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Thompson/Seiad/Grider Ecosystem Analysis

Klamath National Forest
Happy Camp Ranger District

Caring for the Land and Serving People.

ACKNOWLEDGMENTS

Thompson/Seiad/Grider Ecosystem Analysis

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Introduction

ANALYSIS OVERVIEW

Watershed analysis is ecosystem analysis at the watershed scale; it is both an analysis and an information gathering process. The purpose is to provide a means by which the watershed can be understood as an ecological system and to develop and document an understanding of the processes and interactions occurring within. That is the purpose of this analysis of the Thompson/Seiad/Grider watershed (refer to **Figure 0-1** Klamath Basin and Thompson/Seiad/ Grider Ecosystem Analysis Vicinity Map, located on Page 0-3).

This analysis focuses on the issues and Key Questions specifically identified for this watershed. They are assessed in terms of their biological, physical, and social features. Types of information used in the analysis may include: beneficial water uses; vegetative patterns and distribution; disturbance factors; wildlife species and their habitats; human use patterns; and the importance of vegetative and riparian corridors. The analysis also includes an identification of management opportunities which will provide background for the development of management decisions in the future.

The analysis process is also used as a vehicle for implementation of Forest planning direction. It is an intermediate analysis between land management planning and project planning. It is purely an analysis step and does not involve *National Environmental Policy Act* (*NEPA*) decisions. It provides a means of refining the desired condition of the watershed, given the Goals and Objectives, Management Areas and Standards and Guidelines from the Forest Land and Resource Management Plan (*Forest Plan*), current policy, and other applicable State and Federal regulations.

The *Forest Plan* was updated in 1994 to reflect direction contained in the *Record of Decision* (*ROD*) for the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (*FSEIS*), also known as the *President's Northwest Forest Plan*. There are nine different Management Areas contained within the Thompson/Seiad/Grider analysis area: Wilderness, Late-Successional Reserves (LSRs) and Other Special Habitat, Special Interest Area, Backcountry, Riparian Reserve, Recreation River, Retention, Partial Retention VQO, and General Forest. Critical Habitat Units (CHUs) and Released Roadless areas are also found in the analysis area.

PROCESS AND DOCUMENT ORGANIZATION

The analysis was conducted by a core Forest Ecosystem Analysis Team (FEAT) and an expanded team of District resource specialists. During the analysis phase, participation and involvement of other Federal agencies was encouraged.

Following is a summary of the six steps utilized in conducting ecosystem analysis:

Step 1 - Characterization
Step 2 - Issues and Key Questions
Step 3 - Current Conditions
Step 4 - Reference Conditions
Step 5 - Interpretation
Step 6 - Recommendations

STEP 1 - CHARACTERIZATION

The purpose of this step is to place the watershed in context within the river basin, provinces, or a broader geographic area. It briefly describes the dominant physical, biological, and human dimension features, characteristics, and uses of the watershed.

STEP 2 - ISSUES AND KEY QUESTIONS

This step identifies the variety of uses and values associated with the watershed. It focuses the analysis on key elements of the ecosystem that are most relevant to the management issues, human values, or resource conditions within the watershed. Also involved in this step is the formulation of analysis questions using the indicators most commonly used to measure or interpret these ecosystem elements.

STEP 3 - CURRENT CONDITIONS

This step documents the current range, distribution, and conditions of the relevant ecosystem elements.

STEP 4 - REFERENCE CONDITION

Step 4 develops an historic reference for comparison with current conditions. This step explains how existing conditions from Step 3 have changed over time as the result of human influence and natural disturbances.

STEP 5 - INTERPRETATION

This step compares existing, historical, and reference conditions of specific landscape elements, and explains significant differences, similarities or trends, and their causes. Desired conditions for each issue are discussed.

STEP 6 - RECOMMENDATIONS

This step identifies those management activities that could move the ecosystem towards achievement of management objectives or desired conditions, as appropriate. Management Opportunities specified in Step 6 are expressed in general terms; they identify what needs to be done and why, but not how. This step ultimately provides the purpose and need for implementation of individual projects designed to achieve desired conditions.

Appendices A through F are included in support of information and findings contained within the analysis and are as follows:

A - LMP Feedback
B - Cumulative Watershed Effects
C - Aquatic Habitat
D - Fire and Fuels
E - Access and Travel Analysis
F - Numerical Listing of Roads and Their Status
G - Short-Term Timber Program Analysis

The final portion of this document is the Map Packet containing the majority of maps (Figures) referred to within the text of this analysis.

For ease of reading, common names for wildlife and plant species have been used throughout the document, for the most part.

As part of the process, an appendix was created for feedback to the *Forest Plan*, e.g., changes in land allocations, refinements to existing data layers, etc. Refer to **Appendix A** - LMP Feedback, for details specific to the analysis area. Reference to other appendices appear where appropriate throughout the document.

