

Suiattle Watershed Analysis

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Introduction

The Suiattle Watershed Analysis (WA) was conducted to meet the watershed analysis requirements established by the Northwest Forest Plan (*Record of Decision [ROD] for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (USDA, USDI 1994b). This study analyzes the ecosystem at the watershed scale, presenting information to help guide future resource management decisions. The analysis process followed is outlined in: *Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis Version 2.2* (Regional Interagency Executive Committee and the Intergovernmental Advisory Committee 1995). The analysis was conducted using the best available information on the Suiattle watershed. The analysis will be revised and updated as appropriate to consider new information, changing conditions, or potential effects associated with long-term management issues and/or needed actions.

This analysis is not a decision document. Any projects proposed in this area will still need additional analysis as required by the National Environmental Policy Act (NEPA).

Watershed Highlights

The majority (70%) of the Suiattle watershed is congressionally designated as wilderness and another 2 percent is part of the Skagit Wild and Scenic River. Late Successional Reserves cover 19 percent of the watershed, Timber Emphasis Areas are 3 percent and private land is 6 percent. The Suiattle watershed supports relatively intact terrestrial and aquatic ecosystems. Maintenance of the relatively intact systems and restoration of impacted lands in the analysis area assume greater importance as development in the Skagit Basin and Puget Sound Region proceeds.

The Suiattle is a tributary to the Sauk River, the largest tributary into the Skagit River, which in turn, is the largest drainage in the Puget Sound Region of the Western Washington Cascades Province. The Suiattle watershed lies west of Glacier Peak. Increasingly intensive lowland conversion, development and resource extraction in the Puget Sound and the Skagit Basin have resulted in reduced amounts and diversity of available wildlife and fisheries habitats. These changes translate to increasing pressures on the headwater tributaries, such as the Suiattle watershed to function as refuges.

Analysis Area Size and Ownership

The Suiattle Watershed is located on the Baker-Snoqualmie National Forest (MBS), Pacific Northwest Region Six. The watershed is comprised of 94 percent National Forest (NF) land located in Snohomish County, Washington State and administered by the Darrington Ranger District.

Table 1-1 Analysis Area Acreage by Subwatershed

Subwatershed Number	Subwatershed Name	National Forest	Other Ownership	SubWA Total
171100060201	Suiattle River Headwaters	24,966.4	10.5	24,976.9
171100060202	Suiattle/Miners Creek	28,592.7	16.0	28,608.7
171100060203	Sulphur Creek	21,042.7	17.5	21,060.2
171100060204	Downey Creek	22,839.8	3.1	22,842.9
171100060205	Suiattle/Milk Creek	20,531.9	0.0	20,531.9
171100060301	Lime Creek	11,260.8	0.0	11,260.8
171100060302	Buck Creek	21,764.1	0.0	21,764.1
171100060303	Suiattle/Circle Peak	24,911.3	81.7	24,993.0
171100060304	Big Creek	13,486.0	182.1	13,668.1
171100060305	Lower Suiattle/Tenas	17,576.2	12,668.4	30,244.6
	Total	206,971.9	12,979.3	219,951.2

