U.S. Department of the Interior
Bureau of Land Management

Medford District Office
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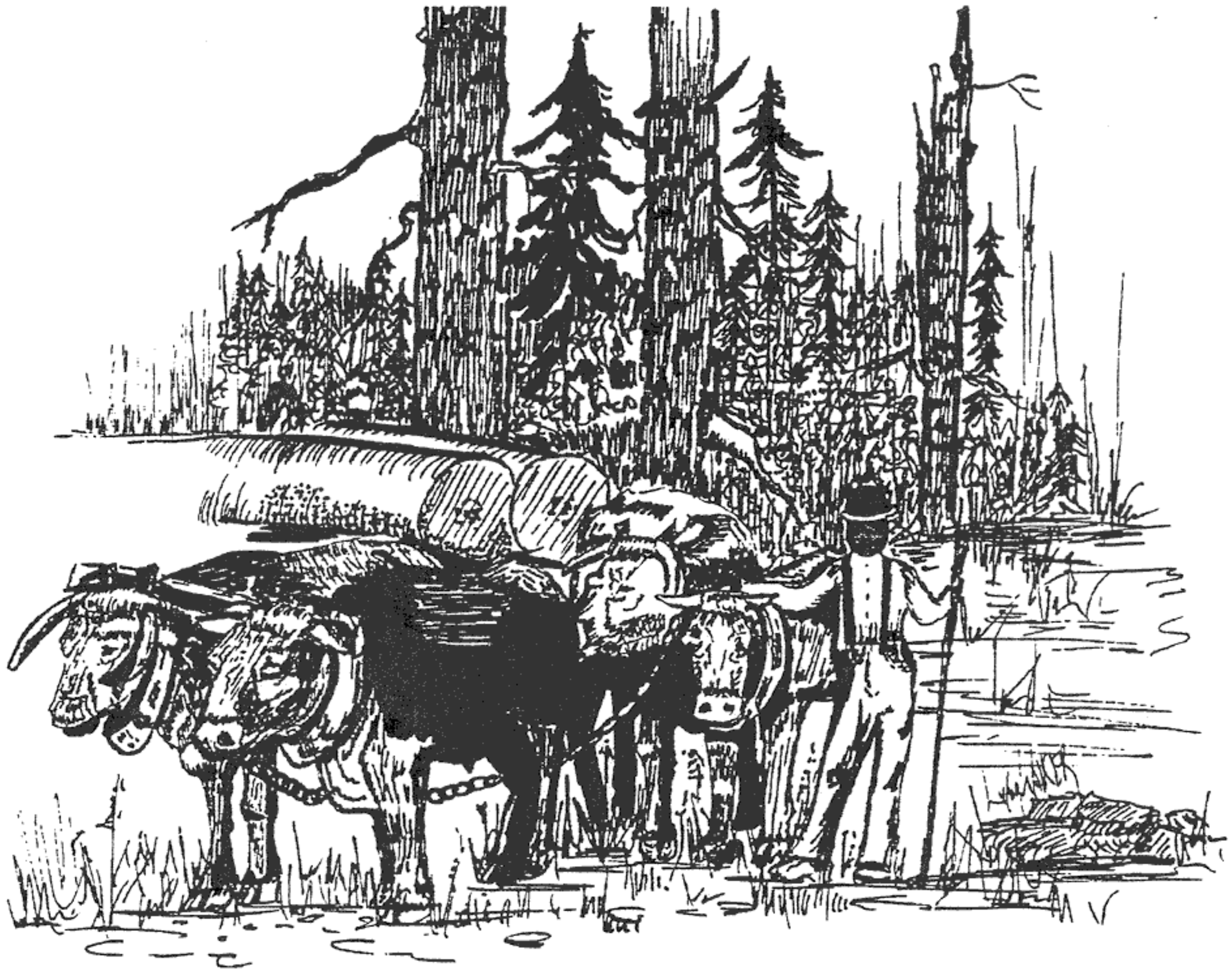
Medford, Oregon 97504

July 1996

Cheney / Slate Watershed Analysis



CHENEY/SLATE WATERSHED ANALYSIS

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Cheney/Slate Watershed Analysis

I. INTRODUCTION

This watershed analysis will attempt to document the past and current conditions of the Cheney/Slate watershed, both physically and biologically. It will interpret the data, establish trends, suggest a desired future condition, and make recommendations on managing this watershed toward the desired future condition.

The first part of this analysis will address the core physical, biological, and human processes that occur in the watershed and their importance to ecological functions. Regulatory constraints that influence resource management in the watershed will also be identified. From this, key issues will be identified that will focus the analysis on the important functions of the ecosystem that are most relevant to the management questions, human values, or resource condition within the watershed.

Next, the current and reference conditions of these important ecosystem functions will be described. An attempt to explain how and why ecological conditions and processes have changed over time will be made during the synthesis portion of the analysis.

The final portion of the analysis will identify the desired future ecological condition of the Cheney/Slate watershed taking into account land management constraints and the demand for the watershed's resources. Recommendations will be made that will guide the management of the watershed's resources toward the desired future condition.

Cheney/Slate Watershed Analysis Team Members

The following resource professionals worked very diligently to complete this document and recommend that the document be read thoroughly before attempting to manage this watershed.

Dale Johnson	--	Aquatic Habitat
Kip Wright	--	Wildlife
John Prendergast	--	Vegetation
Linda Mazzu	--	Special Plants
Tom Murphy	--	Fire
Jeanne Klein	--	Recreation
Matt Craddock	--	Cultural/Minerals
Doug Lindsey	--	Roads
John McGlothlin	--	Geographic Information
Ted Hass	--	Soil/Water, Team Lead

The team would like to specially acknowledge Marji Luther and Nicky Webb for their data collection efforts during the analysis of the Cheney/Slate watershed. We would also like to acknowledge Peter Gaulke, U.S. Forest Service (USFS) and Brendan White, U.S. Fish and Wildlife Service for their participation in team meetings and supplying technical support. The team would like to thank Floy Aschenbrener for the clerical support in pulling the document together.

II. CHARACTERIZATION OF THE WATERSHED

The Cheney/Slate watershed is located within the Klamath Mountain Geomorphic Province of southwestern Oregon approximately 7 miles southwest of Grants Pass. U.S. Highway 199 divides the watershed as it parallels Slate Creek for more than 5 miles on its way to the coast. This 48,915 acre landscape receives from 40 to 60 inches of precipitation annually. About 14 million years ago, and continuing through the present, this area was uplifted and dissected, primarily by water, into an oblong shaped mountainous bowl. This bowl ranges in elevation from 800 feet above sea level to near 4,700 feet and has over 350 miles of waterways that drain into the Applegate River just before it joins the Rogue River. Approximately a third of these waterways are habitat for a number of aquatic species including salmonids. Between the vast network of streams, soil that formed from exposed meta-volcanic and meta-sedimentary rocks supports a myriad of mostly forest type vegetation. This forest supplies wood, recreation, and other special products for human purposes while providing habitat for many species of terrestrial and aquatic wildlife.

A. Regulatory Constraints

The Cheney/Slate watershed analysis addresses all lands within the 48,915 acre Cheney/Slate watershed of southwest Oregon. Federal lands within this watershed comprise approximately 21,823 acres (45%) and are managed by the USDI Bureau of Land Management, Medford District Office (Grants Pass Resource Area), and the USDA Siskiyou National Forest (Galice Ranger District). The remaining lands (55%) within the Cheney/Slate watershed, approximately 27,092 acres, consist of State of Oregon, Josephine County, and private lands.
All federal lands within the Cheney/Slate watershed fall within the boundary of the Applegate River watershed. The Applegate River watershed was identified in the Northwest Forest Plan as an Adaptive Management Area (AMA) to "...encourage the development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives." A portion of the watershed (3,518 acres) has been designated as a late successional reserve (LSR) by the Northwest Forest Plan Record of Decision (ROD). The purpose of the LSR designation is to set aside land for old-growth dependent species and manage those lands accordingly. The remaining AMA lands not designated as LSR fall under the standards and guidelines for the matrix land allocation in the Northwest Forest Plan. According to this plan, most of the timber harvest and other silvicultural activities on federal lands were designed to occur on the matrix lands. Additionally, the probable sale quantity (PSQ) assigned to each federal agency management unit was calculated to come from these lands.

Regulations that dictate the management of federal land include the BLM policy 6840, Endangered Species Act (ESA) of 1973 (16 U.S.C. 1533 et seq.), and the Northwest Forest Plan. BLM policy 6840 states that the bureau will not conduct activities that will adversely effect species or their habitats to a point which leads to the need to officially list animals under the provisions of the ESA. The U.S. Forest Service (USFS) has a similar policy under Title 2600. Under the ESA, federal agencies are required to use their authorities to conserve species,

subspecies, or populations of plants and animals officially listed by the Secretary of the Interior. It furthermore requires agencies not to destroy or adversely modify designated critical habitat. The Northwest Forest Plan developed a management strategy to protect the old-growth related species and produce a sustainable level of timber.

Additional laws and/or regulations that pertain to management of the federal resources include The Clean Water Act, National Environmental Policy Act (NEPA), Federal Land Policy and Management Act (FLPMA), the National Historic Preservation Act (NHPA), the National Forest Management Act (NFMA), Mutiple-Use Sustained-Yield Act, the O&C Act, BLM best management practices (BMPs) as described in the Resource Management Plan (RMP) for the BLM Medford District; and the Forest Plan for the Siskiyou National Forest.

The responsibilities of the federal agencies include the active management of special status plants and their habitats, survey and manage species and their habitat, Special Areas and native plants. Vegetation within the Cheney/Slate watershed represents some of the highest ecological diversity in the United States. The protection of this diversity is a high priority.

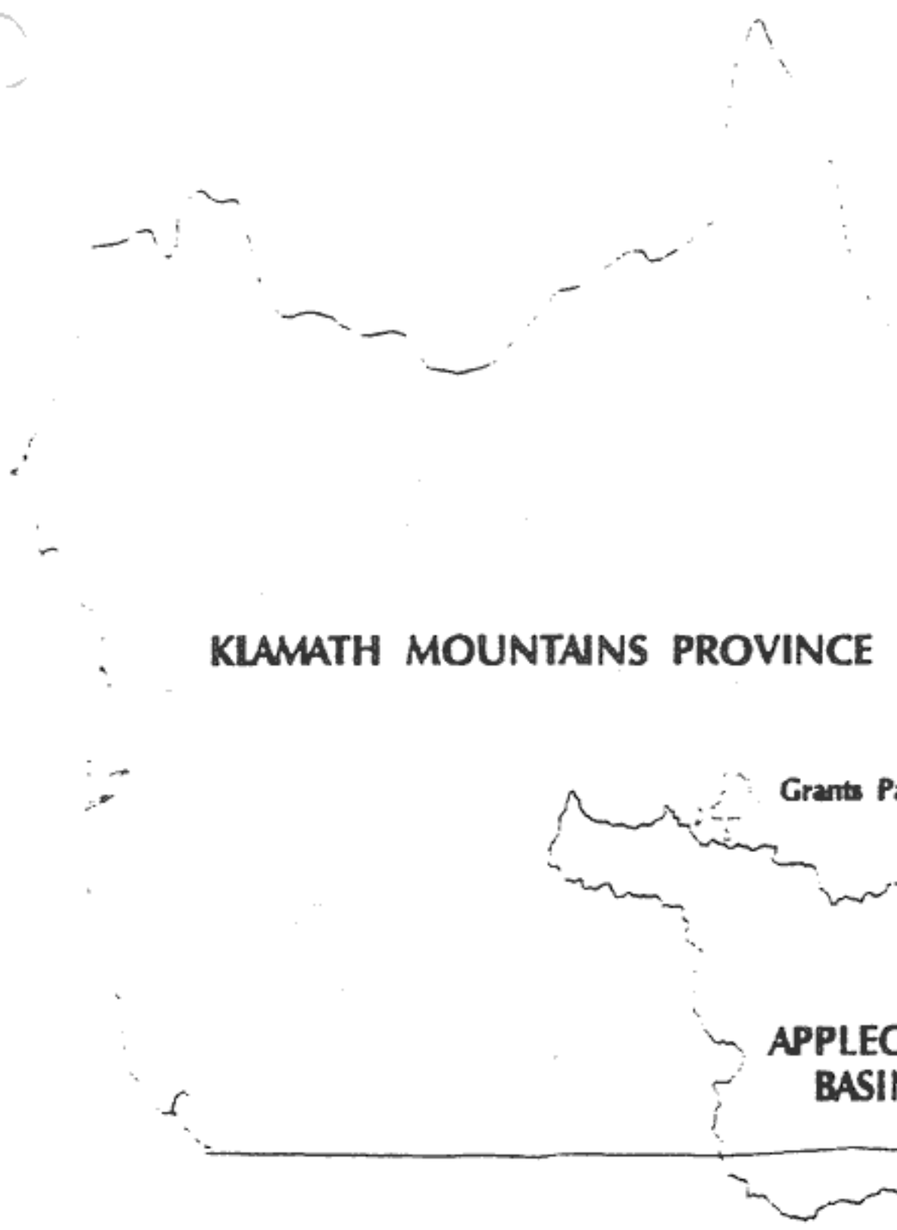
The following are special status plant protection categories used as guidelines for management of special status plants and their habitats:

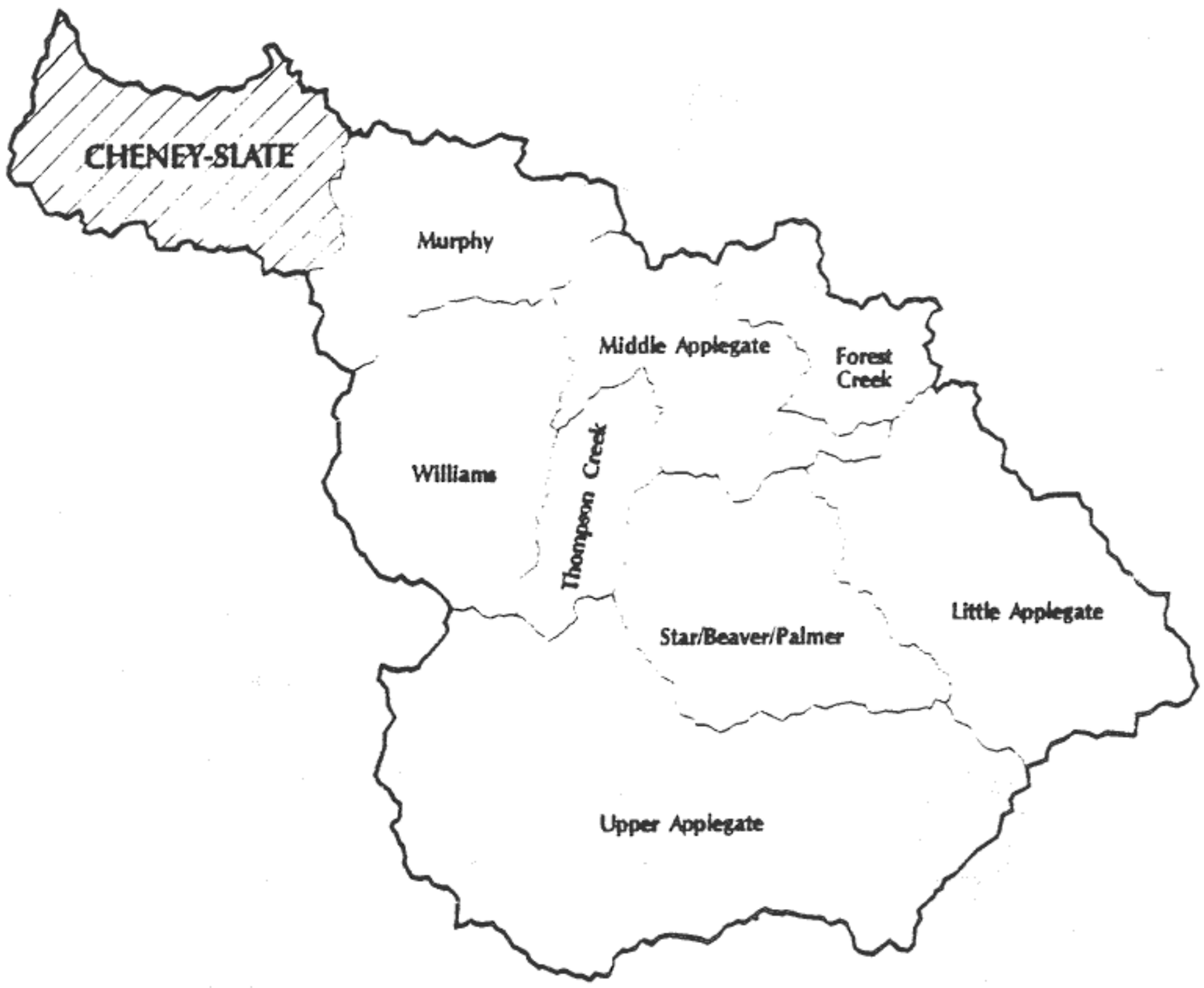
Listed and proposed listed species are those species that have been formally listed by the U.S. Fish and Wildlife Service (USFWS) as endangered or threatened or officially proposed for listing. Enhance or maintain critical habitats and increase populations of threatened and endangered plant species on federal lands. Restore species to historic ranges consistent with approved recovery plans and federal land use plans after consultation with federal and state agencies.

Survey and manage species are both nonvascular and vascular plant species identified as needing special management attention by the Northwest Forest Plan ROD (Table XX). Vascular plants must be managed at known sites and located prior to ground-disturbing activities. Nonvascular plants need to be inventoried extensively.

Candidate and Bureau sensitive species are federal or state candidates and those species considered by the BLM to be of concern in becoming federal candidates. The goal is to manage their habitat to conserve and maintain populations of candidate and Bureau sensitive plant species at a level that will avoid endangering species and the need to list any species as endangered or threatened by either a state or federal government.

State-listed species and their habitats are those plants listed under the Oregon Endangered Species Act. Conservation will be designed to assist the state in achieving their management objectives.





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GENERAL LOCATION OF THE
CHENEY-SLATE WATERSHED

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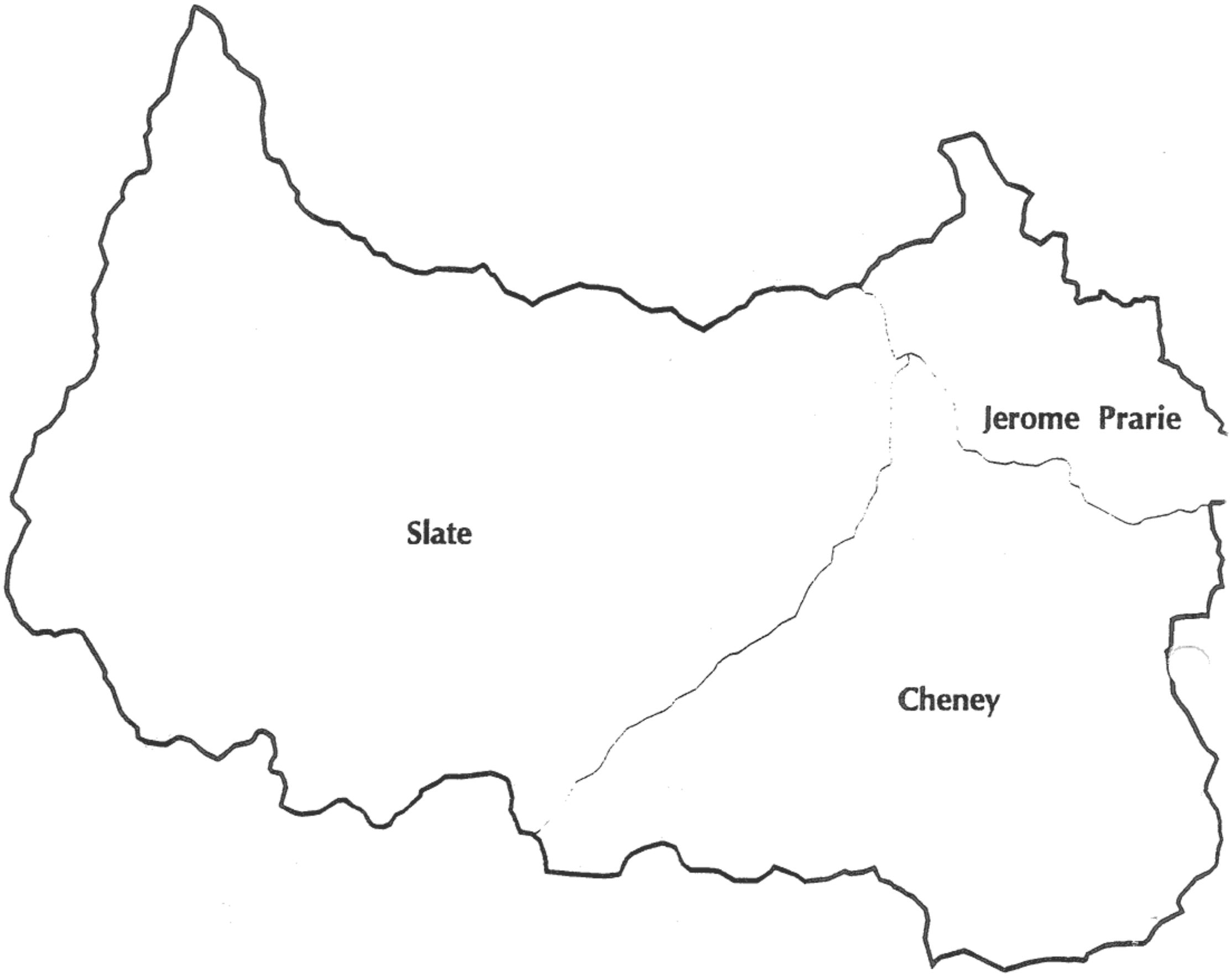
Map 1
General Location Map



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LEVEL 6 SUB-WATERSHEDS IN THE CHENEY-SLATE WATERSHED

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LEGEND

CHENEY-SLATE BOUNDARY

SUB-WATERSHED BOUNDARY

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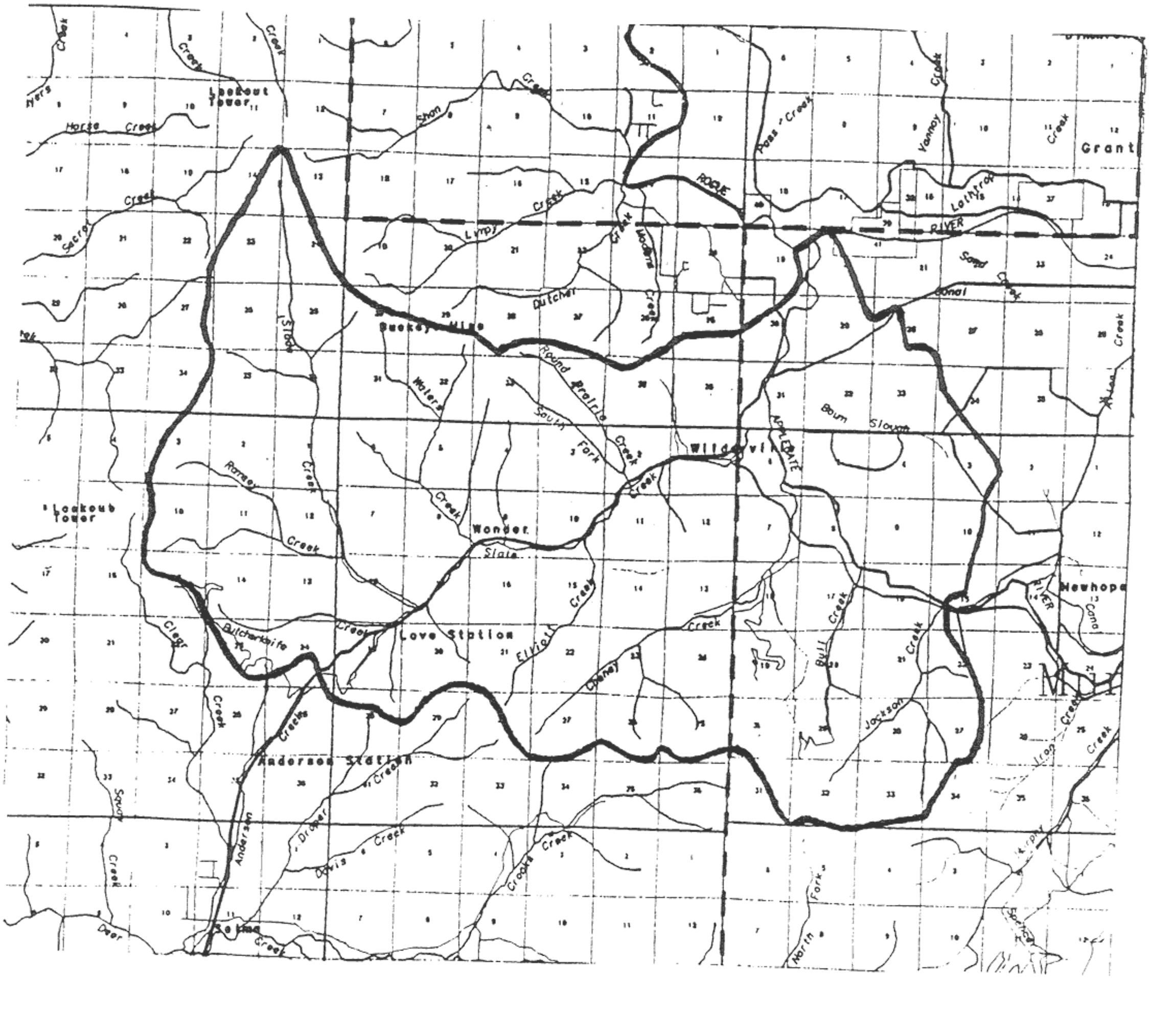
Map 2
Level 6 Subwatershed Map

GENERAL VICINITY MAP
CHENEY SLATE WATERSHED



Scale
1:150,000
1 inch = 2.5 miles

Map 3
General Vicinity Map

R8W R7W R6W

T36S

T37S

WILDERVILLE

199

SCALE 1:110000

GOVERNMENT OWNERSHIP
CHENEY-SLATE WATERSHED

LEGEND

BLM

USFS

WATERSHED BOUNDARY

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OCTOBER 18 1995

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Bureau assessment species are those species considered by the state BLM office as important species to monitor and manage but not on as crucial a level as candidate or Bureau sensitive species. The goal is to manage where possible so as not to elevate their status to any higher level of concern.

BLM tracking species are not currently special status species, but their locations are tracked during surveys to assess future potential needs for protection.

B. Erosion Processes

The dominant erosion processes occurring in this watershed are surface sheet/rill erosion, channel erosion, and mass wasting. Erosional processes exerted on the landscape are driven by gravity and the influence water (precipitation and runoff) has on shear strength. Other factors that have influenced the erosion process on the landscape are climate, vegetation, and fire. Water erosion is important as it not only detaches soil particles (and sometimes parent material) but also transports the material downhill.

Surface erosion (sheet and rill) is a concern on hill slopes that have had most of the vegetation removed. Surface erosion occurs when soil particles are detached by raindrop splash or the overland flow of water and moved to another location on the landscape. Eroded soil particles can move from less than an inch to many miles depending on the topography and vegetative condition of the land. This type of erosion is important as it can reduce the amount of soil on a landscape thus decreasing the productivity of the land and increasing sediments in local waterways.

Channel erosion occurs as large volumes of water and debris rush through the streams and waterways dislodging soil particles from the stream bank and transporting them downstream. This type of erosion is important as it can widen a stream channel which may cause the stream to spread and become shallower. Also the detached soil sediments may deposit in spawning gravel or rearing pools reducing habitat effectiveness.

Mass wasting processes in the Cheney/Slate watershed occur in different forms. These forms are raveling on steep slopes, soil creep, earthflows, slumps, and debris slides. These phenomenon occur on different portions of the landscape and under different conditions but most involve water saturated soil moving downhill. This type of erosion is important as many tons of soil may be lost on the hillside. The soil moving downhill eventually reaches a stream or waterway and can have detrimental effects.

These erosional processes combined with the uplifting of the landscape that has been occurring for the last 14 million years are primarily responsible for the morphological characteristics of the watershed. As the landscape is uplifted, belts of varying rock types are exposed to weathering. The uplifting process is occurring faster than the erosional process which has resulted in steeply incised stream canyons, streams with high gradients in the upper portion of the watershed

(Rosgen Aa+), and alluviated valley streams with low to moderate gradients and entrenched channels (Rosgen B, DA and G). Riparian areas along these streams provide habitat for plants and animals associated with the aquatic resources. Many of the riparian areas of the streams in the watersheds have been disturbed as a result of past timber harvest, roads, or fire. Although only a portion of the riparian areas in the watershed has been surveyed, it is estimated that most of them are in proper functioning condition or functioning at risk.

C. Hydrology

The Cheney/Slate watershed receives approximately 35 to 60 inches of annual precipitation. Most of this precipitation occurs in the form of rain or snow during the late fall through early spring. As a result of the steep topography, water is very efficiently moved through the watershed into the main streams at the bottom. Over the last 22 years, the estimated mean annual discharge contributed to the Applegate River from the Cheney/Slate watershed during the wet season (Nov.- Mar.) was approximately 130 cubic feet of water per second. It is estimated that this watershed contributes approximately 47,000 acre-feet of water annually to the Applegate River.

Although peak flow events are considered climatically controlled, this watershed has a considerable amount of area at 3,500 to 4,500 feet above sea level that is referred to as "transient snow zone." Under the current climatic regime, the transient snow zone often has a snow pack that will be quickly melted as a result of a rainfall event. During extreme climatic periods or "rain on snow" events, local streams will overflow their banks for a short period of time.

One of the main hydrological limiting characteristics of the Cheney/Slate watershed is the minimum stream flow amounts that occur during the summer months. Most of the main streams in the watershed, save for lower Slate Creek, are reduced to small pools with little surface flows. This has been especially apparent during the last 10 years. Streams that continue to flow during the summer months have water temperatures that are considered limiting to beneficial uses. Agricultural development and road construction in the valley bottoms have caused streams to be less sinuous and has reduced the amount of shade. This simplification of the waterways has had a major effect on habitat complexity.

D. Vegetation

The Cheney/Slate watershed is a very diverse and unique landscape. It is contained within the Klamath Geologic Province which is known for both its geologic and vegetative diversity. This diversity, combined with a highly variable Mediterranean climate, has resulted in forest ecosystems known for their variety, abundance, and distribution of species and processes through which they interact. This physical and botanical diversity combines with a long history

of prehistoric and historic disturbances, primarily by fire, to produce highly variable forest communities (Franklin and Dyrness 1973). The ecosystems of the Klamath Province are considered to be the most floristically diverse of any in the western United States (Whittaker, 1960).

The array and landscape pattern of vegetation that exists in the Cheney/Slate watershed today is primarily a function of geology, fire history, and human influences this century. The soils developed from seven distinct geologic formations influence the plant communities present, both forest and nonforest. The predominance of grass/forb and shrub communities in the northeastern portion of the watershed is a result of the stream deposits of the Applegate River floodplain and granitic soils that form the large, flat nonforest area known as Jerome Prairie. Serpentine soils, formed from a long band of ultramafic rock, in the western side of the watershed support vegetative species not commonly found elsewhere. The remainder of the watershed supports the mixed evergreen forests more typical of Siskiyou Mountain forest ecosystems.

Very little old-growth forest exists in the watershed today, even on sites that have never been entered for timber harvest. The majority of the suitable forest lands on federal ownership are in the pole and large pole size classes as a result of previous fire disturbance. Exceptions include earlier seral conditions on sites harvested within the last twenty-five years. Earlier seral conditions are more predominant on the private land ownership. This reflects the more intense human disturbance that has occurred on these lands.

Like the Klamath Province that it is a part of, the vegetation of the Cheney/Slate watershed is very diverse and has been shaped by both the geologic diversity of the watershed and the natural and human caused disturbance patterns. Prior to white settlement in the early to mid 1800s, natural disturbances from fire, wind, flooding, insects, and disease were common. Additionally, Native Americans were known to have used fire to provide better plant and animal food sources. Gradual climatic changes over long periods of time has resulted in numerous species shifts (Atzet et al., 1992). These natural disturbance patterns resulted in very dynamic forest ecosystems that changed constantly over time. Disturbance has played a vital process role in providing for a diversity of vegetation and structures and for managing vegetation density over time. Natural disturbances provided these benefits while still preserving the necessary components of the important ecosystem processes.

These disturbance patterns changed significantly with the advent of white settlement in the mid 1800s. Mining, ranching, settlement, fire suppression, timber harvest, and road building have replaced wildfire as primary disturbance agents. These actions have not always been evenly distributed across the landscape and have sometimes been concentrated in certain areas.

Fire, both its historic frequency and absence over the last fifty years, has been the primary natural disturbance process that shaped the existing vegetation conditions and seral stage distribution

across the watershed today. The pattern of fire disturbance has shifted in the watershed from a low-severity to a high-severity regime. It is important to recognize that each vegetation type is adapted to a particular fire regime (Agee, 1981).

The fire regime for the Cheney/Slate watershed has historically been that of a low-severity fire regime. Fires in a low-severity regime are associated with ecosystem stability, as the system is more stable in the presence of fire then in its absence (Agee, 1990). Frequent, low severity fires keep sites open so that they are less likely to burn intensely even under severe fire weather. With the advent of fire exclusion, the pattern of frequent low intensity fire ended. Dead and down fuel and understory vegetation are no longer periodically removed. This creates a trend toward ever increasing amounts of available fuels present and the longer interval between fire occurrence creates higher intensity, stand replacement fires rather than the historical fire effect of stand maintenance.

In Douglas-fir/hardwood forest shade tolerant and less fire resistant conifer and hardwood trees become established in both the overstory and understory. Douglas-fir increases produce a multilayered stand. The probability of stand replacement type of fire is much higher due to the fuel ladder created by the understory vegetation and woody debris buildup. This tendency for increasing fuel buildup over time is kept in relative equilibrium by the natural fire scenario. The stability of this vegetation pattern is not as great as the former because of lack of disturbance.

In the oak woodlands, once common on the dry sites and lowlands, fire exclusion has lead to massive conifer tree invasion. Conifer invasion produces a dense understory replacing the formerly open oak understory. This creates a fuel ladder and high fire hazard. Over time, Douglas-fir will overtop Oregon white oak and the shade-intolerant mature oaks will die (Agee, 1993).

Ponderosa pine dominated areas are nearly gone. Human use and fire exclusion have resulted the near total loss of areas dominated by this species. A study done in the Applegate watershed (McKinley and Frank, 1995) used historical records from the 1850s, and current GIS data determined that ponderosa pine dominance has dropped from 15-17 percent of the acres to 0.2 percent in the past 150 years. Whereas the pine once dominated in areas (especially in clumps by itself) it is now a scattered component in stands dominated by other species.

Competition and succession are two other processes influencing vegetation in addition to disturbance. Competition is the interaction between species, or within a group of species, that usually results in one individual species having an advantage and dominating or out competing another. When the density of vegetation increases to a certain point, there are not enough site resources to sustain all of the vegetation present. This weakens the vegetation, making it more susceptible to environmental stresses such as drought, insects, and diseases. Accelerated mortality can occur at this point.

Succession is a process that involves a series of vegetation condition changes over time, following a disturbance, where one group of plants succeeds another through stages until the final or climax stage is reached. The developmental series of plant communities is called a sere and defined stages are called seral stages. This process can happen in two patterns. One pattern occurs when a species or a small group of species (i.e., grasses) invade an area following a disturbance and predominate. These species alter the environment on that site and help create conditions that permit another stage of vegetation to move in and succeed it. In the absence of disturbance, different stages of vegetation (seral stages) will succeed each other until the climax stage is reached. In late seral or climax conditions, no other species can successfully reproduce and succeed the climax species dominance. The vegetation will remain in this condition until some form of disturbance alters the site to favor earlier seral stages of succession. In the Klamath Province, late seral forests are generally the least diverse with regard to tree species, least stable, and most susceptible to disturbance. Late seral forests are generally dominated by climax species.

Another form of succession, which is more common in the Klamath Province, occurs when many species invade a site following a disturbance but assert dominance at different times, depending on their competitive advantage. Species that eventually predominate were present soon after the disturbance but did not achieve a competitive advantage until later.

With the exception of the geological influence on vegetation condition and patterns, the vegetative processes in the Cheney/Slate watershed are consistent with other watersheds in the Middle and Lower Applegate River basin. Watersheds in the Upper Applegate basin have a much smaller percentage of private land ownership and the vegetation patterns there have not had the degree of human influence that the Cheney/Slate watershed has. The serpentine influence on vegetation in this watershed is more typical of what is found in the adjacent Illinois River basin to the south. Serpentine influences are not as common in the other watersheds of the Applegate basin.