RELATIONSHIP TO OTHER ANALYSES AND PLANNING

As stated previously, this level of analysis occurs between the *Forest Plan* and project-level analysis. A more detailed assessment is necessary for *NEPA* sufficiency, therefore, individual project analyses will focus on site-specific issues and their potential effects.

The Thompson/Seiad/Grider Ecosystem Analysis is one of many completed analyses; see **Figure 0-2** Completed Ecosystem Analyses/Watershed Boundaries, located on Page 0-4 for a display of completed analyses on the Forest.

INFORMATION AND DATA SOURCES

Data and information used in this analysis have come from several different sources. The set of Klamath National Forest Planning Map Layers, updated as appropriate, and additional map layers were the source for the following geographic information system (GIS) layers which were used during the process; **Hydrology** (with analysis area and subwatersheds delineated and watercourses delineated to approximate the extent of annual scour), **Geology Layer** (with rock types and geomorphic terranes), **Digital Elevation Data Layer**, **Soils and Existing Vegetation Layer**, **Fire Layer** (includes past fire perimeters, starts, and intensity), **Wildlife Layer** (includes critical and suitable habitat), **Land Allocations** (from *Forest Plan*), **Transportation Layer, Visuals Layer** (with existing visual conditions and visual quality objectives)**,** and **Recreation Layer**. From these data layers, information such as fire hazard, current vegetation communities, and short term timber outlook were derived.

Additional non-GIS sources of information were incorporated into the analysis. Stream surveys and fisheries habitat typing data were available for some streams within the analysis area. Other information was obtained from Forest planning documents, aerial photo interpretation, County museum records, published reports and papers, and also through personal communications.

AN ITERATIVE PROCESS

Watershed analysis will be an ongoing process. The initial analysis report will serve as a foundation onto which new information will be added in the future. In addition, the analysis process will continue to be refined as new methods and strategies are developed and applied.

