradicated. This would minimize any possible effect on native plant communities.

Alternative 3

In Alternative 3, the number of service days would be reduced 2,660. There are no new campsites, trails, or other ground disturbing activities being proposed in this alternative, and no additional assigned sites would be designated. The four backcountry assigned sites at Bald Mountain, Sheep Mountain, Crow Lake, and Beaver Creek, in addition to the assigned base camps at the Andrews Creek, Billygoat, Slate Creek, Fish Creek, and Crater Creek trailheads would be retained.

This alternative would amend the Okanogan and Wenatchee Forest Plan standards and guidelines in wilderness, allowing pack and saddle stock outfitter-guide camps to have 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. The plan would also be amended to reduce party size for pack and saddle stock outfitter-guides to 12 heartbeats. Mitigation measures would also restrict the outfitter-guides from creating new travel routes, establishing new camps, increasing the amount of bare mineral soil in established camps, and exposing roots on any trees at existing campsites, as described above, in the discussion of Alternative 2.

Assigned sites would not be open to public use to allow better monitoring of resource use. These sites would continue to receive the highest levels of use of nearly 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. At all other camps used by outfitter-guides, the amount of barren core the outfitters could use would be limited to 2,800 square feet, but continued use by the general public would likely perpetuate the existing amount of barren core.

The smaller party size could result in outfitters needing to make multiple trips to a site to meet client expectations. This could increase stock use over a season because the number of animals needed for two trips may be more than if one trip were possible. 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.

There would be approximately 3% fewer pack and saddle stock in the analysis area compared to the existing condition. Campsite use would remain the same compared with Alternative 2. Since there are no proposed changes in campsite use, there is not expected to be any difference in vegetative recovery compared with Alternative 2.

Wetlands

The 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, resulting in vegetation trampling, selective grazing, and soil damage in approximately 1.4% of the wetland habitat in the analysis area. The remaining 98.6% of the wetlands would be unaffected.

Federally Listed and Sensitive Species

There are no Federally listed *Howellia aquatilis, Hackelia venusta*, *Sidalcea oregano var. calva,* or *Spiranthes diluvialis* populations known to occur within the analysis area. This alternative would have "no effect" on any of these listed species or their habitats. Outfitter pack and saddle stock may 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. Currently, there is less risk of population loss compared to the past 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 would further ensure species viability is not compromised across the analysis area. Specifically, measures included in numbers 3, 5, and 8, beginning on page 2-10, would mitigate potential effects to sensitive species and wetland habitat. 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: *Agoseris elata, Carex heteroneaura var. epapillosa,* and *Gentiana glauca*; Beaver Creek: *Agoseris elata, Carex heteroneaura var. epapillosa,* and *Gentiana glauca*; Sheep Mountain: *Agoseris elata* and *Carex heteroneaura var.epapillosa* Horseshoe Basin: *Carex heteroneaura var.. epapillosa*; Horseshoe Creek: *Carex heteroneaura var. epapillosa*; and Fish Creek Base Camp: *Githopsis specularioides*.

Where *Agoseris elata, Carex heteroneura* var. *epapillosa*, and *Gentiana glauca* occur populations are widely dispersed but concentrated in a small geographical area. Loss of individuals, where camp use overlaps occupied habitat, would not likely result in a loss of population or species viability.

Carex magellanica ssp*. irrigua* and *Salix tweedyi* are riparian and wetland obligates. Where these species occur, use restrictions are in place regulating stock use in order to minimize disturbance in these sensitive wetland habitats and any sensitive species would also benefit from these use restrictions.

Githopsis specularioides is an early spring flowering annual that completes its life cycle before pack stock use occurs. Light use in and around these populations would not result in a loss of species or population viability.

Of the 54 Sensitive and other rare or little known species and their nearly 360 populations that occur within the analysis area, the risk to these species is very low. Use associated with either alternative 2 or 3 may result in the loss of some individuals but would not result in loss of species or population viability. Alternative 2 and 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 due to the reduced number of stock. Private stock users are less likely to turn their animals out to graze any distance from camp, which may result in smaller isolated grazing areas. 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. Since use patterns at these camps were established decades ago, often in association with past livestock grazing, much of the plant community alteration has already occurred. Plant communities would continue to recover throughout the analysis area and with reduced overall use, vegetation recovery would be expected around the camps as well. The mitigation measures included in #4 on page 2-11 would limit party sizes to help reduce impacts from grazing.

The rate of recovery would be dependent on the soil condition and vegetative community involved. Where associated grazing is occurring in moist forb rich meadows, there is an increased risk of soil displacement or compaction. 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 would 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 would not affect the overall recovery rate.

Wildfires are a natural part of the successional dynamics of the plant communities. But when past livestock grazing and unregulated recreation use followed wildfire events, large scale landscape modification of the natural plant succession occurred. With establishment of Forest Plan use standards, landscapes began to recover when livestock grazing was regulated or eliminated and party sizes controlled. Forest Plan use standards will continue to regulate activities that maintain or enhance plant community recovery. Outfitter pack and saddle stock grazing in and around campsites would not result in further landscape modification of natural plant succession due to limited amount of area where the animals graze and the very small number of animals compared to past use.

Invasive Species and Garden Weeds

The risk of invasive species introduction would remain, even though the outfitter-guides would be restricted to feeding only certified weed-free hay across the analysis area. Mitigation measure number 8.d would require outfitters to notify the Forest Service if invasive species are observed. This would improve the chances that weed populations or individuals could be treated soon after establishment, controlled, or locally eradicated. This would minimize any possible effect on native plant communities.

Cumulative Effects

The spatial boundary for this cumulative effects analysis is the analysis area boundary. The temporal boundary is from the early 1900s through 2020, when the 10-year permits would expire.

Past, Present, and Reasonably Foreseeable Future Actions

Past activities that have altered vegetation characteristics within the analysis area have mainly been associated with past livestock grazing and fire. Historical fire years that resulted in large fires over more than one subunit were between 1917 and 1919, 1926, and then again in 1929. Other active fire years prior to 2000 were 1970 for the Chelan side of the Sawtooth Backcountry and in 1985 the largest fire recorded in the Lake Chelan-Sawtooth Wilderness occurred. In all but two of the subunits (Sawtooth Backcountry and Middle Methow) over ½ the total acres burned have burned since 2000 (**Figure 3.3-2**). This fire history supports the fact smoke jumpers became very efficient at fire suppression starting in the 1940's. Fire size trends fell dramatically after smoke jumpers could quickly access the backcountry. The dramatic jump in fire size and acres burnt since 2000 is likely the combined effect of past fire suppression, significant drought years, and an overall drying and warming climate trend.

In the 2001 Rex Creek fire, along the north shore of Lake Chelan, 10 campsites were identified within the fire perimeter that were within the lake Chelan-Sawtooth Wilderness. One of these sites, Fish Creek Base Camp had a known population of *Githopsis specularioide*. This population has not been relocated since before the fire. 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. Drop Camp C had a known population of *Salix tweedyi* nearby. This plant grows in wet riparian and shrub wetland habitats, which rarely experiences high intensity burns resulting in rapid recovery of these ecosystems following fire. This species and the habitat where it grows were likely stimulated by the fire. The fires in 2006 burned over three campsites within the Pasayten Wilderness subunit. One, Horseshoe Creek camp, has suitable habitat for *Carex heteroneura* var. *epappilosa*. 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 3.3-2: 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

In the late 1800's large bands of sheep first were first introduced into both the Sawtooth and Pasayten Wilderness high country, Sawtooth Backcountry, up the Methow Drainage and into the Harts Pass area. 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. Over grazing shifted from bedding areas associated with sheep grazing to increased use in riparian areas with cattle. During this shift from sheep to cattle was when it became evident through much of the analysis area that overgrazing was occurring. These peak grazing years also correspond to some of the largest fire years and the evolution of smoke jumping. Grazing practices likely delayed plant recovery in these fire areas since there were few grazing utilization standards in place.

The North Cascades subunit supports some of the wettest plant associations within the analysis area and rarely ever burned over the last century until the 2003 Farewell/Needles fire. The area was basically inaccessible until the1970's when the North Cascade highway was built making access for fire suppression and for recreation use nearly impossible. But even prior to the opening of the highway, it was not grazed because it did not have the high elevation open forage base desirable to livestock operators.

Bear/Ramsey/Volstead subunit was grazed primarily by cattle and horses and was not part of the main grazing destination driveways used to access the high elevation sheep summer pastures. Cattle grazing is still permitted in the Ramsey/Bear/Volsead area and will continue into the future. During the 2006 Tripod fire, 67% of this subunit burned over. The established outfitter camp escaped this fire event.

Over the next ten years, if global temperatures continue to warm, *Gentiana glauca* 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. This species is a key stone indicator for monitoring the health of other northern species at the southern extent of their range.

Cattle 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.

Much of the most popular recreational outfitter use in the Pasayten and Lake Chelan-Sawtooth Wilderness areas and Sawtooth Backcountry were likely established over 60 years ago. Previous to that outfitter use likely focused on supplying the mining camps. Other past activities such as the construction of the North Cascade Highway, backcountry trail construction, and recreational facility development have increased ease of access into the backcountry throughout the analysis area.

In 2008 the Regional Office funded a taxonomic study of *Carex epapillosa*. Over 40 vouchered specimens were examined by taxa experts and they concluded that all the vouchers examined, including those previously examined and thought to be *Carex atrosquama*, were *Carex heteroneura* var. *epapillosa*. The results of this study also provided enough documentation to return this species to the Region 6 Sensitive species list during the next revision cycle.

Alternatives 1, 2, and 3

The cumulative effect of large fire years combined with the high density of livestock grazing in these areas likely modified the natural plant succession across much of the analysis area, especially in the Pasayten and Lake Chelan-Sawtooth. Grazing was eliminated in the high country by 1990. 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 practices and not the result of pack and saddle stock outfitter-guide or private party stock use. Current stock use 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.

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 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 have the most campsites that will likely exhibit the longest recovery period due to drier conditions.

With the expected increase in recreational use over the next 10 years, there could be increased impacts to vegetation. With more visitors, there will be an increased likelihood of ground disturbance and with it an increased risk for introduction and spread of invasive species. Having well-educated outfitters, wilderness rangers, and visiting public will help with any early detection and treatment of establishing invasive species. The off-road vehicle use that is permitted in the Sawtooth Backcountry (Methow and Chelan) also increases the risk of invasive transport.

In the Bear/Ramsey/Volstead sub-section vegetation recovery will depend on the severity of the burn, and the timing and duration of permitted cattle grazing. The limited, late season use by outfitters in this area occurs after the cattle have been gathered in the fall. The season of use also coincides with vegetation senescence when plant communities are best able to withstand

grazing. There is no anticipated effect to plant resources as a result of continued outfitter use now or in the future in the fire area in Bear/Ramsey/Volstead.

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 a slower recovery due to continuation of 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. The alternatives would reduce the potential loss of individual plants and population viability, and would not contribute to a trend towards Threatened or Endangered or Federal listing of any TES species, rare or uncommon or other species of concern 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). 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, and 2,800 square feet in Alternative 3. Additional party size restrictions apply to Alternative 3. Mitigation measures in both alternatives would prohibit outfitters from creating new travel routes (1.l), establishing new camps (1.f), increasing the amount of bare mineral soil in any established camp (1.d), and not exposing roots on trees at existing camps (1.e). These would be effective in ensuring that outfitter activities are consistent with Forest Plan.

3.4 TERRESTRIAL WILDLIFE

The section below is a summary of the Wildlife Report and Biological Assessment which are available in the project analysis file (Rohrer 2010a and Rohrer 2008). 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

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. Both of the Forest Plans have standards and guidelines for maintaining minimal levels of dead and defective trees and downed logs.

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. 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 wood is collected from further distances and the evidence of years of snag-felling is apparent from the number of sawed stumps and branches.

There are 148 campsites that have been used in the recent past by outfitter-guides. If, at each camp, most snags have been removed from an area within a 300 foot radius of the camp (6 acres), then 888 acres of the analysis area have been impacted by past use. **Figure 3.4-1** shows number of outfitter camps and estimated percent of area impacted by firewood collection by administrative area:

Figure 3.4-1. Percent of Area Impacted by Outfitter-Guide Camps.

Sub-Area	Acres	Outfitter Camps	Area Impacted
Pasayten Wilderness	531,541	67	0.07%
Lake Chelan-Sawtooth Wilderness	153,129	51	0.2%
North Cascades	270,435	16	0.03%
Sawtooth Backcountry	35,149	13	0.2%
Middle Methow	50,550	0	0
Bear/Ramsey/Volstead	58,114	1	0.01%
Alta Lake	3958	0	0
Total	**1,102,876**	**148**	**0.08%**

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.

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 43,465 pack and saddle stock visitor days in the analysis area (all non-outfitted), which would be 5% less than the existing number. Less than one tenth of 1% of the

analysis area has been affected by past snag-felling for firewood. There would be some 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 2

In addition to the public, outfitter-guides and clients would use camps and collect firewood from surrounding areas. There would be no change in the current amount of pack and saddle stock outfitter-guide visitor days in the analysis area. The total number of pack and saddle stock visitor days would be 46,473, with 4,620 of those associated with the outfitter-guides. 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 proposal includes mitigation measures that would prohibit outfitter-guides from establishing new camps (1.f) and not allow cutting snags for firewood (1.h). 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. 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

In addition to the public, outfitter-guides and clients would use camps and collect firewood from surrounding areas. The number of pack and saddle stock visitor days would be reduced by 3% from current levels. 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 proposal includes mitigation measures that would prohibit outfitter-guides from establishing new camps (1.f) and not allow cutting snags for firewood (1.h). 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. 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.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, 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. The use of snags and downed logs for camp firewood has already been evaluated. 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 plan. Prescribed fires can remove some existing snags while creating new ones.

Present Actions

Present activities in the analysis area that may affect primary cavity excavators include snag-felling for camp firewood by outfitted users, those described in this document as well as others, and by private, non-outfitted users. In the Bear/Ramsey/Volstead area, snag-felling for firewood 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, with the exception of snag-felling by outfitter-guides. This proposal includes mitigation that prohibits snag-felling by outfitter-guides. Use of the analysis area, especially the North Cascades Highway Corridor, by private recreationists is predicted to increase in the future.

Alternatives 1, 2, and 3

When considered in conjunction with other activities affecting dead and defective tree habitat, each of the three alternatives would have little cumulative effect on primary cavity excavators. Snags would continue to diminish around camps, but abundant habitat would exist away from these sites, so primary cavity excavator populations as a whole would be largely unaffected.

Consistency Statement

Each of the three alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plan guidelines for primary cavity excavators.

Marten, Pileated Woodpecker, Three-toed Woodpecker, and Barred Owl

Regulatory Framework

The Okanogan Forest Plan identifies the American marten, pileated woodpecker, three-toed woodpecker, 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 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. 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.

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. The barred owl is a management indicator species for mixed conifer old growth and mature habitats.

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 fire 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 Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

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.

Consistency Statement

Each of the three alternatives considered in this project would be consistent with the Okanogan Forest Plan and the Wenatchee Forest Plan (as amended by the Northwest Forest Plan) 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 PACFISH which includes riparian management objectives.

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.

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 deciduous and riparian habitat occurring in natural conditions. Some of the deciduous and riparian habitat in the Bear/Ramsey/Volstead area has been altered by timber management activities and road construction. 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.

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 grazed by domestic sheep in the early 1900s. From 1995 to present, domestic livestock grazing in this area has been limited to that of recreational users and 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 C**.

Many outfitter-guide camps are located near high elevation meadows and wetlands; 59 of the 148 outfitter-guide camps within the analysis area are within 500 feet of a wetland. The abundant grasses and forbs 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, it was found 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. 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 provided both food and cover. Amphibian larvae were 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 43,465 pack and saddle stock visitor days, which would be 5% 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 2

Outfitter-guides and livestock would continue to use trails and camps and impact nearby riparian areas. There would be a total of 46,473 pack and saddle stock visitor days in the analysis area, and 4,620, or 10% would be associated with outfitter-guides. 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 a Forest Plan amendment that would limit the amount of barren core in campsites used by the outfitter-guides to 5,250 square feet, and not allow outfitters to increase the size of campsites with barren cores smaller than 5,250 square feet. This would allow some of the established barren core to recover. This proposal includes mitigation to prohibit outfitter-guides from establishing new camps and new travel routes, and mitigation that would not allow outfitter-guides to graze stock animals within 200 feet of lake shores. 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 3

Outfitter-guides and livestock would use trails and camps and impact nearby riparian areas. The number of pack and saddle stock visitor days would be reduced by 3% from current levels. 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. This reduced impact area 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 prohibit outfitter-guides from establishing new camps and creating new travel routes, and mitigation that would not allow outfitter-guides to graze stock animals within 200 feet of lake shorelines. 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.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

<u>Past, Present, Reasonably Foreseeable Future Actions</u>

Other activities in the analysis area that would affect deciduous and riparian habitat include 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. Parts of the Newby C & H, Little Bridge C & H, Libby C & H, and Hunter McFarland C & H allotments are in the Middle 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 and 3

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. 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 Statement

Each of the three alternatives considered in this project would be consistent with the Okanogan and Wenatchee Forest Plans for managing riparian habitats.

Mule Deer

Regulatory Framework

The Okanogan and Wenatchee Forest Plans both identify mule deer and white-tailed deer as management indicator species for winter range. Both plans have standards and guidelines for managing cover levels on winter ranges.