Figure 1-1 Western Washington Cascades Province Map

Western Washington
Province Map

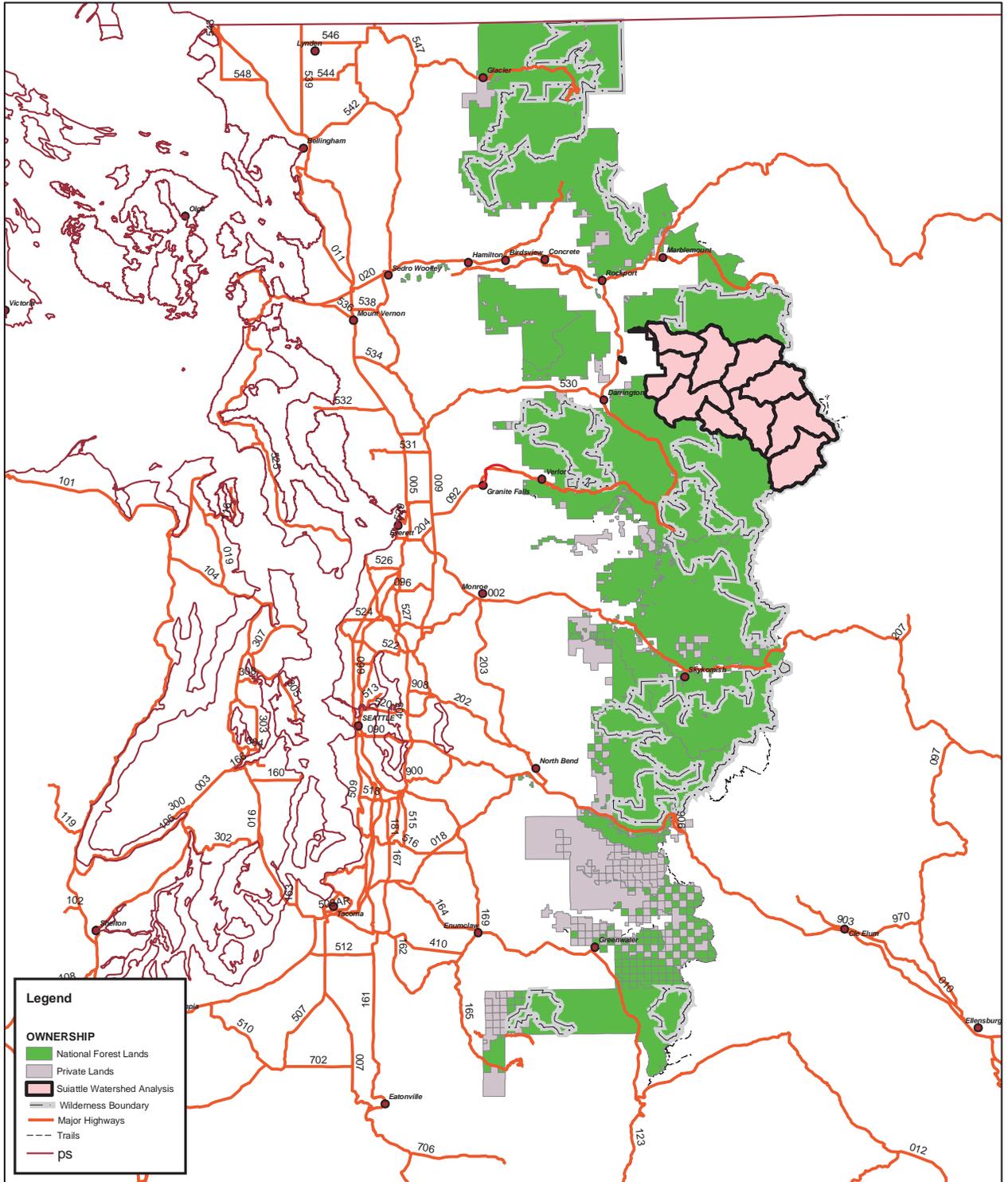


Figure 1-2 Vicinity Map

Suiattle Watershed Analysis Vicinity Map

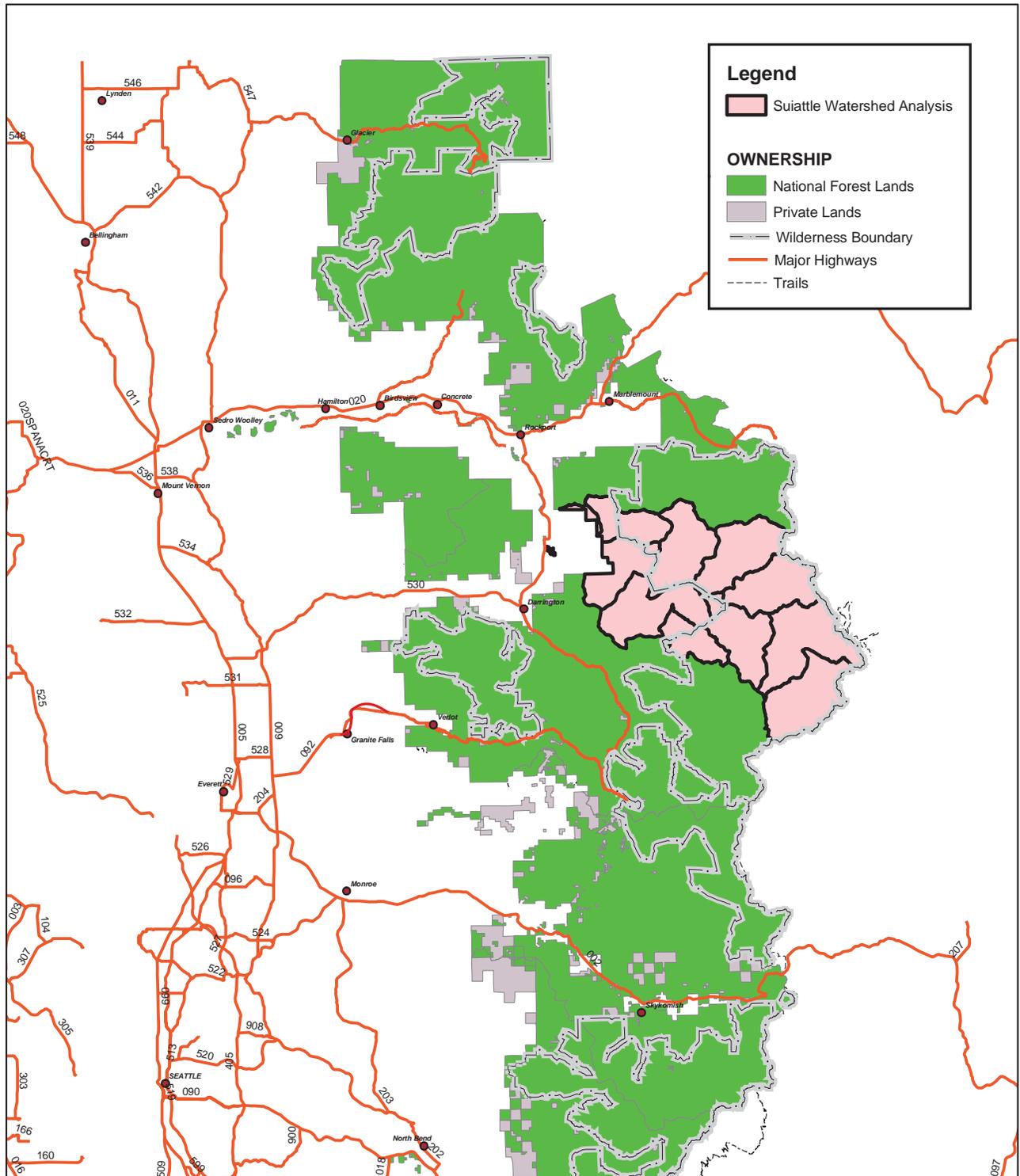
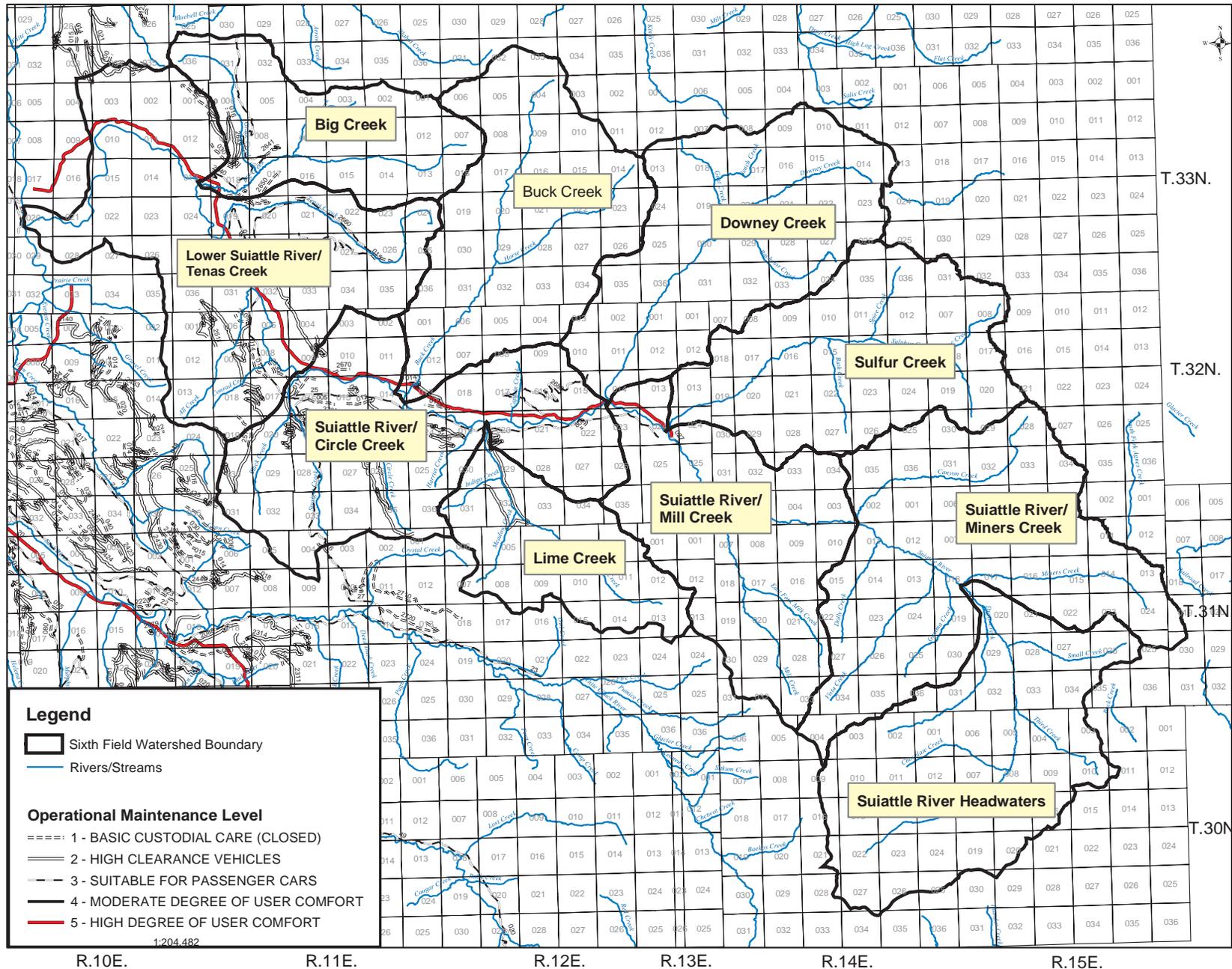


Figure 1-3 Watershed and Subwatersheds



Management Direction

The Forest Plan

The Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan (Forest Plan), as amended,¹ provides management direction for the National Forest lands (NF) within the Suiattle Watershed. Direction is provided in the form of goals and objectives, and Forest-wide and Management Area standards and guidelines (S&Gs).

The 1994 ROD, a major amendment to the Plan, incorporates seven land allocations, which amend the allocations described in the 1990 Forest Plan. (One allocation—Managed Late-Successional Areas—does not occur on the MBS.) There is considerable overlap among some allocations, and more than one set of standards and guidelines may apply (such as Riparian Reserve requirements within a Late Successional Reserve). In addition, where the standards and guidelines of the 1990 Forest Plan are more restrictive or provide greater benefits to late-successional forest-related species than do those of the 1994 ROD, the 1990 Forest Plan S&Gs apply.² For additional detail, refer to the 1994 ROD (USDA, USDI 1994a), particularly pages 8 and 12.

The 1994 amendment also includes additional forest-wide standards and guidelines, and an Aquatic Conservation Strategy with four components—riparian reserves, key watersheds, watershed analysis, and watershed restoration—that are designed to help improve the health of the aquatic ecosystem.

