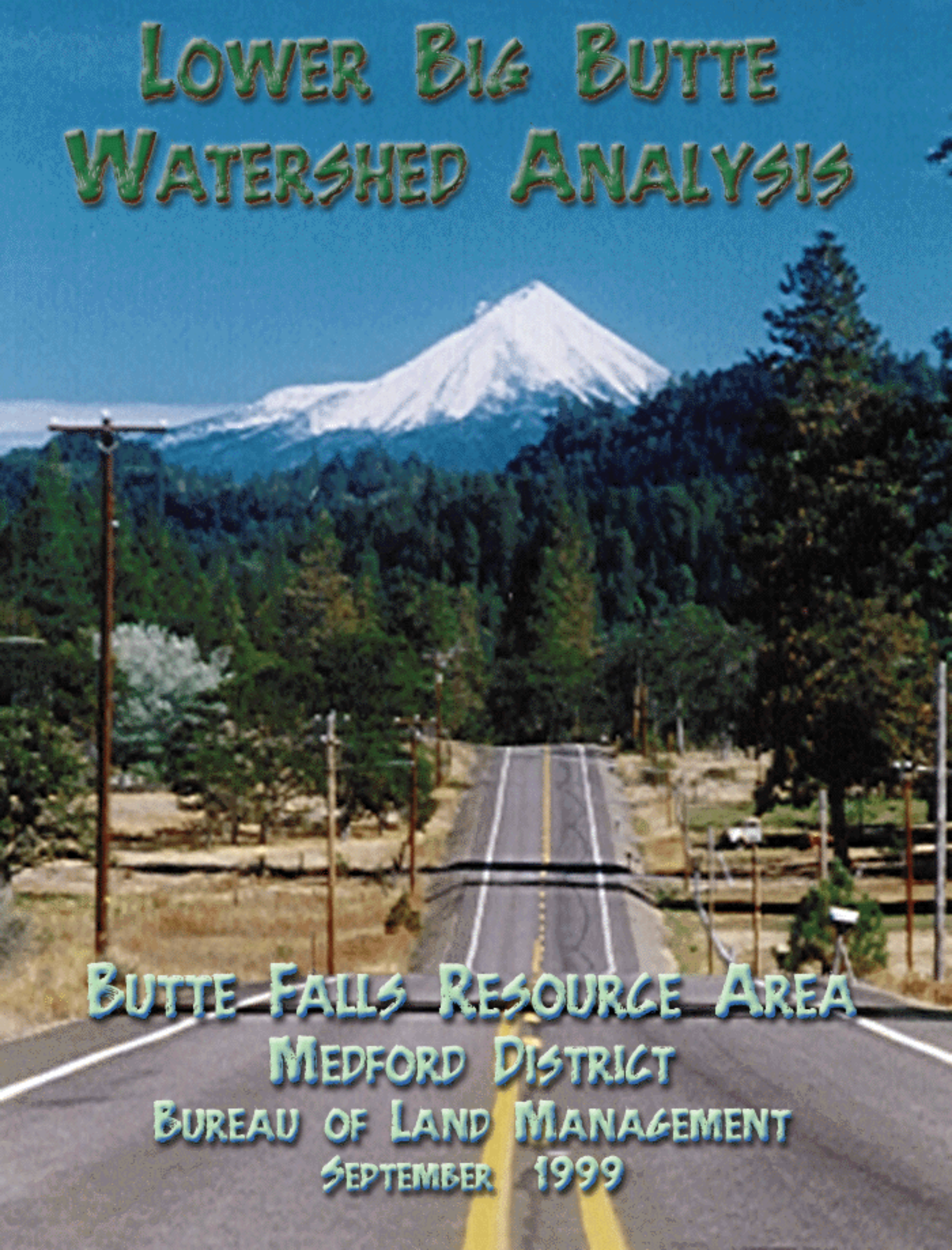
Lower Big Butte Watershed Analysis



Butte Falls Resource Area
Medford District
Bureau of Land Management
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Lower Big Butte Watershed Analysis

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1.0 CHARACTERIZATION of the WATERSHED

The purpose of step 1 is to identify the dominant physical, biological, and human processes or features of the watershed that affect ecosystem functions or conditions. The relationship between these ecosystem elements and those occurring in the river basin or province is established. When characterizing the watershed, teams identify the most important land allocations. Plan objectives, and regulatory constraints that influence resource management in the watershed. The watershed context is used to identify the primary ecosystem elements needing more detailed analysis in subsequent steps.

1.1 PHYSICAL ASPECT

1.1.a Regional Setting

The Lower Big Butte Watershed Analysis Unit (WAU) is located approximately twenty miles northeast of Medford, Oregon and consists of about 43,797 acres (68.4 square miles). Big Butte Creek is a fifth field watershed in the upper Rogue River drainage. The WAU includes portions of Townships 33, 34, and 35 South in Ranges 1 and 2 East. Lower Big Butte WAU is within the Butte Falls Resource Area, Medford District, Bureau of Land Management (BLM), located within the Western Cascade Geological Province in Jackson County. Lower Big Butte WAU is bounded by Lost Creek watershed to the north, Central Big Butte watershed to the east, Little Butte watershed to the south, and Indian Creek watershed to the west. (Maps 1&2)

1.1.b Climate

The climate of this area is Mediterranean with typically cool, wet winters and hot, dry summers. Summer temperatures range from the 80s to the high 90s. Occasional daytime temperatures in the summer may reach 100^{+} degrees Fahrenheit (^{B}F). Winter lows may drop to 10^{B} or 20^{B} F. Annual precipitation ranges from 35 to 50 inches. Typically, most precipitation occurs in the late fall, winter, and early spring as rainfall, with the exception of the higher ridges where snow accumulates.

1.1.c Topography

The elevation within the WAU ranges from 1800 feet along McNeil Creek east of the junction of Crowfoot Road and the Butte Falls Highway to 4880 feet near Summit Prairie. The ridges forming this watershed are primarily Southwest to Northeast in alignment with an array of aspects in the watershed. Within the watershed there are areas of flatter, plateau type landform in addition to the steep topography found in mountainous terrain.

1.1.d Geology

The watershed is generally divided by two geologic provinces. The western and southern portions of the watershed are dominated by the Western Cascade volcanics while the eastern and northern portions are dominated by the High Cascade volcanics. A distinction in drainage patterns can be observed in the two "eco-regions" which are based on the geologic province.

1.1.e Soils

This watershed is characterized by two distinct geographic areas. The northeast portion of the watershed is higher in elevation, has an higher annual rainfall, and lower temperature regimes when compared to the southwest portion of the watershed. These two areas also have distinctively different underlying geologic parent materials on which the soils have formed.

The northeast portion of the watershed is occupied by soils that have been predominantly formed in colluvium from volcanic andesitic rocks (i.e. Clark Creek, Dog Creek, Box Creek, and Geppert Butte area drainages). The most extensive soils are the Freezner, Geppert, Farva, Pinehurst

soil series and in the higher rainfall areas are the Dumont and Coyata soil series. The Freezner, Pinehurst, and Dumont soils are typically deep (40-60 inches) and fine loamy textured. The Geppert, Farva, and Coyata soils are moderately deep (20-40 inches) and are skeletal (greater than 35% rock fragments in the subsoil).

The soils in the southwest portion of the watershed have formed predominantly in parent materials from weathered volcanic tuffs and breccia. These soil types usually are shallow to moderately deep and have high amounts (greater than 30%) of shrink-swell clays. The dominant soil series are the Medco, McNull, Carney, and Coker. The high amount of clay in these soils is most influential characteristic on how these soils respond to disturbance, on what types of vegetative communities they support, and on the formation of the landscape in the portion of the watershed.

1.1.f Water Rights

The BLM has three existing exempt reservoir notices filed with the Oregon Water Resources Department. (Map 3)

Water rights and the appropriation of water within the permitted quantity under existing permits is a concern in this watershed when rural interface landowners may be affected by upstream uses of surface water streams. Unauthorized water withdrawals are thought to occur, but the extent and effect is unknown at this time.

Table 1. Water Developments With Water Rights or Exempt Status For Lower Big Butte Watershed.

ID. No.	Legal Description	Name/ Year Exemption Filed	Uses	Quantity cfs
319	T.35S.,R.2E.19 NE 1/4 NE 1/4	Geppert Butte/ Pump Chance - 1997	W-0.0001 cfs L-0.001 cfs	0.0011 cfs
358	T.34S.,R.2E.9 NW 1/4 SE 1/4	S. Fk. Clark Creek/ Pump Chance - 1997	W-0.0001 cfs L-0.001 cfs R-0.023 cfs	0.0241 cfs
437	T.34S.,R.2E.26 NE 1/4 NE 1/4	Fredenburg Helipond - 1997	W-0.0001 cfs L-0.001 cfs R-0.023 cfs P-0.017 cfs	0.0411 cfs

L=Livestock, P=Prescribed Fire, R=Road Operations, W=Wildlife

1.1.g Hydrology and Water Distribution

Big Butte Creek is a principal tributary to the Rogue River. Generally, Big Butte Creek flows northwest and empties into the Rogue just below Lost Creek Dam. The drainage area of this WAU includes mostly lower elevation valley foothills and the lower slopes of the Cascade Range. The upper portion of Big Butte Creek, the North and South Forks drain the western slopes of the Cascade Range. (These WAUs were discussed in Upper and Central Big Butte.)

Seven major tributaries feed the lower reaches of Big Butte Creek. McNeil Creek and Crowfoot Creek drain the western and southern foothills and flow in a north and easterly direction, while Vine Creek, Clark Creek, Gray Creek, Dog Creek, and Box Creek originate from Round Mountain and Fredenburg Butte region (Map 4). Stream reaches are generally constrained by high terraces, hillslopes and some V-shaped valley types. Floodplains within the reaches surveyed are

narrow and generally restricted by confining terraces.

A portion of the Ginger Springs Municipal recharge area lies in the southeast corner of the Lower Big Butte WAU. Through the southern portion of the watershed, the Eagle Point Irrigation District canal and two Medford Water Commission water distribution lines course their way on a gentle grade to the valley below. (Map 5)

There are approximately 162 stream miles in the Lower Big Butte Watershed. (Map 6) Table 2 displays stream miles by characterization following the Northwest Forest Plan (NWFP) stream categories (i.e. fish-bearing, intermittent).

Table 2. Stream Miles by Category

Fish Bearing Miles	Perennial Non-Fish Bearing Miles	Intermittent Stream Miles	Total Stream Miles
47	36	79	162

1.2 TERRESTRIAL ECOSYSTEM

1.2.a Forest Vegetation

Based upon the Medford District plant grouping criteria addressed in the Medford, 1992 District Resource Management Plan (DRMP), three plant groupings are identified within the Lower Big Butte WAU (Map 7). Plant groupings are aggregations of plant associations with similar management potential, with the same dominant late-seral conifer species, and the principal early-seral species. Table 3 summarizes these plant associations.

Table 3. Plant Associations

Species	Acreage	Percent
Douglas fir/ponderosa pine Ceanothus/herbaceous	23,901 ac.	55%
mixed conifer interior valley/grass	5,742 ac.	13%
white oak/ponderosa pine manzanita/wedgeleaf/grass	14,154 ac.	32%

1.2.b 15% Late-Successional Forest Lands

Lower Big Butte Watershed is part of the fifth field Big Butte Watershed. Analysis for the 15 percent late-successional lands within a watershed is based upon fifth field watersheds. The Big Butte Watershed is above the 15 percent threshold that the NWFP Standard and Guideline addresses.

Of the federal forest ownership (82,393 acres), 12,359 acres are necessary to meet the 15 percent threshold. Using the forest land allocations: Riparian Reserves, Owl Cores, Connectivity Blocks, and Withdrawn Lands, the entire watershed is at 29 percent (24,000 acres) for late-successional stands. No timber management activities are planned for these areas other than activities which would enhance late-successional characteristics.

1.2.c Special Status Plants

Soil, elevation, precipitation, aspect, and the intermingled vegetative community influence the distribution of vegetation and Special Status plants. Locations of Special Status plants are discovered during surveys prior to ground disturbing activities. Vascular plant surveys have occurred over the past ten years on 2,575 acres in the Lower Big Butte watershed. Over 1,600 acres were surveyed in 1999. Six Special Status species are known to occur in this watershed on 23 sites.

Non-vascular plant species are less dependant upon geologic and soil origin and more reflective of the vegetative community diversity, composition of the communities and climatic influences within the watershed. Lower Big Butte watershed provides a broad habitat spectrum for non-vascular plant species that include open Oregon white oak grasslands, mixed hardwood/ conifers, mixed conifers, and dense, cool, humid, riparian vegetative communities. Two newly reported species of particular interest are aquatic lichens found in small perennial and intermittent streams. *Leptogium rivale* and *Hydrothyria venosa* are Survey and Manage category 1 species which occur on rocks in perennial streams. *Leptogium rivale* was found for the first time in intermittent streams. *Hydrothyria venosa* was discovered in 34-2E-29 and is currently the only reported site of this species on the Medford District. *Plectania milleri* is a cup-fungi discovered in the watershed during the spring 1999 fungi surveys. This species is unusual throughout the Pacific Northwest but appears to be more prevalent in southwest Oregon. The voucher specimens collected and sent to the Oregon State mycology lab may be an undescribed species.

Appendix A is a list of vascular and non-vascular Special Status plants, location, and species status discovered in Lower Big Butte Watershed.

1.2.d Noxious Weeds

Although noxious weeds are not as prolific in this watershed as in others, they still occur in enough abundance to be of concern. (Map 8) Canada thistle. Meadow knapweed, Puncturevine, Scotch broom, Skeletonweed, and Yellow starthistle are all capable of expanding their existing populations. Most of the noxious weeds found in this watershed are sun-loving plants, and as such, will not move quickly into areas shaded by trees.

1.2.e Area of Critical Environmental Concern (ACEC)

Poverty Flats ACEC was designated in 1995 RMP-ROD as an ACEC in the Butte Falls RA. The ACEC is located along the Butte Falls Highway approximately 3.5 miles west of Butte Falls in T34S, R2E, section 31. (Map 7) The area was designated as an unusual natural ecosystem that developed over a shallow soil, basalt bedrock outcrop and includes a unique vernal pool wetlands ecosystem. A subspecies of Meadow-Foam (*Limnanthes floccosa ssp. bellingeriana*), a Special Status Plant Species (Bureau Sensitive Species) occurs in the vernal pool wetlands. One small population of *Scribneria bolanderi* was found on upper edge of a vernal pool. A secure population of *Perideridia howellii* was found along the outlet of the vernal pool area in flowing water. Another species of note was *Woodsia scopulina* found in rock crevices in the cliffs along the southwest edge.

Although this unique botanical area supports one of the few known populations of Bellinger's meadow-foam, it is covered with non-native plants including a small population of yellow star thistle in the interior and a larger one in the parking area. The greater threat is from moist site grasses such as velvet-grass (*Holcus lanatus*) and witchgrass (*Panicum capillare*) that occupy some of the same habitat. Bull thistle is lightly scattered in the area but is not a threat. The ACEC was fenced in 1996 to keep cattle from disturbing the area. The Nature Conservancy is responsible for maintenance of the fence and collecting data on population dynamics of the protected species in the ACEC.

See Appendix B for a detailed species list of the Poverty Flat ACEC.

1.2.f Wildlife

The WAU provides a mosaic of habitat types which supports a diverse array of terrestrial wildlife species. Due to land ownership patterns and past management actions, late-successional habitat is highly fragmented, and large areas (in some sections, hundreds of contiguous acres) of early-seral forest are present. Late-successional dispersal habitat is provided by Riparian Reserves and the 100 acre spotted owl activity center reserves (LSR). Most of the private timberland in the WAU is in early- to mid-seral condition.

Unique features in the central and southwest part of the watershed are oak woodland/oak savannah, and grass/chaparral habitat. Although only a small part of the WAU (approximately 720 acres west of Crowfoot Road and the extreme southern part of the WAU) have been designated in the Medford District RMP as "Big Game Winter Range and Elk Management Area", the entire area provides important deer and elk habitat. Oregon Department of Fish and Wildlife studies have determined that the area is an important migration route for blacktail deer traveling from the high elevation summer ranges to the lower elevation wintering areas. (Map 9) Threatened species in the WAU include Northern spotted owl and American bald eagle. The northeastern part of the WAU is a habitat link with the Oregon Klamath and Coastal Geographical Provinces. Three sections in the northeast have been designated by U.S. Fish and Wildlife Service (USFWS) as "Critical Habitat" for the spotted owl.

1.2.g Grazing

Livestock that are permitted to graze in this watershed do so primarily on annual and perennial grasses that occur along roadsides, and within areas that have been recently logged. Newly logged units typically have a flush of new vegetation (grasses, forbs, weeds) which provide forage for livestock, as well as wildlife. As trees grow and shade out the vegetation, livestock move to other areas that have more recently been logged. (Map 10)

1.3 AQUATIC ECOSYSTEM

1.3.a Fish Passage Barriers

The primary barriers for adult and juvenile fish in the WAU are manmade structures such as culverts and irrigation diversions. In addition to human-created barriers to fish migration, there are also barriers which occur naturally such as waterfalls, steep steps, debris jams, and high stream gradient. Stream surveys have documented two large waterfalls on Clark Creek which block upstream migration, although resident cutthroat trout are found above these barriers. There is also a twenty foot waterfall on McNeil Creek which marks the upper limit of fish use. The seasonal effects of these natural features range from delayed to complete obstruction of upstream migration by adult and juvenile fish.

1.3.b Fisheries Distribution

There are approximately 47 miles of fish-bearing streams within the Lower Big Butte Creek watershed. (Maps 6 & 11) Approximately 27 miles of these streams contain anadromous fish populations including chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead trout (*O. mykiss*), and Pacific lamprey (*Lampetra tridentata*). Other native fish species in the watershed include cutthroat trout (*O. clarki)*, rainbow trout *(O. mykiss)*, and reticulate sculpin (*Cottus perplexus*).

Two Special Status fish species utilize the Lower Big Butte Creek watershed for spawning and

rearing: Southern Oregon/Northern California coho salmon (*O. kisutch*), and Klamath Mountain Province steelhead (*O. mykiss*). The National Marine Fisheries Service (NMFS) listed coho salmon in the Rogue and Klamath River basins on May, 1997 as "threatened" under the Endangered Species Act. Steelhead trout were listed by NMFS as a sensitive "at-risk" candidate in March, 1998. NMFS proposed listing the chinook salmon (*O. tshawytscha*) as "threatened" under the Endangered Species Act in February, 1998. A determination was made in September, 1999 to exclude the relatively healthier southern Oregon runs from listing at this time.

Introduced fish found in the watershed include largemouth bass *(Micropterus salmoides)*, redside shiners *(Richardsonius balteatus)*, and bluegill *(Lepomis macrochirus)*. Bluegill were documented in 1998 in the ODFW/BLM fish trap on Lower Big Butte Creek; however, complete range of distribution is unknown.

1.4 RIPARIAN ECOSYSTEM

Lower Big Butte watershed riparian vegetation consists of a mix of upland species and true riparian obligates. The riparian ecosystem can be divided into three broad riparian vegetative communities. On deep forest soils, a conifer forest community occurs in the riparian zone along with a hardwood and herbaceous understory. On moderate to shallow soils, a narrow riparian vegetative community occurs immediately adjacent to the stream channel that is dependant upon regular seasonal stream flow and is characterized mostly by hardwoods or drought resistant conifers such as incense cedar or ponderosa pine. The riparian area lacks large conifer species that provide an upper overstory canopy. The third riparian community type occurs on skeletal soils where the stream channel is dominated by bedrock. True riparian hardwood and conifer obligates are found infrequently along the edge of the stream channel or where sediments can accumulate. Generally, the vegetation is characterized by a grass, forbs, sedges and carex species that occur along a very narrow corridor with widely scattered riparian hardwood and brush species. Upland chaparral species such as deerbrush, buckbrush, or manzanita, with occasional white oak, black oak and madrone hardwoods encroach the stream channel.

Riparian areas in conifer plantations as indicated by vegetation tend generally shift to upland hardwood and brush species. The overstory canopy layer is lost and micro-climate conditions that are keystone traits of riparian ecosystem, such as temperature and humidity, are heavily influenced by upland conditions.

Many rare and unusual species such as mallow (*Iliamna latibracteata*), numerous Monkey-flower species (*Mimulus* spp.), popcorn flower (*Plagiobothrys glyptocarpus*), Howell's false caraway (*Perideridia howellii*), and Bolander's grass (*Sribneria bolanderii*) occur in riparian or seasonally wet habitats. Pacific yew (*Taxus brevifolia*) is generally restricted to forested areas in the riparian zone in Lower Big Butte watershed.

1.5 HUMAN/SOCIAL ECOSYSTEM

1.5.a Fire

Historically fire has had a large impact in shaping the vegetation within this watershed. The large patches of brush species have always been present but in a more scattered condition that created a mosaic of species of brush and grass. The large brush fields are in a mid- to late- seral condition. In the conifer forest, the fires provided a low thinning effect that would have reduced ladder fuels. In the

oak woodlands, fire would have reduced densities of oaks and maintained these sites in an early-seral state. In fire adapted ecosystems the early-seral state provides a greater diversity of species.

1.5.b People and the Land

Ownership within the Lower Big Butte watershed analysis unit is displayed in Table 4 and Map 12.

Table 4. Lower Big Butte WAU Ownership

BLM LANDS (1)	INDUSTRIAL TIMBERLAND	OTHER PRIVATE LANDS	OREGON STATE LANDS
32%	42%	26%	<.1%
14,034 ACRES	18,560 ACRES	11,179 ACRES	40 ACRES

(1) Includes 1,930 acres of Forest Service lands that were transferred to the BLM in 1999.

The Lower Big Butte watershed is characterized, and somewhat unique to other BLM managed watersheds, by its relatively large rural population base. Jackson County Assessors Office records indicate that approximately 165 taxable dwellings are inside the boundary of this watershed.

The watershed is traversed by four Jackson County roads. Road 821, commonly known as the Butte Falls Highway, brings travelers from State Highway 62 to the town of Butte Falls. Several other county roads, originating from the Butte Falls Highway, provide access to extensive rural development areas in the watershed. Road 945, Crowfoot Road, connects to Highway 62 at the mouth of Big Butte Creek. Road 949, Cobliegh Road, accesses the northeastern subwatershed of Lower Big Butte watershed in the upper Clark Creek drainage. Road 957, Obenchain Road, goes southward towards Brownsboro becoming an impassable road on the south slopes (outside of watershed). Many people live along the Butte Falls Highway and on many short private drives off of this road.

Small scale ranching, primarily cattle, occurs on much of the open pastured lots throughout the valley bottoms of this watershed. Timber harvesting may occur on the industrial and private timberlands. It is impossible to characterize the condition or management potential of these low elevation private forests.

The Eagle Point Irrigation District's main canal and Medford Water Commission pipelines run through the southern portion of this watershed. These infrastructures are accessed by numerous natural-surfaced roads. They also provide access to local residents, and others, for hunting and other authorized and non-authorized activities.

The town of Butte Falls owns and maintains a small cemetery on the Obenchain Road which dates to 1868.

There are no maintained recreation sites on BLM lands in the watershed. Recreational use in the watershed is predominately by hunters during the fall hunting season, as day-use or in informally developed dispersed campsites. Other forms of dispersed recreation, such as hiking, horseback riding, berry/mushroom picking, firewood gathering, occur throughout the watershed.

2.0 ISSUES and KEY QUESTIONS

The purpose of step 2 is to focus the analysis on the key elements of the ecosystem that are most relevant to the management questions and objectives, human values, or resource conditions within the watershed. The applicability of the core questions and level of detail needed to address applicable core questions is determined. Rationale for determining that a core question is not applicable are documented. Additional topics and questions are identified based on issues relevant to the watershed. Key analysis questions are formulated from indicators commonly used to measure or interpret the key ecosystem elements.

Issue: VEGETATION

Vascular Plants

1. What is the current stand distribution and trend condition within the watershed?
2. What exotic and non-native species, or locally rare and endemic species are present in the watershed? What is their relative abundance and distribution?
3. What are the current habitat conditions and trends for non-native species and noxious weeds?
4. What is the current condition of forest disease and insect problems within the watershed?
5. What special status plant species have been discovered within the watershed, what is their habitat, abundance and distribution?
6. What special status plant species are likely to occur within the watershed, and what is the habitat associated with the species?
7. How many acres of sensitive plant surveys have occurred in the watershed over the past 10 years?
8. What unique or special habitats occur within the watershed (meadows, rock outcrop, riparian/aquatic) and their relative abundance?

Nonvascular Survey and Manage Plants

1. What Survey and Manage nonvascular plants occur within the watershed and what is their habitat, abundance and distribution?
2. What Survey and Manage nonvascular plants are likely to occur within the watershed, and what is their likely habitat?

Issue: WILDLIFE

1. Where is the designated spotted owl Critical Habitat in the WAU? What are the management options for Critical Habitat?
2. What T&E wildlife species are present in the watershed and how does the watershed provide habitat of those species relative to their entire range?
3. How can connectivity for late-successional dependent species be retained within the watershed?
4. What Special Status species, Survey and Manage species, and protection buffer species are present in the watershed? What level of survey has occurred? What can be done to protect those populations which are considered at-risk from management actions?
5. Where is the deer winter range or designated big game management areas? What is the trend of the herds.
6. Where are there road closure opportunities to protect wildlife?
7. Are there any habitat improvement project opportunities?

8. Are there any special habitats in the WAU? Are any management actions needed to protect or preserve these habitats?

Issue: AQUATIC ECOSYSTEM

Stream Channels

1. What was the relative historic condition of these channels, and what is the current condition and expected trend?
2. What human activities and natural disturbance events have affected these channels?
3. What human activities and natural processes have affected the drainage patterns?
4. What areas are in need of restoration and what type of restoration is needed?

Water Quantity and Quality

1. What is the current flow regime in the watershed and what factors influence this regime?
2. What are the potential sources of changes to base and peak flows and where are these located in the watershed?
3. What are the relationships between the flow regime, fish, and fish habitat in the watershed?
4. How have human activities and natural processes affected stream temperature historically and currently?
5. What effect is non-point source sedimentation having on fish species and aquatic habitat?

Aquatic Wildlife and Habitat (Macroinvertebrates /Aquatic mollusks)

1. What special status species exist in the watershed?
2. What are the habitat conditions required for these species and how are they being affected by human activities and natural processes?

Fish Species and Habitat

1. What are the natural and human-created barriers to fish migration and where are they located within the watershed?
2. What are the effects of individual passage barriers on fish distribution based on fish species, potential habitat above the barrier, and degree of obstruction to migration?
3. What is the current escapement level and trend of anadromous salmonid species within the watershed and how does this vary from historic levels?
4. What human activities or natural processes are influencing fish population trends relative to historic population numbers?
5. What is the current condition and trend of aquatic habitat based on relevant aquatic indicators (i.e. ODFW benchmarks)?
6. What natural processes or human activities have influenced historic and current habitat conditions?
7. What areas are in need of restoration and what type of restoration is needed?

Issue: RIPARIAN ECOSYSTEM

1. What are the general physical characteristics of streams channels within the watershed? (i.e., channel geomorphology, substrate, sinuosity, gradient, and stability.)
2. Where are the current unstable areas and potential unstable areas within the watershed? How many miles of stream occur within unstable areas? Where are the highly erodible soil types and what is the expected impacts to the riparian and aquatic ecosystems? How many miles of stream occur on highly erodible soils?

3. What was the reference condition of headwater streams, wetland areas and springs as they relate to biological and physical components?
4. What are the main anthropogenetic activities that have altered stream morphology, sinuosity, stability, and any other physical characteristics of streams, wetlands, and springs? What relationship is there between these activities and stream functioning condition? Where are the most severely altered systems located? How many miles of roads occur within the Riparian Reserve?
5. What artificial structures are within the watershed? Where are they located and how do they impact the aquatic and riparian ecosystem?
6. What are the main riparian vegetative characteristics within the watershed?
7. How many miles of streams within the watershed on federal lands are properly functioning, functioning-at-risk, and non-functioning?
8. What special status animal or plant species, or Survey and Manage species would likely occur and benefit from Riparian Reserves in the watershed?
9. How many acres of Riparian Reserves (based on a site tree of 180 feet) occur on federal lands within the watershed? How many acres are 20-years of age or younger?
10. What opportunities for stream and riparian restoration exist within the watershed and where are they located?
11. What is the risk of catastrophic fire events within the Riparian Reserve?

Issue: SOILS

Slope Stability

1. Where are landslides most likely to occur within this watershed?
2. What are the soil types and the landforms associated with the highest risk for landslides?
3. What human caused activities have affected the landslide risk the most?
4. What are the effects of landslides on surrounding ecosystems found within this watershed?

Soil Productivity

1. What soil types are at most risk to a reduction of productivity from management activities?
2. What are the soil properties and the type of management activities that most contribute to this risk?
3. What are the effects of soil productivity losses on the surrounding ecosystem?

Soil Erosion

1. What and where are the historic sources of non-point sedimentation and what and where are the current sources of non-point sedimentation?
2. What management activities create the highest risk for increasing non-point sedimentation?
3. What are the effects of non-point sedimentation on the surrounding ecosystem?

Cumulative Effects

1. What are the cumulative effects that create the most risk of altering hydrologic function and aquatic habitat within this watershed and why?
2. What are the factors that increase the risk of these cumulative effects?
3. Where is risk highest within the watershed from these cumulative effects?
4. What are the impacts of these cumulative effects on the surrounding ecosystem?

Issue: FIRE

1. How has fire historically influenced this ecosystem?
2. What risk is the current condition posing?
3. What would be the effect of reintroducing fire into the ecosystem?
4. What is the feasibility of reintroducing fire into the ecosystem?

Issue: TRANSPORTATION

1. What are the characteristics of BLM roads within each stratification unit according to drainage type, distance to streams, whether road drainage reaches stream, character of road cut, character of road ditch, cut and fill erodability classes, road surfacing material, length of flow along the bearing surface; number, type, and condition of stream crossings, and other characteristics that influence erosion rates and sediment delivery to streams?
2. What are the general conditions of non-BLM roads?
3. What opportunities exist to reduce impacts from roads in the watershed?

Issue: GRAZING

1. How and to what degree does livestock grazing impact other programs and resources within the watershed?
2. What role does private land grazing play in this watershed?
3. How do other activities impact livestock grazing within this watershed?

Issue: HUMAN USES

1. Who are the people most closely associated with and potentially concerned about this watershed?
2. What are the major ways in which humans interact with the watershed?
3. Where are the primary locations for human use of the watershed?
4. What are the current human uses and trends in the watershed (economic, recreational, residential development, other)?
5. What are the current conditions and trends of the relevant human uses in the watershed:
    a. authorized and unauthorized uses
    b. logging
    c. special forest products
    d. grazing/agriculture
    e. cultural resources
    f. recreation
6. What are the influences and relationships between human uses and other ecosystem processes in the watershed?
7. What are the anticipated social or demographic changes that could affect ecosystem management?
8. What human interactions have been and are currently beneficial to the ecosystem and can these be incorporated into current and future land management practices?
9. Where can the sale of non-timber resources be proposed in the watershed that may have a beneficial affect on forest health during the next 10 year planning cycle?
10. How can the Special Forest Products (SFP) program management provide a positive

social benefit while not degrading the ecosystem?

11. What is the need for future recreational sites within the watershed?

3.0 DESCRIPTION of CURRENT CONDITIONS

The purpose of step 3 is to develop information - more detailed than the characterization in step 1 - relevant to the issues and key questions identified in step 2. The current range, distribution, and condition of the relevant ecosystem elements are documented.

3.1 FOREST HEALTH

Three structural elements within a forest ecosystem are critical in maintaining ecological diversity and complexity. These are:

Matrix - "The most connected portion of the landscape" (not the same as the FEMAT "Matrix land" designation). It is generally the predominant vegetative type and therefore exerts the strongest control over the movement of living and non-living things across the landscape (fire, wind, plant, people). The matrix affects the rate at which various disturbances move through the landscape.

Patches - Patches are distinct areas different from the general landscape around them.

Corridors - Provide routes between similar seral stages or vegetative types, corridors may include roads, riparian areas, streams, power lines, and timber.

Table 5. Lower Big Butte Vegetation Distribution - All Ownerships

Agriculture Lands	Conifer Early Seral (0-5"dbh)	Conifer Mid Seral (5"-11"dbh)	Conifer Late Seral (12"-21" dbh)	Conifer Mature Seral (22" + dbh)	Other Lands	Barren (Rock)
8%	16%	38%	7%	4%	26%	<.2%
3,671 ac.	7,005 ac.	16,770 ac.	2,976 ac.	1,935 ac.	11,345 ac.	113 ac.

Note: See Map 13

3.1.a Matrix

The matrix forest stages of the Lower Big Butte WAU are defined as early-successional forest. The early- and mid-seral stages make up approximately 54 percent of the landscape and provide the strongest influence over landscape flows. An additional category that influences the landscape within this watershed is the non-forest lands representing 26 percent of the watershed.

Early-Seral: Grass/forb to seedling/sapling, <5"diameter. "From disturbance to the time when crowns close and conifers or hardwoods dominate the site. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly, gradually replacing grasses, forbs, or brush as the dominant vegetation. Forage may be present. Hiding or thermal cover may not be present except in rapidly sprouting brush communities" (Medford RMP, 1995).

Mid-Seral: Poles (5"-11" dbh) "From the time crown closure occurs to the time when conifers would begin to die from competition. Stands are dense and dominated by conifers, hardwoods, or dense brush. Grass, forbs, and herbaceous vegetation is decreasing. Hiding cover for big game is usually present" (Medford, RMP 1995).

The early-successional matrix is most often initiated through logging, and to a lesser degree, fire. The composition, structure, and function of these early-successional forests are somewhat different from those that would be initiated by natural causes. These differences include:

- fewer number of snags remaining, particularly larger diameter classes.
- more soil disturbance from logging, road building, and site preparation affecting post-disturbance plant succession.
- reduction in amount, size, and distribution of woody debris.
- planted species (8' x 8') spacing grid vs. natural (random) spacing. Douglas-fir and ponderosa pine are the principal species planted. Under natural conditions, the species mix would also include hardwoods and a higher proportion of shrub species. Trees are planted all at once as opposed to natural regeneration which occurs over time providing a greater variability of age classes.
- the rate of physical/structural change is more rapid due to intensive silvicultural treatments.
- large, fire tolerant, remnant trees are not present as a scattered stand component.
- some plantations have a higher component of ponderosa pine than would naturally be found on the site.

A landscape's stability is a measure of constancy in the absence of major disturbance. Seedling/sapling and pole size stands can be categorized as unstable as the rate of structural change is relatively rapid compared to stable, slow changing old-growth stands.

Other Lands (Non-Forest) includes 26 percent of the landscape. Lands are classified as non-forest due to shallow soils, and usually, south aspects. Due to site condition, these lands do not produce sustainable timber products although the vegetation is stable unless modified by disturbance events. Growth and vegetative change is slow. Canopy closure is generally open though some areas may provide hiding and thermal cover for wildlife. During the winter these areas may be important for wildlife forage.

The non-forest lands are generally grasslands, meadows, chaparral or white oak vegetative communities that have developed as a result of shallow soils or an extremely hot, dry environment. Current condition of these lands is not well documented at this time. Fire occurs frequently on these sites. Due to harsh site condition, the development of conifers is limited. The lands are vegetated with grasses, brush, and hardwoods which are better competitors than the conifers.

Approximately, 42 percent of the Lower Big Butte forest landscape is privately held and managed by small woodlot owners or by industrial forest corporations. On these lands, the majority of merchantable overstory trees have been removed, leaving younger, and smaller Douglas-fir with lesser amounts of ponderosa pine, incense cedar, and scattered hardwoods. BLM managed lands have undergone harvest practices ranging from salvage to clear-cut, resulting in approximately 8 percent of BLM ownership in seedling/sapling and pole sized stands.

3.1.b Patches

Patches are areas distinctly different from the landscape around them. As a result of logging, fires, and terrain, timber stands and agricultural lands have become the "patches" within the lower Big

Butte landscape. Two types of forest patches and agricultural areas can be identified and described. The description of small sawtimber and large sawtimber apply to unentered/unmanaged stands. Where management has occurred stand conditions will vary.

> *Late Seral* (small sawtimber, 11"-21" dbh). "Stand growth slows. Forest stands are dominated by conifers and hardwoods, canopy closure approaches 100 percent with stand growth decreasing. Stand diversity is minimal. Conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions" (Medford RMP,1995).
>
> *Mature Seral* (large sawtimber, 21"+ dbh). "Forest begins to develop structural diversity. Conifer and hardwood growth gradually declines. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover and some forage are present. With slow growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed" (Medford RMP,1995).
>
> *Agricultural lands*. In addition to producing a land condition that is non-forested, these lands are part of the twenty-six percent of other private lands within the landscape that creates the rural interface of this watershed.

Compared to the landscape matrix, all three patch types are considered stable though agricultural acreage is maintained by human activities. In the forest patches, the older the stand, the less likely that the structure and composition elements will change significantly over time, and any change that does occur would be slow.