E. Sensitive Species and Habitat

1. Terrestrial Wildlife Species

The high diversity of soil types, vegetative communities, and habitats in the Cheney/Slate watershed analysis unit (WAU) provides for the potential of a myriad of sensitive plant and animal species. There is potential habitat for 46 vertebrate special status species (15 mammals, 19 birds, and 12 reptiles and amphibians). In addition, 9 more sensitive invertebrates species are known to occur in the vicinity (see current condition for complete list of sensitive species). Relatively few surveys for wildlife have actually been conducted in the watershed. Distribution, abundance, and presence for the majority of the species is unknown. Other species of concern include cavity nesting species, band-tailed pigeons, and neotropical migrant birds. Twenty-one of the special status species are associated with older forest, 8 with riparian, and 8 with special habitats such as caves, cliffs, and talus. The remaining species are associated with habitats such

as oak stands, meadows, and pine savannahs (see synthesis and interpretation for habitat trends). The Northwest Forest Plan ROD has further identified additional wildlife to be surveyed, known as "survey and manage" species. This list includes 4 birds, 1 reptile, and 6 mammals that must be surveyed prior to ground disturbing activities (see current condition section for further information).

The northern spotted owl (Strix nebulosa caurina) is the only known listed animal in the WAU. Critical habitat has been designated including 5,298 acres in the Cheney/Slate WAU. Any modification of this habitat would require a consultation with USFWS. The Northwest Forest Plan also established 3,518 acres of late-successional reserve in the WAU. For the most part, these lands parallel the established critical habitat.

2. Plant Species

The Cheney/Slate watershed appears to be a stronghold for the survey and manage species, Cypripedium fasciculatum, clustered ladyslipper. With less than 25 percent of the watershed surveyed, a total of 193 plants have been found over 9 populations on BLM land. The populations are scattered among the Waters Creek, Slate Creek, and Elliott Creek drainages. Although, Cypripedium fasciculatum is found in small populations in many parts of the region, the concentration found in the Cheney/Slate watershed is one of the largest. Of important note is that most of the populations found in the watershed were located in previous timber sales. The populations need to be revisited to monitor whether past mitigation was adequate.

The primary habitat for Cypripedium fasciculatum, is mixed evergreen forest of varying plant series. As long as the forest canopy has maintained a closure of 60 - 90 percent, the dominant species could vary from Douglas-fir to tanoak. The plant is most likely to be found on moist, northern aspects, although western and eastern aspects also harbor populations within moister habitats such as draws.

Three other special status plants have been found in the watershed. Only one population of Limnanthes gracilis var. gracilis was found in a seep adjacent to a timber sale unit. More surveys in wetlands and seeps will most likely find more of this plant.

In the serpentine-influenced soil of Bolt Mountain in the eastern portion of the watershed, Microseris laciniata ssp. leptosepala has been collected. Although not a special status plant, its unusual characteristics and location on serpentine-influenced soils lends to the possibility that the federal candidate, Howell's microseris, is present and possibly hybridizing in the area. This botanical phenomenon has drawn the attention of a botanist at Oregon State University and will be further investigated. If Microseris howellii is found on Bolt Mountain, its population will be the farthest north population known and will be considered slightly disjunct from its species center in the Illinois Valley.

Several special status plant species have been located on USFS land within the watershed. The survey and manage species Cypripedium montanum (mountain ladyslipper) has one small population recorded. Its habitat requirements are similar to Cypripedium fasciculatum.

Serpentine bands of the western portion of the watershed (under USFS jurisdiction) harbor at least two federal candidates in small numbers. Microseris howelii and Cardamine nuttalii var. gemmata (purple toothwort) each have one recorded population. Another species, Fritillaria glauca (Siskyou fritillary), a Bureau assessment species, is more abundant, with six populations ranging from 10 to 500 plants per population. Hieracium bolanderi (Bolander's hawkweed) is another Bureau assessment species with one known population of 25 plants. Numerous Bureau tracking species can also be found within the serpentine bands in the western portion of the watershed including Epilobium rigidum (rigid willow herb), Arabis aculeoata (Waldo rockcress), Dicentra formosa ssp. oregana (Oregon bleedingheart), Darlingtonia californica (California pitcherplant) and Cypripedium californicum (California ladyslipper).

It is likely that as the Cheney/Slate watershed gets more survey coverage, more special status plant species could be found. The plant, Allotropa virgata, a survey and manage species, is also found in mixed evergreen forests of varying plant series with high percentage canopy closure. The plant was not surveyed before it was designated survey and manage and therefore, not much is known on the species' location in the watershed.

Additional survey and manage species identified by the Northwest Forest Plan ROD on page C-49, list 234 species of fungi, 81 species of lichens, 41 mollusks, and 23 species of bryophytes. Very little data is available on these species including their description, range, or life requirements. As a result of this lack of information, it is unknown if these species occur in the Cheney/Slate watershed.

3. Aquatic Species

Cutthroat trout, steelhead, coho and chinook salmon are found in the Cheney/Slate watershed. Each is a cold water species and requires complex habitats especially in the early life stages. Quantitative abundance estimates are unknown. A qualitative analysis depicts a low abundance of cutthroat and coho and low to moderate abundance for steelhead and chinook in the tributaries to the Applegate River. Cutthroat trout could be considered a threshold species for tributaries and coho salmon a threshold species for lower gradient tributaries. Cutthroat and steelhead typically have a wider range of distribution and are found higher in the tributaries than coho and chinook. Factors limiting salmonid production include: (1) the lack of water during the end of a water year, (2) high water temperatures, (3) erosion, (4) lack of large woody material in the stream and riparian area, (5) lack of rearing and holding pools for juveniles and adults, respectively, (6) channelization of streams in the canyons and lowlands, and (7) blockages of migration corridors.

The American Fisheries Society (Nehlsen et al, 1991) identified 314 stocks of anadromous fish at risk of extinction. Coho salmon are considered moderate risk of extinction. Coho salmon and

steelhead are both proposed as threatened or endangered in the Rogue River basin. Coho salmon are considered by the Oregon Department of Fish and Wildlife as depressed in the Applegate River basin.

The following special status aquatic species inhabit the Cheney/Slate watershed.

Table 1 - Special Status Aquatic Species

Species	Status
Steelhead	• National Marine Fisheries Service proposes threatened status for wild steelhead in southern Oregon and northern California (3/12/95). • Summer steelhead: American Fisheries Society "at risk" (Nehlsen et al. 1990)
Coho salmon	• All coastal stocks have been petitioned for threatened or endangered status (federal) • American Fisheries Society "at risk" (Nehlsen et al. 1990) • State of Oregon sensitive (ODFW 1992)
Pacific lamprey	• Federal category 2 (USDI 1994)

F. Human Uses

Archeological evidence indicates that human occupation of southwest Oregon dates back about 10,000 years. During these prehistoric times, the native inhabitants who occupied this area minimally impacted the physical landscapes. The native inhabitants of the area are generalized as hunters and gatherers.

The first known whites to enter the Applegate watershed passed through the area in early 1827. They belonged to a party of Hudson Bay Company trappers from Fort Vancouver. Gold mining occurred on a small scale within the Cheney/Slate watershed in the early years. The majority of the mining in the mid-1800s within this watershed was small scale, primarily prospecting.

The land ownership pattern of the Cheney/Slate watershed was primarily molded in the late 1800s and early 1900s. In order to further develop the west, Congress passed several laws enabling settlers to develop and obtain ownership of the public lands. These laws included donation land claim patents, entry under the Homestead Acts, military patents, and mineral patents. In addition to these types of deeds, land was deeded to the Oregon and California Railroad, with some of those lands being sold to private individuals.

In reviewing the master title plats for the Cheney/Slate watershed it is apparent that ownership of several of the low elevation lands was originally deeded from the United States to private individuals through the above acts of Congress. Approximately 55 percent of the watershed is currently in nonfederal ownership. Most residences occur in the valley bottoms and toe-slopes of the watershed. The private lands not used for residence are intermingled with BLM managed

lands throughout the eastern half of the watershed.

Current human use of the watershed includes agriculture, timber, mining, and dispersed recreation. There is almost no economic base in the area. Residents report a changing settlement pattern from agriculture to more suburban use and use by retirees or commuters. People living in the area include farmers, natural resource workers, retirees, environmentalists, commuters, teachers, those involved in light technology, and horse ranchers. The population is increasing with many newcomers in the area. The majority of the settlement is located in the area of Highway 199, Fish Hatchery, and Cheney Creek roads. There are scattered homes along Bull Creek, Elliott Creek, Slate Creek, and Water Creek roads.

Timber has been harvested from the Cheney/Slate watershed for over 50 years. Within the last 30 years, advances in harvesting technology and road access have led to the majority of the forestlands being entered. The practice of clear-cutting during the 1970s and 1980s led to blocks of land that were denuded of trees, burned, and replanted. This has led to noticeable reduction in the amount of large woody material on the landscape especially in riparian areas. Currently, new forestry practices promote a lighter touch on the land through ecosystem management that considers more than just harvesting trees.

Road construction and improvement across federal lands was based mainly on timber management as directed under federal O&C land management. Most of the roads, used to access federal land, were constructed during the 1960s and 1970s. The major travel route through the area is U.S. Highway 199, which divides the watershed from the northeast to the southwest. Other travel routes include: Fish Hatchery Road and a small portion of Riverbanks Road. Satellite road systems include Cheney Creek Road, Bull Creek Road, Elliott Creek Road, Slate Creek Road, and Water Creek Road.

Recreational use of the area is dispersed and includes off-highway vehicle (OHV) use, fishing, mountain biking, and equestrian use. There are two proposed recreation sites in the watershed: Stringer Gap Trail and Round Top Mountain CCC Trail. Another potential recreation site is No Name Cave. Other recreation opportunities include fishing on the Applegate River and day use of Fish Hatchery Park managed by Josephine County Parks Department.

Human actions greatly influence the pattern of fire occurrence and number of fires in the watershed. The watershed as a whole has a high level of risk of human-caused ignition. Human uses which create ignition risk include residential, industrial (light manufacturing, timber harvest, mining/quarry operations), recreational (hunting), tourist, and travel activities. Human use within the watershed is high. Access is generally good into all portions of the watershed except in the extreme northwest. Access includes both on-road and off-road, hiking, and small boating access on the Applegate River.

The human-caused fire occurrence pattern for the watershed would generally start on private lands at low elevations and burn onto BLM lands. The potential of a large-size fire exists

throughout the watershed due to the buildup of fuels, both live and dead, overstocking of conifers and hardwoods, and the presence of less fire-resistant species which have invaded in the absence of fire occurrence.

It is obvious that the Cheney/Slate watershed provides a diverse habitat for an array of plant and animal species while offering a variety of uses for humans. The habitat demands of these species combined with human uses will need to be balanced in order to have a healthy ecosystem.

III. ISSUES AND KEY QUESTIONS

Key issues were identified in order to focus the analysis on the important elements of the ecosystem. The main concerns about these issues are reflected in the key questions. The remaining portion of this analysis will focus on gathering and comparing data related to the key issues in an attempt to answer the key questions.

The prioritization of key issues for future management of the landscape would be based on the direction provided in the previously listed regulatory constraints particularly the Northwest Forest Plan (for federal lands) and the State of Oregon's Forest Practice Act (for non-federal land). The designated land use allocation (LAU) determines the management objectives of the federally managed lands. Most of the federal land is designated as matrix. The overall objective of ecologically managing matrix lands in the Cheney/Slate watershed would be for timber production while protecting or enhancing the habitat of sensitive species. A minor portion of the federal lands is designated late-successional reserve and the objective on these lands is to manage toward maintaining old-growth habitat. There are basically no overall objectives for the privately owned lands as long as the management of these lands is in conformance with the State Forest Practice Act.

The greatest threat to all of these objectives, short of a prolonged drought, is the risk of a severe fire. A high intensity fire that consumes a major portion of the watershed could result in major ecological damage including loss of species native to the watershed. To minimize this risk, all lands need to be managed toward reducing fuel loading and minimizing ignition sources. The amount of harvesting (both spatially and temporally) and road activities are also important factors in reaching the objectives of a healthy watershed.

Six issues that are key to meeting the overall ecological objectives in the Cheney/Slate watershed were identified. These issues are all interrelated in their process and function. It is important to scope out the current and past conditions of the factors affecting these key issues before determining the most important management issues. For this reason, determining the relative importance of the six issues will be accomplished during the "desired future condition" portion of this analysis and the order in which they are listed does not reflect their importance to the overall ecological health of the watershed.

Listed below are the key issues and questions along with a brief description identifying indicators most likely to reveal the answer to the key questions.

A. Key Issue -- Desired Vegetation Conditions

Key Question -- **What landscape pattern of vegetation conditions, including species composition, seral stage, and size class distribution, are desired in the watershed to sustain healthy ecosystems, meet the needs and values of beneficial users, and fulfill the direction contained in land use management plans for these lands?**

There are many competing uses for the vegetation in the Cheney/Slate watershed. Different vegetation conditions provide for a variety of needs for beneficial users. A diversity of vegetation conditions is necessary to sustain healthy ecosystems. The landscape pattern of vegetation in the watershed determines how well the needs and desires of beneficial users is being met. A dominance of one type of vegetation condition means that species which prefer other vegetation types will not have their needs met very well, if at all. Identifying what kind of landscape pattern of vegetation in the watershed will best meet the needs and values of the beneficial users will permit the identification, development, and prioritization of projects to manipulate the vegetation and move it from the existing condition to the desired condition over time.

B. Key Issue -- Water and Stream Habitat

Key Question -- **What are the primary factors affecting the beneficial uses of water and the associated stream and riparian habitat?**

Water, and related stream habitat, is an important issue because it provides various beneficial uses. The beneficial uses in the Cheney/Slate watershed are aquatic, domestic and recreational. The water that flows through this watershed provides a physical medium for fish, herptiles and aquatic insects. The water is also used for domestic purposes such as drinking, cooking, cleaning, waste disposal, and irrigation. The stream bed, streambank and associated riparian area provide environmental conditions conducive to specific types of plants, animals and insects. Beneficial uses from a recreational standpoint include swimming, mining, and fishing. It is apparent that some beneficial uses may conflict with other beneficial uses.

Indicators that will help identify factors affecting the beneficial uses are those that relate to fish migration, spawning, and rearing. Water quality standards established by the Oregon Department of Environmental Quality are also an important factor. Indicators such as temperature, turbidity, sedimentation, numbers and depth of pools, large woody material, riparian vegetative condition, stream morphology, channel stability, and stream diversions and blockages will be examined.

C. Key Issue -- Fire Management

Key Question -- **What is the importance of a high level of risk of a large-scale, high severity fire within the watershed, and what are the social and political concerns that will affect fire protection, fire use, and fuels treatment programs that minimize this risk.**

Fire exclusion has created vegetation and fuel conditions with high potential for large, destructive, and difficult to suppress wildfires. The watershed has a large amount of high values at risk of destruction and loss from wildfire. Wildfire presents a threat to human life, property, and nearly all resource values within the watershed. Management activities can reduce this risk through hazard reduction treatments. Public acceptance of hazard reduction management activities will be critical for the long term health and stability of the forest ecosystem within the watershed.

D. Key Issue -- Sensitive Species

Key Question -- **What are the primary factors affecting populations and habitats of sensitive plant and animal species.**

Federal agencies are responsible for maintaining all native assemblages of plants and animals found on the public land they manage. The Northwest Forest Plan was prepared in recognition that the current land management practices were not meeting these goals, especially in regard to late-successional and old-growth related species. Preservation of rare (i.e., sensitive or special status) plants and animals was a critical factor in determining the new direction for federal land management agencies as outlined by the forest plan. The primary factors affecting sensitive animal and plant species in the Cheney/Slate watershed include habitat quantity and quality. Some sensitive wildlife and plant species are specialists, limited to a particular habitat type. Therefore, survival of these species are intricately tied to maintenance of their particular habitat type. Other species, though not tied to specific vegetation types, are affected by disturbance to their micro-habitats. Specific factors affecting each species will be addressed in the current condition section of this document.

E. Key Issue -- Human Uses

Key Question -- **What are the primary human uses competing for the watershed's resources?**

This was determined to be a key question because of the variety and amount of human uses that occur within the watershed coupled with the diverse demands for those uses. Conflicting uses are compounded by the intermingled private/public ownership and the accessibility of the lands within the watershed. Access is provided by open transportation systems such as U.S. Highway 199, USFS, and BLM public roads.

Indicators of the amount and variety of uses arise following complaints or inquiries by users and private landowners regarding conflicting human uses within the watershed. Types of human uses that occur on public lands within the watershed include: authorized (firewood cutting, timber hauling, mining, etc.); unauthorized (non-permitted firewood cutting, dumping, occupancy); and casual uses such as dispersed recreation (hiking, OHV riding, hunting, and camping).

F. Key Issue -- Private Land

Key Question -- **What effect does the amount of private land ownership have on the other key issues?**

Over fifty percent of the land in the Cheney/Slate watershed is owned by private individuals. Moreover, most of the "bottom land," where a major portion of the fishery streams exist, are controlled by private individuals. Land management constraints are less stringent than those

regulating federal lands. Private land owners can manage their lands as they choose as long as they are within the guidelines of Oregon's State Forest Practices Act. There is no coordinated management objectives established for private lands but the management of these lands could have a major impact on the previously identified key issues. An attempt will be made to answer this key question using the same indicators previously identified for the other 5 key issues but the focus will be on privately owned land.

IV. CURRENT CONDITION

A. Hydrology

There are approximately 145 miles of streams that flow all of the year and 200 miles of intermittent tributaries in the Cheney/Slate watershed. Table 2 reflects the current hydrologic condition of the major streams in the Cheney/Slate watershed. Stream characteristics varied and were divided into reaches for illustrative purposes. The majority of the streams in the watershed are relatively straight with high stream gradients and a moderate to low width to depth ratio (Rosgen A type). Other streams, on lesser gradients, are moderately sinuous and entrenched (Rosgen B and G type). Cheney Creek and the lower reach of Bull Creek have a low gradient and are low to moderately sinuous but only slightly entrenched (Rosgen DA).

The stream channel substrate in the upper reaches is generally bedrock or large cobble and is very efficient in moving sediment and debris to lower portions of the watershed. As the gradient decreases material cannot be as easily moved. As a result, the channel substrate is more alluvial in nature. The substrate of most of the streams in the lower reaches is cobbles and gravel with some intermittent sand.

The stream ecosystem is very much dependant on seasonal precipitation. During the winter and spring the streams flow with an abundance of water (20 to 80+ cfs), but in the late summer most of the streams, save Slate Creek, are relegated to very low flows (0 to 5 cfs) and intermittent pools. The small amount of water that does flow in the streams during the summer months is usually diverted for irrigation and/or domestic purposes. The remaining pools are a vital refuge for most of the aquatic species during that time of the year.

The quality of water in the streams of the Cheney/Slate watershed is generally fair. The parameters that limit water quality in this watershed are sedimentation, summer low flow, and water temperature. Suspended sediments contribute to turbidity and thus affect light transmission through the water and to the streambed. Effects of turbidity on stream biota are related to, but sometimes not clearly distinguished from, the direct effects of suspended sediment. Suspended sediments can abrade and suffocate periphyton, as well as decrease primary production (photosynthesis rate) because of light reduction. It can disrupt respiration and modify behavior of invertebrates. In fishes, respiratory capacity of gill surfaces may be lost and vision and feeding efficiency diminished.

Embedding of cobbles and gravels by sediments reduces the physical habitat of juvenile salmonids (mostly chinook and steelhead trout) and consequently the holding capacity of riffle areas for young fish. Eggs and fry in redds or stony interstitial spaces may be suffocated, reducing reproductive and survival success. Elevated sediment loads increase channel width and decrease channel roughness as pools become filled. The lower gradient reaches of Elliott, Waters and Cheney have been observed as having moderate amounts (15 to 35 percent by volume) of finer material embedded in the stream substrate.

Water quantity is a limiting factor in most of the streams in the Cheney/Slate watershed. Slate Creek and the Applegate river flow all year long but the rest of the streams have very low flows in the late summer and some are reduced to no more than intermittent pools with most of the water moving below the surface. As a result of low precipitation during the past decade, the amount of water entering the streams from seeps and springs has greatly reduced summer flows. Water diversions for human uses also reduces summer flows. The Applegate River is regulated by a dam and records indicate flows near Wilderville of 40 to 70 cubic feet per second (cfs) in August and September of 1994. There are no flow records for the remaining streams in the watershed but visual observation indicate flows of 0 to 5 cfs during the late summer months, except in Lower Slate Creek which has estimated flows between 5 to 15 cfs during summer months.

B. Aquatic Habitat

The upper elevations of Cheney/Slate watershed are composed of narrow canyons with steep sideslopes. The middle elevations are canyons with some smaller floodplain sideslopes. The lower stream reaches are in a narrow alluvial valley. Most BLM streams are located in narrow floodplains or canyons and are inhabited by trout and steelhead, coho and chinook salmon. Trout and steelhead inhabit all stream reaches and coho and chinook inhabit the lower stream reaches with stream gradients of 3 percent or less.

The streams in the Cheney/Slate watershed have been channelized (entrenched) from agricultural practices and road construction. Channeling has prevented the streams from meandering and forming natural side channels which provide more fish habitat and refugia than a single channel. Stream entrenchment has disconnected the floodplain from the channel and has decreased fish rearing capability over the past century. Presently there is no connectivity between the streams and the floodplain where streams are channelized, and few if any side channels exist for rearing. Channelization causes water flows to accelerate which decreases fish and insect production.

Cheney and Slate creeks provide some of the better habitat for anadromous fish in the Applegate River basin. Habitat includes streambed substrate quality and quantity conducive for fish spawning. Pools, large woody debris, and log jams provide good quality for fish rearing. Slate Creek has perennial flows that provide good fish rearing opportunities during the late summer months. Although Cheney Creek has limited summer flows, it has high potential for providing fish rearing habitat. Some of the unnamed tributaries to Cheney Creek are dewatered for irrigation and are considered "areas of lost fish production."

All streams in the Cheney/Slate watershed characteristically have the same primary factors limiting salmonid production: 1) instream habitat complexity is lacking in large woody debris, greater than or equal to 24 inches in diameter and the length should be equal to or greater than the

bankfull width; 2) stream shade less than 60 percent; 3) lack of mature trees, especially conifers, >32 inches in diameter within 100 feet from the stream; 4) limited flows in the lowlands, and 5) coarse woody material more than 150 lineal feet per acre and a minimum of 16 inches in diameter in the riparian zone.

Slate Creek is a major producer of anadromous fish in the Applegate River basin. Spawning substrate, rearing pools, and side channels are numerous on USFS lands while instream habitat complexity is minimal. Coarse woody material on USFS lands lacks mature trees (>32" dbh) which is also typical on BLM, and nonfederal lands (see Appendix **XX**). Large trees greater than 32 inches dbh are nonexistent in the riparian area on USFS lands except for a small amount (10%) within 25 feet of the streambank. Consequently streamside shade is low. Log drop structures were constructed on USFS lands in the 1980s for fish habitat enhancement. A bottomless arch culvert was recently installed on the USFS land (Slate Creek) to allow juvenile fish passage.

Stream surveys accomplished in 1969 showed Slate Creek was limited in spawning gravel, shade, and conifers in the riparian area. Instream large woody debris was likely to be limited since conifers were not abundant. Pools and large wood were limiting factors for trout production as well as for redside shiner population in the lower reaches. Substrate in the lower 10 miles was unusable for salmonid spawning.

Waters Creek is designated by the State of Oregon, Department of Environmental Quality as water quality limited regarding temperature for aquatic life. It was designated as being limited as a result of water temperatures exceeding 58 degrees (°) Fahrenheit (F) during summer of 1994 (BLM data). Temperatures over 64° F for more than 10 days can be detrimental to fish. Waters Creek had a series of log drop structures installed in the 1970s and 1980s, on BLM and USFS lands that have greatly enhanced spawning and rearing conditions. Waters Creek, in 1969, provided a low amount of spawning and rearing habitat. Presently, a few large conifers exist in the riparian area.

Salt Creek, a tributary to Waters Creek, has good spawning and rearing areas yet poor riparian conditions. Bear Gulch, also a tributary to Waters Creek, is poor for spawning and rearing. There was a numerous amount of woody debris in the stream which may have provided adequate opportunity for rearing yearling salmonids but not juveniles less than one year old. Bear Gulch confluence with Waters Creek produced a maximum temperature of 71° F in July 1994 while the average for July was 68° F. Temperatures over 64° F for more than 10 days can be detrimental to fish.

Butcherknife Creek provides fair spawning and poor rearing for juvenile salmonids. The upper 50 percent provides some spawning gravels for trout and the lower 50 percent is more suitable for salmon and winter steelhead. Butcherknife Creek has adequate spawning in the lower reaches. Riparian area shade is high, yet without large conifers.

Elliott Creek is a good producer of anadromous fish with adequate spawning and rearing areas, although instream woody debris and summer flows are low. Elliott Creek has an inadequate irrigation diversion on BLM land as it is not properly screened to prevent access to juvenile fish. The status of the Elliott Creek diversion is pending investigation.

Ramsey Creek spawning habitat is good for salmon and winter steelhead but is poor for trout. There are numerous small woody log jams yet the stream lacks key large anchor logs. The woody material provides the only adequate rearing habitat combined with a few small pools. Ramsey Creek has a 2-foot concrete dam which probably stops juvenile yearling salmonid migration. Ramsey Creek, in 1969, had poor spawning, rearing, and riparian conditions. No conifers were in the riparian area and the stream was in overall poor quality with high velocities producing scour conditions.

Both North Fork and South Fork of Round Prairie Creek had a dense riparian area with a variety of trees especially large conifers, good streamflow, numerous pieces of large wood in the stream and riparian area, excellent spawning, and rearing conditions.

Knight Creek has poor rearing and moderate spawning habitat. The riparian area was poor, lacking in conifers. The stream is intermittent and not used much by fish.

Cheney Creek spawning is excellent, yet rearing area is fair to poor due to low summer streamflows and the lack woody debris in the stream. Rearing pools in the mainstem were nil. The riparian area lacked conifers and adequate shade. Both major forks of Cheney Creek have spawning areas only in the lower reaches. Rearing opportunity in these forks are limited by low summer flows and the lack of wood in the stream.

1. Fish Distribution and Abundance

Cheney and Slate creeks have approximately 116 miles of fish habitat for winter steelhead, coho and fall chinook salmon and resident cutthroat trout. Miles of habitat are represented as follows: coho, 29; chinook, 20; steelhead, 33; and trout, 34 (see Table **YY**). Mainstem Cheney Creek, Slate Creek, and Waters Creek have the highest potential for anadromous fish production. Nongame species such as speckled dace, Pacific lamprey, sculpin, and redside shiner also inhabit the streams.

2. Macroinvertebrates

The lack of cool water, habitat complexity, and diversity required for adequate macroinvertebrate production is very low. In the upper watershed, scour of the streambed frequently occurs and inhibits cool water macroinvertebrate production. There is a wide variety of aquatic insects on the USFS streams. Lower in the watershed, low streamflows, high water temperatures (>58° F), the lack of pools from a meandering channel and the lack of large woody material prohibits large macroinvertebrate populations.

Table 2 - Hydrologic Condition					
Stream Name/ Year Surveyed	**Stream Reach/ Distance (Mi)**	**Average Gradient**	**Sinuosity Ratio**	**Bankfull W/D ratio**	**Channel Entrenched**
Waters Creek/92	#1/0.7	4 %	1	7.85	shallow
Waters Creek/92	#2/0.5	10 %	1	11.43	moderate
Waters Creek/92	#3/0.6	21 %	1	10.36	deeply
Butcherknife Cr/93	#1/0.2	8 %	1	11.20	shallow
Butcherknife Cr/93	#2/0.8	4 %	1	9.4	moderate
Slate Creek/91	#1/0.8	3 %	2	n/a	moderate
Slate Creek/91	#2/1.1	3 %	2	n/a	moderate
Slate Creek/91	#3/1.9	5 %	2	n/a	moderate
Slate Creek/91	#4/0.4	6 %	2	n/a	moderate
Ramsey Creek/90	#1/0.8	2 %	1	n/a	moderate
Ramsey Creek/90	#2/1.1	5 %	1	n/a	shallow
Cheney Creek/91	#1/1.5	1 %	2	10.3	shallow
Cheney Creek/91	#2/1.7	1 %	2	8.8	shallow
Cheney Creek/91	#3/1.0	2 %	1	9.5	shallow
Elliot Creek/96*	#1/1.4	1 %	2	6.0	deeply
Elliot Creek/96*	#2/1.5	6 %	1	10.0	moderate
Round PrairieCr/96*	#1/2.5	5 %	1	8.5	moderate
S.Fk Rnd Prairie/96*	#1/1.8	6 %	1	6.3	moderate
S.Fk Rnd Pr.trib/96*	#1/0.6	9 %	1	10	shallow
Bull Creek/96*	#1/1.6	2 %	1	7	moderate
Bull Creek/96*	#2/1.2	8 %	1	5	shallow
Jackson Creek/96*	#1/1.4	5 %	1	6	shallow
Jackson Creek/96*	#2/0.8	10 %	1	8.5	shallow

*Estimated from field reconnaissance completed for watershed analysis.

Table 3 - Upper Slate Creek (August 1991) on USFS lands above BLM.									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed<35% good >35% poor**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.8	h	cobble	low	58 sm.	no	con hd	high	1.9	3
.9-1.9	h	cobble	low	57 sm.	no	con hd	med.	1.5	3
1.9-3.8	h	cobble	low	116 sm.	no	con/hdss hrub	low	1.3	5
3.8-4.2	m	cobble	low	169 sm.	no	con hd	med.	1.3	6

Table 4 - Waters Creek (August 1992) on USFS lands above BLM									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed <35% good >35% poor**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.7	l	gravel	low	9 sm.	no	hd	high	1.0	4
.7-1.2	l	gravel	low	75 sm.	no	con	med.	1.1	10
1.2-1.8	l	gravel	low	37 sm.	no	hd/	med.	?	21

Table 5 - Butcherknife Creek (September 1993) on USFS lands above BLM.									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed <35% good >35% poor**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
1.25 -2.0	m	cobble bed.	low	nil sm.	no	hd	med.	1.0	?
2.0- 2.8	m	gravel	low	46 sm.	no	con	med.	.9	?

Table 6 - Ramsey Creek (July 1990) on USFS lands above BLM									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**LWD pcs./ mile s/l**	**Embed <35% good >35% poor**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad. %**
0-.76	l	cobble	med.	112 sm.	?	con/l hd/h	m	?	2
.76- 1.9	l	cobble	low	228 sm.	?	con/? hd/?	m	?	2

Table 7 - Cheney Creek (mainstem) (April 1992) from mouth to top.									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0- 2.5	h	cobble gravel	med.	low sm.	possibly	hd	med.	2.3	1
2.5- 5.0	h	cobble gravel	med.	low sm.	possibly	hd	med.	2.0	1
5.0- 7.0	h	cobble gravel	low	low sm.	possibly	hd	med.	1.4	2

Table 8 - Slate Creek from mouth (November 1969).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-1.0	h	gravel	med.	?	possible	shrub	low	?	3
1.0-2.0	l	gravels bldr	med.	?	possible	hd shrub	med.	?	3
2.0-3.0	l	bldr	med.	?	n/a	con/ hd	med.	?	3
3.0-4.0	l	bldr	med.	?	n/a?	?	?	?	3
4.0-5.0	l	bldr bed.	?	?	n/a	hd/ shrub	med.	?	3
5.0-6.0	l	bldr bed.	med.	?	n/a	hd/ shrub	med.	?	3
6.0-7.0	l	bldr bed.	med.	?	n/a	hd/ shrub	med.	?	3
7.0-8.0	l	bldr bed.	med.	?	n/a	hd/ shrub	med.	?	3
8.0-9.0	m	bldr	med.	?	n/a	hd/ shrub	med.	?	3

Table 9 - South Fork Round Prairie Creek from mouth (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	h	gravel	m	?	possible	con/ hd/ shrub	h	?	3
.5-1.0	h	sm. bldr	m	many lg.	possible	con/ hd/	h	?	3-4

Table 10 - North Fork Round Prairie Creek from mouth (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	h	gravel	h	many lg/ sm	possible	con/ hd/ shrub	h	?	3
.5-1.0	h	cobble	m	many lg.	possible	con/ hd/ shrub	h	?	3
1.0-1.5	m	cobble sm. bldr	l	many lg.	possible	con/ hd/ shrub	h	?	3

Table 11 - Elliott Creek from mouth (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	m	cobble gravel	h	?	possible	hd	h	?	1
.5-1.0	l	cobble gravel	h	?	possible	con/ hd	h	?	2
1.0-1.5	l	cobble gravel	h	many lg.	possible	con	h	?	2
1.5-2.0	l	cobble gravel	m	many lg.	possible	hd	m	?	3

Table 12 - Salt Creek, tributary to Waters Creek (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.25	h	cobble gravel	h		possible	shrub	l	?	3

Table 13 - Waters Creek from mouth (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile sm/ lg**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	g	cobble gravel	m	?	possible	con/ hd/ shrub	h	?	3
.5-1.0	g	cobble gravel	m	?	possible	con/ hd/ shrub	h	?	3
1.0-1.5	m	cobble gravel	m	lg.	possible	con/ hd/ shrub	h	?	3
1.5-2.0	m	cobble gravel	m	?	possible	hd	h	?	4

Table 14 - Ramsey Creek from mouth (November 1969).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.75	l	bed.	h	poss.	n/a	hd	h	?	4

Table 15 - Bear Creek, tributary to Waters Creek (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	l	sm. bldr	?	many lg.	n/a	hd	h	?	3
.50-.75	m	sm. blder	?	many lg.	n/a	shrub	l	?	4

Table 16 - Butcherknife Creek from mouth (April 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	h	cobble gravel	h	?	no	hd/ shrub	h	?	3
.50-1.00	l		m	?	poss.	hd/ shrub	h	?	4

Table 17 - Knight Creek from mouth (January 1974).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.5	l	cobble gravel	h	?	no	shrub	l	?	3
.50-1.00	l	sm. bldr	m	?	poss.	con/ hd	h	?	3

Table 18 - Upper Left Fork, Cheney Creek from mouth (February 1966).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no doubtful**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.25	l	gravel	med.	many sm.	possible	?	?	?	3-4
.25-.50	h	bed.	low	many sm.	n/a	?	?	?	3-4

Table 19 - Cheney Creek from mouth (February 1966).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no doubtful**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.75	l	gravel	high	?	poss.	shrub	low	?	1-2
.75-1.25	l	gravel	high	?	poss.	hd/ shrub	med.	?	1-2
1.25-2.0	l	gravel	high	?	doubtful	hd	high	?	1-2
2.0-3.0	no data	no data	no data	many sm./ lg.	no data	no data	no data	no data	no data
3.0-4.0	l	gravel	low	many sm./ lg.	poss.	con/ shrub	high	?	3
4.0-5.0	l	gravel	low	many sm./ lg.	poss.	con/ hd	high	?	4

Table 20 - Lower Left Fork, Cheney Creek from mouth (February 1966).									
Mile	**No. Rear Pools h/m/l**	**Dom. Spawn Sub.**	**Flow**	**CWD pcs./ mile s/l**	**Embed poss./ yes/no doubtful**	**Dom. Rip. Veg. con/ hd/ shrub**	**Shade h/m/l**	**Res. Pool Dep. ft.**	**Grad %**
0-.50	l	cobble	med.	many sm.	poss.	?	low	?	3
.50-1.0	l	bed.	med.	many sm.	n/a	?	?	?	3-4
1.0-1.5	l	bed.	med.	many sm./ lg.	n/a	?	low	?	3-4
1.5-2.0	l	bed.	low	many sm./ lg.	n/a	?	?	?	4

R8W R7W R6W

T36S

WILDERVILLE

SCALE 1:110000

LAND USE ALLOCATIONS
CHENEY-SLATE WATERSHED

LEGEND

- BLM AMA
- LSR IN THE AMA
- WATERSHED BOUNDARY
- USFS AMA
- RNA (Cedar Log Flat)

OCTOBER 18 1995

John McGlothlin

N

Map 5 - Land Use

SCALE 1:110000

STREAM ORDERS & CLASSES
CHENEY-SLATE WATERSHED

February 4 1996

John McGlothlin

LEGEND

ORDER 3
ORDER 4
ORDER 5+

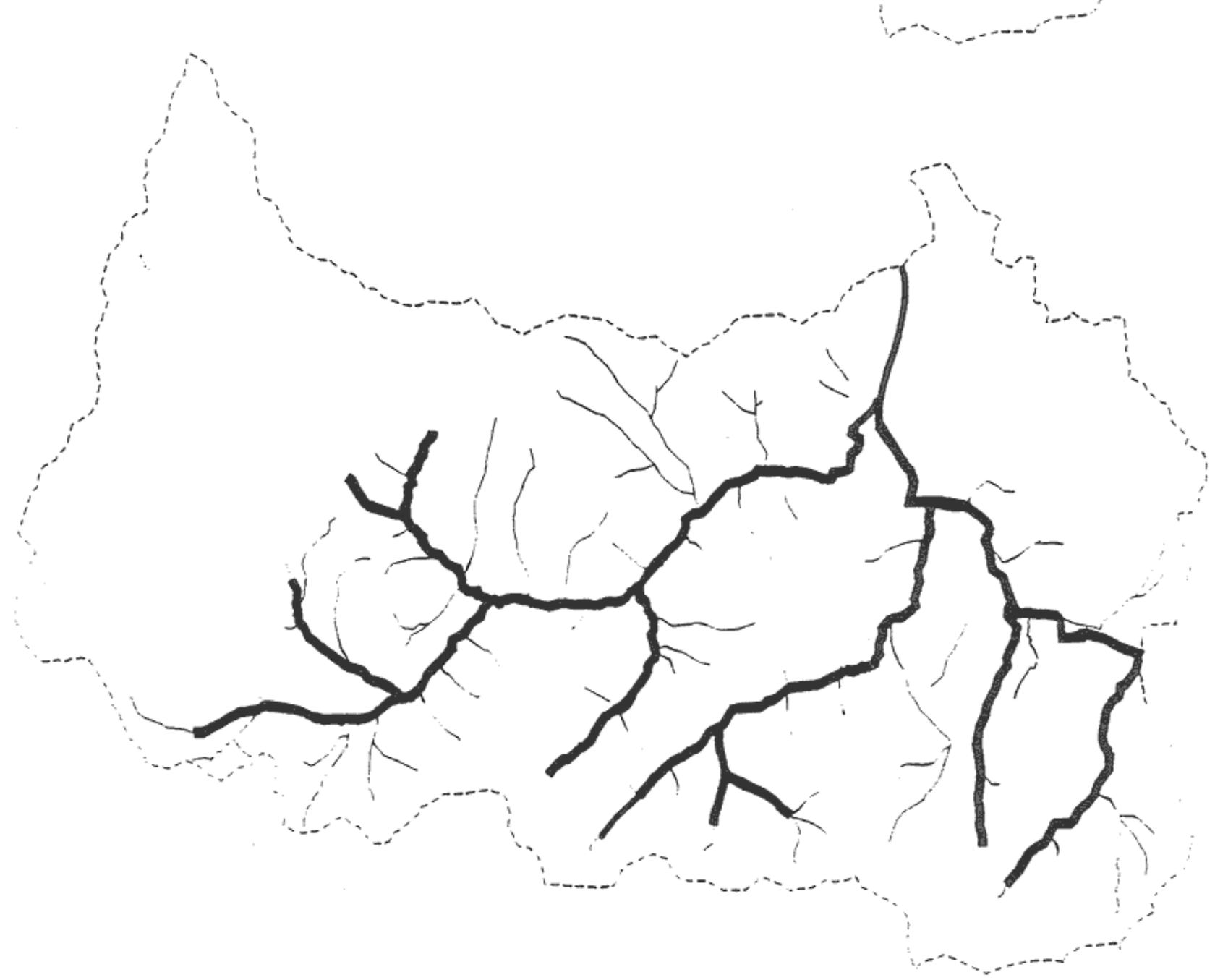
CLASS 1
CLASS 2
CLASS 3

N

Map 6
Stream Order Map

Steelhead

Cutthroat



APPROXIMATE DISTRIBUTION OF STEELHEAD & CUTTHROAT SALMONIDS ON BLM LAND IN THE CHENEY-SLATE WATERSHED

February 4 1996

John McGlothlin

LEGEND

WATERSHED BOUNDARY

DISTRIBUTION OF FISH

N

Map 7
Fish Distribution Map

C. Wildlife Species and Habitats

The Cheney/Slate watershed contains a diverse array of wildlife. There are as many as 11 species of bats, 12 species of amphibians, 18 species of reptiles, hundreds of species of birds, and many thousands of species of insects. All but three indigenous mammals (grizzly bear, wolf, and wolverine) are thought to have the potential to occur in the watershed.