Figure 0-1 Klamath Basin Vicinity/TSG Watershed Vicinity

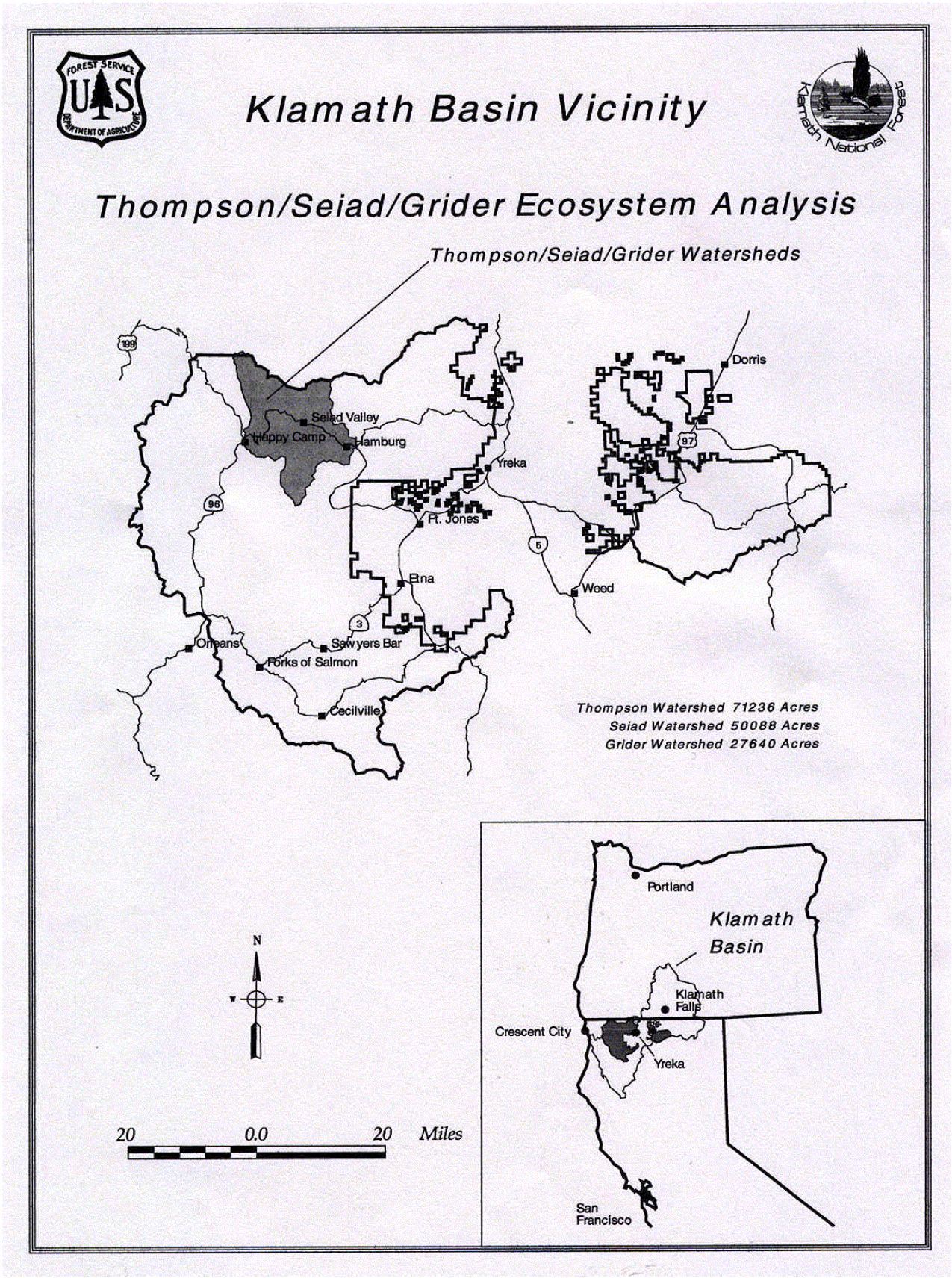
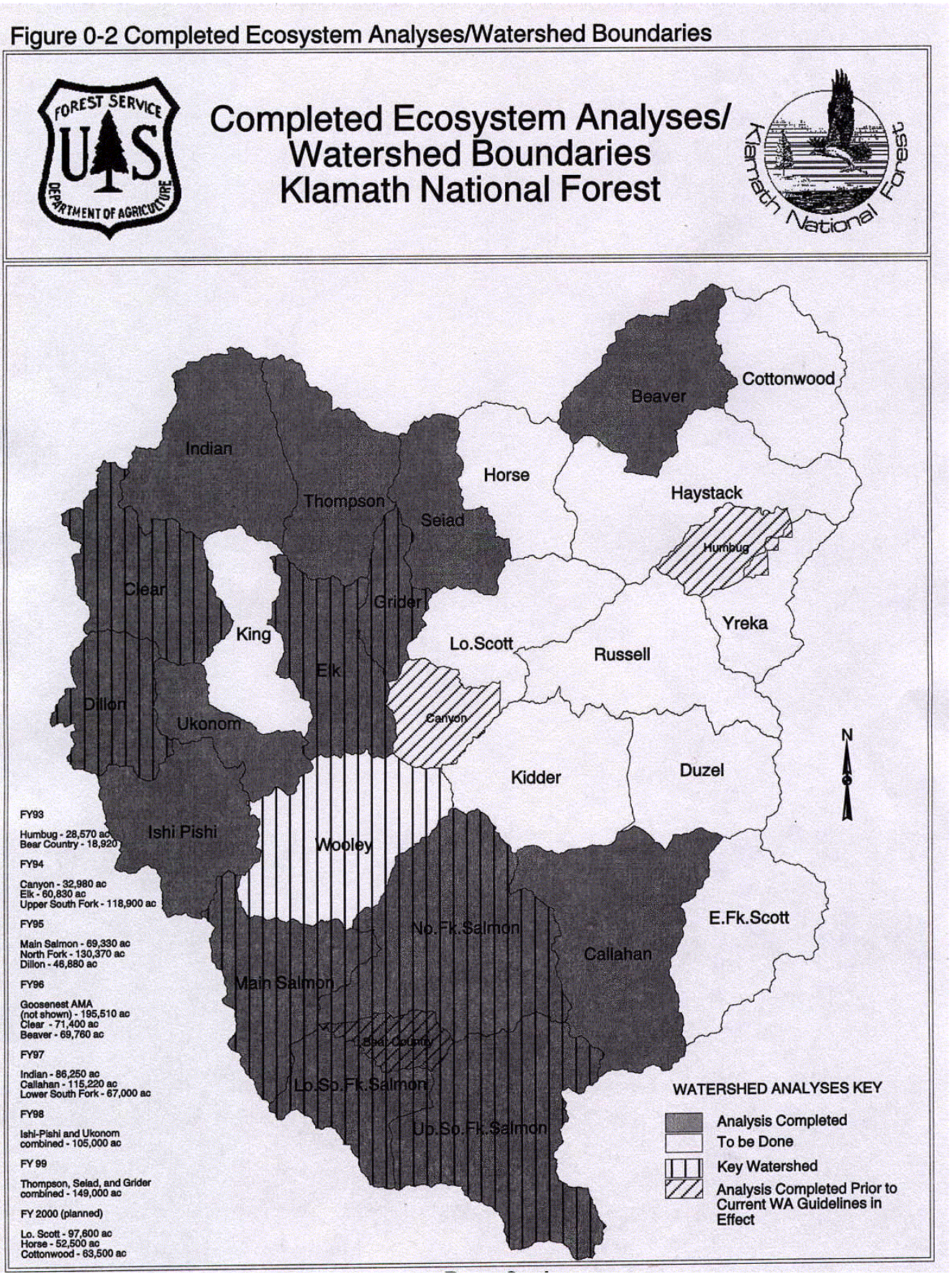