Land Allocations Within the Suiattle Watershed

The following are land allocations found within the Suiattle Watershed:

Congressionally Reserved Areas: Reserved by Act of Congress, these areas include portions of the Glacier Peak Wilderness (Management Area [MA] 10) and the Skagit Wild and Scenic River (MA 6). Over 70 percent of the Suiattle Watershed falls within wilderness.

¹ *Major amendments to the 1990 Forest Plan include: April 1994, Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (1994 ROD or Northwest Forest Plan); January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001 ROD); March 2004 Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (2004a ROD); and March 2004 Record of Decision Amending Resource Management Plans for Seven Bureau of Land Management Districts and Land and Resource Management Plans for Nineteen National Forests Within the Range of the Northern Spotted Owl: Decision to Clarify Provisions Relating to the Aquatic Conservation Strategy (2004b ROD).*

² For example, many acres on the MBS had been allocated to primitive (1A) or semi-primitive (1B) non-motorized dispersed recreation—with no scheduled timber harvest or road construction permitted. Where these areas now fall within the network of Late Successional Reserves, they have been mapped 1ALSR or 1BLSR. The standards and guidelines for both allocations apply, with the most restrictive taking precedent.

Administratively Withdrawn Areas: These include certain recreation, wildlife emphasis, and other allocations from the 1990 Plan that are not scheduled for timber harvest. Included are: MA 1B - Semi-primitive Non-motorized Dispersed Recreation; MA 15 - Mountain Goat Habitat; MA 12 - Habitat for Mature and Old-Growth Wildlife³; MA 18 – Research Natural Areas and MA 19 - Mountain Hemlock Zone.⁴

Late Successional Reserves: The main objectives for these reserves, in combination with other land allocations and standards and guidelines, are to maintain a functional late successional and old growth forest ecosystem as habitat for late successional and old growth related species.

Riparian Reserves: This allocation, an Aquatic Conservation Strategy component, includes areas along all streams, wetlands, ponds, lakes, and unstable or potentially unstable areas. Riparian Reserves are mapped overlaying all other allocations. Silvicultural practices can be applied to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy Objectives (see 1994b ROD, page C-32).

Matrix. The matrix includes the federal land not in the other allocations. It is the area in which scheduled full and partial yield timber harvest may occur. Matrix may also include non-forested areas and lands that are technically unsuited for timber harvest. In the Suiattle Analysis area, matrix allocations include: MA 14 – Deer and Elk Winter Range; MA 17 - Timber Emphasis; MA 1D - Roaded Natural Dispersed Recreation; MA 2A and 2B - Scenic Viewshed, Foreground and Middleground; and MA 5B - Recommended Scenic River (Downey and Buck Creeks).

Refer to Table 1-2 for land allocation acreage and Figure 1-5 Merged Land Allocations

Tier 1 Key Watershed

As noted above, Key Watersheds are one component of the Aquatic Conservation Strategy. A system of Key Watersheds that serve as refugia is considered to be crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. Key Watersheds overlay the other land allocations (including wilderness). The entire Suiattle River drainage is located within a Tier 1 Key Watershed. These contribute directly to the conservation of at-risk anadromous salmonids, bull trout, and resident fish species. Refer to the 1994 ROD, pages B-18 to B-19, and C-7 for more information, and additional standards and guidelines.

³ Pine marten and pileated woodpecker.

⁴ This MA is designed to be a study area to test reforestation within the mountain hemlock zone. No study has yet been prepared.

Other Lands

Roadless Areas: The Suiattle Watershed includes a number of roadless area parcels, inventoried as part of the national Roadless Area Review and Evaluation (RARE II) process in 1979. These areas were excluded from wilderness designation in the Washington State Wilderness Act of 1984 (P.L. 98-339). Figure 1-6 on page 11 shows the roadless areas. See Appendix C, 1990 Forest Plan (USDA 1990a) for additional descriptions. Most of these roadless areas are in Late Successional Reserve (LSR) and Semi-Primitive Non-motorized (MA1B) areas with about 2,600 acres in the Timber Management Emphasis (MA17) area near Tenas Creek and the lower slopes of Huckleberry Mountain.

Figure 1-4 Roadless Areas

Roadless Area Name	Acres
Glacier Peak G	2,605
Glacier Peak I	2,145
Glacier Peak J	19,644
Prairie Mountain	2,192
White Chuck Mountain	3,288
Total Acres Within Suiattle WA	29,874

Table 1-2 Land Allocation Acres

1994 Rod Allocation	1990 Plan Management Area	Acres	Description	% of Total Watershed
Congressionally Withdrawn	MA 10 (A-D)	154,109	Wilderness	70%
	MA 6	4,799	Skagit Wild and Scenic River	2%
LSR And Administratively Withdrawn	LSR	40,964	Late Successional Reserves (includes MA1B = 13,977 acres, MA15 = 1,268, MA12 = 3,389, MA18 = 307, MA19 = 1,411 acres)	19%
	MA 1B	505	Dispersed Recreation, Semi-Primitive Non-motorized (plus 13,977 acres in LSR)	
	MA 12	LSR	Mature & Old-Growth Habitat (all within LSR 3,389 acres)	
	MA 15	LSR	Mountain Goat Habitat (all within LSR 1,268 acres)	
	MA 18	LSR	Research Natural Area (all within LSR 307 acres)	
	MA 19	76	Mountain Hemlock Zone (plus 1,411 acres in LSR)	
	MA 5B	LSR	Recommended Scenic River (all within LSR 93 acres)	
Matrix	MA 17	5,597	Timber Management Emphasis	3%
	MA 14	686	Deer and Elk Winter Range	
	MA 2B	46	Scenic Viewshed, Middleground	
Unmapped		190		
TOTAL NF MBS		206,972		94%
Private Land		12,979		6%
TOTAL WA		219,951		100%
Land Allocations Which Overlap Above Allocations				
Riparian Reserve		63,964	(Overlaps all allocations)	29%

