WATERSHED ANALYSIS OF LOWER EVANS CREEK

May 1995

Medford District, Bureau of Land Management
Butte Falls Resource Area

Summary: *The Lower Evans Creek Watershed Analysis Unit is located in the Evans Creek Watershed. The current landscape condition was assessed for vegetation, roads, streams/fish, recreation, wildlife, geographic features, cultural/historical, non-BLM lands, grazing/livestock, cumulative watershed effects, minerals, and realty. The structural elements of the landscape were defined in terms of the amount and spatial distribution as either matrix, patch, or corridor to identify the diversity and stability within the LAU. Landscape flows having the most influence on the current and future condition of the LAU were determined to be people, fire, water, and wildlife. These flows were analyzed for interactions with the landscape elements.*

Pre-settlement and post settlement landscape conditions were described in terms of human and natural disturbances. In general, the pre-settlement landscape condition was determined to be more stable and resilient to disturbance than post settlement conditions. The major flows were addressed on a larger scale by linkage with surrounding watersheds. The analysis was interjected with standards and guidelines from the FSEIS, Record of Decision, and the Medford BLM District RMP. Three hundred letters were mailed to the local public to identify issues and concerns. The predominant issues identified by respondents were water quality and quantity, fire hazard, smoke emissions, and soil erosion. Seven preliminary landscape management objectives were identified. These included: 1) Increasing natural production of salmon, steelhead, and trout, 2) Providing for a sustainable harvest of forest commodities, 3) Creating and maintaining connectivity between late successional reserves, 4) Improving forest ecosystem health, diversity and resiliency, 5) Increasing late successional forest conditions in designated connectivity block, 6) Reducing potential for catastrophic fire, and 7) Managing habitat for elk away from rural interface areas. Using historical data from the 1916 O&C Revestiture survey and current landscape condition, desired future condition and spatial design were described and mapped.

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LOWER EVANS WATERSHED ANALYSIS

I. INTRODUCTION

This is an analysis of the current condition of this Watershed Analysis Unit (WAU), which will guide management decisions in the future within the guidelines addressed in the Resource Management Plan and the Record of Decision. The objective of this analysis is to look at a "watershed" and describe it's "ecosystem" structures and functions. A rudimentary understanding of watershed level processes and interactions is essential in arriving at ecologically sound management decisions. This planning process requires a major shift away from conventional single resource systems toward a comprehensive "landscape" approach of managing natural resources. Answers are not easily attainable, and will require extensive resource surveys, creative thinking, and trial and error.

The principle objective of managing on a watershed level is to provide for and sustain ecological health and resiliency. This is accomplished through the restoration or maintenance of diversity and complexity within a ecosystem. Processes, levels and patterns that were present prior to European settlement will be used as reference points. Reconstructing what the "landscape" looked like prior to management and fire control provides insight in determining the amount of diversity and complexity to retain or strive for through management actions. Logging, forest plantations, fire suppression, checkerboard ownership patterns, and rural development have altered most landscapes to the extent that a complete return to conditions of previous centuries may not be possible or desired.

Watershed analysis and design processes used in this analysis are based on the methodology outlined in Forest Landscape Analysis and Design (Diaz and Apostle, 1992). This analysis method divides the process into 8 steps: 1) Structure, 2) Flow, 3) Interaction, 4) Disturbances, 5) Linkages, 6) Forest Plan (Resource Management Plan), 7) Narrative objectives, and 8) Spatial design.

II. WATERSHED LOCATION/ECOLOGICAL ZONE

The Lower Evans watershed analysis unit (WAU) is located northwest of Medford and covers approximately 21,766 acres (34 square miles). This includes portions of Townships 35 & 36 South, and Ranges 3, 4 & 5 West. The majority of the WAU lies within the Butte Falls Resource area of the Bureau of Land Management (Table 1). Approximately 1,000 acres lies within the boundaries of the Grants Pass Resource Area. The watershed also falls into two different counties, Josephine and Jackson. The climate of this area is Mediterranean type with typically cool, wet winters and hot, dry summers. Summer temperatures range from the 80's to the high 90's. Occasional daytime temperatures in the summer may reach 100+ degrees fahrenheit (F). Winter lows drop regularly to 10 to 20 degrees F. Annual precipitation ranges from 35 to 45 inches. Typically, most precipitation occurs in the late fall, winter, and early spring as rainfall with the exception of the upper ridges where snow may accumulate.

Ownership within this watershed analysis unit is displayed in Table 1. Delineation of the watershed analysis unit boundary is based upon similar topography, soil types and vegetative conditions.

Table 1. Lower Evans WAU Ownership

INDIAN HILL,LTD	BAXTER	COUNTY	BLM	MEDITE	BOISE CASCADE	OTHER PVT	TOTAL
2 %	2 %	-	25 %	12 %	8 %	51 %	100 %
360 ac.	453 ac.	4 ac.	5,505 ac.	2,688 ac.	1,709 ac.	10,952 ac.	21,671 ac.

Table 2. Acreages and percentages of land types within Lower Evans WAU

RURAL INTERFACE (BLM)	WOODLOT	FARM	RESIDENTIAL
33 %	23 %	12 %	16 %
1,800 ac.	4,951 ac.	2,520 ac.	3,488 ac.

III. IDENTIFICATION AND DESCRIPTION OF CURRENT WATERSHED CONDITIONS

A. VEGETATION

Based upon the Medford district plant grouping criteria addressed in the 1992 Final Medford District Resource Management Plan (DRMP), two plant groupings are identified within the Lower Evans watershed analysis unit. Plant groupings are aggregations of plant associations with similar management potential, the same dominant late seral conifer species and the same principle early seral species.

1. White oak-ponderosa pine/manzanita-wedgeleaf/grass

The White oak-ponderosa pine/manzanita-wedgeleaf/grass grouping has "inclusions of mixed conifer forests. These communities were originally pine-oak savannahs with either manzanita or wedgeleaf brush or perennial grass species dominant, depending on fire frequency. Madrone is locally present." (DRMP, 1992)

2. Mixed conifer/interior valley/grass

In the Mixed conifer/interior valley/grass grouping, "grass, herbaceous vegetation, poison oak, and deerbrush provide severe competition for conifers during the early seral stage. Deciduous brush offers growth competition in mid-seral stages and may delay conifer establishment on hot aspects. Conifer species of late and mature seral stages are Douglas fir and ponderosa pine, with Douglas fir being climax. Tree-form hardwoods are present. Manzanita is locally present and may form dense stands. This group has limited areas which can be considered old growth. A high fire return frequency, coupled with the mortality patterns common to low elevation dry sites, acts to keep this plant grouping in younger age classes." (DRMP, 1992)

Special status plants

Special status plant species are found throughout the watershed on a variety of habitats. Exposed rock ledges are habitat for Lewisia cotyledon. Serpentine wetlands are home for Cyprepedium montanum. While deep organic duff under closed canopy create an environment suitable for Cyprepedium fasciculatum.

A total of 2391 acres have been surveyed over the past 14 years. The surveys included varying levels of intensity. During the 1980's most of the surveys were completed by interested employees working in the resource area. More recently the level of intensity and the skill level have increased considerably. Within the last 4 years qualified botanists have been contracted to undertake the surveys.

The list of threatened and endangered plant species changes year to year. The status of many species has not changed the entire time while some new species have been added or upgraded while others have been dropped or downlisted. The list is updated yearly and surveys reflect the current list.

Table 3. Lower Evans WAU - Tables of Vegetation Distribution

LOWER EVANS CREEK WAU			
SPECIES	NO. OF KNOWN SITES	LOCATION	STATUS
1. Perideridia howellii	2	T36S., R3W., nw of ne, sec 5	
2. Cypripedium fasciculatum	2	T35S., R4W., se of sw, sec 13 T35S., R4W., sw of nw, sec 29	
3. Allium bolanderii	1	T36S., R4W., sw of se, sec 5	
4. Lewisia cotyledon ssp. howellii	4	T35S., R4W., ne of se, sec 13 T35S., R4W., se of ne, sec 13	
5. Smilax californica	1	T35S., R4W., se of se, sec 11	

The following is a list of potential T&E plant species that may occur in the watershed:

Calochrtus umpquaensis
Mimulus douglasii
Perideria howellii
Astralagus umbraticus
Camissia howellii
Plagiobothrys figuratus ssp. corallicarpa
Lewisia cotyledon
Sanicula peckiana
Smilax californica
Fritilaria glauca
Cimicifuga elata
Phacelia capitata
Rhamnus crocea ssp. ilicifolia
Allium bolanderi ssp. mirabile

No fungi or bryophytes listed in the Standards and Guidelines (Table C-3) of the ROD are known to exist in the Lower Evans Watershed. Survey and Management protocols are being developed. Surveys have not been completed yet.

B. ROADS

There are 155 miles of roads within the Lower Evans WAU (according to the GIS database).

All unpaved roads in the Lower Evans WAU are potential sediment producers and may pose a threat to aquatic resources. This risk is most pronounced during major storm events.

A list of specific conditions on forest "system" roads which were inventoried would include:

1. Natural surface roads that are being rutted by drivers using the roads when they are vulnerable (wet), and the runoff water later produced as a result of major rain events being channelized.