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.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The proposed outfitter-guide activities take place primarily in habitats used by mule deer during summer. Those activities that would occur on winter range in Bear/Ramsey/Volstead or Alta Lake would occur during summer and fall.

Some outfitter-guides have placed salt blocks at camps for livestock and also for mule deer. They believe that having salt available will keep 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 (see discussion above in Primary Cavity Excavators on number of camps). The proposed action has mitigation to prohibit establishing new camps, prohibit feeding wildlife, require storage of food in a manner that makes it unavailable to wildlife, and require salt to be applied in such a manner to minimize wildlife attraction.

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

The outfitter-guide activities proposed in each of the alternatives would have no effect on mule and white-tailed deer winter range. 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 size or health of mule and white-tailed deer populations.

Consistency Statement

Each of the three 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.

Mountain Goat

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.

Affected Environment

Mountain goats use cliffy 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. 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. An example in the Spanish Camp area of the Pasayten Wilderness is Sheep Mountain, which was grazed by two bands of sheep. Bald Mountain, Beaver Creek, and Bob Creek were each grazed by one band. A band of sheep includes 1,200 to 2,000 ewes plus lambs.

Sheep grazed the area from 1908 to 1948 and cattle from 1949 to 1994. In 1949 the cattle permit was for 350 yearling steers from July 15 to September 15 in the Bald Mountain, Beaver Creek, Bob Creek, Remmel Lake area. The allotment later expanded to include other areas, and the permit changed to 300 cow/calf pairs. The allotment has not been used since 1995 and in 1999 the grazing permit was waived back to the Forest Service. 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 (1994) 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 on these small meadows too long. The proposed action includes mitigation measures designed to reduce the grazing impact of outfitter-guide stock animals (Chapter 2). The measures listed in number 3 beginning on page 2-10 would be effective in mitigating potential effects since they would be part of the outfitter's operating plans. Compliance would be required by the special use permit.

Some wildlife species would likely not find suitable forage or cover at overused sites. However, outside of localized sites the majority of these habitats receive little, if any, 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, it was found that the existing amount of recreational grazing use was, with a few notable exceptions, not significantly 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 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.

Environmental Consequences

Direct and Indirect Effects

Alternative 1

Outfitter-guide stock would not graze in the analysis area. Use would continue by public stock users. The meadows around existing camp sites would likely continue to be used, but by fewer stock than in the past. There would be 43,465 pack and saddle stock visitor days in the analysis, which would be 5% lower than the current level. This alternative would result in a slight 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. Abundant habitat for mountain goats and other meadow-dependent wildlife away from these recreation sites, so ruffed grouse and beaver populations as a whole would be largely unaffected.

Alternative 2

Outfitter-guide livestock would continue to graze meadows near camp sites in the analysis area. There would be a total of 46,473 pack and saddle stock visitor days in the analysis area, and 4,620, or 10% would be associated with the outfitter-guides. The Forest Plan amendment and mitigation for this alternative to reduce barren core 5,250 square feet would reduce impacts compared to existing conditions. 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. Areas would be temporarily closed to grazing if needed. The amount of outfitter-guide use proposed in Alternative 2 would not significantly 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-dependant wildlife away from these recreation sites, so populations as a whole would be largely unaffected.

Alternative 3

Outfitter-guide stock would continue to graze meadows near camp sites in the analysis area. The number of pack and saddle stock visitor days would be reduced to 44,533 or a 3% reduction from current levels. The Forest Plan amendment and mitigation for this alternative to reduce barren core 2,800 square feet and reduction of party size to 12 heartbeats 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. Abundant habitat for mountain goats and other meadow-dependant wildlife away from these recreation sites is available, so these species as a whole would be largely unaffected.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Past Actions

Past activities in the analysis area that would affect meadow habitats include grazing by outfitter-guide livestock, grazing by general public stock, commercial livestock grazing, and wildfire suppression. Past recreational livestock use has been less than or equal to the present levels, however the lack of party size limitations resulted in some larger parties than have occurred since the Forest Plans were adopted. Historic grazing by sheep and cattle has been discussed. 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 would affect meadow habitats include grazing by outfitter-guide livestock, grazing by general public stock, commercial livestock grazing, and wildfire suppression. There are several active, commercial 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. Parts of the Newby C & H, Little Bridge C & H, Libby C & H, and Hunter McFarland C & H allotments are in the Middle 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 the current annual growth of grasses/forbs. Managing wildfire for resource benefits is now an option in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas. 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, and 3

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. Abundant habitat for mountain goats and other meadow-dependant wildlife away from these sites, so populations as a whole would be largely unaffected.

Consistency Statement

Each of the three alternatives considered in this project would be consistent with the Wenatchee Forest Plan for managing mountain goat habitats.

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 Highway 2) will be managed for mule deer (Wenatchee Forest Plan IV-114). 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 Statement

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 this document is to be considered in all Region 6 Forest Service actions. In addition, Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires proposed federal actions to be evaluated for effects on migratory birds. Landbird habitats that may be impacted by outfitter-guide activities are snags, meadows, and wetlands. The impacts to these habitats are addressed above in Primary Cavity Excavators, Ruffed Grouse and Beaver, and Mountain Goat sections.

Consistency Statement

Each of the three alternatives considered in this project would be consistent with the Landbird Strategic Plan and with Executive Order 13186. 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 the area (less than 0.5%), 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 includes designation of late-successional reserves (LSR) and standards and guidelines for their management.

Affected Environment

There are 210,025 acres 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, and 3

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.

Consistency Statement

All alternatives would be consistent with the standards and guidelines for LSRs in the amended Forest Plans.

ENDANGERED, THREATENED AND SENSITIVE SPECIES

The following list of endangered, threatened and sensitive wildlife species are known or suspected to occur in the analysis area.

Endangered or Threatened

gray wolf
grizzly bear
lynx
northern spotted owl

Designated Critical Habitat: northern spotted owl

Sensitive

California mtn. kingsnake
Columbian sharp-tailed grouse
common loon
eared grebe
ferruginous hawk
fisher
gray flycatcher
great gray owl
northwestern pond turtle
Pacific fringe-tailed bat
peregrine falcon
sandhill crane
sharptail snake
striped whipsnake
Townsend's big-eared bat
upland sandpiper
Western gray squirrel
wolverine

Endangered or Threatened

Gray Wolf

Regulatory Framework

Management guidance for gray wolves and their habitat is 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. There is no recovery plan for wolves in the state of Washington.

Affected Environment

Wolves are wide-ranging predators that utilize a wide variety of habitat types. To successfully inhabit an area they require a prey base of wild ungulates and freedom from persecution by humans (Fritts and Carbyn 1995). Gray wolves are known to occur on the Methow Valley District. In July 2008, 2 adult gray wolves were captured and radio-collared in the Lower Methow watershed. They were part of a group of wolves that were named the Lookout Pack. In addition, there have been credible but unconfirmed sightings in the analysis area for the last 20 years. Mule deer are likely the main prey item for wolves in the analysis area since they are by far the most abundant ungulate. Moose, mountain goats, beavers, marmots, and other small mammals are probably preyed on also.

Gray wolves establish natal dens in late spring and use them for about two months. They then may move pups to one or more rendezvous sites and use them throughout the summer. Sensitivity to den site disturbance varies greatly among individual wolves (Joslin and Youmans 1999). It is suspected that wolves colonizing a new area are more sensitive than those that belong to established packs that have inhabited an area for a few years or longer. 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 suspected den site for the Lookout Pack and one of it's rendezvous sites is outside the analysis area.

Hunter misidentification of wolves as coyotes is not known to have happened in the North Cascades, but it is a possibility. If it were to occur it would most likely happen during big game hunting seasons in the fall. 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.

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.

Direct and Indirect Effects

Alternative 1

There would be no stock-based outfitter-guide activities occurring in the analysis area. There would be a total of 219,441 visitor days in the analysis are, with 43,465 being pack and saddle stock. This would be an overall reduction of 1% from current levels, and a 5% reduction in pack and saddle stock visitor days. Alternative 1 would have "no effect" on the gray wolf.

Alternative 2

There would 46,473 pack and saddle stock visitor days in the analysis area; 4,620, or 10% of these would be associated with the outfitter-guides. The total number of all visitor days would be 222,429. 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 a Forest Plan amendment that would limit barren core and mitigation measures that prohibit outfitter-guides from establishing new camps (1.f) and from creating new travel routes (1.l). The potential for disturbance to den or rendezvous sites would be low. To reduce the possibility of species misidentification, this alternative includes mitigation that would require the outfitter-guides to make clients aware of this issue and the consequences of shooting a wolf. This mitigation measure, number 6.b would be effective since it would be part of the operation plans, with compliance required by the special use permit. Alternative 2 "may effect, but would not likely adversely affect" the gray wolf.

Alternative 3

With implementation of this alternative, the total number of visitor days in the analysis area would be reduced to 220,489 – a 1% reduction from current levels. There would be 44,533 pack and saddle stock visitor days in the analysis area. This would be a 3% reduction of the current number. 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 a Forest Plan amendment that would limit barren core and mitigation measures that prohibit outfitter-guides from establishing new camps (1.f) and from creating new travel routes (1.l). The potential for disturbance to den or rendezvous sites would be low. To reduce the possibility of species misidentification, this alternative includes mitigation that would require the outfitter-guides to make clients aware of this issue and the consequences of shooting a wolf. This mitigation measure, number 6.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.

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 2020, when the 10 year permits would expire.

Past Actions
Past actions that may have affected gray wolves in the analysis area include shooting, trapping, or poisoning individual wolves, and human disturbance to a natal den or rendezvous sites.

Present and Foreseeable Future Actions
Present actions that may affect gray wolves in the analysis area include human disturbance to natal den or rendezvous sites and accidental or intentional shooting.

Alternative 1

Alternative 1 and all past, present, and reasonably foreseeable future actions would have no cumulative effect on gray wolf.

Alternatives 2 and 3

When considered in conjunction with other activities affecting gray wolves, both Alternative 2 and 3 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. There are no known wolf den sites in the analysis area. If a wolf was discovered appropriate actions would be taken in consultation with other wildlife agencies.

Consistency Statement

Each of the three 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.

Grizzly Bear

Regulatory Framework

Management guidance for grizzly bears and their habitat is in Forest Service Manual 2670 (USDA Forest Service 2005b) and 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 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) includes specific guidelines for managing grizzly bears and their habitat.

Affected Environment

The analysis area is within the North Cascades Grizzly Bear Recovery Zone. The number of grizzly bears in the 2,620,775 hectare 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.

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). The current outfitter-guide activities do not occur during the bear denning season.

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 big game hunting seasons in the fall. Several of existing 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 while on the forests.

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 outfitter-guide activities occur outside the den 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 and 3

Neither Alternative 2 nor Alternative 3 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 and Mountain Goat section above for effects to high elevation meadows). 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 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.

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 listed under #2, page 2-10). The potential for a bear getting into a backcountry camp and becoming food conditioned would be mitigated with the proper storage requirement. Alternatives 2 and 3 "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. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

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 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 or high use trail. **Figure 3.4-2** 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 per cent of the camps are in BMUs with an otherwise low level of human influence.

Figure 3.4-2. Number of Camps in Grizzly Bear Core Area, by BMU.

Bear Management Unit	Acres	% Core Area		# of Camps
		Early	Mid/Late	
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, 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.

Alternatives 2 and 3

Alternatives 2 and 3 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. Shooting and trapping grizzly bears is illegal in Washington. 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 Statement

Each of the three 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.

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. The Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) includes specific guidelines for managing lynx and their habitat.

Affected Environment

Lynx are known to occur on the Methow Valley and Chelan Ranger Districts. Lynx inhabit mesic, 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. Effects of human disturbance to lynx has not been studied and is 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).

Environmental Consequences

The potential effects of the proposed activities on lynx are the possibility of an outfitter-guide client accidentally or intentionally shooting a lynx. 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. If it 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.

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 lynx.

Alternatives 2 and 3

Neither Alternative 2 nor 3 would result in any structural habitat modifications or increases in motorized access. There would be no increase in groomed, over-the-snow routes. Neither alternative 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. These alternatives would be consistent with the Lynx Conservation Assessment and Strategy. Alternatives 2 and 3 "may effect, but would not likely adversely affect" 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 2020, when the 10 year permits would expire.

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. Timber sale activities in lynx habitat have removed security cover for lynx and temporarily reduced snowshoe hare habitat. 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 regulated by 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. Present and future management activities are regulated by 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.

Alternatives 2 and 3

When considered in conjunction with other activities affecting lynx and their habitat, Alternatives 2, and 3 may affect, but would not likely adversely affect lynx.

Consistency Statement

Each of the three 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.

Critical Habitat-Lynx

Some of the proposed outfitter-guide activities would occur in critical habitat for lynx. The activities proposed in the three 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, and 3

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 three 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 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 includes specific guidelines for managing northern spotted owls and their habitat.

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. The northern spotted owls in this area typically begin nesting in late March and young owls leave the nest by mid June.

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 outfitters are likely to be active during the spotted owl nesting period. 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 not in suitable habitat.

Direct and Indirect Effects

Alternative 1

This alternative would have “no effect” on northern spotted owls.

Alternatives 2 and 3

These alternatives would not alter any vegetation and thus would have no effect on suitable owl habitat or on owl prey species. It is possible, but improbable, that some of the permitted activity could disturb a nesting pair of northern spotted owls. These two alternatives "may effect, but would not likely adversely affect" the northern spotted owl.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Other activities in the analysis area that affect northern spotted owls include disturbance to a nesting pair by recreationists or management activities and habitat loss from timber management activities.

Alternative 1

This alternative would have no cumulative effect on northern spotted owls.

Alternatives 2 and 3

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 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 Statement

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 three 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.

Affected Environment & Environmental Consequences

The proposed outfitter activities would not occur in or adjacent to habitat for California mountain kingsnake, Columbian sharp-tailed grouse, eared grebe, ferruginous hawk, northwestern pond turtle, sandhill crane, and upland sandpiper. 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 three alternatives of the proposed project would have “no impact” on any of these sensitive species. The proposed outfitter-guide activities could occur in areas inhabited by bald eagles, common loons, fisher, great gray owl, gray flycatcher, Pacific fringe-tailed bat, peregrine falcons, sharptail snake, striped whipsnake, Townsend’s big-eared bat, western gray squirrel, and wolverines. Since there would be no direct or indirect effects, there would be no cumulative effects.

Bald Eagle

Affected Environment

Bald eagles are known to occur in the Methow Valley. 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.

There are no known or suspected bald eagle nesting or roosting sites on Forest Service lands in the Methow Valley. 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 Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

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. 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 Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

All three 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

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 on both Districts. However, based on lack of recent confirmed sightings, the fisher is considered extirpated or reduced to scattered individuals in the State of Washington (USDI Fish and Wildlife Service 2004).

Fishers historically occurred on both sides of the Washington Cascades in low to mid elevation forests (USDI Fish and Wildlife Service 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 suitable for fisher habitat occur throughout 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. 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.

Environmental Consequences

Direct and Indirect Effects

Alternatives 1, 2, and 3

There would be no significant reduction of mature or old growth habitats under any of the three alternatives. Each of the three alternatives would have "no impact" on fishers.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Past actions that may have affected fishers include shooting/trapping/poisoning of individual fisher and timber management. Some forest management activities reduce habitat for fisher. Present and reasonably foreseeable future actions in the analysis area that may affect fisher include accidental shooting or trapping and timber management activities.

Alternative 1

This alternative would have no cumulative effect on the fisher.

Alternatives 2 and 3

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. Timber and other Forest Service permitted management activities are now planned and implemented to avoid or minimize and mitigate impacts to fisher.

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 Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

These three 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 do not alter 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.

Environmental Consequences

Direct and Indirect Effects

It is possible that livestock grazing activities conducted by outfitter-guides or their clients near camps could reduce habitat suitability for great gray owl prey species. 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).

Alternative 1

This alternative would have "no impact" on the great gray owl.

Alternatives 2 and 3

Alternatives 2 and 3 "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 Methow Watershed. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

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 impacted great gray owls by reducing habitat for the voles and pocket gophers they prey upon (see Mountain Goats above). 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 and timber management actions.

Alternative 1

This alternative would have no cumulative effect on the great gray owl.

Alternatives 2 and 3

When considered in conjunction with other past, present, and reasonably foreseeable future actions, these 2 may impact individual great gray owls, but are not likely to cause a trend toward Federal listing or a loss of population viability. Timber and other Forest Service permitted

management activities are now planned and implemented to avoid or minimize and mitigate impacts to great gray owls.

Pacific Fringe-tailed Bat

Affected Environment

The Pacific fringe-tailed bat is known to occur on the Methow Valley Ranger District. Perkins (1989) found fringed-tailed bats near old mine shafts in the Hunter Mountain area, approximately 5 miles east of the analysis area. Fringed-tailed bats occupy arid grasslands and forests, including ponderosa pine and Douglas-fir dry forests (Nagorsen and Brigham 1993). Known elevation ranges for the species in British Columbia are between approximately 1,000 feet and 2,600 feet elevation. Their known roosting habitat includes old buildings, bridges, rock crevices, caves, and mines (Christy and West 1993). They feed primarily on beetles and moths. There is suitable foraging habitat for fringe-tailed bats within the Alta Lake portion of the analysis area. They are not known to roost in the area but there is potentially suitable roosting habitat in the form of rock crevices.