Figure 1-5 Merged Land Allocations

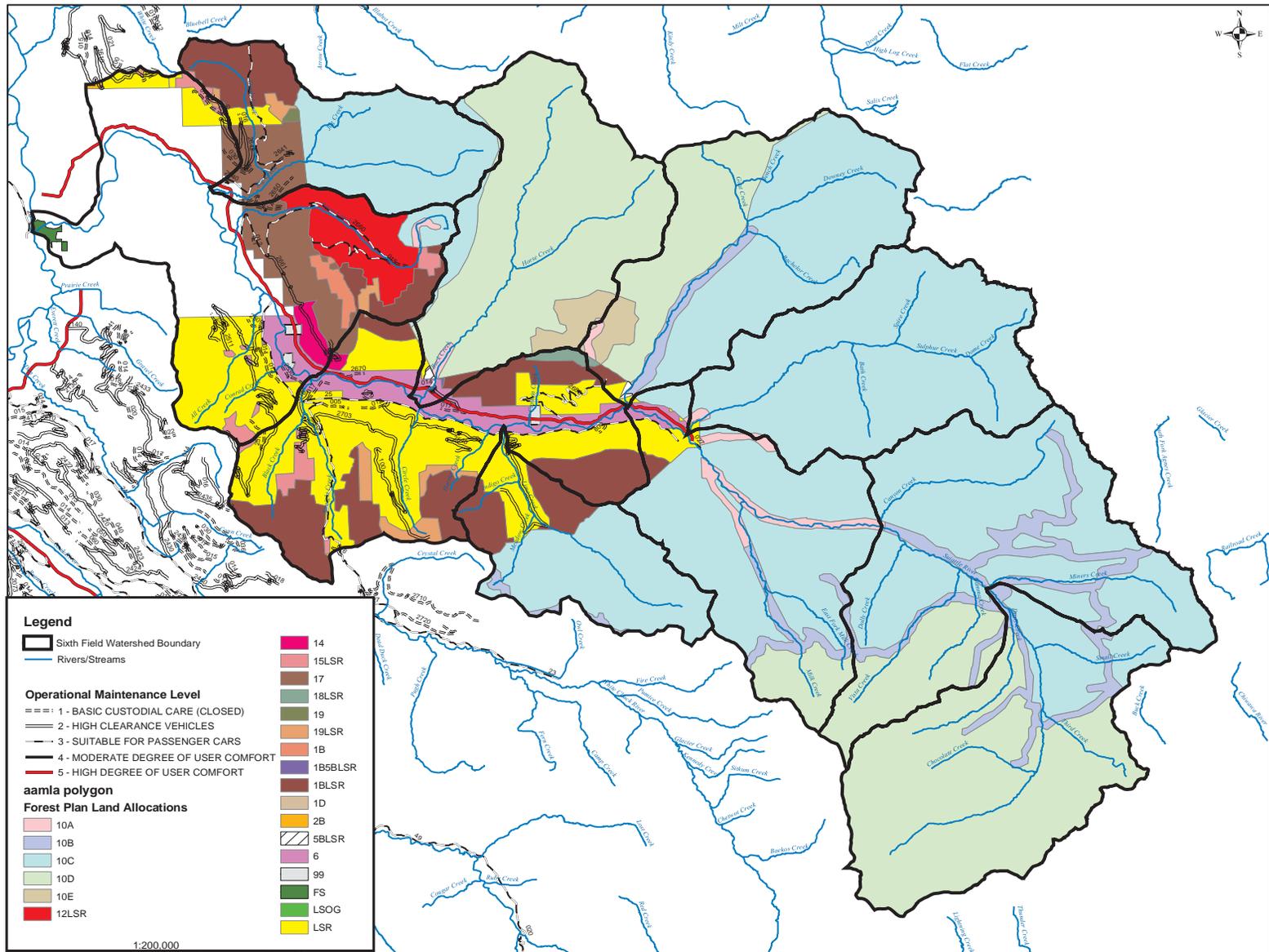
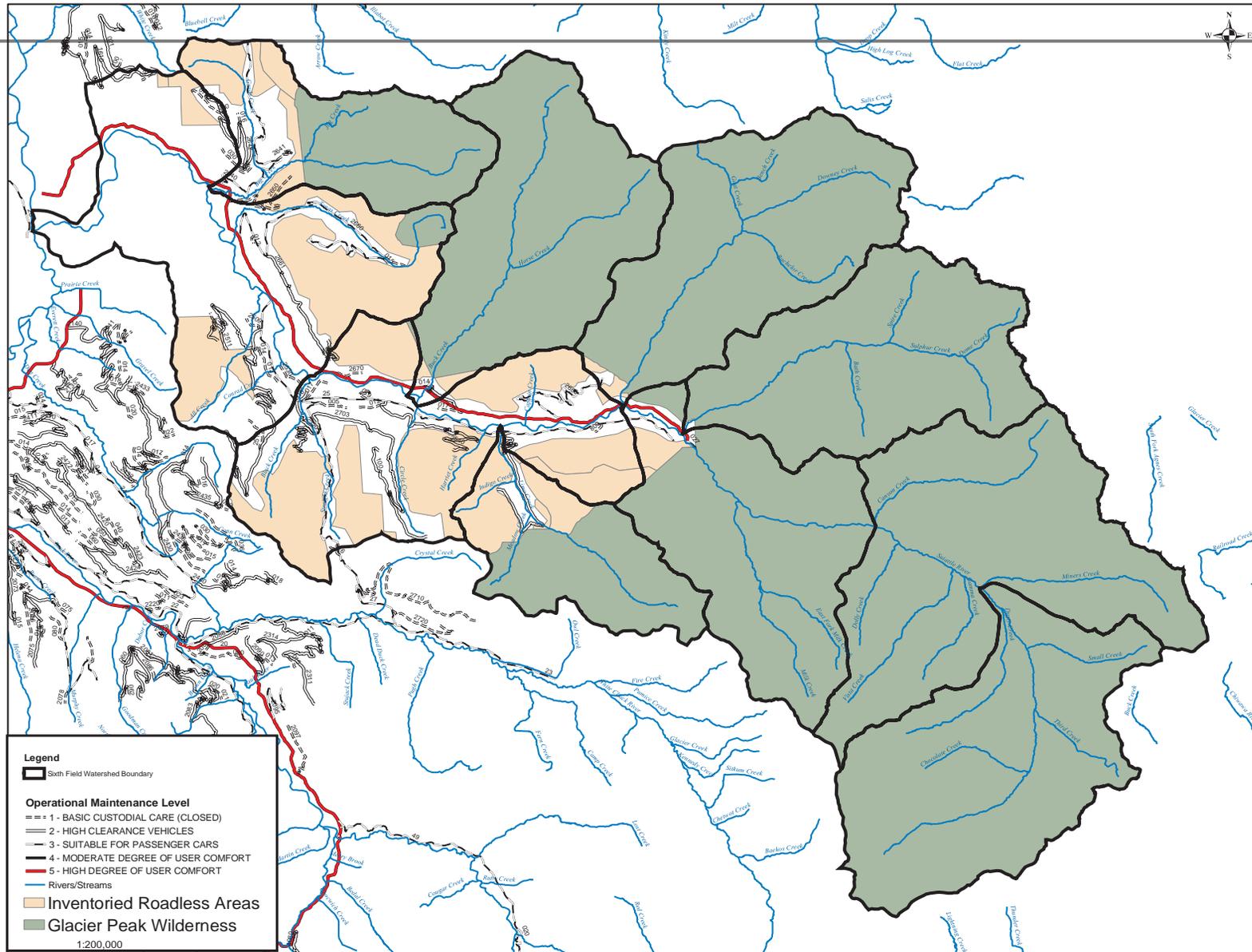