The majority of the small and large sawtimber patches within the Lower Big Butte landscape are located on federally managed lands. The checkerboard ownership pattern has resulted in a highly fragmented landscape. The location and amount of patches within the matrix has created a high degree of contrast, porosity, and edge effect across the Lower Big Butte landscape. Edge represents the interface area between two distinctive vegetative/size classes. Environmental conditions (temperature, light, wind, and humidity) are different within this area, resulting in a drier, windier microclimate along the stand edge. Generally, a 500 foot wide strip adjacent to the edge is affected. The altered microclimate in this area causes a successional change in the species mix and density of herbaceous vegetation and shrub species. Patches of twenty-five acres or less are, in effect, all edge.

3.1.c Corridors

Corridors provide travel routes for plants, animals, and people between similar size classes or vegetative types. Roads, riparian areas, and streams are the primary corridors in the Lower Big Butte landscape. One of the bigger problems in these corridors is the migration of noxious weeds. Road construction equipment and vehicles traveling along establishes roads transport plant parts and seeds, thereby exacerbating the problem.

3.1.d Poverty Flat ACEC

As a result of an agreement between Medco Corporation, The Nature Conservancy, and the BLM (signed June, 1993), a 4-strand barbed wire protection fence was constructed around the

populations of Bellinger's meadowfoam and pygmy monkeyflower, located in the Poverty Flat area in July, 1994. (Map 7) The Medco Corporation allowed the fence to be constructed, the BLM provided materials and administered the construction contract, and The Nature Conservancy agreed to maintain the fence yearly and provide the BLM with monitoring plans for the two protected species.

During the planning phase of the project, intentional short-term livestock grazing was identified as a possible tool for continuing and improving vigor of the vegetation within the exclosure. To date, this tool has not been utilized.

The lands once belonging to the Medco Corporation have since been sold to Lone Rock Timber Company. It is not known whether this agreement signed in 1993 was transferred in its entirety or not, or is still being honored.

Where deeper soils occur within the ACEC, the vegetation composition changes quickly to a hardwood/brush species collection dominated by Oregon ash, Oregon white oak, madrone, manzanita, and into ponderosa pine and Douglas-fir stands. A different assemblage of shade tolerant grasses, annuals and perennials occur under the conifer/hardwood overstory.

The area has not been surveyed for non-vascular plant species. Likely habitat occurs in the ACEC for a variety of species. *Bryoria tortuosa*, and *Lobaria hallii* are known to occur in similar habitat with black oaks and ponderosa pine.

3.2 SOIL

3.2.a Erosion Processes

The western portion of the watershed differs from the eastern portion in that there is less conifer timberlands with more oak/grasslands and rocky meadows. The topography is relatively flat with gentle slopes and low stream gradients. Also, the land ownership is predominantly small woodlot owners, ranchers, and residential homesites with scattered blocks of private and federally owned timberlands. The result is that the impacts on the soil resource come more from roads accessing homes, recreational jeep trails, and to a lesser extent, cattle and wildlife grazing and timber harvest activities. These soils usually are highly erodible, subject to soil productivity losses associated with compaction, and are prone to slope instability (slumping) particularly when disturbed.

Soil erosion and subsequent sedimentation of local stream channels in the western portion of the watershed result predominantly from an extensive network of roads and jeep trails. The majority of these roads are natural surfaced and unmaintained and are on, or access, private lands. During rainstorms and spring stream high flows, runoff from these roads contribute the majority of suspended sediments to the stream system. Due to land ownership patterns (very scattered public interspersed with mostly private) it is difficult to improve or maintain a majority of these roads.

Although the soil types in this portion of the watershed have formed in volcanoclastic parent materials which are prone to mass wasting, there are very few identified landslides or major slumps. There are, however, some smaller areas (typically less than one-half acre) that show signs of slope instability such as jackstrawed trees, tension cracks, hummocky ground, and perched watertables. These areas can produce stream sediments when poor drainage on roads activate slumping or rechannelize waterways. Maintaining some or all of the vegetative cover in areas exhibiting instability can also reduce or slow down potential mass soil movement.

Hillslope erosion in the form of rills and gullies from skid roads does occur in some areas where tractor yarding has been utilized. The amount of sediments and extent of soil compaction from tractor yarding is considered to be at a low level. This is primarily due to relatively low amounts of commercial

timberlands in this portion of the watershed.

The soils in the eastern portion of the watershed typically are very productive and support commercial forestlands. The topography is relatively gentle with broad ridgetops, expansive flat benches, sideslopes commonly less than 35 percent, and wide drainageways with steeper side slopes and incised drainageways in upper elevations and in the headwaters. The overall slope stability (landslide potential) is considered to be at a low level of risk primarily due to these stable landform features. Currently, there are very few observable slumps or landslides in this portion of the watershed. The most common adverse impact to the soil and water resource in this portion of the watershed comes primarily from compaction and Transient Snow Zone (TSZ) openings (elevation band of 3500- 4500 feet) which effects soil productivity and runoff, with associated effects on stream sedimentation. (Map 14) This is a result of an extensive network of skid roads and natural surfaced roads used for accessing timber harvest areas.

The cumulative effect of TSZ openings and soil productivity losses from compaction are the predominant adverse impacts to the soil and water resources from human caused disturbances in this portion of the watershed.

Recent (last fifteen years) and extensive clear cutting in the TSZ has increased the risk for a rain-on-snow event. Rain-on-snow storms typically create floods and high magnitude flows which can dramatically alter stream channel morphology and degrade aquatic habitat for many years. Cumulative effects analysis completed in 1993 using aerial photo interpretation and BLM operations inventory have indicated a high amount of non-recovered openings (35%-60%) in the TSZ in the headwaters of the Clark Creek, Dog Creek, and Box Creek drainages. These drainages also have a large percentage of lands within the TSZ that ranges between 30 - 45 percent. These percentages are considered to be relatively high when compared with other watersheds in southwest Oregon.

Cumulative effects analysis has also indicated a relatively high amount of soil compaction as result of a extensive network of tractor skid roads, log haul roads, log landings and jeep roads. These compacted areas reduce infiltration and increase runoff during rainstorms. This can increase the magnitude and frequency of high stream flows that can increase erosion and subsequent sedimentation, alter stream channel morphology, and degrade aquatic habitat. Cumulative effects analysis completed in 1993 indicated a high level of risk with 16 percent of the Clark Creek land base determined to be in a compacted condition. Recent efforts on BLM lands to reduce soil compaction by tilling skid roads and decommissioning haul roads may have reduced this level somewhat since this analysis was completed.

3.3 WILDLIFE

3.3.a Threatened and Endangered Wildlife Species

Peregrine Falcon

The species was removed from the USFWS T&E species list in August, 1999. The species will be on a "watch list" for the next five years. A monitoring plan is in place. There are no known peregrine falcons within this watershed.

Northern Spotted Owl

Six Northern spotted owl sites have been found inside the watershed boundary. (Map 15) Five have 100 acres of the best habitat retained as close to the nest or activity center as possible. The activity centers are designated as Late Successional Reserve (LSR) and are established around the sites which were known prior to January 1, 1994 (ROD, pg C-10). One of the sites does not have an

activity center because it was located in the summer of 1994.

Spotted owls nest primarily in late-successional mixed coniferous forests, usually dominated by Douglas-fir. They prefer larger stands with multiple layers and a closed canopy. Nests are usually within a quarter mile of small streams.

The central part of the WAU is mostly non-suitable spotted owl habitat due to numerous residences and farmland, smaller dense forested patches of small diameter conifer, mixed conifer/hardwood, and oak woodland/grass chaparral. Much of the south is not suitable spotted owl habitat with scattered patches of timber, large natural openings, and private forest land ownership. The upper elevations along the southern boundary do provide patches of suitable spotted owl habitat, and two activity centers are present in this part of the watershed.

Sections 21 and 22, T34S, R2E are ROD designated connectivity blocks. Under this designation, 25-30 percent of the public lands in each section would be retained in late-successional forest condition to provide habitat for late-successional dependent species.

Spotted owl Critical Habitat is present in sections 1, 2, and 12, T34S, R2E. Critical habitat units on federal lands were designated by USFWS in December, 1991. These are included in Summit Prairie (OR-36) Critical Habitat Unit (CHU). This CHU extends from the Lost Creek WAU and includes approximately 1,120 acres within the Lower Big Butte WAU boundary.

Management of CHU is not clearly spelled out in policy. In discussions with USFWS officials, the interpretation is that the CHU was designated to provide additional habitat protection for spotted owls and to augment connectivity between LSRs, and/or provide additional protection for specific owl sites. This was not carried forward into the FSEIS.

Bald eagle

Two bald eagle nests are located approximately one-half mile north of the watershed boundary. These are alternate nests for the Lost Creek pair. Bald eagles frequently forage along lower Big Butte Creek, during the fall and winter salmon runs. A wintering pair of bald eagles has been reported along the creek near Cobleigh Road. It is undetermined if the wintering eagles are the Lost Creek pair or migrants that over-winter here. Eagles are occasionally sighted near the farmlands in the middle of the watershed where carrion and farm ponds stocked with fish provide foraging opportunities.

3.3.b State and Bureau Sensitive Terrestrial Wildlife Species

Cascades Frog

Three populations of Cascades frog, a Bureau Sensitive species, have been found in the watershed. Habitat for the Cascades frog are small ponds and pools adjacent to streams flowing through grassy meadow areas that remain damp through the summer. They have been found in pump chances (small constructed ponds) within the watershed. They have also been found in other pump chances to the west of the WAU. Although declines in some local populations have been noted, the Cascades frog is still a common species within its range (Corkran and Thoms).

Cattle moving along the banks of pump chances to drink can affect water quality in the pump chance. In the summer, Cascades frogs frequently move away from the pools and into grassy meadows and associated damp areas. Cattle also tend to congregate in these areas to graze.

Northern Goshawk

Two historic goshawk nest sites are known within the watershed. One is protected within an owl activity center. The second is within a quarter mile of an owl activity center. Northern goshawk were proposed for listing by USFWS in September, 1997. After a one year review, a determination was made that the T&E status at this time was not warranted. Management of known sites will be to

protect all nest sites (RMP, pg 57). Goshawk surveys have occurred in the west and south part of the WAU.

3.3.c Survey and Manage and Protection Buffer Wildlife Species

Great Gray Owl

Great gray owls are a protection buffer species (ROD C-21). Two confirmed great gray owl nest sites/activity centers have been located the southwest part of the WAU. One nest was found in 1996 and a pair with two young were located at a second site in 1997. The nest was located in 1999. Both sites are within a mile of each other and the owls were located during surveys in different years. It is unknown if this is the same pair. Great gray owls are difficult to detect as they hoot softly and do not defend a large area and are thought to shift their center of activity from year to year.

Great gray owls generally nest in timbered stands within 1000 feet of meadows. The presence of the meadow and forest habitat in the southwest part of the WAU provides this type of habitat, and this is where the owls have been observed. Little information is available about the life history of great gray owls in low elevation, mixed conifer-oak woodland habitat. Current interagency protocol requires surveys in suitable habitat above 3000 feet. However one of the nest sites in the WAU was at 2200 feet. Consequently required surveys are recommended in all suitable habitat, regardless of elevation.

Protocol surveys for great gray owls have been completed in the Geppert Butte area and along the west side of the WAU in the Fredenberg Butte area. One nest was found within a mile of the south WAU boundary. Clear-cuts up to five years old, ecologically serve as meadows. This type of habitat is more prevalent in the northeast of the WAU. Protocol surveys of suitable habitat will continue in 1999 for proposed project areas.

Bats

Four protection buffer bat species are known to be present in the watershed. Long eared *(Myotis evotis),* long legged *(Myotis volans)*, and silver haired bats (*Lasionycteris noctivagans)* were captured in mist nets placed over a pond near Fredenburg Butte. These bats roost in snags, under loose tree bark and in cracks and crevices in cliffs and rocky outcrops.

A large cave at Poverty Flat is home to a maternity colony of Townsend's big-eared bat, *(Corynorhinus {Plecotus} townsendii)*. Over 300 bats were observed in the summer of 1997 (Cross, 1997). This is the second largest known roost in the state. Townsend's big-eared bat have been observed hibernating in the cave during the winter months. The cave is currently blocked with a gate. The gate is frequently vandalized, and currently needs to be repaired. The cave is within the Poverty Flat ACEC.

Red Tree Vole

Protocol surveys been done on approximately 3,000 acres outside the WAU, to the north and east (Titanic, B Lost, and Round Forks timber sales), and on approximately 2,200 acres to the south (Ginger Springs, Salt Creek, and Bieber Wasson timber sales) with no red tree voles found. The area south of the Rogue River appears to be outside the known range of the red tree vole. Surveys in the WAU are scheduled to begin in the fall of 1999.

Mollusk

Surveys for five terrestrial mollusk species in the Butte Falls RA are required by current interagency mollusk protocol, version 2.0. These are scheduled to begin in the spring of 2000.

It is highly likely that the blue gray and papillose tail droppers (*Prophysaon coeruleum* and *P. dubium)* are present in the watershed, as these species have been commonly found in the district and in

adjacent watersheds.

Appendix C contains a list of all Special Status wildlife species found in the Butte Falls Resource Area and their habitat description.

3.3.d Other Wildlife Species

Deer and Elk

Medford District Resource Management Plan (RMP) has designated the area between Crowfoot Road and west to the Rogue River as "Big Game Winter Range and Elk Management Area". (Map 9) This includes approximately 720 acres within this WAU in sections 9 and 10 in T34S, R1E. Deer and elk are present within the watershed throughout the year, and although the majority of the watershed has not been officially designated deer and elk winter range, the area is an important wintering area for these animals. ODFW blacktail deer studies have identified the area as a migration and wintering area. Most deer and elk move into the higher elevations during the summer. Hunting pressure is heavy in the watershed in the fall, and dispersed hunting camps are set up in flat places near creeks and springs. High road densities throughout the watershed also add to the disturbance to big game populations. Poaching is presumed to be high.

Oregon Department of Fish and Wildlife (ODFW) has identified migration routes through the WAU. A blacktail deer demographic study in Jackson County has been ongoing since 1994. Deer fitted with radio collars have been monitored to collect information on life history, establish migration patterns, and identify key habitat areas. Specific results have traced blacktail deer migrating from the summer range in Sky Lakes and Mountain Lakes wilderness areas to wintering locations at the lower elevations inside the WAU.

ODFW has observed a steady decline in the deer herd numbers in the last four years (Thiebes, personal communication). This is thought to be due to summer and winter range habitat quality decline and increased predation. Elk herds have increased in the last 12 years with population numbers leveling off in the past three years.

Exotic species

Turkey were introduced into the area in 1975 and populations are increasing. Turkey hunting is increasing in popularity in Jackson County.

Szechwan pheasants were released in the Cobleigh Road/Crowfoot road area on three occasions. Two initial releases were on private lands near Crowfoot Road. The third release was in the Cobleigh Road area. They appear to have had marginal success with residual numbers surviving. (Thiebes)

3.3.e Special Wildlife Habitats

Oak Woodlands

Oak woodlands and oak savannah are present in the southwest part of the WAU. These unique habitats were identified in the RMP as areas to be managed to maintain or enhance values for wildlife habitat and biological diversity.

Cliffs and Caves

Basalt cliffs are present along Big Butte Creek where the creek and its tributaries have cut down through old basalt lava flows. These cliffs have cracks, crevices, overhangs, and small caves which provide habitat for many species of wildlife, including bats and other small birds and mammals. The ledges and overhangs also provide nesting platforms for turkey vultures and other animals. Small mammals, snakes, lizards, and salamanders live in the talus which accumulates at the base of these cliffs.

Snails and other invertebrates live in the moist areas below the talus.

A large cave at the base of the cliff at Poverty Flat provides important bat habitat. The cave is used both for hibernating in the winter and in the summer as a maternity site. Several smaller caves are present along this basalt outcrop which also provide roosting and hibernating habitat for Townsends big-eared bats. The area is protected within an ACEC.

3.4 AQUATIC ENVIRONMENT

3.4.a Stream Channel

The Oregon Department of Fish and Wildlife (ODFW) conducted stream surveys in the Lower Big Butte WAU on Dog Creek, Box Creek and Crowfoot Creek in 1996. The stream surveys provide fish habitat information as well as channel information such as amount of large woody material (LWD), substrate composition, and pool complexity and frequency. Stream channel information is summarized in Table 6.

Table 6. Stream Channel Summary

Stream Name	Description of Stream Reaches Surveyed	LWD (pieces/100m)	Substrate (Percent Wetted Area)						Erosion %
			Silt & Organic	Sand	Gravel	Cobble	Boulder	Bedrock	
Box Creek	Bridge to Diversion (3 reaches)	8.1	7	6	23	38	16	9	27
Crowfoot Creek	Conf w/Big Butte to 1.8 km (1 reach)	2.5	1	3	19	35	18	24	9.4
Dog Creek	Conf w/ Big Butte to 6.6 km (5 reaches)	10.2	13	6	16	32	23	10	22

In 1972, the BLM conducted stream surveys on Big Butte Creek, Clark Creek and their tributaries, McNeil Creek, Dog Creek, Vine Creek, and Box Creek. Habitat features that can be compared with ODFW 1996 surveys are: pool quality, gravel abundance, temperature, and stream shade. Stream surveys conducted on these three streams by ODFW and BLM give a general condition assessment (Table 7).

Table 7. Condition Rating of Key Habitat Elements

STREAM	Pool Quality		Spawning Gravel		Stream Shade		Temperature	
	1972	1996	1972	1996	1972	1996	1972	1996
Big Butte Creek	Excl	Unkn	Good	Unkn	Poor	Unkn	Good	Poor

STREAM Clark Creek	Pool Quality		Spawning Gravel		Stream Shade		Temperature	
	Good	Unkn	Fair	Unkn	Fair	Unkn	Fair	Unkn
N.Fork Clark Cr.	Good	Unkn	Excl	Unkn	Excl	Unkn	Excl	Unkn
S.Fork Clark Cr.	Excl	Unkn	Fair	Unkn	Good	Unkn	Excl	Unkn
Trib. to Clark Cr.	Good	Unkn	Good	Unkn	Good	Unkn	Excl	Unkn
McNeil Creek	Fair	Unkn	Fair	Unkn	Poor	Unkn	Poor	Unkn
Dog Creek	Good	Poor	Fair	Fair	Good	Good	Poor	Poor
Box Creek	Fair	Poor	Good	Fair	Fair	Fair	Good	Excl
Crowfoot Creek	Unkn	Fair	Unkn	Fair	Unkn	Poor	Unkn	Excl
Vine Creek	Fair	Unkn	Fair	Unkn	Excl	Unkn	Poor	Unkn

Note: Unkn=Unknown, Excl=Excellent

In general, habitat features found to be in an impaired condition within this watershed are pool quality, quality and quantity of spawning habitat, large wood volume, and temperature. The major identified causes for degradation of aquatic habitat were rural development, logging, roads, and grazing.

3.4.b Water Quality

Stream Temperature

Section 303(d) of the Federal Clean Water Act requires each state to identify water bodies that do not meet water quality standards. In 1996, Oregon's Department of Environmental Quality completed its required review of streams within the state. In 1996, ninety-eight streams or stream segments within the Rogue River Basin were classified as "water quality limited". These streams were listed because they exceeded the water quality standard for summer stream temperature. The water quality standard for summer stream temperature is:

"Seven-day moving average of the daily maximum shall not exceed the following value unless specifically allowed under a Department approved basin surface water temperature management plan: 64EF (17.8EC), except when the air temperature exceeds the 90th percentile of the seven-day daily maximum air temperature for the warmest seven-day period of the year [(OAR 340-41-1-(basin)(2)(b))" (RRNF, 1998)].

Table 8. Rogue River Basin Stream Temperature Monitoring

Maximum Seven-Day High (EF)									
Site Name	Agency	1993	1994	1995	1996	1997	Diurnal range of temps. 1997	Date of max. temp. 1997	# times exceeded DEQ 1997
Big Butte above Dog Cr.	BLM		64.9	63.8	61.4	62.3	53.6- 63.2	Jul 20	0

Maximum Seven-Day High (EF)									
Big Butte above McNeil Cr.	URWC				63.9	62.8	56.1- 63.5	Aug 6	0
Big Butte near McLeod	USGS	69.6	71.1	68.5	70.7	69.6	61.7- 70.7	Aug 6	56
Big Butte at stream mile 3.0	URWC				65.8				
Big Butte at stream mile 6.3	URWC				62.3	60.9	53.9- 61.5	Aug 6	0
Big Butte at stream mile 7.3	URWC				64.2	62.7	54.2- 63.2	Aug 6	0
Big Butte at stream mile 10.3	URWC				61.3				
Clark Cr. (sec 7/BLM)	BLM		68.9	64.4	64.9	61.8	56.9- 63.4	Aug 7	0
Dog Cr. at Big Butte confluence	BLM		74.2	69.8	71.3	72.1	64.3- 73.2	Aug 6	6

From Rogue River National Forest, 1997

Water temperatures have been collected on nine sites within the Lower Big Butte WAU during the summer months (June through October) between 1993 and 1998. Several sites within the WAU exceed the DEQ water quality standard (Table 8).

In the northern and central portion of the Lower Big Butte watershed three streams have been determined, by Oregon DEQ, to be water quality limited: Big Butte Creek, Dog Creek, and Clark Creek which are 303(d) listed streams. (Map 5) Big Butte Creek is water quality limited from the mouth to river mile three due to temperature, sedimentation, and flow. In this part of the WAU, the creek flows entirely through privately owned land. From river mile three to the headwaters the listing parameters are flow and sedimentation. Clark Creek and Dog Creek listing parameter are temperature.

Streams within the WAU that have been monitored include Big Butte Creek, Dog Creek, Clark Creek, and Camp Creek. Stream temperatures for the mainstem Big Butte Creek tend to show a correlation with elevation and the relationship to tributary entrance: cooler stream temperatures are found at the higher elevations (stream mile 10.3). Temperature conditions (based on the seven-day maximum average) varied greatly: cool temperatures less than 64E to 70E F (Clark Creek, Camp Creek), and warm temperatures often greater than 70E F (Dog Creek). Various springs within the creeks may provide cool areas for fish refuge.

3.4.c Flow Regime

Streamflow

The United States Geological Survey (USGS) has operated a gaging station within the Lower Big Butte WAU since October of 1945. The gaging station located on Big Butte Creek is located within this watershed. Two gaging stations on the Rogue River are located at the mouth of Big Butte Creek, but are not within this watershed. Table 9 summarizes the information for the Big Butte Creek

gaging station.

Peak Flow

Based on historical USGS gaging station records, maximum peak flows generally occur in December and January on Big Butte Creek. These peak flows are often the result of "rain-on-snow" storm events that occur when heavy rain falls on snow accumulated in the Transient Snow Zone (TSZ). The combination of rain moving into the stream channels and the rapid snowmelt can result in increased flooding. The transient snow zone occupies 6,580 acres (15 %) within the Lower Big Butte WAU. (Map 14)

Table 9. USGS Gaging Station

Station	Period of Record	Drainage Area (mi^2)	Peak Flow (cfs)	Min. Flow (cfs)	Avg. Flow (cfs)	Avg. Runoff (ac.ft./yr.)
Big Butte near McLeod	1945 - 57 & 1967 - 98	245	16,800	6.4	261	189,000

U.S. Geological Survey Water Resources Data, 1997

Roads quickly transport subsurface water intercepted by roadcuts and water from the road surface to streams (Wemple, 1994). A hydrologic unit that is altered by roads may increase the magnitude of peak flows and have altered runoff timing where it enters the stream. This effect is more pronounced in areas with high road densities and where roads are located in close proximity to streams. Road and stream crossing information is shown in Table 10 for Lower Big Butte Creek.

Table 10. Road Mileage in the Lower Big Butte Creek watershed.

Watershed	Total Road Miles	% BLM Roads	% Other Roads	Road Density (mi./sq. mi.)	Road Miles in Riparian Area
Lower Big Butte	153	36	64	4.6	75

Irrigation

The Eagle Point Irrigation District diverts water from Big Butte Creek near the town of Butte Falls. The greatest need for water occurs during the summer months when demand for irrigation usage is highest and flows decline. Due to some leakage in the canal, the EPID ditch has caused the conversion of several upland areas into wetlands, and in some areas created new channels that downcut and enter the main stream channel.

Sedimentation

Although the amount of sediment being delivered to stream channels is unknown, it is known that roads and road densities can be one of the greatest contributors of non-point source sedimentation. Paved roads generally have the lowest risk of contributing sediment to stream channels. Rocked roads generally have a moderate to low risk of contributing sediment, and natural surfaced roads tend to generate the highest risk of sediment. Sediment is delivered to stream channels from roads as a result of surface erosion, stream crossing failure, and road construction in erodible areas. Highly erodible areas are sites with steep slopes that have a high potential for debris type landslides, and have sensitive soils such as Medco and McNull series.

3.4.d Aquatic Wildlife and Habitat

Macroinvertebrates

In 1992, 1993, 1996, and 1997 the BLM contracted macroinvertebrate sampling on Big Butte Creek, Camp Creek, Box Creek, Clark Creek, Dog Creek, and Crowfoot Creek within the WAU. Aquatic macroinvertebrates can be good indicators of stream habitat quality. The presence or absence of certain taxa can provide information about a stream's condition and any changes in the habitat. Data summaries were available for the following years and streams:

1993

Clark Creek: This site contains a moderate to high taxa (species) richness. Macroinvertebrate densities were also high in all three habitat types (erosional, margin, detritus). Cold water biota were present in Clark Creek in "high richness and abundance", indicating that water temperatures are cool/cold year round. The shredder community here is well developed, which indicates that retention capabilities of the channel are excellent. Both caddisfly and stonefly shredder populations within the community were well developed, with few negative indicator species present. A snail of the family *Hydrobiidae* was present at two of the sites, but was not one of the pebble snails (*Fluminicola* sp.) which are a Survey and Manage species of concern. No sensitive, threatened, or endangered species were found at this site.

1996

Big Butte Creek #3: This site contains a high abundance of macroinvertebrates, a low richness of total taxa, and a large percentage (45%) of *Hydrobiidae*. Both positive and negative indicator species were generally scarce and populations were poorly developed. Intolerant mayflies were rare, and intolerant stoneflies and caddisflies were absent. No threatened or endangered species were found at this site. Limitations for macroinvertebrates at this site include high amounts of sediment which limits crevice habitat, and high seasonal scour.

Big Butte Creek #5: This site contains an extremely low abundance of macroinvertebrates, a low richness of taxa, and a large percentage of *Serratella* sp. and *Chironomidae*. Positive indicator species were generally scarce and the associated communities were poorly developed. Intolerant mayflies and caddisflies were absent. Intolerant stoneflies and xylophages were absent from the detritus. No sensitive, threatened, or endangered species were found at this site. Limiting factors for macroinvertebrates at this site include high amounts of sediment which limits crevice habitat, and high seasonal scour.

Box Creek: This site had different species distribution between the three habitat areas. The erosional habitat contains a low abundance of macroinvertebrates, a moderate to low richness of taxa, and no dominant taxa. Positive indicators were somewhat sparse and the associated community was poorly developed with a low richness of predators, scrapers, and shredders. Intolerant mayflies were rare. Negative indicators were also largely absent, except for a moderate percentage of collector species. The margin habitat contains a low abundance of macroinvertebrates, low richness of total taxa, low to moderate richness of taxa richness, and a dominant percentage of *Epeorus* sp. Positive indicators were moderately rich and the associated community moderately developed. The detritus habitat contains a high to moderate abundance of macroinvertebrates, a moderate richness of taxa, and a large percentage of *Chironomidae*. Positive indicator species were moderately rich, and the associated community moderately developed. No sensitive, threatened, or endangered species were found at this site.

Limitations include high amounts of sediment which limits crevice habitat, and channel scour to clay layer in places.

Crowfoot Creek: This site contains an extremely low abundance of macroinvertebrates, low richness of taxa, and a large percentage of *Lymnaedia* and *Chironomidae*. Positive indicator species were rare and populations were poorly developed. No sensitive, threatened, or endangered species were found at this site. Limitations include stream scoured to bedrock in places, low canopy closure, high stream exposure, and low summertime flows.

Dog Creek: This site contains a low abundance of macroinvertebrates, a low to moderate richness of taxa, and a large percentage of *Ironodes* sp., *Maruina* sp., and *Zapada cinctipes*. Positive species indicators were generally scarce and the associated community poorly developed. No sensitive, threatened, or endangered species were found at this site. Limitations here include high amounts of sediment.

Aquatic Mollusks

The current distribution of aquatic mollusks within the Lower Big Butte WAU is unknown. A report prepared for USDA Forest Service by Deixis Consultants indicates there are no species of special concern thought to occur within the WAU (Frest & Johannes).

3.4.e Fish Species and Habitat

Life History

Chinook salmon, coho salmon, steelhead/rainbow trout, cutthroat trout, Pacific lamprey, and various sculpin are native species which utilize the Lower Big Butte watershed. The general life history patterns vary among these fish species. Little is known about the life history strategies and distribution of Pacific lamprey and sculpin. Rainbow and cutthroat trout are resident salmonid species which spend their entire lives in the stream system. Chinook, coho, and steelhead are anadromous salmonids, which migrate to sea and back to spawn in their natal streams. The following describes their life history strategies (ODFW, 1994)):

Chinook Salmon

Adult spring chinook salmon enter the Rogue River from March through June. These fish typically are bound for the upper Rogue River and its tributaries and hold in areas between Gold Rey Dam and Cole Rivers Hatchery. Spring chinook spawn from September through mid-November.

Adult fall chinook enter the Rogue River from July through October. Spawning takes place from October through late January, and peaks in the mainstem Rogue River in mid-November. Approximately 10 percent of the population spawns above Gold Rey Dam, with spawning densities the highest in the middle Rogue River.

Chinook salmon eggs incubate in the gravel for approximately four months from mid-October through mid-March. Juvenile chinook salmon rear in Big Butte Creek and the mainstem Rogue River, then migrate downstream and enter the ocean in August and September. Once in the ocean, smolts migrate south to rear off the Southern Oregon/Northern California coast, and return to spawn in two to six years.

Coho Salmon

Adult coho salmon enter the Rogue River in September and migrate upstream to spawn as

winter rains raise water levels in tributary streams. Spawning takes place from November through January. Coho salmon eggs incubate in the gravel for approximately four months and emerge in April. Coho rear in freshwater for one year, with a small percentage of the population rearing for two years in fresh water. Juvenile coho over-winter in large, deep pools with complex woody cover, backwaters, alcoves, and side channels which provide refugia during high winter flow months. Juveniles migrate to the ocean from mid-May through mid-July. Most Rogue River coho salmon migrate south and rear off the Southern Oregon/Northern California coast, returning to spawn in two years.

Steelhead Trout

Summer steelhead enter the Rogue River from May through October. Steelhead spawn primarily in tributaries like Big Butte Creek and its tributaries, although many may use the mainstem Rogue River when access to their natal tributary is blocked by a barrier or low winter flow levels.

Summer steelhead spawn from December through March with the peak occurring in mid-January. Fry emerge from the gravel between April and May, then migrate to the mainstem Rogue River in May and June when their natal waters become too warm and dry up. Smolts migrate from April through June with a peak in early May. Most summer steelhead smolt in freshwater at age 2, but can smolt from ages 1 through 4 (Everest).

Summer steelhead are believed to rear in the ocean off the Southern Oregon/Northern California coast for 2 years, though time in the ocean can vary from 1 to 3 years. A large portion (approximately 97 %) of summer steelhead in the Rogue River make a false spawning migration known as the "half-pounder" run. Fish that exhibit this life history pattern enter the river two to four months after migration to the ocean, remain in freshwater over the winter, and return to the ocean the following spring. These fish are generally 16 inches in length (Everest).

Winter steelhead trout enter the Rogue River from November through March. Winter steelhead spawn in Big Butte Creek and its tributaries. Steelhead fry emerge from the gravel between April through August with the peak between late May and early June. Most winter steelhead rear in freshwater for two years before migrating to the ocean.

Most winter steelhead are believed to migrate south off the Southern Oregon/Northern California coast for one to three years. Approximately 30 percent of the wild winter steelhead in the Rogue River make a false spawning migration.

Fish Trapping

In 1998 and 1999, the ODFW and the BLM completed a cooperative smolt trapping project on Big Butte Creek and other Rogue basin streams. Through a mark and recapture procedure, the production of smolts, their timing during outmigration, and the average size of the fish were estimated. (Tables 11 and 12).

Table 11. Coho smolt production estimates for Big Butte Creek.

Stream	Dates Trapped	# Days Trapped	# Coho Captured	# Coho Marked	# Coho Recaptured	Trapping Efficiency	Population Estimate	95% CI (range)
Big Butte (1998)	3/9-6/27	92	874	789	168	21%	4,103	3,448-4,758
Big Butte (1999)	3/16-6/27	104	2,316	1,743	321	18%	12,587	11,204-13,969

ODFW, 1998 & 1999

Table 12. Steelhead smolt production estimates for Big Butte Creek.

Stream	Dates Trapped	# Days Trapped	# steelhead Captured	# steelhead Marked	# steelhead Recaptured	Trapping Efficiency	Population Estimate	95% CI (range)
Big Butte (1998)	3/9-6/27	92	1,266	1,070	107	10%	12,660	10,266-15,054
Big Butte (1999)	3/16-6/27	104	994	930	56	6%	16,567	11,951-21,183

ODFW, 1998 & 1999

Distribution

Approximately 47 miles of streams within the Lower Big Butte watershed are fish bearing. Steelhead trout occupy approximately 27 stream miles, chinook salmon occupy 13 miles, coho salmon occupy 24 miles, and cutthroat occupy 47 miles.

Coho salmon and steelhead trout both have an extensive distribution pattern throughout the Lower Big Butte Watershed. Coho utilize most major tributaries within the watershed. Steelhead utilize most major tributaries within the watershed including McNeil Creek, Vine Creek, Clark Creek, Dog Creek, Crowfoot Creek, and Box Creek. Coho and steelhead migrate into smaller headwater tributaries, with steelhead accessing high gradient areas unobtainable to coho. However, both coho and steelhead spawn in the lower gradient or flat area portions of the high gradient streams. Water flows during the year also contribute to the extent that fish will migrate within a watershed.

Fall and spring chinook utilize the lower reaches of Big Butte Creek near the mouth. Chinook have been documented spawning throughout the lower portions of Big Butte Creek. Chinook utilize the lower gradient portions of mainstem streams, and juveniles generally migrate out of the watershed soon after emerging from the gravel.

There is limited information about the full distribution of resident salmonid species within the Lower Big Butte Creek watershed. Cutthroat and rainbow trout have a wide distribution throughout the Rogue River basin. Within the watershed, they occupy most major streams and tributaries, and are also found in smaller headwater tributaries which are inaccessible to anadromous fish.

Pacific lamprey and various sculpin species are also present within this watershed. Limited information is known about the distribution of these species. It is likely that Pacific lamprey overlap steelhead trout distribution, except for steep gradient tributaries or streams with fish passage barriers. Sculpin species would be expected to have a fairly wide distribution in the Lower Big Butte Creek Watershed.

Fish Passage

Numerous fish passage barriers and limiting structures occur within this watershed. Natural barriers include waterfalls, bedrock chutes, log jams, and stream gradient barriers. Man-made barriers and limiting structures include instream water diversions, diversion canals, irrigation pumps, culverts and diversion dams (Tables 13 and 14).

Table 13. Natural Structures Within Lower Big Butte Watershed.

Stream	Stream Mile	Structure	Size	Barrier	Comments
Big Butte Creek	9.75	log jam	unkn	No	None

Stream	Stream Mile	Structure	Size	Barrier	Comments
Vine Creek	.25	log jam	210 yds	No	None
Vine Creek	.30	log jam	110 yds.	No	None
Clark Creek	.25	boulder falls	8 foot	Possible	None
Clark Creek	1.25	3 log jams	2-4' falls	Possible	None
Clark Creek	1.75	waterfall	50 foot	Yes	None
Clark Creek	2.0	bedrock falls	9 foot	Possible	None
Clark Creek	3.0	log jam	unkn	Unkn	None
N Fk. Clark Cr.	mouth	debris falls	4 foot	No	None
N Fk. Clark Cr.	.50-1.5	7 log jams	6 foot fall	Possible	None
S Fk. Clark Cr.	.50	falls	3 foot	No	None
S Fk. Clark Cr.	1.0-4.0	falls	10'-30'	Yes	None
S Fk. Clark Cr.	2.25	log jam	350 yd	Yes	None
Trib. to Clark Cr.	.25-.75	3 log jams	6'x4'x2'	No	None
Trib. to Clark Cr.	.25	bedrock fall	15 foot	Yes	None
Neil Creek	1.5	log jam	unkn	Yes	None
Dog Creek	.50	bedrock falls	12 foot	Possible	Falls is sloping
Dog Creek	.75	2 log jams	unkn	Unkn	None
Dog Creek	1.5	falls	5 foot	Possible	None
Box Creek	1.25	bedrock falls	15 foot	Yes	Falls is sloping
Box Creek	1.50	2-6 log jams	unkn	Unkn	None
Box Creek	2.25	bedrock falls	45 foot	Yes	None

Table 14. Man-made structures in the Lower Big Butte Creek watershed.