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 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

These alternatives would have "no impact" on the Pacific fringe-tailed bat. Outfitter-guide activities would not alter roosting or foraging habitat for Pacific fringe-tailed bats.

Peregrine Falcon

Affected Environment

Peregrine falcons are known to migrate across the Okanogan-Wenatchee National Forest. They typically nest on sheer cliffs at least 150 feet tall with small caves or overhanging ledges and near water. Their diet consists mainly of birds that are taken in flight. Forage areas include a variety of habitats such as forests, marshes, and grasslands. A peregrine falcon nest has been located on the Goat Wall near Mazama, which is within the analysis area, but there are no pack and saddle stock outfitter-guide activities in that vicinity. Formal surveys of the most suitable nesting areas on the Methow Valley Ranger District were conducted in 1997 and again in 1999 (Haggerty and Woodruff 1997). No other peregrine falcon activity was observed during these surveys.

Environmental Consequences

Direct, Indirect, and Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow and Lake Chelan Watersheds. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

All three 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). It seems to prefer moist habitats and is 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. There are no outfitter-guide camps or other activities proposed to occur in sharptail snake habitat.

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 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

These alternatives would have "no impact" on the sharptail snake. The proposed alternatives would not alter any 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. There are no outfitter-guide camps or other activities proposed to occur in striped whipsnake habitat.

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 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

These alternatives would have "no impact" on the striped whipsnake. The proposed alternatives would not alter any 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 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

Alternative 1 would have no impact on the Townsend's big-eared bat; there would be no change from the existing condition. Alternatives 2 and 3 would have "no impact" on the Townsend's big-eared bat since the project would not alter any bat roosting habitat or effect 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 2020, when the 10 year permits would expire.

Alternatives 1, 2, and 3

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.

Wolverine

Affected Environment

Wolverines are known to occur on the Okanogan-Wenatchee National Forest. Wildlife biologists have recently radio-collared 6 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. Wolverines are uncommon inhabitants of subalpine habitats in western mountain ranges in the lower 48 United States (Aubry et al. 2007). They travel long distances and subsist on carrion and by predating on small to medium sized animals. Most of the proposed outfitter activities would occur in areas that may be inhabited by wolverine. 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 very intolerant of human disturbance at maternal den sites. Wolverines give birth in natal dens from late February to March (Magoun and Copeland 1998). 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 and Indirect Effects

Alternative 1

Alternative 1 would have "no impact" on wolverine from pack and saddle stock outfitter-guides since no permits would be issued.

Alternatives 2 and 3

These 2 alternatives "may impact individual wolverines, but is not likely to cause a trend toward Federal listing or a loss of population viability". Pack and saddle stock outfitter-guide activities would occur after the reproductive den season so disturbance would be unlikely.

Cumulative Effects

The spatial boundary for the cumulative effects analysis is the Methow and Lake Chelan Watersheds. The temporal boundary is from the early 1900s through 2020, when the 10 year permits would expire.

Past Actions

Past actions that may have affected wolverines in the analysis area include shooting/trapping/poisoning of individual wolverine, timber management, and disturbance to reproductive den sites by winter recreation activities.

Present and Reasonably Foreseeable Future Actions

Present and reasonably foreseeable future actions in the analysis area that may affect wolverine include accidental shooting or trapping, timber management activities, and disturbance to reproductive den sites by winter recreation activities.

Alternative 1

Alternative 1 would have no cumulative effect on wolverines.

Alternatives 2 and 3

When considered in conjunction with other past, present, and reasonably foreseeable future actions, these 2 alternatives may impact individual wolverine, but are not likely to cause a trend toward Federal listing or a loss of population viability. Shooting and trapping wolverine in Washington is illegal. Timber and other Forest Service permitted management activities are now planned and implemented to avoid or minimize and mitigate impacts to wolverines. The core area analysis for grizzly bear BMUs is an appropriate evaluation of human disturbance to wolverines (Gaines et al. 2003). Outfitter-guide activities would not change core areas.

Consistency Statement for Sensitive Species

Each of the three alternatives considered in this project would be consistent with Forest Service Manual 2670. None of the alternatives would cause a trend toward Federal listing or a loss of population viability for sensitive species.

3.5 WATER RESOURCES

The section below is a summary of the Water Resources specialist report which is available in the project analysis file (Bennett 2008).

REGULATORY FRAMEWORK

Both the Okanogan and Wenatchee Forest Plans (USDA Forest Service 1989b and 1990) provide direction for the proposed action. 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 goal 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.

The proposed action and alternatives, which include the design criteria and mitigation measures described in Chapter 2, were designed to be consistent with standards and guidelines from the Forest Plans, as amended. All the mitigation measures are considered Best Management Practices (BMP, 40 CFR 130.2, EPA Water Quality Standards Regulation). The standards and guidelines that apply to this project include:

<u>Okanogan Forest Plan, Soil and Water (page 4-45)</u>

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.

Wenatchee Forest Plan, Water (page IV-94)

Protection of water quality (see above Okanogan Forest Standard and Guideline 13-3, items 1 through 6).

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	There should be no change in water quality except for temporary changes that return to normal when activity ceases.

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, which is prepared periodically. Each state also prepares a non-degradation policy for all waters that exceed standards. This policy protects these waters from any further degradation. None of the water resources in the analysis area are listed for fecal coliform on the 2004 Washington State 303(d) list. Within the analysis area water temperature is listed for the Methow River. The impaired waters are near Pateros, Washington; the closest proposed action would be several miles away near Alta Lake.

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 land. Mitigation measures were developed by the IDT for this project and incorporate BMPs. Mitigation measures are identified in Chapter 2.

Throughout this analysis, the best available 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.

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. Fecal coliform levels are estimated by using FECALTOOL (US Environmental Protection Agency 2000). The best available information and science was considered and used for this analysis.

AFFECTED ENVIRONMENT

Hydrology

Annual runoff is related to precipitation. Much of the annual precipitation falls as snow, although rain falls 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. Snow melt continues to provide most stream flow until early August when base flows supply all the flow which continues into the following spring. Base flows 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 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 wilderness are slightly to 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 wider with sustained stream flow

throughout the year. These streams are 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; 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. These intermittent streams are dry most of the year.

Fire History

Fire history 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 by increased by higher rates of debris failures and surface erosion, so more sediment enters the streams and rivers, especially in wilderness and Upper Methow 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 would burn with lower intensity because under natural conditions, fuel loads were low.

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. The Thirtymile Fire also burned in 2001 into the lower portion of the Pasayten area. In the 2003 Farewell Creek fire burned over 80,000 acres, in parts of the Pasayten and Upper Methow area. 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 the fire protection has occurred, so sediment depositional rates are probably within their historic range of occurrence.

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/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. More vegetation was left. The larger cattle did generate more impacts in the wettest areas because cattle have larger hooves and weigh more than sheep.

Domestic livestock and recreational livestock grazing have caused local changes to streams and wetlands. At trail-stream crossings, stream banks are broken down because of the traffic at a single location. Since these trails are also use by hikers and in some limited areas, trail bikes, some of the impact is due to those uses. 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 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.

Location of Trails

Pack and saddle stock on trails also change the character of wetlands. Wetlands occur in all areas, except the lower elevation areas of Alta Lake and Bear/Ramsey/Volstead. Trails passing though wetlands are usually impacted; 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 impact area. Users may also widen and deepen the impacted area. Water may begin to flow as a stream through the wetland, where the water eventually infiltrated into the soil. The net effect is that water leaves the 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. The affected wetlands are noticeable because they are near areas of human visits.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Effects Common to All Alternatives

Stream Sedimentation

Pack and saddle stock, including outfitted and non-outfitted stock, would continue to slightly increase sedimentation. It would not be detectable compared to ongoing channel and hill slope erosion, except at the point of disturbance in the stream channel. 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.

State 303(d) List Implications (water temperature)

No new created openings would occur in riparian or other areas in any alternative. Water temperature in the Methow River would not change from current levels with any alternative.

Stream Flow

No changes in stream flow would occur in any alternative from these actions. Peak flow or low flow levels would remain constant.

Trails

The overall condition trend for trails is stable. Trails would remain in the current condition under current use patterns. The extent of impacted streams and wetlands would be small compared to the total amount of wetlands and other riparian areas.

Alternative 1

Alternative 1 would have no outfitter-guide user days; resulting in a 5% reduction in stock use from existing conditions. There would be a total of 219,441 visitor days. Any fecal coliform would be from private pack and saddle stock and background (e.g. hikers or wildlife). Reductions in total fecal coliform levels would be immeasurably small due to the slight reduction compared to current levels. There would continue to be some public use 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 any state water quality standards. In addition, the relatively harsh environment (low water temperature) is not conducive to fecal coliform survival. There are several 36 CFR order prohibitions for the protection of water resources that apply with this alternative. With this alternative there would be no known detrimental fecal coliform bacteria levels. Overall, there would be no detectable fecal coliform levels in waters leaving each portion of the analysis area.

Alternative 2

Alternative 2 would have 222,429 visitor days across the analysis area. Of these days, 4,620 would be associated with pack and saddle stock outfitter-guides. Fecal coliform levels would be from both permitted and non-permitted stock use and background (e.g. hikers or wildlife). With this alternative, 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 any state water quality standards. In addition, the relatively harsh environment (low water temperature) is not conducive to fecal coliform survival.

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 indirectly benefit water resources by limiting camp impact areas. The Best Management Practices (BMP) included in the mitigation measures in Chapter 2 (refer to measures listed under 2, 3, 5, and 7) would also provide water resource benefits. They would be effective since they would be included in the operating plan, with compliance required by the special use permit. With this alternative there are no known detrimental fecal coliform bacteria levels and there would be no detectable fecal coliform levels in waters leaving each portion of the analysis area.

Alternative 3

Alternative 3 would have 220,489 visitor days across the analysis area. Of these days, 2,660 would be associated with pack and saddle stock outfitter-guides. Fecal coliform levels would be from both permitted and non-permitted stock use and background (e.g. hikers or wildlife). Fecal coliform levels would be less than Alternative 2 but greater than Alternative 1, however the difference would be slight. With this alternative, 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 any state water quality standards. In addition, the relatively harsh environment (low water temperature) is not conducive to fecal coliform survival.

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 indirectly benefit water resources by limiting camp impact areas, to a greater degree than Alternative 2. The Best Management Practices (BMP) included in the mitigation measures in Chapter 2 (refer to measures listed under 2, 3, 5, and 7) would also provide water resource benefits. They would be effective since they would be included in the operating plan, with compliance required by the special use permit. With this alternative there are no known detrimental fecal coliform bacteria levels. Overall, there would be no detectable fecal coliform levels in waters leaving each portion of the analysis area.

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 2020, when the 10 year special use permits would expire. Those past, present, and reasonably foreseeable future action that continue to affect hydrology are summarized below. All other actions would not contribute to cumulative effects.

Past 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. 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. The shift to cattle in the mid-1950s impacted more wetlands since cattle have larger hooves and weigh more than sheep.

Present Actions

Trail Conditions and Use - Domestic livestock and recreational livestock grazing have caused local changes to streams and wetlands. 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.

Recreation Use - Dispersed human use across the analysis areas would continue with camping and walking near streams. Most humans use small shovels to bury human waste and keep it from being leached by precipitation or eroded into streams by overland flow erosion. No detrimental effects would occur from these activities.

Reasonably Foreseeable Future Actions

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.

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. 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.

Limited controlled burning would occur outside the wilderness areas and the high elevation areas such as non-wilderness portion of the Sawtooth Range, North Cascades Highway Corridor, and Upper Methow areas. Controlled burns are normally of low intensity. Where the burning occurs, it would not add to fecal coliform bacteria levels in surface water. Wildfire 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.

Alternatives 1, 2, and 3

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. There are no current 303(d) listings on the Methow River for fecal coliform. Additionally, none of the proposed actions or alternatives would have a cumulative effect on water temperature and therefore no effect on the existing 303(d) listing for the Methow River at Pateros, Washington.

CONSISTENCY STATEMENT

The Best Management Practices (mitigation measures) listed in Chapter 2 were used to ensure that all of the alternatives are consistent with the Okanogan and Wenatchee Forest Plans as amended by the Northwest Forest Plan and PACFISH. The proposed Forest Plan amendment for Alternatives 2 or 3 would provide water resource benefit by limiting camp impact areas.

Clean Water Act

A segment of the Methow River near Pateros, Washington, is listed on the 303(d) list as impaired for water temperature. The impaired segment of river is well downstream of much of the analysis area. Alta Lake is closest 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 this localized reach or at the 6th or 5th HUC scale. Therefore, this project would be consistent with the Clean Water Act.

3.6 AQUATIC RESOURCES

The section below is a summary of the Aquatic Resources Report which is available in the project analysis file (Shull, 2010).

REGULATORY FRAMEWORK

The Okanogan and Wenatchee Forest Plans provides direction for the outfitter guide analysis area (USDA Forest Service 1989b and 1990). The desired condition is to for habitat that supports fish rearing, spawning, and migration will be in an improved state (Okanogan Plan USDA Forest Service 1989 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 1990a: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 1989 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 increasing trend. The primary objective for riparian areas is to maintain and enhance longterm productivity to provide for riparian dependent resources including water quality and fish (USDA Forest Service 1990a:IV-40 & 41).

Okanogan and Wenatchee Forest Plan Standards and Guidelines that apply to this project include: 1) maintaining adequate vegetation along streambanks to provide bank stability; 2) maintain low fine sediment levels (<20% surface fines); 3) manage activities to not result in

exceeding current Washington State water quality standards; 4) maintain wood levels >100 large pieces/mile (USDA Forest Service 1989 pg 4-30 -32 & 1990a:IV-84 to IV-88).

The Northwest Forest Plan (NWFP) amended the Forest Plan in 1994 (USDA and USDI 1994). The NWFP included 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 guide management of National Forest Lands at the watershed scale that focus on maintaining and/or improving conditions and processes associated with streams and adjacent riparian areas (see **Appendix L** for complete list). 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; 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). All the watershed analyses reviewed for the analysis area were reviewed and none in the NFP area identified the existing outfitter guide activity as an issue.

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. The 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 includes eight objectives to guide management of National Forest 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; design, construct, and 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 affect listed anadromous fish; address attainment of RMOs and potential effect on listed anadromous fish and designated critical habitat in wild and scenic rivers, wilderness, and other recreation management plans. All the watershed analyses for the analysis area were reviewed to find if any included commercial outfitter use as an issue. Only one area had a documented issue with outfitter guide activities and that was 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 guidelines, Key Watersheds were established to act as refugia and provide high quality habitat for aquatic species. Priorities within these Key Watershed includes 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 Upper Chewuch, Lower Chewuch, Upper Methow, Middle Methow, Lower Methow, Twisp, and Lost River 5th field watersheds.

These watersheds are Tier 1 Key Watersheds within the NFP boundary. In the PACFISH boundary, the analysis area includes four 5th field Hydrologic Unit Code (HUC) watersheds: Upper Chewuch River, Lower Chewuch River, Middle Methow River, and the Lower Methow River. 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 for more details).

The Endangered Species Act, 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 Sensitive 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 conducted with the US Fish and Wildlife Service (USFWS) prior to issuance of the FEIS and ROD for the project.

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 observations, stream, lake, and fish distribution inventories, and watershed analyses/assessments. Most information is from the last decade. Through this analysis, the best available information and science was considered and used.

Habitat surveys were completed for major fish bearing streams in nearly all the 5th field watersheds included in the analysis area, exceptions are the small piece of the Lower Silkameen River and the Ashnola River. Data for small fish bearing streams and non-fish bearing streams is limited due to the remoteness and difficulty of access in the backcountry. The aquatics analysis relies on professional field observations from past fish biologists and tenured backcountry rangers. All recreation use in the backcountry, including the proposed commercial outfitter guide use, is very concentrated at sites that represent a very small portion of the entire analysis area.

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 the watershed scale 5th field HUC and subwatershed 6th field HUC, 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). 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 J**. 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 sensitive and 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 3,050 miles of stream. **Figure 3.6-1** below breaks them down by 5th field watershed 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.

	Streams in 5th Field Watershed			Streams in Analysis area Boundary		
5th Field Watershed	Perennial Stream (mi)	Intermittent (mi)	Total Streams (mi)	Perennial Stream (mi)	Intermittent (mi)	Total Streams (mi)
ASHNOLA RIVER*	Not Available	Not Available	Not Available	15.5	91.4	106.9
LIGHTNING CREEK	65.5	145	210.5	47.8	134.7	182.5
LOST RIVER	73	224.3	297.3	73	224.3	297.3
LOWER CHEWUCH RIVER	162.6	432.1	594.7	12	58.9	70.9
LOWER METHOW RIVER	159.1	327.5	486.6	41.7	43.9	85.6
LOWER SIMILKAMEEN RIVER	34.7	47.2	81.9	0	1.8	1.8
MIDDLE METHOW RIVER	185	457.2	642.2	85	226	311
PASAYTEN RIVER*	Not Available	Not Available	Not Available	89.1	244	333.1
ROSS LAKE	27.3	66	93.3	13.2	57.7	70.9
RUBY CREEK	77.5	292.2	369.7	77.5	292.2	369.7
SALMON CREEK	107.5	84.4	191.9	1	7.1	8.1
SINLAHEKIN CREEK	223.7	182.8	406.5	14.5	29.1	43.6
TWISP RIVER	144.4	312.4	456.8	100	207	307
UPPER CHEWUCH RIVER	95.5	273.8	369.3	75	215.9	290.9
UPPER COLUMBIA-SWAMP CREEK*	Not Available	Not Available	Not Available	0	1	1
UPPER METHOW RIVER	90.1	337.8	427.9	90.1	337.8	427.9
Total in Methow Watershed	**1445.9**	**3182.7**	**4628.6**	**735.4**	**2172.8**	**2908.2**
UPPER LAKE CHELAN	Not Available	Not Available	129	Not Available	Not Available	20
STEHEKIN	Not Available	Not Available	234	Not Available	Not Available	15.5
LOWER LAKE CHELAN	Not Available	Not Available	207	Not Available	Not Available	50.6
Total in Lake Chelan Waterhsed	**570**	**152.4**	**570**	**Not Available**	**Not Available**	**152.4**

*Stream flow character data was not available for the Chelan portion, the Columbia –Swamp Creek, Pasayten, and Ashnola River Watersheds.