Figure 0-2 Completed Ecosystem Analyses/Watershed Boundaries



Step 1 - Characterization

This analysis addresses an area that covers approximately 150, 000 acres of the Klamath Mountains province in Northern California. The majority of land is administered by the Happy Camp Ranger District of the Klamath National Forest, (see **Figure 0-1** Klamath Basin Vicinity and Thompson/Seiad/Grider Ecosystem Analysis Vicinity Map [Page 0-3], and **Figure 1-1** Base Map, contained in the Map Packet located at the end of this document). The area is almost evenly divided by the Klamath River, which flows from east to west through the middle of the analysis area.

Approximately 95% of the area is public lands administered by the Klamath National Forest (KNF). About 5% of the analysis area is owned by private landholders (see **Figure 1-1**). Most private lands are located along the Klamath River, and the lower portions of Seiad, Walker, Grider, Thompson, and China Creeks. The largest population center is Seiad Valley (population 350) in the center of the analysis area. Primary access is from California State Highway 96 which follows the Klamath River.

This ecosystem analysis covers three major watersheds: Thompson Creek, Seiad Creek, and Grider Creek, but also includes China Creek and smaller face drainages to the Klamath River. These areas will be analyzed together; some information may be grouped by individual watersheds.

Grider Creek is a key watershed in the analysis area. This landscape borders five other watershed analysis areas on the Forest (Indian, Elk, Canyon, Lower Scott, and Horse), Sucker/Grayback Watershed Analysis on the Siskiyou National Forest, and the Middle Fork/Applegate Watershed Analysis on the Rogue River National Forest (see **Figure 0-2** Completed Ecosystem Analysis/Watershed Boundaries [Page 0-4]).

The Klamath National Forest has been divided into distinct land allocations by the Forest's *Land and Resource Management Plan* (*Forest Plan*). This analysis area includes several of these land allocations (see **Figure 1-2** *Forest Plan* Management Areas). The most dominant *Forest Plan* Management Area is Late-Successional Reserve (LSR). Riparian Reserve and Partial Retention are the second most dominant in the analysis area.

Elevations within the watershed area range from 1,120 feet along the Klamath River to 7,025 feet along Big Ridge near Buckhorn Mountain in the Marble Mountain Wilderness. North of the Klamath River the highest elevation is 6,740 feet at Red Butte. The climate is one of a temperate, Mediterranean type, typified by hot, dry summers, and cool, moist winters. Precipitation ranges from an annual rainfall of 40 inches in the lower elevations near the Klamath River, to about 65 inches in the highest elevations, with approximately 90% falling between October and May. Below 3,500 feet in elevation, the predominate precipitation is rainfall, while above 4,000 feet in elevation winter precipitation is predominately snowfall. Rain-on-snow events occur in the transition zone. Summer precipitation occurs predominantly as thunderstorm activity, with high-intensity, short-duration thunderstorms common.

Bedrock in the analysis area consists of structurally complex, metamorphic, marine volcanic, and sedimentary rocks deposited on mafic and ultramafic igneous, oceanic basement. The marine rocks have been strongly deformed while being scraped off the ocean floor, and pushed onto the continent. They have been intruded by younger granitic rocks of intermediate composition, the roots of andesitic volcanoes. Contrast in the character and behavior of the bedrock units is the basis of the geomorphic terranes described later in this assessment. Together, these rocks have been rapidly uplifted and deeply eroded. Rapid uplift and erosion continue today. Earthquakes felt in Happy Camp in recent years originate from subduction related coastal faults, and movements related to Cascade volcanoes. Although there is no historical record of local, active faults or strong shaking, there is insufficient information to preclude the possibilities.

The topography consists of steep slopes (>40%), and dispersed benches up to about 500 acres in size on moderate slope gradients (<40%). Soils on the steep slopes are thin in comparison with the thick soils on the benches. Differences in the origin and hydrology between these two slope classes result in strong contrasts in landslide and erosion processes.

The analysis area provides important habitat and migration corridors for resident and anadromous fish species and other aquatic organisms. Indigenous fish stocks include fall and winter steelhead trout, fall-run chinook salmon, coho salmon, rainbow trout, Pacific lamprey, speckled dace, Klamath smallscale sucker, and marbled sculpin. Fresh water mussels have been observed within the Klamath River but abundance and distribution information on these species is limited. Indigenous Pacific giant salamander and

tailed frogs are common in most of the tributaries to the Klamath River within the analysis area. The foothill yellow-legged frog and western pond turtle are Forest Service Region 5 Sensitive Species and are found in the watershed. Bullfrogs are an exotic species, introduced to the Klamath River, and can be found within the analysis area. Numerous aquatic invertebrate insects inhabit all flowing and standing water bodies in the analysis area.