Figure 1-6 Roadless Areas



Watershed Characterization

Hillslope Processes

The geologic bedrock material is very characteristic of the North Cascades complex structure. Much of the original bedrock material originated from ocean floor sediments, which have been altered to various forms of metamorphic bedrock material. Since the last ice age, (approximately 15,000 years ago) Glacier Peak has produced some of the largest and most explosive eruptions in the state. Pyroclastic flows and mudflows (lahars) have also originated from Glacier Peak. Numerous faults exist within the watershed, particularly in the Lower Suiattle subwatershed.

Soil productivity is quite variable. Approximately one-third of the watershed consists of rock outcrop and talus slopes, which are mainly located in the upper steep slopes. Soil development and productivity is much higher within the valley bottoms and lower toe slopes.

Hydrology

The Suiattle River is approximately 60 miles in length, flowing in a west direction and joining the Sauk River at river mile (RM) 13.2.

The climate in the Suiattle River Watershed is characterized by winter snow, spring and fall rain, and typically dry weather in July and August. The major storms that produce flooding are associated with freezing levels up to 7,000 feet elevation. This makes it probable that there is rain and snowmelt in both the snow-dominated and the rain-on-snow zones that contribute to flooding. The Suiattle River Watershed has a relatively low amount of these zones; and therefore, is not as prone to rain-on-snow flooding, as are other watersheds. The low vegetation disturbance level in the area suggests that current management has little effect on the rain-on-snow runoff.

The majority of the mature streamside vegetation is along the smaller streams (Classes 3 and 4). A relatively small portion of the stream miles has erosive soils and most of those miles have mature vegetation present. There are areas of instability along steep inner gorges where the side slopes are kept overly steep by erosion of the toe slopes.

Water Quality

While the water quality has not been tested in any rigorous way, the Suiattle River is not listed on the 303(d) list of impaired water bodies, and the low level of human-caused disturbance or pollution in the watershed suggests a decreased potential for water quality degradation. There is no evidence that stream temperature standards are violated in the Suiattle River. There is, however, some concern that conditions for bull trout may be impaired in some years. There are small areas in the Riparian Reserves where late seral vegetation is lacking. Overall, these areas should not impair wood recruitment, but may represent small heat loads that contribute to higher stream temperatures. Turbidity in the Suiattle is naturally high because of glaciers in the headwaters, with the highest turbidity in the summer when the glaciers are actively melting.