The majority of disturbances along streams and lakes is localized where camps and day use areas are close to lakes and streams and stream crossings. Trail crossings typically create localized disturbances to stream banks of about 10 feet on each side of the crossing. Streamside campsites are present at low densities. Projects to reduce water routing down trails sediment delivery to adjacent streams have been implemented on all 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 shows that overall PACFISH standard and guidelines are being met with the exception of two small reaches that are recovering. All stream reaches inspected were well-vegetated, most had undercut banks, and bank erosion was generally limited to trail crossings (USDA Forest Service 2000c).

Stream habitat indicators potentially affected by the proposed project are temperature, sediment, stream banks stability, large wood levels, and riparian habitat.

Appendix K shows the aquatic habitat parameters for major fish bearing streams within the analysis area. **Appendix K** includes the results from a 2000 stream survey in the Remmel Lake/Spanish Camp part of the Pasayten Wilderness. 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 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, but are several miles downstream of the analysis area. Otherwise, there are no 303d listed streams. Most streams in wilderness or roadless areas have intact riparian canopies. Exceptions are the Chewuch River and Lake Creek, where fires recently burned. The Chewuch naturally has higher stream temperatures due to its north/south orientation and naturally high width/depth ratio 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.

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. Exceptions are areas with naturally high erosive soils and naturally have higher fine sediment levels such as the Chewuch, Sinlahekin, and Chelan watersheds or where recent fires occurred. Based on the field observations of smaller streams in the analysis area, fine sediment levels appear to be low and properly functioning.

Excessive bank erosion can lead to high sediment levels. The 2000 field survey of streams in the Remmel/Spanish Camp 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, but the low bank erosion rates suggest otherwise, Overall, the fine sediment levels appear to be low and properly functioning.

Large Wood

Large wood levels were found to exceed ESA standards for 16 out of 23 surveyed streams in the analysis area (Figure 3) but not the Okanogan and Wenatchee Forest Plan standards. The Forest Plan standards for wood are much higher then set by NOAA Fisheries, US 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, which removed a significant 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 (Table XXX), suggesting channel structure such as wood are adequate. Since no timber harvest occurs along most streams in the analysis area, wood levels and recruitment are likely at or near natural levels. We consider the existing wood levels to be functioning appropriately for the analysis area as a whole.

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 about 30 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 significant reductions in sheep and cattle grazing across the entire analysis area, 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, 6^{th} and 5^{th} field scale.

Lakes

There are 530 lakes within the analysis area (see **Figure 3.6-2**). 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):

- Black Pine, Lewis Lake, North Lake, Cooney Lake, Sunrise Lake, Eagle Lakes, Crater Lake, Oval Lakes within the Lake Chelan - Sawtooth Wilderness and Sawtooth backcountry in 1994.
- Cougar Lake, First Hidden Lake, Big Hidden Lake, Middle Hidden Lake and Black Lake within the Pasayten Wilderness in 1995.
- Sub-zero, Freezeout, Jerry Lakes, Cabinet Lake, Squad Car, Wing and Lewis Lakes along or near the North Cascades Scenic Highway in 1998.
- Cub Lake, Boiling, Bernice Lake, and Surprise Lake in the Chelan Sawtooth Wilderness in 2000 (Entiat Ranger District).
- Remmel, Cornwell, Lower and Upper Cathedral, and Tungsten 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 3.6-2. 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	10
North Cascades	58
Pasayten Wilderness/Methow	284
Pasayten Wilderness/Tonasket	52
Lake Chelan-Sawtooth/ Chelan	16
Lake Chelan-Sawtooth/Methow	54

Thirty-two lakes in the analysis area have been surveyed, and 19 had frequent human use. These areas get lots of general hiker use. Detailed results of the lake surveys are included in the analysis file. Observations made during lake surveys shows that lakes used by the outfitter-guides have moderate to high impacts but most lakes used by the outfitter guides is for drop camps or for day use and the stock does not stay there more than a few hours.

Water quality data is shown for lakes in the Chelan District portion of the analysis area, similar data has been collected for Methow Valley lakes with no water quality problems identified. Coliform data was not collected for lakes in the Methow Valley.

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 lower Lake Chelan is listed for DDT and PCBs. The four alpine lakes within the analysis area were surveyed and sampled in August 2000. Sampling results are presented in **Figure 3.6-3** 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 be oligotrophic 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. The most significant indicator of contamination by humans and mammals, total coliform, was low (<1.1 colonies/100ml of sample volume) in Cub and Boiling Lakes that were analyzed for this parameter. These two lakes receive the greatest recreational usage of the four lakes measured.

Figure 3.6-3. Results of water analysis for Lakes on the Chelan side of the Lake Chelan-Sawtooth Wilderness (2000).

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	†	
Chlorophyll *a* (µg/L)	0.7	1.5	0.5	1.0	

† = no data

Fish

The analysis area contains or is adjacent habitat for fish species listed under the ESA, Regional Forester's Sensitive Species, Management Indicator Species (MIS), and species for which Essential Fish Habitat (EFH) has been designated under the Magnuson-Stevens Fishery Conservation and Management Act. See **Figure 3.6-4** below.

Figure 3.6-4. Fish Species by Category Present in or adjacent to the Analysis area.

ESA	Sensitive	MIS	Species of Concern	EFH
Spring Chinook (Endangered)	Westslope Cu	Spring Chinook	Pacific Lamprey	Chinook
		Westslope Cutthroat		
Summer Steelhead (Threatened)	Interior Redband Rainbow	Interior Redband Rainbow		
Bull Trout (Threatened)		Steelhead		Coho
		Bull Trout		

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 has not designated Critical Habitat for bull trout in the Upper Columbia Basin; however, habitat has been designated for critical life stages such as spawning and rearing and foraging, migration, and over-wintering (FMO). The Chewuch River below Lake Creek is designated as FMO habitat.

The Upper Chewuch River Watershed is estimated to support between 5% and 25% of fluvial 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 redd counts.

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 coldwater influence to the mainstem river. Bull trout foraging and rearing may increase in the lower mainstem during the spring, fall, and winter when temperatures are favorable. Fluvial bull trout redds and individuals have been documented in Eightmile Creek below a suspected barrier at RM 1.6.

Spring Chinook Salmon
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). National Marine Fisheries Service (NMFS) designated Critical Habitat on September 2, 2005 (70 FR 52630). The Chewuch River from the mouth 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 are designated as Critical Habitat for spring Chinook.

The Chewuch River is one of four identified Major Spawning Areas for spring Chinook in the Methow Sub-basin (ICTRT 2007), supporting roughly 25% of spring Chinook spawning habitat in the Methow Sub-basin. Spring Chinook are not present within the Buck analysis area but are within the aquatic analysis area. This boundary extends to the mouth of the Chewuch River to assess any project effects to spring Chinook habitat in the lower reaches of the Chewuch River.

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 population spawning escapement 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 upgraded to threatened on January 5, 2006 (71 FR 834). NMFS designated Critical Habitat for UCR steelhead on September 2, 2005 (70 FR 52630); this included the mainstem Chewuch River up to the barrier falls at RM 36.6, as well as lower reaches of a number of watershed tributaries including lower Eightmile, lower Boulder, Lake, and Andrews Creeks. Lower Cub Creek was not included.

Steelhead spawn and rear in the entire length of Chewuch River bordering the analysis area. Steelhead also spawn and rear in the lower 0.9 miles of Eightmile Creek, a short reach which supported high redd density in 2005 (Humling and Snow 2005). District Fisheries biologists speculate that juvenile steelhead also rear in lower Cub Creek, below the barrier falls at RM 0.4, though there are no data to verify this.

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.

Interior Redband rainbow trout

Interior redband rainbow trout (*O. mykiss gairdneri*) are native to the Methow Sub-basin. This subspecies is on the USDA Forest Service Regional Forester's Sensitive Species list, updated Jan 31, 2008. Sensitive species are defined as "species…for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density and habitat capability that would reduce a species' existing distribution" (FSM 2670.5).

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 genetic introgression. 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 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. Population trend data for the Methow or the analysis area are not available.

Westslope Cutthroat Trout (WCT)

Westslope cutthroat trout (*O. clarki lewisi*) are native to the Methow Sub-basin and are on the USDA Forest Service's Regional Forester's Sensitive Species list, updated January 31, 2008. 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. The Eightmile local population is a good example of genetically pure westslope cutthroat trout (Proebstel et al. 1998). 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.

Pacific Lamprey

The Pacific lamprey is an ancient, anadromous, native species to the Methow Sub-basin that has suffered widespread decline throughout the Columbia Basin (Close et al. 1995). The Methow Sub-basin lies near the upstream extent of recently documented lamprey presence in the Upper Columbia River Basin (John Crandall, personal communication). Mainstem Columbia River dams and their impoundments likely pose significant passage challenges for lamprey. Lamprey returning to and inhabiting the Methow Sub-basin may be among the most regionally imperiled. Little sub-basin-specific information is known about the lamprey species composition,

distribution, or abundance. Habitat degradation associated with agricultural practices, road construction and flood control may be negatively affecting lamprey in the Methow Sub-basin.

Migrating lamprey have been counted at Wells Dam since 1998. Recent data on adult lamprey passing Wells Dam suggest their numbers are low with only eight counted passing the dam during 2008; however counting conditions for lamprey are difficult and should not be considered complete.

In 2008, the Wild Fish Conservancy, Okanogan-Wenatchee National Forest, and other parties partnered to conduct a sub-basin-wide survey to increase lamprey knowledge. This project is not yet complete but initial data indicate that Pacific lamprey are present within the Chewuch River from the mouth to beyond the upper boundary of the Lower Chewuch Watershed. Ammocoetes (juveniles) were found in sand and silt type habitat throughout the watershed.

Critical Habitat

Critical habitat is defined in Section 3(5)(A) of the ESA as "the specific areas within the geographical area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection." The National Marine Fishers Service designated critical habitat for UCR spring-run Chinook and UCR steelhead on September 2, 2005 (70 FR 52630). See maps in the analysis file for a map of critical habitat for spring-run Chinook and steelhead. The FWS designated critical habitat for bull trout September 26, 2005 (70 FR 56211 56311) and it excluded the Methow. Currently, the FWS has a revised proposed critical habitat rule (75 FR 2269 2431) that includes habitat in the Methow Subbasin.

Summer-run Chinook Salmon: Spring-run Chinook salmon are a MIS on the Wenatchee Forest but are not present in Lake Chelan or in the Methow Subwatershed.

Figure 3.6-5. Watersheds and sub-watersheds with designated critical habitat for Upper Columbia River Spring Chinook and Steelhead Critical Habitat and proposed for Columbia River Bull Trout in the project area.

Watershed	Sub-watershed	Critical Habitat
LOST RIVER	Lower Lost River	CH, ST, BT*
	South Fork Lost River	CH, ST, BT*
LOWER CHEWUCH RIVER	Eight Mile Creek	CH, ST, BT*
	Chewuch River - Pearrygin Creek	CH, ST, BT*
	Boulder Creek	CH, ST
LOWER METHOW RIVER	Mouth of Methow River	CH, ST, BT*
	Libby Creek	ST
	Gold Creek	CH, ST, BT*
MIDDLE METHOW RIVER	Upper Middle Methow River	CH, ST, BT*
	Goat Creek	CH, ST, BT*
	Wolf Creek	CH, ST, BT*
	Upper Beaver Creek	CH, ST, BT*
	Bear Creek	CH
	Lower Beaver Creek	CH, ST, BT*
TWISP RIVER	Upper Twisp River	CH, ST, BT*
	Mainstem Upper Twisp River	CH, ST, BT*
	South Creek	CH, ST, BT*
	Little Bridge Creek	CH, ST, BT*
	Buttermilk Creek	CH, ST, BT*
	War Creek	CH, ST, BT*
	Eagle Creek	ST
	Buttermilk Creek	CH, ST, BT*
UPPER CHEWUCH RIVER	Chewuch River - Kay Creek	CH, ST, BT*
	Windy Creek	None
	Andrews Creek	CH, ST
	Lake Creek	CH, ST, BT*
UPPER COLUMBIA - SWAMP CREEK	Antoine Creek	ST
UPPER METHOW RIVER	Robinson Creek	CH, ST, BT*
	Rattlesnake Creek	CH, ST, BT*
	West Fork Methow River	CH, ST, BT*
	Early Winters Creek	CH, ST, BT*

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 any sensitive status.

Fish Distribution

Most backcountry dispersed recreation occurs 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. 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; it coordinates 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 shows that this occurs at lakes accessed only by foot traffic as well as lakes accessed by horse users, although lakes accessed by horse users tend to have bigger impact areas.

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, Gold Creek, including Foggy Dew Creek and lower Crater Creek.

Fish species listed under ESA, the Regional Forester's Sensitive Species list, 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 3.6-6** and **3.6-7** (see below and on maps in the analysis file). Fish presence/absence is based on stream and fish distribution inventories for the analysis area. Generally, sensitive fish species are below the OG analysis area except for a few areas.

Figure 3.6-6. 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	None
Pasayten River	None	WC, RB	None
Ross Lake	BT	BT	None
Ruby Creek	BT	BT, RB	None
Lightening Creek	BT	BT, WC, RB	None
Salmon Creek	None	None	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, PL*	CH
Lost River	CH, ST, BT	CH, ST, BT, WC, RB, PL*	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
LP – Pacific Lamprey – not a designated sensitive species but is a concern locally

Figure 3.6-7. Watersheds and sub-watersheds with Upper Columbia River Spring Chinook or Steelhead Critical Habitat in the analysis area.

Watershed	Sub-watershed	Critical Habitat
LOST RIVER	Lower Lost River	CH, ST
	South Fork Lost River	CH, ST
LOWER CHEWUCH RIVER	Eight Mile Creek	CH, ST
	Chewuch River - Pearrygin Creek	CH, ST
	Boulder Creek	CH, ST
LOWER METHOW RIVER	Mouth of Methow River	CH, ST
	Libby Creek	ST
	Gold Creek	ST
MIDDLE METHOW RIVER	Upper Middle Methow River	CH, ST
	Goat Creek	CH, ST
	Wolf Creek	CH, ST
	Upper Beaver Creek	ST
	Bear Creek	CH
	Lower Beaver Creek	CH, ST
TWISP RIVER	Upper Twisp River	CH, ST
	Mainstem Upper Twisp River	CH, ST
	South Creek	CH, ST
	Little Bridge Creek	ST
	Buttermilk Creek	CH, ST
	War Creek	CH, ST
	Eagle Creek	CH, ST
	Buttermilk Creek	CH, ST
UPPER CHEWUCH RIVER	Chewuch River - Kay Creek	CH, ST
	Windy Creek	CH
	Andrews Creek	CH, ST
	Lake Creek	CH, ST
UPPER COLUMBIA - SWAMP CREEK	Antoine Creek	CH, ST
UPPER METHOW RIVER	Robinson Creek	CH
	Rattlesnake Creek	CH, ST
	West Fork Methow River	CH
	Early Winters Creek	CH, ST

Sensitive fish near and in the analysis area are generally spawning and rearing. Westslope cutthroat trout are the most common in the analysis area as they stocked in high mountain lakes annually. 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.