Federal agencies are responsible for maintaining all native assemblages of plants and animals found on the public land they manage. This is primarily accomplished by maintaining habitats. There area several habitats of concern in the watershed as well as numerous unique features.

1. Habitats

Wildlife habitats, like the vegetation of southwest Oregon, are extremely diverse. Terrain, climatic factors, and vegetation combine to create the wealth of wildlife habitats found from the valley floor to the peaks of the Siskiyou Mountains. The majority of the Cheney/Slate watershed is dominated by coniferous forest in various stages of stand development with a significant hardwood component. Habitats found on the valley floor include grasslands, oak savannahs, pine forest, chaparral, and riparian. The uplands habitat, though dominated by coniferous forest, includes meadows, riparian areas, chaparral, cedar swamps, alder thickets, and a variety of other unique areas.

Each plant community provides conditions that fulfill certain wildlife species needs. Wildlife requires food, water, shelter, and space to breed and raise young during their lifetime. Some species have adapted to a particular habitat (specialist) while other utilize a great deal of different plant communities to fulfill their needs (generalists). The Cheney/Slate watershed provides a variety of habitats that meet the needs of the diversity of wildlife.

Habitats that are an issue in the Cheney/Slate watershed are late-successional coniferous forest, pine stands, oak groves, and riparian habitat. All of the previously mentioned habitats have been impacted by human activity in the watershed.

a. Valley Habitats

The Cheney/Slate watershed is composed of several drainages flowing into the main stem of the Applegate River. These drainages are typified by a narrow strip of valley habitat and steep timbered hillsides. Habitats found along the valley floor include oak groves (savannahs), brush stands, pine stands, riparian habitat and coniferous forest. Native valley habitats are rare due to their conversion to homesites and agriculture lands. The largest components of valley habitat are associated with the flood plains of the Applegate River and the drainages of Slate, Cheney, and Waters creeks.

The majority of the valley floor is under private ownership and is utilized for homesite, crop production, and livestock grazing. Homesites are distributed throughout the valley in rural fashion. The landscape is largely broken up by houses, roads, fences and nonnative vegetation. Remnants of native valley habitats are scarce and are scattered throughout the watershed, predominately located near the interface of the valley floor and the uplands. The majority of these remnants stands are under private ownership. Of particular concern is the remaining Oak savannah and Ponderosa pine savannah habitat. These stands represent a small percent of the original habitat type, that in pre-settlement times, dominated the valley floor. They have been identified as one of the five critical habitats by the Oregon/Washington neotropical bird working group.

Native valley habitats have shown the greatest decline of native plant communities in the watershed. Tracts of public land are critical in insuring that this habitat type and the biodiversity it supports remain represented in the valley. These stands provide primary nesting habitat for acorn woodpeckers (Melanerpes formicivorous) and western bluebirds (Sialia mexicana) as well as winter range for black-tail deer (Odocoileus hemionus). Smaller mammals, including raccoons (Procyon lotor) and grey fox (Urocyon cinereoargenteus), utilize these areas as primary habitat.

Federal administered tracts of land on the valley floor are scarce. The largest tract is located near Bolt mountain (T37S-R6W-Sec 9). This area is unique due to the lack of disturbance associated with management and development. Bolt mountain is an isolated patch of serpentine soil which harbors numerous rare plant and animals species, as well as a rich component of native grass. This tract is dominated by a Jeffrey pine savannah (Pinus jeffreyi), with patches of scattered oaks (Quercus spp.), Pacific madrone (Arbutus menziesii), wedgeleaf ceanothus (Ceanothus cuneatus) and pockets of Douglas-fir (Pseudotsuga menziesii).

b. Upland Habitats

Upland slopes are dominated by coniferous forest and are distinguished by having a large hardwood component, with many mast crop producing tree species. California black oak (Quercus kelloggii), Oregon white oak (Quercus garryana), tanoak (Lithocarpus densiflorus), and California hazel (Corylus cornuta) offer a rich food source for a variety of wildlife. Berry producing plants such as Pacific madrone (Arbutus menziesii), California coffeeberry (Rhamnus californica), and manzanita (Arctostaphylos spp.) are also important crop producers for wildlife. Communities within the uplands include meadows, riparian areas, chapparal, and white oak stands which add diversity to the forest. Natural disturbances are important generators and maintainers of a number of these plant communities. Human caused disturbances such as logging, mining, and road building, have all impacted the condition of the upland forest. Current condition of the forest determines species abundance, and diversity. The shift from older, structurally diverse forest to younger, structurally impoverished forest has benefitted generalists species, and has been a disadvantage to species that depend on late-successional forest. The most extensive disturbance activity in the watershed has been logging. Currently most private lands in the watershed are in early seral stage to pole stage, with little mature forest. Condition of

federal administered land varies from recent clearcuts to old-growth forest. The majority of federally managed stands are in large-pole size. Remaining stands of old-growth forest are of concern. The majority of these stands are located in the Waters, Slate, Round Prairie, Cheney, Jackson and Elliott creek drainage (see McKelvey map). Fragmentation of old-growth habitat in the watershed is of particular concern.

The high density of roads in the watershed is also a concern in regards to wildlife habitat. Road building has several negative effects on wildlife and their habitat. The watershed has seen a large increase in the road densities on federal land since the second world war. Currently, roadless sections of land are uncommon in the watershed. The largest tract is found in the upper reach of Slate creek. These remaining roadless tracts offer important refugia from human disturbance and are important to species such as black bear.

c. Aquatics

Riparian habitat is one of the most heavily used habitat types found in the watershed both by humans and by wildlife. Many of the life cycle requirements of animals can be met in these areas. Aquatic and amphibious species are intrinsically tied to these habitats, as are all the species that feed on them. Although restricted in distribution, Beaver (Castor canadensis), River otter (Lutra canadensis) and the Muskrat (Ondatra zibethica) were common in the streams on the valley floor prior to settlement. Currently, these species are restricted to the main of the Applegate River. This area of the river also retains a number of birds that utilize the riparian habitat. Great Blue Heron (Ardea herodias), Ospreys (Pandion haliaetus) and Canada geese (Branta canadensis) are common nesters here. Bald eagles (Haliaeetus leucocephalus) often use this stretch of the Applegate river for fishing. In general, the condition of the aquatic and riparian habitat has been degraded from historic conditions and currently is less capable of supporting the original species diversity.

d. Specialized Habitats

Special and unique habitats are those habitats that either are naturally scarce (caves, springs, mineral licks etc.), rare because of human influence on the environment (low elevation old-growth, oak/grasslands etc.) or because of natural cycles (snags, meadow production etc.). Often these habitats receive a greater level of use by wildlife then surrounding habitats, or are essential for certain aspects of a particular animals life history (e.g. hibernation).

The Cheney/Slate watershed contains a number of unique habitats. These habitats represent a small portion of the land base in the watershed but are essential habitat for a large percent of the sensitive species. Sensitive habitats of issue are discussed in the following paragraphs.
Low elevation old-growth forest (late-successional forest) are those forests found below 3,000 feet in elevation, with a multi-canopy structure, dominated by large trees, snags and large down logs. Historically, this type of forest was common on northerly aspects of the watershed. Due to the mild climate found at low elevations, and the wide variety of niches, these forests have a

greater diversity of wildlife species present. Currently, this forest type is restricted to remnant stands, predominantly located in the southern portion of the watershed. Many of these stands are too small in size to meet the needs of some late-successional species. Currently there is no old-growth forest in the watershed outside of federally managed stands.

Meadows under federal ownership are uncommon in the watershed. Meadows were often the first places homesteaders applied for patent, and thus they were converted to agricultural lands. One threat to this habitat is tree encroachment due to the disruption of the natural fire cycle. Meadows are the primary habitat for a number of species such as California vole (Microtus californicus) and the western pocket gopher (Thomomys mazama) and are the primary feeding location for a number of special status species such as the Great grey owl (Strix nebulosa) and western bluebird (Sialia mexicana). Serpentine areas of pine savannah partially function as dry meadows, but generally lack the "edge" and hiding cover that create greater habitat diversity.

Big game winter range is limited in the Cheney/Slate watershed. Winter range is defined as land found below 2,000 feet in elevation. Ideally, this would be a mixture of thermal cover, hiding cover, and forage. Historically the valley floor and adjacent slopes served as winter range for deer and elk. Increased urbanization, agriculture and the control of wildfires, has altered the quantity and quality of winter range. Much of remaining winter forage is in poor condition due to fire suppression and the introduction of exotic plant species. Currently, the Oregon Department of Fish and Wildlife view the lack of winter range, as the limiting factor in expansion of elk in the valley (Wolfe, pers. comm.).

Dispersal corridors into other watersheds aid in gene-pool flow, natural reintroduction and successful pioneering of species into previously unoccupied habitat. Generally these corridors are located in saddles, low divides, ridges, and along riparian areas. Without such corridors many isolated wildlife habitats would be too small to support the maximum diversity of species. An important dispersal corridor between several wilderness areas and Late-successional reserves is located in the Cheney/Slate watershed. This natural ridge corridor follows the southwestern boundary of the watershed, allowing for long term dispersal of late-successional species (see Southwest Oregon Late-Successional Reserve Assessment, page 19 for more information). Any habitat manipulation of this area should consider the importance of this dispersal corridor for the long term viability of these species. Numerous ridge lines within the watershed allow for localized dispersal. Ridges connecting Sloan Mountain and Onion Mountain are heavily used by elk, bear, deer, mountain lions and other species as travel corridors. In addition, contiguous blocks of older forest from the valley floor to the high ridges provides opportunity for "the elevator effect" which allows for seasonal dispersal. Important areas functioning for this type of dispersal can be found along South Fork Round Prairie, and upper reaches of Cheney Creek.

2. Special Status Species

There are 54 potential sensitive species in the watershed (19 birds, 13 mammals, 7 amphibians, 5 reptiles, 8 insects, and 1 mollusk). The habitat requirements for these animal vary from species to

species, but the majority of these animals require undisturbed late-successional forest, oak woodlands/savannahs and riparian areas.

The northern spotted owl is the only documented species listed under the Endangered Species Act known to occur within the watershed. There are three other listed species that could occur within the watershed, including the peregrine falcon, bald eagle, and the marbled murrelet. In addition to the known listed state protected, Bureau sensitive species there are numerous species of wildlife that maybe present, as well as survey and manage species designated in the Northwest Forest Plan ROD (Section C-49).

Tables 21 and 22 list the special status species potentially found in the watershed, along with legal status, and level of survey to date. This list includes species listed under the ESA, proposed for listing, and candidate species being reviewed by the U.S. Fish and Wildlife Service. State listed species as well as Bureau assessment species are also listed (For more information on this list and habitat needs see appendix section).

Table 21 - Cheney/Slate Watershed Special Status Species VERTEBRATES				
Common Name	**Scientific Name**	**Presence**	**Status**	**Survey Level**
Gray wolf	Canis lupus	absent	FE,SE	none to date
White-footed vole	Aborimus albipes	unknown	BS,SP	none to date
Red tree vole	Aborimus longicaudus	present	SM	limited surveys
California red tree vole	Aborimus pomo	unknown	BS	none to date
Fisher	Martes pennanti	unknown	BS,SC,AS	none to date
California wolverine	Gulo gulo luteus	unknown	BS,ST	none to date
American marten	Martes americana	unknown	SC,AS	none to date
Ringtail	Bassacriscus astutus	present	SU	limited surveys
Peregrine falcon	Falco peregrinus	unknown	FE,ST	none to date
Bald eagle	Haliaeetus leucocephalus	present	FT,ST	limited surveys
Northern spotted owl	Strix occidentlis	present	FT,ST	limited surveys
Marbled murrelet	Brachyramphus marmoratus	unknown	FE,SC	limited surveys
Northern goshawk	Accipiter gentilis	unknown	BS,SC,AS	some surveys
Mountain quail	Oreortyx pictus	present	BS	none to date
Pileated woodpecker	Dryocopus pileatus	present	SC,AS	none to date
Lewis' woodpecker	Melanerpes lewis	suspected	SC,AS	none to date
White-headed woodpecker	Picoides albolarvatus	unknown	SC,AS	none to date
Flammulated owl	Otus flammeolus	unknown	SC,AS	none to date
Purple martin	Progne subis	unknown	SC,AS	none to date
Great gray owl	Strix nebulosa	unknown	SV,AS,SM	limited surveys
Western bluebird	Sialia mexicana	suspected	SV,AS	none to date
Acorn woodpecker	Melanerpes formicivorus	present	SU	none to date
Tricolored blackbird	Agelaius tricolor	unknown	BS,SP	none to date
Black-backed woodpecker	Picoides arcticus	suspected	SC	none to date
Northern pygmy owl	Glaucidium gnoma	present	SU	limited surveys
Grasshopper sparrow	Ammodramus savannarum	unknown	SP	none to date
Bank swallow	Riparia riparia	migratory	SU	none to date
Townsend's big-eared bat	Plecotous townsendii	present	BS,SC	limited surveys

Table 21 - Cheney/Slate Watershed Special Status Species VERTEBRATES				
Common Name	**Scientific Name**	**Presence**	**Status**	**Survey Level**
Fringed myotis	Myotis thysanodes	suspected	BS,SV, SM	none to date
Silver-haired bat	Lasionycteris noctivagans	present	SM	none to date
Yuma myotis	Myotis yumanensis	present	BS	none to date
Long-eared myotis	Myotis evotis	suspected	BS	none to date
Hairy-winged myotis	Myotis volans	suspected	BS	none to date
Pacific pallid bat	Antrozous pallidus	present	SC,AS,SM	limited surveys
Western pond turtle	Clemmys marmorata	present	BS,SC	incidental sightings
Del Norte salamander	Plethodon elongatus	present	BS,SV,SM	limited surveys
Foothills yellow-legged frog	Rana boylii	present	BS,SU	limited surveys
Red-legged frog	Rana aurora	unknown	BS,SU	none to date
Clouded salamander	Aneides ferreus	present	SC,AS	limited surveys
Southern torrent salamander (variegated salamander)	Rhyacotriton variegatus	present	BS,SV	limited surveys
Black salamander	Aneides flavipunctatus	suspected	SP,AS	limited surveys
Sharptail snake	Contia tenuis	suspected	SC	none to date
California mtn kingsnake	Lampropeltis zonata	present	SP,AS	incidental sightings
Common kingsnake	Lampropeltis getulus	present	SP,AS	incidental sightings
Northern sagebrush lizard	Sceloporus graciosus	present	BS	incidental sightings
Tailed frog	Ascaphus truei	present	SV,AS	incidental sightings

STATUS ABBREVIATIONS:

FE--Federal Endangered
FT--Federal Threatened
FP--Federal Proposed
FC--Federal Candidate
SE--State Endangered
ST--State Threatened
SM--Survey and Manage
SC--ODFW Critical
SV--ODFW Vulnerable
SP--ODFW Peripheral or Naturally Rare
SU--ODFW Undetermined
BS--Bureau Sensitive
AS--Assessment Species (BLM)

Table 22 - Cheney/Slate Watershed Special Status Species INVERTEBRATES			
Common Name	**Presence**	**Status**	**Survey Level**
Burnells' false water penny beetle	unknown	BS	none to date
Denning's agapetus caddisfly	unknown	Bs	none to date
Green Springs Mtn. farulan caddisfly	unknown	BS	none to date
Schuh's homoplectran caddisfly	unknown	BS	none to date
Obrien rhyacophilan caddisfly	unknown	BS	none to date
Siskiyou caddisfly	unknown	BS	none to date
Alsea ochrotichian micro caddisfly	unknown	BS	none to date
Franklin's bumblebee	unknown	BS	none to date
Oregon pearly mussel	unknown	Bs	none to date

BS--Bureau Sensitive

3. Survey and Manage Species

Table 23 presents the species that are to be protected through survey and management guidelines as outlined in the Record of Decision for Amendments to USFS and Bureau of land Management Planning Documents within the Range of the Northern Spotted Owl (ROD). This table also describes the level of protection and the amount of surveys conducted to date. It is suspected that the current LSR network will not meet the needs of these species, such that further restriction within matrix lands are necessary to ensure long term viability of their populations. All known sites will receive some level of immediate protection. Surveys for new sites in proposed projects that will be implemented in 1997 or later must be conducted for Red Tree Vole, Del Norte Salamander and the five species of bats.

Table 23 - Survey and Manage Species in the Cheney/Slate Watershed and Level of Protection		
SPECIES	**PRESENCE**	**PROTECTION LEVEL**
Del Norte salamander (Plethodon elongatus)	present	Manage known sites and survey prior to activities, within matrix land buffer length of 1 potential site tree or 100 feet which ever is greater.
White-headed woodpecker (Picoides albolarvatus)	suspected	On matrix land no cutting snags 20" DBH or over. Maintain green trees to provide for 100% population potential
Black-backed woodpecker (Picoides pubescens)	unknown	On matrix land no cutting snags 20" DBH or over. Maintain green trees to provide for 100% population potential
Flammulated owl (Otus flammeolus)	unknown	On matrix land no cutting snags 20" DBH or over. Maintain green trees to provide for 100% population potential
Great gray owl (Strix nebulosa)	present	1/4 mile protection zone around nest sites, survey prior to activities, 300 foot buffers of meadow and natural openings.
Fringed myotis (Myotis thysanodes)	present	Manage known sites and survey prior to activities
Silver-haired bat (Lasionycteris noctivagans)	present	Manage known sites and survey prior to activities
Long-eared myotis (Myotis evotis)	present	Manage known sites and survey prior to activities
Long-legged myotis (Myotis volans)	present	Manage known sites and survey prior to activities
Pallid bat (Antrozous pallidus)	suspected	Manage known sites and survey prior to activities
Red tree vole (Aborimus pomo)	suspected	Manage known sites and survey prior to activities

4. Threatened or Endangered Species

Northern Spotted Owl (Threatened)

The northern spotted owl is the only species listed under the ESA known to nest in the watershed. Currently there are 6 known centers of activity within the watershed (5 active, 1 historic) and another 6 sites outside the watershed where the provincial home range (1.3 miles radii) may be affected by activities occurring inside the watershed (see appendix for the list of sites and results of nesting surveys). An active site is one in which a territorial single or pair has occupied the site at least once since 1985. Surveys for Northern Spotted Owls have been conducted since the mid 1970s within the watershed. Early surveys were opportunistic until 1985

when areas where surveyed prior to a proposed management activity. From 1990-1993 a portion of the watershed was intensively surveyed for owls during the Williams Spotted Owl Density Study. The purpose of the study was to determine the total number of owls in a 119 square mile tract of land. For more information on this study see the final report titled Spotted Owl Monitoring: Williams Density Study Area, Final Report 1992.

The U.S. Fish and Wildlife Service (USFWS) uses thresholds for the amount of suitable habitat around spotted owl sites as an indication of the site's viability and productivity. The minimum thresholds have been defined as 50 percent of the area within 0.7 mile of the center of activity, or approximately 500 acres; and 40 percent of the area within 1.3 miles or approximately 1388 acres. Table **XX** in the appendix describes the condition of the sites within the watershed or adjacent to the watershed. In summary, only a single site within the watershed exceeds the 1,388 acres necessary for long term viability. Maintenance and development of late-successional conditions within the provincial home range for the remainder of the sites should be considered a high priority.

Spotted owl habitat managed by the Bureau of Land Management has been analyzed using the McKelvey rating system. The McKelvey rating system is based on a model that predicts spotted owl population based on habitat availability (see appendix for more information on this system). Stands were examined for criteria such as canopy layering, canopy closure, snags, woody material and other features. Biological potential of a stand to acquire desired conditions is also taken into consideration. During the fall and winter of 1995/96 stands were visually rated and placed into the six categories. Map 8 displays the results of this study on federally administrated land. Table 24 summarizes the amount of available habitat for spotted owls in the watershed on lands administered by the BLM. There are 1,565 acres of spotted owl nesting, roosting, and foraging habitat (McKelvey rating #1) found on BLM administered land in the watershed (3 percent of watershed). The largest contiguous blocks are locate in Cheney creek drainage. Remaining optimal habitat in the watershed is heavily fragmented.

The Cheney/Slate watershed has 1,463 acres (3 percent of watershed) of Spotted owl roosting, and foraging habitat (McKelvey rating #2). The largest patches are found in the Elliott, Cheney, Bull and Round Prairie creek drainages. Patches of suitable roosting habitat in the upper portion of Slate creek is naturally limited due to serpentine soils.

Dispersal habitat for spotted owls is defined as stands that have a canopy closure of 40 percent or greater, open enough for flight and avoidance of predators. This habitat is scattered throughout the watershed, with large concentrations in the Elliott and Cheney creek drainages.

U.S. Forest Service

Lands managed by the USFS were typed through the use of satellite imagery into 3 categories; suitable, dispersal, and currently nonhabitat (see appendix for more information). Further classification of the potential of the nonhabitat to become habitat was not possible at this time. The majority of the suitable habitat for the USFS is located in the Slate and Waters creek

drainages. Table 25 displays the current condition of land managed by the USFS.

Nonfederal Land

In 1995 an effort was made by the Bureau of Land Management to classify the forest type on private and county lands in the watershed using the McKelvey model. This information was largely gathered through photo interpretation and ground verification. This endeavor gives a fairly accurate depiction of current status of private, state and county lands. Table 24 displays the amount of available habitat for northern spotted owls on private and County land in the watershed. Nonfederal land is void of late-successional forest. The majority of the nonfederal land is composed of stands that do not meet any needs for late-successional species but has the potential to become optimal habitat (16,628 acres). It is unlikely that land owners will choose to forgo commercial harvest to allow these stands to become suitable habitat. Currently there is 3,227 acres of nonfederal land functioning as dispersal habitat for the Northern spotted owl. The majority of the remaining nonfederal land is agricultural and will never become suitable habitat.

The McKelvey Rating System is as follows:
Class 1-Spotted owl nesting, roosting, and foraging habitat
Class 2-Spotted owl roosting and foraging
Class 3-Currently does not meet 1 or 2 criteria
Class 4-Will never meet 1 or 2 criteria
Class 5-Currently does not meet 1 or 2, but meets dispersal
Class 6-Will never meet 1 or 2 but meets dispersal

Table 24 - McKelvey Rating Classes

	BLM Lands		Nonfederal Lands		BLM and Nonfederal Lands	
Class	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
1	1,565	3.0%	0	0%	1,565	3.0%
2	1,463	3.0%	0	0%	1,463	3.0%
3	1,991	4.0%	16,628	34.0%	18,619	38.0%
4	795	1.6%	6,798	13.9%	7,593	15.5%
5	3,256	6.6%	2,025	4.1%	5,281	10.7%
6	421	1.0%	1,202	2.4%	1,623	3.4%

Coho

Chinook

APPROXIMATE DISTRIBUTION OF COHO & CHINOOK SALMONIDS ON BLM LAND IN THE CHENEY-SLATE WATERSHED

February 4 1996

John McGlothlin

LEGEND

WATERSHED BOUNDARY

DISTRIBUTION OF FISH

N

Map 8
Fish Distribution Map

R8W R7W R6W

T36S

SCALE 1:110000

SPOTTED OWL HABITAT RATING
CHENEY-SLATE WATERSHED

LEGEND

- NONVEG (Not Rated)
- (1) OPTIMAL
- (2) MEETS FORAGING, DISPERSAL, ROOSTING
- (3) MEETS NO REQUIREMENTS; HAS POTENTIAL TO BECOME 1 OR 2
- (4) MEETS NO REQUIREMENTS; NOT LIKELY TO BECOME 1 OR 2
- (5) DISPERSAL ONLY; HAS POTENTIAL TO BECOME 1 OR 2
- (6) DISPERSAL ONLY; NOT LIKELY TO BECOME 1 OR 2
- BLM LAND

FOR USFS LAND:

- SUITABLE
- DISPERSAL ONLY; HAS POTENTIAL TO BECOME 1 OR 2
- MEETS NO REQUIREMENTS

February 27 1996

John McGlothlin

Map 9 - Spotted Ow Habitat Rating Ma

Table 25 - Spotted Owl Habitat on Forest Service Land		
U.S. Forest Service Land		
CATEGORY	**ACRES**	**PERCENT OF WATERSHED**
Suitable	1,973	4%
Dispersal	1,960	4%
Other	8,838	18%

Late-Successional Reserve (LSRs) and Critical Habitat Units (CHUs)

The Cheney/Slate watershed contains 3,518 acres of a late-successional reserve. The role of LSR is to maintain a functional, interactive, late-successional and old-growth ecosystem to serve as habitat for late-successional species (FEIS ROD). Critical habitat for the Northern Spotted owl has been designated including 5,298 acres in the watershed (3,670 acres of BLM). The purpose of this designation is to give direction to the management of the land to aid in the recovery of the species. Specific management options for these lands can be found in the Draft Recovery Plan for the Northern Spotted Owl (1992). Table 26 displays the McKelvey rating for LSR and CHU for the land administered by the BLM.

Table 26 - Status of Critical Habitat Units in the Cheney/Slate Watershed		
Class	**Late-successional Reserve**	**BLM Critical Habitat**
1	1,179 acres	1,176
2	368 acres	466
3	418 acres	482
4	493 acres	493
5	715 acres	708
6	345 acres	345

Marbled Murrelet (Threatened)

Nesting habitat for marbled murrelet consists of older forest stands with trees that have large moss-covered limbs and high (70%) canopy closure. This habitat is further defined by its distance from the coast. Based on MicroStorms information and field verification of McKelvey rating approximately 3,535 acres of suitable marbled murrelet habitat is found on lands managed by the BLM in the watershed. This land, for the most part, corresponds with spotted owl suitable/optimal habitat (see Map 8). There are no known nest location within the Cheney/Slate watershed. It is unknown at this time if the stand that contain components for marbled murrelet

would be used by them. These sites are generally warmer and drier that those located closer to the coast that are occupied by nesting murrelets. The USFS has conducted general surveys for this species in adjacent watersheds with no known detections.

Bald Eagles (Threatened)

There are no known nest sites documented within the watershed, but one does occur on the watershed boundary and nesting habitat does occur on federal administered land. A winter population of bald eagles resides along the Applegate River. The birds are seen between October and March. Preferred nesting habitat consist of older forest, generally near water, with minimal human disturbance.

Peregrine Falcon (Threatened)

Peregrine falcons nest on ledges located on cliff faces. There are no known historic or current peregrine falcon nests in the watershed. It is unknown if Peregrine falcons forage in this watershed.

5. Other Species of Concern

Neotropical Migratory Birds

A number of neotropical birds are known to inhabit the Cheney/Slate watershed. Neotropical migrants are species of birds that winter south of the Tropic of Cancer, and breed in North America. More than twenty years of breeding bird surveys (BBS), breeding bird census (BBC), winter bird population study, and Christmas bird counts indicate that many species of birds are experiencing a precipitous decline. This is particularly true for birds that utilize mature and old-growth forest either in the tropics, in North America or both (DeSante and Burton, 1994). Rates of decline are well documented for birds on the east coast of North America and less so on the west coast. In 1992 the BLM signed a multi-agency agreement called "Partners in Flight." The purpose of this program is to establish a long-term monitoring effort to gather demographic information. This data will be used to establish to what extent deforestation and forest fragmentation has on the temperate breeding grounds.

The Cheney/Slate watershed is thought to contain a number of neotropical migrants that utilize various habitats. Studies conducted on the Medford District have found that neotropical migrants comprise between 42 and 47 percent of the breeding species at lower elevation forest dominated by Douglas-fir (Janes, 1993). In higher elevation forests dominated by white fir, neotropical migrants are less abundant contributing to a smaller portion of the bird species present. Table 27 lists the known and suspected neotropicals found in the watershed, habitat utilized, and national population trends. Habitats of particular concern are valley brushfields, old-growth, riparian, and oak woodland communities. It is important to keep in mind neotropicals will often utilize more than one habitat type during various seasons. Overall, 46 percent of these birds are habitat generalists using four or more habitat types, while 34 percent are habitat

specialists utilizing one or two habitats. In old-growth habitat west of the Cascades two of 32 species of neotropical migrants are known habitat specialists.

Table 27 - Neotropical Birds in Cheney/Slate Watershed

COMMON NAME	PRESENCE	TREND*
Green-winged teal	suspected	insufficient data
Sora	unknown	insufficient data
Turkey vulture	present	decline
Osprey	present	stable or increasing
Flammulated owl	unknown	insufficient data
Common nighthawk	present	insufficient data
Rufous hummingbird	present	decline
Calliope hummingbird	present	insufficient data
Western kingbird	present	insufficient data
Ash-throated flycatcher	present	insufficient data
Western wood-pewee	present	decline
Olive-sided flycatcher	present	decline
Hammond's flycatcher	suspected	insufficient data
Dusky flycatcher	suspected	insufficient data
Pacific-slope flycatcher	present	insufficient data
Vaux's swift	present	decline
Tree swallow	present	insufficient data
Northern rough-winged swallow	suspected	insufficient data
Violet-green swallow	suspected	decline
Cliff swallow	suspected	insufficient data
Barn swallow	suspected	decline
House wren	present	insufficient data
Blue-gray gnatcatcher	unknown	insufficient data
Swainson's thrush	present	decline
Solitary vireo	present	insufficient data
Warbling vireo	present	insufficient data
Townsend's warbler	unknown	insufficient data

Table 27 - Neotropical Birds in Cheney/Slate Watershed		
COMMON NAME	**PRESENCE**	**TREND***
Hermit warbler	present	insufficient data
Black-throated gray warbler	present	insufficient data
Nashville warbler	present	insufficient data
Macgillivray's warbler	present	insufficient data
Yellow warbler	suspected	insufficient data
Orange-crowned warbler	present	decline
Common yellowthroat	suspected	stable/increase
Yellow-breasted chat	present	insufficient data
Wilson's warbler	present	decline
Brownheaded cowbird	present	decline
Northern oriole	present	decline
Western tanager	present	decline
Chipping sparrow	suspected	decline
Green-tailed towhee	suspected	stable/increase
Black-headed grosbeak	present	stable/increase
Lazuli bunting	present	insufficient data

* Based on information from Partners in Flight in Oregon and might not necessarily represent nationwide figures.

Game Species

Species of game animals that are located within the Cheney/Slate watershed include: elk, black-tailed deer, black bear, mountain lion, wild turkeys, ruffed grouse, blue grouse, grey squirrels, mountain and valley quail. The Cheney/Slate watershed is located in the Chetco and Applegate game management unit. The management of game species are the responsibility of the Oregon Department of Fish and Wildlife. The entire watershed is open to hunting during the appropriate season for game species. Information from the Oregon Department of Fish and Wildlife (ODFW) regarding trends of game animals present in the watershed indicate that black-tailed deer populations are overall stable and meeting department goals. Elk are present in the watershed, but due to limited winter range, there are no plans to encourage larger populations.

Black bear populations are extremely hard to monitor due to their secretive nature. Population numbers for the watershed appear to be stable. In 1995, ODFW received numerous complaints from the Wilderville area, and eventually trapped and relocated 5 adult male black bears. Cougar sightings in the watershed have increased with their overall population on the rise.

Grouse and quail had an excellent nesting year in 1995. The population of these birds is cyclic depending on weather conditions. Long term trends appear to be stable. Wild turkeys have not been introduced in this watershed, but appear to have established themselves from adjacent watersheds.

In general all of these game species are habitat generalists that benefit from edge habitats. Past land management practices both on federal and nonfederal lands have increased the overall amount of forest edge within the watershed. In addition, the amount of roads has also increased which in turn impacts the suitability of all habitat types. High road densities have shown to have a negative effect on deer and elk populations, and lead to increase poaching opportunities. For these species, numbers could be expected to increase with a decrease in road densities. Remaining unroaded sections offer key refugia for these species.

Band-Tail Pigeons

Band-tail pigeons (Columba fasciata) are known to occur in the watershed. These birds have shown a precipitous decline in population throughout its range since monitoring began in the 1950s (Jarvis et al, 1993). These birds are highly prized as a game species and restrictive hunting regulations have not led to an increase in bird populations. Habitat alteration due to intense forestry practices may partially explain their decrease in population and ongoing research is now trying to answer these question (Jarvis et al, 1993). Band-tail pigeons are highly mobile and utilize many forest habitat types, but the preferred habitat consist of large conifers and deciduous trees interspersed with berry and mast producing trees and shrubs. In the spring and the fall large flocks are seen migrating through the watershed. The birds utilize this higher elevation, feeding on blue elderberries and also frequent the serpentine slopes west of U.S. Highway 199 where they feed on coffeeberry, manazanita, and Pacific madrone berries. With the exclusion of fire from the landscape, many stands of mast crop producing plants are being negatively affected.

Cavity Dependent Species

Cavity dependent species and species utilizing down logs are of special concern in the watershed because of past silvicultural practices. These practices in the past have focused on even-aged stands which has resulted in deficits of snags and down logs in previously harvested areas.

Exotic Species

A number of non-native species have become established in the watershed. Introduced exotic species compete with native species for food, water, shelter and space. Bullfrogs (Rana catesbeiana) directly compete with native frogs and also consume young western pond turtles (Clemmys marmorata). Opossums (Dedelphis virginiana) occupy a similar niche with our native stripped skunk (Mephitis mephitis) and raccoon (Procoyon lotor). They also consume young birds, amphibians, and reptiles. Other introduced species include European starlings (Sturnus vulgaris), ring-necked pheasants (Phasianus colchicus), and turkeys (Meleagris gallopavo). All of these species have some negative impacts on native flora and fauna.

D. Vegetation

The existing vegetation conditions across the landscape of the Cheney/Slate watershed are highly variable. This is the result of both human and natural influences. The natural influences include major geologic features such as the bands of serpentine soils on the west side of the watershed and the high stream terrace and floodplain of the Applegate River in the northeastern part of the watershed that forms the large, flat grassy area known as Jerome Prairie. These geologic features strongly influence the vegetation existing on those sites today. Primary human influences affecting the current vegetation conditions have included settlement, fire suppression, logging, mining, and agriculture.

With the exception of the northeastern portion, the dominant vegetation in the Cheney/Slate Watershed is forest. The northeastern portion of the watershed is where agricultural activities have been concentrated due to the flat, tillable lands there. Currently, this area is either cultivated fields or open, flat grasslands.

Current vegetation conditions are described and mapped for features such as major plant series and existing condition class with respect to size and structure.