2. Crushed rock road surfaces that are eroding due in some cases to poor road construction originally, and in other cases to inadequately spaced water dips. Erosion of the water dips themselves is largely due to a lack of armoring.

3. Ditchline erosion due to a lack of good cross drain spacing, and a lack of ditchline armoring on steep grades.

4. A lack of adequate skew on some cross drain culverts is a threat which could cause ditch dam failure from runoff during a major flood event.

5. Unprotected cross drain outlets are causing problems, ranging from excessive erosion to major fill slope failures.

6. Eighteen inch draw culverts are commonly found under 10-20 foot high fill on sustained grades. The 1993 Forest Ecosystem Management Assessment Team (FEMAT) report suggests that these have been traditionally sized for about 1/4 of the current flood frequency volume recommendations. Historically, information from floods of 1964 and 1974 suggest that failure of this type of crossing configuration can "re-channel" the creek down the ditchline and hydrologically mine thousands of tons of sediment from the road prism, and turn a normal 12" ditch in to a 6'+ gully.

7. Roads constructed on steep slopes many times have the culverts filled with soil, due to fill slope failures. This problem seems to start within the road prism, and is often graphic evidence of less than full bench construction on topography exhibiting >70% side slopes.

   The overall risk for roads to produce sediments is at a low level for the Lower Evans sub-WAU, due primarily to the predominance of moderately erosive soil types on only a few roads.

   Most road alterations to the Lower Evans Watershed have occurred over the last 120 years. The only significant exceptions are some county and private roads, which probably existed in some form of "traveled-ways" since settlement of the Rogue Valley.

C. STREAMS/FISH

The main stem Evans Creek runs through the WAU. Major tributaries to Evans Creek are Fielder Creek, Trimble Creek, Red Ditch, Greens Gulch, and Bear Branch. Thirteen miles of stream in the WAU support fish. BLM administers approximately 3 miles of fish-bearing stream in scattered segments.

1. FISH PRESENCE IN THE ~~MID~~ LOWER EVANS CREEK WAU

Several small tributaries provide a small amount of fish habitat during times of high water, but most dry up in the summer, and provide no fish habitat.

a. Evans Creek--Fall chinook, coho, steelhead, cutthroat
b. Fielder Creek--Coho, steelhead, cutthroat (in the first .3 mile near the confluence with Evans Creek

2. RIPARIAN FACTORS LIMITING FISH PRODUCTION

a. lack of shade to provide cooler water temperatures (rearing)
b. lack of standing conifer to contribute to large woody debris (rearing)
c. narrow riparian corridor
d. agricultural/pasture lands

3. INSTREAM FACTORS LIMITING FISH PRODUCTION

a. limited salmonid habitat due to lack of large woody debris in the stream (rearing)
b. high water temperatures (rearing)
c. spawning gravels reduced due to sedimentation (spawning)
d. pools aggraded due to granitic sands (rearing & migration)
e. lack of winter coho refugia/side channels
f. lower insect production and quality
g. low summer flows (rearing, migration)

All of the land adjacent to Evans Creek is private agricultural land. Many unfenced riparian areas are present along the creek. Livestock and other agricultural runoff reaches the creek. Water quality in this part of Evans Creek is poor in the late summer, due to low flows, high temperature, agricultural and animal waste in the water.

Water diversions and pumps for irrigation are present along the creek. As the population increases in the valley, demand for irrigation water also increases, which further reduces the flow. BLM assisted ODFW and the Rogue Flyfishers with construction of a fish ladder over Fielder dam in 1980. The project improved upstream passage to over 40 miles of spawning and rearing habitat for fall chinook and coho salmon, as well as summer and winter-run steelhead.

Lower Evans Creek is an important fall chinook spawning area. Spawning areas have become embedded with sand and decomposed granite in this area, reducing the availability of good quality spawning gravels.

D. RECREATION

1. History of Recreation

Research of Southern Oregon Historical Society, General Land Office maps, Gold Hill Historical Society, and the Woodville Museum in Rogue River, resulted in little information on the history of recreation in the Lower Evans WAU.

2. Existing Situation

The Lower Evans WAU is not considered a destination area for recreation. People pass through the area on their way to other, more popular and productive areas.

There have been no data collected on other recreation activities that occur in the Lower Evans WAU. Some of the activities that may occur include hunting, fishing, and swimming. Off Highway Vehicle (OHV) riding also occurs in the area. There are no designated trails in the area.

E. WILDLIFE

1. SPECIAL STATUS SPECIES

Table 4. Lower Evans Special Status Species

U.S. FISH & WILDLIFE T&E SPECIES					
SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Gray wolf	FE, SE	N	A	N/A	None
Peregrine falcon	FE, SE	Y	A	Absent	Limited
Bald eagle	FT, ST	Y	A	Low	Limited
Northern spotted owl	FT, ST	Y	P	High	Thorough

U.S. FISH & WILDLIFE FEDERAL CANDIDATE SPECIES					
SPECIES	STATUS	RANGE (Y/N)	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Spotted frog	FC1,SC,BS	N	A	N/A	Limited
Cascade frog	FC2, SC	N	A	N/A	Limited
Foothill yellow legged frog	FC2	Y	U	Medium	Limited
Red legged frog	FC2, SU	Y	U	Low	Limited
Tailed Frog	FC2, SV	Y	U	High	Limited
Northwestern pond turtle	FC2, SC	Y	P	High	Limited
Northern sagebrush lizard	FC2	Y	U	Low	None
Northern goshawk	FC2, SC	Y	S	Medium	None
Tricolored blackbird	FC2, SP	N	A	Low	None
Western burrowing owl	FC2, SC	N	A	Low	None
Mountain quail	FC3	Y	P	High	Incidental
Fringed myotis	FC2, SV, BS	Y	U	Medium	None
Long eared myotis	FC2,	Y	U	Medium	None
Long legged myotis	FC2	Y	U	Medium	None
Townsend's big eared bat	FC2, SC	Y	U	Medium	None
Yuma myotis	FC2	Y	U	Medium	None

California red tree vole	FC2	Y	S	Medium	None
Fisher	FC2, SC	Y	U	Low	None
California wolverine	FC2	Y	U	Historic (1980's)	None
Coho salmon	Proposed (T)	Y	P	Medium	Thorough
Steelhead trout (summer & winter)	Proposed (T)	Y	P	Medium	Thorough
Pacific lamprey	FC2	Y	U	Medium	None
Burnell's False Water Penny Beetle	FC2	UNK	U	Medium	None
Denning's Agapetus caddisfly	FC2	UNK	U	Medium	None
Green springs Mt. faurlan caddisfly	FC2	UNK	U	Medium	None
Schuh's homoplectran cad-disfly	FC2	UNK	U	Medium	None
Siskiyou caddisfly	FC2	UNK	U	Medium	None
Siskiyou chloealtis grasshopper	FC2	UNK	U	Low	None
Franklin's bumblebee	FC2	UNK	U	Low	None

OTHER (ODFW AND BLM) SPECIAL STATUS SPECIES)

SPECIES	STATUS	RANGE	P/A	HABITAT QUALITY	LEVEL OF SURVEY
Clouded salamander	SC, BS	Y	U	Low	None
California mt. kingsnake	SP, AS	Y	U	Low	None
Common kingsnake	SP,AS	Y	P	Medium	Incidental
Sharptail snake	SV, AS	Y	U	Low	None
Acorn woodpecker	SV	Y	S	Medium	None
Black backed woodpecker	SC,AS	Y	U	Medium	None
Flammulated owl	SC, AS	Y	S	Low	Limited
Grasshopper sparrow	SU	N	A	Medium	None
Great grey owl	SV, AS	Y	S	Medium	None
Greater sandhill crane	SV	N	A	Low	None

Lewis' woodpecker	SC, AS	Y	S	Medium	None
Northern pygmy owl	SU	Y	S	Medium	None
Northern saw-whet owl	AS	Y	S	Medium	None
Pileated woodpecker	SC, AS	Y	P	Medium	Incidental
Pygmy nuthatch	SV	N	U	Low	None
Three-toed woodpecker	SC, AS	N	A	Low	None
Western bluebird	SV, AS	Y	P	Low	Incidental
White headed woodpecker	SC	N	A	Low	None
Pacific pallid bat	SC, AS	Y	U	Medium	None
American marten	SC, AS	Y	U	Low	None
Ringtail	SU	Y	U	Low	None

Status: Presence:

FE - Federal Endangered
FT - Federal Threatened
FC - Federal Candidate
FC - Federal Candidate
BS - Bureau Sensitive
AS - Assessment Species (BLM)
SE - State Endangered
ST - State Threatened
SC - State Critical
SV - State Vulnerable
SP - State Peripheral or naturally rare
SU - State Undetermined

D - Documented
S - Suspected
U - Uncertain
A - Absent
T - Possibly transitory

N - No surveys done
1 - Literature search only
2 - One field search done
3 - Limited field surveys done
4 - Protocol completed

2. FEDERALLY LISTED SPECIES

NORTHERN SPOTTED OWL

Two resident pair on northern spotted owls are known to be present within the WAU boundary. The provincial radius (1.3 mile) of four pair overlap the boundaries of the WAU. Two of these owl pair occur to the west, in lands administered by the Grants Pass Resource Area, and the other two pair occur on the east side of the watershed. There is potential for additional single owls to be present in the watershed, but habitat is limited to the perimeter of the watershed.