Most sensitive fish use occurs downstream or more than 300 feet from the outfitter-guide camps. **Figure 3.6-8** 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	WCT	Spawning/Rearing
Cedar Creek	Cedar Creek	WCT	Spawning/Rearing
Gardner Meadows	Wolf Creek	WCT	Spawning/Rearing
South Fork	Wolf Creek	WCT	Spawning/Rearing
Little Fish Camp	Wolf Creek	BT, WCT, RR	Spawning/Rearing
drop C	Chewuch River	WCT, RR	Spawning/Rearing
drop G	Lost River	BT, WCT, RR	Spawning/Rearing

Current known fish species in Chelan portion of the analysis area consists of native Westslope cutthroat trout, introduced Yellowstone cutthroat trout, introduced rainbow trout, and introduced kokanee (**Figure 3.6-9**). Rainbow trout and kokanee have been stocked in Lake Chelan and some of its tributaries since 1917. Most of the streams in the analysis area have natural barriers (waterfalls within 1000 feet of Lake Chelan) that prevent lake resident fish (adfluvial type) from ascending. No streams in this portion of the analysis area support anadromous fishes due to exclusion by natural barriers in 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). Any effects to fish or their habitat resulting from proposed activities would be immeasurable in Lake Chelan; no downstream effects to listed or unlisted anadromous fish are expected. 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	Adfluvial length	Year(s) Surveyed	Fish Species Present in order of relative abundance
Safety Harbor Creek	1,060 ft.	1993, 2001, 2003	hybrid swarm of westslope-Yellowstone cutthroat, rainbow, kokanee
Canoe Creek	~50 ft.	2001	None
Prince Creek	1,584 ft.	1992, 2003	cutthroat, rainbow, kokanee
Rattlesnake Creek	unknown	No survey	unknown
Rex Creek	0	2001	None
Pioneer Creek	0	2001	None
Cascade Creek	450 ft.	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 x rainbow hybrids, cutthroat
Cub Lake		1990, 2000	cutthroat
Bernice Lake		1990, 2000	cutthroat x rainbow hybrids
Surprise Lake		1990, 2000	cutthroat

Current Outfitter Guide Use and Effects to Streams and Lakes

Pack and saddle stock outfitter guide activities cause isolated disturbance to lake shores, stream channels, and riparian areas are at campsites and day use areas close to lakes and streams and at stream crossings on trails. Some bank trampling and negative impacts occur, however impacts are minimal and represent only a small portion of the resources across the entire analysis area. Based on a GIS fish report, there are 15 campsites within the riparian reserves and RHCA boundary of lakes and 14 between the riparian boundaries and 500 feet of lakes. There are 319 lakes in or bordering the entire analysis area. These lakes have an estimated combined distance of 78 miles of lake shore. Assuming an average distance of disturbed lake shore for the camps in the riparian reserves and within 500 feet is 100 feet and 50 feet, respectively, this equals a combined distance of 0.4 miles or less than 0.001% disturbed lake shores of the 35 total miles.

There are a total 24 camps within riparian reserves and riparian habitat conservation areas and 38 camps between the buffers and 500 feet of streams. There is an estimated 3,050 miles of streams in the analysis area. Based on an assumed distance of 100 feet of disturbed stream banks from camps within riparian buffers and 50 feet from camps outside of buffers but within 500 feet of streams, this amounts to an estimated distance of about 0.83 miles total or less than 0.001% of disturbed stream banks associated with camps.

Based on a GIS analysis there are 709 stream crossings on trails in the analysis area. Based on 10 feet of channel disturbance per stream crossing, this amounts to about 1.3 miles total of bank disturbance out of the 3,180 miles total or less than 0.001% disturbance. Furthermore, these sites would be dispersed across the analysis area and the OG guides do not use all trails, so the effect would be even less.

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 use Sheep, Quartz, Upper Cathedral, Cougar, Remmel, Crow, and Ramon Lakes for day use and/or drop camps.

Impacts are minimal from outfitter guide trips with these types of use because the packstock is tethered at least 200 feet from the lakes and spend no more than a few hours at the sites (Dowie – personal communication). Cooney Lake in the Sawtooth Backcountry has a deluxe 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 stock users) using the backcountry with little negative impacts from the commercial outfitters. There is a deluxe campsite near First Hidden Lake where the outfitters camp with clients but it is over 200 feet from the lake. Packstock are mostly grazed up at Stub Creek, 11/2 mile from the lake, or tethered to hitchrails or highlines. The outfitters do not camp along the other two Hidden lakes and the impacts there are primarily from the general public users. Overall lake impacts from the commercial outfitters to lakes is minimal.

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 have increased after debris torrents from the 2001 Thirtymile Fire and 2003 Farwell Fires (USDA 2006). 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 has declined and there has been no cattle 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 which has occurred in some of these areas, make it more difficult to determine the possible long term effects dispersed recreation or outfitter guide use may be having 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, shows that non-forested Rosgen E channel type (Rosgen 1994) streams in the area were, at one time, beginning to widen and show signs of deterioration but are now recovering from past cattle and sheep use. Grazing use may be shifting to higher and drier meadows above the streams; cattle were more likely to use the wet areas adjacent to streams while horses tend to avoid boggy areas.

With the exception of Cougar Lake, Hidden Lakes, Lake Creek, the Thirtymile trailhead, and the Andrews creek corral, the back country areas used by recreationists and outfitter-guides in the Chewuch watershed are miles upstream from fish species listed under the ESA. 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. An exception to this is the creek that leads into Remmel Lake. A large camp is located on the creek, and approximately 600 feet of streambank is in a deteriorated condition due to the amount of human use. This stream flows into Remmel Lake and is small, hence there is no effect on stream reaches below Remmel Lake or indirectly on the Chewuch River.

Trails that access camping and grazing areas are used by the general public and outfitters. Trails generally follow valley bottoms and located on the outer edge or completely outside of Riparian Reserves. All major 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. These trail segments are used by outfitters and by the non-outfitted public. These effects are localized and do not cause impacts to aquatic or riparian habitat at the reach scale or at the watershed scale.

In the Sheep Mountain area stream channels drain east towards the Ashnola River or west towards the Hidden Lakes and the Lost River. Streams are located well away from major trails

and the trail network has little to no effect on channels. Streams in the Sheep Mountain area Sheep Mountain were also grazed by sheep and cattle in the past.

The trail access to the Hidden Lakes is in the Lost River watershed and most of the stream channels are located far away from the trail system except for 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. The relocation of hitching rails 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.

Trails that begin near Harts Pass and go down into the Pasayten River watershed are located away from stream channels except at crossings and are having little to no effect on stream habitat. Most of the past outfitter use in this area has been in the fall during hunting season.

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 (spawning nests) 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 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. Fishing was good at the 2005 reopening of the area, but bull trout were easily caught. 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.

Packstock Corrals: There are two corrals used by outfitters in the Chewuch drainage that are located in riparian areas. The corral near the Andrews Creek trailhead is located away from the streambanks of the Chewuch River but a portion of the corral is on an intermittent side channel. A two-inch screened pipe delivers water to a stock tank for stock watering, with little if any impact on riparian and aquatic habitat.

The Billygoat assigned site operated by North Cascades Safari in Eightmile Creek is located in the riparian area about 100 feet above the east bank of the creek. Impacts include loss of vegetation in the riparian zone and a small amount of sediment delivery to the stream. Stock watering improvements planned as mitigation at the site will reduce the impact of stock trampling along the banks; a water transmission line from the tributary behind the corral diverts water for stock use at the corral.

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 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. 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 listed fish. There is one large camp used by commercial horse outfitters 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 listed fish. 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 be seen. 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.

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. 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. This trail parallels habitat occupied by bull trout but is not apparent from within the stream or riparian corridor.

In the Upper Methow watershed, outfitter-guides use established trails and roads. Horse 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.

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).

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 present adjacent to any of these trails or in the areas used by outfitters.

The Wolf Creek trail accesses the Mount Gardner area in the 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. The Wolf creek watershed was grazed by cattle until about 2001 when the permit was purchased and waived back to the Forest Service; 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 have been restricted from fording the mainstem of Wolf creek during bull trout spawning season to avoid trampling spawning areas.

Past outfitter-guide impacts cannot be distinguished from other dispersed recreation use and 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.

There are roughly 140 miles of trail in the Twisp River watershed. Many of the tributary drainages in the watershed have a trail that parallels the drainage and 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 fish. Most of these trails are in wilderness; many begin in the late-successional reserve.

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 that used to go through 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.

Bear Ramsey/Volstead

Much of the Bear Ramsey/Volstead area burned in the 2006 Tripod Fire. The area will still be used by outfitter activities but likely for hunting purposes only. 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 has a fragile population of bull trout that is vulnerable to human disturbance. There are no dispersed campsites in this area and the area where this population is known to spawn has been fenced to protect it from livestock grazing.

Alta Lake

The only outfitter use in this unit are day rides. Alta Lake and a small pond are the only water bodies in the unit. There were no sign outfitter guide use signs along these water bodies.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

The existing levels of non-outfitted stock use and hiking would continue throughout the analysis area. Existing trails would be maintained as they are now and all existing camps would be available to the general public as they are now. Alternative 1 would result in a 6% reduction in people using stock over past levels on trails and at camps and a 1% reduction in people (hikers and stock users) in the wilderness over past levels. 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 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 are created by the non-outfitted public and would continue under Alternative 1. Riparian conditions at lakes that are most freuqently visited by stock outfitters and clients may improve slightly. 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, 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 and 3

Alternative 2 has more service days than Alternative 3 but the effects would be the same. Camp locations and access routes would be the same as well as season of use. Stock use and service days would probably remain at existing levels at the most popular destinations and there would be little change from the existing condition. Other than less overall use, the direct and indirect effects to sensitive fish species, aquatic habitat, and riparian habitat would be the same between alternatives.

Outfitter guides generally start trips the first of July but occasionally start the last week of June depending on snow depth. Redband rainbow and westslope cutthroat trout spawn in several streams in the analysis area and incubate in redds until mid July. Outfitter trips occurring before mid-July in Lost River, Wolf Creek, and the upper Chewuch River have access to spawning habitat and potentially could trample redds. Disturbance of the substrate by mechanical trampling would likely destroy eggs immediately or dislodge and expose eggs. Redds could have been disturbed in the past in this manner, although no direct evidence has been found or observed. Although the potential exists for the outfitter guide to trample redband and westslope cutthroat trout redds, the probability is low. There are only a few trips that go out before mid-July, and August gets the highest use. Furthermore, outfitters are required to stay on designated trails, and to open-graze stock, or to contain them by hobbling or tethering to a

highline or hitch rail, so the amount of time and area of streams accessed by would be minimal. Because of the low probability of redd trampling, effects would be inconsequential to the local population.

Bull trout occur near outfitter camps along Wolf Creek and Lost River. Bull trout spawn in September and October, which is when some outfitter-guides lead hunting trips in the Wolf Creek and Lost River drainages. Alternatives 2 and 3 would close the one campsite on Wolf Creek adjacent to bull trout spawning habitat during the fall trips, which would eliminate the risk of trampling redds when camping. The trail crosses the North Fork of Wolf Creek, which occasionally has redds at the stream crossing. Training outfitter-guides to identify bull trout redds would reduce the risk of trampling at this site.

The risk of the stock animals, guides, or clients trampling bull trout redds in the Lost River drainage is extremely low. The access trail to all the camps never crosses the river and the stock animals stay on the trail except when free grazing or dropping off clients at campsites. Free 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 when bringing gear in and out before the hunt and bringing clients in and out for the hunt. Stock animals water at tributary stream crossings on the trail. When not on the trail or dropping off gear or clients, they are camped up on Tatoosh Butte. Of the seven potential drop camps, only two are within 500 feet of the river and the others are over 1/2 mile from the river. Most all the hunting occurs on the east side of the river, which is the side the camps are on. The west side is very steep and rocky; not good terrain for hunting. Outfitters and clients will not be allowed to cross the river during the high hunt trips. Outfitters, stock, and clients will be allowed to get water at the river's edge but this most likely would not occur. The drop camps near the river are on creeks and the outfitters generally do not water their pack train at the river because of difficult access. Based on the little anticipated access to the river during the hunting season and no river crossings, we do not anticipate any bull trout redds being trampled by the high hunt activities.

Outside of spawning season, pack stock and clients may temporarily disturb bull trout if they enter streams occupied. These occurrences would be few and short duration and would not result in any physical harm. The amount of bull trout streams accessed by the outfitter guide activities is only a small fraction of all the habitat across the analysis area.

There is no potential for trampling steelhead or spring Chinook redds as the outfitter-guides do not use areas along habitat for these species. Therefore, there is no potential for direct effects to either of these species.

Pack and saddle stock outfitter guide activities would continue to disturb lake shores, stream channels, and riparian areas are at campsites and day use areas close to lakes and streams and at stream crossings on trails. Some bank trampling and negative impacts would occur, however impacts would be minimal and would represent only a small portion of the resources across the entire analysis area.

Overall, the condition of aquatic habitat and riparian habitat near streams and lakes would be essentially unchanged from the existing condition under Alternatives 2 or 3 because the level of human use would remain essentially unchanged from what has created the existing condition. The existing trail network would continue to be used by the public and outfitters and the level of

use at the lakes would remain the same. The existing trail network would be used for day rides to lakes for fishing and swimming. Areas impacted by cattle and sheep in the past would improve.

By establishing tighter controls, the mitigation measures would eliminate future development of outfitter created trails and stream crossings. The mitigation measures and the operating plan would also allow the outfitters to continue to establish a good role model for stock use in the wilderness. Without this behavior, stock use by the general public could become more damaging to aquatic and riparian habitat as the skills the outfitters bring to the stock-use community are lost. 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.

Aquatic Conservation Strategy

The site specific area of activities, which have the potential to result in water quality, lakeshore and stream bank, and riparian vegetation impacts only occur on a small fraction of the analysis area. Based on GIS analysis and field observations, less than an estimated 0.001% of all lake shores and stream banks are presently impacted by outfitter-guide activity. This scale of impact is a small fraction of the total lakes and streams in any 6th or 5th field watershed let alone the entire analysis area. Therefore, stream and lake impacts are extremely limited in geographic scope and environmental effect while the majority is in properly functioning condition or on a good recovery trend.

Impacts to streambanks and fine sediment levels in lakes and streams from the proposed activity has been minimal in the past and expected to be the same in the future. Liberally estimating the amount of lake shore and stream bank impacts to be between 50 to 100 feet per camp depending on how close it is to water, less than 0.001% of all lake shores and streams in the analysis area would be affected by pack and saddle stock outfitter-guide activities, with the rest being in either pristine or near pristine conditions such as wood levels capable of trapping in small increase in sediment and stream bank vegetation capable of stabilizing channels. Sediment levels in fish bearing streams, as a result of the proposed activity, would be immeasurable. The natural range of variability is so wide for the sediment regime that sediment effects from the existing and proposed continuation of outfitter-guide activity is clearly within this range. Furthermore, the decision to continue would not interfere with sediment trends/conditions in the watersheds as a whole.

Although there may be some changes in water quality at the site scale, the effects would be diluted quickly and would have no downstream effects. Temperatures would remain normal due to the extensive riparian canopy present in the analysis area. Furthermore, no water bodies within the scope of affected area are listed at 303(d) impaired streams.

Pack stock have impacted riparian plant communities at localized scales but these areas represent only a small fraction of all stream and lake/riparian habitats and are dispersed across the analysis area. The high proportion of riparian areas with no use is capable of providing the microclimate conditions, channel stability, and sources of channel structure (wood) to protect aquatic and riparian resources.

There will be no increase in use so present conditions would continue and improve. Monitoring of outfitter-guide activities will ensure standards are met. If conditions appear to exceed standards, the proposed permits and attached operating plans allow for appropriate changes in management to meet aquatic and riparian standards and objectives.

In summary, the small localized effects of the outfitter-guide activity presently and those anticipated in the future would not prevent maintaining the current aquatic and riparian conditions or meeting the ACS Objectives. The majority of streams and riparian areas are presently in excellent or near excellent conditions and those few areas with moderate use would continue develop and improve. These factors, taken in space and time with the overall trend in the watersheds, lead to the finding that these alternatives would meet the Aquatic Conservation Strategy Objectives.

PACFISH Riparian Management Objective

The specific area of activities which have the potential to result in water quality, lakeshore and stream bank, and riparian vegetation impacts only occurs on a small fraction of the analysis area. Based on GIS analysis and field observations, less than an 0.001% of all lake shores and stream banks are presently impacted by the outfitter-guide activity. This scale of impact is a small fraction of the total lakes and streams in any fifth field watershed let alone the entire analysis area. Therefore, stream and lake impacts are extremely limited in geographic scope and environmental effect while the majority are in properly functioning condition or on a good recovery trend.

Impacts to streambanks and fine sediment levels in lakes and streams from the proposed activity has been minimal in the past and expected to be the same in the future. Estimating that the amount of lake shore and stream bank impacts to be between 50 to 100 feet per camp depending on how close it is to water, less than 0.001% of all lake shores and streams in the analysis area would be impacted by pack and saddle stock outfitter-guide activities. The rest of the habitat would remain in either pristine or near pristine conditions, such as wood levels capable of trapping of small increase in sediment. Sediment levels in fish bearing streams, as a result of the proposed outfitter-guide activity, would be immeasurable and insignificant. The natural range of variability is so wide for the sediment regime that sediment effects from the existing and proposed continuation of outfitter-guide activity is clearly within this range. Furthermore, continued pack and saddle stock outfitter-guide activities would not interfere with sediment trends/conditions in the allotments or watersheds as a whole.

Although there may be some changes in water quality at the site scale, the effects would be diluted quickly and would have no downstream effects. Temperatures would remain normal due to the extensive riparian canopy present in the analysis area. Furthermore, no water bodies within the scope of affected area are listed at 303(d) impaired streams.

Pack stock have impacted riparian plant communities at localized scales but these areas represent only a small fraction of all stream and lake/riparian habitats and are dispersed across the analysis area. The high proportion of riparian areas with no use is capable of providing the microclimate conditions, channel stability, and sources of channel structure (wood) to protect aquatic and riparian resources.

The mitigation measures for the special use permits will continue the existing outfitter-guide activity. There will be no increase in use so the present conditions are expected to continue to improve.

Monitoring of outfitter-guide activities will continue to ensure standards are met. If conditions appear they will exceed standards, the proposed outfitter-guide permits allows for the Forest Service to make appropriate changes in management so it meets aquatic and riparian standards and objectives.

In summary, the small localized effects of the proposed activity presently and those anticipated would not prevent maintaining current aquatic and riparian conditions or meeting the PACFISH objectives. The majority of streams and riparian areas are in excellent or near excellent conditions and those few areas with low to moderate use would continue to improve. These factors, taken in space and time with the overall trend in the watersheds, support the finding that these alternatives would meet the PACFISH Objectives.