1. Major Plant Series

Major plant series is an aggregation of plant associations with the same climax species dominants (Atzet and Wheeler 1984). It defines the potential natural vegetation that would exist on the site at the climax stage of plant succession, or the end point of succession. The Douglas-fir series, for example, consists of plant associations that will grow to be dominated by large Douglas-fir if undisturbed by fire, harvesting, floods, insect attacks, slides, etc. Major plant series is also an indicator of site productivity and site potential. Tanoak plant series, for example, occur generally on more moist and productive sites than Douglas-fir series forests. White oak plant series tend to be the driest, warmest sites. Jeffrey pine series occurs exclusively on serpentine sites (ultramafic soils) which are low in productivity. Some of the major plant series mapped include combinations of series such as tanoak/Douglas-fir or pine/Douglas-fir. These occur on sites where there are significant components of both species and the climax dominant species is one or the other, or possibly both (codominants), but there is insufficient existing information to be able to determine the exact series.

The dominant major plant series in the watershed is the Douglas-fir series with fifty-two percent (52%) of the landbase in this series. Douglas-fir is the dominant tree species with varying amounts of tanoak, ponderosa pine, sugar pine, Pacific madrone, incense cedar, and California black oak. Tanoak/Douglas-fir is the next most common plant series with fifteen percent (15%) of the watershed in this category. Species mixes are similar to the Douglas-fir series except tanoak is a more significant component. The Jeffrey pine series occurs on nine percent (9%) of the landbase with most of this occurring in two long narrow bands on USFS lands in the western one-third of the watershed where soils with serpentine mineralology dominates. Jeffrey pine is the dominant tree species but depending on the serpentine influence, Douglas-fir, ponderosa pine and sugar pine can be present also. Grasses, wedgeleaf ceanothus or buckbrush (*Ceanothus*

cuneatus), and other shrubs are commonly found in the understory on Jeffrey pine series sites since the tree density is often low and the sites open. Many special status (rare) plants are endemic to this series. Eight percent (8%) of the watershed is classified as tanoak series. These are the most moist and productive sites in the watershed. Tanoak series has the highest occurrence of fire as the last major disturbance (Atzet, 1995). Fire suppression this century has resulted in these sites being the most vulnerable to a species shift (to tanoak) that would conflict with increasing the amount of conifer dominated mature and old-growth forest in the watershed. Pine/Douglas-fir series comprises five percent (5%) of the landbase and white oak series comprises three percent (3%). These are generally the driest sites with tree vegetation in the watershed. Douglas-fir, ponderosa pine, and Oregon white oak are the dominant tree species. Poison oak, shrubs, and grasses are the major ground cover species. White oak also commonly occurs throughout the watershed along drainages in open areas immediately adjacent to the riparian areas. These are not large enough areas to map so they do not show up on the current condition map. Approximately eight percent (8%) of the watershed is nonforested. Most of these sites occur in the northeastern portion of the watershed in the Applegate River flood plain and the adjacent high river terrace known as Jerome Prairie. This is where most of the agricultural activity occurs in the watershed and approximately 2,152 acres have been determined to have agricultural crops as their dominant vegetative condition.

Table 28 - Major Plant Series - Cheney/Slate Watershed

Nonforest	White Oak	Tanoak	Tanoak/ Douglas-fir	Jeffrey Pine	Pine/ Douglas-fir	Douglas-fir
3,922 acres	1,193 acres	3,819 acres	7,489 acres	4,514 acres	2,471 acres	25,507 acres
8%	3%	8%	15%	9%	5%	52%

R8W R7W R6W

T36S

WILDERVILLE

199

SCALE 1:110000

LSR AND CHU LOCATIONS
CHENEY-SLATE WATERSHED

LEGEND

LSR

CHU BOUNDARY

WATERSHED BOUNDARY

N

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Map 10 - LSR/ Critical Habitat Map

2. Existing Vegetation Condition Classes

Existing vegetation conditions in the watershed have been grouped into ten classes so they could be mapped, described, and analyzed. The condition classes are a combination of dominant form (i.e., grass, shrub, tree form, etc.) and size of the trees in the forested classes. The ten classes include nonvegetated, grass/forb, shrub, hardwood, hardwood/conifer, early (stand replacement disturbance 0-5 years old), seedling/sapling (0"-4.9" in diameter), poles (5"-10.9" in diameter), large poles (11"-20.9" in diameter), and mature (21" and greater in diameter). The hardwood/conifer class is used when a mix of both kinds of trees is present and insufficient information exists to be able to distinguish whether hardwood trees or conifer trees are the dominant life form. These are generally sites that have been harvested and the size class of what is left is typically eight inches in diameter and less. These areas will generally function ecologically as early seral stands. Most of the hardwood/conifer class occurs on nonfederal lands.

The vegetation current conditions are displayed for the three major landowner categories and for the watershed as a whole in Table 29.

Table 29 - Existing Vegetation Condition Classes - Cheney/Slate Watershed

Condition Class	BLM Lands		USFS Lands		Nonfederal Lands		All Lands	
	Acres	%	Acres	%	Acres	%	Acres	%
Nonvegetated	8	<1	104	1	161	1	273	<1
Grass/forb	4	<1	184	1	3,652	14	3,840	8
Shrub	183	2	278	2	50	<1	511	1
Hardwood	319	3	325	3	580	2	1,224	2
Hardwood/conifer	0*	0*	235	2	5,600	21	5,835	12
Early	150	2	0*	0*	0*	0*	150	<1
Seedling/sapling	329	3	0*	0*	47	<1	376	1
Poles	412	4	1,295	10	2,482	9	4,189	9
Large poles	3,901	41	9,949	78	13,937	52	27,787	57
Mature	4,185	44	401	3	144	1	4,730	10

* No data available for this category.

The above condition classes in themselves do not always describe the structural characteristics of the vegetation and its degree of intactness (open vs. closed canopy, partial cut previously, never entered, etc.). These condition classes do not always adequately display the existing vegetative

diversity that exists between major plant series even though they may be of the same size class. As an example, the large pole class (11"-20.9" dbh) in a Douglas-fir plant series could be very different than the large pole class in a Jeffrey pine series. This is because the Jeffrey pine stand will naturally have a much more open canopy due to the serpentine influence. These differences would not always be evident from the mapping.

Natural stands in the Klamath Province are rarely single size class, single storied forests. They are generally multi-aged, multi-storied stands that contain trees with a variety of different sizes. The vegetation current conditions are mapped into single diameter ranges because that is how the existing information is stored. Lumping the stands into one diameter range will often not permit us to assess the functional characteristics of the class for vegetative and habitat assessments. For these reasons, it is important to use the existing vegetation condition map in conjunction with other descriptors such as major plant series, McKelvey rating, and stand intactness. Using these descriptors in conjunction with each other gives a more complete picture of the structural and density characteristics of the existing vegetation. Even with these limitations, some useful assessments can be made when looking at the arrangement on the landscape of the vegetation into these ten classes.

The large pole condition class dominates the vegetation current conditions in the watershed. Fifty-seven percent (57%) of the watershed is mapped in this condition. This figure increases to sixty-three (63%) when looking at forested acres alone. Many of these stands are actually two or multi-storied stands with scattered, larger overstory trees present. But the large pole size trees are the dominant condition and that is how they were classified and mapped. No other condition class comes close to the large pole condition class in amount existing on the landscape. The hardwood/conifer class being the next highest amount at twelve percent (12%). This is consistent across all three of the major landowner categories. The vast majority of the federal lands, eighty-four percent (84%), fall into the large pole and mature category. BLM lands include more acres of the mature class, forty-four percent (44%), than any other category. Relatively few acres of federal lands, six percent (6%), are mapped in early seral conditions. Conversely, less than ten percent (10%) of the watershed contains forests that would be classified as old-growth. The amount of early seral vegetation on private lands is higher with twenty-eight (28%) being mapped in early seral vegetation categories.

Previous timber harvest activity can be used as an indicator of whether the forest has been modified through previous management activities. Intact, unharvested forests of a given condition class may function differently ecologically than partial cut stands of the same condition class. An intact rating is given if less than thirty percent (30%) of the acreage of a stand has had any previous harvest activity, including mortality salvage. For BLM lands in the Cheney/Slate watershed, forty-seven percent (47%) of the lands are considered intact and fifty-three percent (53%) not intact. Intact/non-intact data was available for BLM lands only.

R8W R7W R6W

T36S

SCALE 1:110000

PLANT SERIES IN THE CHENEY-SLATE WATERSHED

LEGEND

NONVEG.	TANOAK	JEFFRY PINE		WATERSHED BOUNDARY
NONFOREST	TANOAK/ D.FIR	DOUGLAS FIR		
WHITE OAK	PINE/ D.FIR	BLM LAND		

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Map 11

E. Special Status Plants/Habitats

Table 30 lists the special status plants found to date in the Cheney/Slate watershed on both BLM and USFS lands. These findings are based on survey of less than 25 percent of the watershed. The most likely plant series and condition classes for special status plants fall into three categories in Cheney/Slate watershed.

First, there are those special status plants dependent upon late successional conditions, such as Cypripedium fasciculatum, Clustered Ladyslipper (CYFA) and Cypripedium montanum, Mountain Ladyslipper (CYMO). According to Appendix J of the FEIS Northwest Forest Plan, CYFA and CYMO are most likely found in areas with 60-100 percent shade provided by older stands of various plant communities within Douglas fir forests. It further states that although these species are not attached to a specific vegetation community, they are, more importantly, dependent on specific microsite characteristics, including high percent shading, high moisture and undisturbed mychorrhizal connections in older age classes. The plant series most likely to harbor these orchids within the Cheney/Slate watershed are Douglas-fir and tanoak/Douglas-fir series. Currently 67 percent of the watershed falls into these plant series. The actual viable habitat for these species is much smaller; limited to microsites with moister, north aspects and 60-90 percent canopy closure.

The majority of CYFA populations known on BLM land were found while surveying timber sale acreage. The sale was cut prior to the Northwest Forest Plan in the early 1990s. Although protection was recommended for each population location, no follow up monitoring was established to determine if populations are currently in stable condition. Therefore it is uncertain how known populations are faring in the watershed.

Current conditions regarding habitat for these orchids can only be postulated using condition class and plant series information. Larger condition classes in Douglas-fir plant series offer a high percentage of acreage in the watershed and the most promise of orchid habitat. But without intensive field surveys it is difficult to determine the actual amount of habitat that exists within these areas. This is because microsite characteristics cannot be determined from vegetation maps.

Another species dependent upon these late successional conditions is Allotropa virgata, Candystick. The current status of this species is unknown because it was not surveyed until its recent designation as a survey and manage species. This species requires coarse, woody debris to survive as well as the characteristics mentioned for the orchids. The species can exist in drier microsites than the orchids.

The second category of special status plants in the Cheney/Slate watershed are those dependent upon serpentine habitat (see Table 30). The Jeffrey pine plant series which contains serpentine soils constitutes 9 percent of the watershed. The bands of serpentine in the western portion of the watershed and the small outcrops in the eastern part contain several plant species endemic to

southwestern Oregon. They only exist on serpentine soils, most only in the vicinity of the Illinois Valley. Most of the serpentine lies on USFS land in the western portion with the smaller eastern acreage on BLM. These serpentine areas represent some of the last intact native grasslands in the watershed. For instance, Bolt Mountain is the only remnant grassland in the eastern portion of the watershed.

A third habitat, wetlands and seeps, harbors at least one known special status species, Limnanthes gracilis var. gracilis. Current conditions of wetland areas or seeps have not been thoroughly documented, though some may remain intact.

Another current condition that could eventually affect special status plants is the invasion of noxious weeds. Though a thorough inventory of noxious weeds has not been completed in the watershed, their occurrence has been documented. They are most common in the nonforested areas where pastures or grasslands have been invaded by such species as star thistle. Scotch broom has also been documented in several forested locations in the central portion of the watershed.

A major data gap is the lack of information regarding nonvascular plants in the watershed. A rough estimate from Table **30**, survey and manage species, shows that 50 nonvascular species could be found in the vicinity of Cheney/Slate watershed. No surveys have ever been done for nonvascular plants in Medford District BLM.

Table 30 - Special Status Plants

Species Name	Species Status	Habitat
Cardamine nuttalii var. gemmata	FCZ	creekbanks, wet places
Cypripedium fasciculatum	SM/FC2	moist to dry, mixed evergreen with filtered sun
Fritillaria glauca	AS	serpentine soils
Hieracium bolanderi	AS	serpentine soils
Limnanthes gracilis var. garcilis	FC2	seeps, wetlands
Microseris howelii (possible)	FC2	dry serpentine soils
Mimulus kellogii	BT	serpentine soils

FC = Federal candidate
AS = Bureau assessment
SM = Survey and manage species
BT = Bureau tracking

Cedar Log Flat Research Natural Area

The Cedar Log Flat research natural area (RNA) covers 441 acres and is entirely located on Siskiyou National Forest land. The RNA fills the Jeffrey pine-grass low elevation serpentine forest-type cell for the Siskiyou Mountains. A permanent stream flows easterly through the RNA and it contains a large, grassy meadow area bounded by Cedar Log Creek and Slate Creek. Three serpentine bogs can be found which harbor such unique plants as the California pitcher plant. Elevations range from 1700 to 3300 feet. Bedrock consists of peridotite or serpentine with shallow soils. Several special status plants exist because of the presence of serpentine and are the primary factors for protecting the area as an RNA.

As noted in the FEIS - Siskiyou National Forest Plan, the RNA shows past evidence of fire throughout the area as fire scars can be seen on most of the larger trees. The USFS plans to initiate a prescribed burn to replicate this past activity. Numerous special status species (BLM category) and USFS sensitive category species are found in the RNA. All were previously listed in Table **30** as occurring in serpentine habitat.

F. Soils

The soils in the Cheney/Slate watershed were formed mainly in alluvium, colluvium and residuum from uplifted layers of rock from the Applegate, Galice, and Rogue geologic formations. Most of the soils are moderately deep (20"-40") to deep (40"+) and contain an array of rock contents depending on the parent material. Ultramafic soils in the western portion of the watershed provide habitat for various special status plant species. The remainder of the soils on the landscape provide an adequate medium for forest vegetation and associated insects, fungi and other soil microbes. The adjoining general soils map exhibits the location of different types of soil on the landscape.

General Soil Map Unit Description

Unit #1 - This area is dominantly on flood plains and low stream terraces. Soils in this map unit are Newberg-Camas-Evans: Deep fine sandy loam, gravelly loam, gravelly sandy loam, and loam

Unit #2 - This area is dominantly on stream terraces, alluvial fans, and associated drainage ways. Soils in this map unit are Takilma-Foehlin-Kerby: Deep, well drained cobbly loam, gravelly loam, and loam.

Unit #3 - This area is located on high stream terraces and low hill slopes. Soils in this map unit are Clawson and Jerome: Deep, somewhat poorly drained sandy loam.

Unit #7 - This area is located on mountainsides, hillsides, alluvial fans and upper stream terraces. Soils in this map unit are Vannoy-Manita-Voorhies: Deep and moderately deep, well drained silt loam, loam and very gravelly loam.

Unit #8 - This area is located on mountainsides and hillsides. Soils in this map unit are Josephine-Speaker-Pollard: Deep and moderately deep, well drained gravelly loam and loam.

Unit #9 - This area is located on mountainsides and hillsides. Soils in this map unit are Beekman-Vermisa-Colestine: Moderately deep and shallow, well drained and somewhat excessively well drained, extremely gravelly loam and gravelly loam.

Unit #10 - This area is located on granite mountainside, hillside and upper stream terraces. Soils in this map unit are Siskiyou-Tethrick: Deep and moderately deep, somewhat excessively well drained and well drained gravelly sandy loam and gravelly fine sandy loam.

Unit #11 - This area is located on mountainside and hillside. Soils in this map unit are Pearsoll-Dubakella-Eightlar: Shallow to deep, well drained and moderately well drained extremely stony clay loam, very cobbly clay loam, and extremely stony clay. These soils have serpentinitic mineralogy.

R8W R7W R6W

T36S

SCALE 1:110000

EXISTING VEGETATIVE CONDITION CLASS
CHENEY-SLATE WATERSHED

LEGEND

NON-VEGETATED	HARDWOODS	SEEDLING/SAPLING	MATURE
GRASS/FORB	HDWD/CONIFER	POLES	BLM LAND
SHRUB	EARLY	LARGE POLES	WATERSHED BOUNDARY

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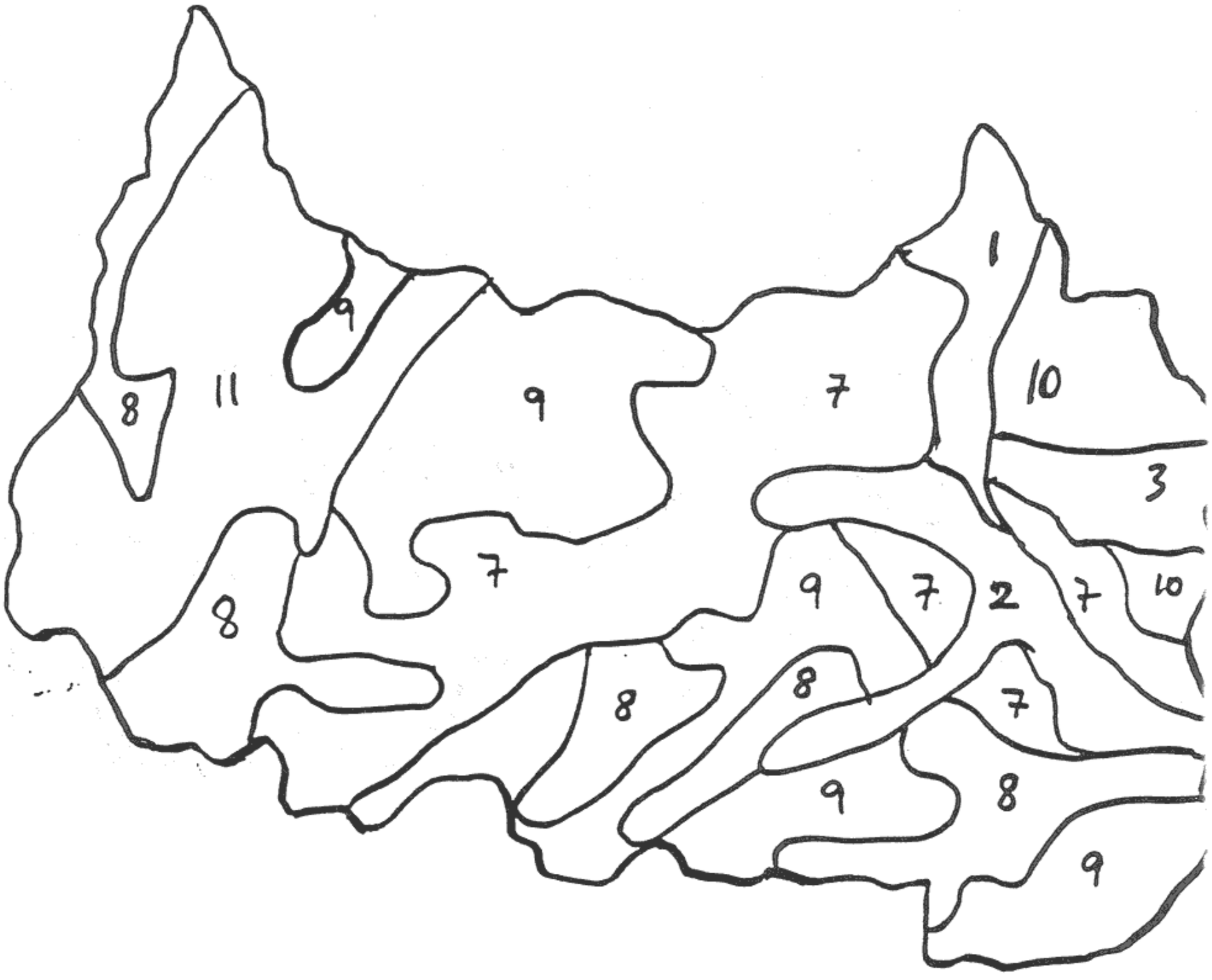
Map 12 - Existing Vegetation Cond. Classes

Cheney/Slate Watershed

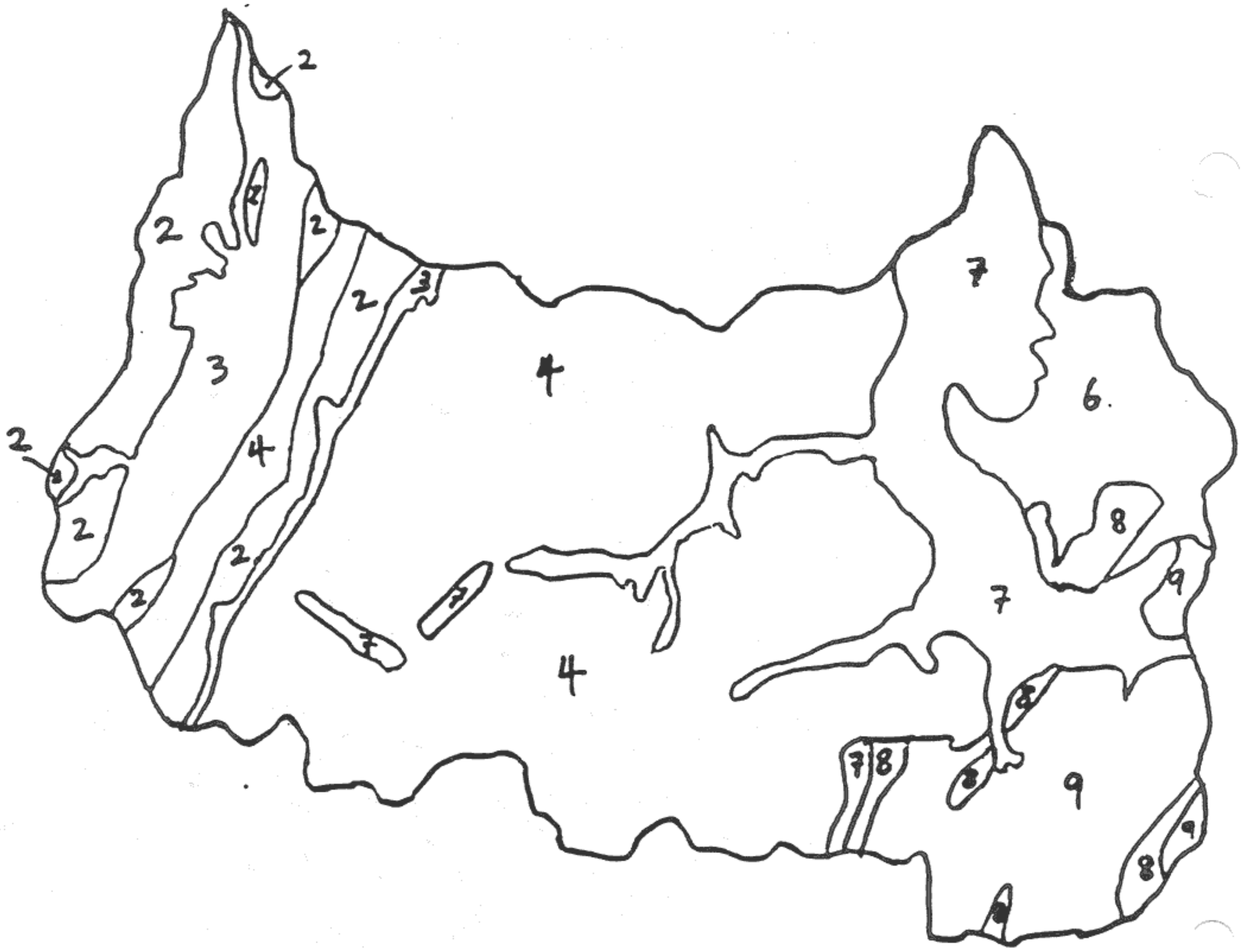


General Soil Map

Unit =1 - Newberg-Camas-Evans
Unit =2 - Takilma-Foehlin-Kerby
Unit =3 - Clawson and Jerome
Unit =7 - Vannoy-Manita-Voorhies
Unit =8 - Josephine-Speaker-Pollard
Unit =9 - Beekman-Vermisa-Colestine
Unit =10 - Siskiyou-Tethrick
Unit =11 - Pearsoll-Dubakella-Eightlar

Map 13
General Soil Map

Cheney/Slate watershed



Geology Map

#2 (Jrgv) -- Metavolcanic rocks from the Rogue and Galice formations.
#3 (um) -- Ultramafic rocks that are intrusive in the formations.
#4 (Jgs) -- Metasedimentary rocks of the Galice formation.
#6 (di) -- Quartz diorite and related rock.
#7 (Qs) -- Quaternary sediments such as stream deposited sand, silts and gravels.
#8 (Tras) -- Metasedimentary rocks from the Applegate formation.
#9 (Trav) -- Metavolcanic rocks for the Applegate formation.

Map 14
Geology Map

G. Fire Management

The data collected for the watershed for hazard, ignition risk, and values at risk for loss from wildfire are summarized in Tables 30, 31, and 32 and displayed on Maps 15, 16, and 17. Rating classification criteria are summarized in Appendix ZZXXX.

Hazard, risk, and value at risk are used to better understand and plan for potential problems and identify opportunities to manage the watershed to meet goals, objectives and desired future conditions. Wildfire occurrence can often prevent the successful achievement of short term and mid term land management goals and objectives. Stand replacement wildfire can prevent the development of mature and late successional forest conditions as well as convert existing mature forests to early seral forest conditions.

Table 30 - Hazard Classification
Cheney/Slate Watershed

OWNERSHIP 48,915 ACRES	HIGH HAZARD	MODERATE HAZARD	LOW HAZARD
BLM ACRES 9,491	8,095 85%	1,323 14%	73 1%
USFS ACRES 12,332	8,058 65%	4,180 34%	94 1%
OTHER OWNERSHIP ACRES 27,092	9,658 36%	14,860 55%	2,574 9%
TOTAL ACRES PERCENT	25,811 53%	20,363 42%	2,741 5%

Current conditions in the watershed have only 5 percent in low fuel hazard conditions, but over half in high conditions. The trend in vegetation shifting to increasingly high hazard conditions will continue over the next several decades to create increasingly high fuel hazard.

Table - 31 Risk Classification Cheney/Slate Watershed			
OWNERSHIP 48,915 ACRES	**HIGH RISK**	**MODERATE RISK**	**LOW RISK**
BLM ACRES 9,491	7,679 81%	443 5%	1,369 14%
USFS ACRES 12,332	10,785 87%	1,075 9%	472 4%
PRIVATE OWNERSHIP ACRES 27,092	26,419 97%	25 1%	648 2%
TOTAL ACRES PERCENT	44,883 92%	1,543 3%	2,489 5%

Risk is defined as the source of ignition. The high level of human population and use within the watershed creates high risk for wildfire occurrence. As human population and use increases, risk will increase.

Table 32 - Value at Risk Classification Cheney/Slate Watershed			
OWNERSHIP 48,915 ACRES	**HIGH VALUE**	**MODERATE VALUE**	**LOW VALUE**
BLM ACRES 9,491	5,683 60%	2,637 28%	1,171 12%
USFS ACRES 12,332	10,426 84%	354 3%	1,552 13%
PRIVATE OWNERSHIP ACRES 27,092	22,954 85%	527 2%	3,611 13%
TOTAL ACRES PERCENT	34,551 71%	6,564 13%	7,800 16%

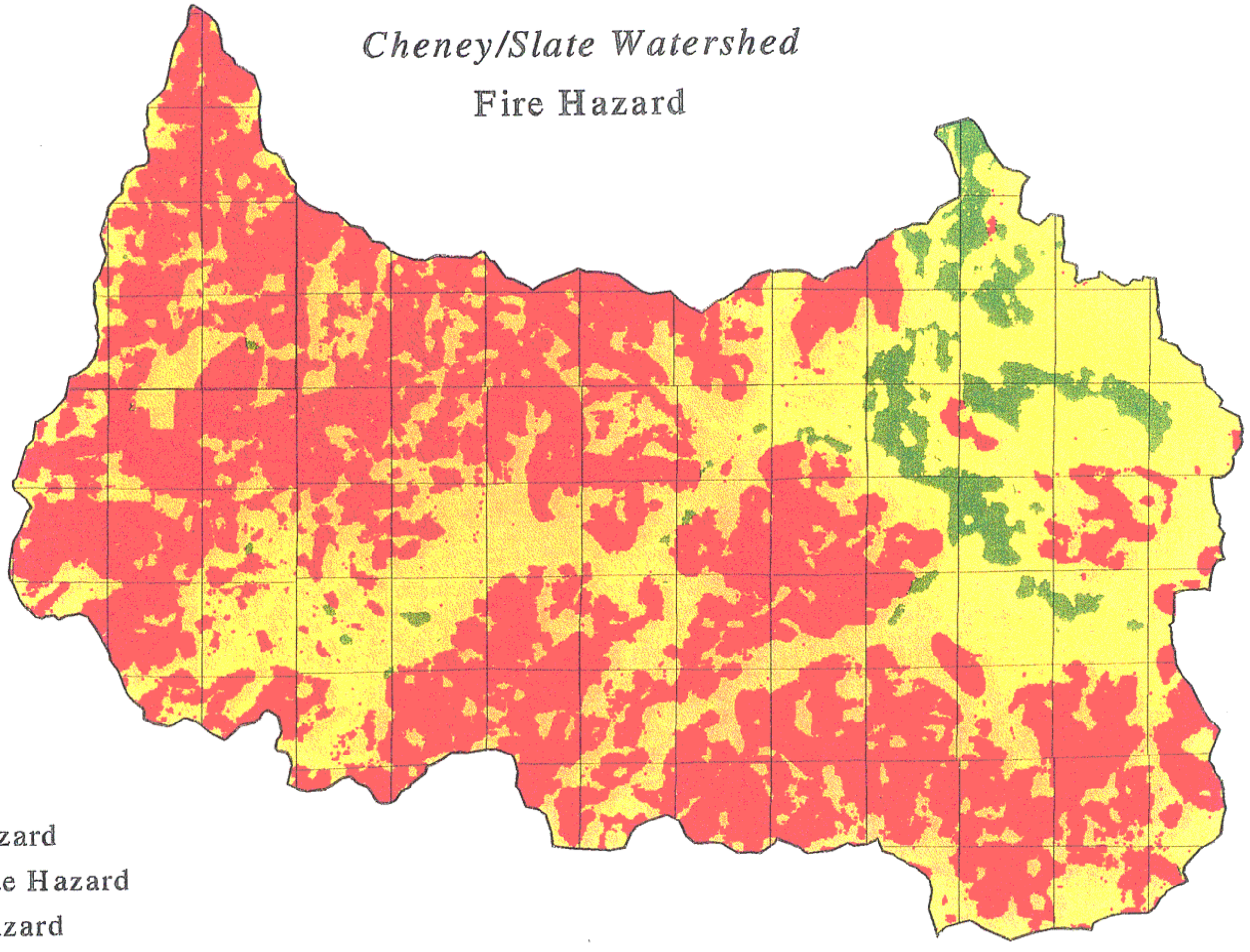
Values at risk are the resource and human value for components of the watershed. The watershed has over 70 percent of the area in high values. This is due largely to the amount of private lands, especially residential areas. As these lands increase in number and spread further to the boundaries of Government ownership the amount of high value in the watershed will increase.

Table 33 - Fire Concern Area - BLM Ownership Cheney/Slate Watershed	
BLM OWNERSHIP	**HIGH CONCERN AREAS**
BLM ACRES 9,491	3,794 40%

Table 34 and map 19 indicates the land in BLM ownership which has been classified as high in hazard, risk, and value at risk. These areas need to be considered as priority areas for management actions and activity that will decrease the potential for large stand replacement wildfire occurrence.

Cheney/Slate Watershed

Fire Hazard



Low Hazard

Moderate Hazard

High Hazard

Map 15
Fire Hazard

SCALE 1:110000

FIRE RISK RATING IN THE CHENEY-SLATE WATERSHED

March 5 1996

John McGlothlin

LEGEND

HIGH

MEDIUM

LOW

BLM LAND

WATERSHED BOUNDARY

N

Map 16
Fire Risk

R8W R7W R6W

T36S

SCALE 1:110000

FIRE VALUE RATING IN THE CHENEY-SLATE WATERSHED

LEGEND

HIGH

MEDIUM

LOW

BLM LAND

WATERSHED BOUNDARY

N

March 5 1996

John McGlothlin

Map 17

H. Human Use

1. Socioeconomic Overview

Current human use of the watershed includes suburban settlement, agriculture, timber management, mining, and dispersed recreation. There is almost no economic base in the area. Residents report a changing settlement pattern from agriculture to more suburban use, and use by retirees or commuters to Grants Pass. Many commuters are upper, middle-class professionals who can afford the higher real estate values in the area. There has been a noticeable increase in timber cutting on nonfederal lands.

People living in the area include farmers, resource workers, retirees, environmentalists, commuters, teachers, those involved in light technology, and horse ranchers. The population is increasing with many newcomers in the area. (Priester, 1994)

The majority of the settlement is located in the area of U.S. Highway 199, Fish Hatchery and Cheney Creek roads. Wilderville, Wonder, and Love Station are "developed" sites in the Cheney/Slate watershed. Wilderville has a post office, store, church and scattered residences. There are also scattered homes along Bull Creek, Elliott Creek, Slate Creek and Waters Creek roads.

Issues of concern to residents of the watershed include: Marble Mountain mine, land use (zoning issues), recreation demand, and private logging. (Priester, 1994)

2. Recreation

Current recreational use of the watershed is dispersed and includes OHV riding, fishing, mountain biking, hiking, hunting and equestrian use. Most recreation activity is done by local residents and people from the two-county region. (Priester, 1994) There are three proposed recreation sites in the watershed. These sites are the Stringer Gap Horse Trail, the Waters Creek Interpretive Trail (USFS) and portions of the Round Top Mountain CCC Trail. The Stringer Gap Trail and the Round Top Mountain CCC Trail are proposed as designated trails in the Medford District, RMP Record of Decision. The Waters Creek Interpretive Trail is proposed by the Siskiyou National Forest. Information on the proposed sites follow.
Stringer Gap Horse Trail: (T37S, R6W, Sections 2, 3, 9, 10) This potentially designated trail crosses BLM land, private land and Josephine County land between Fish Hatchery Park and Elk Lane. Currently the trail receives equestrian and OHV use, but is not maintained.

Round Top Mountain CCC Trail: (T37S, R6W, Section 33) This trail is also proposed as a designated recreation trail. The trail is located along the ridge top dividing the Cheney/Slate watershed and the Murphy and Deer Creek watersheds. The 5 mile trail is a historical Civilian Conservation Corps route.

Waters Creek Interpretive Trail: (T36S, R7W, Section 32) This area is proposed as the site of an interpretive trail by the Siskiyou National Forest. The proposed trail is located in a flat along Waters Creek.

The Applegate River is located in the eastern portion of the watershed and also provides recreation opportunities. The main public access point to the river is provided by Fish Hatchery Park, (T37S, R6W, Section 16) managed by Josephine County Parks Department. The day-use only park is located on both sides of the river and is used for fishing, swimming, nature study, and access for hiking and equestrian use. Locked gates prohibit vehicular access throughout the winter, but are open in the summer.

Extensive OHV use occurs in the northwest part of the watershed, along existing USFS roads and non-maintained trails. This use is concentrated along Waters Creek Road, Newt Gulch, Slate Creek Road and tying in to Limpy Creek, Shan Creek and Dutcher Creek drainages in the Pickett/Hog watershed. Off Highway Vehicle use also occurs along BLM roads and trails in the watershed.

3. Minerals

An inventory, utilizing the mining claim microfiche prepared by the BLM Oregon State Office, revealed that there are sixteen mining claims currently existing within the watershed. However, it should be noted that only four claimants either paid annual rental or performed assessment work for 1994/1995. Therefore, the remaining twelve claims will be eventually declared null and void for the lack of payment of fees, or for failure to complete the required assessment work.

When ground disturbing activities are proposed on public lands administered by either the BLM and USFS a mining notice or plan of operations must be submitted and reviewed by the proper agency administering the lands. At this time one notice has been submitted within the watershed. No plans of operations have been submitted for activities on the public lands within the watershed.

A mineral potential map for the watershed is included in this report. The mineral potential is mapped using the current available information for the BLM lands. The potential for the USFS lands was not mapped, however, the mineral potential for those lands can be estimated using the information found for the BLM lands.

In general, the entire watershed has low potential for mineral development with the exception of the area in the southeast corner of the watershed which has medium potential. The only mining notice within the watershed covers activities within this medium potential area in upper Cheney Creek. This notice entails mining activities on the Campman #44 claim in which the claimant is mining high grade lime. The lack of mining claims and mining activities within the watershed reflects the low to medium mineral potential in the Cheney/Slate watershed.

The existing physical condition of all areas within the watershed that have been mined are good. There are no areas where mined site reclamation is needed. One visual reminder of mining within the watershed is evident when looking at the Marble Mountain Quarry, a private quarry on the ridge between Cheney and Bull Creeks.

4. Cultural

There are no recorded cultural sites within the watershed. Some areas were surveyed during proposed ground disturbance activities over the years such as timber sales, road construction, and other projects.