Stream	Stream Mile	Structure	Size / #	Limiting?	Comments
Big Butte Creek	.72	irrigation dam	unkn	No	None
Big Butte Creek	2.0	irrigation diversion and pumps	20 sites	Possible	None
Big Butte Creek	13.0	irrigation canal	unkn	unkn	None
Vine Creek	.30	culvert	8 ft drop	Yes	lg. pond created in culvert
Clark Creek	1.0	irrigation canal	unkn	Yes	None
Clark Creek	4.25	concrete weir	unkn	Possible	irrigation weir

Stream	Stream Mile	Structure	Size / #	Limiting?	Comments
Clark Creek	5.25	culvert	4 ft drop	Possible	None
Neil Creek	1.50-2.75	irrigation pumps, pipes, and diversions	2-5	Yes	None
Neil Creek	2.50	concrete dam	unkwn	Yes	None
Dog Creek	1.75	concrete irrig. weir	8 ft fall	Yes	barrier to fish
Dog Creek	2.0	concrete irrig. weir	unkn	Yes	diversion, possible barrier
Box Creek	.50	diversion dam	unkn	Yes	None
Box Creek	.75	diversion dam	unkn	Yes	None
McNeil Creek	mouth	high stream temp.	to mile 4.0	Yes	cattle / logging impacts

BLM, 1972, 1996

Fish Hatcheries

Two fish hatcheries are located within the Rogue Basin: Cole Rivers Hatchery and the Butte Falls Hatchery. Cole Rivers Hatchery began operation in 1975 and was built to mitigate for fish loss of anadromous salmonid habitat above Lost Creek Dam. The ODFW has had an active fish stocking program in Big Butte Creek. Legal sized (>8") and fingerling rainbow trout are stocked during spring months near the town of Butte Falls to support and promote recreational angling.

Introduced Fish

Some private landowners within the WAU have water impoundments such as ponds and reservoirs which have been stocked with introduced warm water species such as largemouth bass and sunfish, or with non-native salmonids such as brown and brook trout. In some cases these impoundments intercept streams which contain populations of coho salmon, steelhead/rainbow, or cutthroat trout. Escapement of introduced fish from these impoundments into the stream systems is known to occur, as evidenced by trap data.

3.5 RIPARIAN ECOSYSTEM

The riparian ecosystem is a unique zone that interacts between geology, hydrology, and topography and is influenced by the local climate, flora and fauna. The physical environment establishes the basic conditions surrounding the riparian zone. Parent material and land form features such as slope, aspect, and elevation shape the vegetative community. Riparian vegetation develops in response to the physical environment and supports a wide variety of dependent fauna. The riparian ecosystem becomes more important as elevation decreases, summer daytime peak temperatures increase, and precipitation decreases. (Map 16)

The importance of the riparian ecosystem is expressed in total biological complexity. Up to 80 percent of plant and animal species occur in or are dependant upon the riparian zone during all or a portion of their life cycle. Indicator riparian plant species typically found in Lower Big Butte watershed include red alder, cottonwood, Oregon ash, bigleaf maple, willow, vine maple, rocky mountain maple, Douglas spirea, saskatoon, service berry, mock orange, ninebark, oceanspray, dogwood, and a variety of ferns, mosses, lichen, and liverworts.

The overstory conifer canopy is a key component that influences the functioning condition of the stream channel and riparian zone. The canopy layer shelters streams from direct solar radiation and large diurnal temperature changes during the summer. The overstory riparian canopy acts as an insulator between the hot, dry air mass above and a cooler, moist air mass underneath. In addition, the canopy creates a moderated environment where plant and animal species dependant upon high humidity can survive. Mortality of conifer trees in the riparian zone is often 50 to 100 percent higher than in the uplands. Usually, a second or third canopy layer occurs within the riparian zone in conifer stands in Lower Big Butte watershed. These canopy layers, generally, are comprised of different heights of hardwood and brush species. Each canopy layer provides additional diversity and insulation of the aquatic system and habitat for animal, bird, and insect species.

Riparian vegetation helps retain the physical structure of stream channels by moderating stream flows and reducing the velocity of stream energy during flood events. Roots protect the integrity and stability of stream banks, especially during floods. Bank vegetation tends to redirect flood currents away from erodible stream banks and reduces direct hydrologic forces. Vegetation captures sediment, rock, and debris and many times creates temporary stream channel diversions of accumulated material.

Coarse wood generally provides a variety of physical and biological functions. However, the lack of coarse wood found in stream systems in Lower Big Butte watershed is most likely the single most deficient component across the watershed. Large wood creates diversity and complexity within the riparian zone and stream system. Hydrologic processes are altered by the amount, size and quantity of coarse woody debris. Debris accumulates periodically creating log jams, significantly influencing and shaping stream channel characteristics. The main stem of Big Butte Creek captures a significant amount of water during storm events and can transport large wood easily. Lateral tributaries tend to capture and retain woody material better and create more structural features such as debris jams. Coarse wood, many times, plays a key role in reshaping the stream channel by redirecting hydraulic energy and altering channel characteristics. Energy is dissipated and/or redirected onto the flood plain during flood events, depositing sediment loads. Particularly important is the ability of coarse woody debris to retain moisture during summer droughts and act as refugia for plant and animal species that require cooler and humid conditions to persist. Hiding and foraging habitat is created for many terrestrial animal species.

Common riparian associates in Lower Big Butte watershed are easily divided along plant series and association groups. In higher elevations where Douglas-fir/white fir plant associations dominate the landscape, typical riparian vegetation includes Douglas-fir and grand fir in the conifer overstory and western hemlock and Pacific yew in the understory, hardwood species that include bigleaf maple, scattered red alder and cottonwood, Oregon ash, Scouler's willow, vine maple and Douglas maple, Douglas spirea, western serviceberry, mock orange, ninebark, cream oceanspray, pacific dogwood, dwarf Oregon grape, creeping snowberry. Common riparian forbs include marbled wild ginger, Oregon bedstraw, western twinflower, three-toothed mitrewort, miners lettuce, starry false Solomon's-seal, western wake-robin, white inside-out flower, sword fern and stream violet. Mosses, lichen and liverworts thrive in abundance along the banks of the stream channel, on rock and the forest floor and on the bark tree trunks and branches, heavily influenced by the cool, humid riparian micro-climate.

In lower elevation areas comprised of White Oak/Grassland and Mixed Conifer plant series, the riparian vegetation zone narrows considerably. Many riparian areas in these communities are totally exposed to the sun and lack micro-climatic influences. Typical riparian species are characterized by a lack of true riparian conifers in many places. Riparian hardwoods include black cottonwood, Oregon

ash, Indian plum, and scattered red alder, bigleaf maple, and Scouler's willow. Common riparian forbs include wild onion, sedges, juncus, wild teasel, Backs downingia, yellow monkey flower.

3.5.a Lower Big Butte Field Inventories

Riparian stream surveys were conducted in Lower Big Butte watershed from October through November, 1996 on approximately one-third of the watershed and completed in the summer of 1997. The initial survey utilized rapid assessment techniques. A comprehensive assessment was conducted in 1999 that thoroughly covered the watershed including the previously surveyed area. The survey objectives were to evaluate the current riparian functioning condition, establish the source of intermittent streams and the Riparian Reserve land allocation, collect and compare baseline data for long term trend assessment, ground truth and correct current GIS hydrography data, and utilize the information collected for watershed analysis and restoration projects.

Riparian surveys were completed for 239 stream reaches comprising approximately 65.5 miles of tributaries in Lower Big Butte watershed. A total of 104.6 miles of perennial, intermittent, ephemeral streams, and dry draws were assessed. The data provides a descriptive snapshot of the current condition in the watershed. A total of 41.9 miles (153 reaches) were classified as "properly functioning". These reaches maintain most or all of the original biological and physical characteristics of the stream channel and vegetation. Human activities have had little to no influence on these stream reaches. Approximately 23 miles, totaling 71 reaches, are classified as "functioning-at-risk". These reaches have been moderately to heavily disturbed by land management activities, but are generally stable and in the process of recovery. However, nine reaches were identified with downward trend indicating a deteriorating condition. There are one-half miles (3 reaches) that are classified as "non-functioning". These reaches have multiple impacts which are severely affecting channel stability, water passage, water quality, or riparian vegetation.

A summary of positive and negative factors was created which described each reach. The most common factors which are contributing to a deteriorating functioning condition are: lack of large woody debris or structure, lack of riparian buffer, incised channel, roads near channel, and high sediment.

The riparian survey team ground-truthed the stream system in the watershed against the BLM GIS hydrography features. Aquatic Conservation Strategy (ACS) criteria was used to determine where intermittent and perennial streams began. As a result, a total of 8.4 miles of new, unmapped, stream miles within the watershed were discovered and added to the GIS data base. Approximately 27 miles of streams, delineated on the current hydrography layer, did not meet true ephemeral stream, intermittent or perennial stream definition.

Range cattle are released on grazing allotments within the watershed in the spring. Generally, the cattle have unrestricted access to streams within the allotment. Survey data indicate relatively few riparian areas have been negatively impacted by cattle.

3.5.b Riparian Reserve Network

The Riparian Reserve land allocation established under the ACS of the Northwest Forest Plan, ROD and the Medford District RMP is intended to protect the health of the riparian and aquatic ecosystems, and provide adequate habitat for a variety of late-successional species. On a landscape scale, the network of Riparian Reserves on federal lands are intended to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems throughout the landscape.

The Riparian Reserve land allocation provides refugia for a wide variety of plant, vertebrate and

invertebrate animal species. Riparian Reserves are intended to act as corridors of late-successional habitat and as transition zones which connect the uplands to the aquatic zone. This connectivity is particularly important for reptiles and amphibians during specific periods of their life cycle. The Riparian Reserves act as a buffer in protecting riparian associated species from upland environmental extremes. The edge effect from forest openings, such as clearcut plantations, affect micro-climate environmental conditions and the composition and structural characteristics of riparian vegetation. In addition, Riparian Reserves are designed to protect unstable areas, provide a conduit for coarse woody debris, and protect the hydrologic function of streams and the delivery of high quality water that supports the aquatic ecosystem.

The Riparian Reserve system acts as an important biological network across the landscape which is particularly important with fragmented ownership, such as Lower Big Butte watershed. The amount of protection of the riparian and aquatic ecosystem on private lands is expected to be significantly less.

The BLM Riparian-Wetland Initiative for the 1990s was developed as a planning and management guide that recognized the importance of the riparian ecosystem. The goal of the initiative is to restore and maintain riparian-wetland areas so that 75 percent or more are in properly functioning condition by the year 1997. The goals and strategies of the Riparian-Wetland Initiative integrate with the Aquatic Conservation Strategy and apply to management activities within the Riparian Reserve to meet long-term objectives. However, it is unlikely that the goal of restoring or maintaining 75 percent of the riparian-wetland areas in proper functioning condition can be met in forested eco-systems where "functioning at risk" stream reaches may take 20 to 50 years to provide adequate forest stand structure.

3.5.c Riparian Reserve Seral Development

An analysis of the forest seral stages within Riparian Reserves on federal lands was completed using current GIS information. Riparian Reserves were mapped on second order streams and higher as they best approximated the source of intermittent streams. Average Riparian Reserve widths for fish-bearing and nonfish-bearing streams were established for analytical purposes to approximate Riparian Reserve boundaries and to calculate acreage. Seral stage data was extracted from the Forest Operations Inventory theme and applied to stands within Riparian Reserves (Map 19 and Table 15).

Table 15. Riparian Reserves by Seral Stage

	Early Seral	Mid-Seral	Late Seral	Mature Seral	Other Lands
Size Class	0 "- 5"	5" - 11"	12" - 21"	> 21"	
Total Acres (Percent)	84 (4%)	605 (26%)	686 (29%)	777 (33%)	186 (8%)
Plantation Acres	72	162	5		
TOTAL RIPARIAN RESERVE 2,338 ACRES					

Late and mature seral stage forests are particularly important within this watershed because of the good wildlife habitat these forest types provide (especially in the winter) and the key habitat components they provide for andromous fish species. Late and mature seral stage forests comprise 62 percent of the federal forest stands within the Riparian Reserves as compared to 11% on all late and mature stands within the watershed. However, many forest stands on federal lands were partially

harvested of the largest pines and Douglas-firs in the past and are now a mix of a remnant overstory and a developing understory stand. Some key biological components such as coarse wood, canopy closure and canopy layers associated with mature and late seral stage forests are altered from the original forest condition. Old access roads and skid trails exist throughout Riparian Reserves from old logging operations. Some Riparian Reserves however, retain an intact, properly functioning late to mature seral forest. Many tend to be located on isolated or steep parcels.

The fragmentation of land ownership and past land management practices within the watershed compounds any cohesive riparian habitat linkages along tributaries and between sub-watersheds. Severe limitations surrounding a designed comprehensive approach to riparian habitat improvement are obvious unless mutual objectives are agreed to by cooperating landholders. However, as a significant landowner within the watershed, a strong framework exists of good quality Riparian Reserves comprised of mature and late seral forests. Another 26% of the Riparian Reserves are comprised of mid-seral stands moving in a positive direction towards higher quality habitat over the next few decades with a high chance of success given the current management plan.

Only 4 percent of Riparian Reserves within Lower Big Butte watershed is comprised of early seral stage stands compared to 16 percent on all lands. Approximately eight percent of the Riparian Reserves occur on lands classified as other: such as meadows, chaparral, white oak communities, rock outcrops, right-of-ways, etc.

3.5.d Roads Within Riparian Reserves

Approximately 62 miles of roads occur within Riparian Reserves on federal lands in the watershed (Map 20). Other roads on private lands are located close to streams. A road analysis was completed for all BLM roads within the watershed. Each road was considered for one of three categories; as a system road to be maintained or upgraded, as candidate for possible decommissioning, or as a candidate for road obliteration. One priority for road decommissioning or obliteration designation focused on roads occurring within Riparian Reserves.

Most of the BLM and industrial timber company roads within the watershed are included in the M-800 or M-660 Road Use Agreement area. Management actions must be mutually agreed to by both parties which limits opportunities for decommissioning and obliteration. The Transportation Management Objectives review identified a preliminary list of roads targeted for decommissioning and obliteration, subject to approval by the agreement party. Further review and refinement of road designations is necessary as priorities and circumstances change.

3.6 HUMAN ENVIRONMENT

3.6.a Fire

The lack of widespread low intensity fires in the 1900s has played a major role in creating conditions for large scale catastrophic fires. Three things are needed for large fires to occur. One is currently in place - existing fuel loadings. The second are weather conditions conducive to large fires. A report done by Oregon State Department of Forestry offers evidence that these weather conditions can occur about 11 days during a “normal” summer. An ignition source is the third item. Traditionally lightning has played a large role in starting fires in this watershed. Lightning as a primary ignition source may be changing as more of the area is developed into rural home sites. A study of fire starts from 1980 to 1990 shows 46 fires occurring - of these 9 were lightning-caused while 35 were some form of human-caused. (Map 17) The majority of these starts are clustered around main roads and residences. To adequately describe the project area it needs to be broken into two distinct zones. The

first are lands below 3,500 foot elevation.

The lower elevation lands are currently in high to very high fire hazard condition. A large proportion of these lands are decadent brush fields. Many of these lands are in the rural interface area, with many homesites which poses an increased risk of fire ignitions. The areas that are primarily wedgeleaf Ceanothus meet the criteria for fuel model 4. These sites could be expected to burn with 19 foot flame lengths under typical mid to late fire season conditions. Those sites that are composed of primarily manzanita meet the fuel model 6 criteria and would burn with 6 foot flame lengths. Those areas containing conifers could be expected to burn somewhere between the two fuel models depending on vegetation percentages. Slope will contribute to fire intensity - the greater the slope, the more intense the expected fire behavior.

The second area are lands above the 3,500 foot level. These lands are currently in a moderate to high fire hazard condition. In portions of these stands there is a potential for crown fires to occur. In order for crown fires to occur certain conditions need to be present. There must be enough ladder fuels present to move surface fires into the crowns. Crown closure must be tight enough to sustain and move a crown fire once initiated. This occurs as snags develop which increases spotting potential. Slope can contribute to fire intensity. Open timber stands will meet the criteria for fuel model 10. These sites could be expected to burn with 4-5 foot flame lengths under typical mid to late fire season conditions. Closed canopy conifer stands with continuous ladder fuels may burn as either fuel model 6 or fuel model 4 or somewhere in between. These sites could be expected to burn with 6-19 foot flame lengths under typical mid to late fire season conditions. (Map 18) The significance of these numbers is as follows: *Flame lengths less than 4 feet* can be attacked by a crew using hand tools. Hand lines will generally hold the fire. *Flame lengths 4-8 feet* cannot be attacked by hand crews, hand lines generally will not hold. Equipment such as pumpers, dozers and aircraft can be effective. *Flame lengths 8 -11 feet* create fires that may present serious control problems such as torching, crowning and spotting. *Flame length greater than 11 feet* can cause crowning, spotting and major runs are probable.

3.6.b Transportation System

The road transportation system is highly developed and provides extensive access into the Lower Big Butte watershed. There are about 153 miles of inventoried roads within the watershed. This includes 0.3 miles of state highway, 28 miles of county roads, 70 miles of private timber company roads and 55 miles of federal roads. There are approximately 50 miles of non-surfaced roads in this watershed. This watershed also contains an additional 164 miles of non-attributed roads, i.e. roads that are recorded in Geographic Information System (GIS) but not identified as to ownership, surface type, or control, for a total of 317 miles of existing roads in the watershed.

Due to BLM's scattered land ownership, the BLM has entered into numerous reciprocal Rights-of-Way Agreements and Permits with adjacent landowners. These do not necessarily grant rights for the general public to use roads constructed under the agreements. It grants certain rights to the holder of the Permit as to the use and responsibilities of the road system. These agreements enable the BLM to use private roads to access BLM lands. Adjacent landowners rely on a significant portion of these roads to cross BLM lands for access to their property.

Transportation Management Objectives (TMO) for BLM roads have been developed for the Lower Big Butte watershed. One of the objectives for this watershed is to use temporary roads or alternative harvest techniques to minimize new road construction. The TMO process has identified

about 4½ miles of BLM controlled and .4 miles of privately controlled roads for closure within this watershed.

As calculated from the GIS data source, the watershed contains approximately 4.6 miles per square mile of road density. The road density for inventoried roads is 1.8 miles per square mile and for non-inventoried roads as 2.8 miles per square mile.

There are approximately 75 miles of road within the Riparian Reserve, of which, 30 miles are system roads and 45 miles are non-system roads. Of this 30 miles of system roads, approximately 8 miles of roads are not surfaced. (Maps 16 & 20)

The Butte Falls Resource Area is participating in the Jackson County Cooperative Travel Management Area (TMA) program with Oregon Department of Fish and Wildlife and Boise Cascade Corporation. The TMA prohibits unauthorized vehicular travel on secondary roads during certain times of the year in the Crowfoot Road area.

3.6.c Grazing

The Crowfoot Creek, Derby Station allotments and the McNeil Creek and Poverty Flat pastures of the Big Butte allotment lie totally within the Lower Big Butte watershed. Only portions of the remaining pastures or allotments lie within the watershed boundary. As such, only some of the livestock indicated above in those allotments which partially lie within the boundaries are considered in this watershed analysis. (Map 10)

Table 16. Grazing use within the boundaries of the Lower Big Butte Watershed

Allotment / Pasture	livestock	season of use	% Public Lands	AUMs	lvtk based on % land in WAU
Baker Mt.	410 cattle [1]	4/16 - 5/31	100 %	610	168 cattle
Bear Mt.	54 cattle	4/16 - 5/31	100 %	82	4 cattle
Crowfoot	144 cattle	4/16 - 6/30	100 %	365	12 cattle
Crowfoot Cr.	28 cattle	4/16 - 6/30	100 %	70	28 cattle
Derby Rd Sawmill	10 cattle	4/16 - 7/15	100 %	30	5 cattle
Derby Station	Cancelled	> > >	> > >	> > >	> > >
McNeil Creek	294 cattle	4/16 - 5/31	varied	205	294 cattle
Mule Creek	183 cattle	6/1 - 9/30	varied	206	99 cattle
Neil-Tarbell	37 cattle	4/16 - 5/31	100 %	56	36 cattle
Perry School	294 cattle	4/16 - 5/31	varied	205	232 cattle
Poverty Flat	221 cattle	4/16 - 5/31	varied	85	221 cattle
Rocky Flat	221 cattle	4/16 - 5/31	varied	85	175 cattle
Round Mountain	184 cattle	6/1 - 9/30	40 %	295	28 cattle

[1] The livestock numbers illustrated in this line use Baker Mt, Daily Mill, McCarty Flat, Piney, Lick Creek, Rice, and Rocky Flat pastures within the Big Butte Allotment.

Allotment / Pasture	livestock	season of use	% Public Lands	AUMs	lvtk based on % land in WAU
West Derby	26 cattle	4/16 - 6/15	100 %	47	8 cattle

3.6.d Human Uses

The Lower Big Butte watershed has seen sustained and regular growth of private residences. An analysis of the 1998 Jackson County tax records show that there are 165 taxable structures in the watershed area, based on the year the structure was built. There are several structures still in use that were built in 1910. The range of the year structures were built gives an indication as to how the area has grown through the decades. Based on the 1998 data, twenty-four structures were built from 1910 to the 30s. An additional forty-seven were added during the 40s through the 60s. In the last thirty years an additional ninety-four have been built. For each thirty year period the growth rate, by this data, indicates a doubling in construction rate. The 1998 true cash value of these improvements in this rural residential area is over sixteen million dollars. Residential development potential probably will remain high in this watershed. The tax record show there are over 450 private (non-industrial forest) tax lots in the watershed. Though it would be difficult to estimate the number of people residing in this watershed analysis area, it may not be unreasonable to expect that it will continue to grow.

Though livestock ranching continues in the watershed, especially in the lower elevations, it is not as prevalent as in the past, as larger parcels have been divided into smaller tax lots to become residential building sites.

Due to lack of legal access into the lower elevation federal lands (everything but upper Clark Creek drainage) previous management activity has been limited or non-existent. Easements into much of this area are few and access is limited to areas via County roads. As the rural residential population in the watershed increases, the likelihood of simple access to federal lands will continue to diminish.

The Medford District RMP identified three potential recreation sites on BLM lands within the watershed: Box Creek (T34S, R2E, Sec.33), Cobliegh Bridge (T34S, R2E, Sec.29) and Rocky Hill (T34S, R2E, Sec25). These sites could provide public access to Big Butte Creek from public lands.

Visual resources are the land, water, vegetation, structures, wildlife, and cultural modifications that make up the scenery of BLM administered lands. Criteria used to determine Visual Resource Management (VRM) classes are: scenery quality ratings, public sensitivity ratings, and the seen area distance zone. Management objectives are to maintain, enhance, or preserve scenic values which are one-of-kind. The Cobliegh Road from Highway 821 (Butte Falls Highway) to the junction of the "A" and "B" Road (T34S, R2E, Sec. 7, SE¼) is classified as VRM II, which allows for low levels of change to the characteristic landscape within the foreground/middleground (i.e., within one mile or to the first ridge, whichever is closest) of Cobliegh Road. Management activities may be seen but should not attract the attention of the casual observer. BLM's ability to affect any area's overall scenic quality depends, to a large degree, on land ownership patterns. In most of the Lower Big Butte watershed, public lands are intermingled with private lands. Management activities on these lands can dominate the visual landscape regardless of BLM's management activities.

4.0 DESCRIPTION of REFERENCE CONDITIONS

The purpose of step 4 is to explain how ecological conditions have changed over time as a result of human influence and natural disturbances. A reference is developed for later comparison with current conditions over the period that the system evolved and with key management plan objectives.

4.1 VEGETATION

Forest ecosystems are complex, dynamic, and always changing. Changes occur as elements and processes are altered by both coarse filter (i.e.,stand replacement fires) and fine filter (i.e., individual tree mortality) events. Ecosystems can adapt to these changes and can function well under a range of conditions. Within this "natural range of variability" biological and ecological functions are sustainable. When an element or process is outside of this range, that element and those depending upon it may not be sustainable.

In the Rogue River basin, it has been estimated that prior to logging, approximately 71 percent of the land contained large-sized timber. This estimate is based upon detailed forest surveys completed during the 1930s. The pre-logging time frame includes the period prior to late 19th century and early 20th century. Large-size class timber is defined as Douglas-fir greater than 20"dbh, ponderosa pine greater than 22"dbh and white fir greater than 16"dbh. Furthermore, approximately 89 percent of this large size timber was in one large connected patch extending throughout most of western Oregon. The average size for burned timber patches in the Rogue River basin was approximately 9,500 acres (Ripple).

Table 17. SUMMARY - Historic Range of Forest Stand Conditions

Vegetation Condition	Historic Range by percent
Riparian Vegetation	
Early-Successional conditions	10 - 40
Late-Successional conditions	45 - 75
Terrestrial Vegetation	
Early-Successional/no snags	2
Early-Successional/with snags	10 - 40
Late-Successional/single layer	2
Late-Successional/multi-layer	45 - 75

Note: Early-successional conditions are the stages in forest development that includes seedlings, saplings, and poles. Late-successional conditions are the stages in forest development that includes mature and old growth stands, generally greater than 80 years of age.

Specific to the Lower Big Butte watershed; approximately 65 percent of the watershed was identified as large size conifer forests. The remaining 35 percent was identified as small conifer forests and lesser amounts of non-commercial oak woodlands.

The natural range of variability is further defined in an ecosystem health study for National Forest lands. The Lower Big Butte watershed is part of the Upper Rogue River sub-basin that was analyzed. Although the analysis was focused only on lands administered by the Forest Service, the

vegetative composition, climate and landform characteristics of the eastern two-thirds of the watershed are very similar to the adjacent Rogue River National Forest lands.

The analysis addressed the historic range, current range, and current mode of aquatic, riparian, and terrestrial elements. The historic range was defined as the conditions that existed before timber harvesting began in the early 1900s. Because of the same general geographic location, BLM and Forest Service managed lands probably had similar historic conditions as cited in the study. This does not hold true for the information provided for the current range and current mode conditions. The study did not focus on the portion of the Upper Rogue sub-basin that included BLM and private lands. Because of the checkerboard ownership pattern and intensive harvesting activities on private industrial lands, it is probable that there would be a greater decline in "natural" conditions than estimated in the study. Therefore, that information is not valid for this watershed.

4.1.a Vegetation pattern

The landscape pattern was uniform with late-successional forests providing large contiguous areas of interior forest habitat. Fragmentation of late-successional forests was limited and occurred in areas where stand replacement fires left large patches of "green" stands interspersed between fire-killed stands. The amount of edge between early- and late-successional vegetation was low and occurred in areas where stand replacement fires provided the abrupt transition between early- and late-successional forests. Canopy openings were not uniform, but variable in size. The openings were larger as a result of stand replacement fires.

4.1.b Insects and disease

Widespread vegetative changes due to insects and/or diseases were likely minimal. Mortality was probably limited to individual trees or small groups of trees. Some insect populations may have increased to moderate levels following fires due to fire induced stress (cambial damage and/or crown scorch) or during long periods of drought. Root diseases were present and provided small gaps in the forest canopy. Large areas of root rot were probably minimal due to periodic underburns which maintained disease resistant seral species. Dwarf mistletoe, specifically in the Douglas-fir overstory was likely common but with minimal intensification. Periodic underburning maintained open stands of mixed conifers and hardwoods. Mistletoe brooms on smaller Douglas-fir trees probably increased torching and tree mortality, thereby regulating mistletoe severity and spread in the understory.

4.1.c Frost

Vegetative damage caused by frosts was likely minimal. Canopy cover provided protection against freezing temperatures in most areas except for openings created by stand replacement fires.

4.1.d Pocket Gophers

Gophers were likely at low population levels throughout most of the watershed because of late-successional forest conditions. Late-successional, dense canopy forests, harbor few, if any, gophers. Population levels may have increased in areas of stand replacement fires. Fires created openings and reset succession to early-seral conditions. Post-fire vegetation would have consisted of early-seral broadleaf herbs, the favored food of pocket gophers.

4.1.e Noxious Weeds

Noxious weed populations were initially small, if existing at all. Only after the construction of dwellings, roads, logging, and other human uses have noxious weeds made their way into the watershed. Soil disturbance and dispersal of seed by vehicles are the primary reasons weeds have had

a fairly easy time of moving into forest lands.

4.2 WILDLIFE

Since late-successional forests were more prevalent in the past, the numbers of late-successional dependent wildlife species would have been higher (than today). Large ponderosa and sugar pine were more common in the earlier forests. These pine species would have provided more habitat for wildlife species such as great gray owl, flammulated owl, and goshawk.

Lower elevation streams were likely well vegetated with willow, alder, bigleaf maple, and Oregon ash. It is likely that mature Douglas-fir and pine grew along many of the streams, creating habitat corridors that connected the hills surrounding the valleys.

Anecdotal information from historical recollections after the arrival of the Euro-American settlers arrived indicate game was abundant. Most species currently present in the watershed were likely present in the early-to-mid 1800s. Species which appear to be positively associated with mature/old growth conifer forests probably had populations which were greater and more stable than today.

Past wildlife management has focused primarily on big game and predator management throughout the early 1900s. Elk, deer, black bear, and cougar were mentioned in early documents, and the population numbers probably were much higher than today's numbers. Species that were present, but now have been extirpated include the grizzly bear and gray wolf.

Some exotic species, including bullfrogs, Virginia opossum, and European starling, have moved into the watershed and pose a threat to native wildlife. Wild turkey and pheasant have been introduced into the watershed by Oregon Department of Fish and Wildlife to improve hunting experiences. These were not historically present.

The lower elevation, southern aspect slopes probably had more open meadows with fewer (but larger) oak and conifer trees than today. Native American practice of burning would have maintained large oak woodland/meadow complexes with early-seral condition grasses and low shrubs, and open oak/pine woodlands in the lower elevations. Remnant large oak snags and a few large remnant conifer stumps indicate that these areas were more open grassland with scattered savanna type oaks and large pine. This would favor species which use open spaces for foraging and species which use cavities for nesting, roosting, and denning.

Some of the farmland in the areas along Big Butte Creek and the Butte Falls Highway was likely forest land which was cleared for pasture and fields.

4.2.a Threatened and Endangered Species

There is little suitable peregrine habitat and they were probably not present in the watershed. Bald eagles were likely present, due to high salmon numbers in lower Big Butte Creek. There are no historical records of nesting eagles within the WAU.

The abundance of late-successional habitat indicates spotted owls were present. Possibly population numbers in the upland forests would have been higher, since the total amount of habitat would have been greater with less fragmentation. Lower elevation forests were likely more open with a higher pine component and likely would have been less suitable habitat for spotted owls than today.

4.2.b Special Status Species

Special Status species known to be present today are assumed to have been present in the watershed prior to Euro-American settlement. Most of the threats associated with current status were generally not present prior to settlement, and populations were probably greater and more stable.

4.2.c Survey and Manage and Protection Buffer Species

As with the Special Status species, it can be assumed that the survey and manage species known to exist in the watershed today were present in the watershed when the Euro-Americans arrived. Without the threats of habitat loss and increased human presence, populations were probably larger and more stable.

4.3 FISH

Prior to Euro-American influences, headwater streams in the Lower Big Butte Creek watershed likely had large amounts of large wood material within the stream channel. This watershed provided channel structure, fish spawning and rearing habitat, and pool complexity. Streams in the valley bottoms most likely had greater sinuosities, side channels, lower width/depth ratios, and log jams. The abundance of beavers was greater in the watershed prior to the arrival of fur trappers in the 1830s. Beavers are important to stream habitat by creating pool habitat and dams which add large wood material to the stream, thus trapping and storing gravels and providing cover used by spawning and rearing fish.

Since the arrival of Euro-Americans, stream channels within the watershed changed. Activities such as logging, grazing, fur trapping, agriculture, residential development, and road building greatly influenced stream channels. Fur trapping in the 1830s - 40s resulted in a decrease in beaver populations and the loss of beaver dams.

Cattle and sheep were also introduced in this watershed, although the exact time is not known. Cattle tended to congregate along stream edges which likely caused bank degradation and impacts to riparian vegetation. Historically, cattle most likely congregated in meadow areas where soil became compacted and native vegetation was trampled.

Logging and land clearing for agricultural and residential use resulted in the removal of large wood in some areas. Areas that were cleared reduced the amount of large wood recruitment sources for in-stream structure from the adjacent riparian area.

Roads were constructed during this time to create access for homesites, logging areas, and access to lands. Construction of roads near streams likely increased the sediment rate into the streams and altered the timing and variability of base and peak flows within these areas.

Historically, anadromous fish populations flourished in the Rogue River Basin. Chinook salmon, coho salmon, winter and summer steelhead trout, and Pacific lamprey were well distributed throughout the watershed and more abundant than current populations (Table 18).

Table 18. Fish population counts over Gold Rey Dam (1942-1960).

Run Year	Spring Chinook	Fall Chinook	Coho Salmon	Summer Steelhead	Winter Steelhead
1942	41,779	1,670	4,608	7,387	
1943	36,136	1,611	3,290	5,648	15,314
1944	30,632	1,223	3,230	5,530	13,380
1945	31,996	1,641	1,907	7,302	16,083
1946	28,374	1,691	3,840	4,448	8,729
1947	33,637	1,176	5,340	3,221	9,653

Run Year	Spring Chinook	Fall Chinook	Coho Salmon	Summer Steelhead	Winter Steelhead
1948	26,979	757	1,764	2,133	8,605
1949	18,810	1,233	9,440	3,618	8,052
1950	15,530	1,204	2,007	4,583	8,684
1951	19,443	1,489	2,738	3,262	5,744
1952	15,888	2,558	320	4,200	10,648
1953	31,465	2,083	1,453	3,831	10,945
1954	24,704	955	2,138	2,222	7,228
1955	15,714	836	480	1,703	5,239
1956	28,068	1,884	421	2,753	8,775
1957	17,710	1,060	1,075	1,323	4,508
1958	15,016	700	732	1,293	3,855
1959	13,972	735	371	865	4,550
1960	24,374	1,843	1,851	2,034	6,901

4.4 RIPARIAN

No data exists at this time, or has been discovered that describes the reference condition of the Lower Big Butte watershed.

4.5 SOILS

The western portion of the watershed was typically grass and hardwood woodlands with scattered rocky meadows and patches of conifer stands. Frequent fire occurrence in this portion of the watershed was probably the most influential factor on erosion rate from hillslopes. Several years after wildfires the bare soil areas exposed by fire are subject to detachment and transport during rainstorms. High flows in burned over areas had the most influence on stream channel stability and subsequent streambank erosion. Historically, these events contributed to the majority of erosion and sedimentation in this portion of the watershed.

In the eastern portion of the watershed which has higher elevation the reference condition was primarily conifer forest with full canopy. As a result wildfires were less frequent but more severe when they did occur. Forest duff layers were deep and continuous and helped the soil to recover from catastrophic fires. Natural hillslope erosion in this portion of the watershed was most likely rare prior to man-caused disturbances and came predominantly from geologic erosion (landslides) and stream channel erosion from flood events. In the areas where forest stand replacement wildfires occurred, the bare soil areas were the major source of runoff, sedimentation, and change in morphology of the stream channels.

4.6 FIRE

Fire suppression has changed the vegetation patterns. Fire resistant trees such as large

diameter ponderosa pine and large white oaks are no longer found in the stands to the degree that they once were. The large trees, particularly the oaks, are one of the fastest vanishing ecosystems in the west (Agee). These trees provided wildlife habitat such as roosting sites for bats and other cavity nesters. Frequent fires not only provided a low thinning effect on conifers, they also reduced large continuous brush fields and provided a more diverse vegetative pattern. These changes have increased the risk of large destructive fires. Ladder fuels have significantly increased over the past decades. The potential for these fires puts residences and ecosystems at high risk of fire.

4.7 GRAZING

Although there is no information readily available which describes vegetative and/or cultural conditions specific to the area of this report prior to the introduction of livestock, it can be speculated that the only large ungulates to graze in the area were Elk, and that their impact was fairly minimal, since there were few, if any, fences to limit their movement, which was transient by nature.

4.8 HUMAN USES

4.8.a First Nation

The original inhabitants of the Lower Big Butte Watershed were members of a multilingual complex of inter-locking cultures. They should be thought of as populations focused on streams and estuaries rather than tribes occupying territories that might be delineated by lines on a map. Boundaries between groups were vague. However, this watershed area was occupied by Native American tribes made up of the Shasta, Takelma, and Latgawa. The Shasta spoke a Hokan language distinctly related to the Siouan language of the Great Plains. They occupied the area of the valleys and to a lesser extent the tributaries of this watershed.

Numerous pre-historic as well as historic sites exist within the boundary of the Lower Big Butte watershed. Pre-historic sites constitute the bulk of the archaeological sites include lithic scatters and house sites. Archaeological sites tend to be relatively small (probably reflecting seasonal base-camp and single-task use by dispersed family groups) and are typically located close to the stream channels of the major creek areas. On the higher elevation areas of the watershed, archaeological sites tend (with some exception) to be quite small, shallow, and contain very low-density deposits.

Numerous historic sites exist within the boundary of the Lower Big Butte watershed. These sites include: a look out, possible old post office remains, an irrigation sluiceway, and various other historic structures.