Aquatic Habitat and Fish Species

The Skagit River basin is the most important salmonid-producing basin in the Puget Sound in terms of abundance, population diversity, and types of habitat (Smith 2003). The eight anadromous salmonid species of the Skagit River comprise approximately 30 percent of all anadromous fish entering Puget Sound. Most of the salmonid populations in the Skagit River are considered native in origin with little influence from non-native introductions.

The Suiattle River watershed was preliminarily assessed (Doyle 1999a) to determine baseline conditions of fish and fish habitat indicators for Chinook and bull trout, per criteria established in the USFWS Matrix of Diagnostics/Pathways and Indicators (USFWS 1998). The objective of the matrix is to integrate the biological and habitat conditions to arrive at a determination of the potential effect of land management activities on a proposed or listed species. The integration of habitat indicators rated the lower Suiattle River as “functioning unacceptably,” the middle Suiattle River as “functioning at risk,” and the upper Suiattle River as “functioning appropriately.”

Vegetation

The Suiattle watershed exists in the driest part of an otherwise wet Ranger District. Between the west end of the watershed and Puget Sound lie a series of peaks and ridges that wring much of the moisture from storm systems before they arrive. The relative dryness causes the primary vegetation zone boundaries to shift uphill compared with other wetter parts of the District. Conversely, the silver fir zone dips to a relatively lower elevation in the watershed along some streams where cold air drains. Due to the amount of high elevation in the analysis area, a large amount of acreage is also non-forested. There are seven vegetation zones in the Suiattle watershed more than most watersheds. Because the drainage is bordered on the east by Glacier Peak, and by lesser peaks on the north and south, an extreme range of elevations and, therefore, vegetation zones are present.

The primary influences on the area’s vegetation are fire, topography, soils and past volcanic activity, climate, and past harvest. Tree species and plant associations that are very unusual for the north end of the Forest can be found in this watershed. Previous harvesting occurred at the west end of the analysis area. Analysis of the seral stages shows that each vegetation zone is within or very near its natural range of variability.

Wildlife

The Suiattle Watershed supports habitat for a variety of wildlife species typically found in the North Cascades. With 70 percent of the watershed in wilderness and another 19 percent in Late Successional Reserve, the area is important for wildlife species with large home ranges. This watershed supports habitat for wildlife species such as the bald eagle, grizzly bear, gray wolf, wolverine, marten, and spotted owl. The Suiattle analysis area is within the North Cascades Recovery Zone for the grizzly bear.

The Suiattle watershed includes a dynamic river valley with associated riparian habitat for beaver and many songbirds, bats and spring forage areas as well as dispersal habitat. The anadromous fish of the Suiattle River provide forage for wintering bald eagles that range from the Nooksack River drainage to the Nisqually River drainages. The upper elevation areas of parkland and Glacier Peak provide unique habitats, such as steep, rocky cliffs that serve as habitat for mountain goats, a Forest Management Indicator Species (MIS).

Human Use

The Suiattle River was the ancestral territory of the present day Sauk-Suiattle Tribe. Salmon fishing may have occurred on the Suiattle, and parts of the watershed were used for plant gathering and hunting. Current uses of the watershed by Indian tribal members include the exercise of treaty rights and practices of ceremonial and religious significance.

The watershed offers a variety of recreational opportunities. It contains 123 miles of trails, including 26.9 miles of the Pacific Crest National Scenic Trail. Over 75 percent of the trails are rated “more difficult,” 23 percent of the trails are rated “easiest,” and three percent are rated as “difficult.” Most of the trails are designated as stock trails and are in wilderness.

Issues and Key Questions

This step of the watershed analysis process helps to focus the analysis on the key elements of the ecosystem that are most relevant to the management questions, human values, or resource conditions within the watershed. This chapter is arranged by three major ecosystem types; Aquatic System, Terrestrial Ecosystem, and Human Use. For each ecosystem type, river basin and watershed scale issues are described. The watershed level issues were developed during an interdisciplinary process that included public involvement. For each watershed level issue, key questions were formulated.

Aquatic System

Broader Scale Issues – Sauk and Skagit River Basin

The Skagit River is one of only four river systems in the State of Washington managed primarily for wild salmon and sea-run cutthroat trout (WDFW and WWTIT 1994). Fish production in the Skagit River tributaries is significant to the sport, subsistence, and commercial fisheries in the Puget Sound Region. The Sauk River flows into the Skagit River and supports spawning runs of all five Pacific salmon species (Chinook, coho, chum, pink, sockeye) as well as steelhead, coastal (sea-run) cutthroat and sea-run char. The Sauk River is the largest free-flowing tributary of the Skagit River, making it important as refugia habitat for anadromous fishes of the Skagit River. The Suiattle River supports all the species found in the Sauk River, except for chum. It is a major tributary to the Sauk River and provides a source of high quality water.

Watershed Scale Issues – Suiattle River

Key Issue

Maintain healthy and diverse aquatic communities.

Key Questions

How and to what extent are humans affecting aquatic processes, habitat, and species within the watershed?

What are the potential effects to at-risk species downstream in the Sauk River?

Key Issue

Maintain high water quality.