The five largest Klamath River tributaries in this landscape: Thompson, Seiad, Walker, Grider, and China Creeks, all have at least three species of anadromous fish. Other tributaries are smaller and contain relatively few miles of suitable habitat for salmon and steelhead trout. All tributaries within this analysis area contribute critically important cold water to the Klamath River for the maintenance of anadromous fisheries in the Klamath Basin.

Vegetative cover in the landscape area is primarily of the Klamath mixed conifer type. Vegetation communities vary with Douglas-fir/live oak at the lowest elevations to mixed conifer and true fir types at the higher elevations. Shrub/forb areas are common, particularly in the areas most affected by the 1987 wildfires, and in the areas of poorest soils. Habitat exists for three plant species listed as Sensitive by the Regional Forester; Lewisia cotyledon var. howelli, (Howells lewisia), Silene marmorensia, (Marble Mountain catchfly), and Pedicularis howelli, (Howells lousewort).

Wildfire is the primary natural disturbance process in the landscape. All the natural vegetation types developed and adapted to a frequent fire disturbance regime, and many are dependant upon fire for their persistence. Before European settlement, lightning and American Indian ignited fires were primary factors shaping the vegetation. Fire suppression became effective in the 1930s, through efforts of the Civilian Conservation Corp. (CCC). Mechanized support (fire engines, dozers, aircraft, etc.) increased fire suppression efficiency in later years. With effective fire suppression, vegetative response has been to fill areas that were historically more open, and to favor shade-tolerant species. This has resulted in increased competition for moisture and sunlight, shading out and killing understory species, and crowding the overstory. Stand densities and fuel loadings have significantly increased over presuppression periods. The most recent large fires that have occurred in the analysis area were in 1987, when fire suppression forces were overwhelmed with multiple fires starting from a dry lightning storm at the end of August. These fires burned 62,000 acres in the analysis area. Due to their intensities, many of the effects are still being realized, and will be discussed in detail through the analysis.

Wildlife habitats are determined by the distribution of vegetation communities on the landscape, by their structure, and mix of species within a community. The analysis area supports a variety of wildlife species representative of animals found throughout northwestern California. The mix of species is diverse because of the range of habitats found within these large watersheds, from small intermittent streams to high mountain meadows. All vegetative seral stages are represented in the analysis area with a corresponding compliment of wildlife species.

There are several species found in the watershed which have special and unique habitat needs. They are recognized as Threatened, Endangered, or Sensitive, based on current population estimates and threats to their habitats. Federally listed Threatened and Endangered wildlife species that may occur in the analysis area include: northern spotted owl, possibly marbled murrelet, bald eagle, and peregrine falcon. Forest Service Region 5 Sensitive wildlife species include: goshawk, willow flycatcher, fisher, wolverine, great gray owls, and marten. Big game species, such as bear and black-tailed deer, are abundant within the landscape, as well as small game species and a wide variety of migratory songbirds.

Survey and Manage species exist in the analysis area. This area is known to have both Siskiyou Mountain and Del Norte salamanders; it is called the zone of contact for these two species. It is also thought that several Survey and Manage mollusks may occur in the analysis area.

The Klamath River is designated as a Recreational component of the National Wild and Scenic River system, with approximately 35 miles of the river flowing through the analysis area. Grider Creek was found suitable and recommended for inclusion in the Wild and Scenic Rivers System. State Highway 96, which parallels the Klamath River through the analysis area, is part of the State of Jefferson National Scenic Byway.

The analysis area provides for human uses and values as diverse as the biological features; and habitats found within them. The diversity of forest habitats near the Klamath River provided ideal conditions for pre-historic settlement along the river. The Karuk and Shasta Indian Tribes are the first known inhabitants who lived in the lower elevations adjacent to the Klamath River. Karuk descendants living in the region continue to value and use traditional resources consistent with their cultural heritage.

Europeans arrived in 1850 as miners entered the Klamath River region in search of gold. For approximately 50 years, mining activity was the most important rural industry. It is estimated that several thousands of miners from various ethnic backgrounds, including large numbers of Chinese, worked the river bars and stream channels. Many of the first roads and trails were built for mining access. Hardrock, placer, and dredge mining occurred extensively in the past, and continues largely on a recreational scale today. Following the decline of mining activities, other land uses, including: homesteading, cattle grazing, and farming, increased. After 1950, logging became the most important rural industry. Timber harvest occurs both on private lands and on National Forest managed lands within the analysis area.