At the time that Euro-American settlers arrived, the Lower Big Butte watershed was inhabited by bands of Latgawa (or Upland Takelma), Shasta, and possibly other tribes. Portions of the higher plateau section were probably visited seasonally, largely for hunting game or acorn gathering by even smaller groups of First Nation people. The total population of people living in and using the watershed over the course of a years time may well have been a few hundred at most. These people followed an "annual round" of fishing, hunting, and gathering. The annual round was a subsistence pattern which typically brought them from their low-elevation winter villages to the adjacent foothills by spring. As edible plants and game animals became increasingly abundant at higher elevations during the summer and early fall, the people "followed the harvest" into the watershed's uplands, returning to the winter villages by mid-autumn. Anadromous fish were a major component of the local native diet. In addition to chinook and coho salmon taken from major fishery sites along the Rogue, sizable numbers of fish

would also have been taken from the waters of Big Butte Creek drainage. Deer and elk were major game species of the watershed, although a variety of other animals were hunted as well. Blood residue studies of artifacts from archaeological sites within and near the watershed point to hunting of bighorn sheep. Hunting methods, aside from solitary hunting or snaring, included communal endeavors in the canyons that employed dogs and fire to help drive large numbers of deer into brush enclosures. Acorns (Oregon white oak and California black oak) were staple wildland harvest food. Blue Camas, along with acorns made up a key elements in the diet of these early Native American peoples. In addition to edible/useful plants, a certain mineral resources of the watershed were gathered by native people. Crptocrystalline silicate rocks (such as jasper and agate) were useful for making into chipped stone tools. Also, fine-grained basalt and andesite were plentiful.

By 1852, there was a tradition of exchanges of violence between First Nation peoples and Euro-American settlers, miners, and trappers. White settlers to this area began to see these First Nation peoples as enemies. Some of them participated enthusiastically in the Indian Wars of 1855-1856. Consequently, as a result of these violent and bloody wars Native American survivors were eventually forcibly relocated to reservations in the northern Oregon coast range.

Pre-historic archaeological sites within the Lower Big Butte watershed have experienced past and present vandalism, usually in the form of looting. This problem is a major threat to cultural resources.

4.8.b Euro-Settlement

Earliest records of settlement in the Big Butte Country date in the 1860s when westward expansion homesteaders found the lush meadows of lower Big Butte Creek area suitable for farmlands and winter pastures. Communities in their earliest form began to take shape in Derby (T34S,R1E,27) and Dudley (T34,R2E,14), which included post office facilities. Schools districts sprang up to educate the growing populations of kids at Derby (structure remains), Eureka (Cobliegh Rd), Perry (Obenchain Rd), and Schoolhouse Flat (Butte Falls Hwy). To meet the aging populations needs for the hereafter, the Butte Falls Cemetery was opened for business in 1868. The Pacific & Eastern Railroad was constructed through the southern portion of the watershed and arrived at the Town of Butte Falls in 1910. This line served a variety of purposes by hauling people, supplies and lumber products in the earliest days and later logs to Medford Corporation. As road systems developed and transportation means improved, the communities in Lower Big Butte continued to grow.

5.0 SYNTHESIS and INTERPRETATION of INFORMATION

The purpose of step 5 is to compare existing and reference conditions of specific ecosystem elements and to explain significant differences, similarities, or trends and their causes. The capability of the system to achieve key management plan objectives is also evaluated.

5.1 VEGETATION/ FOREST HEALTH

The trend within this watershed over the past 70 years has been one of structural, habitat, and species simplification. (Table 19) Some of the changes from historic levels include:

- The current landscape pattern has been shaped predominately by logging. Historically, the landscape pattern was a result of disturbances, such as fire, windthrow, insects, and disease that was partially influenced by environmental gradients such as climate, soils, and landform.
- Logging and road construction have created a landscape that is more fragmented with greater edge and patch densities than historic levels. Large blocks of mature forests are now mosaics of young plantations, mature forests, and forest stands modified by varying degrees of logging.
- Reduced interior habitat for species requiring late-successional forests.
- A shift in abundance and species composition of soil and canopy arthropods towards those most associated with early-successional stands.
- A shift from early-seral species, such as ponderosa pine, to mid-/late-seral species, such as Douglas-fir and white fir, due to fire exclusion and the harvest of large diameter overstory trees.
- Post-harvest treatments may modify the natural process of vegetative succession. The temporal and spatial occurrence of herbaceous, shrub, and hardwood species may be altered by management treatments (e.g., slashing, burning, brushing, girdling, herbiciding, scalping, fertilizing). Treatments may not always be representative of natural processes, and their effects upon long-term ecological health and process may be unclear.
- Stand densities have increased, increasing soil moisture and nutrient demands which result in increased tree stress and greater numbers of trees predisposed to insect and disease attack.
- The low thinning effect of fire is absent.
- Vertical canopy structure has increased in existing late-successional stands.

Table 19. Forest Stand Condition

Forest Stand Condition	Historic Range	Current Mode
Early-successional/ No Snags	2%	75%
Early-successional/ With Snags	10-40%	6%
Late-successional/ Single Layer	2%	8%
Late-successional/ Multi-layered	45-75%	14%

NOTE: Due to data gaps, the percentages shown for current mode are estimates only.

The cumulative effects of these changes affects the ecological processes and functions within the landscape. The extent and the degree of change can be assessed by comparing the current conditions with the "natural range of variability". Within this "natural range of variability" biological and ecological

functions are sustainable. Elements and processes outside of this range and those depending upon it may not be sustainable.

5.1.a Insects and Disease

Simplification of forest landscape patterns, structure and diversity may lead to increases in pest populations and pathogen occurrence. Homogenizing forest landscapes reduces natural controls and barriers that regulate the kind and extent of insects and disease. Older stands, with their complex array of tree and predator species, stand size, and high structural/age diversity are less favorable to pest outbreaks than are simplified forests created through past regeneration practices (Schowalter, et. al.).

The pattern of forest communities and age classes influences the habitat of natural predators, distribution of food sources for insects and pathogens, and the ability of insects or diseases to survive and spread. Larger areas of uniform early-successional stands are present today than historically occurred. These stands have limited structural and species diversity and, if stressed, may be more susceptible to insect and disease outbreaks.

5.1.b Frost

Openings created by logging have increased the amount of damage to seedlings and saplings caused by frosts.

5.1.c Pocket Gophers

Logging, specifically clearcutting in conjunction with high snow accumulation areas, has created large areas of habitat favored by gophers. In some areas of the watershed, gopher populations are at epidemic levels and have hampered reforestation efforts.

5.1.d Special Status Plants

No historical data exists on Special Status plant species or populations within the watershed. It is difficult to determine the extent to which any Special Status species occurred within the watershed historically and any relative change over time. We can, however, relate the change in habitat types and conditions over time and draw general conclusions about quantity and quality changes of suitable habitat.

Special Status plant species can be grouped according to habitat types. The four main habitat associates are old-growth forest stands, riparian zones, meadows and grasslands, and rock out-crops. In forested stands, generally higher up in the watershed, the amount of late- successional and old-growth forest stands which support rare vascular plant species such as *Cypripedium montanum*, *Cypripedium fasiculatum* and *Allotropa virgata* have been reduced. Nonvascular plant species habitat, particularly fungi and lichens, has been similarly reduced. The riparian zone, which provides habitat for vascular plant species such as *Plagiobothrys glyptocarpus* and *Limnanthes floccosa* ssp. *bellingeriana* has been modified in many places, particularly along the valley bottoms surrounding Big Butte Creek and McNeil Creek, by land development and ranching, and in conifer forests by timber harvesting. In both ecosystems a general loss of riparian vegetation has occurred and a narrowing of the riparian zone due to a loss of mature vegetation which support high quality habitat and specific host species. A high percent of agricultural and ranch lands were developed from low elevation meadows and oak grasslands. However, few Special Status plant species occur on this habitat within the watershed other than certain rare lichens, such as *Bryoria tortuosa, Dendriscocaulon intricatulum*, and *Lobaria halli* which occur on black oaks and white oaks. Rock outcrops provide habitat for species such as *Scribneria bolanderi*, and possibly *Cheilanthes intertexta*, and *Lewisia cotyledon* var. *Howellii*, but have been generally unaffected by development. Overall, few Special Status plant

species are known to occur within the watershed compared to other adjacent watersheds due to a relatively recent and homogenous geologic formation. In relation to other resource values and activities within the watershed, Special Status plant species are a relatively small, but critical component with generally few, scattered sites that should pose few management constraints.

5.1.e Noxious Weeds

Unless some effort is undertaken to curtail the spread of noxious weeds in this watershed, they will continue to spread, overtaking native flora and changing the landscape forever. Forever is not too extreme a word to use in light of future funding prospects, possibly more constraints on the use of herbicides, and a higher impact of use on the landscape (hunting, harvest activities, livestock grazing, and basic land management activities). Small populations are easier to control, as well as less costly.

5.2 WILDLIFE

The current condition is primarily due to human initiated disturbance in the watershed. Land management activities within the WAU have altered wildlife habitat and populations in a variety of ways. Loss of old growth and mature forest habitat, fragmentation of old growth patches, removal of riparian vegetation, increased road building, suppression of fire, extensive rural residential development, and the introduction of cattle grazing are the major sources of change.

Late-successional wildlife habitat within the WAU is highly fragmented. This is partly the result of 32 percent BLM ownership intermingled with 68 percent industrial timber and other private lands. Fragmentation tends to create small islands of late-successional habitat within a "sea" of early-to-mid seral habitat. Lack of connectivity between these islands causes wildlife species which are more dependent upon mature and old growth habitat to be more susceptible to inclement weather conditions, exploitation, predation, and starvation. As the size of the mature and old growth patches decrease some species become packed into smaller areas with closer proximity and there may be an increased chance of predation. An example of this would be when a goshawk becomes a resident in a spotted owl 100 acre activity center.

Species which predominantly use early-to-mid seral stands are expected to increase as this type of habitat becomes more dominant on the landscape. The WAU is predominantly a mix of early and mid-seral timber and agricultural lands (62 percent of the total watershed acres). Twenty-six percent is withdrawn lands which includes oak/pine woodlands.

Connectivity is provided by Riparian Reserves where they have the late-successional characteristics. Due to past harvest practices, many Riparian Reserves in the watershed are in early- to mid-seral condition and do not provide good late-successional connectivity. Future projects within the Riparian Reserves should be identified for areas where there is a need to improve the trend toward late-successional habitat condition.

Snags and large coarse woody debris are being emphasized in management prescriptions. These habitat components are important for many different groups of species, including, bats, pine martins, fisher, other owls (including flammulated and pygmy), woodpeckers, etc.

Grazing by cattle, elk and deer may remove the grass and forb cover, and temporarily reduce the quality of habitat at pump chances where Cascades frogs may be located. These pump chances should be evaluated for impacts from grazing, and fenced if impacts are unacceptable.

5.2.a Threatened, Endangered and Sensitive Species

When late-successional timber is harvested, habitat for old growth dependent wildlife species

declines. Spotted owl habitat has been reduced in the WAU within the last two decades, to the point where none of the existing spotted owl sites have greater than 40 percent nesting, roosting, foraging habitat within the provincial radius of the province (1.2 miles). Weak population connectivity within the provinces because of poor habitat conditions in areas of checkerboard ownership is a result.

5.2.b Other Wildlife

Historically, the oak/pine woodlands of the mid-elevation area would have produced good forage of acorns, grasses, forbs, and shrubs. Many of these areas are declining due to fire exclusion and non-native plant invasion. The lack of fire and conifer encroachment have increased mortality, reduced growth, and diminished acorn production.

Large oaks, which provide natural cavities and acorn crops are important to a variety of wildlife species. Populations of the species that use the features found in the oak and oak/pine woodlands have likely declined. Currently there is no baseline data to establish historical population numbers, but many of the species which occur on ODFW sensitive species list are species which use old growth forests or are cavity dependent species.

The quality and quantity of grass/forb/herbaceous habitat in grasslands throughout the watershed has declined. Conifer and wedgeleaf or manzanita encroachment has primarily been the result of fire exclusion in an area that likely burned frequently. This decline in quality and quantity of forage has had an adverse impact in the herbivores in the watershed. Generally, fire is the primary agent for creating early-seral stages in these habitats. Reintroduction of fire and other projects such as thinning would reduce competition and intrusion of hardwoods and pine into the meadows. It would also encourage new growth of tender shrubs and forbs which would improve quality and quantity of forage. This watershed is an important wintering area and migration route for deer and elk and emphasis should be placed on improving forage, hiding and thermal cover for these species.

High road density is also a factor which affects wildlife. High road density contributes to disturbance and increased hunting pressure in some areas due to ease of vehicle access. Hiding cover along roads is important to deer and elk because it provides protection from disturbance. "Road hunting" and poaching is higher in areas with lack of cover and high road densities.

5.3 FISH

5.3.1 Stream Channel

Stream channel conditions reflect the historic land use practices of logging, land clearing, grazing, and road building, as well as natural occurrences such as heavy rainfall and debris dams releasing in channels. The amount of large wood greater than 24 inches diameter and 50 feet in length in the stream systems are low according to NMFS standards (less than 25 pieces/mile). Percent of channels showing active bank erosion is high, pool quality is poor to fair, and spawning gravels are fair. All of these indicators point to a lack of riparian vegetation which provides bank stability and large wood recruitment. In addition, changes in peak flows have contributed to erosion of banks which are already destabilized by a lack of deep-rooted vegetation.

5.3.2 Stream Temperature

Several streams within the WAU are listed by DEQ as "water quality limited" due to temperature, including the mainstem of Big Butte Creek and Dog Creek. Temperatures are affected by lack of stream shading, high width/depth ratios, and low flows caused by irrigation withdrawals.

5.3.3 Flows

Stream flows within the WAU have been altered by logging, roads, and irrigation withdrawals. Peak flows are higher than would normally be expected and summer low flows are lower. High flows can contribute to bank erosion, sedimentation, and movement of large wood out of the system. Low flows affect stream temperature and movement of fish within the system.

5.3.4 Sediment

Although the percent of fines (silt, sand, and organics) on surveyed streams was found to be relatively low, macroinvertebrate surveys indicate that sediment is a limiting factor in the watershed. Intolerant taxa were rare or absent at most sites, indicating high sediment levels. Sediment is contributed through roads, slides, bank erosion, and ground-disturbing activities such as timber harvest.

5.3.5 Fish

Anadromous fish population numbers have declined over the past twenty-five years in the Rogue River basin. This can be partly attributed to land management practices which have impacted aquatic habitat, including removing large wood from streams and clearing of riparian vegetation. Increased timber harvest activities and high road densities contribute sediment to the streams, impacting juvenile and resident fish by reducing the numbers of macroinvertebrate prey species available for food. Spawning adults are also impacted by sediment which chokes spawning gravels. Water withdrawals and human-made barriers have created additional impacts by reducing the amount of suitable habitat available to fish and interrupting connectivity of aquatic systems.

5.4 RIPARIAN

5.4.1 Timber Harvesting

Lower Big Butte watershed is characterized by equal proportions of federal land ownership, private ownership, and industrial timber lands. Early timber harvesting policies and management practices were less cohesive and systematic across the landscape. This resulted in generally low levels of impacts to the riparian and aquatic ecosystems, although some areas were harvested intensively, particularly on private industrial lands. Federal land management policies were linked closely with industrial timber lands and some private woodland owners during the 1950s through the 1980s. Activities focused on road construction for access and timber harvesting. Road systems tended to be constructed along stream systems, although to a lesser degree than in watershed where topography is steeper. Forested stands were harvested through the riparian zone. Riparian areas were generally not considered an ecosystem that merited special management consideration, and in the earlier phases of development within the watershed this was likely true. As timber harvesting intensified and harvesting practices moved from high-grading and select cut to clearcuts the amount of riparian areas adversely affected by an increase in early seral stage, loss of shade and mature riparian vegetation, loss of canopy, and a decrease in coarse wood, significantly changed the characteristics of the aquatic and riparian ecosystems on many reaches. Headwater streams were impacted particularly severe. Clark Creek drainage was deferred from harvest in the Medford RMP (1994) as a result of cumulative effects caused by extensive timber harvesting.

Currently, the Aquatic Conservation Plan of the Northwest Forest Plan and listing of anadromous fish species within the watershed under the Endangered Species Act have added protection measures that restrict timber harvesting, road construction, and development activities within the Riparian Reserves while the recent Oregon State Forest Practices Act provided additional protection measures on private lands to fish streams and other perennial streams. Protection and

conservation of riparian and aquatic ecosystem values as part of broader natural resource are increasing in stature.

5.4.2 Development

With the implementation of the Northwest Forest Plan on federal lands and the generally developed timberlands of the industrial timber land owners within the watershed, relatively low levels of development is expected to occur on forest lands. Development on private lands has shown a continued upward trend over the past 15 years and should be expected to continue. Land subdivision, new home construction, and related infrastructure developments are likely to negatively impact riparian and aquatic ecosystems. Development is concentrated in the lower third of the watershed along the Butte Falls Highway and Crowfoot Road which would impact McNeil Creek, lower Big Butte Creek and its tributaries.

5.4.3 Ranches and Farming

Generally, agricultural lands were established along the bottom lands of Big Butte Creek and McNeil Creek in the early to mid 1900s. Approximately 8 percent of the watershed is cultivated. Agricultural lands are and will continue to be a component of the watershed and impact the aquatic and riparian ecology. Farming tends to reduce the width of the riparian ecosystem, draw water from the creek for irrigation, and increase sediments, nitrogen, herbicide and pesticide use. Ranches tend to concentrate cattle around streams and water sources, trample riparian vegetation and increase nitrogen and fecal contaminates. It is difficult to determine the extent of the impacts due to the variety of agricultural practices and land owners. McNeil Creek and some of it's tributaries are located within pastures with relatively high concentrations of cattle. Generally, due to the low percentage of area within the watershed under cultivation, direct impacts to the riparian and aquatic ecosystem are currently at low levels and are expected to remain about the same.

5.5 SOILS

In the southwest portion of the watershed, surface erosion from non-surfaced and poorly maintained roads is the major contributor of sediments to the stream systems. Prior to this disturbance, soil erosion from bare soil areas created by intense wildfires were most likely the dominant sources of sedimentation to the stream system. Due to the colloidal clays from the soils in this part of the watershed, much of the materials reaching streams are in the form of suspended sediments which can stay in solution for long distances downstream adversely affecting water quality.

Other sources of sedimentation to the stream system comes from mass wasting. Historically, prior to disturbances, mass wasting was not very prevalent and could be attributed to slumping during soil saturation from intense rainstorms. Currently, the extensive network of roads and timber harvest (large regeneration treatments) has reactivated some of the slump prone areas which is contributing to sediment levels, although not to the extent that runoff from roads do.

In the northeast portion of the watershed the cumulative effect of the transient snow zone (TSZ) openings and soil productivity losses from compaction are the predominant adverse impacts to the soil and water resources.

Prior to human disturbances, forest canopy cover and uncompacted soil areas reduced the magnitude and frequency of floods which led to a reduction in adverse watershed effects and a greater capability to recover from these associated effects.

Currently, openings of greater than 2 acres in the forest canopy within the TSZ from timber

harvest are at risk for accumulations of snow pack that are subject to creating flooding conditions during warm winter rainstorms. This risk is especially high for the headwaters of the Clark Creek, Dog Creek, and Box Creek drainages where a large percentage of the lands fall within the TSZ.

Soil productivity was relatively unaffected except for short durations after intense wildfires in areas that charred the soil prior to human disturbance. Currently, an extensive network of skid roads, haul roads, and landings from timber harvest activities has created compacted areas that are less productive in terms of plant growth and also contributes to increases in runoff during rainstorms. The highest risk is in the Clark Creek drainage of this watershed.

5.6 FIRE

It is nor only possible, but desirable to reintroduce fire into this ecosystem. Some of the larger brush fields will need to be treated in a series of treatments. All areas that are treated will require multiple entries to restore vegetative conditions similar to those we would expect under normal fire regimes. By doing these initial treatment and necessary follow-ups we can expect to see a long-term reduction in fire risk. By returning the brushfields to early-seral conditions there should be some additional benefits to wildlife.

5.7 GRAZING

Animal husbandry and livestock grazing were always practiced in agricultural communities throughout the west, first as a means of providing meat for single families, then as a business for providing meat to other consumers. Public land administration, and specifically grazing, was one of the primary reasons for the passage of the Taylor Act in 1934, and later the establishment of the Bureau of Land Management in 1946. Since that time, public land grazing has been more closely managed, with an emphasis on sustained production of grasses, forbs, shrubs, and other species having the ability to stabilize the soil. Certainly, unmanaged grazing that occurred prior to the Taylor Act produced a landscape in far worse condition than that which we manage now.

Current demands on the public land resources exceed those of only the livestock operators, who were once the only users of public lands. In some cases, these new demands are not consumptive in nature, and are therefore more acceptable by the public-at-large. Consumptive uses are under more scrutiny today, and in some situation like livestock grazing, ranchers are being pressured to discontinue what has been a part of their livelihood for decades, regardless of whether the use was proper or improper. Proper and/or appropriate livestock management is essential to the industry's survival in today's political environment.

5.8 HUMAN USES

5.8.a Roads

The road network has developed primarily for two purposes. Government roads were built to access stands of timber for commercial harvesting and private roads were constructed to provide access to residential properties or private timber holdings. Drainage structures and surfacing on private roads are generally substandard, and these roads have the potential to contribute large amounts of sediment to streams. Most federal roads are generally in better condition, with improved drainage

structures and surfacing designed to minimize erosion and sedimentation. However, drainage structures may not meet current 100-year flood standards, and one-fourth of existing inventoried roads are natural surface. A thorough review of BLM roads is necessary before actual conditions are known. County and state roads are generally paved and receive a high level of maintenance. These roads contribute very little to overall sediment levels within the watershed.

The existing road network is adequate for the access needs of timber management, silvicultural treatments, and fire suppression efforts in eastern portions of the watershed. High road densities in the southwestern portion poses problems for wildlife and presents a threat to water quality and fish habitat. Efforts to minimize impacts should be focused on roads within the Riparian Reserve. Some roads may be appropriate for closure and/or decommissioning to reduce the impacts on natural resources.

5.8.b Modern Developments

Much has changed in the Lower Big Butte watershed in recent times. Where there was once roving bands of First Nation peoples or scattered settlers/ranchers there is now extensive rural housing developments and small "ranchettes". As road systems developed and technology of resource extraction improved, the effect on the landscape became dramatic. Large land parcels were made into smaller parcels. The area continues to absorb new developments. Forest and meadow habitats that once allowed free movement of wildlife are now impeded with fences and roads. The recent past saw residents of the area making a living from the land and being close to the resource they lived amongst. Many current residents commute to work from their rural homes. The tie to the resource is weaker but the feeling of connection to the land is just as intense as when it was relied upon for sustenance. People cut firewood, hunt for recreation or just enjoy being in the "country". Some make at least part of their living by extracting firewood or other special forest products, such as poles, house logs, berries, mushrooms, etc.. This demand, whether authorized or unauthorized, will not likely fade away.

6.0 RECOMMENDATIONS

The purpose of step 6 is to bring the results of the previous steps to conclusion, focusing on management recommendations that are responsive to watershed processes identified in the analysis. By documenting logical flow through the analysis, issues and key questions (from step 2) are linked with the step 5 synthesis and interpretation of ecosystem understandings (from steps 1,3, and 4). Monitoring activities are identified that are responsive to the issues and key questions. Data gaps and limitations of the analysis are also documented.

6.1 VEGETATION

Stand and Forest Health

Objective: Promote stand and forest health

- Utilize regeneration harvests to promote and/or maintain stand and forest health.
- Increase stand/forest vigor through implementation of density management programs.
- Implement vegetative treatment practices in early-seral stands that would lead to the development of late-seral stand conditions.
- Fertilize pre-commercial and commercially thinned stands to increase growth rates and to promote the development of older seral stand conditions.
- Implement vegetative treatment practices to promote and develop late-seral conditions in riparian areas.
- Implement fuel hazard reduction activities to lower fire risks within the watershed.

Special Status Plants

Objective: Identify and protect Special Status vascular and non-vascular plant populations in the WAU.

- Survey for rare and Special Status vascular and nonvascular plants to locate new populations, collect population data and species specific data. Include special habitat areas and reserve areas in surveys when possible.
- Protect and manage Special Status plant species populations and habitat according to current policies and guidelines. Monitor populations within project areas as part of a project plan, and monitor all Special Status plant populations throughout the watershed on a regular basis.

Noxious Weeds

Objective: Stop the encroachment of current locations of noxious weeds in the watershed and eliminate existing populations of known sites.

- Through the Upper Rogue Watershed Association, prepare and implement a Weed Management Plan, which would include the Lower Big Butte watershed. This plan would incorporate prevention, detection, and treatment measures of noxious weeds across all ownerships. This plan wold also incorporate weed prevention measures in all ground-disturbing activities.

6.2 WILDLIFE

Big Game

Objective: Maintain or enhance current native terrestrial wildlife populations and distribution.

- To the extent possible, timber harvest should provide hiding cover between treatment areas along roads which are open all year.
- Provide for adequate hiding cover patches (<1 acre) along roads and across the landscape.
- Adequate escape cover should be provided adjacent to existing or planned forage areas.
- Hiding and thermal cover should be maintained along migration routes.
- Minimize new road construction within planning area to reduce potential for poaching and big game harassment.
- Road closures from October 15-June 30 during hunting season and calving or fawning season.
- Install barricades on new roads to minimize degradation of elk and deer habitat.
- Maintain existing road closures and review open roads for possible closure.
- Develop forage for big game with prescribed fire, timber harvest, and brush removal.
- Consider including key deer and elk wintering areas in big game management areas in next RMP to include areas below 3500 feet.

Threatened and Endangered and Special Status Species

Objective: Maintain or enhance current native terrestrial wildlife populations and distribution and ensure management activities do not lead to the listing of Special Status species as threatened or endangered. Maintain, protect, and enhance special habitat features.

- Designate 25 percent of the best and oldest habitat in the connectivity blocks.

- Maintain connectivity between LSRs with emphasis on spotted owl critical habitat.

- Identify areas to reserve large green conifers on ridges and on the edge of canyon rims to provide bald eagle nesting habitat adjacent to Big Butte Creek.

- Identify areas where there is a deficiency in snag numbers or CWD, and design a management strategy to leave higher numbers for mitigation.

- Identify goshawk nest sites, protect with a forty acre no-cut buffer. Maintain post-fledgling family area.

- Protect great gray owl nests with buffer. Leave at least 2 of the largest snapped-off trees in stands adjacent to current nest stands.

- Repair and maintain cave grate at Poverty Flat ACEC.

- Evaluate, protect, and monitor pump chances within the WAU for Cascades frog habitat.

Native grass/oak woodland Habitats

Objective: Maintain or improve the natural function of the native grass/oak woodland plant associations.

- Plan projects in oak woodland/oak grasslands and brush fields to improve quality of grass, improve acorn and other seed production, and improve palatability and nutritional value of shrubs. Use fire and thinning, both mechanical and manual, to encourage new growth.

6.3 FISH

Objective: Increase stream bank stability

- Identify stream reaches which are experiencing active bank erosion.

- Stabilize banks through silvicultural treatments such as planting native riparian hardwood species (alder, willow, ash, cottonwood) and encouraging the development of late-seral characteristics in Riparian Reserves.

- Exclude cattle from areas where the stream banks are being degraded by cattle crossings.

Objective: Increase stream channel complexity.

- Encourage the development of late-seral characteristics in Riparian Reserves to provide future recruitment of large woody debris (LWD). In areas where the LWD recruitment potential is

low, consider placement of log structures to provide habitat complexity and retain spawning gravels.

! In areas where the stream has been channelized, encourage development of side channels and meanders by reconnecting the stream with its former floodplain.

Objective: Reduce summer stream temperatures.

! Encourage the development of late-seral characteristics in Riparian Reserves to provide increased stream shading.

! Exclude cattle from areas where riparian vegetation can be shown to be over-utilized by cattle.

! Explore opportunities with private landowners and the Eagle Point Irrigation District to increase summer flows by implementing alternative irrigation methods such as drip systems, or by releasing stored water from impoundments.

Objective: Reduce sedimentation of stream substrate.

! See recommendations under Soils.

Objective: Restore aquatic habitat connectivity.

! Identify man-made passage barriers such as culverts and irrigation diversions.

! Replace culverts on fish-bearing streams with bottomless arches or similar structures.

! Explore opportunities with private landowners and the irrigation district to remove unused or nonfunctional diversions, or to replace utilized diversions with pumps or infiltration galleries.

Objective: Monitor populations of T&E fish species.

! Continue smolt trapping project on lower Big Butte Creek.

! Periodic (5 years) monitoring by snorkeling or electrofishing.

! Monitor aquatic habitat restoration projects for effectiveness.

6.4 RIPARIAN

Objective : Management of Ephemeral Drainages.

! Establish protection buffers along ephemeral drainages, as necessary, where steep topography and unstable soils occur to reduce increased flows, down-cutting, potential slumping, erosion,

and sedimentation.

- Reduce roads, skid trails, and compacted soil in the vicinity of ephemeral drainages.
- Increase protection measures that maintain natural hydrological flow patterns.

Objective: Monitoring Riparian Reserves.

- Repeat similar watershed level riparian monitoring approximately every 10 years to determine general and site specific changes over time and functioning condition trends.
- Use riparian survey recommendations to identify restoration project areas.
- Project level monitoring should be included as part of the project design.

Objective: Restoration of Degraded Riparian Reserves

- Reduce roads, soil compaction, and erosion within the Riparian Reserve. Relocate roads to locations outside Riparian Reserves where possible.
- Restore natural hydrologic flow regimes by reducing winter peak flow levels and increasing summer low flow levels where appropriate.
- Employ silvicultural practices that increase the rate of growth of conifers to achieve mature stand characteristics as soon as possible in plantations, early- and mid-seral forest stands in the Riparian Reserves.
- Promote stream shade, stream-side vegetation, multiple canopies, and channel stability.
- Restore young plantations with excessive amounts of ponderosa pine to the original conifer species mix appropriate for the site.
- Reduce cattle impacts in riparian areas where they are proven to cause or excessively contribute to negative impacts on the riparian and aquatic ecosystems.
- Develop working relationships and coordinate with neighbors, industrial forest land owners, Upper Rogue Watershed Council, state agencies and others at the project level for a more comprehensive and broad-based effort.
- Consider controlled fire within intermittent and non-fishbearing perennial Riparian Reserves to maintain the health and vigor of forest stands, reduce ladder fuels, and the risk of catastrophic fire.

Objective: Eagle Point Irrigation Canal.

- Establish Riparian Reserves on federal lands along streams and around wetlands created by leakage from the Eagle Point Canal to meet ACS objectives.

6.5 SOILS

Objective: Move the sediment regime towards levels existing prior to human disturbances.

- Improve road conditions (i.e., rock surfacing, drainage structures, etc.) and schedule adequate maintenance on BLM roads.

- Use the lower Big Butte road inventory data for identifying roads segments that cause concentrated flows and downslope gullying. Consider road decommissioning or seasonal closures during wet periods, particularly on roads within the Riparian Reserves.

- Perform adequate and timely maintenance on the road system to minimize sediment delivery to streams. (This may require partnerships or cooperation from the local landowners or the irrigation district. Consider Wyden Amendment funding.)

- Upgrade all stream crossings and cross-drain culverts to meet 100 year flood standards.

- Install armored waterdips and outslope low-gradient and low-use access roads.

- Identify non-system roads for decommissioning/obliteration/blocking/improving.

Objective: Protect active and potentially active landslides and severely eroding areas.

- Avoid road construction through active or potentially active landslide areas.

- Consider alternatives to regeneration harvest in areas to maintain slope stability. Leave sufficient large tree component to maintain adequate root strength to reduce slope instability.

- Use the lower Big Butte road inventory data to identify road segments with existing or potential landslides that have, or may in the future, delivered sediments to streams.

- Establish or maintain vegetative cover, or use rock buttressing, to stabilize active landslides.

Objective: Reduce potential impacts of rain-on-snow events on the aquatic habitat.

- Reduce amount of forest canopy openings in the TSZ. For existing non-recovered openings in the TSZ, consider silvicultural practices that would enhance long-term canopy closures.

- Avoid harvest practices that reduce forest canopy cover below 60 percent on south aspects and 70 percent on north aspects in the TSZ. Openings under two acres in size may be utilized when

necessary provided they are well spaced throughout the harvest unit.

- Prioritize roads from the TMOs to identify where decommissioning of roads can be accomplished.

- Identify opportunities from road inventory data to upgrade stream crossings and culvert spacing to meet 100 year flood standard.

- Conduct an updated cumulative effects analysis to determine the level of activity in Clark Creek drainage to make recommendations for status of deferral in next RMP.

Objective: Restore and maintain soil productivity to levels prior to human disturbances.

- Utilize soil tillage operations to ameliorate existing compaction, particularly on skid roads and landings.

- Utilize harvest equipment that minimizes soil disturbance. Require seasonal restrictions and soil moisture restrictions on ground-based equipment.

- Use temporary roads or alternative harvest techniques to minimize new road construction.

- Manage vegetation to reduce fire hazards and fire intensity to minimize potential impacts of wildfire on soils.

- Use prescribed fire to maintain protective duff layers and minimize soil damage.

6.6 FIRE

Objective: Fire Hazard Reduction

- In order to reduce crown fire potential, canopy closures should be reduced to 60 percent or less. This reduction would decrease potential for running crown fires in conifer stands.

- Treat ladder fuels in timber and white oak stands to reduce potential for running or active crown fires.

- Decrease ground fuels in both commercial and non-commercial stands to reduce fire intensities and associated site damage.

- Treat activity fuels in both commercial and pre-commercial projects. Treatments should utilize both fire and mechanical means.

- Treatment should be site specific and include such methods as slash and burn, underburning, slash, handpile and burn, construction of fuel modification zones, lop and scatter, and use of

mechanical treatments.

- Maintain or improve existing suppression facilities such as pump chances. Reconstruct pump chance at Geppert Butte.

- Explore partnership opportunities for fuels treatments with adjacent land owners.

- Target areas that transition between rural interface and forest land for fuels treatments to reduce potential for fires to move from residential land to forest land.

  Note: Priority areas would likely be as follows: Rural Interface Areas, areas with high value or unique values, such as owl activity centers and LSRs, large continuous brush fields, and the area between the Butte Falls highway and the irrigation canal. By foregoing fuels treatments in areas such as the LSRs and riparian areas along fish bearing streams that may require a "hands off" approach, there is the potential increased risk from fire damage. By treating adjacent areas the risk may be somewhat reduced. Any proposed road closures should continue to take fire suppression needs into consideration.

6.7 GRAZING

Objective: Minimize resource damage while allowing existing levels of livestock use.

- When specific areas of resource degradation are identified as a result of the BLM grazing program, develop an implementation strategy that will correct the problem.

6.8 HUMAN USES

Archeological

Objective: Minimize or stop the ongoing looting of archeological sites.

- Assess archeological sites to determine their scientific and heritage values and protect or recover these values.

- Define the type of historic and prehistoric sites that are likely to occur within the watershed.

- Minimize new road construction in areas with high archeological values.

- When an archeological site is found, implement best management practices to protect the site.

Present Day

Objective: Develop opportunities for Special Forest Products program.

- In the implementation of various forest health, fuels reduction or habitat modification programs, consider projects to be completed through a Special Forest Products permit.

- In BLM areas that are without legal access, develop project efforts with local neighbors that will assist in completing resource modification.

Objective: Maintain or enhance recreation/visual resources program.

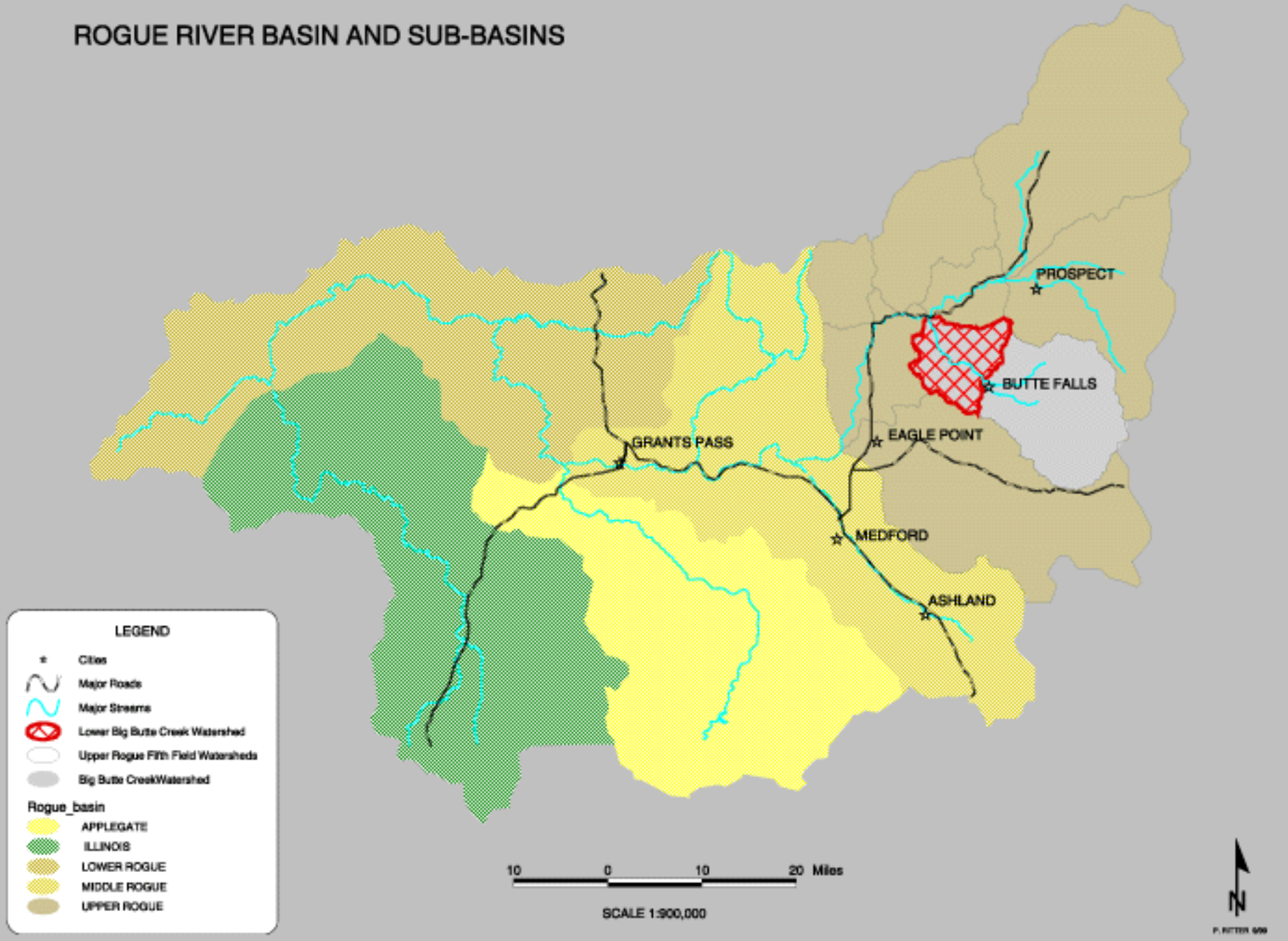
- Reconsider potential recreation sites identified in RMP for appropriate development. Individual sites would be evaluated in future EA's.