There have been no sightings of bald eagle or peregrine. Due to the proximity to the Rogue River, bald eagles may fly through the area.

No other listed threatened or endangered species are known to occur in or adjacent to the WAU.

3. SPECIAL SPECIES HABITAT

NORTHERN SPOTTED OWL

All of the suitable habitat in the Lower Evans Creek WAU has been surveyed to U.S. Fish and Wildlife Service protocol for the Northern spotted owl (six times in two years). Late Successional Reserves (100 acres of the best habitat near the center of activity) have been designated around the known Northern spotted owl sites in the WAU. Optimal habitat provides nesting, roosting, and foraging habitat, while dispersal provides roosting and foraging habitat. Suitable habitat has been mapped.

Table 5. Suitable spotted owl habitat (Provincial radius and WAU area)

	Optimal habitat (1.3 mi)	Dispersal Habitat (1.3 mi)	Optimal habitat (.7 mi)	Dispersal habitat (.7 mi)
West Site #1*	252	768	134	990
East Site #2*	220	168	125	123
Total for WAU	428	2067		

* includes 249 acres from adjoining watersheds

4. FEDERAL CANDIDATE SPECIES:

Eighteen species which are on the candidate species list could be present in the WAU. Little data is available, and surveys have not been done. Seven invertebrate species are also on the list. No inventory has been done, and it is unknown if they occur in this area.

5. SPECIAL EMPHASIS SPECIES

Western Pond Turtles

Western pond turtles are present in Evans Creek. They can be seen basking on logs along the stream. The surrounding fields and meadows are most likely used as over-wintering areas. Irrigation ditches may also provide corridors of travel, and turtles are found in local farm ponds.

6. CAVITY NESTERS

Little inventory data is available on snag and cavity nester populations. More information is needed. Among the species on the USFW and Oregon State Sensitive Species list, which could be present in the area, 16 are cavity dependent or make use of available cavities. No inventory has been done on snag and down/woody material in the watershed. Preliminary analysis indicates that snag densities are low.

7. GAME ANIMALS

Information from Oregon Department of Fish and Wildlife (ODFW) regarding numbers of big game present in the Mid Evans Creek WAU indicate that approximately 20-25 elk are present in the Fielder Creek area. No data is available on elk calving areas. Elk can occasionally be seen grazing in the private farmland at the edges of the valley. Poaching levels in the area are believed to be high. This may be due to the high rural interface with homes, farms, roads, general high use, and ease of access through the area.

Turkey are present in the Lower Evans Creek WAU, but numbers are low. Suggestions for managing turkey

would be to maintain oak-savannah woodlands and roost trees. Quail and grouse are present in the WAU. Planting beneficial shrub species in wildfire areas can be a management tool for healthy game bird populations.

Bear, deer and cougar are also present in the WAU. Cougar population densities, according to ODFW, are estimated to be 7 cougar for every 100 square miles of suitable habitat. In the past year, cougar have been sighted near the city limits of Rogue River.

8. NEOTROPICAL MIGRATORY BIRDS

Neotropical migrants are present in the area during the spring, summer, and fall. Species type, population numbers, and habitat use are not well documented. Surveys are needed.

9. SPECIAL OR UNIQUE HABITATS

Caves, cliffs, talus slopes, ponds, springs, and meadows are all are considered special wildlife habitats. The presence of these special habitats in the Lower Evans Creek WAU is poorly documented. These unique habitats are important to the survival and reproductive success of some species. One hundred thirty seven acres of grass/forb habitat are present. Some of these acres include open talus slopes. Many farm ponds are present on private lands, but none are known to exist on BLM lands. Large rock outcrops are not present in the WAU. The meadows in the bottom of the valley are private.

F. PHYSICAL FEATURES

Soils

Soil types within the Lower Evans WAU have a wide range in physical characteristics. This is primary due to the presence of two distinct geologic parent materials and different positions on the landscape (e.g. bottomlands and upland sideslopes).

The sideslopes of the eastern ridges of this basin have soils that are formed colluvium in parent materials derived from decomposed granitoid rocks. The most extensive soil found on these sideslopes (35-70%) is the Tallowbox soil series. These soils are highly erodible and are very sensitive to disturbances such as road construction, tractor yarding, and wildfire. These soils have high potential to produce large amounts of sediments.

The footslopes, alluvial fans, and bottomlands below the eastern ridges have formed an alluvial from the same parent materials as the upland soils with some mixing of mineralogies. The most extensive is the Schefflein soil series. These soil types have the same potential for erosion and sediment production as the associated upland soils.

The sideslopes of the western ridges of this basin have soils that have formed in colluvium in parent materials derived from metamorphosed sedimentary and volcanic rocks. The most extensive soils on these sideslopes (50-80%) is the Caris-Offenbacher soil complex. On the slopes that are less steep (35-60%) is the Vannoy-Voorhies soil complex. Typically these soils are relatively stable in terms of landslide potential, and have a moderate erosion potential. There are, however, depositional areas (draws and swales) that may have deep accumulations of ravel or lag.

The footslopes, alluvial fans, and bottomlands below the western ridges have formed in alluvium from the same parent materials as the upland soils with some mixing of mineralogies. The most extensive is the Ruch and Central Point soil series.

Physical Features/Topography

The elevations in this WAU range from 1,000 ft. on the valley floor, to a high of 3534 ft. on Fielder Mountain. The valley floor is very broad (1½ miles wide) and is characterized by gently sloping pediments to flat deep depositional floodplains. The ridge systems along this portion of Evans Creek are generally aligned to the north and south. Extensive geologic erosion along the western ridges have resulted in very steep sideslopes (50 to 80% is common). The underlying competent metamorphosed rock maintains a relative linear and stable topography. In contrast, the eastern ridges are highly dissected and have a high potential for translational mass movement due to an underlying of incompetent granitoid rocks.

Geology

The Lower Evans Watershed occurs in the Klamath Mountain Province. This mountain range is characterized by accreated terraines which are slabs of the ancient ocean floor thrust onto the continental plate resulting from the subduction of the oceanic plate. The rocks associated with this mountain range tend to be metamorphosed and highly deformed.

There are three rock types that dominate the landscape in the watershed, Upper Triassic (190 million year old) to Paleozoic (570 million years old) metavolcanic rocks of the Applegate Group occur in the Fielder Creek area. Jurassic metavolcanic and shallow intrusive rocks of the Sexton Mountain Ophiolite occur in the Bear Branch Area, and the Jurassic (143 million years old to 166 million years old) deeply weathered granitic plutonic rocks occur in the eastern and central portions of the watershed. The Evans valley floor is composed of quaternary (<2 million years old) alluvium, terrace gravel deposits, and alluvial fan deposits. For a more detailed description see appendix 2.

A few strike slip faults occur near the Northeast corner of the watershed, several placer mines can be found in this area as well, including the Sparks mine, a vein deposit, in T. 35 S., R. 4 W., Section 2. Besides gold deposits there is a manganese prospect. The Woods prospect is a vein prospect located in T. 35 S., R. 4 W., Section 25. There is also the possibility of the presence of chromite, copper, molybdenum, and silver.

G. CULTURAL/HISTORICAL

Refer to the Evans Creek Watershed Analysis and Historical Study, which will be available for the public in March, 1995.

H. NON-BLM ELEMENTS

1. AGRICULTURAL LANDS - The agricultural lands (18 % of the WAU) are positioned around the valley floor adjacent to Evans Creek, and are all private. The agricultural lands are in the grass types basically being used for cattle grazing with some harvest of hay. There are scattered residences throughout the bottom land.

2. FOREST LANDS - The non-agricultural lands are forest lands and are classified as industrial forest lands (24 %), and woodlot (non-industrial) forest lands (23 %). The majority of the non-BLM forest land are in the young forest size class. The majority of these forest lands consist of sapling (<8" dbh) and smaller size trees with some scattered large green cull trees. When forest stands develop into merchantable timber, these stands become available for harvest.

The road system on these lands is a combination of rocked and natural surfaced roads on the agricultural lands. On industrial and woodlot forest lands the roads are basically natural surfaced and are maintained during time of use. The majority of the harvest systems have been ground based systems with some cable systems on the

extremely steep terrain.

Some streams are diverted during the spring and summer months for irrigation purposes which impacts the volume and quality of water flowing down Evans Creek.

The trend in the past 20 years has been from a rural (agricultural) community to an urban interface (satellite community to Medford/Grants Pass) community. The neighborhood has changed and the population is booming with new house construction on the rise.

I. GRAZING/LIVESTOCK

EXISTING SITUATION
There are two grazing allotments in this watershed.

The Fielder Creek Allotment, T.35 S.,R.4 W., section 4 SE¼ of the SE¼, is inactive and has not been used since 1990. Records indicate that this allotment was active from 1973 to 1990, during which 5 head of cattle were run on the 40 acre parcel from April to June. It is not probable that this allotment will be active again in the near future.