Alternatives 2 and 3: Summary Effects to Aquatic Species:

Alternative 1 would have "no effect" on spring-run Chinook salmon, steelhead, bull trout, and "no effect" on critical habitat for spring-run Chinook salmon and steelhead.

Due to the distance from the outfitter guide activities to anadromous fish, Alternative 2 and 3 would result in "No Effect" to spring-run Chinook salmon and steelhead, and critical habitat for these species. These alternatives would have a "May Affect, Not Likely to Adversely Affect" to bull trout because of possibility of minor impacts to bull trout habitat in the Lost River and Wolf Creek areas. When guides, packstock, and clients access bull trout habitat, we expect some minor disturbance to habitat but not to the extent of harming bull trout.

Cumulative Effects

The geographic area for cumulative effects is the Methow River and Chelan watersheds. The temporal timeframe is the early 1900s through 2019, when the 10-year permits would expire.

Past, Present, and Reasonably Foreseeable Future Actions

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 Harts Pass area and in the Lake Chelan-Sawtooth and Sawtooth Backcountry. Cattle grazing have 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 in these areas is 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 5% in the future. In the Bear/Ramsey/Volstead area livestock grazing will be rested for at least another year to allow the burned 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 26% over the next 10 years. 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. Use on trails and at lakes would increase by about 26% 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.

It is expected that the Washington State Department of Fish and Wildlife will continue fish stocking of wilderness lakes depending on considerations for native aquatic species 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 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 the few impacted areas would likely have little improvement. Therefore, eliminating the existing outfitter guide use would not be meaningfully measurable or detectable and would have little to no cumulative benefit

Alternatives 2 or 3

Alternatives 2 and 3 would continue outfitter use with 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. Given the large size of the analysis area, over one million acres, compared to the little amount of impacted area, cumulative impacts would too small to meaningfully measure or detect.

There have been significant 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.

Overall, aquatic and riparian conditions would continue to maintain high quality conditions at the reach, 6^{th} and 5^{th} field scales as one would expect in wilderness and roadless 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. Therefore, the cumulative effects would little to no negative cumulative effect.

CONSISTENCY FINDING

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 number 7 beginning on page 2-12 would be effective in mitigating any potential effects. They would be part of the operating plans, with compliance required by the special use permit. Action 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) and Aquatic Conservation Strategy and PACFISH objectives at the 6th and 5th field watershed scale.

Standards and Guidelines

The aquatic and riparian Standard and Guidelines are met as follows:

Riparian

- Forest Plan 2-4 is met by mitigation measures 7a and 7b.
- Forest Plan 2-9 is met through current conditions and mitigation measures 2.b, 3.e, 3.f, and all measures under 7.
- Forest Plan 2-12 is met by current conditions and mitigation measures.
- Forest Plan 2-13 is met through current conditions and mitigation measures

Fisheries

- Forest Plan 3-1 is met through current conditions and mitigation measures.
- Forest Plan 3-4 and 3-5 are met through current conditions and mitigation measures.
- Forest Plan 3-6 is addressed by current conditions and mitigations measures.

PACFISH

- GM-3 is addressed through current conditions, alternative design, and mitigation measures.
- RM-1 through RF 3 are addressed by current conditions, alternative design, and mitigation measures.
- LH-3 is addressed through current conditions, alternative design, and mitigation measures.

Northwest Forest Plan

- GM-1, GM-2, and GM-3 are addressed through current conditions, alternative design, and mitigation measures.
- RM-1 and RM-2 current conditions, alternative design, and mitigation measures.

PACFISH Riparian Management Objectives

All the alternatives would be consistent with the PACFISH Riparian Management Objectives. To assess consistency with the RMOs, we described if the proposed project would maintain or restore healthy and functioning aquatic and riparian resources. The rationale for this determination is included in **Appendix M**.

Aquatic Conservation Strategy Objectives

All the alternatives would be consistent with the Aquatic Conservation Strategy Objectives. . The rationale for this determination is included in **Appendix L**.

Clean Water Act

A segment of the Methow River near Pateros, Washington is listed on the 303(d) list as impaired for water temperature. It is unlikely that the stream temperatures of this localized reach or at the 6th or 5th HUC scale will increase due to the proposed outfitter-guide activity, therefore, this project would be consistent with the Clean Water Act.

Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Consultation

Informal consultation on the proposed action with USDI Fish and Wildlife Service (FWS) is planned for June, 2008, in accordance with the regulations implementing the ESA, 50 CFR 402.14(b)(1). Due to the analysis area being above critical habitat for steelhead and spring Chinook, the project would be a no affect to these species.

All watersheds in wilderness and areas with few roads are nearly pristine condition; little to no restoration work is needed. The Upper, Middle, and Lower Methow, Upper and Lower Chewuch, and the Twisp River 5th field watersheds have more human impacts, especially the Middle Methow and Lower Chewuch watersheds. Past restoration efforts in these watersheds includes restoring fish passage, improving irrigation diversions, reducing riparian road miles, adding channel structure, reducing riparian recreation impacts, and restoring floodplain/side channel habitat. The proposed project does not include any restoration of streams or riparian vegetation in the few areas where moderate to low impacts occur; however, the mitigating measures and standard and guidelines for the project will allow these areas to improve over time. Areas with moderate use occur mostly around camps close to lakes and streams, and at a few stream crossings.

3.7 SOIL RESOURCES

The section below is a summary of the Soils Report which is available in the project analysis file (Davis 2006).

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 (> 20% reduction of soil bulk density);

- soil displacement—acres of “off-site” eroded soil material (eroded soil material buries grass or shrub root crowns);
- grazing practices trigger soil erosion—grazing utilization standards >50% and ocular evidence of surface and overland flow ;
- soil effects at stream crossings— acres 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.

ANALYSIS METHODS

Soil conditions were evaluated in terms of soil compaction, 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 measures were used. The soil scientist visited a sampling of impacted areas, and conducted compaction surveys, and gathered qualitative information about the soil condition.

Throughout this analysis, the best available 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

Historical Disturbance Factors

The volcanic ash soils in the analysis area have a level of resiliency, yet with prolonged or intense disturbance to surface vegetation, detrimental soil compaction, displacement, and erosion can occur. Current soil conditions will focus on 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 public and outfitters. Due to the level of historic and continuing use, these hardened campsites are still devoid of vegetation cover. Some of the camp areas predate the current Forest Plans and exceed current plan standards for compacted

bare mineral soil (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 most 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.

Presently no 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. This assessment will evaluate the affect of recreation livestock use and consider whether future outfitter-guide livestock use will continue.

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 occur 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 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 (OM) and nutrients at the soil surface (USDA Forest Service 2003a and Hungerford et al. 1991). The decline in OM 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.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

Soil Compaction

Soil compaction has occurred from historic sheep grazing. Old sheep driveways, trails, and camps have detrimentally compacted bare mineral soils. The level of compacted bare mineral soil in some existing camps exceeds Forest Plan standards and guidelines. Most of this detrimental compaction associated with historic sheep operations pre-dates land management planning. Soil bulk densities typically range from 1.0 to 1.2 grams/cubic centimeter in these sites. The increase in soil bulk density reduced soil pore volume which indirectly reduced plant vigor causing a decline of vegetation cover. This level of bulk density often restricts vegetation recovery. The normal range of bulk density of surface soils with volcanic ash normally range from 0.7 to 0.8 grams/cubic centimeter.

With Alternative 1, many camp areas and trails would continue to be used by the public. Most of the proposed permit areas draw a lot of public use, with the exception of Alta Lake and Bear/Ramsey/Volstead. The bare compacted soil in existing camps would likely remain in the existing condition due to this continued use. Based on field inspections, most camp sites are nearly flat with fairly dense adjoining understory vegetation. Little evidence of surface runoff or eroded soil was readily apparent, so no additional soil erosion would be expected. Surrounding vegetation would trap and stabilize any eroded material that did occur.

In the Pasayten Wilderness, total detrimental compacted bare mineral soil associated with pack and saddle camp areas is 5 acres, with 484 acres for existing system and non-system trails, 3 acres for old stock driveways, and 10 acres for moist/wet meadow areas. In the Lake Chelan-Sawtooth Wilderness, the total amount of detrimental compacted bare mineral soil associated with camps is 11 acres, with 224 acres for existing system trails, and 10 acres for stock driveways. Detrimental compaction of bare mineral soil from the other permit areas 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.

No additional mitigation or restoration would occur with this alternative. The public would continue using camp areas and user trails, consequently the total square feet of compacted bare mineral soil in camps, trails, and driveways would continue. Detrimental soil compaction in the 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.

Soil Displacement

Pack and saddle outfitter-guides would have no effect on soil displacement with implementation of Alternative 1. Non-outfitted pack and saddle stock use would have no 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. The overall level of detrimental soil displacement would be improved. Reducing livestock use would improve the current condition, however recovery would take a number of years.

Grazing Practices Triggering Soil Erosion

There would be no soil erosion triggered by pack and saddle stock outfitter-guide grazing with this alternative. Detrimental grazing effects from the general public could continue. Continued recovery of subalpine meadows is expected with a gradual increase in plant cover and flowering forbs.

Soil Effects at Stream Crossings

According to the Pasayten Wilderness Recreation Activity Review, 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. This campsite would still be used by the general public with implementation of Alternative 1, so recovery of the riparian vegetation is unlikely. 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.

Soil Erosion from Pack and Saddle Stock Watering Areas

Soil erosion from public pack and saddle stock use would continue at some wet soil/meadow watering areas. This erosion would not affect water quality beyond the isolated, local area due to relative small size and infrequent occurrence. The amount of soil erosion from pack and saddle stock watering areas in the Pasayten Wilderness would be less than two acres while in the Lake Chelan-Sawtooth and Sawtooth Backcountry there would be less than one acre.

Alternatives 2 and 3

Soil Compaction

The level of soil compaction would be similar to Alternative 1. Forest Plan amendments included in Alternatives 2 and 3 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. It is expected that over time, unused areas would recover with protective vegetation cover.

The total amount of compacted bare mineral soil in the Pasayten and Lake Chelan-Sawtooth Wilderness Areas would be similar to Alternative 1. When compared to the acreage of the entire areas, camp areas and trails would be inconsequential; normal hydrologic functions would not be impaired. There would be about 10 acres of compacted meadows, an effect that likely predates the Forest Plans. Continued pack and saddle stock grazing or even trailing through wet areas could increase the level of detrimental soil compaction. The mitigation measure that identifies travel routes in and around these wet soils and meadow areas would reduce the risk of soil compaction in these areas.

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 and 3 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

Most of long-term detrimental grazing effects such as trailing, driveways, terracing, and changes in vegetation composition is related to historic sheep grazing operations, which predates land management planning. The mitigation measures included in Alternatives 2 and 3 would minimize the possibility of detrimental grazing effects from outfitter-guide pack and saddle stock.

The mitigation measures included in "Vegetation and Soil" number 5 on page 2-11 would reduce impacts to soil. Travel routes would be identified to avoid wet areas and loose herd grazing practices would be encouraged. The implementation of these measures would substantially reduce the possibility of detrimental grazing effects from outfitter-guide stock.

All of the previously stated grazing design and mitigation measures are intended to disperse grazing animals, only allow grazing when soil and plants can withstand use, limit grazing in degraded areas, and limit the level or intensity of grazing use. Overall, these measures would limit the risk of concentrated pack and saddle stock use.

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 stream crossings would be similar to those of Alternative 1. Most stream banks are well-vegetated, stable, and meet Plan standards and guidelines. Alternatives 2 and 3 would not further degrade existing stream crossing stream banks 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 increase approximately 1% with Alternative 2, and would decrease 3% with Alternative 3.

Some localized stream crossings have been detrimentally degraded by past activities. There is a large camp that has degraded riparian vegetation along the stream flowing into Remmel Lake. This campsite would still be used with implementation of Alternatives 2 or 3, so recovery of the riparian vegetation is unlikely. The same would be true for other crossings in the analysis area. Due to the isolated nature, soil erosion at these crossings would not cause degraded water quality beyond the immediate area.

The mitigation measure requiring travel routes for pack and saddle stock outfitter-guides through wet soil/meadows would help reduce soil damage at stream crossings.

Soil Erosion from Pack and Saddle Stock Watering Areas

The overall level of soil effects at stream crossing would be similar to the effects of Alternative 1. 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 would be identified to avoid wet soil and meadow areas. This measure would substantially reduce soil trampling damage resulting from pack and saddle stock outfitter-guide activities.

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. The temporal boundary is from the early 1900s through 2019, when the 10-year permits would expire.

Past Actions

Historic sheep operations in the early 1900s that predated land management planning have had some lasting effects in the analysis area. Old camps, trails and stream crossings are still being used today by the general public and permitted outfitter and guide operations. Often the old camp areas exceed current standards and guidelines for the allowable area of bare, compacted soil. Old sheep driveways are still apparent in the upper elevations. These driveway segments are denuded and it will take years before some areas recover with natural vegetation. Most of the driveway segments in forested environments are no longer used as travel routes and are beginning to recover with litter, downed trees, and emerging vegetation. Trailing paths and terraced landscapes are prominent in most subalpine and alpine meadows. Wildlife continues to use these paths and terraces; it is likely these features remain as permanent fixtures in meadows.

With the reduction of historic sheep numbers, 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. 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 are 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. These operations are relatively recent and at a small scale. Grazing is closely monitored as required by allotment management plans and little detrimental soil disturbance has been observed.

Natural and human-caused wildland fires are natural processes in the analysis area. Vegetation communities have evolved across the landscape largely due to the presence of fire. Natural fires are partly responsible for the maintenance of the large expanse of meadows in the subalpine regions of the analysis area. Dense seral stands of lodgepole pine are common in the mid- to high-elevation areas. These stands are maintained by 60-100+ year fire intervals, while relatively frequent fires help create and maintain park-like ponderosa pine and Douglas fir stands in lower elevations (see analysis file for Wildland Fire Regimes of Oregon and Washington).

About 100 years ago, management practices disrupted the natural role of wildland fires. Past activities including grazing, vegetation manipulation, and fire suppression have altered vegetation structure which then alters natural fire regimes (Everett et al. 2000). The effect of altered natural fire regimes has very likely increased the severity of current wildland fires in the analysis area. Over 380,000 acres have burned in the last 5 years with a range of fire intensity. In areas with high severity fire, mortality was high and surface fire temperatures were lethal enough to remove fine litter duff and volatize organic matter and nutrients in at the soil surface. In these high severity areas the drastic decline in organic matter content in forest soils has a long-term effect of reducing nutrient capital for at least 30 years.

Much of the lower elevations surrounding the western slopes of the Lake Chelan-Sawtooth Wilderness have burned in the last 5 years. This burn pattern will reduce the short-term probability of fires burning upslope from Lake Chelan and spreading to the wilderness. Over 150,000 acres have burned in the Pasayten Wilderness in the last 5 years. High severity fire effects in Andrews and Farewell Creeks will continue to elevate the risk of debris slides in these two watersheds. Smaller wildland fires have occurred in the lower elevations of the analysis area. These fires were generally low to moderate severity and detrimental soil disturbance has not been observed.

Timber harvest activities have occurred mainly in the lower elevations of the Methow Valley. These activities typically removed large ponderosa pine trees and built a number of access roads. These roads provided access to the existing trail heads in the area. Harvest operations and road construction resulted in soil compaction, erosion, and damage in isolated locations.

Present Actions

Permitted livestock grazing permits are being implemented and managed according to Forest Plan standards and guides. Annual grazing inspections ensure that forage utilization is not exceeded. These permitted livestock operations are implemented with appropriate soil quality mitigations measures.

Wildland and human-caused fires will likely continue with increased fire severity. There will be isolated areas of soil damage resulting in erosion loss of organic matter.

Timber management actions continue but have limited detrimental soil disturbance. These timber harvest activities are implemented with appropriate soil quality mitigation measures. Soil hydrologic functions and process will also not be adversely altered

Reasonably Foreseeable Future Actions

Livestock grazing is expected to continue into the future in some portions of the analysis area, with little detrimental soil disturbance. Prescribed landscape burning will also continue. These prescribed burns are designed and implemented with low fire severity and no detrimental soil disturbance effects are expected.

Wildland fires will occur in the future. High severity fires in the *Glacial Trough Landform Group* are expected to dramatically increased 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 will also continue. The fireline will be rehabilitated, but some erosion will 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. Adverse "off-site" sedimentation is not expected from these fire lines.

Other management actions are not expected to trigger detrimental soil effects. Most land management treatments are planned with soil design measures that reduce the risk of detrimental soil effects.

Summary for Alternatives 1, 2, and 3

The cumulative soil effects of Alternative 1, 2, and 3 and all past, present, and reasonably foreseeable future actions are essentially the same. The cumulative differences between these three alternatives are so slight that the magnitude of difference is immeasurable. Hence, all three alternatives are evaluated together.

The cumulative effects of any of the three 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 be a small portion of the analysis area. On-site soil disturbance would not 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. The level of detrimental soil disturbance evaluated at the watershed scale is immeasurable.

Other past, present, and reasonably foreseeable future actions listed at the beginning of Chapter 3 of this document would not cumulatively cause detrimental soil disturbance to exceed 20 percent of the analysis area or the area used by outfitter-guide operations. Including proposed mitigation, there would be a net improvement for soils over the analysis area as a whole.