- Adjust VRM II boundary to reflect the area seen from Cobliegh Road (Map 21).

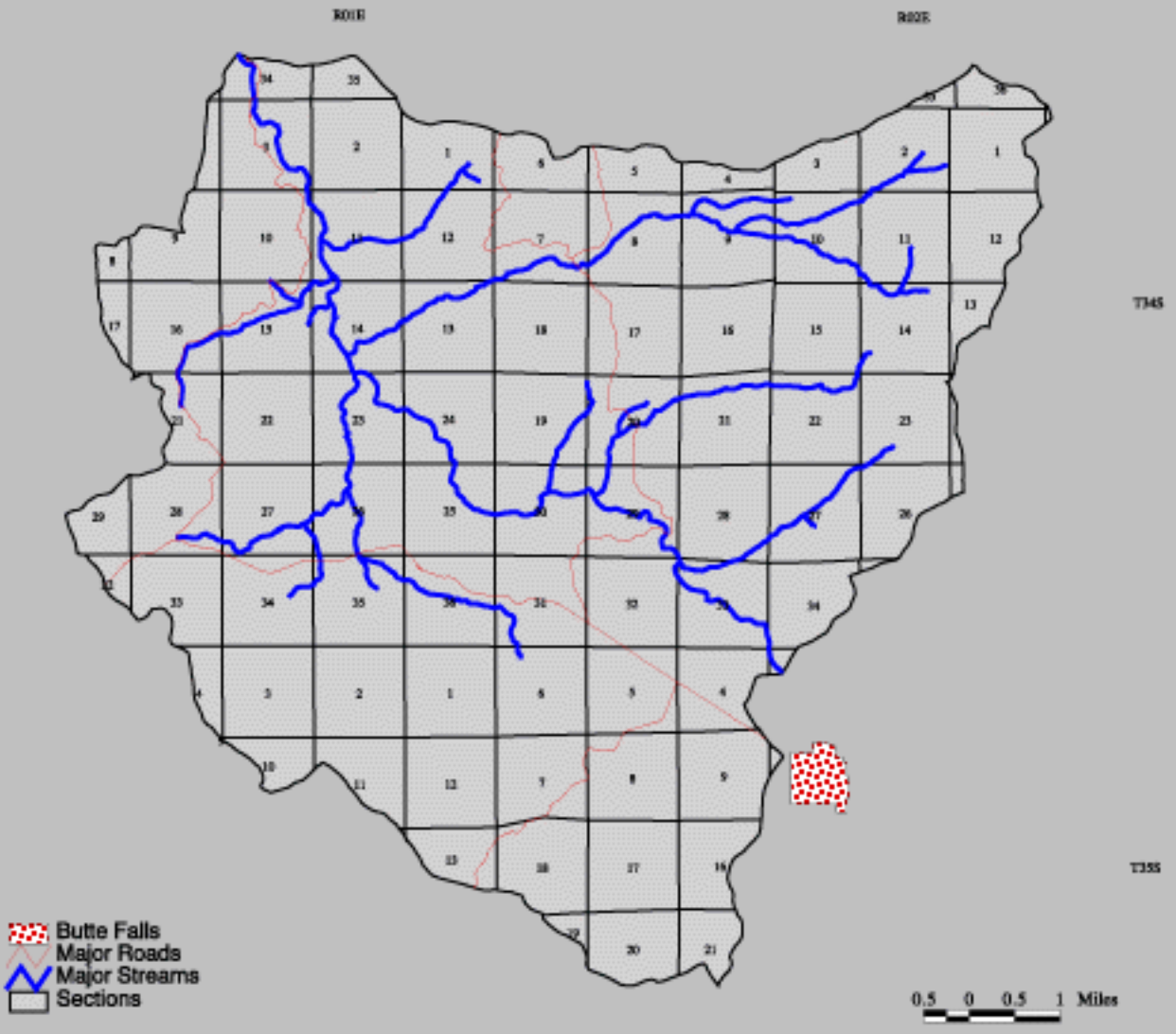
- Do a plan maintenance to change the boundary lines that were incorrect. Boundary changes reflect area that is seen from Cobliegh Road.

- Maintain VRM II characteristics along Cobliegh Road.

ROGUE RIVER BASIN AND SUB-BASINS



Lower Big Butte Watershed



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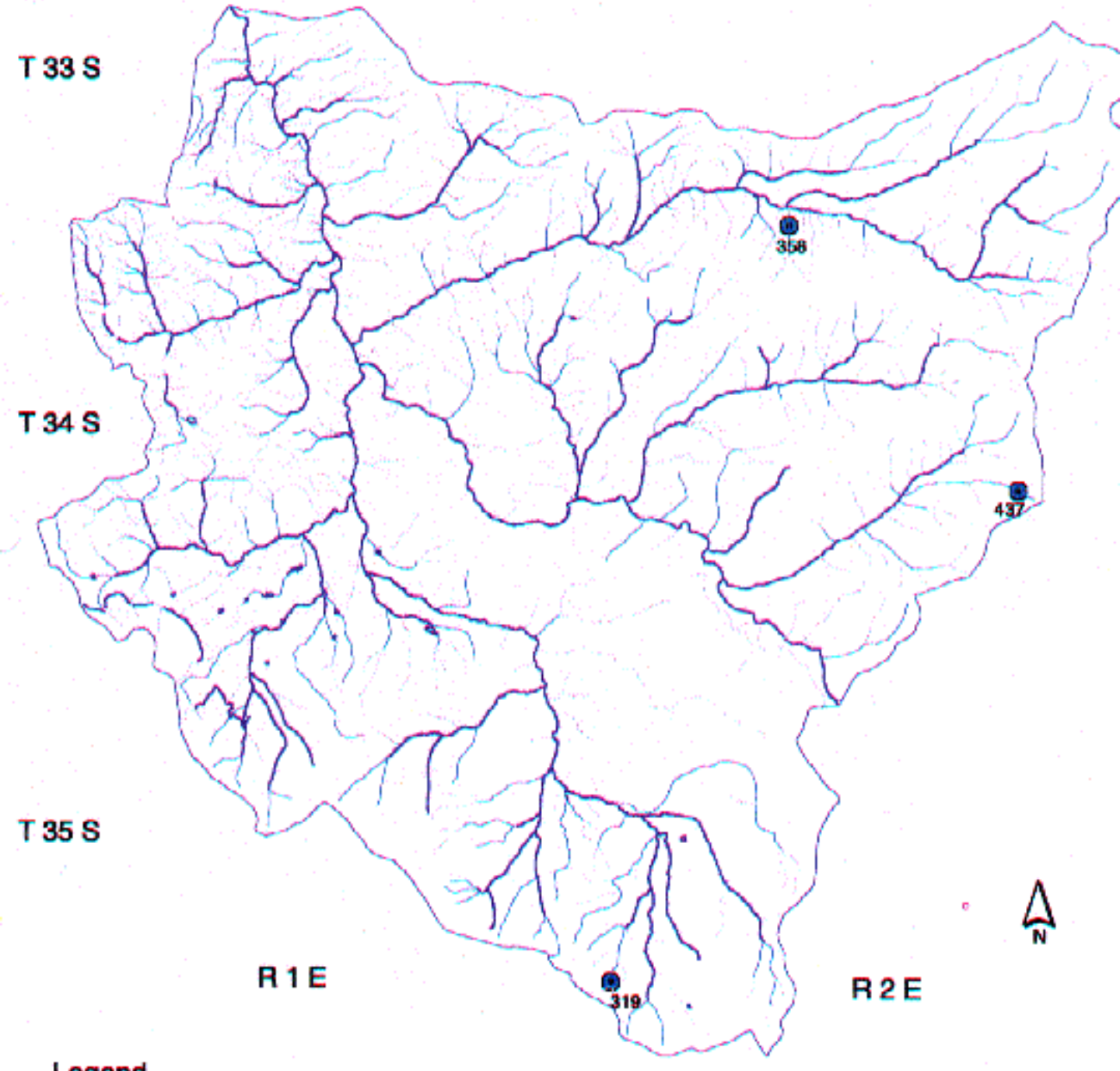
Lower Big Butte Watershed Hydrology



Legend

- Ephemeral Streams
- Perennial Streams
- Intermittent Streams
- Reservoirs with Water Rights/Exemptions
- Watershed Boundary

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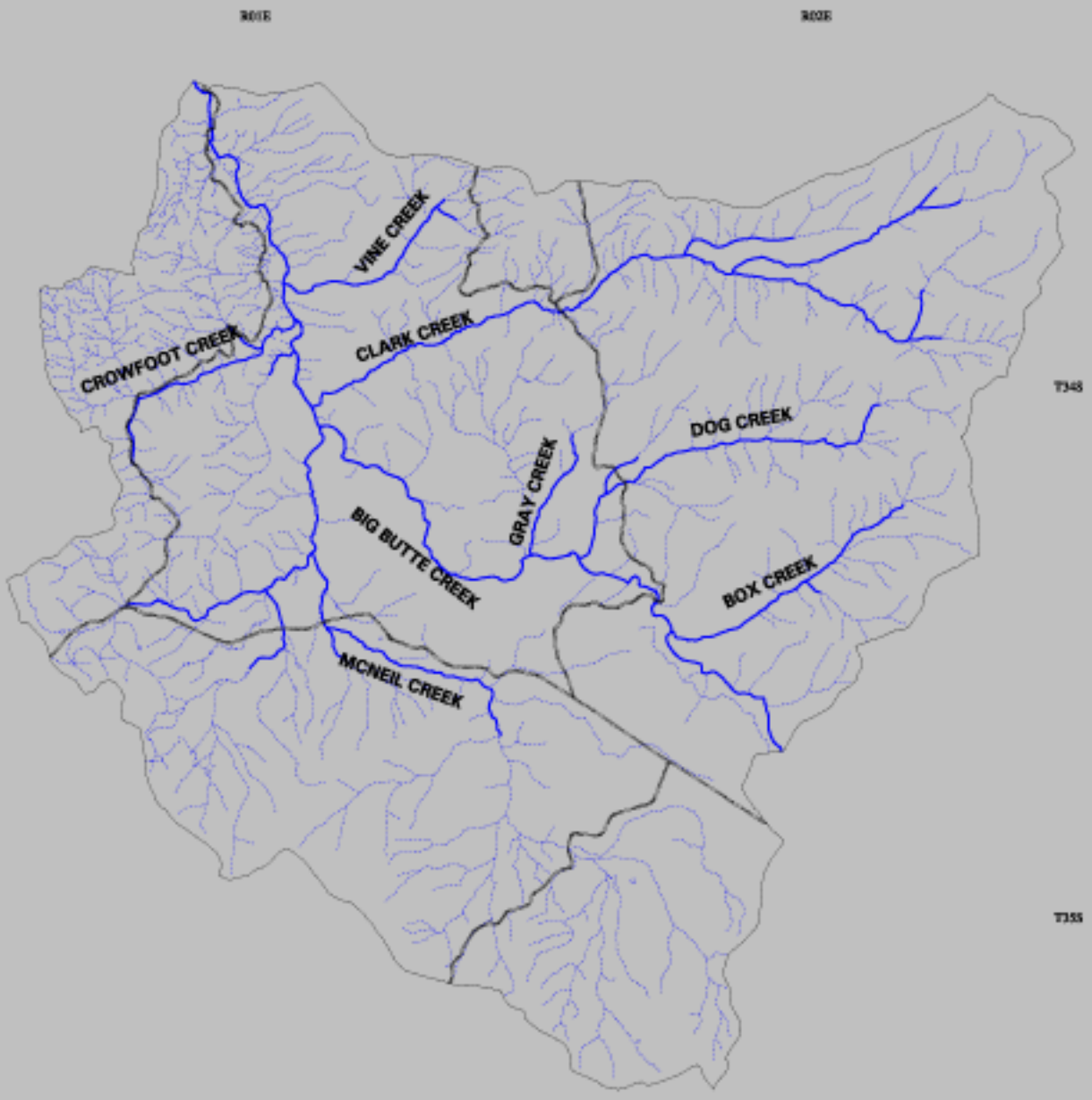
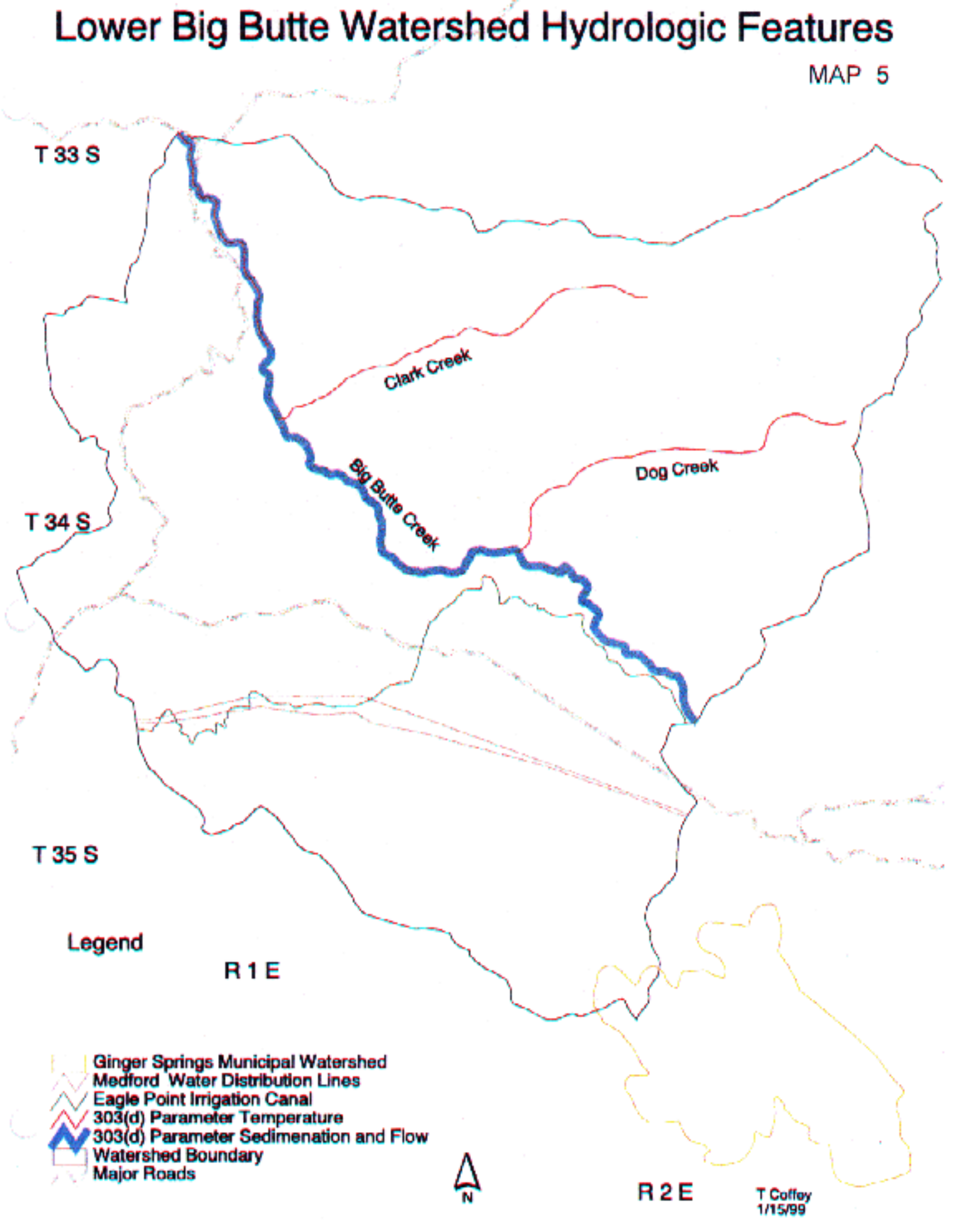
Lower Big Butte Hydrology

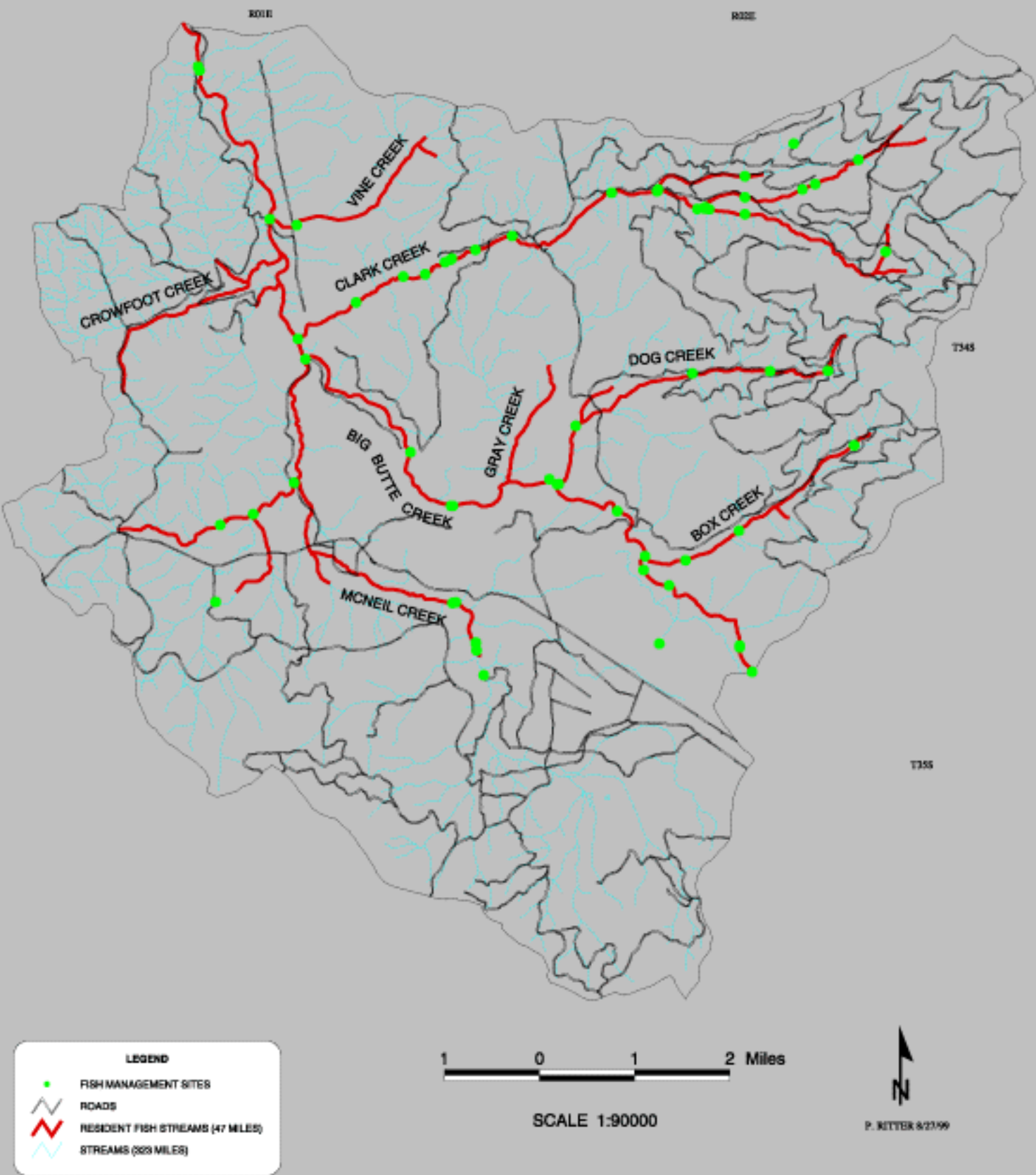


Lower Big Butte Watershed Hydrologic Features

MAP 5



Lower Big Butte Resident Fish Streams



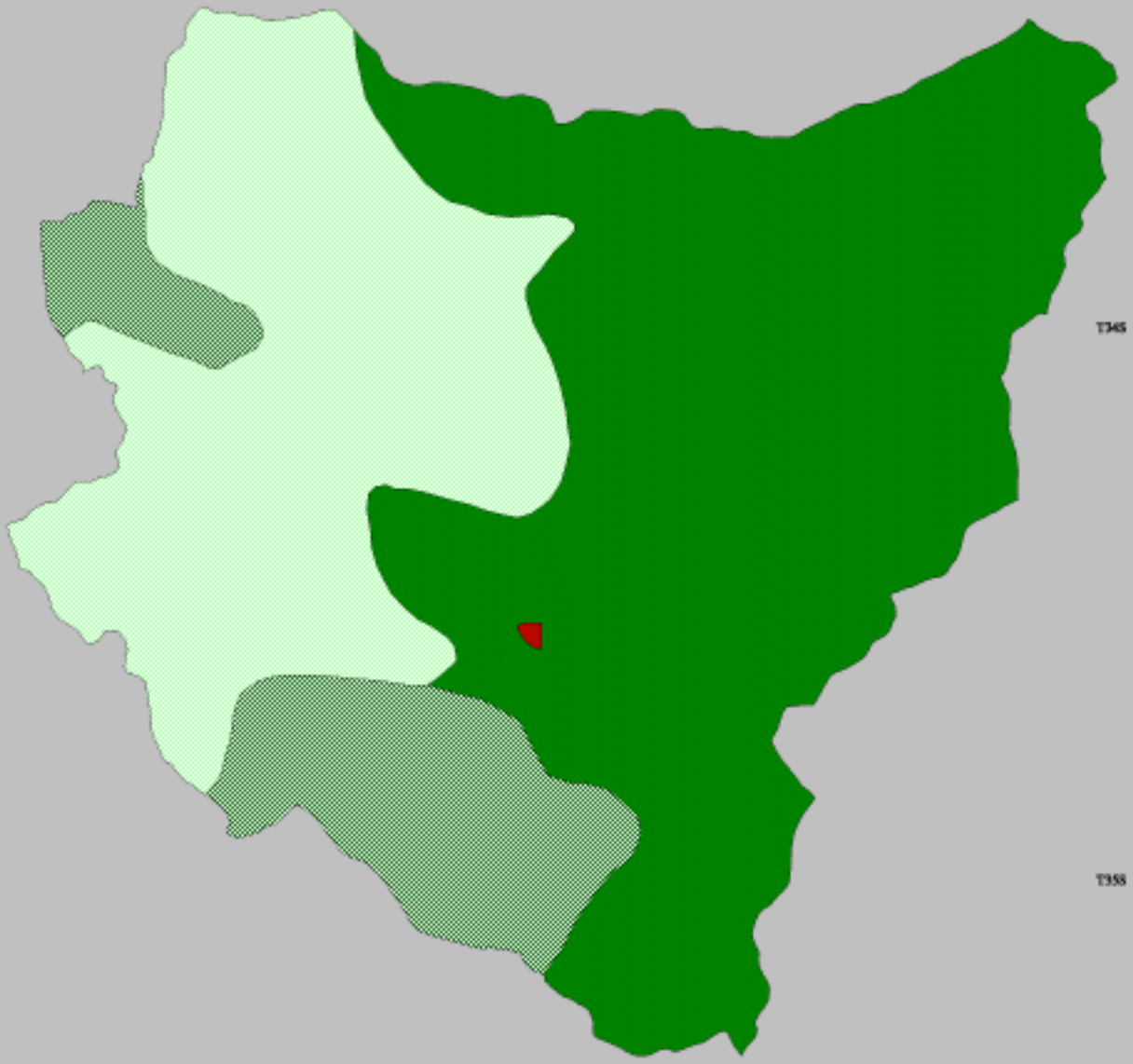
Lower Big Butte Major Plant Groupings

R01E

R02E

T34S

T35S



LEGEND

Poverty Flat ACEC

Plant Groups

Douglas Fir-Ponderosa Pine/ Ceanothus/ Herbaceous Grouping

Mixed Conifer/Interior Valley/ Grass Grouping

White Oak-Ponderosa Pine/ Manzanita-Wedgeleaf/ Grass Grouping

1 0 1 2 Miles

Scale 1:110,880

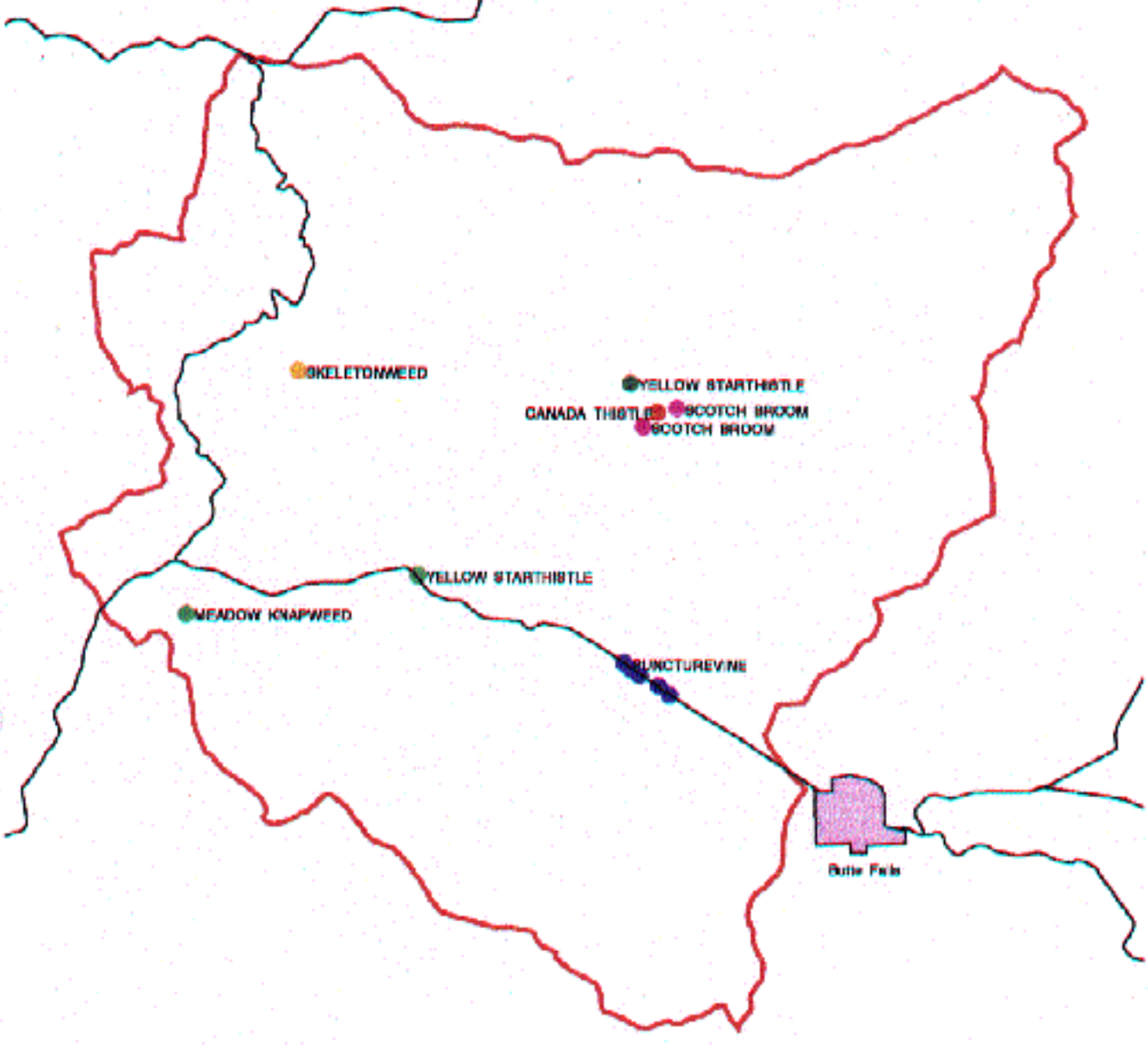
1" = 1.75 miles

N

D Looper 1/22/99

Lower Big Butte Watershed Noxious Weed Locations

MAP 8



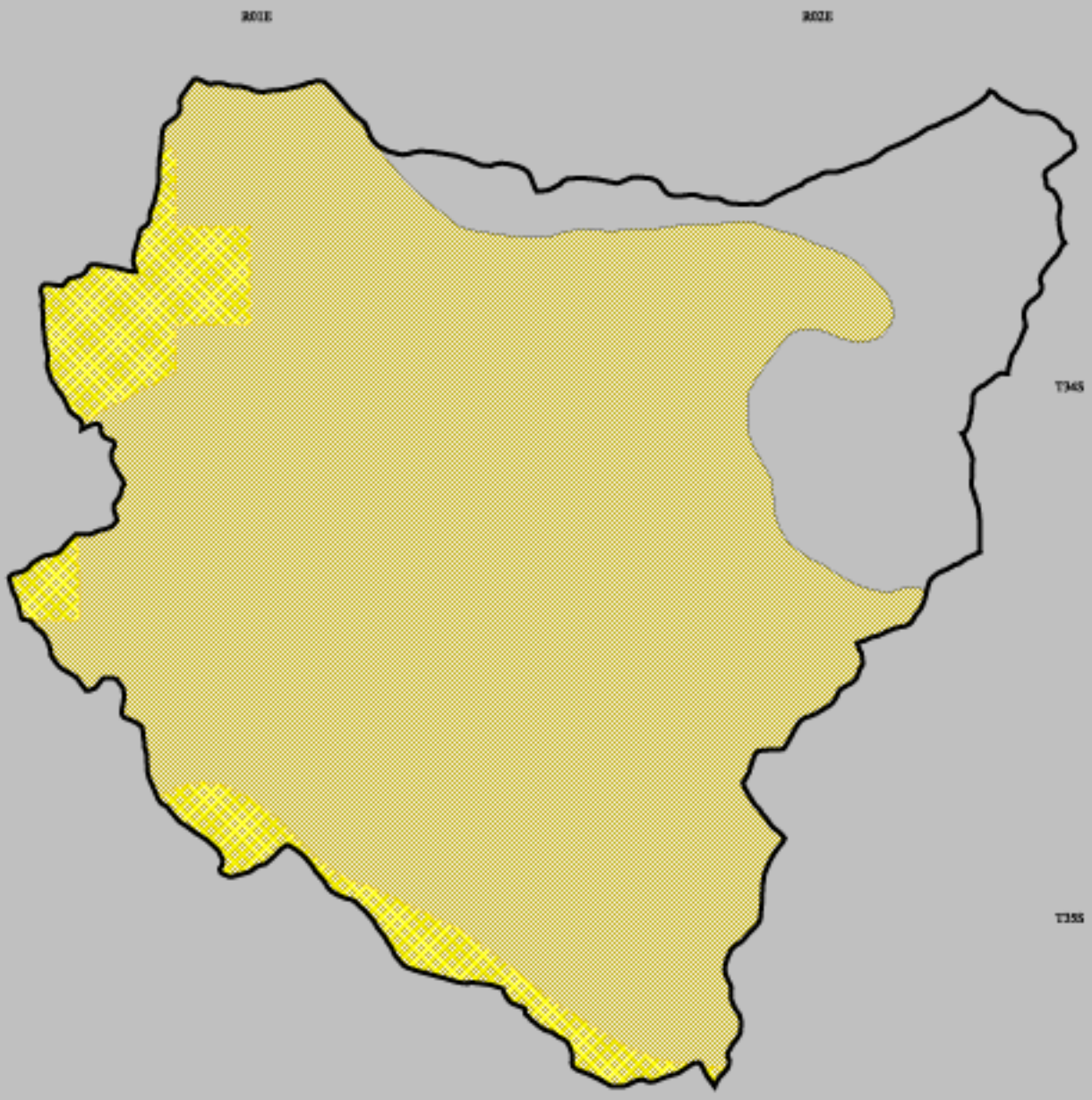
1.9 0 1.9 Miles

Cities
Majorrds
Lobweeds
- CANADA THISTLE
- MEADOW KNAPWEED
- PUNCTUREVINE
- SCOTCH BROOM
- SKELETONWEED
- YELLOW STARTHISTLE

Lower Big Butte WAU

Common name	Town range	Section	Square fe	Cover
CANADA THISTLE	034W07	22	100	50
MEADOW KNAPWEED	033W05	07	10000	10
MEADOW KNAPWEED	033W05	18	500	1
PUNCTUREVINE	035E02	05	100	50
PUNCTUREVINE	035E02	05	100	40
PUNCTUREVINE	035E02	05	100	50
PUNCTUREVINE	035E02	05	100	50
PUNCTUREVINE	035E02	05	100	50
SCOTCH BROOM	034W07	23	100	50
SCOTCH BROOM	034W07	23	100	50
SKELETONWEED	033W05	17	450	50
YELLOW STARTHISTLE	034E02	20	50	50

Lower Big Butte Deer Winter Range



Important Deer Winter Range (36,310 Acres)

RMP Designated Big Game Winter Range and Elk Management Area (5,484 Acres)