5. Lands/Realty

The scattered land patterns in the watershed are discussed in the Reference Conditions section. In general, the land patterns have been molded by the transfer of public lands from the United States Government to various private landowners through several different Congressional Acts. This left the lands owned by the United States Government and administered by the BLM scattered with access nonexistent in some cases. This also leaves the private landowners with access problems and needs that entail rights-of-way across BLM administered lands. In general, the land pattern of the USFS lands is a contiguous block, thus the problems associated with scattered land ownership is nonexistent.

Rights-of-way issued to private landowners include roads, water systems, powerlines, phonelines, and communication sites. The actual locations of these rights-of-way can be found in master title plats kept updated at the Medford BLM Office.

6. Roads

Many roads in the Cheney/Slate watershed have been constructed based on the public and federal agencies need for access. Some of these roads were built over lands that had little or no original disturbance and range in design from natural to asphalt surfaced. The average road density across lands managed by the USFS in the Cheney/Slate watershed is 1.05 miles per square mile.

The federal agencies have no authority over private land use. Many natural surfaced road systems are built over private lands and are a major source of erosion and sedimentation into streams. There are approximately 6 miles of road per square mile on privately owned lands. This is a concern in the Cheney/Slate watershed and will require community involvement by private land owners to establish a policy on nonfederal land transportation management.

Road construction and improvement across BLM managed lands was based mainly on timber management as directed under federal O&C land management. Many natural surfaced roads remained opened for administrative access after timber sales were completed. These roads are

known to be major contributors of sediment production to local streams.

The Cheney/Slate watershed varies in road density and type of roads within the drainage area. The average BLM road density in the Cheney/Slate watershed is 2.49 miles per square mile on BLM land. This density is low compared to other watersheds across the Medford BLM District. There are four sections of high density roaded areas within the Cheney/Slate watershed, on BLM administered lands, that are affecting the total density.

Table 34 - Miles of Road in the Cheney/Slate Watershed

ROAD OWNERSHIP	SURFACE TYPE	MILES
BLM	NAT	23.46
BLM	PRR	05.35
BLM	GRR	06.40
BLM	ABC	01.71
BLM	ASC	00.09
BLM	BST	00.00
USFS	UNK	20.13
PRIVATE	UNK	253.48
Total Road Miles		310.62

LEGEND
NAT = Natural Surface
PRR = Pit Run Rock
GRR = Grid Rolled Rock
ABC = Aggregate Base Coarse
ASC = Aggregate Surface Coarse
BST = Bituminous Surface Treatment
UNK = Unknown/Various Types

R8W R7W R6W

T36S

SCALE 1:110000

FUEL MODELS ON THE BLM LANDS IN THE CHENEY-SLATE WATERSHED

LEGEND

- GRASS AND GRASS DOMINATED
- SLASH
- WATERSHED BOUNDARY
- CHAPARRAL AND SHRUB FIELDS
- FUEL MODELING NOT APPLICABLE
- TIMBER LITTER
- BLM LAND

N

March 5 1996

John McGlothlin

Map 18

V. REFERENCE CONDITION

A. Hydrology

The upper reaches of the stream network have always been relatively straight. The function of these streams and their tributaries has always been to produce high quality water to the lower gradient streams in the valley bottoms. The forest vegetation intercepted the precipitation and either stored it (snow pack) or yielded it (runoff). The organic matter along the forest floor protected the soil from detaching forces and also aided in filtering out sediments before the water entered the streams. Sedimentation rates were low, and habitat for aquatic dependant species was high.

A mature forest provided shade and an abundance of coarse woody material in the forest and creeks (as a result of tree mortality). This was used as a food source and shelter for many insects, fungi, and benthos. Debris jams and flood events would change the stream course causing it to meander across the flood plain. Most of the creeks were more sinuous and, therefore, the streams were longer and more complex with more aquatic habitat available.

B. Aquatic Habitat

1. Pre-European Settlement

A pre-European depiction of the Cheney/Slate watershed would include robust beaver and salmon populations, a mixture of mature conifer and hardwood riparian areas, large woody material or logs distributed through the stream and riparian area, and plenty of cool, clear water. There was an abundance of fish in most streams. Native Americans relied heavily on salmon, steelhead, lamprey, and suckers for subsistence and ceremonial purposes.

Prior to European settlement, streams meandered with unconstrained channels. Multiple stream channels dissipated flows and created fish habitat. Stream channels contained larger amounts of large woody debris for insect and fish production, low water temperatures ideal for salmonids, and low sedimentation in the gravels or stream substrate.

2. Post-European Settlement

European settlers trapped beaver extensively and over the decades began the reduction in numbers of coho salmon. As beaver numbers decreased so did the amount of summer juvenile coho salmon habitat or pools and small pondings. Settlers cleared the floodplains and adjoining lands. The lands were drained and streams channelized. Stream meander was eliminated along with the connectivity of the stream with its floodplain.

The number of irrigation diversions increased and water rights were over-appropriated for agricultural use in the 1900s. Timber harvest was at a minimum until the late 1800s and

accelerated in the 1980s. Both of these land use practices decreased available habitat for coho salmon. Irrigation of farmlands de-waters streams and prevents juvenile yearling fish migration upstream and downstream to seek cooler waters.

Coho salmon numbers have dramatically decreased by 90 percent since 1970. Coho production potential and habitat complexity has subsequently decreased as a result of agricultural practices, timber harvest, and road activities. Fish numbers were very high during the 1800s and early 1900s.

The combination of these factors caused a cumulative effect and consequently reduced fish numbers, especially coho salmon.

C. Wildlife

A pre-European/Asian depiction of the Cheney/Slate watershed would be dramatically different than one would see today. Native Americans were managing the landscape for habitats and products they found useful. Fires were used to burn off undesirable vegetation and to promote growth of desired products. Wildlife was extensively used by these people to meet their everyday needs. Human exploitation of these wildlife resources was at a sustainable level. Each species maintained its role in an intricate food chain, where their presence benefitted the community as a whole. Large predator species, such as grizzly bear and wolf (Canis lupus), were present in the watershed (Bailey, 1936). These, along with cougar (Felis concolor) and black bear (Ursus americanus), maintained the balance of species, such as Roosevelt elk (Cervus elaphus) and black-tailed deer (Odocoileus hemionus). Predator species kept herbivore species in balance with vegetation. Predator species also benefitted other community members like ground-nesting birds. They harvested small mammals,such as raccoon (Procyon lotor), that fed on the young birds. Predators also made available carcasses in the winter that benefitted species as diverse as the striped skunk (Mephitis mephitis) and the black-capped chickadee (Parus atricapillus).

The landscape was open and the movement of animals was unrestricted. Many animals would migrate with the seasons to take advantage of food, shelter, and water. Black bears in the early spring sought green grass to activate their digestive system. Winter kills that remained around were utilized by the bears at this time. During early summer California ground-cone (Boschniakia spp.) became an important part of their diet, until berries were available. As fall approached, the salmon would return to the river, spawn, and die. This abundant food source was available to a host of consumers. Deer and elk also followed the seasons. Winter was primarily spent in the oak/savannahs. As the season progressed they would enter the uplands, until fall arrived. Other species, such as the wolverine (Gulo gulo luteus), remained at high elevations throughout the year. This species was a opportunistic predator, feeding on animals such as porcupine (Erithizon dorsatum) as well as occasional winter kills.

Historically, the valley floor was dominated by an open stand of large conifers and oak/grasslands kept free of brush due to fire. Maps produced in 1857 by the general land office

characterize this area as a pine/oak savannah with smaller amounts of fir and madrone. This habitat type provided nesting habitat for various species, mast crops of acorns for wildlife forage, and big game winter range. A variety of bird species such as the acorn woodpecker (Melanerpes formicivorus), western blue birds (Sialia mexicana) and the Lewis' woodpecker (Melanerpes lewis) were intricately tied to these stands. Species such as the sharptailed snake (Contia tenuis), the common kingsnake (Lampropeltis getulus), and the mountain kingsnake (Lampropeltis zonata) utilized the grassland-riparian interface area as their primary habitat. The open condition and the grass were highly beneficial to a number of game animals and ground nesting birds. Deer and elk utilized this area for winter range. In turn, game animals provided sustenance for a host of predator species. Grey fox (Urocyon cinereoargenteus) used the valley and nearby brushy slopes as their primary habitat.

The area found above the valley floor was dominated by conifers. This area was characterized by forest in various stages of stand development due to disturbance events, such as fire. Stands found on the north and east facing slopes were generally composed of multi-canopied stands with large amounts of snags, down wood, and large trees. South and west facing aspects were composed of stands with a higher fire return interval and were often devoid of large amounts of down woody material. The amount of old-growth forest historically found in the watershed is unknown, but a range as high as 71 percent has been estimated for southwestern Oregon (Ripple, 1994).

Species that benefitted from these forests, such as the pileated woodpeckers (Dryocopus pileatus), northern flying squirrels (Glaucomys sabrinus) and red tree voles (Phenacomys longicaudus), were found in greater numbers than they are at present. Dispersal of animals, recolonization of former habitats, and pioneering into unoccupied territories was accomplished more easily than it is today due the connectivity of the older forest. Species that benefitted from edge environments like striped skunk (Mephitis mephitis) were less common in the uplands than they are today.

Snags were more numerous than they are today, and species that utilize snags for their primary habitat were more common. Species, such as northern pygmy owl (Glaucidium gnoma), western screech-owl and northern flicker (Colaptes auratus), had more habitat than what is currently available.

D. Riparian

Prior to the settlement of the valley, pristine streams flowed from their source to the Applegate River. Water quality was extremely high. Seeps, springs, and snow all contributed to keeping the water cool. Due to the mature nature of the majority of the forest in the higher elevations of the watershed, winter snowpack would remain for longer periods of time than it currently does. During the winter and spring occasional floods would flush the system clear of sediment that was deposited from natural slides and erosion. Stream courses in the uplands were primarily lined by conifers with a narrow band of deciduous trees. These streams were generally well defined by

entrenched channels. As the stream dropped to the valley floor, wide floodplains developed and the streams began to meander, taking on a variety of courses from year to year. This highly sinuous stream system consisted of undercut banks and oxbows, with an accumulation of large woody material from both the uplands and lowlands which created an extremely diverse aquatic system and associated habitats. Here the riparian zone would also widen, with deciduous trees playing a more important role than they did in the uplands. Due to higher humidity, conifers near the streams resisted burning, allowing them to mature, resulting in heavy loading of large woody debris in the water. Adding to the diversity was a myriad of wildlife species. Beavers (Castor canadensis) acted as a keystone species, creating backwater sloughs behind their dams, and adding finer woody material to the stream. This fine material particularly benefitted fish in the stream providing them with cover. Species such as ducks and geese also benefitted from the creation of ponds which provide nesting habitat. The diversity of wildlife species was not restricted to the surface as a profusion of aquatic insects took advantage of the variety of available niches. These insects in turn supported a assortment of vertebrate species including anadromous fish. As the adult fish returned to their native streams, their carcasses would produce a rich source of food which in turn supported Minks (Mustela vision), American black bears (Ursus americanus), Grizzly bears (Ursus arctos), Bald eagles (Haliaeetus leucocephalus) and a number of other scavenger species that would benefit from this annual event.

E. Vegetation

The vegetative conditions found in the watershed today differ in some significant ways from the historic conditions. For the purposes of this discussion, the reference condition will be considered to be prior to Euro-American settlement during the latter half of the last century.

Prior to white settlement in the mid to late 1800s, natural disturbances, primarily by fire were common. Additionally, Native Americans were known to have used fire frequently to provide better habitat for some plants and animals. These disturbance patterns resulted in dynamic forest ecosystems that changed constantly over time. They also played a vital process role in providing for a diversity of vegetative types, structures, seral stages, and for maintaining sustainable densities.

As is consistent with generally all forests in the Klamath Province, the forests in the Cheney/Slate watershed were historically diverse, contained a mix of seral stages and size classes, and were generally more open than they are today. The forests were complex and contained a variety of species and structures. The largest and oldest trees were generally pine which developed in more open conditions than the dense pole stands present across much of the watershed today. Mid seral hardwood species such as Pacific madrone and California black oak were common, especially where fire frequency and intensity had been greater. Tanoak occurred less frequently than is found in the watershed today.

To try and assess vegetative conditions in the watershed at the turn of the century, the 1916 O&C Land Survey Notes were examined. Unfortunately, specific data or stand descriptions are not

available for the watershed prior to this time. The 1916 O&C Revestment Surveys were done to determine the economic worth of the land at that time, estimate the volume and quality of timber present, and recommend best use of the land. Every forty acre parcel of O&C land was surveyed. The information is general and brief but some conclusions can be drawn as to what the general landscape looked like in the early part of this century.

The largest and highest quality trees for timber described in the notes are pine, both sugar and ponderosa. Douglas-fir is generally described as being small and of poor quality. Some larger Douglas-fir are described in places but nowhere in the notes are thick stands of Douglas-fir old growth described. Hardwoods are described as a significant component of the stands in places. As an example, a forty acre parcel in T.36S,R7W,Sec.35 that is mapped as mature forest today is described as follows in 1918: "clay soil, thick stand of black oak from 10 to 26 inches on the stump, make good cordwood, short coarse bodied and heavy tops. No timber." The no timber description is referring to conifer timber only. Other descriptions found for parcels mapped as mature or large poles today include: "open clean woods, many black oak, make grazing land" and "no brush, surface is clean and smooth. Will make good grazing land."

Since this inventory took place during the homestead entry period, high emphasis was placed on potential agricultural endeavors. Because the landscape was more open, many of the parcels surveyed were classified as agricultural. For example,every forty acre parcel surveyed in T.36S.,R7W.,Sec.35 was recommended for agricultural land. The agricultural land classification implied nontimber use and didn't necessarily imply crop farming. If the parcel was too steep for crop farming but could still be used for cattle grazing, it was usually classed as agricultural land. All of the BLM lands in these same parcels today are mapped as either large poles or mature forest for the current condition.

The oldest aerial photographs that could be located of the watershed are from 1953. These photos indicate extensive harvesting had occurred on the nonfederal lands by that time. Most to these harvests probably occurred in the late 1940s and 1950s, just after World War II. Some of the harvests appear to have extended over on to federal lands also. Whether these were done by the federal agencies or inadvertently done because ownership lines weren't established at that time is not known. The harvests appear to have been high grade type harvests where most of the larger trees were removed and the lower value understory trees were left. Most of these areas are classified as large poles in the current condition mapping with the remainder classified as hardwood/conifer or poles.

F. Special Status Plants

Special Status plants have only been surveyed in the Cheney/Slate watershed in any intensive manner over the past fifteen years. It is difficult to assess the adequacy of older surveys because the listing of special status plants have changed over the years. A plant considered special status today may not have been in the past, which means that no information on the presence of the species would have been documented.

It can be postulated that the habitat for those late successional special status species (the Cypripedium sps. and Allotropa virgata) was once more extensive in the watershed before timber harvest was common. Even though larger condition classes do exist in the watershed today, it is impossible to know what presettlement habitats harbored the most orchid populations. The microhabitat required was most likely more abundant and contiguous with frequent, low intensity fires helping to maintain a competitive edge for these species in the herbaceous layer. Due to the complex life history of these plants, they were probably never a dominant species in the herbaceous layer, but they could have occurred more frequently in the watershed and with higher numbers of plants per population area if moister, shaded microsite conditions occurred more frequently.

Serpentine reference conditions most likely exhibited higher species diversity in the herbaceous layer than in the past. Since serpentine areas occur because of unusual soils their area was probably similar to and contained the same type of plants as today. Also, one can only assume that wetlands or seeps probably existed more frequently before settlement of the area.

G. Soils

Soil productivity has fluctuated over time as natural and human caused events occurred. Wildfires have oxidized and reduced vegetative material and soil microbe populations. This reduction was proportional with the intensity of the wildfire. Although the plant material was reduced during a wildfire event, the oxidized material often remained in place for the remaining microbe population to rebuild upon. Standing dead material as a result of a wildfire event would eventually fall to the ground, contributing to the organic matter content and the soil forming process.

Erosion rates were less than today as soil disturbing activities were less. Soil depths increased as weathering of parent material occurred faster than erosion rates.

H. Fire

1. Historical Fire Regime

The historical fire regime of the Cheney/Slate watershed was dominated by a low-severity regime. The low-severity fire regime is characterized as frequent (1-25 years) fires of low intensity (Agee,1990). A small amount of area of the watershed approaches a moderate-severity regime at the higher elevations on the western portion of the watershed. These areas had a longer fire frequency of 25-35 years and experienced a range of effects from high to low severity. These areas are a minor component in the total watershed and will not be discussed further.

2. Low-Severity Regime

Fires in a low-severity regime are associated with ecosystem stability, as the system is more

stable in the presence of fire than in its absence (Agee, 1990). Frequent, low severity fires kept sites open so that they were less likely to burn intensely even under severe fire weather. Limited overstory mortality occurred. The majority of the dominant overstory trees were adapted to resist low intensity fires because of thick bark developed at an early age. Structural effects of these fires were on the smaller understory trees and shrubs. These were periodically removed or thinned by the low intensity fire along with down woody fuels.

With the advent of fire exclusion, the pattern of frequent low intensity fire ended. Dead and down fuel and understory vegetation were no longer periodically removed. Species composition changed and less fire resistant species increased in numbers and site occupancy. This created a trend toward an ever increasing build-up in the amounts of live and dead fuel. The longer interval between fire occurrence creates higher intensity, stand replacement fires rather than the historical fire effect of stand maintenance.

I. Air Quality

Poor air quality due to natural and prescribed (human) fire has been a historical occurrence in the spring, summer, and fall seasons for Southern Oregon. Numerous reference are made by early euro-american explorers and settlers to native american burning and wildfire occurrence in Southern Oregon. Smoke-filled sky and valleys were once typical during the warm seasons. Air quality impacts from natural and prescribed fire declined with active fire suppression and decline in settlement and mining burning. Factors influencing air quality shifted away from wildfire and human burning to fossil fuel combustion as population and industry grew. This created a shift in season of air quality concern to the winter months when stable air and poor ventilation occurs. By the 1970s, fossil fuel emissions became the major factor along with wood stove and "backyard" burning. Prescribed burning related to the forest industry increased throughout this period and was an additional factor, particularly in the fall season. Regulation of prescribed burning smoke emissions and environmental regulation of fossil fuel combustion sources has lead to a steady improvement in air quality since the 1970s.

Air quality as a reference condition is determined by legal statues. The Clean Air Act and the Oregon State Air Quality Implementation Plan have set goals and objectives. Management actions must conform so that effort is made to meet National Ambient Air Quality Standards, Prevention of Significant Deterioration, and the Oregon Visibility Protection Plan and Smoke Management Plan goals.

J. Human Use

1. Mining/Cultural

Archeological evidence indicates that human occupation of southwest Oregon dates back about 10,000 years. During these prehistoric times the native inhabitants occupied southwest minimally impacted the physical landscapes. The native inhabitants of the area are generalized as hunters

and gatherers.

Evidence in the Applegate River watershed indicates that natives burned their landscape for a variety of reasons. These reasons included pest control; stimulation of new plant growth for various utilizations; the reduction in undergrowth; and hazard control near residences.

The first known whites to enter the Applegate watershed passed through the area in early 1827. They belonged to a party of Hudson's Bay Company trappers from Fort Vancouver under the leadership of Peter Skene Ogden. The Hudson Bay Company trappers continued to visit the area for several years. Others trappers and explorers made periodic visits to the area up to the time of the discovery of gold in Jackson County.

Gold was discovered on Jackson Creek (near present day Jacksonville) in the Rogue Valley in late 1851, or early 1852. Although gold was discovered elsewhere along the Applegate and Illinois Rivers previously, this gold discovery brought an influx of thousands of miners to the region in search of gold.

Gold mining occurred on a small scale within the Cheney/Slate watershed in the early years. The majority of the mining in the mid 1800s within this watershed was small scale, primarily prospecting.

Conflicts arose between settlers and natives within southwest Oregon, with one such conflict occurring within the Cheney/Slate watershed at Jerome Prairie. Jerome Dyer, settler of the Jerome Prairie, was killed while travelling home from Crescent City in 1855. This incident occurred during escalating conflicts between the Indians and settlers throughout southwest Oregon.

In the 1850s, in conjunction with the increased mining and settlement in southwest Oregon, a road was constructed from Crescent City to Jacksonville. The original route of this road crossed into the Cheney/Slate watershed from the south down Cheney Creek. This route was eventually rerouted to cross into the Applegate valley, and into the Cheney/Slate watershed, to the west of Cheney Creek along Slate Creek. In addition to the road access along Slate Creek, an extension of the railroad was run from the O&C Railroad in Grants Pass to Waters Creek to additionally serve the Illinois Valley. In 1857, the Junction House was established at the site of present-day Wilderville. The house served as a stopping place and store to those travelling through and living in the area.

As mentioned in the characterization section, the land ownership pattern of the Cheney/Slate watershed was primarily molded in the late 1800s and early 1900s. The lands in the watershed in the mid 1800s were public lands owned by the United States and administered by the General Land Office. The first primary transfer of public lands out of ownership by the United States was to the State of Oregon following statehood in 1842.

In order to further develop the west, Congress passed several laws enabling settlers to develop and obtain ownership of the public lands. These laws included Donation Land Claim patents, entry under the Homestead Acts, Military patents, and Mineral patents. In addition to these types of deeds, land was deeded to the Oregon and California Railroad, with some of those lands being sold to private individuals. In reviewing the master title plats for the Cheney/Slate watershed it is apparent that ownership of several of the low elevation lands were originally deeded from the United States to private individuals through the above Acts of Congress.

One notable large inholding in the Siskiyou National Forest within the watershed, called the Buckeye Mine, was deeded to the mining claimants in 1918 as a mineral patent. This is located west of Waters Creek. This is the largest block of private land located in the Forest within the watershed.

In the 1930s, and into the 1940s, the Marble Mountain limestone quarry was operational. This site was located on public lands and claimed by the Beaver-Portland Cement Company. This quarry was the largest active mining operator and employer in the Cheney/Slate watershed for several years. The excavated lime rock was either trucked or transported by tramline to the valley floor, then transported to Gold Hill by rail. In 1940, most of the lime rock was then transported on to paper mills. The public lands at the location of the Marble Mountain quarry were deeded by mineral patent in the 1950s to Portland Cement. Today the quarry remains a visual landmark within the Cheney/Slate watershed on the ridgeline between Cheney and Bull Creeks, south of the Applegate River.

2. Recreation

Until the 1930s, much of the land in southern Oregon was inaccessible for recreation. The 1930s brought about the Civilian Conservation Corps, which, among other duties, was responsible for building many roads. These new roads provided recreation opportunities that were not previously accessible to many people. People began using roads to access sites for hiking, camping and driving for pleasure. According to an Oregon forester at the time, "Motorists and campers moved into areas previously unreachable or discovered alternative shortcuts to favored recreation spots...Where there are roads, you'll find the public." (McKinley and Frank, 1995) One of the first known recreation reports was developed in 1935 in the Applegate District of the USFS. (Preister, 1994) Other recreation opportunities in the area included hunting and fishing.

3. Roads

Before settlement of the west, ground disturbances were caused by animal trails and forces of nature. As the west developed, trails became narrow roads used to transport people and supplies. These roads were generally natural surface with the amount of sediment flow dependent upon use, location, weather conditions, and soil type. As the use of these roads increased over the years, the roads themselves changed in design. Many of today's highways began as trails and are now widened, realigned, and surfaced to meet the increase and change in vehicle traffic. Even

with the increase in traffic flow, crushed rock surfacing, asphalt, modern techniques in road stabilization, and improved road drainage have actually decreased sedimentation and erosion along the original natural surfaced roads.

IV Data Synthesis and Interpretation

A. Hydrology

The geomorphology of most of the streams, particularly in the valley bottoms, have changed over time as a result of mostly physical influences. Manipulation of the vegetation and landscape (either natural or human) and flooding has greatly affected the fluvial processes. Roads constructed in flood plains and along some creeks (Slate, Waters, Round Prairie) have straightened the stream's channel. Agricultural activities in the valley bottoms have pushed the creeks against the hillside reducing meander and sinuosity. This has reduced stream length which decreased the amount of available aquatic habitat and ground water recharge area. Logging in riparian areas has reduced shade, lowered the amount of large wood in and along the stream and destabilized banks. Logging and road building in the hills above the streams has increased sedimentation rates which has embedded spawning and rearing habitat. Water diversions either for domestic or agricultural purposes during the summer months decreases flow thus reducing the amount of aquatic habitat available while increasing water temperature.

Desired Future Condition

The hydrologic processes in the Cheney/Slate watershed have been greatly influenced by past human uses. Precipitation cycles will continue to fluctuate through time. Precipitation intensity, duration and amount will vary over the coming years causing floods and/or drought. The manner in which the factors affecting the streams are managed will determine the future hydrologic conditions. Four factors were identified that are currently having a major affect on the beneficial uses of water and the associated stream and riparian habitat. These factors are low stream flow in the summer months, high sedimentation rates, high water temperature during the summer months and the lack of large wood in the stream and riparian areas.

The desired future condition of the streams in the Cheney/Slate watershed is to have adequate summer flows (8-15 cfs) of relatively clean, cool water. Streambanks should be in stable condition with some signs of natural meandering. The perennial streams should be shaded for the majority of the day. A dense riparian canopy along the perennial streams can aid in shading out the sun and high evapo-transportation rates can keep humidity levels high thus creating a cooler environment. It is important that riparian canopy be dense (>60%) with a mixture of mature deciduous and coniferous trees. The presence of large trees will ensure future recruitment of large woody material.

Intermittent streams should have the banks in stable condition and the riparian condition in proper functioning condition. Although shading these intermittent streams during the summer months is not as important for water temperature, it is important for maintaining habitat for sensitive species and insect populations that depend a cool, moist habitat. An abundance of large wood in the intermittent stream's riparian area would also increase habitat diversity and effectiveness.

B. Aquatic Habitat

Since the 1930s there has been a substantial decrease in fish populations due to the cumulative impacts from irrigation diversions, mining, timber harvesting, road construction, dams, and over-fishing. These factors have changed the landscape and have had an adverse impact on fish populations over the past 100 years.

Diversions from streams for irrigation and mining purposes combined with century old water rights have significantly decreased the amount of water available to fish, especially during low flow periods. Changes in the landscape are caused by agriculture, roads (stream channelization), and timber harvest. Irrigation withdrawals primarily exacerbated the adverse effects of poor land management and continue to force a decline in the anadromous fishery.

Timber harvest caused a loss of large wood and no recruitment of conifer trees in the riparian zones. The probability of recruitment of large wood in stream channels in the near future is low. Large wood contributes to the riparian and stream, habitat, shade and nutrients for terrestrial and aquatic insects.

Road construction occurred next to streams. Roads channelize streams, prohibit stream meander and act as heat sinks which transfer an inordinate amount of heat to the riparian area and consequently increase stream water temperature.
Cattle grazing exacerbates regeneration of conifers causing a total decline in conifer reestablishment, due to soil compaction in the riparian areas. The result is lack of shade and an increase in stream temperature. Large tree recruitment is extremely slow or nonexistent.

Timber harvesting and the presence of roads accelerated surface water runoff and erosion of sediment into the streams, resulting in decreased insect and fish production. While timber harvesting accelerated in the 70s and 80s, coho production dropped 90 percent.

The cumulative effects of management activities have substantially altered the timing and quantity of erosion and changes in stream channels, all which have impacted fish production at one time or another. Streams and riparian areas with federal ownership are in much better condition than streams on nonfederal lands. During low flow periods, water flows off federal lands and in some streams, such as Elliott and Waters creek, is totally withdrawn for irrigation, leaving the stream bed dry.

1. Stream and Riparian Trends - Federal and Nonfederal Lands

The future trend in aquatic habitat conditions in the Cheney and Slate Creek watersheds will be influenced by four major limiting factors:

(1) successional stage of vegetation in riparian zones;
(2) the amount of stream flow between early summer and fall,

(3) the rate and magnitude of sediment delivery.
(4) water temperature of the streams in the summer and fall.

The expected fish habitat trend in both watersheds will vary with land ownership.

2. Riparian Reserves and Coarse Woody Material

Federal Lands

Streamside shade and coarse woody debris will increase. It will take approximately 150 - 300 years for streamside areas on federal land to attain late-successional characteristics in previously harvested areas. Large mature trees will contribute to fish habitat complexity after falling into the stream.

Age and structural diversity of vegetation in riparian areas on federal land will increase in response to BLM and USFS actions that meet Aquatic Conservation Strategy objectives. There is no intent to change riparian widths but to protect and actively manage riparian areas to meet the objectives of the ACS and improve factors no limiting aquatic habitat.

Nonfederal Lands

Quality of stream and riparian habitat on nonfederal land will decrease as timber harvest proceeds in unentered or previously lightly harvested timber stands.

Revised State Forest Practice Rules probably will not maintain or reduce stream temperatures because they allow extensive timber harvest as close as 100 feet from fish-bearing streams. There are no setback or shade requirements on class 3 and 4 streams on private or state land. A 75 foot no-cut riparian buffer strip is necessary in some cases to maintain or lower water temperatures. In addition, largest diameter conifers often with the fullest canopy and best potential for shading and between 20 and 75 feet from streams will probably be cut when they reach commercial size.

The amount of coarse woody material in the riparian area on private land will diminish due to natural processes or timber harvest. It will not be replaced to any appreciable degree because largest conifers in riparian transition zones will be logged when they reach commercial size.

Roads on private woodlands and on private commercial forest land will be primarily natural surface with inadequate drainage. Tractor yarding will continue to be the most frequently used yarding method, even on steep slopes. Water bars will often be ineffective. This will cause excessive siltation in the streams which will smother salmon eggs and reduce fish survival.

3. Instream Large Woody Debris

Federal Lands

The greatest potential for improvement in complexity of fish habitat on a small watershed scale

(smaller than a sub-watershed) over the long term will be on federal lands. As a result of improvement projects, streams on federal land would become more effective at dissipating stream flow energy; scouring pools, providing complex habitat for fish, amphibians and invertebrates; and would be more retentive of organic detritus.

Boulders and rubble rather than large wood, play a major role in creating fish habitat in larger streams (i.e., >3rd order). However large woody debris continues to be important in the steeper class 3 and 4 streams by dissipating stream energy (i.e. forming a stepped channel profile), controlling the movement of sediment and small organic matter and providing habitat for fish and amphibians.

Riparian condition, as well as contribution of large woody debris to streams, will improve on federal land as the BLM and USFS implement projects under Aquatic Conservation Strategy (ACS) objectives.

The BLM and USFS should undertake watershed restoration projects to reduce sediment sources and provide fish passage to potential habitat.

Nonfederal Lands

Class 3 and 4 streams on forested nonfederal land may become less capable of controlling movement of sediment and fine organic material and providing habitat for amphibians because of the lack of amount of large woody debris. It will probably never recover to pre-management conditions without substantial improvements to current state forest practice rules. Riparian transition zones will remain in early and mid-successional stages on nonfederal lands.

4. Sedimentation

Federal Lands

Stream sedimentation is expected to decrease in class 3 and 4 streams on federal lands if there is full implementation of the aquatic conservation strategy (ACS) and best management practices (BMPs) in all watershed restoration activities. Assuming new activities will not contribute to existing sedimentation problems.

Nonfederal Lands

Many roads and tractor skid roads on private lands do not receive regular maintenance, nor were most of them designed with adequate drainage or erosion control features. These problems are expected to continue unless much more restrictive state and county laws are created and enforced. Sediment from these areas can be expected to adversely impact streams on public and other private lands downstream. However, there may not be an appreciable change in the amount of sediment deposition in class 1 and 2 streams if road construction standards and tractor logging practices do not substantially improve on private lands.

5. Stream Flow

Federal Lands
Water flows should increase in the future during dry seasons based on the application of the latest revised Best Management Practices (BMPs).

Intensity and frequency of peak flows, if they have occurred as a result of management activities, will diminish as vegetation regrows in previously harvested areas and if road mileage is reduced to meet objectives of the Aquatic Conservation Strategy. Potential indirect adverse effects of altered peak flows on salmonid reproduction would diminish. This assumes that timber harvest on nonfederal land will continue at no greater than the present rate and that new road construction on private land will not offset efforts to reduce road mileage on public lands.

Nonfederal Lands
Water diversions from streams for irrigation and mining purposes combined with century old water rights have significantly decreased the amount of water needed by fish, especially during low flow periods. Changes in the landscape are caused by agriculture (water diversions), roads and timber harvest. Irrigation withdrawals primarily exacerbated the adverse effects of poor land management and continue to force a decline in the anadromous fishery.

Sand and gravel operations typically redirects and impounds water from streams. This action diverts adults and juvenile fish away from productive stream habitats. Warm water fish inhabit the ponds and prey upon juvenile salmonids. This additional predation will decrease the anadromous and resident salmon, trout and steelhead populations in the Cheney/Slate watershed.

6. Stream Temperature

Federal
Stream temperature in upper portion of watershed should decrease with implementation of the ACS and BMPs. Water temperatures, on federal land in the lower portion of watershed where intermingled with nonfederal lands, are expected to remain below optimum levels for salmonids, some amphibians and aquatic macroinvertebrates.

Nonfederal Lands
Water temperatures will increase in class 1-3 streams on private lands. Water temperatures in the lower portions of Cheney and Slate Creeks are expected to remain below optimum for salmonids, some amphibians and aquatic macro-invertebrates, regardless of the water year because stream flows are over-appropriated with excessive water rights.

7. Aquatic Species

Factors outside the Cheney/Slate watershed that will continue to influence escapement of anadromous fish to the watershed include ocean productivity, recreational and commercial

harvest, predation in the Applegate and Rogue Rivers and the ocean, habitat changes due to human developments in floodplains, and migration and rearing conditions in the Applegate and Rogue Rivers. Equal effort must be given to correcting human-related factors that limit fish survival in freshwater and marine environments. Habitat for Pacific lamprey in the middle and lower river is expected to remain stable to moderate condition.

Federal Lands

Cheney and Slate Creeks summer steelhead and coho salmon are at moderate and high risk of extinction, respectively (FSEIS 1994). Implementation of the Aquatic Conservation Strategy on public land will improve watershed health. However, potential for recovery of anadromous fish habitat is poor because the majority of the watershed is in private ownership.

Nonfederal Lands

Current resource management practices on nonfederal lands and water diversions, which are beyond the scope of the Aquatic Conservation Strategy, will continue to limit potential for recovery of salmon and steelhead habitat and populations. The Aquatic Conservation Strategy must be applied equally across all ownerships to achieve potential for recovery of at-risk fish stocks. In addition innovative ways must be found to fully restore natural flows to the river during summer.

Nonfederal lands, which contain most all fish habitat in the watershed, will continue to be managed intensively for wood production and livestock pasture.
The cumulative effects of management activities have substantially altered the timing and quantity of erosion and changes in stream channels, all which have impacted fish production at one time or another. Streams and riparian areas with federal ownership are in much better condition than streams on private lands.

Desired Future Condition

Riparian

Riparian areas would support a diversity of native plants, provide for stream bank stability, shade to maintain water temperature, connectivity to other habitats and support healthy populations of native birds, aquatic and terrestrial animals and plant species. Microclimate and ecological conditions found in unmanaged systems would be restored and maintained.

Sixty percent stream shading or maximum site potential should be achieved. Coarse woody material in the riparian area should be at least 150 lineal feet per acre with a minimum diameter of 16 inches. There is a need to maintain buffer widths and shade to contribute large wood to the streams and coarse wood to the riparian areas. Streams with defined channels and no annual scour should receive a 30 foot "no entry" reserves when adjacent slopes are greater than fifty percent (50%) and channels with adjacent slopes less than fifty percent (50%) should receive a 20 foot buffer. This buffer on intermittent streams represents the channel stability zone and will prevent annual scour from occurring.

Large Woody Debris
Large woody debris in streams would be well-distributed and abundant, forming frequent pools and providing complex cover for aquatic organisms in both winter and summer. It may be appropriate to adopt the standard for Columbia River basin streams east of the Cascades (Chen 1994) on an interim basis because there currently are no standards for interior southwest Oregon.

The proposed interim standard for good habitat is at least 20 pieces of wood per mile with a minimum diameter of 24 inches and at least as long as the bank full width.

Sedimentation
Erosion and sedimentation would be in balance with stream transport capacity, resulting in pools with good depth and cover and spawning or riffle substrate embeddedness ranging between 15 and 30 percent.

Stream flow
The desired condition is to maintain or return to a "pre-European settlement" stream flow quantity from April through October. Remove all barriers to juvenile salmonids. All culverts on streams with gradients of 3 percent or more should have a natural streambed and no pool below the culvert, regardless of the type of culvert. This is an important criteria for maintaining juvenile salmonid migrations under varying physiological conditions.

Stream Temperature
Daily maximum water temperature during July through October at the mouth of Cheney and Slate Creeks would not exceed 58F.

Aquatic Species
Desired condition for the Cheney and Slate Creeks are a functioning ecosystem, sustaining healthy populations of anadromous and resident fishes, amphibians, and aquatic invertebrates.

A sustainable and functioning ecosystem in the Cheney and Slate Creeks will require the Aquatic Conservation Strategy be applied equally across all ownerships and that anadromous fish populations and habitats are properly managed beyond borders of the watershed. Restoring a natural stream flow regime during summer is also crucial for recovery of the aquatic ecosystem.