Table 6. Table of Livestock Use - Fielder Allotment

FIELDER CREEK ALLOTMENT				
YEAR	# OF COWS	BEGIN DATE	END DATE	AUMS / USER
1973-1990	2	4/1	6/15	5/Baker
Prior to 1993	***	***	***	Guthert

*** Information Not Available

The Stiehl Allotment is active and is comprised of approximately 180 acres located in T.36 S., R.4 W., the Northern portion of section 15, and Southern portion of section 10. The improvements for this allotment consists of perimeter fencing. The elevation within the allotment is 1300'-2000', and precipitation is less than 35" a year. This allotment has been active since 1951, and has historically had approximately 20 cattle utilize the available forage.

Table 7. Table of Livestock Use - Stiehl Allotment

STIEHL ALLOTMENT				
YEAR	# OF COWS	BEGIN DATE	END DATE	AUMS / USER
1994	12	4/16	5/31	18/Stiehl
1993	7	4/16	5/31	11/Stiehl
1992	12	4/16	5/31	18/Stiehl
1991	6	4/16	5/31	9/Stiehl
1990	6	4/16	5/31	9/Stiehl
1975-1989	12	4/16	6/15	18/Stiehl
1972-1974	9	4/16	6/15	18/Stiehl

STIEHL ALLOTMENT				
1971	9	4/16	6/30	18/Stiehl
1970	4	10/1	2/28	19/Stiehl
1967-1969	***	***	***	19/Stiehl
1964-1967	***	10/1	3/1	19/Stiehl
1961-1964	***	***	***	19/Stiehl
1951-1960	***	***	***	24/Stiehl

*** Information Not Available

J. CUMULATIVE WATERSHED EFFECTS

1. Summary of cumulative effects analysis as of 2/95:

Total Acres: 21,766

BLM Acres: 5,505 25 % BLM Ownership:

Non-BLM Acres: 16,166

Total miles of road on BLM lands: 29.2 miles

Road Density on BLM lands: 3.39 miles/section

Road Density on private lands: 5.02 miles/section

Overall road density: 4.55 miles/section

Total Acres in TSZ (transient snow zone) = none

Equivalent Clear Cut Area by Compartment:

Bear Branch	130 acres
Evans Wimer	100 acres
Red Ditch	No data
Evans Rogue	No data
Fielder Creek	407 acres

Total Compacted Areas:

Bear Branch	135 acres
Evans Wimer	78 acres
Rogue	No data
Red Ditch	No data
Fielder	363 acres

2. Upland Restoration Projects

1993 T, 35S., R. 4W., Sec, 26, 35, Fire rehab/Sediment retention dams

1993 T. 35S., R. 3W., Sec. 26, Fire Rehab./hardwood planting, stream stabilization

1994 T, 35S., R. 3W., Sec. 19, Fire Rehab./sediment retention dams

In summary, the cumulative impacts to this WAU with regard to water quality and quantity are related to effects of road construction on steep sideslopes, removal of large conifers from the riparian areas (timber harvest and fire), removal of water for irrigation, and grazing of livestock along Evans Creek. For a description of cumulative effects analysis, see Appendix 3.

K. MINERALS

Two mining claims exist within this watershed. The Medford District has established one community rock pit within the Lower Evans WAU. This amounts to a de facto withdrawal from mining for these areas.

L. REALTY

The Boise Cascade Road Use Right-of-way Agreement OR 48747 blankets a good share of this watershed. Bate Company also is involved with a Reciprocal Road Use Agreement OR 48737 within this watershed.

Four (4) road easements have been acquired for the United States within the watershed. An additional one is pending.

Two power lines exist within the watershed.

This watershed has experienced some unauthorized use by the public. Nine (9) trash dump sites have been found, as well as two abandoned vehicles.

M. RMP ALLOCATIONS

Of the seven land allocations identified in the PRMP, the matrix, riparian reserves, and late successional reserves are the three located within the WAU. The late successional reserve consists of two spotted owl sites containing 200 acres.

IV. DESCRIPTION OF WATERSHED ELEMENTS

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

Matrix - "the most connected portion of the watershed". It is generally the predominant vegetative type and therefore exerts the strongest control over the movement of living and non-living things across the watershed (fire, wind, plants, animals, people). The matrix affects the rate at which various disturbances move through the watershed.

Patches - patches are usually smaller areas of land, whose attributes make them different than the general watershed around them.

Corridors - provide routes between similar seral stages or vegetative types, and may include roads, riparian areas, powerlines, timber.

The structure, amount, and spatial arrangement of the **matrix, patches**, and **corridors** determine the function, resiliency, and species diversity of a forest watershed.

A. MATRIX

The majority of the lands (74%) within the Lower Evans WAU are privately owned. The upper 1/3 of this watershed is a solid block of privately owned lands. The lower 2/3 of the watershed has a checkerboard ownership pattern of BLM and private lands. The matrix of this WAU consists of two landscape conditions affected greatly by this ownership situation. One category includes grass/pasture lands and the shrub to seedling/sapling size class, which together make up 53% of the landscape with 93% in private ownership. The second category consists of the tree size classes from poles to small sawtimber and makes up 34% of the landscape with 68% under private ownership.

The grass/pasture lands are primarily agricultural lands located along the valley floor. Small ranches and farms as well as residential areas are main elements within this category. 18% of the watershed is composed of this condition. With the influx of people into the area the stability of this condition is uncertain.

The shrub/hardwood areas are classed as withdrawn on BLM lands. The hardwoods continually dominate the site, while conifers are usually scattered and develop slowly.

The third part of the 1st category is the seedling/sapling condition. This condition consists of trees 0-5 years old and 0-5 inches in diameter, where the areas are dominated by forbs or sprouting shrubs or hardwoods. The conifers develop slowly and then gradually replace these vegetative components becoming the dominant vegetation. These early successional stages were initiated through fires and to a larger degree logging. The structure, composition and function of these early successional forests are somewhat different from those that would be initiated by natural causes.

Forage under each of these conditions may be present for big game whereas hiding or thermal cover may be lacking.

The second major matrix condition consists of the tree size classes from poles to small sawtimber and covers approximately 30% of the watershed. These stands range from 5 to 21 inches in diameter and 11 to 100 years old. These stands are dense with canopy cover approaching 100% and are dominated by conifers,hardwoods and thick brush. These stands are the result of stand replacement fires approximately 80-100 years ago. Scattered surviving larger diameter Ponderosa pine, Douglas-fir or Incense cedar are quite often present in these stands. Grass, forbs and herbaceous vegetation decrease as the stand age increases and become minimal except in understocked stands or meadow inclusions. Conifers would begin to die from competition as they reach pole size, 5-11" diameter. This condition type provides for hiding cover for big game.

These two main conditions can be categorized as unstable as the rate of structure change is relatively rapid as opposed to the slow changing old growth stands.

Lower Evans WAU - Tables of Vegetation Distribution

Table 8 Private Lands

Grass/Pasture	Shrubs & Hard-woods	Seedling/sapling 0-5" dbh	Poles/small saw-timber 5-21" dbh	mature/old growth 21"+/>200 yrs.
3,858 ac. (24%)	4,110 ac. (26%)	2,228 ac. (14%)	4,840 ac. (30%)	1,060 ac. (6%)

Table 9 BLM Lands

Grass/Pasture	Shrubs & Hard-woods	Seedling/sapling 0-5" dbh	Poles/small saw-timber 5-21" dbh	mature/old growth 21"+/>200 yrs.
0 ac. (0%)	827 ac. (15%)	618 ac. (12%)	2,235 ac. (42%)	1,649 ac. (31%)

Table 10 All Lands

Grass/Pasture	Shrubs & Hard-woods	Seedling/sapling 0-5" dbh	Poles/small saw-timber 5-21" dbh	mature/old growth 21"+/>200 yrs.
3,858 ac. (18%)	4,937 ac. (23%)	2,846 ac. (13%)	7,075 ac. (33%)	2,709 ac. (13%)

B. PATCHES

Patches are areas distinctly different from the landscapes around them. As a result of logging and fires, the large sawtimber/old growth forest vegetation types constitute the primary patch condition within the Lower Evans WAU and covers approximately 13% of the land area within the watershed. 8% are found on BLM lands and 5% on private lands.

These large sawtimber/old growth stands consist of trees 21"+ diameter or 200 years old. They are characterized by the development of structure diversity with multi size classes and multi-layering of vegetation. Conifer and hardwood growth gradually decreases. Understory development is significant in response to openings in the canopy created by disease, insects and windthrow. Larger snags are formed. These stands show evidence of historic underburning and partial stand replacement fires. Compared to the matrix components these old growth stands have the higher degree of stability. They provide for big game hiding and thermal cover and some forage. They also provide habitat for spotted owls, goshawks, bats, and other old growth dependent species.

C. CORRIDORS

Corridors provide travel routes for plants, animals and people between similar size classes or vegetative types. Roads, riparian areas, powerlines, and streams are the primary corridors in the Lower Evans watershed.