1 0 1 2 Miles

Scale 1:110,880

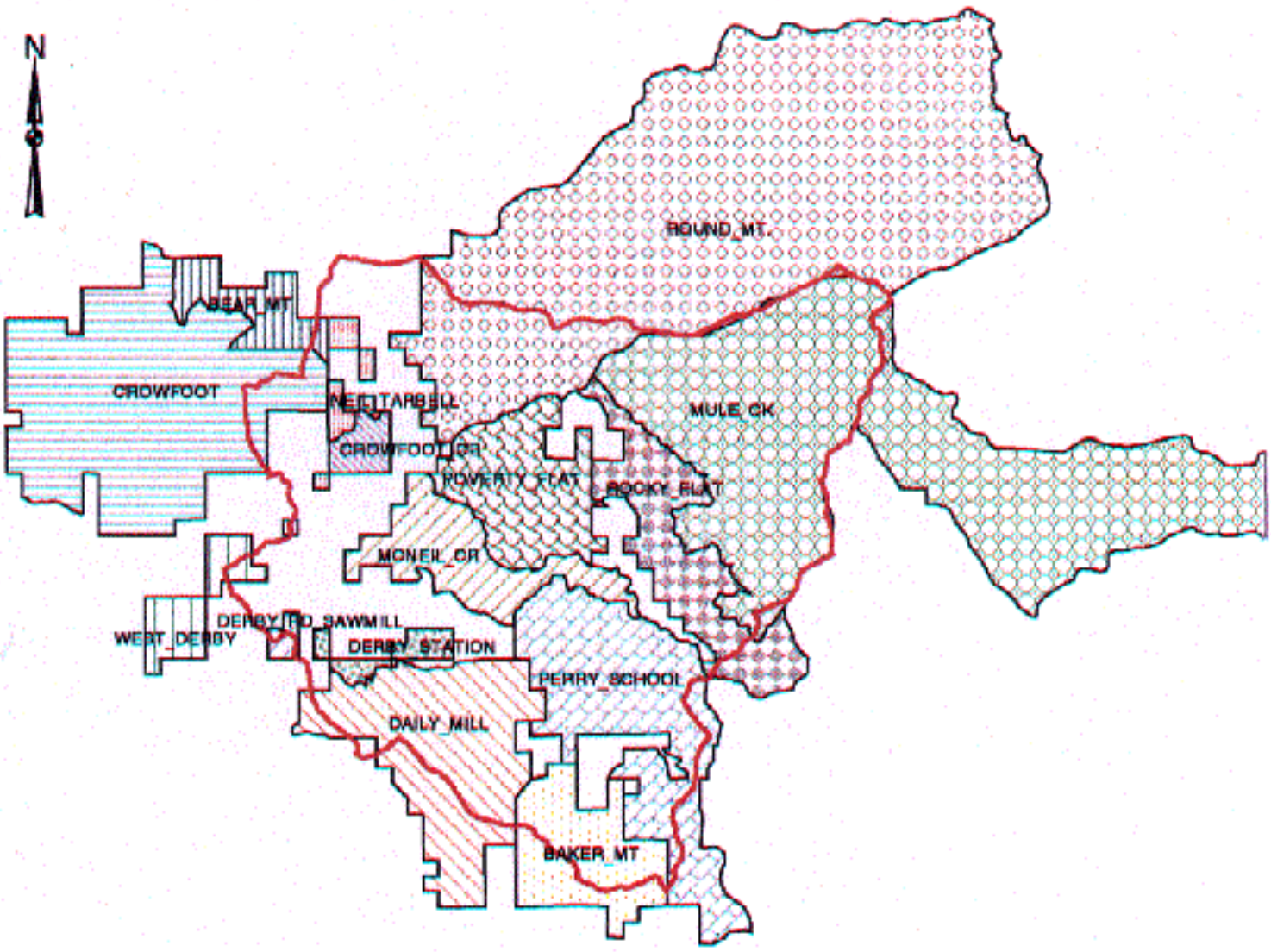
1" = 1.75 miles

N

D.Looper 1/19/99

Lower Big Butte Watershed
Grazing Allotments

MAP 10



Lower Big Butte WAU

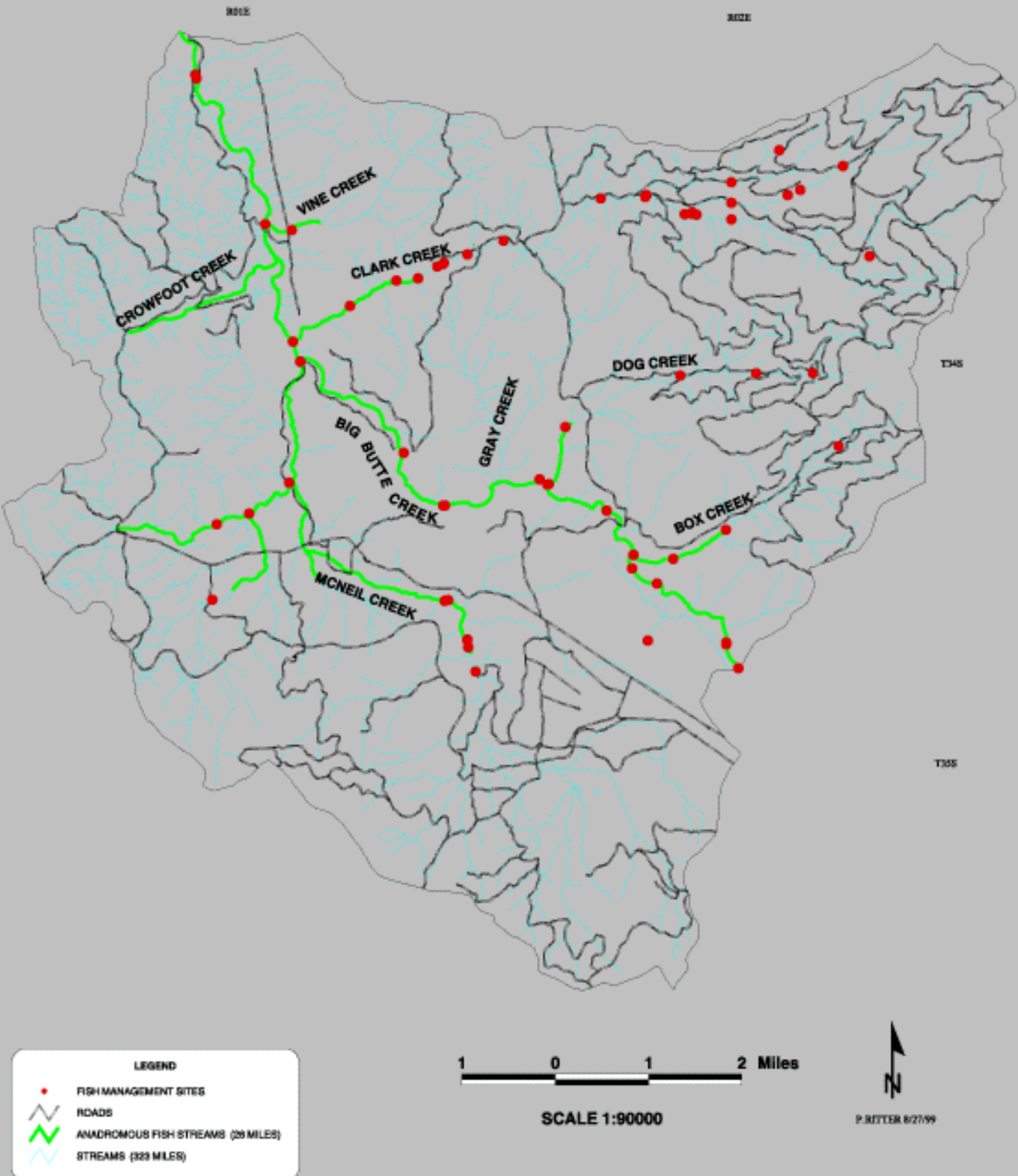
Allotments

- BAKER_MT
- BEAR_MT
- CROWFOOT
- CROWFOOT_CR
- DAILY_MILL
- DERBY_RD_SAWMILL
- DERBY_STATION
- MCNEIL_CR
- MULE_CK
- NEIL_TARBELL
- PERRY_SCHOOL
- POVERTY_FLAT
- ROCKY_FLAT
- ROUND_MT.
- WEST_DERBY

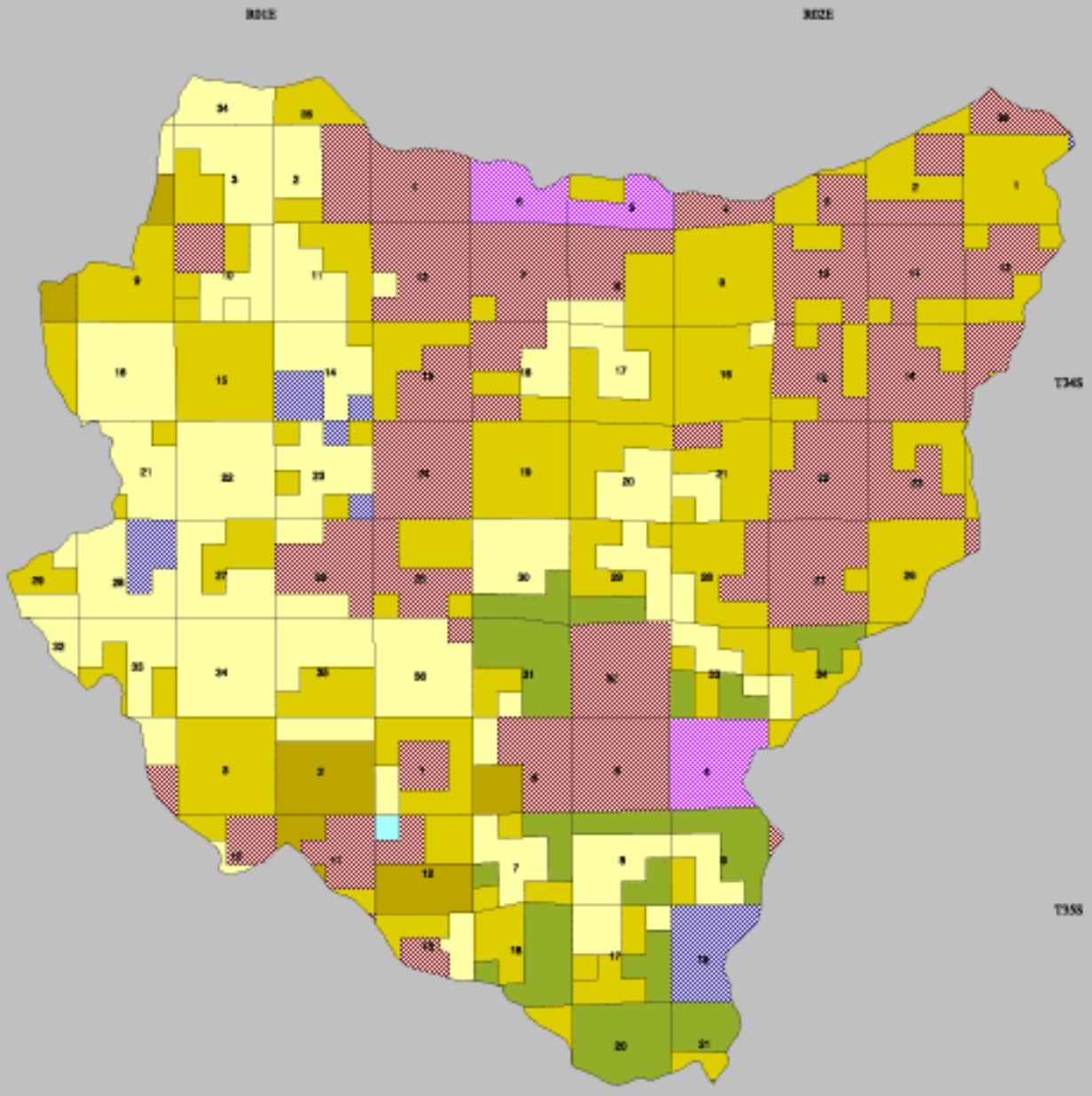
2 0 2 4 Miles

Allot_name	Past_name	On_date	Off_date	Acres	Pref_aum
SUMMIT_PRAIRIE	ROUND_MT.	05/01	09/30	23987.90	293
CROWFOOT	CROWFOOT	05/15	07/30	9169.60	365
BEAR_MT	BEAR_MT	04/16	05/31	1432.20	81
SUMMIT_PRAIRIE	MULE_CK	05/01	09/30	15625.40	206
NEIL_TARBELL	NEIL_TARBELL	04/16	05/31	182.10	56
NEIL_TARBELL	NEIL_TARBELL	04/16	05/31	81.00	56
SUMMIT_PRAIRIE	ROCKY_FLAT	04/16	05/31	1425.70	85
NEIL_TARBELL	NEIL_TARBELL	04/16	05/31	191.80	56
SUMMIT_PRAIRIE	POVERTY_FLAT	04/16	05/31	5136.10	85
NEIL_TARBELL	NEIL_TARBELL	04/16	05/31	53.80	56
CROWFOOT_CR	CROWFOOT_CR	04/16	05/30	521.30	89
SUMMIT_PRAIRIE	MCNEIL_CR	04/16	05/31	2617.70	348

Lower Big Butte Anadromous Fish Bearing Streams



Lower Big Butte Land Ownership



OWNER
- BLM (14,036 acres)
- State Forestry (40 acres)
- Private (11,180 acres)
- Boise Cascade (1,237 acres)
- C & D Lumber (1,103 acres)
- Lone Rock Timber Co (3,187 acres)
- Rough & Ready (917 acres)
- Superior Lumber Co (12,117 acres)

1 0 1 2 Miles

Scale 1:110,000

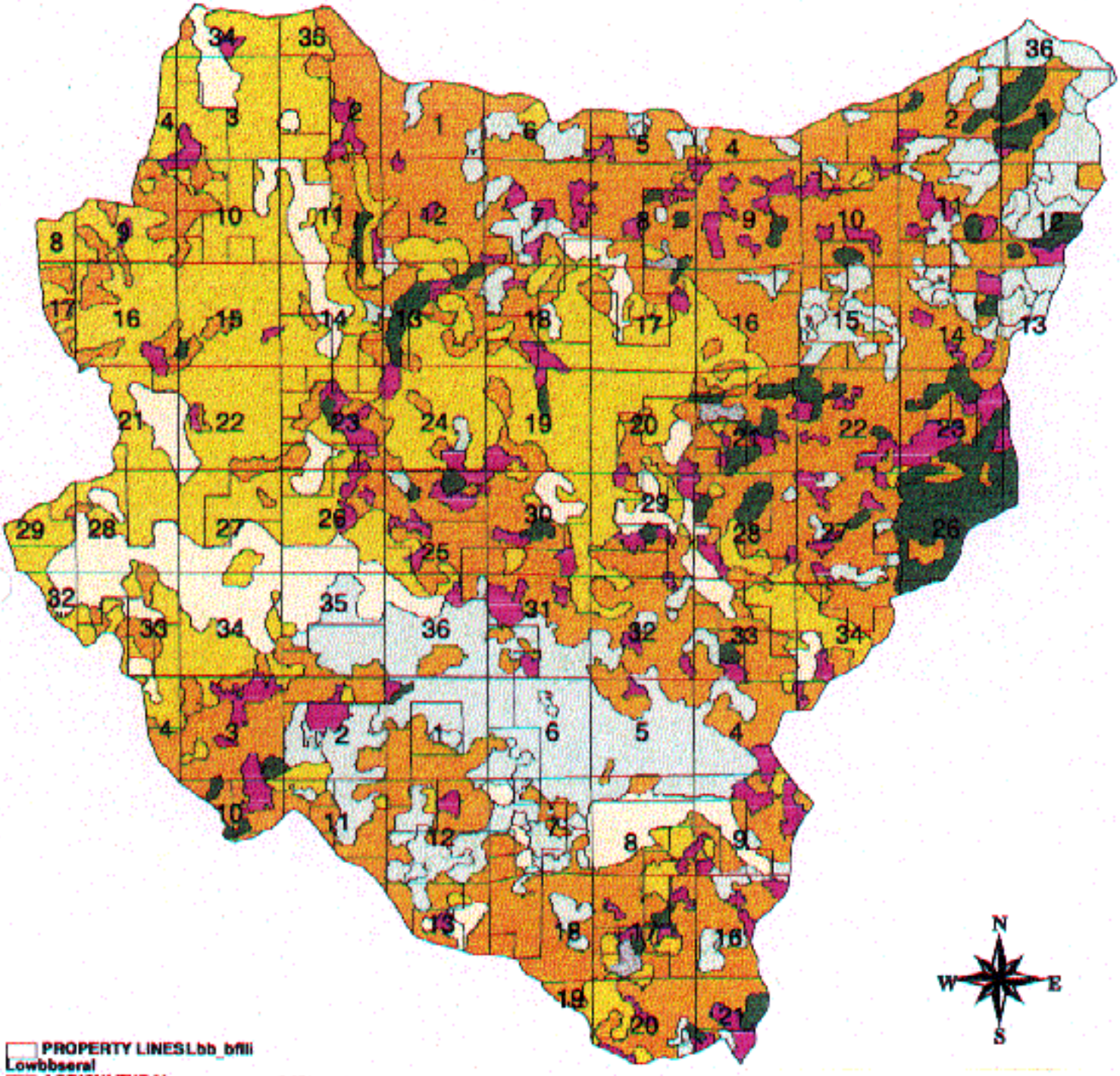
1" = 1.75 miles

N

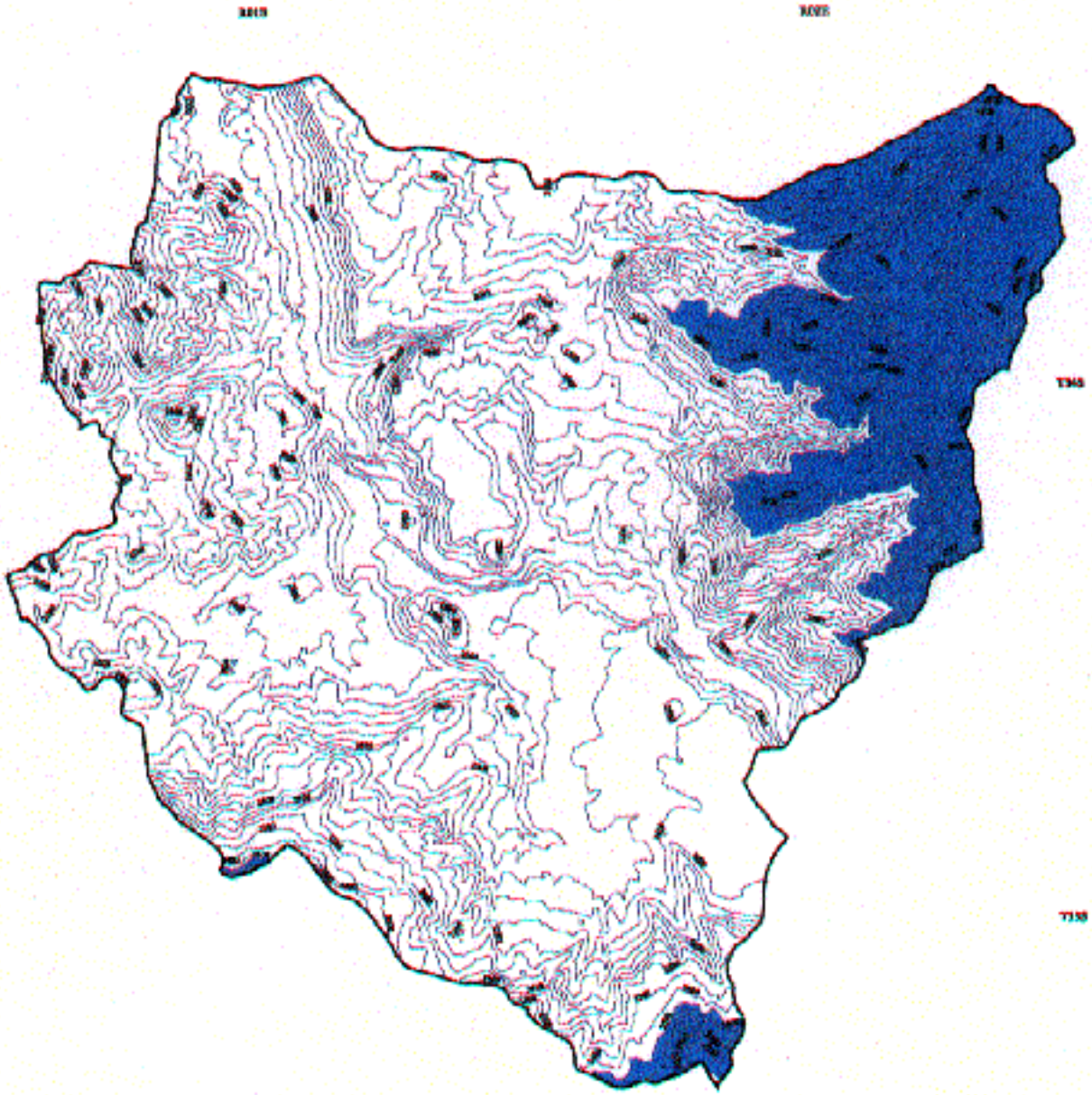
D Looper 1/19/99

LOWER BIG BUTTE SERAL STAGES

MAP 13



Lower Big Butte Transient Snow Zone



1 0 1 2 Miles

Scale 1:110,880

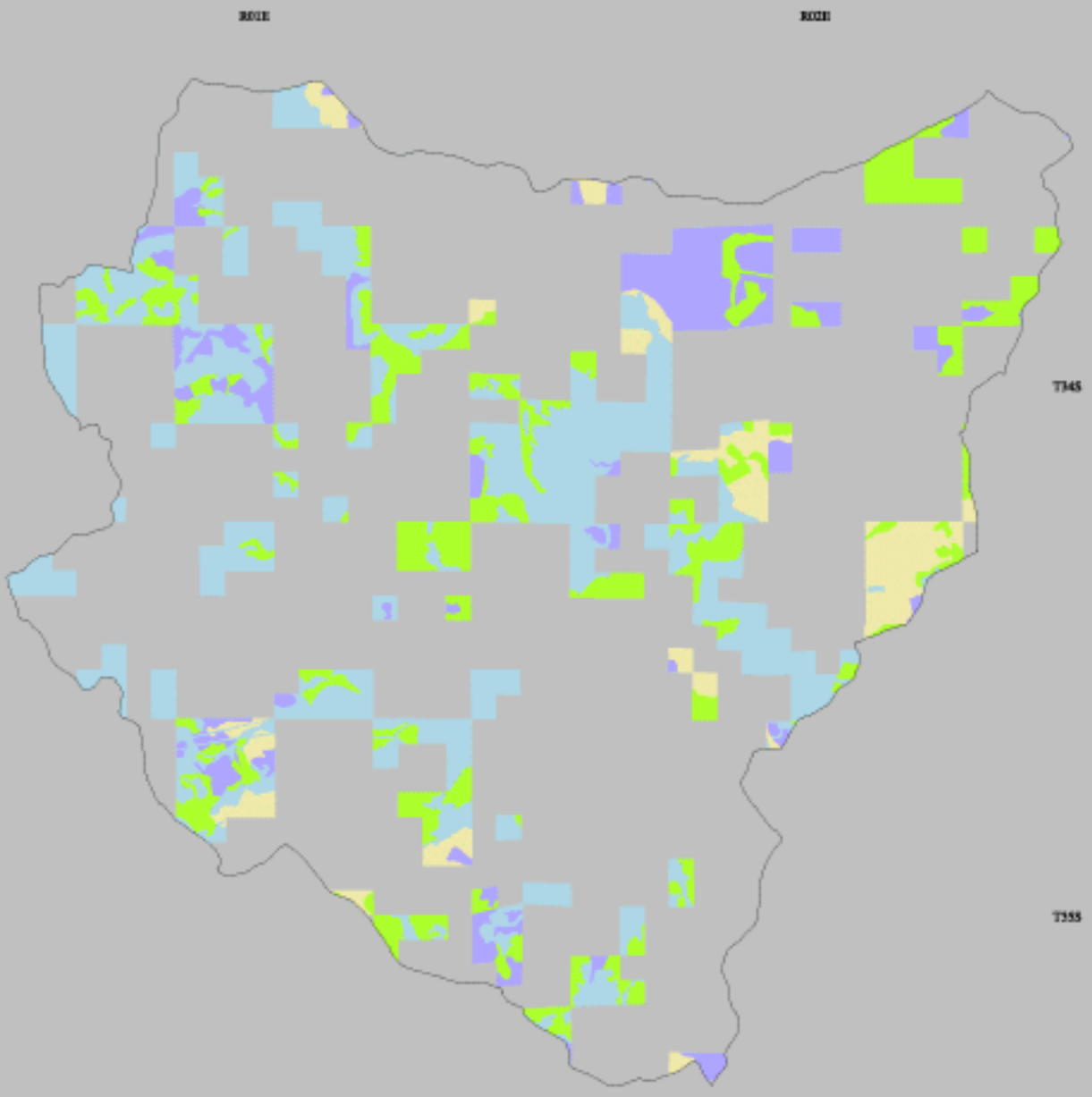
1" = 1.75 miles

Transient Snow Zone (6,580 acres)

100' Contours

D.Leeper 1/6/99

Lower Big Butte Spotted Owl Habitat



Spotted Owl Habitat
- 1 Nesting
- 2 Roosting / Foraging
- 3 Other
- 4 Not Owl Habitat

1 0 1 2 Miles

Scale 1:110,880

1" = 1.75 miles

N

D.Looper 1/19/99

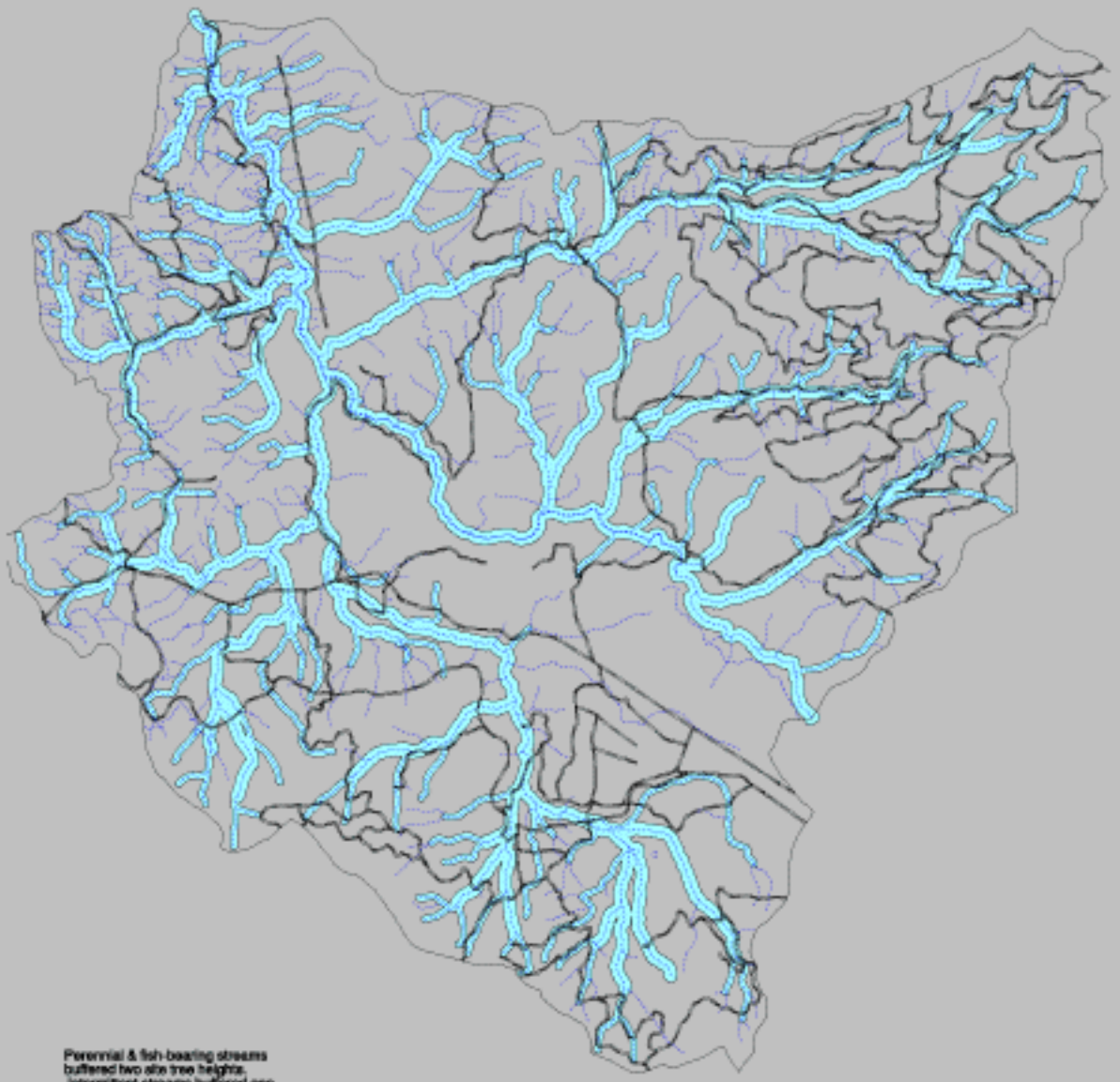
Lower Big Butte Riparian Reserves

R01E

R02E

T34S

T35S



Perennial & fish-bearing streams buffered two site tree heights. Intermittent streams buffered one site tree height.

LEGEND

Roads

Hydrology

Riparian Reserves

1 0 1 2 Miles

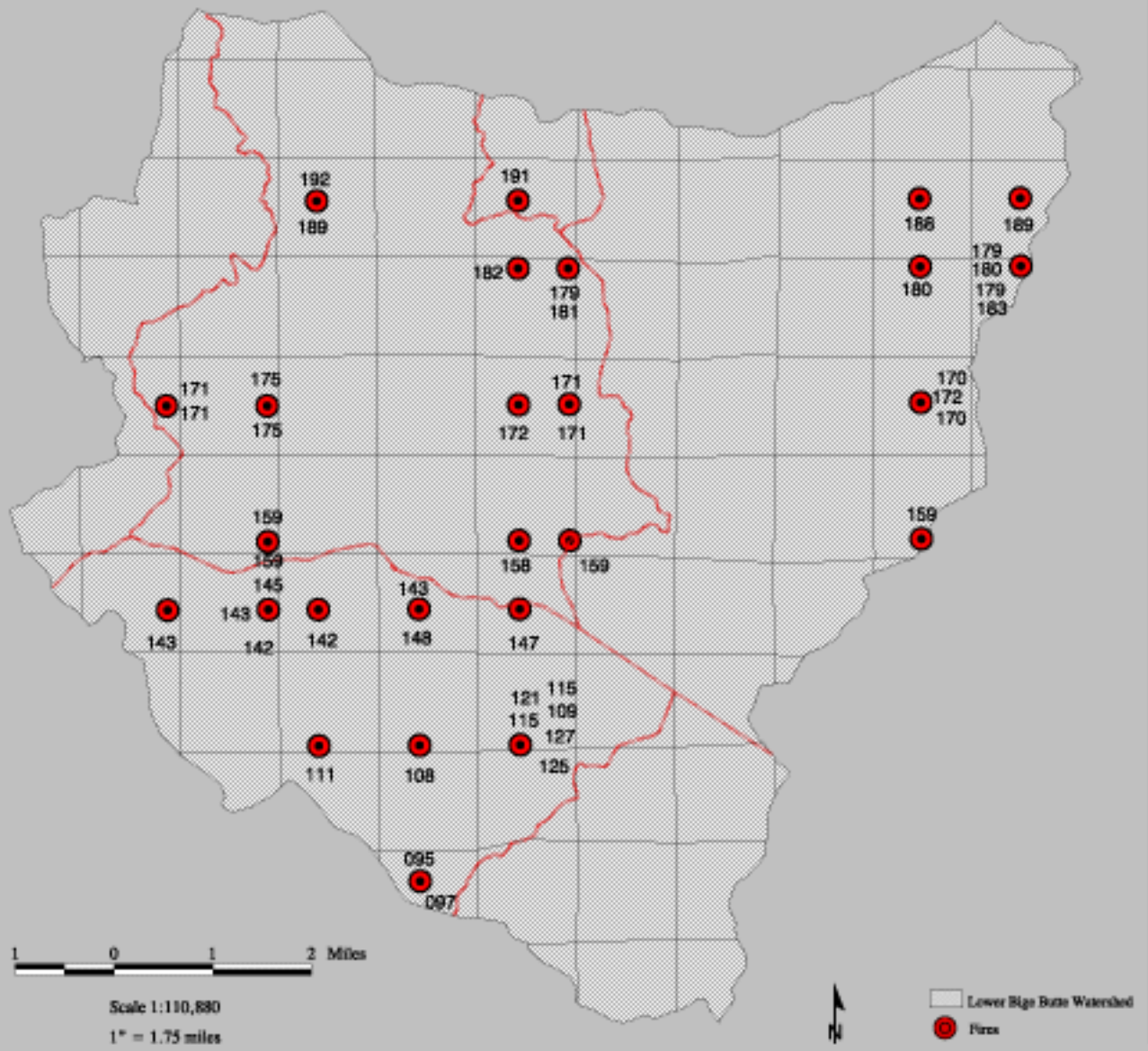
Scale 1:110,880

1" = 1.75 miles

N

D Looper 1/19/99

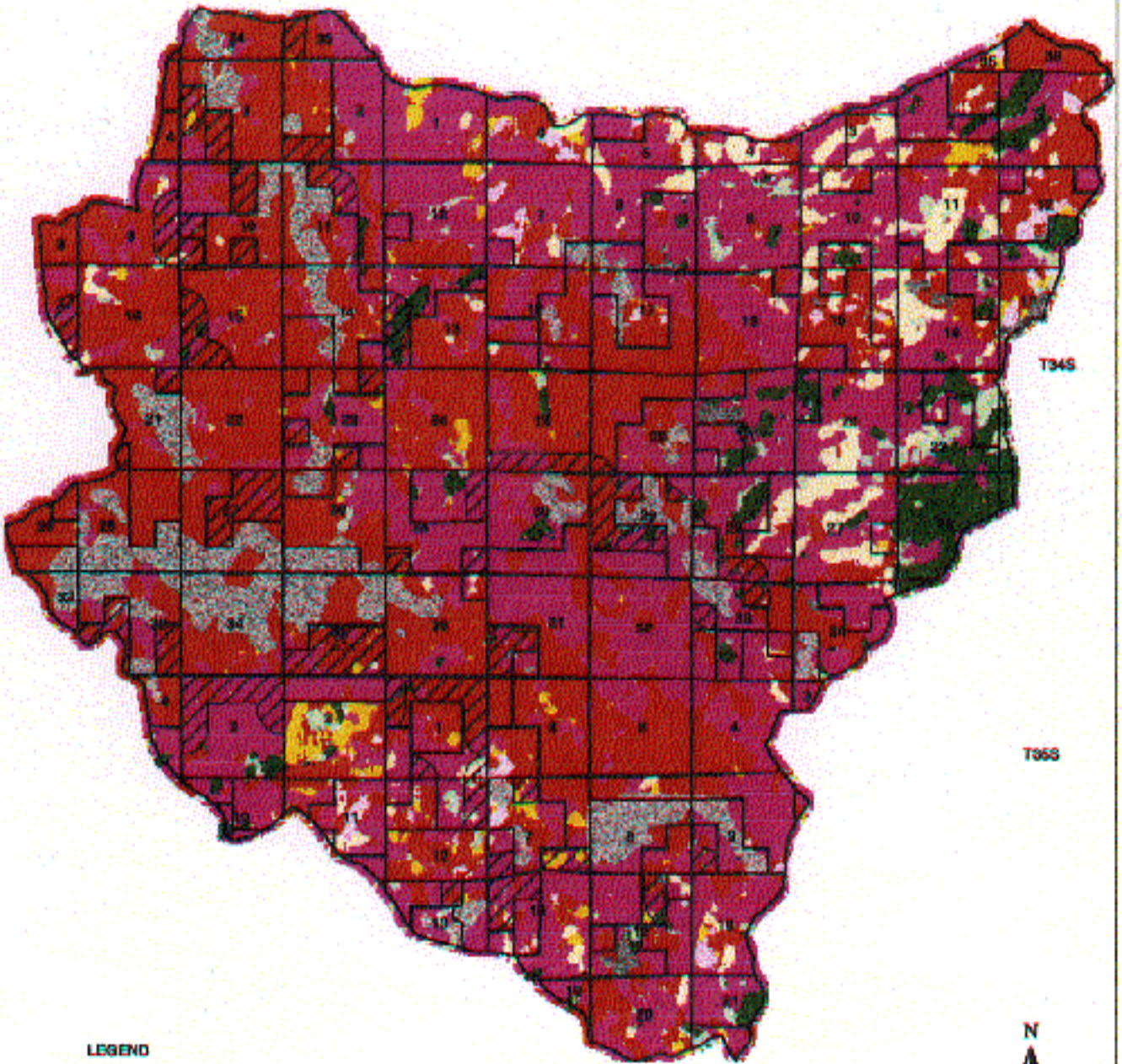
Lower Big Butte Fire History



Fire_num	Year	Cause	Size
095	1985	Smoking	0 - .25 acres
097	1984	miscellaneous	0 - .25 acres
108	1985	miscellaneous	.25 - 10 acres
109	1982	Lightning	0 - .25 acres
111	1980	Lightning	0 - .25 acres
115	1982	Lightning	0 - .25 acres
115	1985	miscellaneous	10 - 100 acres
121	1987	Children	0 - .25 acres
125	1980	miscellaneous	0 - .25 acres
127	1982	Equipment use	0 - .25 acres
142	1986	Smoking	.25 - 10 acres
142	1982	Railroads	.25 - 10 acres
143	1980	Railroads	0 - .25 acres
143	1986	miscellaneous	0 - .25 acres
143	1984	miscellaneous	0 - .25 acres
145	1982	Incendiary	0 - .25 acres
147	1982	miscellaneous	.25 - 10 acres
148	1986	Lightning	0 - .25 acres
158	1982	Fire use	0 - .25 acres
159	1982	miscellaneous	0 - .25 acres
159	1986	miscellaneous	.25 - 10 acres
159	1980	Equipment use	0 - .25 acres
159	1988	miscellaneous	.25 - 10 acres
170	1980	Equipment use	.25 - 10 acres
170	1986	Children	.25 - 10 acres
171	1983	Lightning	0 - .25 acres
171	1986	miscellaneous	0 - .25 acres
171	1988	miscellaneous	.25 - 10 acres
171	1984	miscellaneous	0 - .25 acres
172	1988	miscellaneous	0 - .25 acres
172	1986	Equipment use	0 - .25 acres
175	1980	Equipment use	.25 - 10 acres
175	1983	Lightning	0 - .25 acres
179	1981	miscellaneous	10 - 100 acres
179	1984	Equipment use	0 - .25 acres
179	1988	Lightning	0 - .25 acres
180	1981	miscellaneous	0 - .25 acres
180	1986	Fire use	0 - .25 acres
181	1988	miscellaneous	0 - .25 acres
182	1984	Lightning	0 - .25 acres
183	1984	Lightning	0 - .25 acres
188	1986	Incendiary	.25 - 10 acres
189	1986	miscellaneous	0 - .25 acres
189	1981	Equipment use	.25 - 10 acres
191	1986	miscellaneous	0 - .25 acres
192	1981	miscellaneous	0 - .25 acres