The numerous streamcourses provide water for domestic and agricultural use. There are range allotments in the Seiad Creek watershed, and in the Marble Mountain Wilderness.

Recreational use within the landscape is relatively low, compared to other National Forests in the California Region which are closer to urban centers. As the more accessible areas become over-populated, the importance of this area is increasing. Recreational experiences in this landscape are unique, in that the number of users are still relatively low. Whitewater rafting and fishing are important recreational uses for this area. This segment of the Klamath River receives considerable use from commercial guides for both of these activities. Forest Service campgrounds, dispersed recreation sites, access to the Marble Mountain and Red Butte Wilderness areas, and livestock packing all occur within the analysis area. The Pacific Crest Trail traverses the assessment area. Hunting and fishing occurs throughout the landscape. In the winter, the higher elevations are used for cross-country skiing, snow shoeing, and other snow-play activities.

Step 2 - Issues and Key Questions

The following eight issues have been identified by the Analysis Team and District Ranger: *AQUATICS*; **Hillslope Processes, Riparian Areas,** and **Aquatic Dependent Species,** *TERRESTRIAL*; **Fire, Late-Successional Habitat** and **Terrestrial Wildlife,** and *HUMAN DIMENSION*; **Roads** and **Human Uses**. A background statement for each issue was developed to provide the context of the issue and focus for the analysis. Key Questions follow and are presented for Steps 3, 4, and 5.

Other possible key questions concerning desired conditions and recommendations are implied rather than stated directly. The desired conditions will be discussed under each issue in Step 5 and recommendations are presented in Step 6.

ISSUES AND KEY QUESTIONS

AQUATICS

HILLSLOPE PROCESSES - Watershed conditions within the analysis area are influenced by various watershed disturbances in combination with a large percentage of unstable or easily eroded land types. Large portions of the watershed have been adversely impacted by recent (1987) wildfires and the January, 1997 flood event. Some areas have received extensive timber harvest and have high road densities. The land types of the watershed include easily eroded granitic soils and both dormant and active landslides. This analysis will discuss the important hydrologic and erosion processes, re-evaluate cumulative watershed effects, and make recommendations for future management throughout the landscape.

STEP 3 - CURRENT CONDITIONS

1- What are the dominant hydrologic and erosional characteristics and processes within these watersheds, including impacts of the 1997 flood?

2- What parts of the watershed are considered Areas with Watershed Concerns (AWWCs) in the *Forest Plan* and what additional areas will be evaluated in the process? What parameters are used to make this determination?

STEP 4 - REFERENCE CONDITIONS

1- What were historical (pre-Euro-American settlement) and reference erosion rates, and what natural processes and post-European activities affected them?

STEP 5 - INTERPRETATION

1a- What changes are there between current and reference/historical runoff and erosion rates and what causes these changes?

1b- What are the hydrologic/erosional concerns in the analysis area and in each subwatershed? What management strategies should be used or changed to improve watershed conditions?

2- Which subwatersheds have continued watershed concerns, when will they be considered recovered, and how can recovery be promoted and maintained?

3a- What watershed processes are of concern with the current road system?

3b- What are the criteria used to assess roads for the *Access and Travel Analysis* included in **Appendix E** of this document?

4- What are the trends for hillslope processes in the analysis area?

RIPARIAN AREAS - The January, 1997 flood event had a considerable affect on the Thompson/Seiad/ Grider watershed and contributed large amounts of sediment into analysis area streams. Most significantly affected were Walker, and Portuguese Creeks. Riparian area disturbances, including roads, wildfire, timber harvest, and mining may have compounded and contributed to stream impacts. As a result, instream habitat conditions are of concern as well as the condition of streamside vegetation. Minimizing the impacts in riparian areas from past and future disturbances, including additional riparian area damage from future wildfires, is also a concern. Riparian Reserves are a National Forest land allocation intended to protect riparian areas. This analysis will discuss current and reference conditions of riparian areas and delineation and management of Riparian Reserves. It will also make recommendations for future management and stabilization of riparian areas in the watershed.

STEP 3 - CURRENT CONDITIONS

1- What are the current stream channel characteristics and aquatic species habitat conditions?

2- What is the extent of interim Riparian Reserves, and how are they defined?

STEP 4 - REFERENCE CONDITIONS

1- What are the historic and reference riparian conditions in the analysis area?

STEP 5 - INTERPRETATION

1- How have Riparian Reserve acreage estimates evolved from the *Forest Plan* through this analysis?

2- What are the natural and human causes of change between historical/reference and current riparian area conditions, including the impacts of roads and other disturbances?

3- How do the current riparian habitats compare to optimum habitats, and how can riparian areas be protected and/or restored? What poses problems to stream channel stability and resilience?

4- What are the trends for riparian areas in the watershed?