1. Roads - Several major roads run through the area. The Evans Creek road and West Fork Evans Creek road, Jackson County administered roads, lead from Interstate 5 to Wimer and the surrounding area. Private access roads and driveways, private logging roads, and BLM roads are present in the area. BLM roads are mostly rocked, although some ditches are becoming filled in by erosion of the banks. Work on cleaning the ditches and culverts will begin in the summer of 1995. Many of the private roads are unsurfaced, and are a source of sediment runoff during storm events.

West Evans Creek Road follows Evans Creek, in many places within 30-50 feet of the stream. The road is the edge of the riparian vegetation along the creek.

2. Riparian areas - Human activities have altered the vegetative communities within the riparian zones of all the creeks. Ownership patterns in the watershed are such that almost all of the riparian corridor in the lower reaches of the creeks are on private lands. Riparian vegetation in these private lands along Evans Creek from Wimer to the City of Rogue River is mature cottonwood, large alder, scattered large pine, and Douglas fir. The riparian vegetation area is narrow, often only existing within the banks of the stream which are 20-30 feet high in most places and protected somewhat by the large trees. Several homes are built on the high bank immediately adjacent to the streams. Some of the homes have vegetation removed down to the edge of the water. Pasture lands are present in the areas between the homes.

   In some of the uplands, no-cut buffers were left. Old buffer widths were less than current requirements in the ROD, so the widths of the riparian reserves on BLM lands are below current standards. Some of the private lands have had most of the vegetation removed to the edge of the stream. The pattern of buffered and non-buffered areas along each creek has resulted in poorly connected riparian corridors through the area. Areas which have been harvested have dense brushy undergrowth with few large conifers present. Some areas appear to have high fuels loading.

3. Powerlines - Two Pacific Power distribution lines traverse the area. One of these is a 230 KV line, and the other is a 115 KV line. These areas have 100 foot right-of-way corridors which exist beneath the lines which will be maintained in early successional condition.

4. Streams - Evans Creek is the major stream in the area, and flows into the Rogue River at the city of Rogue River. Major tributaries to Evans Creek are Fielder Creek, Bear Branch, and Trimble Creek. Most of the tributaries are dry in the late summer, but function as fish habitat for part of the year. Anadromous fish travel from the Rogue River to spawn in this area. Lower Evans Creek is the major migration corridor to the spawning and rearing grounds in the adjoining watersheds of West Evans Creek and East Evans Creek.

5. Irrigation ditches - Two major irrigation ditches are present in the WAU. The Vroman Irrigation Ditch is a historic ditch which is abandoned. Water rights assigned to the ditch are restricted to direct removal from Evans Creek.

The Williams and Whelan Irrigation Ditch is an active ditch used for irrigation and stock water. The ditch source is near Murphy Gulch confluence east of the Lower Evans Watershed boundary. The maximum use of the ditch is from April to the end of October for irrigation purposes. However, there is a reduced allocation of flow throughout the year to satisfy stock water rights.

Further information is available from the Jackson County Watermaster.

Table 11. [illegible]raction Between Elements and Flows LANDS[illegible]E FLOWS LOWER EVAN[illegible]-WATERSHED

		WATER	WILDLIFE	PEOPLE	
MATRIX	Agriculture	-fertilizer may impact water quality -increased input on water table -change in runoff patterns -decrease in filtration rates -increased demand on natural water sources	-Provide forage for elk and deer -pasture fences impede wildlife migration -increased demand for water greatly impacts fish & fish habitat	-wells impact water table -influx of people changes vegetation	-pastures offer fuel breaks for wildfire -private ponds serve as water source for fire protection
	Residential	-increased subdivisions increase demand on domestic water	-landscaping modifications next to riparian zones impact wildlife -dogs increase harassment of wildlife	-Limited recreation & commercial timber values	-potential ignition source
PATCHES	Shrubs/hardwoods	-same as pole to mid seral	-habitat for deer, turkey, quail, and neo-tropical birds. -habitat for acorn dependent species.	-urban encroachment such as recreation and hunting	-same as pole to mid seral
	Early seral (0-5"DBH)	-increased rapid runoff -low interception -moderate erosion potential	-provides forage for elk and deer, nesting for birds -rehab of fires and draw elk away from human population centers	-low commercial timber value and recreational value -opens up area to development	-high potential for large, fast moving fires -low intensity -easy to control
	Pole to Mid Seral (5-21"DBH)	-high interception -moderate runoff -low erosion potential	-provides forage and hiding cover for deer and elk -provides nesting habitat for birds	-recreation opportunities limited -medium to high commercial timber values	-potential for large moderate to high intensity fires -vegetation moderately sensitive to fires
	Mature/Old Growth (21"+DBH)	-moderate interception -moderate runoff -moderate erosion potential	-high value to spotted owl -thermal cover for big game -salamander habitat	-high commercial timber values -increased aesthetic values -greatest recreational values	-low intensity fires -less potential for large fires
CORRIDORS	ROADS	-roads impact drainage patterns, riparian functions, & increase sedimentation potential -increase intensity & frequency of peak flows -increase potential for erosion	-Open roads increase disturbance to wildlife (poaching, traffic, noise)	-Conflict over need for roads (i.e. hunting) -Highest potential for spread of noxious weeds -Primary access for most users	-Access for fire suppression -Fire break (potential) -Increased starts
	RIPARIAN	-moderates storage -Regulates flows & temp -Increased importance in filtration function and channel stability	-Nesting, roosting, foraging habitat for wildlife -Provides thermal buffer for wildlife -Important salamander habitat -Provides travel corridor	-Increased use & alteration of riparian corridor -Increase potential for riparian degradation due to human activities -greatest potential for recreation opportunities	-May act as fire break -High potential for alteration by fire
	POWER LINES	-same as early and mid seral	-May provide some forage and travel corridors for big game	-Decreased aesthetic values -Potential increased management constraints	-Increase value at risk -Increase complexity of fire suppression
	IRRIGATION DITCHES	-catch and disperse water during and after major rainfall events -potential pollution source -vector for noxious weeds -pulls water from natural drainages	-may provide some habitat and cover for wildlife species	-decreased use of irrigation ditches in favor of sprinkler systems	-may act as fire break

V. WATERSHED FLOWS & INTERACTIONS

"Flows" are those things that move across the watershed. Flows that will be critical to the future watershed and are most likely to be affected by human activities are of the greatest concern. Four major flows are considered to be important within the Lower Evans WAU. These flows were fire, wildlife, people, and water.

A. WATER

Irrigation in the Lower Evans WAU is a drain on the basin's water resource. The urban growth and expansion of residential dwellings into rural areas of the watershed have resulted in increased well drilling for domestic and irrigation needs. Legal and illegal diversions from streams have had an impact on aquatic life due to reduced stream flows and increased water temperatures. Both well drilling and in stream diversions for irrigation may have affected the local ground water table and, as expansion continues, will be a growing concern.

Water quality has been impacted partially by road construction. Sedimentation and increased turbidity in nearby streams can, in part, be attributed to road construction. Irrigation and rainfall have carried fertilization residues from agricultural lands, and has contributed to increased nitrate levels, and decreased oxygen content in nearby streams. Runoff from livestock operations, as well as failing or improperly installed domestic septic systems, may contribute to fecal coliform levels of local streams.

B. WILDLIFE

Many species of wildlife flow through the area in a variety of ways. Temporal and spatial flows occur. Some species move through the area during the breeding season, while others move through the watershed as the temperatures and seasons change. Adult Northern spotted owls are resident, but juveniles disperse across the watershed. Game species such as elk, deer, bear, turkey, quail and grouse are present in the WAU and flow on a larger scale across the area. Bull elk may spend the summer separated from the main herd, but during the late summer/fall breeding season, move into the area with the cows. Cow elk move to calving areas to give birth in the spring. Birds, snakes, lizards, and salamanders all flow through the area in a much smaller scale. Coho and steelhead migrate through the creek corridors as they travel through Evans Creek and travel up the tributaries to spawn. For a more complete discussion of wildlife and habitat interaction, see Appendix C. Analysis was limited to major flows which occurred throughout the WAU and across the watershed boundaries.

C. PEOPLE

People are an important facet of this watershed. Their use of the road systems, primarily Evans Creek Rd., is to drive to and from work, and to access other activities outside this watershed.

D. FIRE

As a flow, fire can have a variety of extremes as an agent of disturbance. These extremes are influenced by changes in weather patterns, vegetative species composition, vegetation age classes, and topography.

Fire will exert extreme influence over vegetation in the seedling/sapling and pole size classes. Conifers are most susceptible to a fire's influence in these early successional stages. The Lower Evans WAU is at high risk for large destructive wildfires, primarily because of the high component of seedling/sapling and pole size stands. This risk is magnified by the density of these stands.

In the white oak component somewhat the opposite is expected. The stands are at a later successional stage due to fire exclusion. The probability of a large destructive fire is increasing as the stands mature. As the stands mature, conifers begin to colonize the site, they contribute to the fuel profile, thereby increasing intensities and

the potential for stand replacement fires.