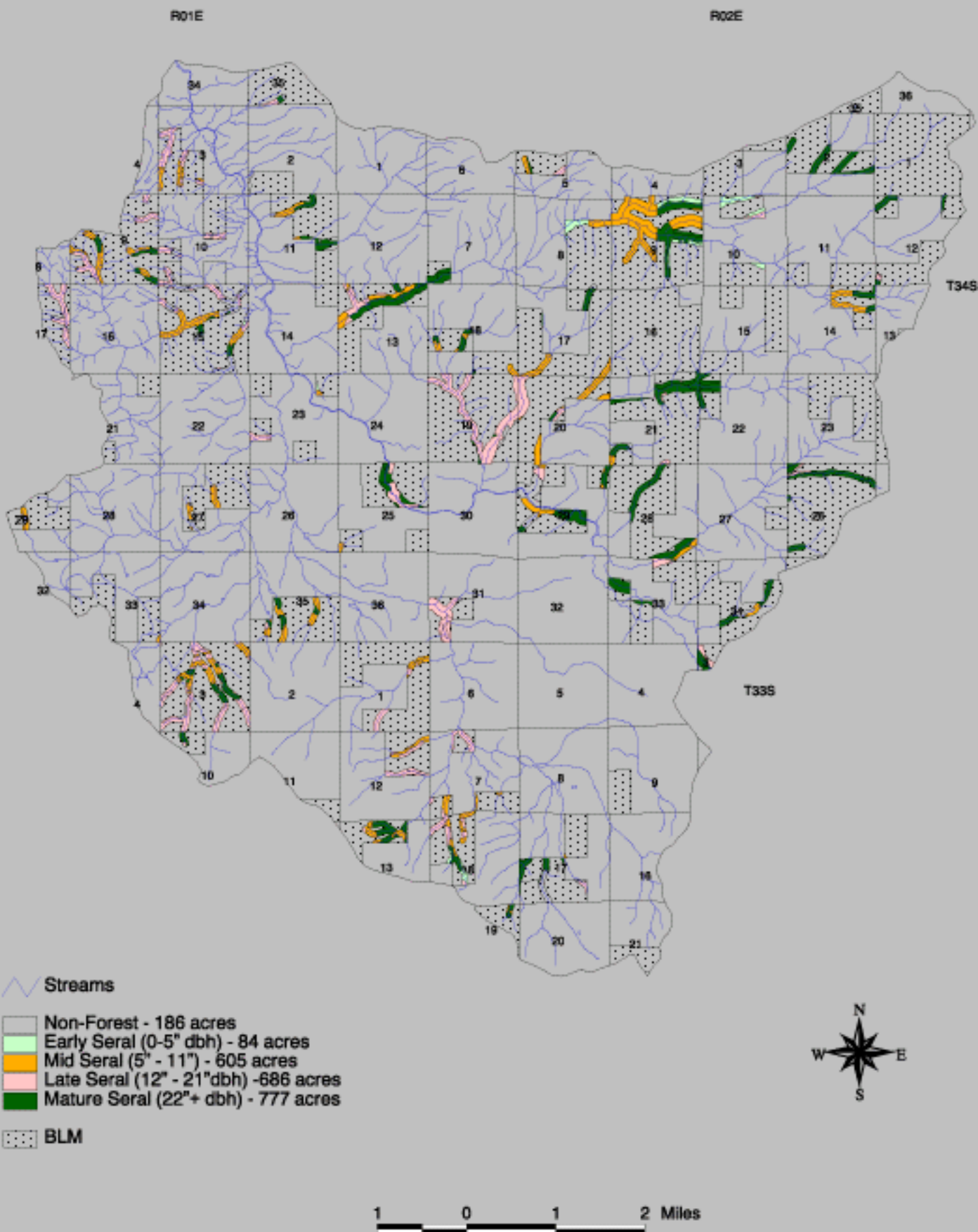
D:Looper 1/25/99

DRAFT LOWER BIG BUTTE FUEL MODELS

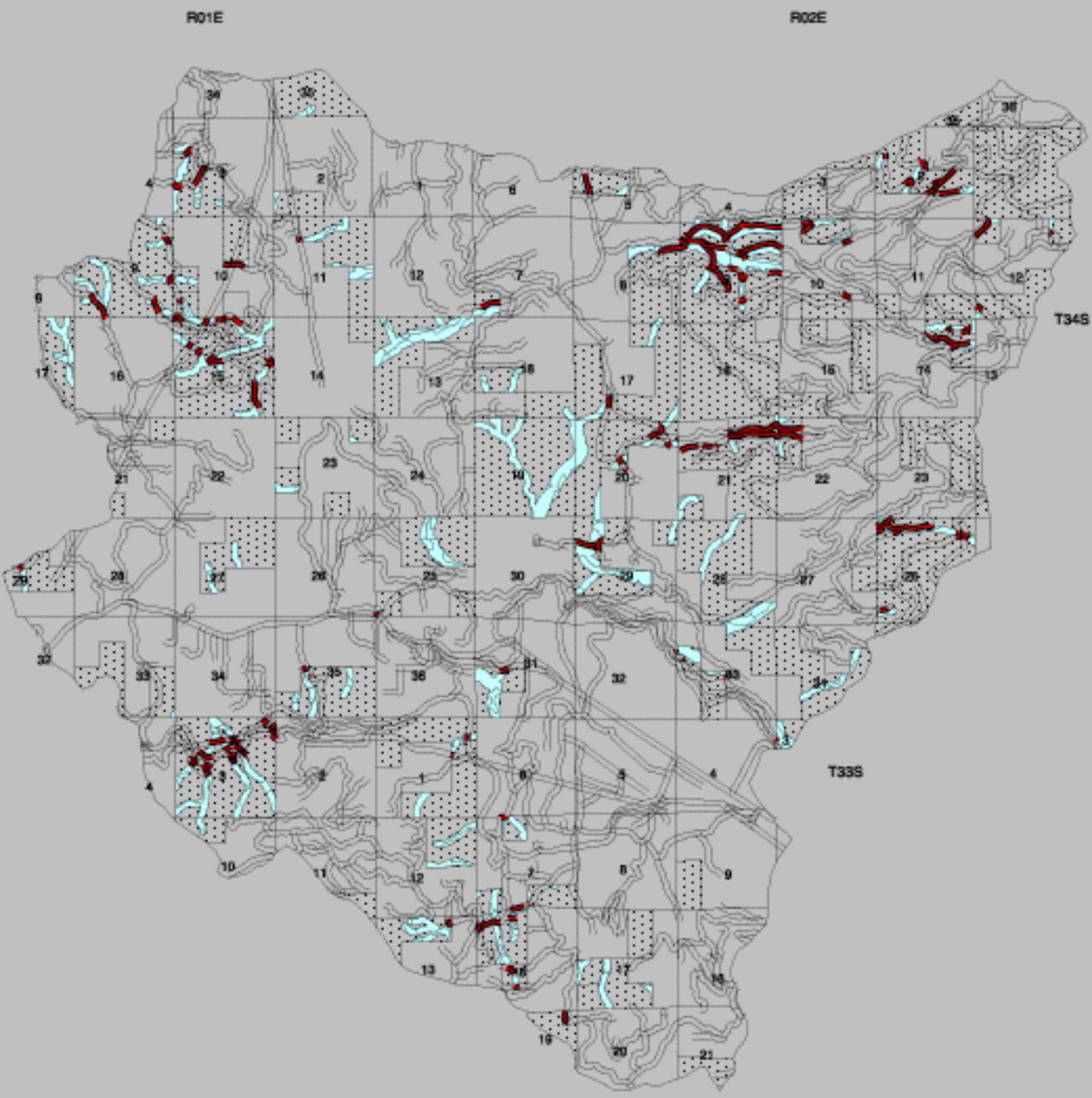


MAP 19

BLM Riparian Reserves by Seral Stage

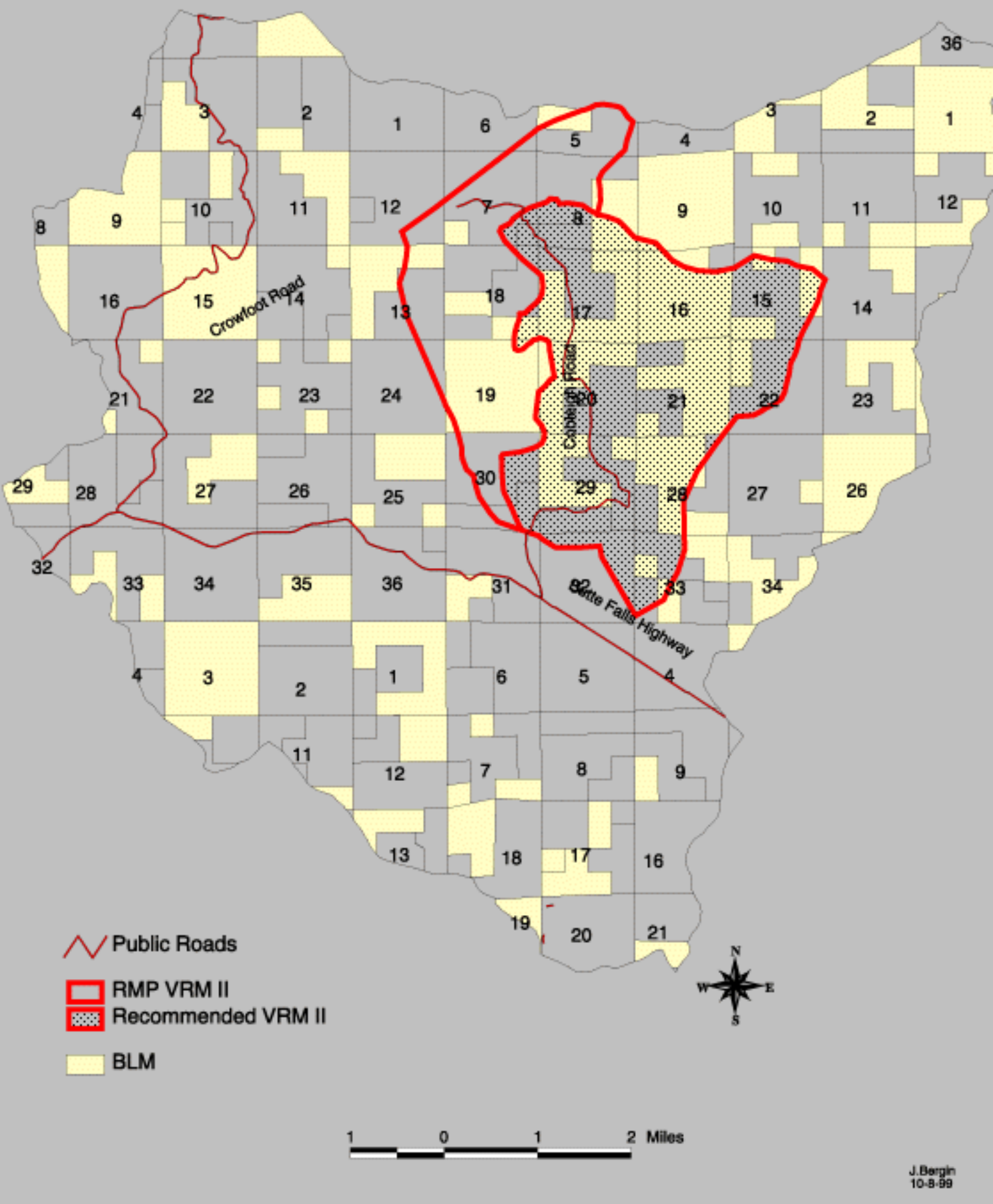


BLM Roads within Riparian Reserves



J.Bergin
10-8-99

Lower Big Butte Recommended VRM II



SURVEY and MANAGE PLANTS

VASCULAR PLANTS

SENSITIVE SPECIES	STATUS	LOCATION
Scribneria bolanderi	BWO	33-1E-35, 34-1E-10, 34-1E-15 34-1E-24, 34-1E-29, 34-2E-31 (Poverty Flat)
Plagiobothrys glyptocarpus	BAO	34-1E-11, 34-1E-15, 34-2E-19 34-1E-15, 34-2E-28, 34-2E-31 (Poverty Flat)
Geranium oreganum	BTO	34-1E-23, 34-2E-28
Limnanthes floccosa ssp. *bellingeriana*	BSO	34-2E-19, 34-2E-31 (Poverty Flat)
Cypripedium fasciculatum	BSO/ S&M 1 and 2	34-2E-34, 34-2E-34

NONVASCULAR PLANTS

LICHENS AND BRYOPHYTES	STATUS
Leptogium rivale	S&M 1 and 3
Hydrothyria venosa	S&M 1 and 3
Lobaria halli	S&M 1 and 3
Buxbaumia viridis	PB
Lobaria pulmonaria	S&M 4
Nephroma helveticum	S&M 4
Nephroma resupinatum	S&M 4
Peltigera collina	S&M 4
Pseudocyphellaria anomala	S&M 4
Pseudocyphellaria anthrapsis	S&M 4

FUNGI

TERRESTRIAL spp.	Status
Plectania milleri	S&M 1 and 3
Helvella compressa	S&M 1 and 3
Ramaria rubripermanens	S&M 1 and 3
Gyromitra esculenta	S&M 3 and 4
Gyromitra gigas(montana)	S&M 3 and 4
Gyromitra infula	S&M 3 and 4
Phlogiotis helvelloides	S&M 3 and 4

Plectania melastoma	S&M 3
Sarcosphaera crassa (aka *S. eximia*)	S&M 3
Lignicolous spp.	
Pithya vulgaris	S&M 1 and 3
Sarcosoma mexicana	S&M 3; PB
Phytoconis ericetorum (aka *Omphalina ericetorum*)	S&M 3 and 4

Bureau Sensitive:

- BSO: Bureau Sensitive in Oregon; ONHP List 1; Oregon Candidate
- BAO: Bureau Assesment in Oregon; ONHP List 2
- BTO: Bureau Tracking Species, ONHP lists 3 & 4
- BWO: Bureau Watch Species, ONHP list 4

Survey and Manage (S&M) Strategies:

1 = manage known sites
2 = survey prior to ground disturbing activities and manage newly discovered sites
3 = conduct extensive surveys and manage high-priority sites
4 = conduct general regional surveys

Protection Buffer (PB) Species

SPECIAL STATUS VASCULAR PLANT SPECIES DESCRIPTION

Cypripedium fasciculatum is a small orchid dependant upon habitat conditions associated with mid- to late-successional forest communities. They are terrestrial species adapted to partial to full canopy closure with a moderate accumulation of organic debris. There appears to be a microrihizza association also.

Plagiobothrys glyptocarpus is generally a riparian associated species and occurs in open areas along the margins of seasonal or perennial wetlands. Many times it is found growing on the edge of basalt dominated bedrock stream channels and flowers throughout late spring and early summer as seasonal flows evaporate. The numerous flowers are small, white, but somewhat showy as the raceme uncoils.

Scribnaria bolanderii is an inconspicuous native grass, generally associated with seasonally wet areas or seeps on rock cliffs. Known locations occur on sandstone and basalt rock outcrops and areas with shallow soils. Bolander's grass has been found at scattered locations from southern California to Washington.

Limnanthes floccosa ssp. *bellingeriana* is a member of the Woolly Meadow Foam. This sub-species is found at Poverty Flat ACEC. It is a terrestrial species that occurs in vernal pools or in seasonally wet areas. The plant is prostrate and the flowers are moderate in

size and white.

SPRING 1999 FUNGI SPECIES LIST
LOWER BIG BUTTE WATERSHED

Terrestrial spp.	**STATUS**
Plectania milleri	SM 1,3
Helvella compressa	SM 1,3
Ramaria rubripermanens	SM 1,3
Agrocybe praecox	
Amanita calyptrata	
Armillaria albolanaripes	
Armillaria olida	
Boletus chrysenteron	
Calocera viscosa	
Caloscypha fulgens	
Camarophyllus sp.	
Clavulina rugosa	
Clavulinopsis laeticolor	
Clitocybe sp.	
Collybia sp.	
Coprinus micaceus	
Cortinarius multiformis	
Cortinarius obtusus	
Cortinarius ponderosus	
Cortinarius sp.	
Discina perlata	
Gaestrum sp. (skeletons from last year)	
Galerina cedretorum	
Galerina sp.	
Geopyxis vulcanalis	
Gyromitra esculenta	SM 3,4
Gyromitra gigas (montana)	SM 3,4
Gyromitra infula	SM 3,4
Hebolema albidulum	
Hebolema mesophaeum	
Helvella lacunosa	
Helvella leucomelaena	
Helvella queletii	
Hygrocybe goetzii	
Hygrocybe psittacina	
Hygrocybe sp.	
Inocybe geophylla	
Inocybe maculata	
Inocybe sp.	
Melanoleuca evanosa	
Melanoleuca graminicola	
Morchella deliciosa	
Morchella elata	
Morchella esculenta	
Mycena sp.	
Nolanea stricta	
Nolanea verna	
Peziza echinospora	
Peziza sylvestris	
Phlogiotis helvelloides	SM 3,4
Plectania melastoma	SM 3
Plectania nannfeldtii	
Psathyrella gracilis	
Pseudohydnum gelatinosum	
Ramaria botrytis	
Ramaria rasilispora	
Ramaria rubricarnata	
Ramaria sp.	
Ramaria stasseri	
Russula albidula	
Russula emetica	
Sarcosphaera crassa (aka *S. eximia*)	SM 3
Suillus ponderosus	
Trichoglossum hirsutum	
Verpa conica	
***Lignicolous* spp.**	
Pithya vulgaris	SM 1,3
Sarcosoma *mexicana*	SM 3; PB
Auriscalpium vulgare	
Calocera viscosa	
Coprinus micaceus	
Coriolellus sepium	
Crucibulum laeve	
Cryptoporus volvatus	
Daldinia grandis	
Echinodontium tinctorium	
Fomitopsis cajanderi	
Fomitopsis officinalis	
Fomitopsis pinicola	
Ganoderma oregonense	
Gloephyllum saepiarium	
Helvella maculata	
Heterobasidion annosum	
Lenzites betulina	
Mycena alcalina	
Naematoloma fasciculare	
Phaeolus schweinitzii	
Phellinus gilvus	
Phellinus igniarius	
Phellinus pini	
Pholiota sp.	
Phytoconis ericetorum	SM 3,4

(aka *Omphalina ericetorum*)
Pleurotus ostreatus
Pluteus cervinus
Polyporus badius
Polyporus elegans
Polyporus tuberaster
Poria corticola
Poria sp.
Pseudohydnum gelatinosum
Schizophyllum commune
Stereum hirsutum
Stereum striatum
Trametes hirsuta
Trametes versicolor
Tremella foliacea
Tremella mesenterica
Trichaptum abietinus
Tubaria furfuracea
Tubaria pellucida
Tyromyces amarus
Xeromphalina campanella
Xeromphalina fulvipes

Species on Feces
Cheilymenia coprinaria
Coprinus radiatus
Peziza vesiculosa

NON-VASCULAR
SURVEY AND MANAGE and PROTECTION BUFFER SPECIES REQUIRING SURVEY

BRYOPHYTES

SPECIES	SURVEY STATUS	HABITAT	SUBSTRATE	RANGE
LIVERWORTS				
Diplophyllum plicatum	S&M 1,2	cool, humid patches; moist north-facing cliffs, shaded cliff crevices in riparian areas, soil of upturned roots.	decayed wood, down logs, trunks of PSME, TABR, Sitka spruce; mineral soil, rock.	Not suspected for this area, OR-no. coast.
Kurzia makinoana	S&M 1,2	shaded, moist sites, bogs, <3000 ft.	rocky cliffs & ledges, soil banks & cuts, decayed wood, rarely base of trees.	Not suspected for so. Cascades, no known OR sites, potential habitat.
Marsupella emarginata var. aquatica	S&M 1,2	aquatic, swift-flowing water at high elevations.	submerged rocks in cold perennial streams.	central Cascades (Lane Co. only known OR site), potential habitat.
Ptilidium *californicum*	S&M 1,2 PB	dense, shady & humid coniferous forests, mid elev. to high elev.	Bark, trunks of large Doug-fir trees.	No. CA north to WA and Canada.
Tritomaria exsectiformis	S&M 1,2	dry to moist, partially shaded sites.	soil or litter, soil in rock crevices.	central Cascades farthest south?, potential habitat.
MOSSES				
Brotherella roellii	S&M 1,3 PB	cool to moist mixed deciduous & conifer forests, low elev., along valley margins, stream terraces, slopes, swampy floodplains.	rotten logs, stumps, bases of trees; big leaf maple, red alder.	potential habitat; Pacific northwest.
Buxbaumia viridis	PB	dense, shady & humid coniferous forests, low elev to subalpine	rotten logs, peaty soil & humus.	potential habitat
Rhizomnium nudum	PB	middle to high elev. forests.	moist but not wet organic soil; sometimes among rocks, on rotten logs, or along streams.	potential habitat

Tetraphis geniculata	S&M 1,3 PB	cool, shaded, humid locations at low to middle elev., especially on stream terraces & floodplains.	Well-rotted stumps, logs, rarely on rocks.	**not susepcted in southern OR**
Ulota meglospora	PB	lowlands to submontane	epiphytic on conifers & hardwoods, esp. maples, alder, tanoak, PSME, HODI; trunks & branches, esp. toward tips.	potential habitat; known site in sw OR.

LICHENS

SPECIES	SURVEY STATUS	HABITAT	SUBSTRATE	KNOWN RANGE
Hypogymnia duplicata	2	Moist sites, maritime and old-growth TSHE, PSME, Pacific silver or noble fir forests, from Alaska to Mendocina CA.	epiphyte--tree branches & boles, moss-covered rock outcrops?	Potential habitat: Throughout PNW but almost always west of Cascades. Known site in Roseburg.
Lobaria linita	2	var *linita*: Temperate mature/old growth Doug-fir forests, elev., oak forest w/rock outcrops	epiphyte--lower boles, branches, trunks of conifers, deciduous trees, shrubs; moss-covered rocks in cool, shaded humid micro-sites.	Potential habitat: only 2 known sites in north Ore. Cascades.
		var *tenuior*: Alpine Meadows	soil surface	Potential habitat: only 2 known sites in north Ore. Cascades
Psudeocyphellaria rainierensis	2	mesic to moist old growth PSME/TSHE forests w/ cool, humid micro-climate, in Ore. not restricted to interior or old growth forests, 1600-2950 ft. elevation.	epiphyte--PSME, TSHE, Pacific silver fir, TABR, western redcedar, Sitka spruce, red alder, chinquapin, big-leaf maple, vine maple, black cottonwood, canopy litterfall, low to mid-canopy	Potential habitat; Western Cascades south to Roseburg.

FUNGI

SPECIES	SURVEY STATUS	HABITAT	SUBSTRATE	KNOWN RANGE
Aleuria (Sowerbyella) rhenana	PB	mixed conifer or HW/con forests, low to mid-elev.	duff or humus.	potential habitat
Bridgeoporus (Oxyporus) nobilissimus	S&M 1,2,3	Abies procera & A. Amabilis forests, mesic to wet microsites, old growth, mtn. tops, ridges, west-north aspects.	grows on collar or root crowns of >43" ABPR or ABAM live or dead standing trees, snags, stumps.	**unlikely in BFRA because of habitat**, OR & WA Cascades, Olympic Mtns.,OR Coast Mtns?

Bondarzewia montana	S&M 1,2,3	late-successional conifer forests.	conifer snags, stumps.	known in RRNF, potential habitat.
Otidea leporina	PB	conifer forests, not restricted to old-growth.	terrestrial, under conifers & hardwoods.	known site in Josephine Co., potential habitat.
Otidea onotica	PB	conifer forests.	duff or moss, bare ground under conifers & hardwood.	known sites in Josephine Co. & RRNF; potential habitat.
Otidea smithii	PB	conifer forests.	under conifers on duff, esp. PSME & *Quercus*.	potential habitat.
Polyozellus multiplex	PB	late successional, mid-elev., montane conifer forests.	ectomycorrhiza with *Abies* sp. roots.	potential habitat.
Sarcosoma mexicana	PB	old growth forests.	rotting wood, duff under conifers.	known from BFRA.

POTENTIAL SPECIAL STATUS PLANT SPECIES LIKELY TO OCCUR IN LOWER BIG BUTTE WATERSHED

VASCULAR PLANTS	STATUS
Allotropa virgata	S&M 1&2
Calochortus monophyllus	BAO
Cheilanthes intertexta	BAO
Cypripedium montanum	S&M 1&2
Cimicifuga elata	BSO
Iliamna latibracteata	BAO
Lithophragma heterophyllum	BTO
Lewisia cotyledon var. Howellii	BSO
Mimulus douglasii	BWO
Nemacladus capillaris	BAO
Ranunculus austro-oreganus	BSO
Romanzoffia thompsonii	BSO
Sildalcea malvaeflora ssp. asprella	BWO
Smilax californica	BWO

NON-VASCULAR PLANTS

LICHENS	STATUS
Bryoria subcana	S&M 1,3
Bryoria tortuosa	S&M 1,3
Calicium viride	S&M 4
Collema nigrescens	S&M 4
Dendriscocaulon intricatulum	S&M 1,3
Leptogium saturninum	S&M 4
Sticta fulginosa	S&M 4

FUNGI	STATUS
Bondarzewia mesenterica	S&M 1,2,3
Cantharellus formosus	S&M 1,3
Clavariadelphus ligula	S&M 3,4
Clavariadelphus pistilaris	S&M 3,4
Clavariadelphus truncatus	S&M 3,4
Clavulina cristata	S&M 3,4
Gomphus floccocus	S&M 3
Mycena lilacifolia	S&M 3
Phlogiotis helvelloides	S&M 3,4
Ramaria cyaneigranosa	S&M 1,3
Sparassis crispa	S&M 3
Sarcosoma mexicana	PB

Aleuria rhenana	PB
Otidea leporina	PB
Otidea smithii	PB
Helvella compressa	S&M 1,3

MOSSES	**STATUS**
Antitrichia curtipendula	S&M 4
Ulota meglospora	PB

Bureau Sensitive:

- BSO: Bureau Sensitive in Oregon; ONHP List 1; Oregon Candidate
- BAO: Bureau Assesment in Oregon; ONHP List 2
- BTO: Bureau Tracking Species, ONHP lists 3 & 4
- BWO: Bureau Watch Species, ONHP list 4

Survey and Manage (S&M) Strategies:

1 = manage known sites
2 = survey prior to ground disturbing activities and manage newly discovered sites
3 = conduct extensive surveys and manage high-priority sites
4 = conduct general regional surveys

Protection Buffer (PB) Species

HABITAT DESCRIPTION OF NON-VASCULAR SURVEY & MANAGE FUNGI, LICHENS & BRYOPHYTES THAT OCCUR OR POTENTIALLY OCCUR IN LOWER BIG BUTTE WATERSHED

List of Survey and Manage (S&M) Species and Protection Buffer (PB) Species by survey category and plant community. Included is a brief description of habitat and known sites in southwest Oregon.

LICHENS

Oak Woodland Plant Community:

Bryoria tortuosa (1,3) - on bark or wood of hardwood or conifers, semi-open conifer stands at low elevation transitional areas between wet coastal forests and drier inland forests. Found in Bieber-Wasson (Little Butte Watershed).

Conifer and Conifer/Hardwood Mature-Old Growth Forest Stands

Dendriscocaulon intriculatum (1,3) - found in Bieber-Wasson (Little Butte Watershed) on Black oak, at edge of mixed conifer, mature stand.

Lobaria hallii (1,3) - found in Bieber-Wasson/Double Salt (Little Butte Watershed) and Lower Big Butte Watershed; on hardwoods, usually *Quercus garryana*, in low to mid-elevation riparian forests.

Bryoria subcana (1,3) - within 50 kms of coast, bark & wood of conifers, *Picea, Abies* & wetter *PSME* forests

Mature-Old Growth Forest Stands:

Hypogymnia duplicata (1,2,3) - epiphytic in moist old-growth mountain hemlock/Pacific silver fir forests, old growth western hemlock forests, old-growth Douglas-fir or noble fir forests (Oregon sites), 1100-5500 ft. elevation.

Nephroma occultum (1,3) - old-growth PSME - western hemlock stands, most frequent in mid to upper canopy

Pannaria rubiginosa (1,3) - bark & wood of conifers & hardwoods, moist lowland habitats; coastal thickets of old shrubs

Pilophorus nigricaulis (1,3) - on rock, cool, moist, rocky slopes, often north-facing, usually in open but where sheltered by surrounding topography, such as steep narrow valleys.

Pseudocyphyellaria rainierensis (1,2,3) - mesic to moist old growth forests in western hemlock or lower Silver fir zones, may be on Douglas-fir, Pacific silver fir, western hemlock, subalpine fir, Pacific yew, Sitka spruce, western redcedar, bigleaf maple, vine maple, red alder cascara, chinquapin, black cottonwood, 330-4000 elevation.

Tholuma dissimilis (1,3) - conifer twigs, exposed subalpine ridges and peaks, occasionally at low to mid-elevations in cool, moist sites.

BRYOPHYTES

Brotherella roelii (PB, 1,3) - cool to moist mixed deciduous and conifer forests, usually at low elevations along valley floors

Buxbaumia viridis (PB) - dense, shady, humid coniferous forests, with logs & stumps in advanced stages of decay. Found in Bieber-Wasson (Little Butte Watershed)

Encalypta brevicolla var. *crumiana* (1,3) - on soil in shaded crevices in igneous rocks, along ridgetops subject to frequent fog penetration.

Plagiochila satoi (1,3) - lower elevation riparian forests, on cliffs, rocks, bark.

Ptilidium californicum (1,2, PB) - mid-elevation forests, mature-old growth; at base of standing trees or recently fallen logs. Found in Bieber-Wasson (Little Butte Watershed)

Rhizomnium nudum (PB) - mid-high elevation forests, moist organic soil.

Schistostega pennata (PB) - dark, dense forests, on damp rock, soil, decaying wood, in dark places.

Tetraphis geniculata (1,3, PB) - well-rotted stumps and logs or rocks, shaded, humid locations at low to mid-elevations.

Tritomaria excectiformis (1,2) - mixed coniferous forests, 3200-5100 ft. elevations, on peaty or humic soil or rotting wood, creek banks.

Ulota meglospora (PB) - on conifers & hardwoods, lowlands to montane, old growth forests; maples, alders, tanoak, douglas fir, oceanspray, elderberry.

FUNGI

Cantharelles formosa (1,3) - widespread in disturbed sites in mature conifer forests.

Bondarzewia mesenterica (1,2,3) - on or around conifer trees or stumps (*PIPO* in BFRA) in coniferous forests.

Aleuria rhenana (PB) - on ground or moss in well-developed conifer litter in late-successional conifer forests, sea level to treeline.

Otidea leporina (PB) - under hardwoods and conifers, widely distributed, winter and spring.

Otidea smithii (PB) - under conifers, fall and winter.

Polyozellus multiplex (PB) - known from Oregon Cascades, on ground under conifers (usually spruce and fir).

Sarcosoma mexicana (PB) - found in Bieber-Wasson (Little Butte Watershed) and Lost Creek Watershed, saprophyte on decayed wood and soil in coniferous woods, higher elevations, spring.

Ramaria cyaneigranosa (1,3) - on ground in mature mixed conifer stand.

OTHER FUNGI SPECIES DISCOVERED IN SOUTHWEST OREGON

Choiromyces alveolatus (1,3) -old growth *Abies* or *Tsuga mertensiana* or mid-high elevations, late winter, spring, early summer.

Gastroboletus subalpinus (1,3) - 4500 ft - timberline, *Pinaceae*, spring to summer.

Helvella compressa (1,3) - found in Butte Falls RA, associated with late-successional forests, under redwood, oak, pines; late summer and fall.

Helvella elastica (1,3) - associated with late-successional forests, but also found in a variety of deciduous and coniferous woods.

Martellia fragrans (1,3) - truffle, upper elevation *Abies* forests, mature and old growth with *Abies* component and coarse woody debris.

Mycena monticola (1,3) - 3500-4500 elevation, conifer forest, on beds of pine needles.

Neournula pouchetii (1,3) - saprophytic in conifer litter, late-successional stands, *Tsuga* or *Thuja* associated, spring-early summer.

Nivatogastrium nubigenum (1,3) - truffle, inhabits dead mountain conifers, assoc. with *Abies* and *Pinus contorta*, spring.

Nivatogastrium nubigenum (1,3) - dead mountain conifers, especially *Abies* and *Pinus contorta*, spring.

Plectania milleri (1,3) - saprophytic on conifer duff, in spring, adjacent to snow melt.

Ramaria rubrivanescens (1,3) - on ground in forest of western hemlock, fall.

1998 VASCULAR PLANT SPECIES LIST FOR POVERTY FLATS ACEC

Butte Falls Resource Area

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
ACMI2	*Achillea milefolium*	common yarrow	*Asteraceae*	NA
ACLE	*Achnatherum lemmonii*	Lemmon's needlegrass	*Poaceae*	NA
AGGR	*Agoseris grandiflora*	large-flowered agoseris	*Asteraceae*	NA
AGHE	*Agoseris heterophylla*	woodland agoseris	*Asteraceae*	NA
AGCA	*Agrostis capillaris*	colonial bentgrass	*Poaceae*	weedy
AICA	*Aira caryophylla*	silver hairgrass	*Poaceae*	NA
ALAM	*Allium amplectens*	paper onion	*Liliaceae*	NA
ALLIU	*Allium sp.*	onion species	*Liliaceae*	NA
AMAL2	*Amelanchier alnifolia*	western serviceberry	*Rosaceae*	NA
ANAR5	*Antennaria argentea*	silver pussytoes	*Asteraceae*	NA
ARME	*Arbutus menziesii*	Pacific madrone	*Ericaceae*	NA
ARVI4	*Arctostaphylos viscid*	whiteleaf manzanita	*Ericaceae*	NA
BEPI2	*Berberis piperiana*	Piper's Oregongrape	*Berberidaceae*	NA
BIFR	*Bidens frondosa*	sticktight	*Asteraceae*	weedy
BRHO	*Bromus hordeaceus*	soft brome	*Poaceae*	weed
BRJA	*Bromus japonicus*	Japanese brome	*Poaceae*	weed
BRRI	*Bromus rigidus*	ripgut brome	*Poaceae*	weed
BRTE	*Bromus tectorum*	cheat grass	*Poaceae*	weed
CADE3	*Calocedrus decurrens*	incense cedar	*Cupressaceae*	NA
CATO	*Calochortus tolmiei*	Tolmie's mariposa	*Liliaceae*	NA
CAUN	*Calochortus uniflorus*	Monterey mariposa	*Liliaceae*	NA
CAQUQ	*Camassia quamash ssp.*	common camas	*Liliaceae*	NA
CASI	*Carex sitchensis*	Sitka sedge	*Cyperaceae*	NA
CAST	*Carex stipata*	sawbeak sedge	*Cyperaceae*	NA

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
CAREX	*Carex sp.*	sedge species	*Cyperaceae*	NA
CAAT	*Castilleja attenuata*	valley tassels	*Scrophulariaceae*	NA
CECU	*Ceanothus cuneatus*	buckbrush, wedgeleaf	*Rhamnaceae*	NA
CEIN3	*Ceanothus intergerrim*	deerbrush, wild lilac	*Rhamnaceae*	NA
CESO3	*Centaurea solstitiali*	yellow star thistle	*Asteraceae*	noxious weed
CEGL	*Cerastium glomeratum*	sticky mouse ear	*Caryophyllaceae*	weedy
CEBE3	*Cercocarpus betuloide*	birchleaf montain-mahog	*Rosaceae*	NA
CHGR	*Cheilanthes gracillim*	lace fern	*Pteridaceae*	NA
CHLE	*Chrysanthemum leucant*	ox eye daisy	*Asteraceae*	weedy
CIIN	*Cichorium intybus*	chicory	*Asteraceae*	weedy
CIVU	*Cirsium vulgare*	bull thistle	*Asteraceae*	noxious weed
CLGR	*Clarkia gracilis*	slender clarkia	*Onagraceae*	NA
CLRH	*Clarkia rhomboidia*	tongue clarkia	*Onagraceae*	NA
CLARK	*Clarkia sp.*	clarkia species	*Onagraceae*	NA
CLPE	*Claytonia perfoliata*	miner's lettuce	*Portulacaceae*	NA
CLRUR	*Claytonia rubra ssp.*	red miner's lettuce	*Portulacaceae*	NA
COGR2	*Collinsia grandiflora*	large-flowered blue-eye	*Scrophulariaceae*	NA
COLI	*Collinsia linearis*	narrow-leaved blue-eyed	*Scrophulariaceae*	NA
COPA	*Collinsia parviflora*	small-flowered blue-eye	*Scrophulariaceae*	NA
COBO	*Conyza bonariensis*	hairy fleabane	*Asteraceae*	weedy
DACA	*Danthonia californica*	California oatgrass	*Poaceae*	NA
DACA?	*Daucus carota*	Queen Anne's lace	*Apiaceae*	weed
DAPU	*Daucus pusillus*	little wild carrot	*Apiaceae*	NA
DELPH	*Delphinium sp.*	larkspur species	*Ranunculaceae*	NA
DEEL	*Deschampsia elongata*	slender hairgrass	*Poaceae*	NA
DIARA	*Dianthus armeria ssp.*	grass pink	*Caryophyllaceae*	weedy
DICO	*Dichelostemma congest*	ookow	*Liliaceae*	NA