CONSISTENCY STATEMENTS

All alternatives would be consistent with Regional policy and Forest Plan standards and guidelines for achieving soil objectives. The proposed Forest Plan amendment for Alternatives 2 or 3 would enhance soil resource protection. As an example, existing areas of detrimental soil disturbance at campsites and trails would be used on successive trips. Additional detrimental soil disturbance from proposed action would be mitigated with various measures described in Chapter 2.

3.8 RANGE RESOURCES

The section below is a summary of the Range Report which is available in the project analysis file (McFetridge 2008a).

REGULATORY FRAMEWORK

The Okanogan National Forest Land and Resource Management Plan (USDA Forest Service 1989b) established management goals. The most pertinent goal to range management is: to intensively manage range resources to achieve a high level of range outputs while protecting the basic productivity of the land and providing for the production of wildlife, recreation opportunities, and other resources (Management Area 25, Page 4-103). Regarding the proposed action, the objective of range management is to protect resources and continue the management of the affected 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.

ANALYSIS METHOD

The geographic boundary for range is the analysis area plus the area of all grazing allotments that overlap outfitter-guide activities (active trailheads, trails, camps). The temporal boundary is the period of time from the 1900s through 2018.

This analysis assesses the effect of the proposed actions on six livestock grazing allotments and the effect of current and historic grazing. 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 on the project area compared to the level of current impacts.
- The effects of outfitter-guide pack and saddle stock and 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.

Throughout this analysis, the best available 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

There are no permitted livestock (cattle or sheep) grazing in the Pasayten Wilderness, Lake Chelan-Sawtooth Wilderness, or the Sawtooth Backcountry areas. All prior allotments are vacant, closed, or going through the closure process.

The Bear/Ramsey/Volstead, North Cascades, Middle Methow, and Alta Lake areas have some level of 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 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. There is virtually not 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.

Permitted Livestock Grazing within the Project Area

The following are brief descriptions of the livestock grazing allotments that 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). 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, 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.

Ramsey Allotment is 12,312 acres with three pastures. Currently the permit 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 (9,626acres) and the Lost River (3,291 acres) watersheds. There are two grazing permittees on the allotment.

Currently the permit allows 170cow/calf pairs to graze from June 1 to September 30 every year, which equals 669 cow months or 883 animal unit months (AUM). One permittee has a permit for 126 cow/calf pair and the other has a permit for 44 pair. The second permit (44 pair) has been in non-use for 3 years.

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.

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 only the Falls Creek pasture in the project area, this is in the Little Falls Creek watershed.

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 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.

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 has been in non-use since 2000 with partial use in 2003. This permit will likely be waived back to the Forest Service in 2008. 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.

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. The allotment boundary includes several sections of land but only the bottom of the coulee is grazed by the 25 cow/calf pair. The coulee bottom is grazed in conjunction with permittee private land to the south. There is a division 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.

Pack and Saddle Stock Grazing within the Project Area

The pack and saddle stock outfitter-guides currently are allotted 270 Animal Unit Months (AUM) in the analysis area. This is noticeably lower than the 6,464 AUMs grazed by livestock in the recent past (1960s), and substantially lower than the 15,000 AUMs allotted to the area in the early to mid 1900s.

Pasayten and Lake Chelan-Sawtooth Wilderness Areas:
There are no permitted cattle in the wilderness or backcountry areas of the analysis area. A portion of the 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 an estimated total of 1,550 acres affected by pack and saddle stock grazing in the Pasayten Wilderness and 375 acres affected in the Lake Chelan-Sawtooth Wilderness. All of the affected area is directly associated with the 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 no effect on natural plant succession. The amount of grazing impact is highest at the camps and decreases the farther one moves away to the point of no impact. Stock can travel up to two miles from camps to graze, but the majority of the grazing occurs near the campsites.

Upland Forage associated with established outfitter campsites is meeting Forest Plan utilization standards on all wilderness range with the exception of a few spots where there is localized high use is exceeding 60%. These relatively small areas 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. These infrequent spots occur in spite of Forest Service administration and outfitter-guide efforts to implement best management practices. Current wilderness forage use by outfitter guide stock is well below recent historic use levels permitted within wilderness livestock grazing allotments (see Past Actions). The highest levels of outfitter-guide and general public pack and saddle stock use are at the Remmel/Spanish Camp and the Sheep Mountain areas.

Wilderness Riparian Areas are currently meeting Forest Plan forage utilization standards including standards for streambank alteration (Cowley et al. 2006). There is limited use by outfitter stock in wilderness riparian areas with the exception of a few spots where there is localized disturbance. These 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.

Extensive monitoring of livestock impacts to similar riparian areas within grazing allotments on the Methow Valley Ranger District has shown that the measurable impacts are often associated with watering sites and crossing areas; impacts outside of these areas are typically light and the area of impacts is small relative to the total length of riparian area. Forest Plan riparian grazing

standards are generally met in grazing allotments. The areas of highest impact in the allotments are areas where road placement, past timber harvest activities, and fence locations combined with water access and steep topography results in the virtually unavoidable concentration of animals where allowable use levels can be exceeded. The potential for a similar level of concentrated impacts by pack and saddle stock in the wilderness riparian areas is low.

Outfitter-guide stock forage utilization monitoring was conducted in the Pasayten Wilderness on September 24-27, 2001 by the Methow Valley Ranger District Range Management Specialist. The following notes are from that trip:

Spanish Camp: North of the cabin there is no grazing use along the creek, or away from the trail.

Airplane Ridge: The camp is below the ridge. Plants outside the utilization cage were lightly grazed, and not much different in height from plants inside the cage. Grazing looked minimal; sedges and low willow at the nearest livestock watering spot on Beaver Creek showed only where the horses came and left. There was a small site of hoof shear less than five feet across.

Sheep Mountain: This camp has light grazing use (<20-30% of mean annual production) in the immediate vicinity. There was little to no grazing use on Sheep Mountain, just a few bites out of the *graminoids*.

Cathedral Lakes: Looked at biological crust and did not see hoof shear effects on bryophytes or cryptograms.

Cathedral Drive: The effects of past sheep band grazing are still evident. There are long-term effects of the sheep browsing on willows along the trail. Routes where sheep bands regularly grazed could still be seen from high vantage points. The shortened growing season extends the needed time for recovery on these plants.

Remmel Lake: observed effects of past camps which where previously on the lake shore. These sites had some bare soil patches yet, and an influx of native strawberry- which does quite well as a pioneer native species. Some of the hairgrass was starting to come into these sites. The uplands, and passes between these lakes didn't show much if any grazing use.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

This alternative would have no pack and saddle stock outfitter-guide recreation use in the wilderness and back country on the Methow Valley, Chelan, or Tonasket Ranger Districts. This would result in a 5% reduction in the number of pack and saddle stock users in the analysis area. No AUMs would be used by outfitter-guides.

Outfitter-guides would not use the forage needed to support pack and saddle stock. 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 the stock would be negligible and have a minor effect on forage availability for permitted livestock grazing.

Alternatives 2 and 3

Under Alternatives 2 or 3, only areas where outfitter stock remain at campsites would have grazing impacts to the range resource. Within the non-wilderness backcountry areas only drop camps are used where there are no pack and saddle stock grazing impacts. In addition to the general public pack and saddle stock, the outfitter-guide stock would use the forage at the camps and the surrounding areas. The 4,620 service days associated with pack and saddle stock outfitter-guides in Alternative 2 would be a slight increase compared to the current amount of use. Alternative 3 would reduce the outfitter-guide visitor days to 2,660; an 3% reduction from current levels. Alternative 2 would allow 270 AUMs for the outfitter-guide use. Alternative 3 would include 150 AUMs.

The amount of forage use and resource impacts would be less than or similar to that of the recent past. Outfitter-guides would be using all existing trails and camps, and no new camps or trails would be developed. A negligible amount of the available forage within the livestock grazing allotments would be grazed by the outfitter-guide stock. The amount of outfitter-guide use proposed in Alternatives 2 and 3 would not reduce the amount of forage available for permitted livestock within the analysis area. The areas where there is dual use by cattle and by outfitter-guide stock is limited and any combined use has not contributed to exceeding allowable use standards or negatively impacted resources. Outfitter guide stock forage utilization is well within allowable use standards with the exception of the localized areas of high use associated with the camps. 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 grazing allotment stocking rates.

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 and Chelan Ranger Districts.

Past Actions

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 area. 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 exist today as Forest Service system trails. Other 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.

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.

Compared with sheep, cattle operations are more recent and more closely monitored by the Forest Service. Currently the only active cattle allotments in the project area are the Ramsey and Alta allotments. Grazing is closely monitored for grazing utilization. No detrimental grazing practices have been documented on the currently active allotments.

Sheep camps and trails were established by the sheep grazing operations. Outfitter-guides utilized old existing sheep camps and trails.

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) 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 Colman 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 opened 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 and that the Horsethief Basin area first received use by sheep in 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 the present. The season of use was May 15 to October 15 then shortened to September 30 in 1946, and in 1951, the present season of June 1 to September 30 was established. This allotment has not been grazed since 2003. 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. Only the cattle 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 badly abused. In 1930 the entire Wolf Creek drainage was included in the Wolf Creek Cattle Allotment and grazed until the wilderness portion was waived 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. There were 1,070 AUMs in this area before the permit was reduced in 2000.

The history of 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.

Bear/Ramsey/Volstead

The Ramsey Creek Allotment has been used by cattle since about 1900; it includes the Ramsey, Pearrygin, Bear, and Cougar Creek drainages. The area was heavily grazed from1906 to 1920. This allotment extends along the Forest boundary for 10.5 miles and was joined by a large number of homesteaders; 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 outside 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 the abandoning of homesteads. 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 322 AUMs in this area.

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 from1965 to the present. There are 912 AUMs in this area.

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 ever 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.

Reasonably Foreseeable Future Actions
All vacant allotments within the Pasayten Wilderness Area, Lake Chelan-Sawtooth Wilderness Area, and the Sawtooth Backcountry project areas are scheduled to be closed by 2010. Permitted livestock grazing will continue outside of wilderness. There are no future plans to restock the currently vacant allotments.

Cumulative Effects Summary

Alternatives 1, 2, and 3

There would be no cumulative effect of any of the alternatives and the past, present, and reasonable foreseeable future actions. Presently no grazing is authorized in the historic sheep ranges in wilderness and backcountry areas. All of the grazing allotments 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. Livestock grazing would continue outside of the wilderness. 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. Range management techniques such as numbers of 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.

Outfitter-guides will continue to use camps established by old sheep grazing operations and continue to use existing trials created for livestock access.

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 grazing allotment stocking rates.

CONSISTENCY STATEMENTS

Action alternatives would be consistent with the amended Forest Plans. Livestock grazing would be managed to limit resource impacts to consistent with Forest-wide standard and guidelines for range planning and improvements. The proposed Forest Plan amendment would provide minor range resource benefits by limiting camp site impact areas. All alternatives would be consistent with other laws, regulations, and direction.

3.9 INVASIVE PLANTS

The section below is a summary of the Invasive Plant Management Analysis which is available in the project analysis file (McFetridge 2008b).

REGULATORY FRAMEWORK

This analysis conforms 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, the *Okanogan and Wenatchee National Forests Weed Management and Prevention Strategy and Best Management Practices* (USDA Forest Service 2001b), the *Guide to Noxious Weed Prevention Practices* (USDA Forest Service 2001c) that supports the February 3, 1999 Executive Order on Invasive Species, and the *National Strategy and Implementation Plan for Invasive Species Management* (USDA Forest Service 2004c).

This analysis also addresses the *Record of Decision of the FEIS for Managing Competing and Unwanted Vegetation* (USDA Forest Service 1988), hereafter referred to as the 1988 R6 FEIS, as supplemented by the Mediated Agreement (Northwest Coalition for Alternatives to Pesticides, *et al.* v. Clayton Yeutter 1989). The portions applicable to the proposed action include the standards set forth by the new 2005 PNW ROD (USDA Forest Service 2005a) and an evaluation of the prevention strategy required in the Mediated Agreement (see analysis file).

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.

The Okanogan and Wenatchee Forest Plans each require a prevention emphasis on noxious weed control.

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. 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. 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) including invasive plant treatments for current outfitter-guide activities. 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:

- 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 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.

Throughout this analysis, the best available 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

Three categories of invasive plant populations are present in the analysis area. Categories are used to prioritize inventory and treatment of invasive species:

- "Established Invaders" are those species whose population levels and distribution are such that seed production cannot be prevented.
- "New Invaders" are species that occur sporadically on the Forest and that may be controlled by preventing seed production and early treatment;
- "Potential Invaders" are species that occur on lands adjacent to the analysis area but have not been documented on lands administrated by the Forest. However, the potential for infestation is imminent as described in the *Okanogan National Forest Integrated Weed Management Environmental Assessments* (1997 and 2000 Weed EAs, USDA Forest Service 1997e and USDA Forest Service 2000d).

Figure 3.9-1. Established, New, and Potential Invaders in or adjacent to analysis area.

Established Invaders:	New Invaders:	Potential Invaders:
bull thistle	whitetop	*sulfur cinquefoil
Canada thistle	Russian knapweed	yellow hawkweed
common mullein	common crupina	*orange hawkweed
dandelion	common tansy	Japanese knotweed
cheatgrass	oxeye daisy	
lambsquarters	spotted knapweed	
tansymustard	dalmatian toadflax	
dwarf mallow	houndstongue	
common plantain	Scotch broom	
white clover	diffuse knapweed	
field bindweed	St. Johnswort	
common mullein		
yellow salsify		
crane's bill		
prickly lettuce		
bulbous bluegrass		

*Bear/Ramsey/Volstead subunit only

The analysis area contains a moderate potential for spread of potential and new invaders from adjacent private and state lands.

Figure 3.9-2. Existing New Invader Noxious Weed Characteristics.

SPECIES	CHARACTERISTICS
diffuse knapweed Centaurea diffusa	An annual or short-lived perennial; highly competitive.
spotted knapweed Centaurea maculosa	A short-lived perennial; tolerates shade; spread by vehicles, wind, animals; highly competitive.
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.
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.
Canada thistle Cirsium arvense	A creeping perennial; established slowly; difficult to control because of rhizomes and from sprouting root buds; prolific seed producer; seeds dispersed by wind/water in late summer and fall; seeds can survive in soil up to 22 years depending on the depth of burial.
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.
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.
dalmatian toadflax Linaria dalmatica	A perennial reproducing by seed and rhizomes; it is aggressive on roadsides and rangeland; difficult to control.
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.
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 and is commonly found on roadsides, fence rows, pastures, stream banks and waste areas.
common crupina Crupina vulgaris	A Washington State Class A Noxious weed; A fall germinating annual, primary habitat is southern slopes in steep canyon grasslands; 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.
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.
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.

SPECIES	CHARACTERISTICS
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.

Figure 3.9-3. Equivalent State and County weed board classification and strategy for treatment.

Forest Service Classification	State and County Classification	Strategy for Treatment
New Invader or Potential Invader:	”A”	Prevention, Early Treatment and Eradication
New Invader:	Class B, “B-designate”	Prevention, Early Treatment and Correction
Established Invader:	”B” and “C”	Prevention, Containment, Maintenance, Correction, No Action

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.

Half of the invasive plant species in the analysis area that occur on the Methow Valley and Chelan Ranger Districts have been approved for herbicide use under the1997 and 2000 Integrated Weed Management EA Decision Notices and the 2003 Crupina Integrated Weed Management EIS Record of Decision. The remaining species are subject to manual control treatments. The larger dalmatian toadflax and diffuse knapweed populations have warranted using bio-control agents.

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). 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 current 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

New Invaders

These weeds are minimal; there is currently one outfitter-guide camp with a new invader noxious weed population. 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. The new invader weeds with the highest risk of establishment are whitetop, oxeye daisy, and orange and yellow hawkweed. The areas with the highest potential for new introduction and spread are the lower elevation trails associated with trailheads with established weed populations.

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 (an assigned site) but there is a large patch near the corral and plants are scattered through the trailhead area. The 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 has not yet established.

Noxious weed information and analysis for the following sites has been conducted through the 1997 and 2000 Weed EAs, the 2003 Crupina EIS, and through recent inventories for this project. **Figure 3.9-4** lists trailheads associated with the analysis area that have new invader weed infestations.

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

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	25	233
	*diffuse knapweed	12	692
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	18	66
	*diffuse knapweed	17	595
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	33	202
	*diffuse knapweed	10	282
North Cascades Highway	many species	Numerous roadside	600+
Alta Lake	Russian knapweed	2	3
	dalmatian toadflax	4	436
	Total	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 are not affected by outfitter-guide activities (see below under Potential Invaders). 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.

Pasayten Wilderness

Currently the only weed population in this area was a whitetop site at Black Lake. The site was buried by the debris of a mud slide after the Farewell fire of 2003; it is not likely to re-establish. There are three known new invader sites on trail systems beyond the trailheads. 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. 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.

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, 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 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 Slate Creek trailhead and associated horse corral 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 moderate to high 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; the area has well-established populations of noxious weeds. Common tansy, 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 are under treatment. 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. The dalmatian toadflax is currently being treated under 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 continues 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. Many of the established invaders are present in the disturbed areas. There are three acres of Russian knapweed and 436 acres of dalmatian toadflax.

<u>Established Invaders</u>

Lower-priority established invaders occur throughout the analysis area. These weeds are found Forest-wide and generally not site-specifically inventoried.