C. Wildlife

1. Species

Recovery of native wildlife by the federal government is limited by availability of species to repopulate habitat, land ownership, spatial relationship of the federal controlled land, and habitat quantity and quality.

The extirpation of native species of wildlife from an area influence how the remainder of the community functions. Native species play roles that benefit the community as a whole. Removal of one species may lead to a population imbalance in another. Historically, wolves and grizzly bears served as predators in the watershed. The act of predation played a critical role in defining the remaining character of the community. Prey remains not consumed by the wolf were available to a host of other animals. Deer and elk populations were kept in balance with the vegetation. The community as a whole benefitted from the predation.

When exotic species enter a community the food chain is set out of balance. Historically, the watershed did not contain largemouth bass (Micropterus salmoides). The introduction of this species into the community has had deleterious effects on turtles, frogs, and ducks. The ability of the federal government to recover species of concern will be limited by the fact that some species are extirpated and exotics have been introduced.

Species known to be extirpated from the watershed include grizzly bear and wolf. Wolves have remained on sensitive species list due to sightings of large canids within southwestern Oregon. Currently, Oregon is not included in the recovery plans for these two species. Species such as the wolverine that have remnant populations in the province may have the ability to recover themselves in this watershed, but due to the checkerboard ownership, the federal government has limited options to promote the remote habitat these species require. The expected trend for the remaining sensitive species can be found in the following table.

Table 36 Expected Federal Habitat Trends for Species of Concern

COMMON NAME	HABITAT	EXPECTED HABITAT TREND
GRAY WOLF	GENERALIST, PREFERS REMOTE TRACTS OF LAND	INCREASE IN LATE-SUCCESSIONAL RESERVE/DECREASE IN MATRIX LAND
WHITE-FOOTED VOLE	RIPARIAN ALDER/ SMALL STREAMS	INCREASE IN HABITAT AS RIPARIAN AREAS RECOVER FROM PAST DISTURBANCE.
RED TREE VOLE	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE MATRIX LAND .
CALIFORNIA RED TREE VOLE	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE MATRIX LAND
FISHER	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE MATRIX LAND

COMMON NAME	HABITAT	EXPECTED HABITAT TREND
CALIFORNIA WOLVERINE	REMOTE/HIGH ELEVATION FOREST	INCREASE IN LATE-SUCCESSIONAL RESERVE/DECREASE IN MATRIX LANDS
AMERICAN MARTEN	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
RINGTAIL	ROCKY BLUFFS, CAVES AND MINES	POSSIBLE DECREASE IN HABITAT AS HARD ROCK MINES/QUARRIES REOPEN.
PEREGRINE FALCON	REMOTE ROCK BLUFFS	NO NESTING HABITAT AVAILABLE
BALD EAGLE	RIPARIAN/MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
NORTHERN SPOTTED OWL	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
MARBLED MURRELET	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
NORTHERN GOSHAWK	MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
MOUNTAIN QUAIL	GENERALIST	STABLE.
PILEATED WOODPECKER	MATURE CONIFER FOREST/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LAND.
LEWIS' WOODPECKER	OAK WOODLANDS	DECREASE UNTIL MANAGEMENT STRATEGY DEVELOPED
WHITE-HEADED WOODPECKER	HIGH ELEVATION MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX
FLAMMULATED OWL	MATURE PONDEROSA PINE/MATURE DOUGLAS-FIR FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS.
PURPLE MARTIN	FORAGE IN OPEN AREAS NEAR WATER/CAVITY NESTERS	INCREASE AS RIPARIAN AREAS RECOVER AND FOREST MATURE

COMMON NAME	HABITAT	EXPECTED HABITAT TREND
GREAT GRAY OWL	MATURE FOREST FOR NESTING/MEADOWS & OPEN GROUND FOR FORAGING	POSSIBLE DECREASE IN FORAGING HABITAT AS CLEAR-CUTS MATURE / INCREASE IN NESTING HABITAT AS FOREST MATURE IN LSR/DECREASE IN MATRIX LANDS.
WESTERN BLUEBIRD	MEADOWS/OPEN AREAS	DECREASE AS CLEARCUTS RECOVER AND MEADOWS BECOME ENCROACHED WITH TREES
ACORN WOODPECKER	OAK WOODLANDS	DECREASE UNTIL MANAGEMENT STRATEGY DEVELOPED
TRICOLORED BLACKBIRD	RIPARIAN HABITAT/CATTAILS	STABLE
BLACK-BACKED WOODPECKER	HIGH ELEVATION MATURE CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
NORTHERN PYGMY OWL	CONIFER FOREST/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE ON MATRIX LANDS
GRASSHOPPER SPARROW	OPEN SAVANNAH	DECREASE UNTIL MANAGEMENT STRATEGY DEVELOPED FOR SAVANNAH HABITAT
BANK SWALLOW	RIPARIAN	INCREASE AS RIPARIAN HABITAT RECOVERS
TOWNSEND'S BIG-EARED BAT	MINE ADIT/CAVES	STABLE
FRINGED MYOTIS	ROCK CREVICES/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
SILVER-HAIRED BAT	CONIFER FOREST	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
YUMA MYOTIS	LARGE TREES/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
LONG-EARED MYOTIS	LARGE TREES/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
HAIRY-WINGED MYOTIS	LARGE TREES/SNAGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS

COMMON NAME	HABITAT	EXPECTED HABITAT TREND
PACIFIC PALLID BAT	LARGE TREES/SNAGS/ROCK CREVICES	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
WESTERN POND TURTLE	RIPARIAN/UPLANDS	INCREASE AS RIPARIAN HABITAT RECOVERS
DEL NORTE SALAMANDER	MATURE FOREST/TALUS SLOPES	STABLE IN LSR/POSSIBLE DECREASE ON MATRIX
FOOTHILLS YELLOW-LEGGED FROG	RIPARIAN/PERMANENT FLOWING STREAMS	INCREASE AS RIPARIAN HABITAT RECOVERS
RED-LEGGED FROG	RIPARIAN/SLOW BACKWATERS	INCREASE AS RIPARIAN HABITAT RECOVERS
CLOUDED SALAMANDER	MATURE FOREST/SNAGS/DOWN LOGS	INCREASE AS FOREST WITHIN LATE-CESSIONAL RESERVE MATURES/DECREASE IN MATRIX LANDS
SOUTHERN TORRENT SALAMANDER (VARIEGATED SALAMANDER)	RIPARIAN/COLD PERMANENT SEEPS/STREAMS	INCREASE AS RIPARIAN HABITAT RECOVERS
BLACK SALAMANDER	TALUS/DOWN LOGS	INCREASE AS FOREST WITHIN LATE-SUCCESSIONAL RESERVE MATURES
SHARPTAIL SNAKE	VALLEY BOTTOM	STABLE
CALIF. MTN. KINGSNAKE	GENERALIST	STABLE
COMMON KINGSNAKE	GENERALIST	STABLE
NORTHERN SAGEBRUSH LIZARD	OPEN BRUSH STANDS	STABLE
TAILED FROG	RIPARIAN/MATURE FOREST	INCREASE AS RIPARIAN HABITAT RECOVERS

2. Cavity Dependent Species

Cavity dependent species and species utilizing down logs are of special concern in the watershed due to the decrease of this type of habitat. Historically, snags were produced by various processes including drought, wind-throw, fires, and insects. The amount of snags fluctuated through time in response to these events. This natural process has largely been interrupted by demands for timber harvest. The potential recovery of snag dependent sensitive species such as the Pileated woodpecker will rely on the ability of the federal agencies to manage this resource. Silvicultural practices have historically focused on even-aged stands and have resulted in deficits of snags and downed logs in harvested areas. Other activities that have depleted snags and down

logs are site preparation for tree planting (particularly broadcast burning), fuel wood cutting, post fire salvage, and previous entries for mortality salvage. Managed stands that currently contain 10-12 (5 MBF) overstory trees per acres or less, are also of concern from a wildlife tree/downed log perspective. Stands with remaining overstory trees have the potential to provide for current and future snag/downed log requirements throughout the nest rotation if existing trees are retained.

Snags and down logs provide essential nesting/denning, roosting, foraging, and hiding cover for at least 100 species of wildlife in western Oregon (Brown et al. 1985). For some species, the presence or absence of suitable snags will determine the existence or localized extinction of that species. In forested stands, cavity nesting birds may account for 30-40 percent of the total bird population (Raphael and White, 1984). The absence of suitable snags (snags decay stage, number and distribution) can be a major limiting factor for these snag dependent species.

The hardness (decay stage) of a snag is an important factor in determining its foraging, roosting and nesting use by individual species. Woodpeckers, like the pileated woodpecker (Dryocous pileatus) often choose hard snags (stage 1) for nesting where as wrens and chickadees use the softer stage 2 and 3 snags. The use of snags as a foraging substrate also changes with time and the decay stage of the snag. As a snag decomposes the insect communities found within it changes. Evans and Conner (1979) identified three foraging substrates provided by snags: the external surface of the bark, the cambium layer and the heartwood of the tree.

Snags are also used as food storage sites and as roosting/resting sites for many species. A variety of mammals, birds and some owls use snags to cache prey and other food items. Vacated nesting cavities are often used by wildlife for protection from inclement weather or on hot summer days. The marten (Martes americana) often use snags as resting and hunting sites and a pileated woodpecker may use up to 40 different snags for roosting.

Snags continue their function as a key element of wildlife habitat when they fall to the ground as downed logs. Once again, down log use by individual species is dependent on the decay stage of the log. The larger the diameter of the log and the longer its length the more functional it is for wildlife. Depending on the decay stage of the log it will be used for lookout and feeding sites, nesting and thermal cover, for food storage or for foraging. For example, species like the clouded salamander (Aneides ferreus) require the microhabitat provided by bark sloughing of the log where as small mammals such as red-backed voles (Clethrionomys occidentalis) burrow inside the softer logs.

Past and future Bureau of Land Management policy as outlined in the current Resource Management Plan (RMP) target maintaining primary cavity nesting species at 40 percent of their naturally occurring population levels (biological potential). Maintaining biological potential at 40 percent is considered to be the minimal viable population level for any given species. By managing for primary cavity nesters at 40 percent biological potential we have also managed for many other snag dependent species, such as flying squirrels (Glaucomys sabrinus), mountain bluebirds (Sialia currucoides) and Vaux's swift (Chaetura vauxi) at an unknown level. Managing

for populations at 40 percent biological potential does not allow for species flexibility in adapting to changing environments or to major environmental events such as wildfire or long term climatic change. In addition, managing at 40 percent biological potential does not meet BLM policy guidelines for those species where we are trying to restore, maintain and enhance existing populations (Manual 6840).

3. Dominant Processes

The settlement of the watershed, and the subsequent division of land between the public and private ownership has limited the ability of the federal agencies to restore historic conditions in the watershed. Currently, the checkerboard ownership pattern of federal land, and the limited federal control of some plant communities prohibits the recovery of species of concern without the cooperation of private land owners. This is particular true for native grasslands, oak savannahs, and anadromous fish bearing streams (riparian habitat). Suppression of fire within the watershed has changed vegetation patterns and historic habitat distribution. Timber harvest has affected older forest habitat and associated species. Road building has decreased the effectiveness to a number of habitats due to disturbance. Timber harvest and road building has led to increased sedimentation, increased stream temperatures, and decreased stream stability and structural diversity.

4. Expected Habitat Trends

<u>Habitat</u>
The habitat trends for species of concern varies with ownership and plant community. In general, habitats found on private lands have undergone the most significant change from historic conditions. Public lands management by the federal government have undergone less dramatic change but are notably different from conditions found in pre-settlement times. Expected trends on private lands are nearly impossible to gauge, but there is a tendency for short term rotation on forest lands (60-80 years), and heavy use of most native grasslands, riparian, and oak woodlands for agriculture and homesites. Native plant communities such as grasslands, pine stands, oak savannahs, and old-growth forest, and their associated animal communities should be considered at risk on private lands.

Trend for habitats found on federally administered public lands are determined by the Northwest Forest Plan. Broadly speaking the Cheney/Slate watershed is composed of LSR, and matrix land. Late-successional reserve (LSR) comprises 7.1 percent of the watershed. Expected trend for the LSR is a gradual increase in forest with old-growth conditions. Ideally, as this area increases in older forest, stable populations of species requiring this forest type will also be established. The success of the reestablishment of old-growth species will be depend on the species dispersal capabilities, habitat condition of the matrix land, and ownership pattern. Matrix land comprises 37 percent of the watershed. Matrix land will be primarily managed for timber extraction, with a trend towards younger forest with some old-growth components. Expected habitat trend for each plant community can be found in the following narrative. Table **XX**

presents expected trends for species and habitat in the watershed.

Potential limiting factors for recovery of habitats of sensitive species existing in watershed include fire suppression and habitat fragmentation. Historically many habitats within the watershed were created and maintained by disturbance events, in particular fire. Fire for the most part has been excluded from the watershed for the last 80 years. Fire created habitats and associated wildlife species have been negatively impacted from fire suppression. This is particular true for oak/savannah and pine stands. Currently timber harvest is the dominant disturbance found in the watershed.

Habitat fragmentation occurs both on the valley floor as well as the uplands. Habitats found along the valley floor have experienced severe fragmentation due to conversion to agricultural lands, and homesites. Due to habitat fragmentation, patch size, and access for wildlife, many sites no longer function to their biological potential. Of particular concern is the remaining oak woodlands and Ponderosa pine sites. The loss of these habitat types will continue to contribute to the decline of associated species of wildlife. Tracts of public land are critical in insuring that this habitat type and the biodiversity it supports remain represented in the valley.

Fragmentation of old-growth habitat in the watershed is of particular concern. Due to the checkerboard ownership pattern and past timber harvesting, the remaining mature and old-growth habitats are widely fragmented. Species dependent on older forest such as the American marten (Martes americana), the Fisher (Martes pennanti) and the Northern spotted owl (Strix occidentalis) have limited habitat in the watershed. Many of the remaining older stands no longer serve as habitat for late-successional dependent species due to the amount of edge the stands contain which is increased by irregular shapes and small sizes. The edge to interior ratio affects how useful the stand is for late-successional species. Stands with a great deal of edge no longer function as interior forest. The micro-climatic changes of the "edge effect" can be measured up to 3 tree lengths in the interior of the stand (Chen, 1991). Isolated patches of old-growth habitat may be too small to support the maximum diversity of species. In heavily fragmented environments, larger predators that naturally occur at low densities are lost first (Harris and Gallagher, 1989). The California wolverine (Gulo gulo luteus) utilizes high elevation, undisturbed habitat and their population is now in jeopardy due to fragmentation. Fragmented habitats lead to isolated populations of animals which lose genetic vigor, and is a serious threat to biological diversity (Wilcox and Murphy, 1985). Intact old-growth corridors are critical for insuring gene-pool flow, natural reintroduction and successful pioneering of species into unoccupied habitat. Animals disperse across the landscape for a number of reasons including food, cover, mates, refuge, and to locate unoccupied territories. The vast majority of animals must move during some stage of the life cycle (Harris and Gallagher, 1989). Dispersal corridors function when they provide hiding and resting cover. Species that depend on late-successional forest are poor dispersers and more vulnerable to extinction in fragmented landscapes than species associated with early successional stages (Noss, 1992). This is particularly true for flightless species such as the Fisher (Martes pennanti). Fishers are reluctant to travel through areas lacking overhead cover (Maser, 1981) and are at risk for genetic isolation.

The high density of roads in the watershed are of concern due to their effects on habitats. The construction of roads contributes to the delivery of sediment into the aquatic system. Road building along streams has also led to increased channelization of the stream. Sediments can negatively affect fish by filling pools, embedding spawning gravel and smothering eggs. Roads also lead to increased disturbance, such as poaching, and decrease habitat effectiveness. Increased disturbance to deer and elk increase their metabolic rate and decrease their reproductive success (Brown, 1985).

Pine Habitat

Maps produced in 1857 by the General Land Office characterize much of the valley floor as having a pine component. Many of these stands have been lost on private land through timber harvest and conversion to homesites and agriculture. The majority of pine stands on public land have been harvested while other stands have been allowed to degrade due to fire suppression and encroachment of fire intolerant species. Expected trend for private land is for continued harvesting of this habitat on a short term rotation basis. Expected trend for federal managed land is an increase in mature pine habitat in the LSR. Pine habitat found outside the LSR will continue to be available for timber harvest. Pine habitat found on withdrawn land will continue to degrade in quality until such time that a management strategy has been developed. The remaining pine habitat located on land withdrawn from the timber base has largely been ignored.

Oak woodlands

Oak woodlands within the watershed are disappearing faster than they are regenerating themselves. The precise amount of this habitat type historically found in the watershed is unknown, but current quantity of this habitat are thought to be a fraction of what historically occurred. Expected trends on nonfederal lands for oak woodlands is to remain static or decline. The majority of federal controlled oak woodland are found on land withdrawn from the timber base, and largely remain unmanaged. Natural disturbance such as fire have been reduced, and many of these stands are in poor condition. Expected trend is for further habitat degradation until these problems can be addressed with a management strategy.

Old-Growth Forest

Private old-growth forest is nonexistent in this watershed. Due to short rotation between timber harvests on private forest land there is not expected to be an increase in old-growth forest. Federal administered old-growth forest is expected to recover in the Late-Successional Reserve as are species associated with this habitat type. Quantity and quality of old-growth forest in matrix land is expected to decrease.

Desired Future Conditions

The desired future stream conditions for the Cheney/Slate watershed would be to maintain and create habitats of concern in quantity and quality so as to contribute to de-listing all the known special status species. The process of identifying the amount of these habitats necessary to

accomplish this goal remains uncertain, particular in recognition of the number of limiting factors already identified. It has been estimated that watersheds in southwestern Oregon during pre-settlement times contained between 45 percent and 70 percent old-growth forest. Because the federal government only manages approximately 45 percent of the watershed a number of sensitive habitats would have to be maintained in this limited area. All stands within the watershed naturally capable of achieving old-growth condition should be managed in a manner that promote these characteristics. Stands not capable of achieving this habitat type should be brought back to their own natural range of conditions (i.e. meadows, pine savannahs, oak woodlands, etc.).

D. Vegetation

There are some important differences between the vegetation reference condition and the current conditions in the watershed. Replacing fire as the primary disturbance agent, as was the case in the reference condition, with human disturbances such as logging, farming, mining, and settlement has resulted in a landscape pattern of vegetation that is probably outside the range of natural conditions. The desired vegetation conditions in the watershed are probably more consistent with the reference condition than the current condition.

The vegetative and structural conditions of the forests in the watershed have seldom been constant and have changed frequently with the historic disturbance patterns. Disturbance has played a vital process role in providing for a diversity of vegetation and structures and for managing vegetation density over time. The presence of fire, insects, disease, periods of drought, and resultant tree mortality have always been components of these ecosystem processes but have occurred within a range of natural conditions. Maintaining vegetative diversity and densities that are sustainable over time are important terrestrial and riparian ecosystem processes that have been impacted by the shift from frequent, low intensity wildfire to settlement related disturbances and fire suppression. When forest density, species composition, structure (variety of tree sizes, presence of snags and large down logs, etc.), populations of insects, presence of disease, incidence of catastrophic wildfire, and tree mortality occur outside the range of natural conditions, some component of the ecosystem processes has been impacted. This is the current trend for many of the forests in the Cheney/Slate watershed.

The previous timber harvest patterns in the watershed have tended to simplify forest structures and alter the natural mix of seral and age class distributions. A high percentage of the watershed (57%) exists in the large pole size class. This predominance of one size and structure class does not represent the structural diversity found in the reference condition nor the desired vegetation condition of a diverse landscape pattern of vegetation to meet the many values being managed for in the watershed. Similarly, fire suppression this century has permitted dense pole stands to develop over much of the watershed, crowding out important mid-seral species less tolerant to shade such as ponderosa and sugar pine, Pacific madrone and California black oak, and creating stands vulnerable to a stand replacement wildfire. Fire suppression has also permitted tanoak to become a much more significant stand component than in the reference condition in many areas

of the watershed. This has resulted in these areas being vulnerable to a major species shift from a conifer dominated forest to mostly tanoak if something happens to disturb the overstory. A classic example of this is a 130 acre block in Section 25, T.37S., R7W. This parcel, which is classified as tanoak plant series, had most of the overstory removed in a seed tree cut in 1952. The block appears as a clearcut in the 1953 high level aerial photos. Nothing was done to treat the tanoak after the harvest and today this 130 acre block is mostly a dense stand of tanoak. This parcel, which is inside the Late-Successional Reserve (LSR), currently provides little to no habitat for late-successional species.

When forests remain at unsustainable densities for too long, a number of trends begin to occur that effect stand health. Species composition, relative density, percent live crown ratio, and radial growth are all indicators of how forests can be expected to respond to environmental stresses.

Forests of the Klamath Mountain Province are known for their rich species diversity. This diversity is not only an important habitat quality for plants and animals, diverse forests are much better able to withstand environmental stresses such as drought and insect and disease attacks. As stand densities increase beyond the range of natural conditions, important mid-seral species drop out and the forests become dominated by late-seral, climax dominants such as Douglas-fir and tanoak. Forests composed of climax dominant species, as is the trend in the watershed, are more unstable and become increasingly vulnerable to environmental stresses. The 3,518 acres of federal lands allocated to LSR in the southern portion of the watershed also happen to occur where tanoak is the most prevalent. If some intervention is not done to reverse the trend of tanoak dominated understories in these forests, it is unlikely that LSR objectives will be met over the long run.

Relative density is a measure of the density of a forest that compares the current density with the biological maximum density (Reineke 1933). It is expressed in percent. The threshold of concern for relative density is 60 percent. When relative densities exceed 60 percent, tree mortality begins to occur from competition (Drew and Flewelling 1979) (Hann and Wang 1990). A significant portion of the forests in the watershed are presently at relative densities greater than 60 percent.

Percent live crown ratio and radial growth are physiological indicators of trees' abilities to produce food and defensive compounds. Healthy live crowns are essential for healthy trees. The threshold of concern for live crown ratio is 40 percent. When the average live crown ratios of forests drop much below 40 percent, the canopy's ability to support vital processes in the tree becomes diminished. Live crown ratios begin to recede as forests remain in an over-dense condition for too long. When live crown ratios are reduced too far, trees are unable to respond to the release provided by density management thinnings and partial cutting management prescriptions may no longer be a forest management option. The trend for average live crown ratios in the forests of the watershed is below 40 percent. Similarly, radial growth rate is an indicator of whether trees have sufficient resources to support vital physiological processes. Low production of stem wood per unit of foliage has been associated with a trees inability to

accumulate reserves or to produce defensive compounds. Stem growth only occurs once the resource demands of foliage and root growth have been accommodated. When trees are not able to produce sufficient photosynthate and defensive compounds, they become increasingly vulnerable to insect and disease attacks. Many of the dense pole stands in the watershed are currently exhibiting poor radial growth.

These same trends and conditions exist in the forests within the interim riparian reserves as described in the Northwest Forest Plan. It has been noted in this analysis that large trees and large down wood are important riparian components missing from many of the riparian areas of the watershed. Density reduction and species manipulation are management actions that will be necessary if the large conifer component is to be successfully returned to the watershed's riparian reserves.

Periods of extended drought are not particularly harmful to trees if densities are maintained within the range of historic natural conditions and trees are able to have well developed root systems and canopies that capture sufficient sunlight so they can photosynthesize when conditions are suitable. The accelerated mortality occurring in the forests of southwestern Oregon during the recent drought period is a result of the over-dense conditions in the forests. Insect activity and population levels in the forests of southwestern Oregon, including the Grants Pass Resource Area, have shown a marked increase since 1989. Overstocking is probably the most predisposing factor to vulnerability to bark beetle attacks on most sites in the Cheney/Slate watershed (Applegate AMA Ecosystem Health Assessment 1994).

In the mixed evergreen forests of the Siskiyou Mountains, old growth is a forest condition, not a seral stage of vegetation succession. Old growth is a condition where the forest exists in a complex mixture of both species and structures. An old-growth forest is multi-layered with at least two or more canopy layers. The overstory layer is composed of a minimum of six to eight large conifer trees per acre greater than 32 inches in diameter. More are preferable. Ideally, these would be a mix of pine and Douglas-fir. The understory layers would include a mix of species and size classes, including hardwood trees. In the forests of the Cheney/Slate watershed, several large hardwood trees (>16" dbh) per acre are important understory components. Standing snags and large down logs are also important components of an old-growth forest.

The percentage of the forests in the watershed that currently exist in an old-growth condition is less than 10 percent. The percentage that existed in an old-growth condition in the reference condition is not known but it was probably greater than 10 percent. The low amount of old-growth is a combination of the natural disturbance history, timber harvesting this century, and site limitations. Approximately 25 percent of the landbase of the watershed is not biologically capable of producing old-growth conditions due to site limitations. Little of the 47 percent of the BLM lands that are intact (little to no previous harvest entry) currently exist as old-growth. This clearly illustrates that natural disturbance history, along with timber harvest history, plays an important role in the amount of old-growth existing in the watershed today.

Decreasing the percentage of the forests in the watershed that exist currently in the large pole category by accelerating the development of more mature and old-growth conditions is an important management objective, particularly inside the LSR. This would help restore a more balanced landscape pattern of vegetation in the watershed than currently exists. Increasing the amount of mature forest is a more attainable goal in the short term since many of the large pole acres could be developed into this category if provided with sufficient release. Mature forests in the Cheney/Slate watershed can generally be defined as stands between 100-200 years in age with most of the dominant trees exceeding 16-20 inch in diameter. Mature forests will tend to be more single layered than multi-layered with regards to canopy layering. Mature stands generally contain trees with a smaller average diameter, less age class variation, and less structural complexity than old-growth stands of the same forest type.

The desired future condition for the vegetation of the watershed would be a landscape pattern of vegetation conditions that provides for diversity, maintains the rich species mix that mixed evergreen forests of the Klamath Mountain Province have historically existed with, balances seral and size class distributions throughout the watershed, and maintains vegetation densities that are sustainable over time. Forests will be maintained in a more open condition, as was the reference condition, providing for the development of large trees of mixed species and maintaining tree mortality rates within the range of natural conditions. In the dispersal corridor, especially the portion within the LSR land allocation, mature and old-growth forest conditions will dominate the landscape and canopy closures will generally exceed 40 percent. Tanoak levels will be reduced to what was more typical of the reference condition.

E. Special Status Plants/Habitats

The obvious difference between current and reference conditions
as related to special status plants is in habitat extent and quality. Fragmentation of older forest due to timber extraction is the limiting factor that has brought on a decline in microsite habitat size and quality for the Cypripedium species and Allotropa virgata. Although large pole and mature condition classes do exist in the majority of the watershed today, a good portion of this area has been cut over since the 1940s on federal land and since the 1800s on nonfederal lands. Aerial photos from 1953 confirm that most low elevation nonfederal timbered lands had been clearcut and tractor logged, although forty-seven percent (47%) of the forest is still intact on BLM lands.

Appendix J states that loss of Cypripedium fasciculatum populations due to timber harvest have occurred. Therefore any harvested area in the watershed could have once harbored more populations of this species, especially in the sub-basins of Elliott, Love, Slate and Cheney creeks which were harvested in the 1940s. Though it is true that these species are currently found in areas logged in the past, it is impossible to know without past records whether they were more common in old growth before logging began. Current population occurrences could represent marginal habitat or could represent the best of habitat available. These populations could be older aged and able to exist due to excellent microsite conditions or they could be new

populations moving in. Without long term research these speculations will never be more than educated guesses.

In the same respect, development of buildings and roads is another factor that has contributed to the fragmentation of Cypripedium species and Allotropa virgata habitat. As with timber harvest practices, disruption of high quality microsites has undoubtedly occurred. Besides limiting the amount of habitat available there has also been a disruption in the movement of these species into new areas by development.

Suppression of fire in the watershed is another limiting factor that has brought on a decline of habitat for Cypripedium species. These plants are adapted to low intensity fires that reduce competition in the herbaceous vegetation layer. The rhizomatous roots of the species are deep enough in the ground to survive low intensity fires. It has been found that they will not survive high intensity fires, though.

For serpentine habitats, the differences between current and reference conditions are not as great. The limiting factors affecting serpentine habitat are active mining claims and off-road vehicle use. In the eastern portion of the watershed, the serpentine areas have been used for recreation and is surrounded by rural development. Serpentine habitats do provide the highest concentrations of native grassland left in the watershed. All of the above activities would threaten native grasses as well as serpentine special status species. The lack of natural fire is a limiting factor, as well, that has created a built up herbaceous and shrub layer on serpentine soils. Frequent, low intensity fire would maintain the herbaceous layer in a more diverse condition (i.e. larger variety of species) as well.

Though not common in serpentine, noxious weeds have been reported to be slowly encroaching. The impact of their invasion will be most noticeable in native grasslands such as the Bolt Mt. area, where noxious weeds could easily replace native species without aggressive eradication efforts.

Since little documentation exists it is impossible to determine the differences between current and reference conditions for wetlands and seeps. It is most likely that some have been reduced in size or completely eradicated due to development, domestic water use and timber sale activities.

Desired Future Condition

The primary desired future condition for special status plants in the Cheney/Slate watershed is to have a watershed healthy enough to maintain stable, viable populations of special status plants, which would contribute to the delisting of these species. This would be accomplished by maintaining and enhancing habitats to a quantity and quality that can support these species.

For all three habitats discussed a thorough inventory of special status plants in the watershed would be necessary to accurately assess the extent of population. For late successional dependent

species, protection of remaining old growth stands is necessary by increasing size and connectivity through stand enhancement projects. Focus would be on ensuring that microsite conditions throughout the watershed are maintained for the late successional species. For both late successional and serpentine species it is necessary to use prescribed fire to reduce hazardous fuel to natural levels and to enhance species diversity and competitive edge for special status species in the herbaceous layer. For wetlands and seeps it will be necessary to accurately locate these unique habitats in order to assess their condition throughout the watershed. For both wetlands and serpentine it is important to remove any ground disturbing activities, such as mining or off road vehicle use, that could be destroying these habitats.

The limiting factors in reaching these desired future conditions for late successional species is lack of remaining old growth. Stand enhancement to promote old growth characteristics will take a long time for success to become apparent. Another limiting factor is the high level of fire hazard in the watershed. This will make attempts at use of prescribed fire difficult. Compounding this factor is the amount of development that will make the initiation of prescribed fire projects even more challenging. One last limiting factor is the spread of noxious weeds from agricultural areas into the more natural parts of the watershed. Without cooperation from private landowners, the spread of noxious weeds could counter any efforts to improve watershed conditions.

F. Soils

The soils in the Cheney/Slate watershed are relatively young in a geological time frame and are still in a young stage of development. Physical forces exerted on rocks in the watershed have detached fine particles that accumulate in place or are relocated to another position on the landscape by gravity or water. The newly formed soil particles that remain on site have increased in depth over time and developing into a physical base for plants to grow. As the soil develops, it incorporates organic matter from existing and past vegetation. Depending on the amount of organic matter in the soil, populations of bacteria and fungi increase or decline. These soil microbes break down the organic matter into available plant nutrients and aid plants in assimilating these nutrients. The more nutrients available and assimilated by plants produce more vegetative material which eventually becomes organic matter. Humus is also necessary to provide protein for nitrogen fixation. The main source of humus in the forest environment comes from animal waste. This cyclic process continues over time with physical factors such as temperature and moisture influencing its speed and efficiency. Soil productivity increases when soil depth and nutrient capital increases.

Timber harvesting has reduced the amount of vegetative material that would be available to be converted organic matter and, eventually, soil nutrients. Harvesting timber also disturbs the soil which increases erosion and decreases soil depth. Roads built to provide access in the watershed removes productive soil and reduces the amount of area contributing vegetation to the nutrient cycle.

Fire suppression efforts, that have allowed fuel to build up over the landscape, has increased the risk of a high intensity wildfire occurring that would substantially reduce vegetative amounts and soil microbe populations.

Desired Future Condition

The soils in this watershed should be as productive as possible and the soil building processes enhanced. Erosion rates should be managed so that the soil is not eroding faster than it is formed and accumulates. Soil organic matter should be optimized and managed so the risk of a high intensity fire is reduced. Large logs scattered across the landscape would be a long term source of organic matter while providing habitat to animals that provide humus.

G. Fire Management

Fundamental Changes to the Fire Regime System

The exclusion of fire occurrence (both natural and prescribed) has led to a shift in the fire regime. Current condition is now that of a unnatural high-severity fire regime where fires are infrequent, usually high-intensity, and are stand replacement fires. Where natural high-severity fire regime normally occur (e.g. northern Cascades or Olympic Mtns.) fire return intervals are long and usually associated with infrequent weather events such as prolonged drought or east wind, low humidity events and lightning ignition sources. Southern Oregon and the Cheney/Slate watershed has the same weather conditions and topography that created the former low-severity fire regime. The only change in the fire environment has been the fuel conditions created since the removal of frequent fire. Vegetation has shifted to become dense, overstocked stands of less fire resistant species, dead and down fuels have been allowed to build-up, and a dramatic increase in human ignition sources has occurred. This has created a current condition for increasingly destructive, large, difficult to suppress wildfire with the capability to destroy many of the resource and human values present in the watershed.

H. Human Use

As noted when comparing the reference conditions with the current conditions of the watershed several changes have occurred. In general, the changes include an increase in population in the watershed, including rural residences; an increase in the miles of roads within the watershed; increased use of the public lands with recreation use changing from nonmotorized to motorized use; and an increase in illegal uses within the watershed.

The road densities have increased primarily due to the past high levels of timber harvest and to access private lands within the watershed. With the increase in road densities, coupled with the increase in the population of the area, a larger amount of public lands are available for human use type activities. These uses include recreation, timber harvest activities, agricultural uses, and illegal activities, such as unauthorized timber cutting and increased dumping.

The increase in road densities and local area populations are directly tied to increased recreation use. Road densities and population increases also affect the amount of illegal activities occurring on the public lands, however, increased dumping is also related to the increase in dumping fees at local landfills, and increased timber/firewood theft is related to the lack of available fuelwood sources.

Anticipated social or demographic changes/trends that could have ecosystem management implications include an increase in population which increases the demand for use (or abuse) of public lands, a continuation of the illegal use of the watershed due to lack of law enforcement patrol, and the continued increase in dump fees.

VII. DESIRED FUTURE CONDITION

The synthesis of data/information and interpreting current trends has revealed the ecological importance of the Cheney/Slate watershed. This watershed provides two important ecological functions. Although this watershed provides many other resources, these two ecological functions are critical not only to a healthy watershed but to the provincial ecosystem. The first major ecological function provided by the Cheney/Slate watershed is a critical terrestrial link to other provincial watersheds. The other major ecological function this watershed provides is aquatic habitat, especially for salmonids. The desired future condition of the watershed emanate from these two important ecological functions.

The southern mountainous ridge line that separates the Cheney/Slate watershed from the Deer Creek watershed is an important dispersal route for terrestrial species, especially old-growth dependent species. This dispersal route, which includes all of the designated Late-Successional Reserve (LSR) lands, connects watersheds from the Illinois River basin with those of the Rogue River basin and provides a vital link to the coastal mountain range. In order to maintain and increase the effectiveness of this dispersal route, the forest vegetation needs to be managed toward providing the habitat conducive to old-growth dependent species. Along this dispersal corridor, the forest canopy closure and structure required by old-growth dependent species should be maintained on lands currently in that condition and created on lands that do not currently exhibit those conditions. A reduction in the level of tanoak, currently in the understory of much of the forest in this corridor, will be necessary to achieve this objective. This corridor also needs to be protected from catastrophic fire events and further degradation from road construction.

The desired condition of the vegetation along the dispersal corridor would be an old-growth forest. Vegetation manipulation should be accomplished so that canopy closure is maintained at 40 percent or more. Large hardwood trees would be mingled amongst the old conifer trees. The understory would be a scattered young conifer stand with numerous large downed logs on the forest floor in various stages of decay. Aside from the scattered downed large wood, debris and slash should be minimal on the forest floor.

The forest outside of the dispersal corridor should be in a range of seral stages and structural conditions that have the potential to develop into mature and old-growth characteristics but the canopy closure should not be restricted. The amount of land in the various developmental stages needs to be balanced so that no condition class greatly dominates as the large pole class does currently. It is assumed that the nonfederal timbered land will continue to be harvested on a 60 to 80 year rotation. This harvest rotation will adequately supply the watershed with a young seral stage component. The federal lands must supply the mature and old-growth component necessary to maintain species viability. Federal lands that are suitable for forest production should be maintained within a relative stand density of between 35 to 60 percent. This density will provide for proper physiological functioning of the trees, maintain a diverse species mix including mid-seral species and keep tree mortality rates within the range of natural conditions.

The native valley habitats such as the oak savannahs and Ponderosa pine stands are two important landscape components that will be very difficult to maintain at current levels. Most of the land where valley habitat occurs is controlled by private citizens or local governments and coordinating a management plan to maintain or increase these types of lands tends to be very difficult. There is a small portion of land around Bolt mountain, managed by the BLM, that should be manipulated to maintain or enhance the native valley habitat and act as a hub from which to expand the this habitat.