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
DIFU	*Dipsacus fullonum*	wild teasel	*Dipsacaceae*	weed
DOHE	*Dodecatheon henderson*	Henderson's shooting st	*Primulaceae*	NA
DOBA	*Downingia bacigalupii*	Bach's downingia	*Campanulaceae*	NA
DRVE2	*Draba verna*	vernal draba	*Brassicaceae*	NA
ELELE	*Elymus elymoides ssp.*	squirreltail	*Poaceae*	NA
ELGL	*Elymus glaucus*	blue wildrye	*Poaceae*	NA
EPCIC	*Epilobium ciliatum ss*	glandular willow-herb	*Onagraceae*	NA
EPMI	*Epilobium minutum*	small-flowered willow-h	*Onagraceae*	NA
ERSE3	*Eremocarpus setigerus*	turkey mullein	*Euphorbiaceae*	weedy
ERLA6	*Eriophyllum lanatum*	wooly sunflower	*Asteraceae*	NA
ERCI6	*Erodium cicutarium*	filaree, redstem storks	*Geraniaceae*	weedy
FEID	*Festuca idahoensis*	Idaho fescue	*Poaceae*	NA
FRVI	*Fragaria virginiana*	Virginia strawberry	*Rosaceae*	NA
FRLA	*Fraxinus latifolia*	Oregon ash	*Oleaceae*	NA
FRITI	*Fritillaria sp.*	fritillary species	*Liliaceae*	NA
GAAP2	*Galium aparine*	catchweed bedstraw	*Rubiaceae*	NA
GAPA2	*Galium parisiense*	wall bedstraw	*Rubiaceae*	NA
GALIU	*Galium sp.*	bedstraw	*Rubiaceae*	NA
GEDI	*Geranium dissectum*	cut-leaved geranium	*Geraniaceae*	weedy
GNCAT	*Gnaphalium canescens*	slender cudweed	*Asteraceae*	NA
HIAL2	*Hieracium albiflorum*	white-flowered hawkweed	*Asteraceae*	NA
HICY	*Hieracium cynoglossoi*	houndstongue hawkweed	*Asteraceae*	NA
HOLA	*Holcus lanatus*	common velvet-grass	*Poaceae*	weed
HYDRO	*Hydrocotyle sp.*	pennywort	*Apiaceae*	NA
HYPE	*Hypericum perforatum*	Klamathweed, goatweed	*Hypericaceae*	weed
HYRA	*Hypchoeris radicata*	false dandelion	*Asteraceae*	weed
JUEFE	*Juncus effusus var. e*	common rush	*Juncaceae*	NA
JUNCU	*Juncus sp.*	rush	*Juncaceae*	NA

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
KOCR	*Koeleria cristata*	prairie junegrass	*Poaceae*	NA
LASE	*Lactuca serriola*	prickly lettuce	*Asteraceae*	weedy
LIFLB	*Limnanthes floccosa s*	Bellinger's meadow-foam	*Limnanthaceae*	ONHP-1 BLM-BAO
LIFL2	*Limnanthes floccosa*	wooly meadow-foam	*Limnanthaceae*	NA
LIBI	*Linanthus bicolor*	bicolored linanthus	*Polemoniaceae*	NA
LIPA5	*Lithophragma parviflo*	prairie star	*Saxifragaceae*	NA
LONU2	*Lomatium nudicaule*	pestle lomatium	*Apiaceae*	NA
LOUT	*Lomatium utriculatum*	spring gold	*Apiaceae*	NA
LOHI	*Lonicera hispidula*	hairy honeysuckle	*Caprifoliaceae*	NA
LOIN4	*Lonicera interrupta*	chaparral honeysuckle	*Caprifoliaceae*	NA (tracking)
LOMI	*Lotus micranthus*	small-flowered deervetch	*Fabaceae*	NA
LOPI2	*Lotus pinnatus*	bog lotus	*Fabaceae*	NA
LUBI	*Lupinus bicolor*	miniature lupine	*Fabaceae*	NA
LUPIN	*Lupinus sp.*	lupine	*Fabaceae*	NA
LUCA2	*Luzula campestris*	field woodrush	*Juncaceae*	NA
MAEX	*Madia exigua*	little tarweed	*Asteraceae*	NA
MAGL	*Madia glomerata*	stinking tarweed	*Asteraceae*	NA
MADIA	*Madia sp.*	tarweed	*Asteraceae*	NA
MAOR3	*Marah oreganus*	wild cucumber	*Cucurbitaceae*	NA
MIAL	*Mimulus alsinoides*	chickweed monkeyflower	*Scrophulariaceae*	NA
MIGU	*Mimulus guttatus*	yellow monkeyflower	*Scrophulariaceae*	NA
MOEN	*Moenchia erecta*	moenchia	*Caryophyllaceae*	weed
MOLI	*Montia liearis*	narrow-leaved montia	*Portulacaeae*	NA
MYDI	*Myosotis discolor*	yellow & blue scorpion-	*Boraginaceae*	weedy
MYMI	*Myosurus minimus*	least mouse-tail	*Ranunculaceae*	NA
NAIN2	*Navarretia intertexta*	needle-leaf navarretia	*Polemoniaceae*	NA
NEPE	*Nemophila pedunculata*	meadow nemophila	*Hydrophyllaceae*	NA

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
OECE	*Oemelaria cerasiformi*	Indian plum, osoberry	*Rosaceae*	NA
ORUN	*Orobanche uniflora*	naked broomrape	*Orobanchaceae*	NA
OSCH	*Osmorhiza chilensis*	mountain sweet-root	*Apiaceae*	NA
PACA6	*Panicum capillare*	witchgrass	*Poaceae*	NA
PEPU	*Pectocarya pusilla*	little pectocarya	*Boraginaceae*	NA
PEDA	*Penstemon davidsonii*	Davidson's penstemon	*Scrophulariaceae*	NA
PEDE2	*Penstemon deustus*	hot rock penstemon	*Scrophulariaceae*	NA
PEGA3	*Perideridia gairdneri*	Gairdner's yampah	*Apiaceae*	NA
PEHO5	*Perideridia howellii*	Howell's false caraway	*Apiaceae*	ONHP-4 BLM-BWO
PHHE2	*Phacelia heterophylla*	varileaf phacelia	*Hydrophyllaceae*	NA
PHGR	*Phlox gracilis*	pink annual phlox	*Polemoniaceae*	NA
PILA	*Pinus lambertiana*	sugar pine	*Pinaceae*	NA
PIPO	*Pinus ponderosa*	ponderosa pine	*Pinaceae*	NA
PLCO	*Plagiobothrys cognatu*	allied allocarya	*Boraginaceae*	NA
PLNO	*Plagiobothrys nothovu*	rusty popcorn flower	*Boraginaceae*	NA
PLTE	*Plagiobothrys tenellu*	slender popcorn flower	*Boraginaceae*	NA
PLLA	*Plantago lanceolata*	English plantain	*Plantaginaceae*	weedy
PLMA?	*Plectritis macrocera*	desert plectritis	*Valerianaceae*	NA
POPR	*Poa pratensis*	Kentucky bluegrass	*Poaceae*	NA
POA++	*Poa sp.*	bluegrass	*Poaceae*	NA
POIMI	*Polystichum imbricans*	imbricate sword fern	*Dryopteridaceae*	NA
POBAT	*Populus balsamifera s*	black cottonwood	*Salicaceae*	NA
POGL9	*Potentilla glandulosa*	sticky cinquefoil	*Rosaceae*	NA
POGR9	*Potentilla gracilis*	northwest cinquefoil	*Rosaceae*	NA
PRVU	*Prunella vulgaris*	self-heal	*Laminaceae*	weedy
PSME	*Pseudotsuga menzeisii*	Douglas-fir	*Pinaceae*	NA
QUGA4	*Quercus garryana*	Oregon white oak	*Fagaceae*	NA
RAAQ	*Ranunculus aquatilis*	water buttercup	*Ranunculaceae*	NA

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
RAOC	*Ranunculus occidental*	western buttercup	*Ranunculaceae*	NA
RARE3	*Ranunculus repens*	creeping buttercup	*Ranunculaceae*	NA
RORIP	*Rorippa sp.*	yellow cress	*Brassicaceae*	NA
ROEG	*Rosa eglanteria*	sweetbriar rose	*Rosaceae*	weed
RUDI2	*Rubus discolor*	Himalaya berry	*Rosaceae*	weed
RUAC3	*Rumex acettosella*	sheep sorrel	*Polygonaceae*	NA
RUCR	*Rumex crispus*	curly dock	*Polygonaceae*	NA
SAGR5	*Sanicula graveolens*	Sierra snakeroot	*Apiaceae*	NA
SAIN	*Saxifraga integrifoli*	northwestern saxifrage	*Saxifragaceae*	NA
SCBO	*Scribneria bolanderi*	Scribner's grass	*Poaceae*	ONHP-4 BLM-BWO
SCAN3	*Scutellaria angustifo*	narrowleaf skullcap	*Laminaceae*	NA
SEST	*Sedum stenopetalum*	narrow-leaved stonecrop	*Crassulaceae*	NA
SEIN2	*Senecio integerrimus*	western butterweed	*Asteraceae*	NA
SICA2	*Silene campanulata*	bell catchfly	*Caryophyllaceae*	NA
SIBE	*Sisyrinchium bellum*	California blue-eyed gr	*Iridaceae*	NA
SYAL	*Symphoricarpos albus*	common snowberry	*Caprifoliaceae*	NA
TACA8	*Taeniatherum caput-me*	medusahead	*Poaceae*	weed
TAOF	*Taraxacum officinale*	dandelion	*Asteraceae*	weed
TOTE	*Tonella tenella*	small-flowered tonella	*Scrophulariaceae*	NA
TOAR	*Torilis arvensis*	field hedge-parsley	*Apiaceae*	weedy
TODI	*Toxicodendron diversi*	poison oak	*Anacardiaceae*	NA
TRDU	*Tragopogon dubius*	yellow salsify	*Asteraceae*	weedy
TRLA	*Trichostema lanceolat*	vinegar weed	*Lamiaceae*	NA
TRDU2	*Trifolium dubium*	little hop clover, sham	*Fabaceae*	weedy
TRLO	*Trifolium longipes*	long-stalked clover	*Fabaceae*	NA
TRWI	*Trifolium willdenovii*	tomcat clover	*Fabaceae*	weedy
TRIFO	*Trifolium sp.*	clover	*Fabaceae*	NA
VALO	*Valerianella locusta*	corn salad	*Valerianaceae*	weedy

CODE	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPECIAL STATUS
VEDU	*Ventenata dubia*	unknown	*Poaceae*	weedy
VETH	*Verbascum thapsus*	common mullein	*Scrophulariaceae*	weed
VEPE3	*Veronica persica*	winter speedwell	*Scrophulariaceae*	NA
VUMI	*Vulpia microstachys*	Nuttall's fescue	*Poaceae*	NA
VUMY	*Vulpia myuros*	rattail fescue	*Poaceae*	weed
WOSC	*Woodsia scopulina*	rocky mountain woodsia	*Dryopteridaceae*	NA

Federally listed by U.S. Fish and Wildlife Service and the National Marine Fisheries Service:

- FE: Federal endangered
- FT: Federal threatened
- FP: Federal proposed T(hreatened) or E(ndangered)
- FC: Federal candidate T(hreatened) or E(ndangered)

State Listed:

- SE: State endangered
- ST: State threatened
- SC: State candidate

Bureau Sensitive:

- BSO: Bureau Sensitive in Oregon; ONHP List 1; Oregon Candidate
- BAO: Bureau Assessment in Oregon; ONHP List 2
- BTO: Bureau Tracking Species, ONHP lists 3 & 4
- BWO: Bureau Watch Species, ONHP list 4

1999 SPECIAL STATUS SPECIES OCCURRENCE

Butte Falls Resource Area

U.S. FISH & WILDLIFE T&E SPECIES

SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Peregrine falcon	FE, SE, 1	Y	A	Medium	None
Bald eagle	FT, ST, 1	Y	P	Medium	Winter & nesting survey
Northern spotted owl	FT, ST, 1	Y	P	Medium	Protocol
Vernal Pool Fairy Shrimp	FT	N	A	Absent	None

STATE, BUREAU, ONHP, SPECIES of CONCERN

SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Cascade frog	SoC, SV, BS, 3	Y	P	Low	Ponds*
Clouded salamander	SU, BS, 3	Y	S	Medium	None
Foothill yellow legged frog	SoC, SV, BS, 3	Y	U	Medium	Stream**
No. red legged frog	SoC, SU, BS, 3	N	A	Low	Ponds
Tailed Frog	SoC, SV, BS, 3	N	U	Low	None
Western pond turtle	SoC, SC, BS, 2	Y	A	Low	Ponds
Western toad	SV, 3	Y	U	Low	Ponds
California mt. kingsnake	SV, AS, 3	Y	S	Low	None
Common kingsnake	SV, AS, 3	Y	S	Low	None
Sharptail snake	SV, AS, 4	U	U	Low	None
Acorn woodpecker	SU, 3	Y	P	High	Incidental
Black backed woodpecker	SC, AS, 4	N	U	Medium	None
Flammulated owl	SC, AS, 4	Y	S	Low	1 yr survey
Great gray owl	SV, AS, SM, 4	Y	P	Medium	Some survey
Greater sandhill crane	SV, 4	Y	A	Low	None
Lewis' woodpecker	SC, AS, 3	Y	P	Medium	Incidental
Northern goshawk	SoC, SC, BS, 3	Y	Y	Medium	Some survey

SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Northern pygmy owl	4	Y	P	Medium	Incidental
Northern saw whet owl	AS	Y	S	Medium	Incidental
Olive sided flycatcher	SV, 3	Y	P	Medium	Incidental
Pileated woodpecker	SV, AS, 4	Y	P	Medium	Incidental
Three-toed woodpecker	SC, AS, 4	N	A	Low	None
Tricolored blackbird	SoC, SP, 2	N	A	Low	None
Western Bluebird	SV, 4	Y	P	Medium	Incidental
White headed woodpecker	SC, 3	N	A	Low	None
American martin	SV, 3	Y	U	Low	None
Fisher	SoC,BS,SC,2	Y	U	Low	None
Fringed myotis	SoC, SV, BS, 3	Y	U	Medium	Limited
Long eared myotis	SoC, BS, SU, 4	Y	P	Medium	Limited
Long legged myotis	SoC, BS, SU, 3	Y	P	Medium	Limited
Pallid bat	SV, 3	Y	U	Medium	Limited
Red tree vole	SoC, SM	?	U	High	Planned
Ringtail	SU, 3	Y	U	Low	None
Silver haired bat	SU, 3	Y	P	Medium	Limited
Townsend's big eared bat	SoC, SC, BS, SM, 2	Y	P	Medium	Limited
Yuma myotis	SoC, BS, 4	Y	U	Low	Limited
Western gray squirrel	SU, 3	Y	P	High	Incidental
Oregon Shoulderband	SM	U	U	Medium	Planned
Oregon Megomphix	SM	U	U	Medium	Planned
Crater Lake tightcoil	SM	U	U	Medium	Planned
Blue-grey tail-dropper	SM	Y	S	High	Planned
Papillose tail-dropper	SM	Y	S	High	Planned
Burnell's False Water Penny Beetle	SoC, BS, 4	U	U	Low	None
Denning's Agapetus caddisfly	SoC, BS, 3	U	U	Low	None
Green springs Mt. faurlan caddisfly	SoC, BS, 3	U	U	Low	None

SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Schuh's homoplectran caddisfly	SoC, BS, 3	U	U	Medium	None
Siskiyou caddisfly	SoC, BS, 3	U	U	Low	None
Siskiyou chloealtis grasshopper	SoC, BS, 3	U	U	Low	None
Mardon skipper butterfly	BS, 2	U	U	Low	None
Franklin's bumblebee	SoC, BS	U	U	Medium	None

*Ponds on BLM lands have been surveyed.
**None were observed during fish surveys

Status:
FE - USFW Endangered - in danger of extinction throughout a significant portion of its range.
FT - USFW Threatened - likely to become endangered species within the foreseeable future.
SoC- Taxa whose conservation status is of concern to the USFW (many previously known as category 2 candidates), but for which further information is needed.
SE - State Endangered - in danger of extinction in the state of Oregon.
ST - State Threatened - listed as likely to become endangered by the state of Oregon.
SC - State Critical - listing is pending, or appropriate, if immediate conservation action not taken.
SV - State Vulnerable - listing not imminent, and can be avoided through continued or expanded use of adequate protective measures and monitoring.
SP - State Peripheral or naturally rare - populations at the edge of their geographic range, or historically low numbers due to limiting factors.
SU - State Unknown - status unclear, insufficient information to document decline or vulnerability.
SM - Survey & Manage - Forest plan ROD directs protection of known sites and/or survey for new sites.
BS - Bureau Sensitive (BLM) - eligible for addition to Federal Notice of Review, and known in advance of official publication. Generally these species are restricted in range and have natural or human caused threats to their survival.
AS - Assessment Species (BLM) - not presently eligible for official federal or state status, but of concern which may at a minimum need protection or mitigation in BLM activities.

1 - Oregon Natural Heritage Rank, threatened with extinction throughout its range.
2 - Oregon Natural Heritage Rank, threatened with extinction in the state of Oregon.
3 - Oregon Natural Heritage Rank, more information is needed before status can be determined, but may be threatened or endangered in Oregon or throughout range.
4 - Oregon Natural Heritage Rank, of conservation concern. May be rare, but are currently secure. May be declining in numbers or habitat but still too common to be considered as threatened or endangered. May need monitoring.

P/A Presence:
P - Present
S - Suspected
U - Uncertain
A - Absent
T - Possibly transitory

Habitat quality:
H - High
M - Medium
L - Low
A - Absent

SPECIAL STATUS WILDLIFE SPECIES--1998

HABITAT AND OCCURRENCE IN THE BUTTE FALLS RESOURCE AREA

Acorn woodpecker (*Melanerpes formicivorus*)

Habitat is oak woodlands or pine forests where oak trees are abundant.

American martin (*Martes americana*)

Martin inhabit mature and old growth forests that contain large quantities of standing and downed snags and other coarse downed woody material, often near streams. They often use down logs for hunting and resting. They feed on small mammals, birds, fruits, and insects.

Bald eagle (*Haliaeetus leucocephalus*)

Six nest sites are known in the Medford BLM district, with 2 on adjoining private lands. Four of these are within the Butte Falls Resource area. In Oregon, the majority of nests (84%) are located within one mile of lakes, reservoirs, large rivers, and coast estuaries. Nest trees are larger, dominant or co-dominant trees in the stand and are usually components of old growth or older second growth forests. Prey is fish, waterfowl, small mammals (rabbits, etc.), and carrion.

Black-backed woodpecker (*Picoides arcticus*)

Presence is undetermined in the Medford BLM district. Has been documented in Cascade Mountains in Jackson County and in the Siskiyou Mountains in Josephine County. In Oregon, the black-backed woodpecker tends to occur in lower elevation forests of lodgepole pine, ponderosa pine, or mixed pine/conifer forests. Dead trees used for foraging have generally been dead three years or less.

Blue-grey tail-dropper (*Prophysaon coeruleum*)

Found in open to moist conifer and mixed conifer forests at elevations (500-3000 ft.). In open or dry areas, it is usually located in sites with relatively higher shade and moisture levels than those of the general forest habitat. It is usually associated with partially decayed logs, leaf and needle litter (especially hardwood leaf litter), mosses and moist plant communities such as bigleaf maple and sword fern associations.

Burnell's false water penny beetle (*Acneus burnelli*)

This species has not been found in the Medford BLM district, but could be present. Adults are found along small, rapid, low elevation streams, frequently near waterfalls. Larvae were found in rapid sections of a stream in pools of quiet water protected form any current by large boulders. This species has been found in Coos Co., Upper Middle Creek, 15 miles SW of Powers, OR.

California mountain kingsnake (*Lampropeltis zonata*)

Habitat includes oak and pine forests. Found under or inside rotting logs and in talus areas. They are not common, and are mostly found in the western part of the District.

Cascade frog (*Rana cascade*)

Found in the Cascade mountains, above 2600 feet, on the east side of the District. They are most commonly found in small pools adjacent to streams flowing through meadows. They are also found in small lakes, bogs, and marshy areas that remain damp thorough the summer.

Clouded salamander (*Aneides ferreus*)

Habitat requirements are forest and forest edges from sea level to 1500 meters. There is a correlation between clouded salamander abundance and large conifers as well as down woody material. They occur mainly under loose bark in decayed, standing and fallen snags, and stumps. They have been found as high as 20 feet in trees. May also be found in cracks in cliff rocks, under

moss and leaf litter.

Common kingsnake (*Lampropeltis getulus*)

In Oregon, they are found only in Douglas, Jackson, and Josephine Counties in the more mesic river valleys. Common kingsnake inhabit oak/pine woodlands, open brushy areas, and river valleys, often along streams, and in thick vegetation. They may also be found in farmlands, especially near water areas.

Crater Lake tightcoil (*Pristiloma arcticum crateris*)

Species is known from south of Crater Lake, Klamath County and an occurrence in Jefferson County. Species may be found in moist conifer forests and among mosses and other vegetation near wet lands, springs, seeps and riparian areas above 2000 ft. elevation.

Denning's agapetus caddisfly (*Agapetus denningi*)

This species has not been found in Medford BLM district, but could be present. No habitat information is available. The only information available is from the life history of *A. taho*, a similar species, which is found in cool, mid to large size streams of moderate gradient in forested areas over a large elevation range. A single specimen was collected in Rogue River National Forest.

Fisher (*Martes pennanti pacifica*)

Habitat is mature and old growth forests. They appear to be closely associated with riparian areas in these forests. In a study done in Trinity County, California, a preference was shown for conifer forests with some hardwoods present. They seem to prefer 40-70% canopy cover. They mainly use large living trees, snags and fallen logs for denning. Occasional sightings on the Medford district, but little information is available as to distribution and density.

Flammulated owl (*Otus flammeolus*)

Habitat is a mosaic of open forests containing mature or old-growth ponderosa pine mixed with other tree species. In California, habitat included conifer and black oak. Nests mainly have been located in abandoned Northern flicker or pileated woodpecker cavities. The presence of dense conifers for roosting may be a necessary habitat components. Feeds mostly on insects. May also eat other arthropods and small vertebrates.

Foothill yellow legged frog (*Rana Boylii*)

Habitat is permanent streams with rocky, gravelly bottoms. Distribution is west of the Cascade crest from sea level to 1800 feet. These frogs are closely associated with water.

Franklin's bumblebee (*Bombus franklini*)

Franklin's bumblebee has been found in herbaceous grasslands between 1400-4000 ft. elevation. Activity spans the entire blooming season, so they do not appear restricted to a particular host or flower. Adults probably present and in active flight from May (on warm sunny days) through early September. Range restricted to southwestern Jackson County, Oregon, perhaps southeastern corner of Josephine County, perhaps part of northern California.

Fringed myotis bat (*Myotis thysanodes*)

Fringed myotis is a crevice dweller which may be found in caves, mines, buildings, rock crevices, and large old growth trees. They have been captured in openings and in mid-seral stage forest habitats. Food consists of beetles, butterflies, and moths.

Great gray owl (*Strix nebulosa*)

Habitat preference is open forest or forest with adjoining deep-soil meadows. Nest in broken top trees, abandoned raptor nests, mistletoe clumps, and other platforms created by whorls of branches. Majority of nests in one study were in over-mature or remnant stands of Douglas fir and grand fir forest types on north facing slopes. Probably found in low densities across the district.

Greater sandhill crane (*Grus canadensis tabida*)

A spring and summer resident of Oregon, sandhill cranes roost, nest, and rear young in wet meadows, including wild, irrigated hay meadows and shallow marshes. The cranes may use agricultural croplands for feeding during non-nesting season. Sandhill cranes have been observed on the Ashland Resource Area near Howard Prairie and Hyatt Lake and in the Butte Falls Resource area near the communities of Prospect and Butte Falls.

Green springs Mt. farulan caddisfly (*Farula davisi*)

Species of *Farula* inhabit cool, highly humid areas. This species was collected near a small stream with a marshy area nearby. One is probably the habitat. Two adult specimens were collected from Green Springs Mt., 10 miles east of Ashland near a large stream.

Lewis' woodpecker (*Melanerpes lewis*)

These woodpeckers breed sparingly in the foothill areas of the Rogue and Umpqua river valleys in Douglas, Jackson, and Josephine Counties. Habitat preference is hardwood oak stands with scattered pine near grassland shrub communities. Breeding areas in the Rogue Valley are uncertain. In some locales, the woodpeckers breed in riparian areas having large cottonwoods and in oak conifer woodlands. They usually do not excavate nest cavities, but most often use cavities excavated by other woodpecker species. They winter in low elevation oak woodlands.

Long eared myotis (*Myotis evotis*)

A crevice dweller found in coniferous forests in the mountains. Individuals are frequently encountered in sheds and cabins. They have also been found beneath the loose bark of trees. They seldom reside in caves, but may occasionally use caves as a night roost. They are not known to occur in large colonies.

Long legged myotis (*Myotis volans*)

Long legged myotis is an open forest dweller which is found in small pockets and crevices in rock ledges, caves, and buildings. When in caves, they hang in clumps in deep twilight zones.

Mardon skipper butterfly (*Polites mardon*)

Only known in four localities, two in Washington state, one in Del Norte County coastal mountains, and the fourth in high mountain meadows along the summit of the Cascade Mountains in Jackson and Klamath Counties. They are found in wet mountain meadow habitats.

Northern goshawk (*Accipiter gentilis*)

Goshawks are found in a variety of mature forest types, including both deciduous and conifer types. Dense overhead foliage or high canopy cover is typical of nesting goshawk habitat. Perches where they pluck their prey, known as plucking posts, are provided by stumps, rocks, or large horizontal limbs below the canopy.

Northern pygmy owl (*Glaucidium gnoma*)

Believed to be present across district. Population numbers and trends are unknown. Habitat needs are not clear, but the species is regularly recorded in forested areas of numerous types and age classes in Oregon, most commonly along edges of openings such as clearcuts or meadows. Nests in tree cavities excavated by woodpeckers. Feeds on insects, small vertebrates and birds.

Northern red legged frog (*Rana aurora*)

Red legged frogs prefer slack water of ponds and low gradient streams with emergent vegetation for reproduction. These frogs are found in lower elevations and can be found during the summer months up to 1000 feet from standing water in humid, old growth forests and moist meadows.

Northern saw-whet owl (*Aegolius acadicus*)

Believed to be present across the district. Population numbers and trends are unknown. Habitat is dense conifer and mixed conifer/hardwood forests. Nest in abandoned woodpecker holes and natural cavities. Feed on small mammals and birds.

Northern spotted owl (*Strix occidentalis caurina*)

Old growth coniferous forest is preferred nesting, roosting and foraging habitat, or areas with some old growth characteristics with multi-layered, closed canopies with large diameter trees with an abundance of dead and down woody material. Northern spotted owls commonly nest in cavities 50 or more feet above the ground in large decadent old growth trees. Other nest sites include large mistletoe clumps, abandoned raptor nests, and platforms formed by whorls of large branches. Over 200 northern spotted owl "core areas", 100 acres of the best habitat around activity centers for known sites (as of 1/1/94) have been designated and mapped as late successional reserves. Prey is primarily small arboreal mammals, such as flying squirrels, woodrats, voles, etc. and occasionally small birds.

Olive sided flycatcher (*Contopus borealis*)

Fairly common in coniferous forests, burns, and clearings. Often perches high on tall conifer or snag at edge of clearcut. Feeds on insects and other invertebrates, including caterpillars.

Oregon Megomphix (*Megomphix hemphilli*)

Expected to occur in moist conifer/hardwood forests up to 3000 ft. Found in hardwood leaf litter and decaying non-coniferous plant matter under bigleaf maple trees, especially if there are any rotten logs or stumps nearby. A bigleaf maple component in the tree canopy and an abundance of sword fern on forested slopes and terraces seems characteristic of the sites.

Oregon shoulderband (*Helminthoglypta hertleini*)

This species is known from rocky areas including talus deposits, but not necessarily restricted to these areas. Suspected to be found within its range wherever permanent ground cover and/or moisture is available. This may include rock fissures or large woody debris sites. Somewhat adapted to somewhat xeric conditions during a part of the year.

Pallid bat (*Antrozous pallidus*)

This bat is a crevice dweller. Rock crevices and human structures are used as day roosting sites. Recent radiotelemetry studies indicate that these bats also use interstitial spaces in the bark of large conifer trees as a roost site. One colony of pallid bats was observed roosting in a hollow tree. Food consists of beetles, grasshoppers, moths, and other insects found on or near the ground or on grasses or shrubs.

Papillose tail-dropper (*Prophysaon dubium*)

Appears to be strongly associated with hardwood logs and leaf litter. It has been found in sites that are similar to, but somewhat more exposed than those described for *Prophysaon coeruleu, above.*

Peregrine falcon (*Falco peregrinus*)

Primary habitat is tall cliffs. Two confirmed active sites occur in the Medford District. Occasional sightings are made during the winter months, but these are thought to be migrating individuals. Forest lands provide habitat for prey species for peregrine falcons. Prey is mostly birds, especially doves and pigeons. Peregrines also prey on shorebirds, waterfowl, and passerine birds.

Pileated woodpecker (*Dryocopus pileatus*)

Pileated woodpeckers are common across the Medford BLM district. They are found mainly in old growth and mature forests, but can feed in younger forests and clearcuts. A new nest is excavated each year. They mainly use dead trees that have the strength to handle a nest cavity that averages

8 inches wide and 22 inches deep (≥20 inches dbh). Pileated woodpeckers

excavate an new nest each year, and need 1-2 hard snags per 100 acres. Studies show that the pileated woodpeckers need about 45 large trees with existing cavities in their home range (300-1000 acres) to provide roosting habitat.

Red tree vole (*Pomo longicadus*)

An arboreal vole which lives in Douglas fir, spruce, and hemlock forests. Food consists entirely of needles of the tree in which they are living. They build a bulky nest, up to the size of a half bushel measure in the branches, usually near the trunk, 15-100 feet above the ground. The nest becomes larger with age, and may be occupied by many generations.

Ringtail (*Bassariscus astutus*)

Ringtails are most commonly found in areas having cliffs, rocky terrain near water, riparian hardwoods, and sometimes conifers. They nest in hollow trees, brush piles, caves, and abandoned buildings. They are encountered infrequently across the District.

Schuh's homoplectran caddisfly (*Homoplectra schuhi*)

Larvae are found in spring-seepage habitats in forested montane areas. *Homoplectra* sp. are found in streams with moderate to close shading from a forest canopy with most sites having a mixed deciduous- conifer canopy. The distribution of the species appears to be limited with specimens found in the Cascade and Coast range mountains of southwestern Oregon and northern California, where suitable habitat is found.

Sharptail snake (*Contia tenuis*)

Habitat is conifer forests and oak grassland edges. Found in rotting logs, moist talus, under rocks, boards, or other objects, mostly in interior valleys.

Silver-haired bat (*Lasionycteris noctivagans*)

The species is a tree dweller, living mostly under bark and in tree trunks. It may also be found roosting in foliage of trees. Silver haired bats are rarely found in human structures.

Siskiyou caddisfly (*Tinodes siskiyou*)

Adult collection records indicate the larvae are associated with mid-size streams, with moderate to dense shading from a mixed hardwood/conifer overstory. Adults have been collected adjacent to both cool, spring-fed streams and from streams with a high annual temperature range. Members of this genus have been found from the coastal mountains of northern California and from 2 disjunct populations in Oregon, one from the Squaw Lakes region of the Rogue River National Forest, 10 miles SW of Medford.

Siskiyou chloealtis grasshopper (*Chloealtis aspasma*)

This species has been found in the Siskiyou Mountains near Mt. Ashland and near Willow Lake. Appears to be associated with elderberry plants. Females lay eggs in the pith of elderberry plants.

Tailed frog (*Ascaphus truei*)

Habitat is cold, fast flowing permanent streams in forested areas. Temperature tolerance range is low, 41-61 degrees Fahrenheit. Tailed frog are closely tied to water.

Three toed woodpecker (*Picoides tridactylus*)

Presence is undetermined in the Medford BLM district. Range is along the crest of the Cascade Range and eastward. Generally found in higher elevation forests, above 4000 feet. In eastern Oregon, three-toed woodpeckers nest and forage in lodgepole pine forests. They are occasionally found roosting in hemlock and Engelmann spruce trees in mature and over mature mixed conifer forests. Bark beetle larvae are primary food source.

Townsend's big-eared bat (*Plecotus townsendii*)

Roost in mines, caves, cavities in trees, and attics of buildings. They have low tolerance to changes in temperature and humidity and removal of trees around these sites may change airflow patterns to make the area less desirable as a hibernaculum, maternity, or roosting site. Food consists primarily of moths, and other arthropods.

Tricolored blackbird (*Agelaius tricolor*)

Tricolored blackbirds are found in the interior valleys of southern Oregon, near freshwater marshes and croplands. Individuals have been reported near Roxy Ann Peak, in Sams valley, and near Table Rock.

Vernal Pool Fairy Shrimp (*Branchinecta lynchi)*

Habitat is vernal pools. They have only been found in Agate Desert and Table Rock areas.

Western bluebird (*Sialia mexicana*)

In western Oregon, western bluebirds nest in open areas near farms and in clearcuts in standing snags. They nest in natural cavities, old woodpecker holes, and in nest boxes.

Western gray squirrel (*Sciurus griseus*)

Arboreal squirrel that is found in oak, oak-pine, hardwood-mixed conifer, and mixed conifer forests. Feeds mostly on acorns and conifer seeds. Nests in tree cavities or in nests made of sticks and shredded bark.

Western pond turtle (*Clemmys marmorata marmorata*)

Live in most types of freshwater environments with abundant aquatic vegetation, basking spots, and terrestrial surroundings for nesting and over-wintering. Some northwestern pond turtles leave water in late October to mid-November to overwinter on land. They may travel up to 1/4 mile from water, bury themselves in duff and remain dormant throughout winter. Turtles have been found to generally stay in one place in areas with heavy snowpack, but may move up to 5-6 times in a winter in areas with little or no snow. General habitat characteristics of overwintering areas appear to be broad. There may be specific microhabitat requirements, which are poorly understood at this time.

In many areas, predation on the hatchlings and competition from bullfrogs, bass, and other exotic species is limiting population levels. Adult turtles are relatively long lived, but as the adults age, recruitment is not occurring at levels which can maintain future healthy populations.

Western toad (*Bufo boreas*)

Largely terrestrial, found from sea level to high mountains. They often use rodent burrows. They are nocturnal during dry weather, and may forage in daytime on rainy or overcast days. Optimal habitat is humid areas with dense undergrowth. They have been found beneath bark and within decayed wood in large Douglas fir logs, especially those partially submerged in water. Breed in ponds, pools, and slow moving water in streams. In the Oregon Cascades, they may prefer mud bottomed shallows of lakes and ponds.

White headed woodpecker (*Picoides albolarvatus*)

Presence in the BLM Medford district is undetermined. White headed woodpeckers occur in ponderosa pine and mixed ponderosa forests. They forage mainly on trunks of living conifers for insects. Nest cavities are within 15 feet of ground in dead trees which have heart rot. Standing and leaning snags and stumps are used. Area is in periphery of known range.

Yuma myotis (*Myotis Yumanensis*)

Yuma myotis is commonly found in human structures, closely associated with water nearby. They will use caves as night roost areas. The species is colonial and hangs in a closely clumped group, often under bridges, in mines and caves.

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STREAM/RIPARIAN SURVEY

Keywords for Remarks

A. Channel Characteristics
- 01. Incised channel
- 02. Channel shifting
- 03. Unstable channel
- 04. Poorly defined channel
- 05. High width/depth ratio
- 06. Channel widening
- 07. Poor sinuosity
- 08. Lack of structure
- 09. Lack of LWD
- 10. High sediment
- 11. Channel scoured to bedrock
- 12. Too much LWD

B. Water Conditions
- 01. High water temperatures
- 02. Subsurface flow
- 03. High algae content
- 04. High water velocity
- 05. Lowered water table
- 06. Springs/wetlands
- 07. Waterfalls

C. Vegetation
- 01. Inadequate shading
- 02. Lack of riparian buffer
- 03. Lack of LWD recruitment
- 04. Lack of streambank vegetation
- 05. Lack of conifer seedlings
- 06. Lack of root masses
- 07. Dense/brushy vegetation
- 08. Lack of riparian species
- 09. Even-aged stand
- 10. Cutover stand
- 11. Early seral stand
- 12. Mid seral stand
- 13. Late seral stand
- 14. Old growth
- 15. Oak savannah

D. Erosion/Geomorphology
- 01. High slump potential
- 02. Inactive slumping
- 03. Active slumping
- 04. Active downcutting
- 05. Steep side slopes
- 06. Steep upstream gradient
- 07. Talus/ravel slopes
- 08. Saturated soils
- 09. Sidewall erosion
- 10. Headwall erosion
- 11. Bank undercutting
- 12. Seep zone

E. Disturbances/Management
- 01. Clearcut
- 02. Plantation
- 03. Roads near stream
- 04. Water flow on roadbed
- 05. Exposed water table
- 06 Disturbed landforms-due to roadcut, bulldozing, equipment
- 07. Culvert problems
- 08. Natural surface road
- 09. Gravel road
- 10. Skid/cat trail
- 11. Grazing impacts
- 12. Aqueduct leak/diversion
- 13. Diversions
- 14. Mining
- 15. Brushing/release/PCT
- 16. Irrigation ditch
- 17. Interrupted flow due to ditch
- 18. Compacted soils
- 19. Selective cut
- 20. Wildfire
- 21. Noxious weeds
- 22. Road problem
- 23. Windthrow
- 24. OHV trails
- 25. Road crossing
- 26. Mining ditch
- 27. Road diverts flow

F. Other
- 01. Beaver activity

Z. Keywords-Recommended Actions
- 01. None
- 02. Add channel structure
- 03. Add LWD
- 04. Buffer riparian zone
- 05. Stabilize channel
- 06. Riparian thinning
- 07. Tree planting
- 08. Enhance shading
- 09. Culvert improvement
- 10. Reduce flow velocity
- 11. Minimize road use
- 12. Sediment traps
- 13. Bank protection
- 14. Cattle exclosure
- 15. Road closure/decommission
- 16. Road obliteration
- 17. Road repair
- 18. Road surfacing
- 19. Install waterbars
- 20. Install trash racks
- 21. Slash cap

22. Headwall planting
23. Monitor
24. Hydromulch
25. Fish survey
26. Weed control
27. Increase velocity
28. Removal of LWD
29. Return flow to streambed

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