As a general rule, later successional stages, including old growth, are at least risk from high intensity fires. However, fire occurrence rates will remain unchanged. In this WAU, the stability of these stands is subject to some discussion because of the influences of the oak woodlands and the high proportion of successional stands.

VI. DISTURBANCES/SUCCESSION

A. PRE-SETTLEMENT WATERSHED CONDITIONS

1. WATERSHED HYDROLOGY

In general, the impacts from natural disturbances such as floods were less damaging to the aquatic resources because of a greater resiliency to withstand such occurrences. A larger amount of vegetative cover, smaller amounts of compacted acres, and more properly functioning riparian areas help contribute to stabilize and aid in the recovery of these natural disturbances. Vegetation intercepts and protects the soil from runoff, compacted ground contributes to rapid runoff, and properly functioning riparian areas trap sediment, store water, and help regulate water temperatures and flows. These factors reduce the risk of high magnitude impacts to the aquatic resources.

2. HUMAN INFLUENCE

a. Native American influence

Any description of the native vegetation in the Lower Evans WAU must be based on the assumption that it resulted from human intervention. There is no specific information about the pattern of vegetation in Southwest Oregon, but general ideas can be generated. There is evidence that the Indians of this region had a dynamic relationship with the environment and existed in equilibrium with it, through a sustainable pattern of use, for thousands of years.

The Indians of the Rogue valley used fire as a management tool, and this changed the entire ecology of the forest, plant, and animal communities they interacted with. Low intensity ground fires set by humans were much more common than is often realized. Burning extended the range of forest types that depend on a frequent fire regime and led to the creation of open prairie ecosystems, glades, and savannas. Burning by American Indian people created an element of ecosystem stability that would not have existed without it. Frequent, low intensity, human-caused fires substantially reduced the numbers and area of less frequent, but high intensity, stand replacing holocausts that otherwise would have occurred.

Other information about native influences on the watershed were mentioned in the cultural/historic overview already prepared for this WAU.

b. Livestock

Domesticated livestock were not introduced until after white settlement, therefore there were no impacts to assess.

c. Noxious Weeds

Prior to white settlement in this area, there were no noxious weeds as we know them today. For the most part, all the plants that grew in this WAU were indigenous, and had their own predators. There may have been a few isolated plants, whose seeds were brought in by birds, but those cases were very rare.

3. INSECT & DISEASE

The amount and extent of insects and disease within a forest landscape is an indicator of forest ecosystem health. Widespread mortality from insects and disease indicates poor forest health. Whereas, the mortality of individual or small groups of trees represents a "natural" component of a healthy ecosystem. This low level of mortality maintains and/or creates structural and species diversity.

Widespread vegetative changes due to insects and/or diseases were most 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). Otherwise, both insect and disease were present at low levels and were not a major disturbance agent.

Two environmental conditions are the primary reasons why insect and disease disturbances were kept low.

a. Frequent low intensity underburns and partial and catastrophic stand replacement fires regulated stand density. Stand conditions in the white oak series, pine series and Douglas-fir series were considerably more open than present. The lower density levels maximized tree vigor, thereby reducing susceptibility to insect and disease attack.

b. Species diversity (hardwoods, conifers, and shrubs) provided a vegetative mosaic within the watershed. This species mix provided "natural" barriers that restricted the spread of insects and disease.

4. FIRE

INTRODUCTION

Fire has played a major role in the disturbance regime in the Lower-Evans watershed prior to the arrival and settlement of early pioneers. In the post settlement era the disturbance regime has been drastically altered by fire suppression and settlement. In this report we will assume that fire and vegetation patterns are those that were present prior to European settlement. Native American burning will be considered part of the natural process as we are unable to separate their burning from that of natural ignition.

About 68% of the land base is classified as south aspect in this watershed. Under TPCC classifications, south aspect ranges from 90 to 314 degrees. The remaining 32% is classified as north aspect. This information is important in determining both fire history and distribution of seral states. Based on this information we could reasonably expect 40-60% of this watershed to be maintained in an early seral state, 5-15% would fall into the mid-seral category, and late seral would range from 20-30%. Approximately 20% of the watershed would have been in white oak woodland series, with 80% in the Douglas-fir series.

FIRE HISTORY - PRESETTLEMENT

In order to establish a fire frequency it is necessary to establish a data base. We have accurate data on fire occurrence, and intensities for the last 25 years. Prior to that we have to rely on fire scars and age classes of reproduction to establish fire return intervals. In addition we have vegetation types recorded in various

documents such as the 1916 revestment surveys and survey notes. We can also use historical references to establish fire occurrence rates. In the Lower-Evans watershed the "natural return interval would have been 10-20 years in the white oak woodlands. On the south aspects we could expect a 10-20 year return interval. The majority of this aspect would have been maintained in a early seral stage because of the short fire return interval. Natural and live fuels would have not had sufficient time to accumulate to provide for high intensity fires. Fire originating on the south slopes would have raced up the south slopes, and backed down the north slopes to provide for low to moderate intensity burns. These types of fires would not have allowed establishment of large stands of conifers to occur. The north slopes would have had a 15-40 year fire return interval. With longer time frames between fire returns conifers would have had a better chance to establish themselves. When fire did occur it would have had a greater intensity, possibly including some patchy areas of stand replacement events, these events would begin to create the diverse canopies that we see today. In these stand replacement events, there would have some pockets that would have survived. These pockets of refuge would provide today's old growth. In those areas that were subjected to moderate intensity underburns, it is safe to say that stand densities were considerably less than they are today because of frequent underburning as stands established themselves, the species composition would also change. In the absence of fire more fir would be found. The majority of the white oak woodland would have been found on the valley floor, the midslope and lower on the south aspects. Fire intensities would have been light to moderate based on the frequent fires. Few pine and no fir would have been present on these sites prior to settlement and fire suppression efforts of the white man. This series would be classified as early successional.

CONCLUSION

Most stands of oaks and pines were open grown with a grass/brush understory. This fuel type would have produced fires that caused minimal long term losses to site productivity. Most Doug-fir occurred on the north slopes and in clumps in the draws that served as pockets of refuge from the many fires that occurred. What Doug-fir that did occur was wolfy and open grown with low commercial value. There was minimal incense cedar present and probably no white-fir present due to fire frequency. We can state that stands with even aged reproduction burned with moderate severity. Evidence suggests that fires often burned over long periods of time with varying intensities often flaring up and dying down depending on then current weather conditions. These observations are borne by the observations of the Peter Skene Ogden party. While travelling in the Tin Pan Peak area, they noted that the south slopes were bare of all but a few pockets of trees, and that the north slopes were covered with woodlands.

B. POST SETTLEMENT WATERSHED CONDITIONS

1. WATERSHED/HYDROLOGY

In contrast to pre-settlement, the impacts from floods as a result of post-settlement disturbances has increased the potential for greater damage to the aquatic resources. Roads, timber harvest activities, and lower frequency and higher intensity of wildfires (partially human caused) have contributed to destabilize and decrease the capability to recover from natural disturbances.

Flood frequency in the area is approximately every 9-11 years. Major floods in the last 50 years occurred in 1945, 1953, 1955, 1964, 1973, and 1982. The largest flood recorded in the area occurred in 1861. This flood event eclipsed the 1964 flood, which was the largest in the 20th century. The potential for future damage will likely be high due to more people building in the floodplain, and the disturbances which have occurred in the riparian areas with the removal of large trees which help capture debris and slow the velocity of the water.

2. HUMAN INFLUENCE

a. "European settlement"

The first documented occurrence of Euro-american disturbance in the Lower Evans WAU occurred in March of 1827 when a party of trappers with Ogden's expedition explored the Evans Creek valley. While the number of beaver trapped over the ensuing three decades is unknown, that animal's population was probably reduced to some degree. Stream morphology could have changed due to breaching of dams and increased bank scouring. Riparian vegetation may have shifted toward more willow and alder, and fewer conifers.

The discovery of gold in Jacksonville in 1851 started a new influx of people. Mining, settlement, agriculture and lumbering were major elements that changed the watershed. After Theodore Roosevelt became President in 1901, the central theme of his conservation policy was to provide the "greatest good for the greatest number for the longest time". This called for developing public lands in a manner that promoted the best and highest use of resources. Fire suppression activities were given increased emphasis and this allowed development of dense understories of Douglas fir to occupy space in stands that were historically more open. Where frequent low intensity fires once maintained stable and healthy forests ladder fuels and woody debris accumulated. The landscape created by the native people was changing from open oak and grass woodlands in the valley and mixed conifer forest in the higher elevations to one choked with brush. There is little likelihood of achieving an equilibrium state with these conditions because a single disturbance event can negatively impact a large portion of the watershed.

Logging became the greatest human influence on the watershed during World War II. From the time of the Oregon & California Act of 1937 until the mid 1950's, BLM harvest were partial cuts. The O&C Act called for implementation of a sustained yield cutting program so that continuous forest production could be assured. Access road construction and a system of three-stage shelterwood cutting became the preferred logging treatment in the early 1970's. This method gave way to the use of clearcut logging in 1979 when a new Management Framework Plan was signed. New guidelines in this plan included clearcut size limitations, stream buffer width guidelines and impetus for intensive forest management. Harvest activities on BLM lands within the watershed have occurred almost entirely within the Fielder and Bear Branch drainages because of the scattered nature of federal parcels throughout the remainder of the watershed.