Key Questions

What are the processes most likely to affect water quality?

What are the potential threats to water quality?

How and to what extent are humans affecting soil erosion and sedimentation processes?

Terrestrial Ecosystem

Broader Scale Issues- Sauk and Skagit River Basins

Over the past century, there has been conversion of low and mid-elevation west-side forests to agriculture, industrial, urban and other uses. This has resulted in a regional reduction of older forests, especially in the western hemlock and Pacific silver fir zones, and a relative increase in the value of old growth on public lands to provide for organisms associated with the older forests. Due to the large amount of lands managed as wilderness and as Late Successional Reserves in the North Cascades, this area is important for the potential conservation of a number of large home-range species, such as the grizzly bear, wolverine, gray wolf and spotted owl. Outdoor recreation is also attracted to the North Cascades and creates challenges in managing for plant and wildlife resources, as well as human use demands. Modification of habitat over the past century has had an impact on plant distribution and abundance. Roads, and disturbed sites from agriculture, timber harvests, recreation, and land conversion to urban sites has led to the introduction and spread of invasive weed species.

The Sauk and Skagit River basins have been intensively harvested and farmed since the late 1800s. The remaining late successional forest is found primarily on federal lands. The forest stands within the lower elevations of the Sauk drainage were railroad logged in the late 1800s through the 1940s. In the 1950s through 1980s, timber harvesting on National Forest pushed into the upper elevations with logging roads that provided easier access to backcountry and more fragmentation of habitat. The Suiattle River drainage is one of four major tributaries to the Sauk River and is a relatively intact drainage of older forests and unroaded areas. The watershed receives high levels of recreation due to the Suiattle being a major portal to the wilderness and the Pacific Crest Trail, two campgrounds, and one cabin rental. This will contribute to increasing demand that federal lands serve both wildlife and plant recovery plans, as well as human use desires.

Watershed Scale Issues – Suiattle River

Key Issue

Maintain unique plant and wildlife habitats, and species of concern in the watershed.

Key Questions

What and where are the known populations of botanical and wildlife species of concern and what is their relative importance in the analysis area and at a larger scale?

What and where are the known or suspected habitat types that are important to the above species and to biodiversity?

What and where are areas important for ethno-botanical reasons?

Are there threats to species viability or habitats?

What and where are noxious weeds, and what factors are involved in their introduction, spread, and persistence?

Are there activities needed to address botanical and wildlife habitat and species issues?

Key Issue

Maintain seral stages and disturbance regimes in the watershed within the range of natural variability.

Key Questions

Is the basin vegetation within the range of natural variability?

Are there actions needed to return to the range of natural variability?

What are the factors and processes limiting wildlife and botanical species' use of habitats?

Human Use

Broader Scale Issues- Sauk and Skagit Basins

In October 2002, the Washington State Interagency Committee (IAC) for Outdoor Recreation released the updated State Comprehensive Outdoor Recreation Planning (SCORP) Document. This document reports that walking and running are still some of the most popular activities. In 1990, IAC reported that 76 percent of all Washington households walked or hiked for recreation. In the October 2002 report, participation had dropped to 53 percent. However, since 1990, the state has seen a 20 percent increase in population (approximately one million people). Concurrent reports of increased obesity and diabetes indicate an increasingly sedentary population. The National Forests are the largest owners of public lands in Washington State at nine million acres. The Department of Natural Resources has three million acres and the National Park Service two million acres. The Washington State Parks reports ownership of about 107,000 acres of recreational lands. This indicates that the Forest Service may currently be the largest potential provider of recreation opportunities and will see increased pressure to provide recreational opportunities. The SCORP concluded that an increasingly sedentary population is tending to exercise closer to home and recommended that the State concentrate efforts in acquiring low-elevation open space, improving or creating city and neighborhood parks and sporting facilities such as ball fields. It also stressed that this did not lessen the increasingly important role of federal agencies, especially the Forest Service, to consider the SCORP findings in management plans, maximize its recreation resources and work with constituents to identify areas outside wilderness that would allow for higher levels of access and use.

A large portion (70%) of the Suiattle Watershed is designated wilderness and the Suiattle Trailhead is a major portal into the Glacier Peak Wilderness. The demand for hiking and climbing is expected to continue to increase. The Skagit Wild and Scenic River Management Area is about 2 percent of the National Forest within the Suiattle Watershed.

Recreation, tourism, and forest products are a significant part of the local and regional economy. Changes in the outputs of forest products and recreational opportunities could affect the local and regional economies. Identification of the level of sustainable economic and non-economic outputs could help direct the future of local and regional economies and communities.

Watershed Scale Issues – Suiattle River

Key Issue

Provide for increasing demand for recreation use in the watershed.

Key Questions

What is the demand by the public for access, and can it be balanced with resource and budget concerns?

What are the current and anticipated future demands for recreation use, and can the current management of trail and road facilities provide for it?

What are the human uses in the Glacier Peak Wilderness, and can they be provided and still preserve and protect the wilderness character?

Are the key values of the Skagit Wild and Scenic River being maintained?

Are there areas important for tribal uses or treaty rights?

Key Issue

Contribute toward the Forest Plan goal of providing for the production of timber on suitable lands.

Key Questions

What areas are suitable for timber production in the watershed, and where are opportunities for timber management?

What kind and quantity of special forest products are available in the watershed that can be provided for human use?