AQUATIC DEPENDENT SPECIES - The analysis area contains a significant portion of the middle Klamath River which is the corridor for anadromous fish species to access habitat both upstream and downstream. It also provides important habitat for coho salmon which have been placed on the Federal Endangered Species list. Chinook salmon, steelhead trout, and other, less studied fish species and aquatic dependent amphibians and reptiles also access portions of the Thompson/Seiad/Grider watershed. This analysis will describe the current status of aquatic dependent species, as compared to historic populations, describe their trends, and describe maintenance, protection, and recovery needs of species at-risk.

STEP 3 - CURRENT CONDITIONS

1- What is the distribution and population size of anadromous and resident salmonid species? What is the status and role of non-salmonid aquatic dependent species?

2- What aquatic dependent species are threatened, endangered, proposed, petitioned, or sensitive?

3- To what extent does Thompson/Seiad/Grider anadromous fish populations contribute to Klamath River basin fisheries?

STEP 4 - REFERENCE CONDITIONS

1- What were the distribution and population sizes of aquatic dependent species?

STEP 5 - INTERPRETATION

1- What are the natural and human causes of change between historical/reference and current species distribution and population sizes?

2- What areas are critical for maintenance, protection, and recovery for at-risk species?

3- What are the population trends for aquatic dependent species in the watershed?

TERRESTRIAL

FIRE - Past forest management, including fire suppression activities, has changed the character of the vegetation within the analysis area from pre-settlement times. Current concerns center around remaining Late-Successional conifer forests (especially within Late-Successional Reserves), and an increase in fuels (hazard) leading to catastrophic wildfire. This analysis will evaluate current vegetation communities and the current fire regime to make recommendations on how to maintain and enhance vegetative diversity and provide an ecological role for fire within the analysis area, which will reduce hazard and fire severity.

STEP 3 - CURRENT CONDITIONS

1a- What are the current vegetation communities found in the analysis area and what is their distribution?

1b- What are the vegetation and fuels conditions within 1987 fire areas?

2- What are the current seral stage distributions and stand densities found in the analysis area?

3a- What are the disturbance regimes impacting the vegetation in the analysis area?

3b- What are the current risks (potential ignition sources) found in the analysis area?

3c- What are the current fuel models and the fire behavior potential in the analysis area?

STEP 4 - REFERENCE CONDITIONS

1- What were the historic disturbance regimes (i.e., fire, insects, disease)?

2- What is the history of fire suppression and fuels treatment in the analysis area?

3- Based on the historic disturbance regimes, what were the vegetative conditions?

STEP 5 - INTERPRETATION

1- How have the vegetation communities changed over time and what have been the agents of change?

2- Where are large areas at risk from catastrophic disturbance and what areas are important to treat or protect?

3a- What is the desired role of fire in the analysis area and how can fire be incorporated as an ecological process?

3b- What are some expected future trends that will affect fuels management within the analysis area (i.e., survey and manage, workforce, road closures, air quality, budget)?

4- What are desired conditions based on vegetation communities, site classes, and land allocations (including late-successional habitats and connectivity)?

LATE-SUCCESSIONAL HABITAT - The amount, distribution and condition of late-successional forest habitat has been identified as an issue in this analysis area as it relates to the management of late-successional forest related species and the recovery of Federally listed species. Roughly 55% of the analysis area has been allocated as LSR, in the *Forest Plan*, to provide habitat for late-successional forest associated wildlife species. All LSRs on the Forest were recently analyzed as part of the *Forest-Wide LSR Assessment*; the *Thompson/Seiad/Grider Ecosystem Analysis* will utilize information from the *Forest-Wide LSR Assessment* to develop more site specific management opportunities for the two LSRs in the analysis area. Human activities, including past Forest management, have fragmented habitat in the LSRs and across the watershed. These activities, combined with fire suppression, have left some areas of late-successional habitat at risk to loss from large-scale disturbance such as wildfire or pest epidemic. This analysis will evaluate the current condition and make recommendations for providing and sustaining late-successional habitat within LSRs. The analysis will also assess the existing condition of late-successional forest connectivity and recommend ways to provide connectivity across the watershed, both within and between LSRs.

STEP 3 - CURRENT CONDITION

1a- What is the current distribution and condition of late-successional habitat within the analysis area and within LSRs?

1b- Which vegetative communities provide late-successional habitat?

1c- Which vegetative communities are capable of, or have the potential of providing late-successional habitat?

2- Where does connectivity of late-successional habitats occur within and between LSRs? Where are the barriers to dispersal?

3 - What is the current density of roads in the analysis area and within LSRs?

STEP 4 - REFERENCE CONDITIONS

1- What was the historic distribution of late-successional habitat and what was its condition?

STEP 5 - INTERPRETATION

1a- How has the amount, distribution, and condition of late-successional habitat changed across the watershed?

1b- What have been the agents of change (timber harvest, roads, 1987 fires, fire suppression)?