Disposal of domestic trash and abandoned vehicles is becoming a problem. Stream contamination from human and livestock waste is another potential disturbance as is the increasing threat from wildfire due to expanding human populations on the forested slopes. Further information regarding human influences on the ecosystem can be found in Atwood and Lang's "Evans Creek Watershed Landscape Analysis and Historical Study" written under contract as a part of this Analysis.

b. Livestock

The two allotments in this watershed have had little impact on the overall watershed. The Fielder Creek Allotment has been inactive since 1990, and records indicate very few cattle occupied the allotment when it was active. The Stiehl allotment is active, with a small number of cattle utilizing the area.

c. Noxious Weeds

During and after the time of white settlement, exotic plant species became established on all mid-latitude continents. Other forms of introduction were probable, including livestock bedding and forage, wool, and purposeful import as seeds for rootstocks for early gardens and herb beds. Without their natural enemies, these exotic plants soon spread across the new nation. It is difficult to say when these weeds as we now know them became established in this WAU.

The encroachment of noxious weeds has reduced resource values, agricultural croplands, and native wildlands, rendering wetlands and habitats unusable by wildlife, increasing soil erosion, decreasing water quality, decreasing property values, reducing biological diversity, and increasing the economic burden of maintaining recreation and wilderness areas. To what degree they have disrupted the Lower Evans watershed is difficult to say. What is clear, however, is that yellow starthistle currently inhabits much of the road shoulders in adjacent watersheds. Control efforts have been implemented, and more are being considered. Dispersal of biological agents (insects) has taken place throughout Southern Oregon, and more control measures are being studied and considered all the time.

4. INSECT AND DISEASE

Fire suppression has resulted in higher stand densities than would have occurred under natural fire regimes. With higher stand densities, greater inter-tree competition for site resources occurs. The most critical site resource within the Lower Evans watershed is moisture. Moisture availability determines vegetative growth, vigor, and survival. High stand densities result in earlier summer water deficits and reduced tree vigor. Sustained periods of low moisture availability reduces photosynthetic activity, depletes carbohydrate reserves, decreases tree canopy and inhibits defense mechanisms.

Current conditions: Within the Lower Evans watershed, conifer mortality due to a prolonged drought that began in 1986 and bark beetles is occurring in highly scattered small patches on ridgelines, and south and west aspects in the Douglas fir series. In the white oak series and pine series conifer mortality is occurring throughout all topographic features. The insect damage survey of 1994 indicated a reduction in recent damage compared with the years 1991-1993.

Western pine beetles (*Dendroctonus brevicomis*), mountain pine beetle (*Dendroctonus ponderosae*) and red turpentine beetle (*Dendroctonus valens*) are present and are affecting low vigor ponderosa pine and sugar pine. The Douglas fir beetle (*Dendroctonus pseudotsugae*) is less active and has attacked individual and small groups of small diameter Douglas fir.

Future trend: Insects have the potential to become a major disturbance factor. If precipitation trends remain low, stand density levels remain high, and if the predicted climate change (global warming) materializes, insect population levels will increase substantially. Beginning in dense stands (relative density 40%+) epidemic levels of insects may occur and would affect **all** vigor and size classes. Stand replacement may occur, shifting stands towards an earlier successional state. Bat and bird populations can provide buffering effect on severity of insect outbreaks.

The impact of disease within the Lower Evans watershed has been minimal and is not expected to play a significant role in shaping future watershed conditions.

5. FIRE

Currently a large portion of this watershed that is under BLM management is at high risk for wildfire. Fire records show that this watershed has averaged 6-7 fire starts per year for the last 25 years. The majority of the fire starts are human caused. These fires often start in the rural residential zone and spread to the woodlands. The East Evans Creek Fire of 1992 started in this watershed and spread to adjacent watersheds. This fire consumed about 10,000 acres. In addition, the Fielder Mountain Fire of 1979 burned about 700 acres. In 1981, the Tin Pan Peak fire burned about 2600 acres. In 1993, the same area burned once again consuming 600 acres. Although these last two fires were not in the watershed they could have easily spread into the Lower Evans WAU without suppression actions. All of the above fires were human caused. In the earlier seral stages the closed canopy conifer reproduction would fall into the fire behavior fuel model (FM) 4. With typical summer conditions such as fuel moistures of 8% and a 5 mph wind, expected fire spread rates are 5,000 ft per

hour and flame lengths of 19 feet. The brush component would fall into a fuel model 6 category (using same conditions as FM 4), with spread rates of 2,000 feet per hour and flame lengths of 6 feet. The current white oak component would fall into fuel model 4 guidelines, primarily because of the dense stands of off-site conifers that are encroaching. Traditionally in this vegetation series the primary carrier of fire would have been grass. High rates of spread but lower flame lengths and intensities are expected. Fire exclusion has allowed live fuels, such as brush and small diameter conifers to encroach. Due to dense stocking and droughty conditions, these plants are placed into a moisture stress condition which adds to the fire hazard. The majority of oak woodlands are adjacent to residential areas, leading to an increase in values at risk as well as an increased risk of fire occurrence.

GUIDE TO FIRE INTENSITIES

Low Intensity

Flame length of 0-2 ft.
Direct attack by hand tools successful
Little or no spotting
Smoldering or creeping fire activity

Moderate Intensity

Flame length 2-4 ft.
Indirect attack supported by equipment (dozers & aircraft)
Spotting moderate, 100-400 ft.
Constant moderate activity, occasional torching of individual trees

High intensity

Flame length of 4 ft. and greater
Indirect attack pulled away from the fire
Constant short and long range spotting- 1/4 mi +
Constant rapid activity with spot fires as growth contributors, crown fires
(Albini, GTR-INT-30, 1976)

The majority of fuel buildup is occurring in the live vegetation component at this time. This trend will continue until either some form of density management is performed accompanied by some form of fuels treatment, or the area is subjected to another wildfire. It is important to include some form of fuels management, or fire intensities will be greater when they occur. As can be seen from the fire intensity charts there is a high probability that fires occurring under optimum burning conditions may escape initial attack and grow rapidly. By removing naturally occurring ignitions and changing timeframes under which human caused ignitions occur, we have shifted the area from that of low intensity and high frequency, to one of high intensity and low frequency. By altering this fire frequency, we have changed vegetation successional patterns. Vegetation plays a major role in the buildup of fuel loads in the rural interface area. As vegetation becomes more dense, we can expect fires to become more costly to control. In addition, we can expect our success rate to decline as vegetation (live fuels) increase.

The rural interface also poses a second problem, that of complexity and cost. We have noticed an alarming trend over the last several years - that of increasing costs. Because of concern for the homes and property at risk, more costly methods of fire suppression are used (more helicopters, more retardant, etc). A large amount of resources that are available to that fire may be unavailable for suppression actions because they are needed for structure protection. Wildland fire personnel are not trained in structure protection. In addition, we are directed by bureau and state policy not to fight these fires. When wildland firefighters do take action under

these circumstances, they often place themselves at greater risk than when fighting fire by more traditional means. Normally, we would avoid a running fire and back off to likely control points and begin a burnout operation when weather conditions were acceptable to rob the fire of available fuel. These types of actions would aid greatly in firefighter safety.

There is a definite need to begin some hazard reduction treatments in this watershed. Some examples would be shaded fuel breaks on ridges, density management areas and fuel treatments around homes, etc. Some of these actions can be implemented by federal and local governments, but others must be implemented by the affected residences. Shaded fuel breaks will not stop a fire under extreme burning conditions, but they may slow it down or give firefighters safety zones or places to begin suppression actions.

6. SUCCESSION

Succession is the replacement of plant (and animal) populations in a regular progression (seral stages) toward a highly stable "climax" vegetative community. The problem with describing succession in this manner is that few stands ever reach "climax" because of frequent disturbance events (fire). To acknowledge the role of disturbance in succession and plant community stability a reference point called "potential natural vegetation" is used rather than "climax". For forest communities the "potential natural vegetation" is generally represented by the conditions found in unmanaged old growth stands.

Within the Lower Evans watershed three vegetative series are present, white oak, pine and Douglas-fir. All the vegetative series are found on lower elevation sites. The white oak series is on the driest and warmest end of the environmental gradient, followed by the pine series and then the Douglas-fir series.

Within the series, climate and fire (natural and human) are the principal factors that have a influence on the structure, composition, spatial pattern and seral stage of the series.

Climate: Hot dry summers limit biomass productivity and increase transpirational demands. Moisture limitations affect the survival and growth of vegetation, therefore, drought tolerant species predominate throughout all the series. Low elevation sites and southerly aspects represent the hottest and driest conditions and are the least productive sites within the Lower Evans watershed. Accumulation of downed woody debris is limited with decomposition rates slow.

Fire: Fire frequency and intensity have influenced vegetative structure, composition and seral stage. Fires occur as either low intensity underburns, partial stand replacement or catastrophic stand replacement events. Snags and downed logs are generally rare as many are/were consumed by repeated fire.