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*). It appears these species are restricted to the most hardened and disturbed sites, but their persistence and potential for spread is not fully understood in these high elevation environments.

Lake Chelan-Sawtooth Wilderness
Established Invaders include Canada thistle (Cirsium arvense) field bindweed (*Convolvulus arvensis)*, and common mullein (*Verbascum thapsus*). Many non-native, undesirable species are found along trails: 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 current outfitter-guide activities. As these small sites are isolated from most of the analysis area, they are classified as potential invaders. These sites were surveyed and mapped with treatment planned. 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.

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.

ENVIRONMENTAL CONSEQUENCES

Direct and Indirect Effects

Alternative 1

The trailheads, corrals, trails, and camp sites would continue to be used by the general public but by less vehicle traffic and stock than in the past. There would be 5% less pack and saddle stock traffic in the analysis area with this alternative compared to the current condition. Introduction and spread of noxious weeds by outfitter-guide and associated vehicles would not occur. There would be a lower rate of weed spread and introduction expected, however less recreation administrative activities would occur which would reduce the degree of new weed recognition and reporting. This would result in longer weed establishment time frames and larger infestation sizes prior to initial treatment

There is one assigned corral and campsite in the Middle Methow subunit at Crater Creek. Other assigned corrals are at Andrews Creek and Billygoat in the Upper Methow, Slate Creek in the Middle Methow, and Fish Creek Camp in the Lake Chelan-Sawtooth Wilderness. Outfitter-guides would not use the corrals needed for pack and saddle stock. Less administration and

maintenance at these locations would contribute to more weed establishment and less weed detection.

With fewer stock and people using an area, some vegetation recovery is expected. The general public would continue to use areas, so disturbance at these sites would continue. However, even with less stock, inexperienced stock or stock handlers could result in greater resource damage to an area than would occur with a more experienced outfitter-guide. The risk of invasive introductions would continue with the general public use, but to a lesser degree because of fewer overall stock using the trails and campsites with a lower rate of spread and introduction expected.

Alternatives 2 and 3

Introduction and movement of invasive species transported by animals would continue. Stock as well as hikers have the potential to further spread weed species into wilderness and elsewhere where suitable habitat exists. The mitigation measures listed under #8 on page 2-12 would minimize the potential establishment and spread of noxious weeds in the analysis area.

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. 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 above 4,000 feet and are suspected to do well at higher elevations and in colder climates where most outfitter-guide activities occur.

Along with designated trailheads, points of entry into the backcountry and wilderness areas are also the same entry points used by the public. The greater number of trail miles and greater number of stock associated with outfitter activities would increase the potential introduction and spread of invasive species. The current outfitter-guide use is 4,083 days. This number would be increased in Alternative 2 to 4,620, and reduced to 2,660 in Alternative 3 (35% reduction from current level). The potential for introduction and spread would be less than or similar to that of the existing condition. Outfitter-guides would use existing trails and camps; no new camps or trails would be developed.

Under the 2005 PNW ROD (USDA Forest Service 2005a) there is direction that prohibits the possession or transporting of processed feed or hay on National Forest System Lands unless it is certified weed free. Outfitters typically use processed hay when feeding stock in the backcountry or turn animals out to 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 unless it is fed certified weed free feed for several days before entering the backcountry. There is a similar risk associated with stock used by the general public. It is expected that the potential for

new weed introduction and spread through pack and saddle stock manure would be higher than Alternative 1 because of the larger number of pack and saddle stock in the analysis area.

As mitigation, a noxious weed Identification and mapping program will be designed specifically for pack and saddle stock outfitter-guides. This program will be in coordination with the District invasive plant specialist. It is expected that the implementation of this program will increase the number and distribution of people able to recognize potential new invaders. Implementation of the Prevention and Management Strategy 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.

The Forest Plan amendments included in Alternatives 2 or 3 would also help control the potential spread of invasive plants by limiting the barren core areas in outfitter-guide wilderness campsites.

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 as presented in the analysis area map, and the temporal boundary is the period of time from the early 1900s through 2020.

Past Actions

Livestock grazing introduced and spread invasive plants in the analysis area in the past. Numerous 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 livestock, recreationists, and outfitters. Ground disturbance at the sheep camps, along trails, and stock driveways created areas of disturbed soil suitable for weed introduction and establishment.

Logging activity started in the 1950s. Secondary roads were completed in the 1960s and 1970s in conjunction with timber sales through the 1990s. An increase in recreation and cattle use followed. Road construction increased motor vehicle and livestock access to the edge of wilderness. This opened portions of the analysis area to the potential for weed introduction through dispersal of weed seed on motor vehicles and livestock. Ground-disturbing logging activities, fuels treatments, and recreational activities all created areas of disturbed soil suitable for weed introduction and establishment.

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 increased the potential for weed establishment and spread in the analysis area.

Present and On-going Actions

Invasive plant treatment and surveys will continue to be conducted in the Lake Chelan side of the Lake Chelan-Sawtooth area as part of the Slick Creek Fire BAER treatment plan. More acres were surveyed in 2008 for common crupina. 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. Common crupina occurs in a wide range of habitats in the Pacific Northwest, but the primary habitat is southern slopes on steep canyon grasslands. Crupina infests sites where cheatgrass, wheatgrass, and arrowleaf balsamroot occur and is associated with ponderosa pine and Douglas fir. It is a Mediterranean weed and it is not likely to invade into the subalpine habitat types and unlikely to spread into the higher elevation outfitter-guide camp activity areas above 3500 feet. The treatment strategy will further reduce the risk of spread into this area.

Invasive plants treatment and surveys will continue to be conducted in Bear/Ramsey/Volstead area as part of the Tripod BAER treatment plan. More acres will be surveyed in 2008 for orange hawkweed.

Aggressive weed surveys and treatment have been conducted at trailheads over the past two years and have been a priority for the past 10 years. Virtually all the new invader weed sites at trailheads were detected early and crews were able to respond rapidly for treatment. This early treatment strategy has been effective in reducing the trailhead weed populations, and in some cases, to the point of local eradication. The exception to this is the oxeye daisy at the Billygoat trailhead where there has been no apparent reduction in population with manual treatments. The strategy was to contain the population with hand pulling as the entire population is close to a stream and beaver pond area. With the implementation of the Region 6 FEIS for Managing Competing and Unwanted Vegetation through a Forest-wide EA (to be implemented in 2009), new management strategies will be available for controlling weeds in riparian areas.

All new invader sites are currently under an aggressive treatment strategy to contain, reduce, or eradicate the populations. Herbicides will continue to be used in areas approved under the1997 and 2000 Integrated Weed Management EA (USDA Forest Service 1997e and USDA Forest Service 2000d) Decision Notices and the 2003 Crupina Integrated Weed Management FEIS (USDA Forest Service 2003b) Record of Decision. 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 (IWM) 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.

Livestock can transport weed seeds across the landscape with dispersal into disturbed areas. Given the existing low noxious weed densities in the analysis area, and that there are virtually

no areas where outfitter-guide activities occur in livestock (cattle or sheep) grazing areas, the likelihood of cattle facilitating dispersal of noxious weeds is low.

Reasonably Foreseeable Future Actions

It is foreseeable that all current weed management activities will continue in the future and that these efforts will locally eradicate or control many populations and reduce the risk of spread. A Forest-Wide EA will be completed in 2011 to cover a majority of the analysis area that is not currently covered by a decision document for herbicide treatment. The actions allowed by the new EA will help control the spread and establishment of invasive plants in the analysis area.

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. Current disturbances would continue to provide sites suitable for weed establishment. Control of existing weeds would continue to occur under the existing IWM decisions which would result in reductions in weed populations. A Forest-wide EA is planned for 2011; the decision would likely help to control the spread and establishment of invasive plants in the analysis area. 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 the1997, 1999 and 2000 Weed EA Decision Notices and the 2003 Crupina EIS Record of Decision.

The cumulative effect 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 weed prevention awareness by recreationists, including on-going weed management, weed populations would be reduced.

Alternatives 2 and 3

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 EA is planned for 2011; the decision would likely help to control the spread and establishment of invasive plants present in the analysis area. 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 the1997, 1999 and 2000 Weed EA Decision Notices and the 2003 Crupina EIS Record of Decision. With implementation of mitigation measures included in Alternatives 2 and 3, 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.

The cumulative effects of Alternatives 2 and 3, and 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 STATEMENTS

The proposed action is consistent with the both the Okanogan and Wenatchee Forest Plans that contain management direction for invasive species that is focused on the strategy of weed prevention. Compliance with the pertinent prevention standards listed in the 2005 PNW ROD (USDA Forest Service 2005a) are addressed in the discussions of the mechanisms of invasive species spread, prevention measures, and the risks that remain after implementation of the prevention measures. Proposed amendments to the Okanogan and Wenatchee Forest Plans would improve prevention measures.

3.10 Heritage Resources

The section below includes information included in the Heritage Program Appendix B Project Documentation Report (Dowie and Lenz 2008).

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 significance, 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)

- 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 (IV-66).
- Evaluate the significance of inventoried sites by applying the criteria for eligibility to the National Register of Historic Places (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).

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.

Tribal Consultation

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 affects 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 (see **Map 1-1** on page 1-2). 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.

Because of the acreage involved, field survey specific to this undertaking was limited to a sample of outfitter campsites located in readily accessible high site probability areas. The survey was guided by the site survey model used on the Okanogan-Wenatchee National Forest. 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. The objective of the sample reconnaissance is to locate all extant archaeological resources that may reasonably be detected from an inspection of ground surfaces. All campsites, except the Hootowl site are within high probability areas because of proximimity to perennial water and slopes less than 15 percent.

AFFECTED ENVIRONMENT

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 (Dowie and Lenz 2008). Because of the acreage and large number of sites involved, the survey model was applied to this project by surveying all assigned sites, on which all use is solely attributed to outfitter-guide operations, and surveying a sample of primary outfitter campsites located in readily accessible high site probability areas. Remaining high-probability sites are also used by non-outfitter recreationists with on-going monitoring being prioritized for future surveys.

All of the sites are associated with historical sheepherding, mining, hunting, trapping, recreation (trail shelters) or fire suppression (former lookout sites). Other than the can dumps, no 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 is no longer within the APE.

There are known sites located in the general vicinity of the camps frequented by pack and saddle stock outfitter-guides, but not within the camps. Outfitters may ride by or stop and look

at such sites but such activity should have no significant effect on the sites. Historic cabins at the Airport and Hidden Lakes are in close proximity to campsites 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. Outfitter use in the vicinity of the Airport and Hidden Lake structures is confined to adjacent camp areas, non-historic hitchrails, and the picnic shelter. The outfitter use of the picnic shelter is incidental compared to use from the non-outfitted public.

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 and 3

Neither of these alternatives would affect cultural resources based on the fact that there is currently no indication that they are being affected by present pack and saddle stock outfitter-guide activities. Pack and saddle stock outfitter-guide visitor days would be approximately 2% of overall use in Alternative 2, and 1% of overall use in Alternative 3. Although there are numerous identified cultural resource sites in the analysis area, it is unlikely that outfitter-guide activity would affect cultural resources any more than the activities by the recreating public. Therefore impacts attributed to permitted activities would be considered negligible. In particular, outfitter-guide activities would be less likely to affect cultural resources than the recreational activity of the non-outfitted public because the following resource protection clause would be part of all operating plans, and compliance with all clauses would be required under the special use permits:

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.

Cumulative Effects

The area considered for heritage resources cumulative effects analysis consists of the Area of Potential Effect, described above. 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. 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.

Alternative 1

There would be no cumulative effect from this alternative because there would be no action to analyze in combination with all past, present, and reasonably foreseeable future actions.

Alternatives 2 and 3

The cumulative effect of all past, present, and reasonably foreseeable future actions, and Alternative 2 or 3 would be a slight potential of damage to cultural resources, which would be minimized by the requirement for outfitter-guides to protect cultural resources.

CONSISTENCY STATEMENT

In both action alternatives, the consideration of effects to heritage resources is consistent with Forest Plan standards and guidelines. Consultation with the Yakama Nation and Confederated Tribes of the Colville Reservation has been completed. 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 will be excluded from case-by-case review by SHPO.

3.11 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.

Throughout this analysis, the best available 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.

Inventoried Roadless Areas and Unroaded Areas

The analysis area includes portions of, and entire Inventoried Roadless Areas and other unroaded areas. The Okanogan-Wenatchee National Forest is completing a 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.

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. 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 DEIS meet that direction is included in the discussions above in Chapter 3. The analysis documented in this Draft EIS meets the National Environmental Policy Act of 1969 and its implementing regulations and Forest Service policy, 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 ASHP, Washington State Historic Preservation Officer (SHPO), and Region 6 of the US Forest Service.. The project meets the conditions listed in Appendix B of the Programmatic Agreement and will be excluded from case-by-case review by SHPO.

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, contribute to a trend toward federal listing, nor 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. Consultation with the regulatory agences will be completed prior to the signing of the Record of Decision.

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 identified PM10 (coarse) particles are 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. The Pasayten Wilderness is the only Class I airshed in or near the analysis area.

Smoke from campfires in the Pasayten 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 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 .

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 wiithin one-quarter mile of the river, but maintenance of the corral would not affect future potential designation under the Wild and Scenic River system.

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 47 camps within 500 feet of wetlands, and approximately 117.4 acres of wetlands would be potentially affected by this project. The 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 1.4% of the wetland habitat in the analysis area. The remaining 98.6% 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 3-92) for detailed information about the existing condition and environmental effects on wetlands. The Aquatic Resources section beginning on page 3-162 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. 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 Area
No outfitter-guide activities would be allowed in Research Natural Areas, so there would be no direct, indirect, or cumulative effects to these areas.

Environmental Justice, Civil Rights
The project would issue special use permits to private companies. Under Executive Order 11246, companies with special use permits are prohibited from job discrimination the basis of race, color, religion, sex or national origin. The U. S. Department of Agriculture prohibits discrimination in its employment practices based on race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and family status.

Executive Order 12898 (59 Fed, Reg. 7629, 1994) directs Federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

The following discussion is derived from the 2000 census information found at http://www.census.gov. The town of Omak has large Native American and Hispanic communities. Large Hispanic communities are also found in the towns of Oroville, Tonasket, Okanogan, Brewster, Pateros, Chelan, Entiat, Wenatchee and Cashmere, and the rural portions of Okanogan and Chelan County. The Colville Indian Reservation covers a large portion of Okanogan County and the population on the reservation is 60 percent Native American. Almost all of the towns and rural areas in Okanogan, Ferry and Chelan Counties, and the Colville Indian Reservation exceed both the national and State average (12% and 7% respectively) for people living below the poverty level. Poverty is especially acute (more than twice the national average) in the towns of Oroville, Tonasket, Omak, Okanogan, Brewster, and Republic, and on the Colville Indian Reservation.

Many Hispanics in the area hold lower paying jobs in the service and agricultural industries, and many Native Americans live below the poverty level. The project area is near the Colville Indian Reservation and traditional use areas of the Yakama Indian Nation. Many Native Americans have a rural lifestyle that is reliant on a clean and healthy environment, and the Forest is important in providing religious or spiritual settings, and hunting, gathering and fishing opportunities.

Government-to-government letters were sent to the tribal governments for both the Confederated Tribes of the Colville Reservation and the Yakama Nation. No comments were received.

The effects from any of the action alternatives on civil rights and low income or minority communities would be minimal. The special use permit holders are prohibited from discrimination on the basis of race, color, religion, sex or national origin.

The effects on hunting and fishing opportunities can be derived from the effects on wildlife and aquatic resources discussed earlier in this chapter.

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 or in the project analysis file (e.g. Clean Water Act in Water Resources and Aquatic Resources sections and Clean Air Act in the project analysis file). 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. Sustained yield of timber, wildlife habitat and other renewable resources all rely on maintaining long-term site productivity. 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 propose standards, guidelines, design criteria and mitigation measures for maintaining long-term habitat and species productivity (see Wildlife, Aquatic Resources 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, therefore their use would not have an effect upon continued availability of these resources. There would be no other irreversible and irretrievable commitment of resources with any alternative.

Unavoidable Impacts

Each section of Chapter 3 documents the unavoidable impacts associated with the project. Figure 3.11-1 summarizes these impacts:

Figure 3.11-1: Unavoidable Impacts

Resource	Impact
Wildlife	**Disturbance and displacement impacts causing wildlife to at least relocate and possibly experience negative population effects.** • 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 report). • Vegetation loss within campsites (see Wilderness and Botany reports). • Loss of grass and forb production from weed invasion and spread (see Invasive Species report). • Riparian habitat effects from stock watering and trail crossings (see Aquatics and Water Resources reports).
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.
Soil	Soil disturbance within campsites, at stock watering locations, and trail crossings (see Soils report).
Forest Vegetation	Vegetation loss within campsites (see Wilderness and Botany reports).
Plant Communities	No long-term modifications of plant succession or communities. Isolated short-term modifications that can recover in one growing season could occur (see Botany report).
Invasive Plants	Soil disturbance would create sites for establishment of invasive plants.
Recreation	Outfitter-guide activities would add to the total number of non-outfitted recreationists in the area (see Recreation report).
Air Quality	Smoke from isolated campfires could cause local, short-term changes in air quality. No violations of Clean Air Act (see Air Quality 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 report).

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. No comments were received from either tribe.

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 are

a irreversible commitment of resources. These energy sources are not currently in short supply, and the amount of fuel used annually would be very small, 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.

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 APE.

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.