2- What is the desired condition of late-successional habitat within LSRs and across the watershed?

3- How will connectivity of late-successional habitat be maintained within and between LSRs?

4a- How will the effects of high road density on late-successional habitats be minimized?

4b- What are the criteria used to assess roads for the *Access and Travel Analysis* included in **Appendix E** of this document?

TERRESTRIAL WILDLIFE - The analysis area is biologically and vegetatively diverse. Habitats within the watersheds include late-successional forest, riparian areas, cave habitats, rock cliffs, oak

woodlands, montane chaparral, and grassy meadows. The analysis area provides habitat for a variety of wildlife species, including: Threatened and Endangered species, Forest Service Sensitive species, species of local and cultural interest, and Survey and Manage species from the *Forest Plan*. The condition of wildlife habitats has been influenced by a variety of factors, such as: natural and human-caused fires, weather events, insects, disease, and human impacts. In addition, the distribution and condition of habitats for these species can have implications for management activities in the watershed. This analysis will evaluate the populations and habitats of these species and recommend strategies to provide for them over time.

Species identified for analysis in the assessment area include: bald eagles, northern spotted owls, marbled murrelets, northern goshawks, fisher, marten, willow flycatchers, red tree voles, bats, salamanders, mollusks, peregrine falcons, deer, elk, bear, turkeys, Forest Service Sensitive plants and Survey and Manage plants.

STEP 3 - CURRENT CONDITIONS

1a- For the species identified in this analysis, what are the habitat needs?

1b- Where is the habitat for these species and how much habitat is in the analysis area?

1c- What is our current knowledge of the populations in this watershed?

2- What unique plant species or communities are found in the watershed (either natural or human introduced)?

3- What exotic plants or animals occur within the watershed (distribution/habitat)?

STEP 4 - REFERENCE CONDITIONS

1- What was the historic distribution of habitats and populations for the identified species?

STEP 5 - INTERPRETATION

1- For these wildlife species, what has changed from historic to present and what have been the agents of change (fire suppression, timber harvest, cattle grazing, private land)?

2- What are the expected future trends for these wildlife species?

3- What are the desired conditions for these wildlife species and their habitats?

4- Are there any management implications with regards to wildlife populations and habitats?

5- What are the effects of exotic species on the ecosystems within the watershed?

6 - How will the effects of high road density on wildlife species be minimized?

HUMAN DIMENSION

ROADS - The original road system was developed to provide access to private property, area gold mines, and later extended for timber extraction. An extensive road system of 492 miles (including State, County, Forest Service, and private roads) now provides access to many parts of the watersheds. The road system is used for a variety of human uses such as timber and fire management, recreation, access to wilderness trailheads, hunting, woodcutting, sightseeing, etc., while causing some resource impacts to streams, riparian areas, and wildlife.

Recent changes in agency policy, budget, focus, and direction have caused all National Forests to critically examine their road systems. An *Access and Travel Analysis* (*ATA*) has been developed which identifies current road system uses, impacts, and resource concerns (refer to **Appendix E**). The *ATA* also documents the Analysis Team's recommendations for future transportation system management including restoration, maintenance, and decommissioning segments of the existing road system. Recommendations in the *ATA* require further site-specific environmental analysis before implementation.

STEP 3 - CURRENT CONDITIONS

1- What are the current conditions and uses of roads within the watershed?

2- How does the current road system provide access outside the watershed?

STEP 4 - REFERENCE CONDITIONS

1- Why and how was the road system developed?

STEP 5 - INTERPRETATION

1- How have road uses changed from the past and why?

2- What resource and social concerns exist with the current road system?

3- What are future trends in road uses, needs, and management?

4- What is the recommended travel and access network?

HUMAN USES - A variety of human uses occur in the analysis area, including recreation, commodities (timber and mining), and heritage resources. The communities of Hamburg and Seiad Valley are located in the analysis area. This analysis will discuss recreational activities, community values and interests, commodity uses, and heritage resources. It will also recommend opportunities to maintain or enhance these uses and community values.

STEP 3 - CURRENT CONDITIONS

1- What are the recreational facilities and uses in the analysis area?

2- What are private land uses and local community concerns and interests about this analysis area?

3- What commodities are produced in the analysis area?

4- What are the heritage resources of the analysis area?

STEP 4 - REFERENCE CONDITIONS

1- What were the prehistoric and/or historic human uses in analysis area?

2- What and where were the historic uses in relation to recreation/community interests/commodities of the analysis area?

STEP 5 - INTERPRETATION

1- How have recreation uses changed from the past and what are their trends?

2- How has community interest/involvement changed from the past and what is likely to change in the future?

3- How have commodity uses changed from the past and what are their trends?

4- What are the contemporary American Indian uses and trends and how have they changed?