All lands with sensitive plant species should be managed to protect the existing populations. This is particularly true for the dense canopy forest stands in the dispersal corridor where the Cypripedium species are located. On the matrix lands outside of the corridor, research should be accomplished to fully identify the habitat requirements and disturbance tolerance of this special status plant species. Sites where Allotropa virgata is identified should also be fully protected and the habitat enhanced whenever possibly. The sensitive plant species found on serpentine soils should be protected and the landscape managed to protect this fragile environment from encroachment by non-native plant species. The serpentine meadows should be burned periodically to maintain the native grass component and prevent encroachment by tree and shrub species.

It is desired that the entire watershed be returned to a low intensity fire regime. Although much of the landscape was identified as high value, the dispersal corridor should be the highest priority for protection since it provides such an important ecological function. It is recognized this will be a long term process and require a coordinated effort between federal and nonfederal entities. A proactive fuels management program must be enacted, and funded, to reduce the risk of a catastrophic event.

The other important ecological function that the Cheney/Slate watershed provides is aquatic habitat. There are many miles of stream and associated riparian areas that can provide this habitat. Although the current condition of the habitat is good compared to other watersheds in the Rogue River basin, it is actually poor when compared to the reference condition. The desired future condition of the streams in the Cheney/Slate watershed is to have an abundance of large woody material in the streambed and along the streambanks with an adequate amount (8-15 cfs) of relatively clean, cool water (<58F) flowing during the summer months. Springs and seeps that provide the summer flow should be protected from disturbance and water diversions should be managed. The stream riffles should have bed substrate with a good mixture of cobbles and gravels with only a small amount (<25%) of finer materials embedded. There should be numerous, deep, well protected pools intermixed with the riffles. The stream system of this watershed should be protected from activities that would reduce the quality and quantity of aquatic habitat.

The riparian areas should consist of a dense canopy (>60%) of mature conifers and deciduous trees that provide good shading of the stream channel, annual leaf litter and large wood recruitment. An abundance of large logs (6 to 8 per acre) in various stages of decay would be

scattered across the landscape. The streambanks should be in stable condition with some signs of natural meandering in the lower gradient streams.

Soil erosion from the mountain slopes should be reduced from the current rates by decreasing the amount of area currently disturbed and minimizing future disturbances, especially during the rainy season. The productivity of the soil should be maintained or enhanced by allowing the organic material to decay on site. Frequent, low intensity fire occurrences would keep the organic matter and soil microbe population from being drastically affected by catastrophic fire. Large decaying logs should provide a refugia for soil fungi and bacteria during the summer months. This is important for the special status plant and animal species as well. The forest floor should be shaded for the majority of the day especially during the summer months.

Human use of the Cheney/Slate watershed should continue at current levels and above. Demand for the watershed's resources for domestic purposes, agriculture, timber production and recreational opportunities should increase as the human population increases. It is important that the humans using this watershed realize the affects their use has on the natural environment. Use of this watershed's natural resources should be monitored and managed so disturbances or depletion, that could permanently alter the natural ecosystem, would not occur. Water use should be managed so that the available fishery habitat for spawning and rearing is utilized to its fullest potential and so that wetlands, seeps, and bogs maintain special status species. Native salmonid species survival depends on the humans to use the water system to maintain and restore their habitat. The human use of the forest should be balanced to provide valuable commodities while maintaining or enhancing habitat for the sensitive plants and animals.

The transportation system traversing this watershed should provide access for human activities while reducing sediment production below current levels. Roads located near riparian areas should be surfaced. Cut banks and fill slopes should be well vegetated so to provide slope stability. Human use of the transportation system should be managed so that use during rainy periods are minimized and roads used during this period are adequately surfaced. Roads that intersect fishery streams should be designed and maintained to provide fish passage to juveniles. Road construction in riparian areas should be avoided. If roads are built in riparian areas, substantial measures should be implemented to minimize sediment production and maintain riparian habitat for terrestrial and aquatic plant and animal species.

Recreational use of the watershed, particularly off-road vehicles, should be managed so they do not adversely impact other uses of the watershed. Trails should be designated and users should be held accountable for their actions. Mining should be accomplished in a manner so as not to disturb sensitive plant and animal habitat. Withdrawing some of the land or streams from mineral entry should be considered if this activity has the potential to cause further degradation of sensitive species habitat. Special forest products, such as cutting firewood and mushroom picking, should be managed and monitored so it does not adversely affect sensitive species or cause additional negative affects on the roads, streams and riparian areas. Harvesting special forest products from riparian areas should not be permitted unless it enhances the riparian

habitat. Illegal trash dumping activities should be halted. A coordinated effort between federal, state and local governments should be initiated to examine this problem and institute solutions.

In conclusion, it has been determined that the Cheney/Slate watershed provides some critical ecosystem functions. The effectiveness of these functions will be determined by future use and management of the watershed's resources by humans. The time has come to make some tough choices between natural resource use and species' survival. It should be desired that human use of the natural resources does not preclude the survival of plant or animal species in the Cheney/Slate watershed.

VIII. MANAGEMENT RECOMMENDATIONS

The following tables list recommended management actions that will lead towards the desired future condition of the Cheney/Slate watershed. The prioritization for initiating the recommended actions should reflect the affects these actions would have on the two important ecological functions that occur in the Cheney/Slate watershed, dispersal of terrestrial species and aquatic habitat.

It is suggested that a coordinated effort between federal and nonfederal entities be initiated to gather information pertaining to the natural resources. It is also recommended that data collection parameters become more consistent between the federal agencies and the local governments. This measure would make the interpretation process much more efficient. It is difficult to put together a document of this importance with limited, and sometimes inconsistent, amounts of information.

It is obvious that proper management of the resources in this watershed will take a cooperative effort between federal and nonfederal entities. This is especially the case as far as salmonid habitat is concerned as most of the perennial streams in the lower portion of the watershed are on nonfederal land. It is highly recommended that a Cheney/Slate watershed council be formed to address the issues identified in this analysis and help implement recommendations. Working together will make the difference.

WILDLIFE RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
LATE-SUCCESSIONAL RESERVE	MAPPED LOCATIONS	MAINTAIN ALL OLDER STANDS, MEET STANDARDS AND GUIDELINES DEVELOPED IN THE ROD. DECREASE FRAGMENTATION AND INCREASE INTERIOR FOREST, DECREASE ROAD DENSITY, PREVENT STAND REPLACING FIRE.
MATRIX LANDS	MAPPED LOCATIONS	HARVEST TIMBER IN A MANNER THAT MIMICS NATURAL DISTURBANCE, MAINTAIN STRUCTURAL DIVERSITY. MINIMIZE TIMBER HARVEST IN ALL MATURE AND OLD-GROWTH STANDS, MINIMIZE ROAD BUILDING, FOCUS TIMBER HARVEST ON LARGE POLE STANDS.
LANDS WITHDRAWN FROM THE TIMBER BASE	WATERSHED WIDE	MANAGE SITES TO BRING BACK TO NATURAL RANGE OF CONDITION.
SPOTTED OWL CORES	PROVINCIAL HOME RANGE OF KNOWN SITES	INCREASE AMOUNT OF OLD-GROWTH FOREST WITHIN PROVINCIAL HOME RANGE TO STANDARDS DEVELOPED BY U.S. FISH AND WILDLIFE SERVICE (1,388 ACRES WITHIN 1.3 MILES).
FIRE	WATERSHED WIDE	REINTRODUCE FIRE INTO THE ECOSYSTEM TO MAINTAIN SENSITIVE HABITATS (e.g. MEADOWS, OAK WOODLANDS ETC.) AND PREVENT STAND REPLACING FIRES.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
RIPARIAN HABITAT	WATERSHED WIDE	MEET AQUATIC CONSERVATION STRATEGY, MAINTAIN OLDER FOREST FOR CONNECTIVITY, BUILD NO NEW ROADS, DECREASE ROAD DENSITY, ROCK UNSURFACED ROADS. PROMOTE OLD-GROWTH CONDITIONS.
OLD-GROWTH FOREST (McKELVEY #1)	MAPPED LOCATIONS	MAINTAIN ALL MATURE AND OLD-GROWTH HABITAT, PROMOTE STAND SIZE AND CONNECTIVITY BY MANIPULATING ADJACENT STANDS TO ACHIEVE OLD-GROWTH CONDITIONS.
DISPERSAL CORRIDORS	MAPPED LOCATIONS	ESTABLISH THE DISPERSAL CORRIDOR DESCRIBED IN THE DESIRED FUTURE CONDITION SECTION (SEE MAP FOR LOCATION). FOR PORTION OF THE CORRIDOR LANDS FOUND IN THE LATE-SUCCESSIONAL RESERVE MEET STANDARDS AND GUIDELINES DEVELOPED IN THE ROD, FOR MATRIX LANDS IN THE CORRIDOR MAINTAIN MATURE/OLD-GROWTH STANDS, MAINTAIN CANOPY CLOSURE OF 40% IN TIMBER HARVEST UNITS EXCEPT IN PINE STANDS WHERE SITE DICTATES CONDITION, DECREASE ROAD DENSITY, NO NEW ROADS CONSTRUCTION, PREVENT STAND REPLACING FIRE.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
WINTER RANGE	AREAS LOCATED BELOW 2,000 FEET	SEASONAL CLOSURE OF ROADS TO PREVENT DISTURBANCE, REDUCE ROAD DENSITIES BY PUTTING ROADS TO BED, NO NEW PERMANENT ROAD CONSTRUCTION, RESTRICT MANAGEMENT ACTIVITIES BETWEEN NOVEMBER 15 TO APRIL 1.

SPECIAL STATUS PLANT SPECIES RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
LATE-SUCCESSIONAL SPECIAL STATUS PLANTS	WATERSHED WIDE	SURVEY ENTIRE WATERSHED FOR SENSITIVE PLANTS, PROTECT KNOWN SITE DURING GROUND DISTURBING ACTIVITIES WITH 100 FT BUFFERS, MAINTAIN 60% CANOPY AT SITES, INSTITUTE PRESCRIBED BURN PROGRAM THAT REPLICATES LOW INTENSITY FIRE IN AREAS WHERE SENSITIVE SPECIES ARE FOUND.
PRIVATE LAND	PRIVATE LAND	WORK WITH NONFEDERAL LAND OWNERS, HELP THEM IDENTIFY AND PROTECT SENSITIVE PLANTS.
MATURE/OLD-GROWTH HABITAT	MAPPED LOCATIONS	ENSURE THROUGH LONG RANGE PLANNING THAT LARGE AREAS OF MATURE FOREST REMAIN INTACT IN THE WATERSHED.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
CYPRIPEDIUM sps.	LANDS OUTSIDE THE DISPERSAL CORRIDOR	INSTITUTE RESEARCH ON THE LANDS OUTSIDE THE DISPERSAL CORRIDOR ON THE CYPRIPEDIUM sps. REACTION TO FIRE, VARIOUS LEVELS OF TIMBER HARVEST, AND IMPORTANT MYCHORRHIZAL CONNECTIONS.
SERPENTINE PLANTS	SERPENTINE SITES	INSTITUTE A PRESCRIBED FIRE OF LOW INTENSITY TO REDUCE HERBACEOUS LAYER BUILD UP AND SHRUBS & TREES ENCROACHMENT, ENSURE GROUND DISTURBING ACTIVITIES SUCH AS MINING AND ORV USE ARE KEPT TO A MINIMUM.
WETLANDS/SEEPS	WATERSHED WIDE	LOCATE, SURVEY AND MAP WETLANDS/SEEPS FOR SPECIAL STATUS PLANTS, DETERMINE WHERE WATER WITHDRAWALS ARE TAKING PLACE AND TRACK DEVELOPMENT IN THESE AREAS, PROTECT REMAINING WETLAND/SEEP AREAS THROUGH COOPERATION WITH NONFEDERAL LANDOWNERS AND/OR BY PURSUING WATER RIGHTS.
BOLT MOUNTAIN	FEDERAL MANAGED LAND AROUND BOLT MT.	DESIGNATE SITE AS AN ACEC, RNA, OR ENVIRONMENTAL EDUCATION AREA, INSTITUTE A PRESCRIBED FIRE PROGRAM TO REDUCE ENCROACHMENT OF SHRUBS AND TREES ON GRASSLANDS.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
NOXIOUS WEEDS	WATERSHED WIDE	DEVELOP AND ACTIVE ERADICATION PROGRAM FOR NOXIOUS WEEDS IN THE WATERSHED, ESPECIALLY IN THE NATIVE GRASSLANDS ADJACENT TO AGRICULTURAL AND DEVELOPED AREAS.

AQUATIC HABITAT RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
STREAMS	WATERSHED WIDE	MEET STANDARDS AND GUIDELINES OF THE ROD AND AQUATIC CONSERVATION STRATEGY, PROVIDE ADEQUATE SHADING, DEPTH, AND CURRENT TO KEEP TEMPERATURE BELOW 58 F, RESTORE STREAM COMPLEXITY, STREAM BANK AND BOTTOM INTEGRITY, MAINTAIN & RESTORE JUVENILE SALMONID REARING AREAS, AND ADULT SPAWNING AREAS, RETAIN GRAVEL AND SEDIMENT, NUTRIENT AND WOOD ROUTING, PROVIDE INSTREAM COMPLEXITY OF LARGE WOOD 24" IN DIAMETER WITH A LENGTH OF 1 BANKFULL WIDTH OR GREATER.
WATER DIVERSIONS	ELLIOT CREEK DRAINAGE	MODIFY OR REMOVE IRRIGATION DIVERSION LOCATED ON BLM LAND THAT JEOPARDIZES JUVENILE FISH PASSAGE.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
FISH HABITAT	SLATE/WATERS CREEK DRAINAGE	INCREASE NUMBER OF RESTING POOLS FOR CHINOOK IN LOWER REACHES OF SYSTEMS.
RIPARIAN CONDITION	WATERSHED WIDE	MAINTAIN 60% STREAM SHADING OR MAXIMUM SITE POTENTIAL, PROMOTE GROWTH OF MATURE CONIFERS (32" dbh. or greater) WITHIN 160' FT OF STREAM, REESTABLISH COARSE WOODY MATERIAL 6-8 CONIFER PER ACRE OR 150 LINEAL FEET PER ACRE WITH MINIMUM OF 16" (dbh) IN THE RIPARIAN ZONE.
SAND AND GRAVEL OPERATIONS	WATERSHED WIDE	PROHIBIT OPERATIONS THAT ADVERSELY AFFECT SURVIVAL OF SALMONIDS.
RESEARCH	WATERSHED WIDE	FURTHER RESEARCH INTO THE LIFE REQUIREMENTS OF SALMONIDS IN THE WATERSHED.
MONITORING	WATERSHED WIDE	MONITOR RELATIVE ABUNDANCE, AND DISTRIBUTION OF EXOTIC FISH SPECIES, CLASSIFY ALL STREAMS, CONDUCT BENTHIC MACROINVERTEBRATE SURVEYS AT 5-10 YEAR INTERVALS, SURVEY FISH HABITAT AT 10-15 YEAR INTERVALS, INSPECT ALL CULVERTS, MONITOR EFFECTIVENESS OF FISH STRUCTURES, ANNUAL POPULATION STUDIES OF CUTTHROAT TROUT.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
CULVERTS	WATERSHED WIDE	CULVERTS ON FISH BEARING STREAMS WITH GRADIENTS GREATER THAN 3% SHOULD HAVE NATURAL STREAMBED WITH NO POOL BELOW CULVERT.
ROADS	WATERSHED WIDE	DECREASE ROAD DENSITY TO 2 MILES PER SECTION, DECREASE STREAM CROSSINGS, PROHIBIT NEW ROAD CONSTRUCTION IN RIPARIAN AREA. MODIFY EXISTING ROADS THAT DISRUPT SPECIES MIGRATION AND DISPERSAL. SURFACE ROADS USED DURING THE WET SEASON AND CLOSE ROADS NOT SURFACED.
HEADWATER CONDITION	WATERSHED WIDE	EVALUATE HEADWATER TRIBUTARIES FOR SEDIMENT PRODUCTION, WATER CONTRIBUTION, AND RIPARIAN POTENTIAL.
RIPARIAN WIDTHS	WATERSHED WIDE	MAINTAIN RIPARIAN WIDTHS ESTABLISHED IN THE ROD. INSTITUTE SILVICULTURAL PRACTICES THAT WILL ENHANCE RIPARIAN AREAS TOWARD DESIRED FUTURE CONDITION AND AQUATIC CONSERVATION STRATEGY. INTERMITTENT STREAMS WITH DEFINED CHANNELS BUT NO ANNUAL SCOUR SHOULD RECEIVE A DISTURBANCE BUFFER. THIS BUFFER SHOULD BE 10 FT.WHEN SIDESLOPES ARE LESS THAN 50% AND 15 FT. WHEN ADJACENT SLOPES ARE OVER 50%.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
FISH HABITAT	WATERSHED WIDE	SEEK COOPERATION WITH NONFEDERAL LANDOWNERS TO RESTORE RIPARIAN AND FISH HABITAT ON THEIR LANDS, MODIFY STREAM WATER DIVERSIONS TO ALLOW FOR ADULT AND JUVENILE MIGRATION/REARING.

FIRE RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
FIRE	WATERSHED WIDE	REDUCE POTENTIAL FOR STAND REPLACING FIRE THROUGH FUEL REDUCTION IN LANDS WITH HIGH RATINGS FOR ALL THREE CATEGORIES (HAZARD, RISK AND VALUE AT RISK) STARTING WITH THOSE FOUND IN THE DISPERSAL CORRIDOR. RETURN WATERSHED TO LOW INTENSITY FIRE REGIME. DO NOT COMPROMISE SHORT TERM MANAGEMENT ACTIONS TO SUPPRESS WILDFIRES.

HUMAN USE RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
RECREATION	WATERSHED WIDE	CONDUCT INVENTORY OF AMOUNT AND TYPE OF CURRENT RECREATION IN THE WATERSHED, CONDUCT RECREATION OPPORTUNITY SPECTRUM INVENTORY TO DETERMINE POTENTIAL RECREATION OPPORTUNITIES IN WATERSHED, PROVIDE MORE DESIGNATED RECREATION SITES TO DECREASE IMPACTS OF DISPERSED RECREATION.
ROADS	WATERSHED WIDE	COMPLETE TRANSPORTATION MANAGEMENT PLAN FOR ROADS.
CULTURAL RESOURCES	WATERSHED WIDE	COMPLETE FIELD SURVEYS FOR PRESENCE OF HISTORICAL/PREHISTORICAL CULTURAL RESOURCES.
QUARRIES	WATERSHED WIDE	COMPLETE FIELD SURVEYS FOR CONDITION OF QUARRIES, AND DESIGN RESTORATION STRATEGY.
ILLEGAL DUMP SITES	WATERSHED WIDE	INCREASE VISIBLE PRESENCE IN THE WATERSHED, CONCENTRATE EFFORTS ON ENFORCING EXISTING RULES AND REGULATIONS, PHYSICALLY CLOSE MOST POPULAR DUMP SITES.

VEGETATION RECOMMENDATIONS		
ISSUE/CONCERN	**LOCATION**	**RECOMMENDATION**
MAINTAINING STAND DENSITY WITHIN RELATIVE DENSITY RANGE OF 35-60% TO PROVIDE FOR PROPER PHYSIOLOGICAL FUNCTION AND KEEP MORTALITY RATES WITHIN RANGE OF NATURAL CONDITIONS.	WATERSHED WIDE	UTILIZE THINNING, GROUP SELECTION, AND PRESCRIBED FIRE TO REDUCE DENSITY OF OVERSTOCKED STANDS.
MAINTENANCE AND RESTORATION OF SPECIES STRUCTURAL COMPOSITIONS OF FOREST WITHIN THE RANGE OF NATURAL CONDITIONS.	WATERSHED WIDE	MAINTAIN AND RESTORE PINE STANDS WHEREVER POSSIBLE THROUGH DENSITY MANAGEMENT PRESCRIPTIONS; MAINTAIN A COMPONENT OF MID-SERAL HARDWOOD SPECIES SUCH AS PACIFIC MADRONE AND CALIFORNIA BLACK OAK THROUGH DENSITY MANAGEMENT PRESCRIPTIONS. PROVIDE FOR STRUCTURAL DIVERSITY IN SINGLE LAYERED STANDS, INCLUDING YOUNG PLANTED STANDS, THROUGH GAP INTRODUCTION, VARIABLE SPACINGS, THINNING, AND SELECTED HARDWOOD RELEASE. REDUCE THE AMOUNT OF TANOAK CURRENTLY EXISTING IN THE UNDERSTORIES OF MANY STANDS.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
IN THE FOREST CONDITION CLASSES, DEVELOP AND MAINTAIN A BALANCE IN THE SIZE CLASSES AND SERAL STAGES ACROSS THE WATERSHED SO THAT NO ONE CONDITION PRE-DOMINATES. STRIVE FOR APPROXIMATELY 20% IN THE FIVE FOREST CATEGORIES.	LARGE POLE SIZE CLASS ACROSS THE MATRIX LANDS IN THE WATERSHED WHICH CURRENTLY PRE-DOMINATES; AND YOUNG, PLANTED STANDS.	ASSUME EARLY SERAL CONDITION BALANCE FOR THE WATERSHED WILL BE MET ON THE NONFEDERAL LANDS ACCELERATE THE DEVELOPMENT OF THE SMALL AND LARGE POLE CONDITION CLASSES INTO MATURE AND OLD-GROWTH CONDITIONS THROUGH THINNING, GROUP SELECTION CUTS, AND PRESCRIBED FIRE. ACCELERATE THE DEVELOPMENT OF PLANTATIONS THROUGH AGGRESSIVE PRE-COMMERCIAL THINNING.
RESTORE SERAL STAGES OF THE MAJOR PLANT SERIES TO SUSTAINABLE AND DESIRABLE SERAL CONDITIONS WITHIN THEIR HISTORIC RANGE.	JEFFREY PINE PONDEROSA PINE/ DOUGLAS-FIR, AND WHITE OAK PLANT SERIES AREAS.	UTILIZE PRESCRIBED FIRE AND THINNING TO RESTORE JEFFREY PINE AND WHITE OAK SERIES COMMUNITIES TO MORE OPEN EARLY TO MID-SERAL CONDITIONS. REDUCE INVADING DOUGLAS-FIR AND SHRUBS ON THESE SITES AND RESTORE NATIVE GRASSES AND FORBS.
INCREASE AMOUNT OF FOREST LANDS IN AN OLD-GROWTH CONDITION FROM WHAT CURRENTLY EXISTS.	DISPERSAL CORRIDOR	ACCELERATE THE DEVELOPMENT OF LARGE TREES THROUGH THINNING FROM BELOW AND UNDERBURNING. MAINTAIN CANOPY CLOSURE AT DESIRED LEVELS AND PROVIDE FOR THE DEVELOPMENT OF LARGE HARDWOOD TREES IN THE UNDERSTORY.

ISSUE/CONCERN	LOCATION	RECOMMENDATION
REDUCE THE TANOAK DOMINATION IN THE UNDERSTORIES OF MANY OF THE FORESTS IN ORDER TO MINIMIZE THE RISK OF THESE FORESTS FROM UNDERGOING A MAJOR SPECIES SHIFT TO TANOAK IF SOMETHING HAPPENS TO DISTURB THE CONIFER OVERSTORY.	TANOAK AND DOUGLAS-FIR/TANOAK PLANT SERIES SITES. ESPECIALLY IN T37S.,R7W., SECTIONS 22 23, 25, AND 27.	USE AGGRESSIVE SLASHING AND UNDERBURNING TO REDUCE TANOAK COMPONENT. PLANT DOUGLAS-FIR, SUGAR PINE AND PONDEROSA PINE IN OPENINGS SUFFICIENT TO SUPPORT REGENERATION. AGGRESSIVELY FOLLOW-UP BY SLASHING TANOAK RE-SPROUTING IN SUBSEQUENT YEARS.
RESTORE SITES TAKEN OVER BY TANOAK TO THE PREVIOUS CONIFER DOMINATED CONDITIONS.	T.37S.,R.7W., SEC.25, 130 ACRE BLOCK IN THE EAST 1/2 OF SECTION.	SLASH AND BURN AS MUCH OF THE AREA AS POSSIBLE TO KNOCK TANOAK BACK. AGGRESSIVELY PLANT AND MAINTAIN A MIX OF DOUGLAS-FIR, SUGAR PINE AND SOME PONDEROSA PINE ON SOUTH ASPECTS. AGGRESSIVELY SLASH TANOAK RE-SPROUTS IN SUBSEQUENT YEARS.
RESTORE LARGE CONIFER TREE COMPONENT TO THE RIPARIAN AREAS OF THE WATERSHED.	ALL RIPARIAN AREAS IN THE WATERSHED. FOCUS ON FISH BEARING STREAMS FIRST.	THIN TO RELEASE AND ACCELERATE THE DEVELOPMENT OF EXISTING CONIFER TREES IN THE RIPARIAN AREAS. IN RIPARIAN AREAS DOMINATED BY HARDWOODS AND LACKING CONIFER TREES, REDUCE THE HARDWOOD COMPONENT AND PLANT CONIFER SPECIES. INCLUDE PRIORITY AREAS FOR PLANTINGS, ESPECIALLY ON NONFEDERAL LANDS, IN FUTURE RIPARIAN TREE PLANTING ACTIVITIES SPONSORED BY THE APPLEGATE WATERSHED CONSERVANCY AND APPLEGATE PARTNERSHIP.

SOILS RECOMMENDATIONS		
ISSUES/CONCERNS	**LOCATION**	**RECOMMENDATION**
SOIL PRODUCTIVITY	ENTIRE WATERSHED	REDUCE THE RISK OF A HIGH INTENSITY FIRE OCCURRENCE AND RETURN TO A LOW INTENSITY FIRE REGIME
SOIL PRODUCTIVITY	ENTIRE WATERSHED	REDUCE THE SOIL EROSION RATES BY LIMITING THE GROUND DISTURBING ACTIVITIES ENTIRE WATERSHED
SOIL PRODUCTIVITY	ENTIRE WATERSHED	CONDUCT RESEARCH IN ORDER TO ESTABLISH LOCAL STANDARDS FOR DOWN WOOD. CONTINUE TO MEET ROD GUIDELINES DURING INTERIM
SOIL PRODUCTIVITY	ENTIRE WATERSHED	CONDUCT SOIL NUTRIENT CAPITAL INVENTORIES
SOIL EROSION	ENTIRE WATERSHED	MONITOR SOIL EROSION RATES

Table 38: Identified Data Gaps

Botany	Nonvascular plants: No surveys have been conducted, need to survey for at least Survey & Manage species. Vascular plants: Only 75% of the watershed has been surveyed, need to survey the remainder. Noxious weeds: No surveys have been conducted. Wetlands/seeps: Little known about location and extent and no special status plant surveys done in this habitat.
Wildlife	Presence/absence information for most of the special status species is unknown. Little information on special status species habitats and condition of these habitats. Location of unique habitats such as wallows, mineral licks, migration corridor for the most part unknown.
Fisheries	Condition of habitat on BLM largely unknown. Range of fish in most streams unknown. Temperature information on most streams unknown. Condition of macro-invertebrate community on BLM and nonfederal land unknown. Condition of habitat on private land largely unknown. Location of features contributing to increased sediment problems unknown. Condition of culverts in the watershed unknown. Areas with fish passage problems largely unknown.
Human use	Condition of roads, amount of use, surface depth and barricade effectiveness information is largely unknown. Information on condition of quarries is largely not available and restoration strategy is absent. Information concerning amount, type and effects of private roads/skid trails is unknown.
Hydrologic/ Riparian	Stream condition on BLM and nonfederal lands unknown. Functioning condition of riparian areas on all land unknown.
Soils	Soil nutrient capital unknown. Soil erosion rates unknown.
Vegetation	Stand examination inventory data, including snag and down wood data, for the federal lands in the watershed. Density condition information for nonfederal lands. Incidence of western pine beetle, mountain pine beetle and fir engraver beetle activity in the watershed. Known Port-Orford-cedar and Port-Orford-cedar root disease locations. Specific reference information on the seral and size class mixes of the forests in the watershed. Previous harvest data on BLM and nonfederal lands.
Fire	Identification of individuals who have special concerns with prescribed burning emissions, smoke dispersion modeling and amounts of smoke produced from understory burning largely unknown, Baseline emission data for various plant association and theoretical emission information for various plant association is absent, Historic fire and current fire

R8W R7W R6W

T36S

SCALE 1:110000

POTENTIAL HIGH PRIORITY
HAZARD REDUCTION TREATMENT AREAS
CHENEY-SLATE WATERSHED

LEGEND

- Potential Treatment Areas
- BLM LAND
- WATERSHED

March 7 1996

John McGlothlin

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Map 19 - High Priority

USFS

SCALE 1:110000

MINERAL POTENTIAL FOR LANDS OUTSIDE THE USFS BOUNDARY IN THE CHENEY-SLATE WATERSHED

LEGEND

- LOW POTENTIAL
- MEDIUM FOR MO
- MEDIUM FOR AU;NI
- MEDIUM FOR AU;NI;MO

OCTOBER 18 1995

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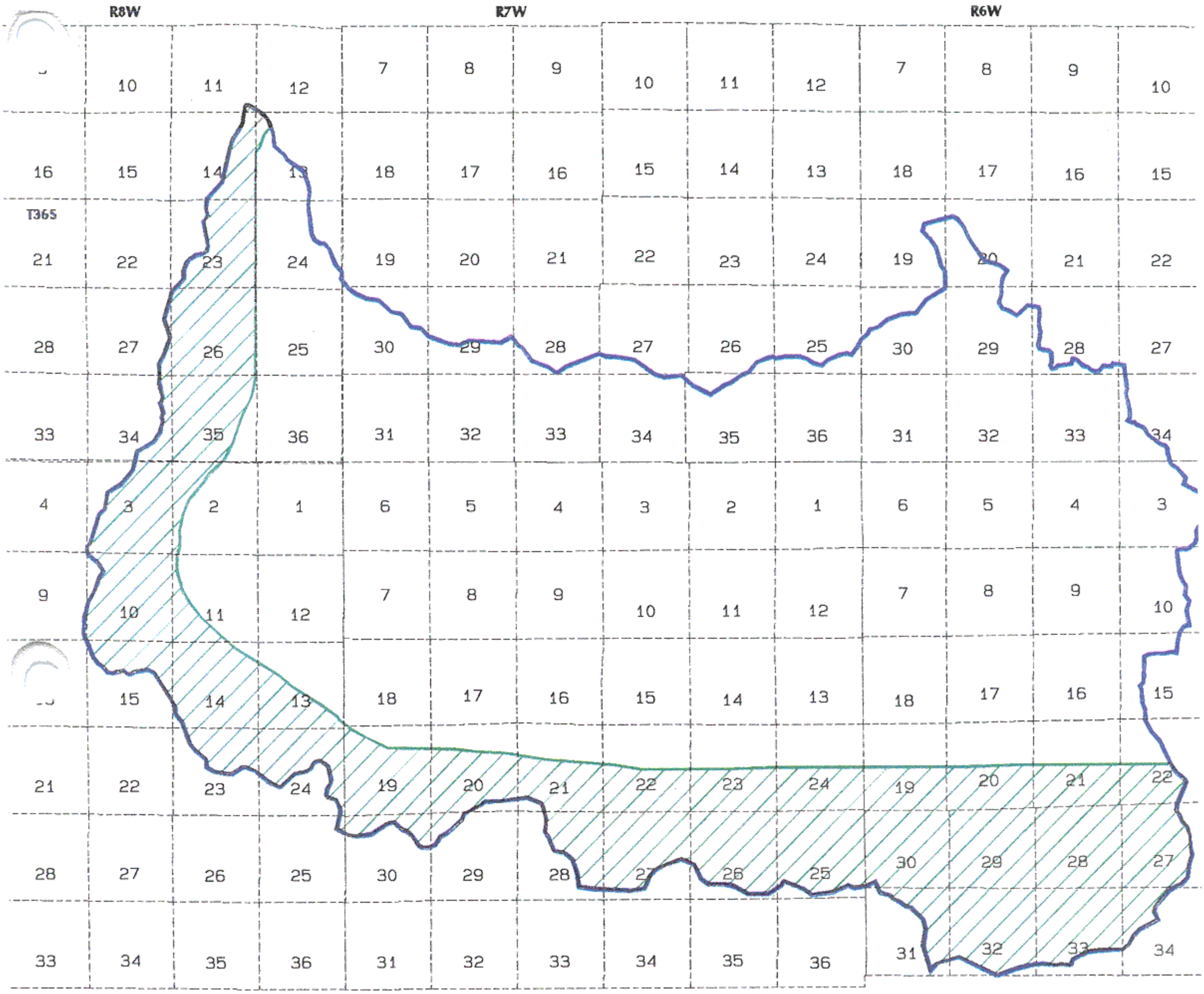
Map 20
Mineral Potential



SCALE 1:110000

TERRESTRIAL DISPERSAL CORRIDOR
CHENEY-SLATE WATERSHED

LEGEND

CORRIDOR

WATERSHED BOUNDARY

March 25 1996

John McGlothlin

Map 21

APPENDICES

Appendix for Wildlife

Appendix for Fire Management Planning

Appendix for Riparian Vegetation

Appendix for Road Information

APPENDIX FOR WILDLIFE

Table APW1. Spotted owl sites located within watershed.

Site Name	Level of Protection
Cheney Cr.	Inside the late-successional reserve
Elliott Cr.	100 Acre core has been established
Knight Cr.	100 Acre core has been established
Iron Eagle	Inside the late-successional reserve
Main Cheney	100 Acre core has been established
Mooney Mtn.	Inside the late-successional reserve

Table APW2. Spotted owl sites located outside watershed, with provicial home range falling within watershed.

Site Name	Level of Protection
Bonnie's Delight	100 Acre core has been established
Case Creek	Inside the late-successional reserve
Davis Creek	100 Acre core has been established
Draper Creek	100 Acre core has been established
Iron Creek	Inside the late-successional reserve
North Fork Deer Creek	Inside the late-successional reserve
West Lookout	Inside the late-successional reserve

Table APW3. Spotted owl habitat availability for known sites

SITE NAME	MSNO	BUREAU ADMINISTERED HABITAT WITHIN 0.7 MILES	BUREAU ADMINISTERED HABITAT WITHIN 1.3 MILES	PERCENT SUITABLE WITHIN 1.3 MILES
Bonnies Delight	2632	254 Acres	996 Acres	30%
Case Creek	2257	92 Acres	353 Acres	11%
Cheney Creek	0913	381 Acres	999 Acres	30%
Davis Creek	2227	263 Acres	449 Acres	13%
Draper Creek	2228	339 Acres	755 Acres	23%
Elliott Creek	3557	311 Acres	742 Acres	22%
Knight Creek	2281	211 Acres	468 Acres	14%
Iron Creek	2067	626 Acres	1159 Acres	34%
Iron Eagle	3556	449 Acres	942 Acres	28%
Main Cheney	1951	435 Acres	705 Acres	21%
Mooney Mtn.	2259	474 Acres	1513 Acres	45%
Mooney Mtn. Alt.	2259A	532 Acres	1286 Acres	38%
N. Fork Deer Creek	0080	721 Acres	1473 Acres	43%
West Lookout	2362	204 Acres	1199 Acres	36%

Table APW4. Results of Nesting Surveys In the Cheney/Slate WAU

SITE NAME	85	86	87	88	89	90	91	92	93	94	95
Cheney Creek	U	U	P	P/2	P	P/1	P/2	P	PU	P/3	P/1
Elliott Creek	NS	NS	NS	NS	NS	NS	SU	S	P	X	NS
Knight Creek	NS	NS	NS	NS	NS	P	P/1	P	P/1	P	S
Iron Eagle	NS	NS	NS	NS	NS	NS	SU	P	X	X	S
Main Cheney	NS	NS	P/2	NS	NS	NS	X	X	X	X	X
Mooney Mountain	NS	NS	NS	NS	NS	NS	P/2	P/2	P	P/2	P

NS=NOT SURVEYED
SU=SITE UNKNOWN AT THIS TIME
S=SINGLE BIRD
P/?=PAIR/NUMBER YOUNG PRODUCED
U=UNKNOWN X=NO BIRDS PRESENT
P=PAIR DIDN'T NEST
PU=PAIR NEST STATUS UNKNOWN

McKelvey rating system

Spotted owl habitat managed by the Bureau of Land Management has been analyzed using the McKelvey rating system. The McKelvey rating system is based on a model that predicts spotted owl population based on habitat availability. Stands are examined for criteria such as canopy layering, canopy closure, snags, woody material and other features. Biological potential of a stand to acquire desired conditions is also taken in consideration. During the fall and winter of 1995/96, stands were visually inspected and rated into the six following catergories; optimal (#1), suitable roosting/foraging (#2), currently not #1 or #2, but has potential to be (#3), will never be **This rating system has some serious short comings and does not reflect the actual amount of habitat. Factors not considered are connectivity and fragmentation. For instance a single acre of optimal habitat surrounded by clear cuts is as valuable in this rating system as an acre of optimal connected to hundreds of acres.**

Special Status Species

Special status species are animals that are recognized by the federal or state government as needing particular consideration in the planning process, due to low populations (natural and human caused), restricted range, threats to habitat and for a variety of other reason. This list includes species officially listed, proposed for listing and candidate species being reviewed by the U.S. Fish and Wildlife Service. State Listed Species are those species identified as threatened, endangered, or pursuant to ORS 496.004, ORS 498.026, or ORS 546.040. Also included are Bureau Assessment Species which are plants and animals species that are found on

List 2 of the Oregon Natural Heritage Data Base and those species on the Oregon List of Sensitive Wildlife Species (ORS 635-100-040) and are identified in BLM Instruction Memo No. OR-91-57. Bureau Sensitive species are those species eligible for federal listed, federal candidate, state listed, or on List 1 in the Oregon Natural Heritage Data Base, or approved by the BLM state director.

Table APW5 Special status species habitat needs

SPECIES (COMMON NAME)	HABITAT ASSOCIATION	SPECIAL HABITAT FEATURE	CONCERN
Gray Wolf	Generalists	Large blocks of unroaded habitat	Extirpated
White-footed Vole	Riparian	Alder/mature riparian	Naturally rare, modification/loss of habitat from development
Red Tree Vole	Mature/old growth conifer	Mature Douglas fir trees	Declining habitat quality/quantity from logging
California Red Tree Vole	Mature/old growth conifer	Mature Douglas fir trees	Declining habitat quality/quantity from logging
Fisher	Mature/old growth riparian	Down wood/snags	Declining habitat quality/quantity & fragmentation from logging
California Wolverine	Generalists	Large blocks of unroaded habitat	Declining habitat quality/quantity & fragmentation from logging and road building, human disturbance
American Martin	Mature/old growth	Down wood, living ground cover	Declining habitat quality/quantity & fragmentation
Ringtail	Generalists	Rocky terrain, caves, mine adits	Northern limit of range
Townsends Big-eared Bat	Generalists	Mine adits, caves	Disturbance to nurseries, hibernacula & roosts, closing mine adits
Fringed Myotis	Generalists	Rock crevices & snags	Disturbance to roosts and colonies
Yuma Myotis	Generalists	Large live trees with crevices in the bark &	Limited mature tree recruitment
Long-eared myotis	Generalists	Large live trees with crevices in the bark	Limited mature tree recruitment
Long-legged Myotis	Generalists	Large live trees with crevices in the bark	Limited mature tree recruitment
Pacific Pallid Bat	Generalists	Snags, rock crevices	General rarity/disturbance/snag loss

List 2 of the Oregon Natural Heritage Data Base and those species on the Oregon List of Sensitive Wildlife Species (ORS 635-100-040) and are identified in BLM Instruction Memo No. OR-91-57. Bureau Sensitive species are those species eligible for federal listed, federal candidate, state listed, or on List 1 in the Oregon Natural Heritage Data Base, or approved by the BLM state director.

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American Martin	Mature/old growth	Down wood, living ground cover	Declining habitat quality/quantity & fragmentation
Ringtail	Generalists	Rocky terrain, caves, mine adits	Northern limit of range
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Pacific Pallid Bat	Generalists	Snags, rock crevices	General rarity/disturbance/snag loss

SPECIES (COMMON NAME)	HABITAT ASSOCIATION	SPECIAL HABITAT FEATURE	CONCERN
Common Kingsnake	Habitat generalists	Habitat generalists	Edge of range, general rarity, collectors
Northern Sagebrush Lizard	Open brush stands	Open forests or brush with open understory	Edge of range, fire suppression

SPECIES (COMMON NAME)	HABITAT ASSOCIATION	SPECIAL HABITAT FEATURE	CONCERN
Peregrine Falcon	Generalists	Cliff faces	Low numbers, prey species contaminated with pesticides
Bald Eagle	Lacustrine/rivers	Large mature trees with large limbs near water	Populations increasing
Northern Spotted Owl	Mature/old growth	Late successional mature forest with structure	Declining habitat quality/quantity & fragmentation
Marbled Murrelet	Mature/old growth	Large limbed trees,high canopy closure	Declining habitat quality/quantity
Northern Goshawk	Mature/old growth	High canopy closure forest for nest sites	Declining habitat quality/quantity & fragmentation, human disturbance
Mountain quail	Generalists		No concern in the watershed
Pileated Woodpecker	Large trees	Large diameter snags	Snag and down log removal from logging,salvage & site prep
Lewis' Woodpecker	Pine/oak woodlands	Large oaks,pines & cottonwoods adjacent to openings	Declining habitat quality/quantity fire suppression,rural & agriculture development, riparian modification
White-headed woodpecker	Pine/fir mountain forests	Large pines living and dead	Limited natural populations,logging of large pines and snags
Flammulated Owl	Pine/oak woodlands	Pine stands & snags	Conversion of mixed-aged forest to even-aged forests
Purple martin	Generalists	Snags in burns with excavated cavities	Salvage logging after fire and fire suppression
Great Gray Owl	Pine/oak/ true fir/ Mixed Conifer	Mature forest with adjoining meadows	Declining quality/quantity of nesting and roosting habitat
Western Bluebird	Meadows/ Open areas	Snags in open areas	Snag loss/fire suppression competition with starlings for nest sites
Acorn woodpecker	Oak woodlands	Large oaks	Declining habitat quality/quantity
Tricolored blackbird	Riparian	Wetlands, cattail marshes	Limited & dispersed populations, habitat loss from development
Pygmy nuthatch	Pine forests	Large dead & decaying pine	Timber harvest of mature trees, salvage logging

SPECIES (COMMON NAME)	HABITAT ASSOCIATION	SPECIAL HABITAT FEATURE	CONCERN
Black-backed woodpecker	Pine	Snags and pine	Removal of mature insect infested trees
Williamsons Sapsucker	Montane conifer forest	Trees with advanced wood decay	Removal of heartrot trees,snag removal,conversion to managed stands
Northern Pygmy Owl	Mixed conifer/	Snags	Snag removal, depend on woodpecker species to excavate nest cavities
Grasshopper Sparrow	Open savannah	Grasslands with limited shrubs	Limited habitat, fire suppression, conversion to agriculture
Bank Swallow	Riparian	Sand banks near open ground or water	General rarity, declining habitat quality
Western Pond Turtle	Riparian/uplands	Marshes, sloughs ponds	Alteration of aquatic and terrestrial nesting habitat,exotic species introduction
Del norte salamander	Mature/old growth	Talus	Declining habitat quality/quantity & fragmentation
Siskiyou mtn. Salamander	Closed canopy forest	Talus	Declining habitat quality/quantity & fragmentation
Foothills Yellow-legged Frog	Riparian	Permanent streams with gravel bottoms	Water diversions, impoundments, general declines in genus numbers
Red-legged Frog	Riparian	Marshes,ponds & streams with limited flow	Exotic species introduction loss of habitat from development
Tailed frog	Riparian	Cold fast flowing streams in wooded area	Sedimentation and removal of riparian vegetation due to logging, grazing & road building
Clouded Salamander	Mature	Snags & down logs	Loss of large decaying wood due to timber harvest and habitat4 fragmentation
Variegated salamander	Riparian	Cold, clear seeps & springs	Water diversions & sedimentation from roads & logging
Black Salamander	Generalists	Down logs, talus	Limited range, lack of data
Sharptail Snake	Valley bottoms low elevation	Moist rotting logs	Low elevation agricultural and development projects that remove/limit down wood
California Mountain Kingsnake	Habitat generalists	Habitat generalists	Edge of range, general rarity, collectors

5) Ladder Fuel Presence — Points

Use when forest vegetation has DBH of 5" or greater (vegetation condition class 6). Exceptions are possible based on stand conditions.

Ladder fuel absent.	0
Present on less than 1/3 percent of area; vertical continuity can be either less or greater than 50%.	5
Present on 1/3 to 2/3 percent of area; vertical continuity is less than 50%.	15
Present on 1/3 to 2/3 percent of area; vertical continuity is greater than 50%.	25
Present on greater than 2/3 percent of area; vertical continuity is less than 50%.	30
Present on greater than 2/3 percent of area; vertical continuity is greater than 50%.	40

POINTS	HAZARD RATING
0-45	LOW
50-70	MODERATE
75-135	HIGH

B. <u>RISK</u>

Assigned based on human presence and use, and on lightning occurrence.

HIGH RATING When:

Human population areas are present on or adjacent within 1/4 mile of the area; area has good access with many roads; relatively higher incidence of lightning occurrence; area has high level of human use.

MODERATE RATING When:

Area has human access and experiences informal use; area is used during summer and fall seasons as main travel route or for infrequent recreational activities. Lightning occurrence is typical for the area and not notably higher.

LOW RATING When:

Area has limited human access and infrequent use. Baseline as standard risk, mainly from lightning occurrence with only rare risk of human fire cause.

C. VALUE AT RISK

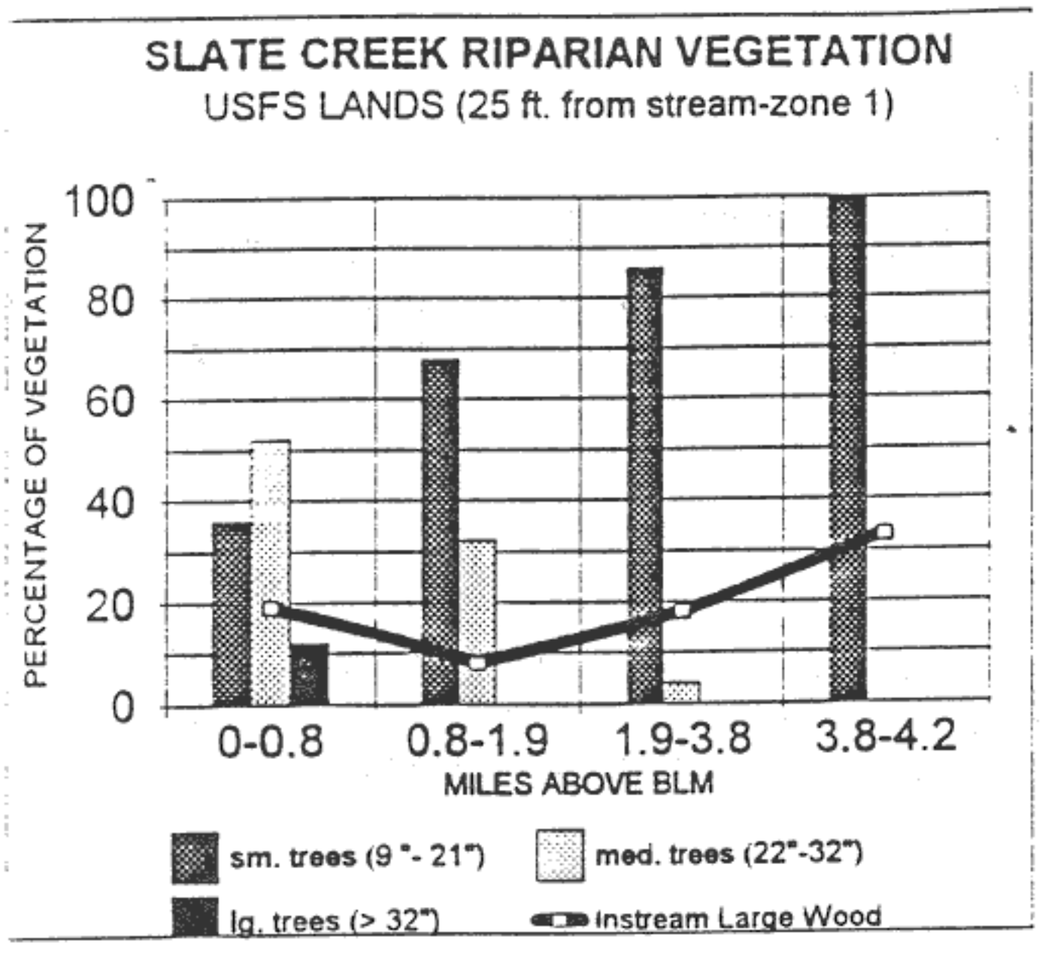
Best assigned through interdisciplinary process. Based on human and resource values within planning area. Can be based on land allocations, special use areas, human improvements/monetary investment, residential areas, agricultural use, structures present, soils, vegetation conditions, and habitat.

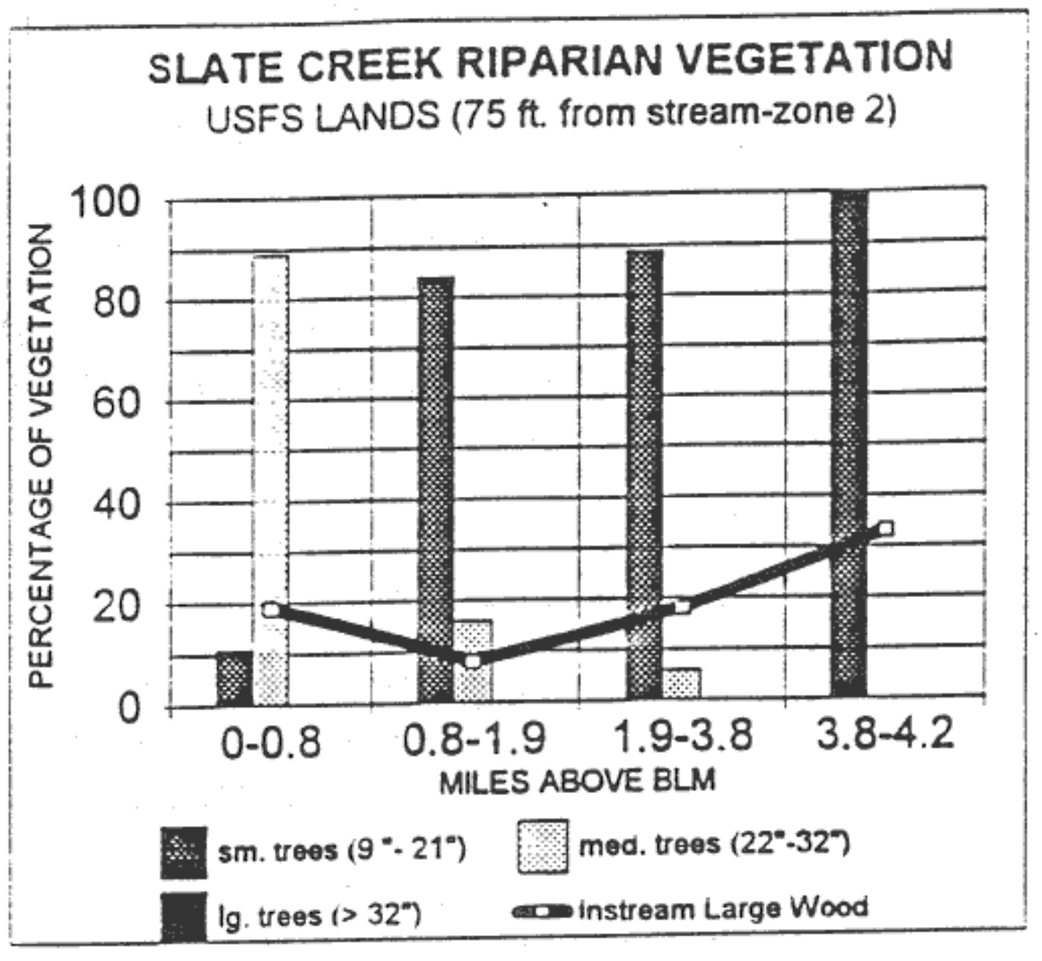
Examples:

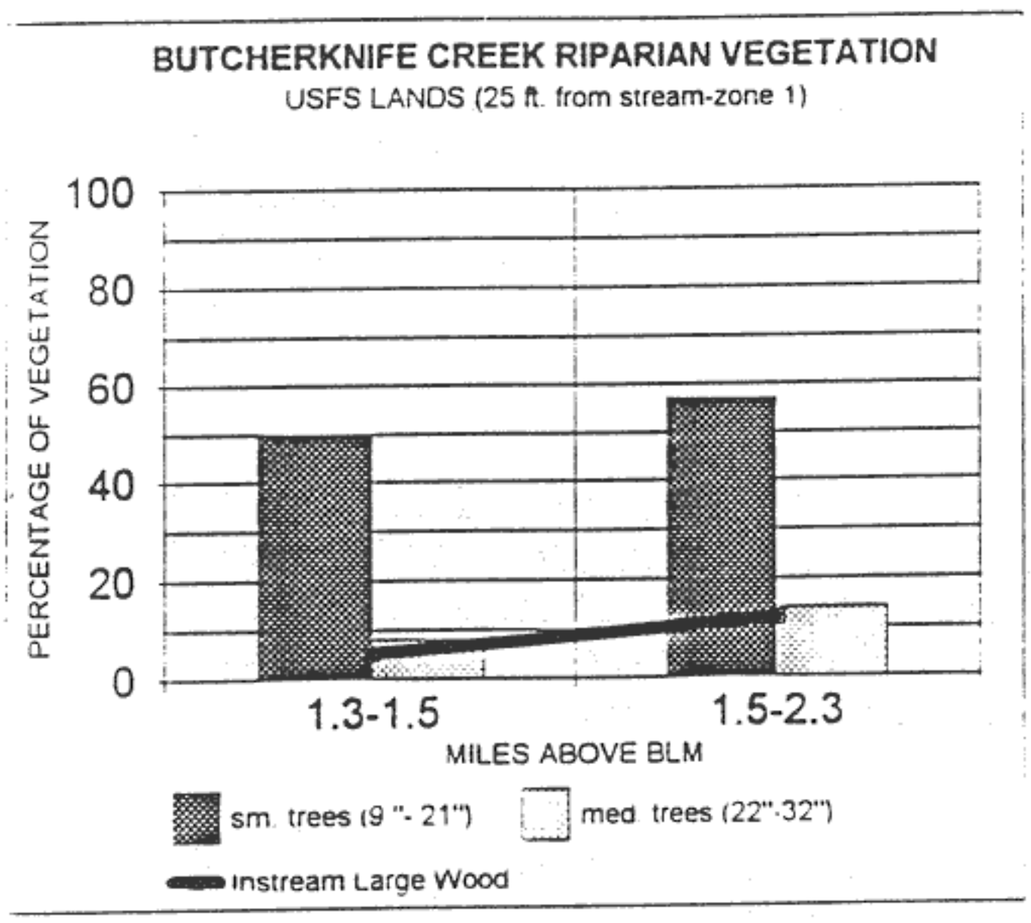
HIGH RATING - ACEC, RNA, LSR, Special Status species present, critical habitats, recreation area, residential areas, farming, vegetation condition and McKelvey ratings of 81, 82, 71, 72; vegetation condition of 4 and 5. Caves, cultural, or monetary investment present. Riparian areas.

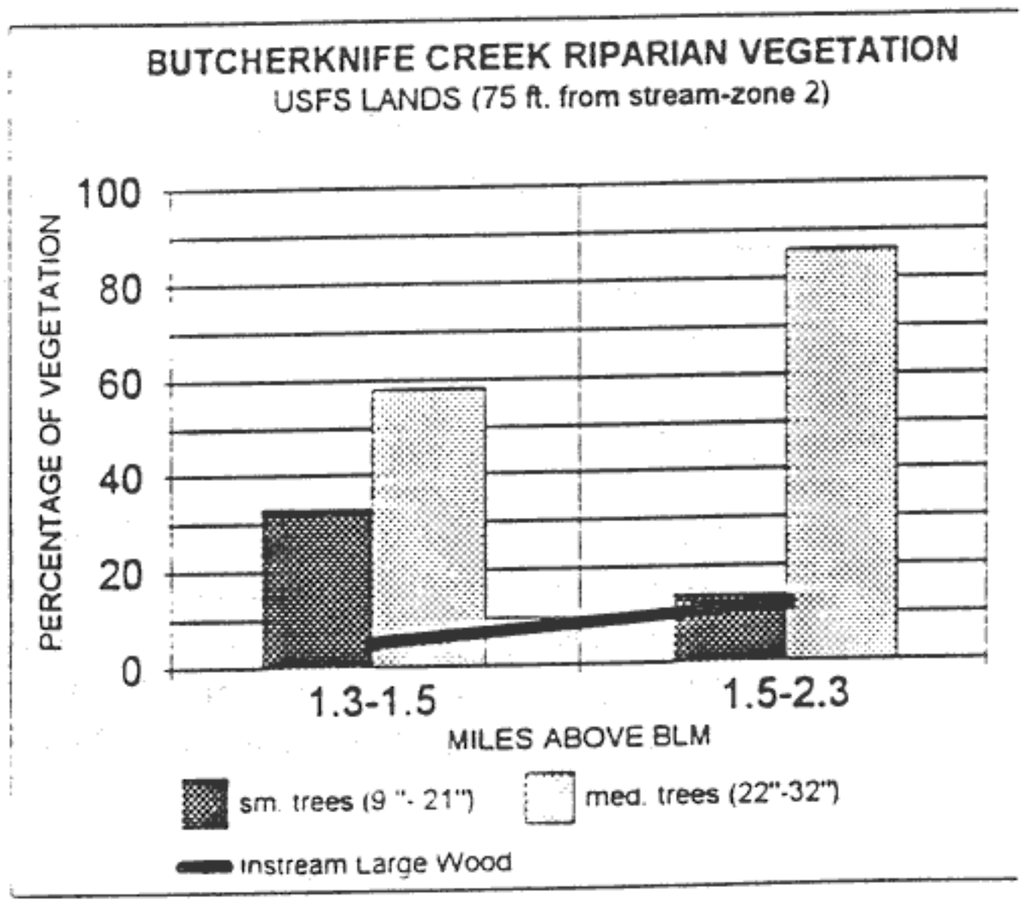
MODERATE RATING - Granitic soils, informal recreation areas and trails. Vegetation and McKelvey rating 85, 75, 65.

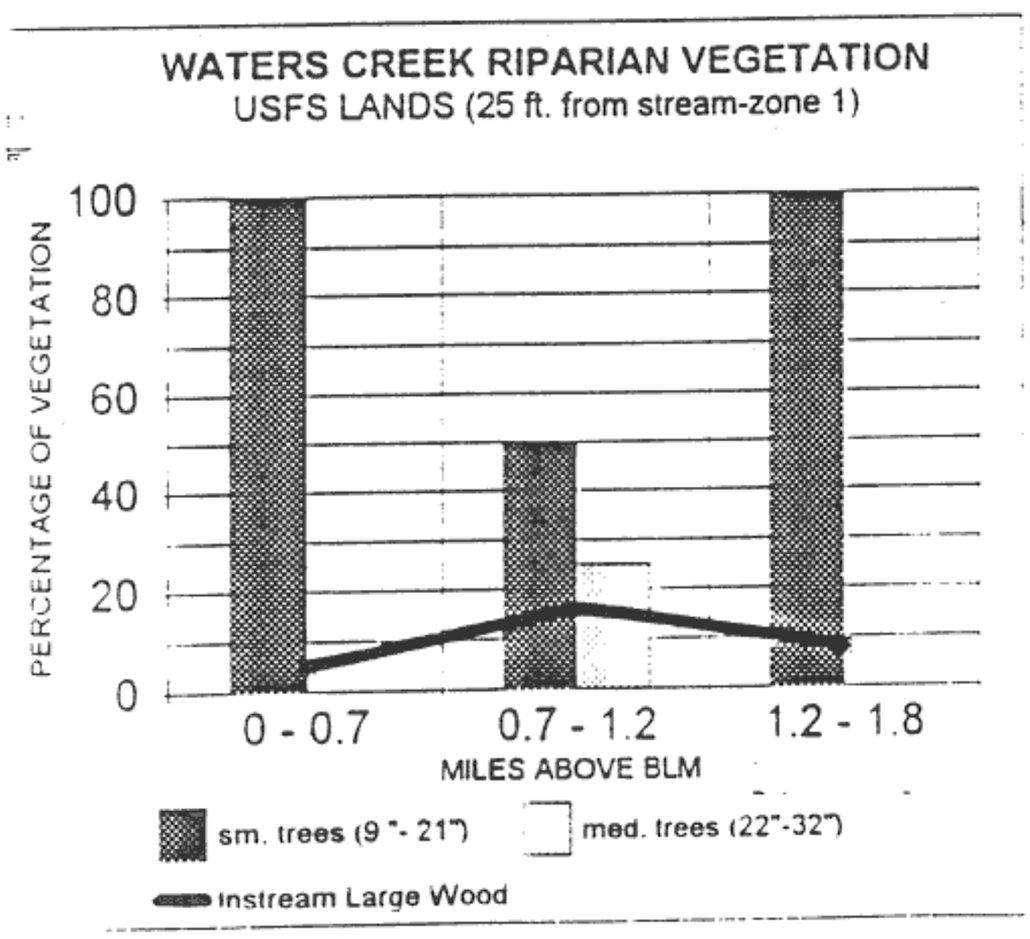
LOW RATING - Vegetation condition class 1, 2, 3; and vegetation 5, 6, 7 with McKelvey rating 4.

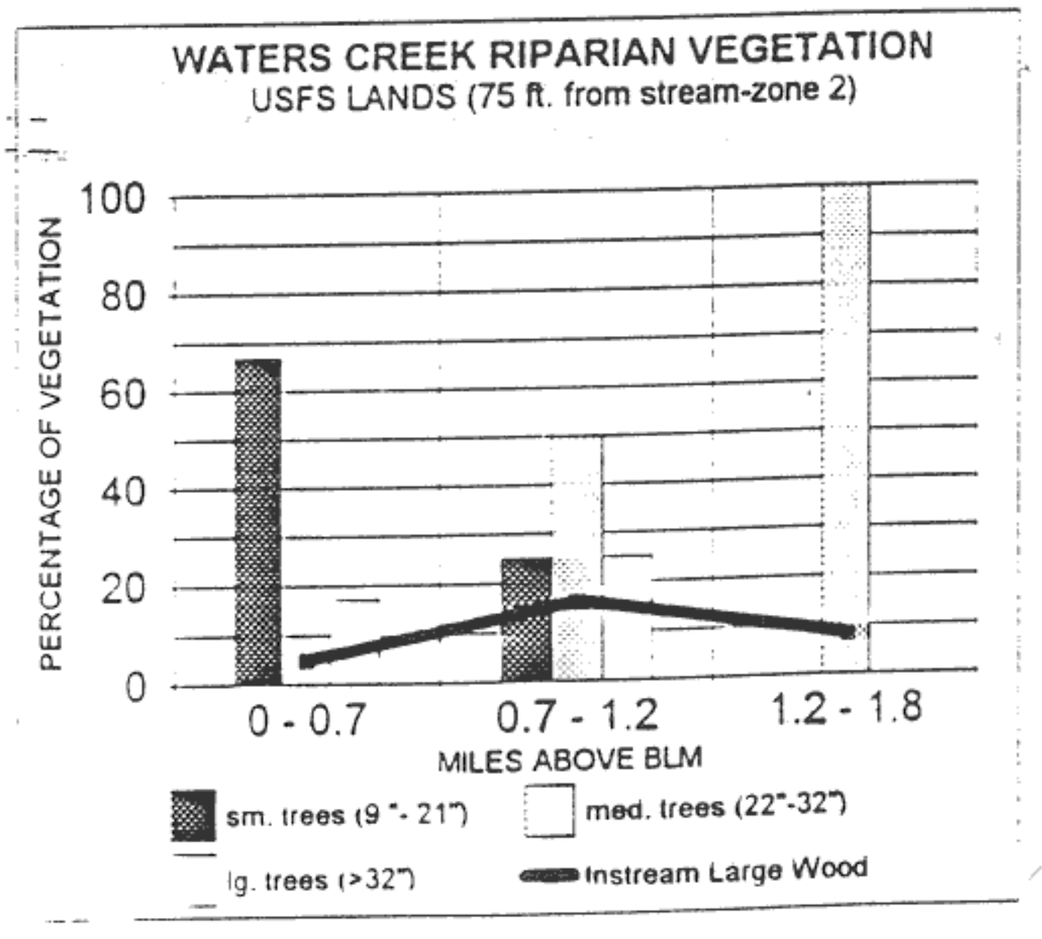

SLATE CREEK RIPARIAN VEGETATION
USFS LANDS (25 ft. from stream-zone 1)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
0-0.8
0.8-1.9
1.9-3.8
3.8-4.2
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
lg. trees (> 32")
Instream Large Wood


SLATE CREEK RIPARIAN VEGETATION
USFS LANDS (75 ft. from stream-zone 2)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
0-0.8
0.8-1.9
1.9-3.8
3.8-4.2
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
lg. trees (> 32")
Instream Large Wood


BUTCHERKNIFE CREEK RIPARIAN VEGETATION
USFS LANDS (25 ft. from stream-zone 1)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
1.3-1.5
1.5-2.3
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
Instream Large Wood


BUTCHERKNIFE CREEK RIPARIAN VEGETATION
USFS LANDS (75 ft. from stream-zone 2)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
1.3-1.5
1.5-2.3
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
Instream Large Wood


WATERS CREEK RIPARIAN VEGETATION
USFS LANDS (25 ft. from stream-zone 1)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
0 - 0.7
0.7 - 1.2
1.2 - 1.8
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
Instream Large Wood


WATERS CREEK RIPARIAN VEGETATION
USFS LANDS (75 ft. from stream-zone 2)
PERCENTAGE OF VEGETATION
100
80
60
40
20
0
0 - 0.7
0.7 - 1.2
1.2 - 1.8
MILES ABOVE BLM
sm. trees (9 "- 21")
med. trees (22"-32")
lg. trees (>32")
Instream Large Wood

Cheney Slate Watershed Road Information

T.	R.	Sec.	Seg.	Name	O&C	PD	Other	Total Miles	Srf. Type	Sub. Wid.	Srf. Dp.	Who Ctrls.	Cus. Mtn.	Opr. Mtn.	Who Mtn.	Comments
36S	07W	25.00		Cricket	.73	0	.11	.84	NAT	14'		BLM	2	2	BLM	
37S	06W	06.00		Wilderville Ridge	.71	0	.27	.98	ABC	14'	6"	BLM	3	3	BLM	
37S	06W	07.00		Wilderville Sp	.73	0	0	.73	ABC	14'	6"	BLM	3	3	BLM	
37S	06W	15.00		Jackson Creek	.51	0	.30	.81	NAT	14'		BLM	2	2	Other	
37S	06W	17.01		Bull Creek Sec. 17	.28	0	.03	.31	NAT	14'		BLM	1	1	BLM	
37S	06W	20.00	A	Bull Creek	0	0	.56	.56	PRR	14'	6"	BLM	3	3	BLM	
37S	06W	20.00	B	Bull Creek	1.70	0	0	1.70	PRR	16'	8"	BLM	3	3	BLM	
37S	06W	20.00	C	Bull Creek	.56	0	0	.56	NAT	17'		BLM	2	2	BLM	
37S	06W	29.00		Bull Creek Spur A	.45	0	0	.45	NAT	14'		BLM	2	2	BLM	
37S	06W	29.01		Bul Ridge Spur B	.50	0	0	.50	PRR	14'	8"	BLM	3	3	BLM	
37S	06W	29.02		Manasses A Sp	.79	0	0	.79	NAT	14'		BLM	2	2	BLM	
37S	06W	29.03		Manasses B Sp	.72	0	0	.72	GRR	14'	8"	BLM	3	3	BLM	
37S	06W	29.04		Manasses D Sp	.20	0	0	.20	NAT	14'		BLM	2	2	BLM	
37S	07W	02.00	A	Old Railroad Grade	0	0	.42	.42	NAT	10'		PVT	1	1	Other	
37S	07W	02.00	B	Old Railroad Grade	.18	0	0	.18	NAT	10'		BLM	1	1	BLM	
37S	07W	02.00	C	Old Railroad Grade	0	0	.05	.05	NAT	10'		PVT	1	1	Other	
37S	07W	05.00		Bear Water	.22	0	0	.22	NAT	14'		BLM	2	2	BLM	
37S	07W	07.00		Slate Creek X Sp	.76	0	0	.76	NAT	14'		BLM	2	2	BLM	
37S	07W	07.01		Slate Creek B Sp	2.58	0	0	2.58	NAT	14'		BLM	2	2	BLM	
37S	07W	07.02		Slate Creek C Sp	.13	0	0	.13	NAT	14'		BLM	2	2	BLM	
37S	07W	07.03		Slate Creek D Sp	.09	0	0	.09	NAT	14'		BLM	2	2	BLM	
37S	07W	07.04		Slate Creek E Sp	.08	0	0	.08	NAT	14'		BLM	2	2	BLM	

Cheney Slate Watershed Road Information

T.	R.	Sec.	Seg.	Name	O&C	PD	Other	Total Miles	Srf. Type	Sub. Wid.	Srf. Dp.	Who Ctrls.	Cus. Mtn.	Opr. Mtn.	Who Mtn.	Comments
37S	07W	07.05		Slate Creek F Sp	.10	0	0	.10	NAT	14'		BLM	2	2	BLM	
37S	07W	07.06		Slate Creek K Sp	.52	0	0	.52	NAT	14'		BLM	2	2	BLM	
37S	07W	07.08		Slate Creek Y Sp	.11	0	0	.11	NAT	9'		BLM	2	2	BLM	
37S	07W	07.09		Slate Creek Z Sp	.06	0	0	.06	NAT	14'		BLM	2	2	BLM	
37S	07W	08.00	A	Salt Creek	0	0	.55	.55	NAT	14'		PVT	2	2	Other	
37S	07W	08.00	B	Salt Creek	.26	0	0	.26	NAT	14'		BLM	2	2	BLM	
37S	07W	10.00	A	Elliott Creek	1.23	0	.23	1.46	PRR	14'	6"	BLM	3	3	BLM	
37S	07W	10.00	B	Elliott Creek	1.02	0	.26	1.28	PRR	14'	6"	BLM	3	3	BLM	
37S	07W	10.00	C	Elliott Creek	1.07	0	0	1.07	PRR	14'	6"	BLM	3	3	BLM	
37S	07W	10.00	D	Elliott Creek	.38	.29	0	.67	PRR	14'	6"	BLM	3	3	BLM	
37S	07W	13.00	A	Cheney Creek	.09	0	0	.09	ASC	16'	6"	BLM	2	3	BLM	
37S	07W	13.00	B	Cheney Creek	.53	0	.31	.84	GRR	14'	6"	BLM	2	3	BLM	
37S	07W	13.00	C	Cheney Creek	1.01	0	1.63	2.64	GRR	16'	6"	BLM	2	3	BLM	
37S	07W	13.01		Cheney Creek Sp	.73	0	0	.73	NAT	16'		BLM	2	2	PVT	
37S	07W	15.00		Elliott Creek Sp	1.64	0	0	1.64	NAT	14'		BLM	2	2	BLM	
37S	07W	15.01		Elliott Ridge	.57	0	0	.57	NAT	14'		BLM	2	2	BLM	
37S	07W	15.02		Hare Gulch	.52	0	0	.52	NAT	14'		BLM	2	2	BLM	
37S	07W	15.03		Elliott Creek Sp	.51	0	0	.51	GRR	17'	6"	BLM	3	3	BLM	
37S	07W	15.04	A	Hare Gulch Sp	.30	0	0	.30	NAT	14'		BLM	2	3	BLM	
37S	07W	15.04	B1	Hare Gulch Sp	0	0	.07	.07	NAT	14'		BLM	2	2	BLM	
37S	07W	15.04	B2	Hare Gulch Sp	0	0	1.02	1.02	NAT	14'		PVT	2	2	Other	
37S	07W	19.00	A	Knight Creek	0	0	.23	.23	NAT	14'		BLM	2	2	BLM	
37S	07W	19.00	B	Knight Creek	.13	0	0	.13	NAT	12'		BLM	2	2	BLM	

Cheney Slate Watershed Road Information

T.	R.	Sec.	Seg.	Name	O&C	PD	Other	Total Miles	Srf. Type	Sub. Wid.	Srf. Dp.	Who Ctrls.	Cus. Mtn.	Opr. Mtn.	Who Mtn.	Comments
37S	07W	19.00	C	Knight Creek	.70	0	0	.70	NAT	12'		BLM	2	2	BLM	
37S	07W	19.01		Knight Creek Sp	.50	0	0	.50	NAT	14'		BLM	2	2	BLM	
37S	07W	21.00		Eliott Ridge A Sp	1.29	0	0	1.29	NAT	14'		BLM	2	2	BLM	
37S	07W	21.01		Eliott Ridge B Sp	1.11	0	0	1.11	NAT	16'		BLM	2	2	BLM	
37S	07W	21.02		Eliott Ridge C Sp	.54	0	0	.54	NAT	16'		BLM	2	2	BLM	
37S	07W	21.03		Eliott Ridge D Sp	.53	0	0	.53	NAT	14'		BLM	2	2	BLM	
37S	07W	21.04	A1	Eliott Creek Sp	.55	0	0	.55	GRR	17'	6"	BLM	3	3	BLM	
37S	07W	21.05		Quarry Sp	.09	0	0	.09	GRR	14'	6"	BLM	2	3	BLM	
37S	07W	22.00		Cabax Mills	.34	0	.20	.54	NAT	14'		PVT	2	2	BLM	
37S	07W	23.00	A	Upper Cheney Creek	0	0	.44	.44	NAT	14'		PVT	1	2	Other	
37S	07W	23.00	B	Upper Cheney Creek	.53	0	0	.53	NAT	14'		BLM	2	2	BLM	
37S	07W	23.01		Cheney Sec 23	.48	0	0	.48	NAT	14'		PVT	2	3	Other	
37S	07W	23.02		Cheney Sec 25	1.31	0	.21	1.52	NAT	14'		BLM	2	3	BLM	