SUCCESSIONAL PATTERNS

1. WHITE OAK SERIES

The four stand conditions below represent potential successional stages (early to late) for the white oak series. The frequency and intensity of fire influences the length of time in any one stage. The white oak series is generally found on valley bottoms and as a topographic "climax" on southerly slopes.

GRASS --- OAK SAVANNAS --- OAK FORESTS --- OAK/PINE FORESTS

GRASS

- Incidental amounts of hardwoods or shrubs.

OAK SAVANNAS

- Widely spaced/open grown white oak (driest sites) and black oak
- Canopy closure less than 25%
- Grasses are the predominate ground cover.
- Herbs present include: Bedstraw, strawberry, legume species.
- Some shrubs

OAK FORESTS

- Smaller diameter oaks represent majority of stand
- Widely scattered large multi-branched oaks (remnants of oak savannas).
- Madrone as an occasional associate.
- Canopy closing
- Shrubs include: Wedgeleaf ceanothus (driest sites), whiteleaf manzanita, deerbrush ceanothus, poison oak, creeping snowberry, hairy honeysuckle, baldhip rose, hazel, etc.
- Herbs: Bedstraw sps.,strawberry, etc.
- Grasses

OAK/PINE

- Scattered overstory of ponderosa pine, with lesser amounts of sugar pine and/or incense cedar. These species represent may represent minor "climax species or an incidental tree which occurs on favorable micro-sites or because of an adjacent seed source.
- Lower canopy layer of oaks, with incidental amounts of madrone.
- Shrubs: Wedgeleaf ceanothus (driest sites), whiteleaf manzanita, deerbrush ceanothus, poison oak, creeping snowberry, hairy honeysuckle, baldhip rose, hazel, etc..
- Herbs: Bedstraw sps.,strawberry, etc.
- Grasses

2. PONDEROSA PINE SERIES

Ponderosa pine typically occurs as isolated stands and as a topographic climax on southerly slopes. Timber productivity is low to moderate with slow growth rates and stocking limitations. Natural regeneration is slow due to infrequent seed crops, low soil moisture availability and vegetative competition.

Fire is the principle disturbance event within the pine series. Following fire, herbaceous vegetation and grasses would be the first plants to occupy the site. Shrub species would begin to re-sprout or grow from dormant seed. Ponderosa pine and oak species may be present as fire remnants and would provide a seed source for natural regeneration. White and black oak may occur as a minor "climax" species with incidental amounts of Douglas-fir on favorable micro-sites.

3. DOUGLAS-FIR SERIES

Depending upon the severity of disturbance, Douglas-fir follows the successional trends illustrated below. Common early successional hardwoods may include, madrone, black oak and big leaf maple. Shrubs may

include oceanspray, poison oak, oregon grape, hazel, deerbrush ceanothus, creeping snowberry and rubus (blackberry & raspberry) species. Herbaceous vegetation may include baldhip rose, western starflower, fern, lupine, hairy honeysuckle and strawberry.

VII. LINKAGES

This step determines how the analysis area being considered fits into the context of the larger landscape. In other words, what things cross landscape analysis borders, and how do they do it?

A. WATER

Evans Creek is a link from the Rogue River to spawning habitat in other watersheds. Adult and juvenile coho salmon, steelhead, and cutthroat trout migrate from the Rogue River through the Lower Evans watershed. Fish spawn in the tributaries. Juvenile fish migrate throughout the watershed seeking food and cool waters present in springs and tributaries. Steelhead and salmon smolts move through the area on the migration to the ocean. Fish may also move from the Rogue River into Evans Creek tributaries to escape the high water velocities during high flows.

Water links sediment transport to stream substrate and limits fish production in the streams. Water withdrawn for irrigation can affect the linkage for fish, as lack of water can affect the survival of fish and is a lost opportunity for maintaining fish production and genetic linkages in the stream. Small irrigation dams block juvenile fish upstream migration through the area, and into other watersheds.

B. WILDLIFE

Elk, deer, and turkeys move between Lower Evans and the surrounding watersheds. Elk move into Sams Valley to forage and into the thermal and hiding cover of the forests in the Lower Evans area. Elk move from the surrounding watersheds into the Lower Evans area. Deer and turkeys move in and out of the watershed in a random pattern.

Neotropical birds also move into the watershed when returning from southern wintering grounds and migrate out of the area during the fall and winter months. The success of nesting in the northern areas is important to the survival of the species.

Juvenile Northern spotted owls disperse across the watershed into (and out of) adjoining watersheds in search of territories, mates, and suitable habitat for roosting, nesting, and foraging.

The interchange of genetic material within all species in the watershed is a critical component in the genetic makeup and survival of the individuals in a species and the species as a whole. The "gene flow" across the watershed is an important "linkage" which should not be overlooked.

C. PEOPLE

People flow into and out of this WAU generally along the Evans Creek County Road. Commodity extraction occurs from this watershed out to the local population centers of Medford, Rogue River and Grants Pass. Primary commodity extraction has been timber, special forest products, and other agriculturally based products.

Recreation use within the WAU is low with some hunting, fishing, and swimming. People generally pass

through Lower Evans to access other recreation areas (i.e. West Evans).

People flowing into the area have settled along Evans Creek and have had a significant impact in the removal of water from Evans Creek for agricultural irrigation. Continued settlement into this WAU has occurred not only along the creek, but moved up onto the hillsides, and into tributary drainages.

D. FIRE

Fires may move from one watershed to another if weather conditions are conducive to large fires. Fires will typically move across topographic barriers if vegetation (live fuel) or concentrations of dead or down fuels (such as heavy concentrations of activity fuels or concentrations of standing dead) are continuous enough to provide fire control problems. Normally, in order for fires to move across topographic barriers fires must be very intense. Fires usually move across these barriers by long range spotting and/or crown fires. Fires may also move into the watershed from agricultural and residential land adjacent to the watershed.

Multiple ignitions may occur as lightning storms move across the watershed. Often these storms create many fires that may burn together, linking several drainages into one conflagration.

VIII. PLANS CONFORMANCE

A. CONSISTENCY WITH FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (FSEIS)

The following is based on the FSEIS and may change when the Record of Decision (ROD) is published (and all court actions settled). Many of the guidelines presented below must be affirmed, or can be modified by the watershed analysis. This includes, among others, riparian reserve widths, coarse woody debris requirements, the role of fire, identification of species/habitats that will require survey to protect identified species.

1. **Riparian Reserves:** Riparian Reserves generally parallel the stream network, but also include areas necessary for maintaining hydrologic, geomorphic, and ecological processes. Riparian Reserves occur throughout the watershed unit. The widths are defined as follows;

A. Fish bearing streams - width equal to 2 site potential tree heights, or 300 ft., whichever is greater.
B. Permanent flowing non fish-bearing streams - 1 site tree height or 150 ft., whichever is greater.
C. Intermittent streams - 1 site potential tree height or 100 ft., whichever is greater.
D. Constructed ponds and reservoirs - 1 site potential tree height or 150 ft, whichever is greater.
E. Lakes and natural ponds - 2 site potential tree height or 300 ft, whichever is greater.

The watershed analysis (WA) needs to define the "site potential tree" for each site class (see FEMAT) and arrive at definite distances. The FEMAT site class distances are as follows: II=250 ft, III=210 ft, IV=170 ft, and V=140 ft. The riparian buffer widths are based upon site-specific environmental conditions (ie: for intermittent streams, riparian buffers may be 1 site tree, or ridge line, or break in slope, which ever is appropriate). The distances are slope distances, and apply to both sides of the streams. If the above widths are changed it is still important to meet the objectives of the Aquatic Conservation Strategy in Riparian Reserves.

Salvage of dead trees in riparian reserves will only be allowed when coarse woody debris requirements are met and other riparian objectives are not adversely affected.

2. **Owl Activity Centers:** The 100 acre core areas around owl activity centers (known and mapped in GIS as of 1/1/94) are to be managed as Late Successional Reserves. No new owl activity centers are to be added even if new ones are discovered and no existing centers are to be deleted if owls abandon the site. In other words, these are fixed sites that are to be managed for the benefit of a variety of old-growth associated species. However, in the course of consultation with U.S. Fish and Wildlife Service, new owl cores will probably be protected.

3. Green Tree Retention Guidelines:

A. Northern General Forest Management Areas (GFMA): Leave 6-8 green trees per acre in harvest units.

B. Connectivity/Diversity (C/D) Blocks in the Northern GFMA: C/D blocks established in 1993. Manage in 150 year old rotation, retain 12-18 green trees per acre in harvest units, and 25-30% of each C/D block must be in a late successional forest condition at any point in time.

C. Southern GFMA: Leave 16-25 large green trees per acre in harvest units. There is no spacing or clumping requirements for leave trees. The green tree retention guidelines are minimums that may not be changed downward by watershed analysis.

4. **Snag Retention Guidelines:** Retain snags, live cull trees, and green merchantable trees to provide a minimum of approximately 40% of optimum primary excavator population needs. The RMP will state that this generally corresponds to 180 snags greater than 16" dbh per 100 acres.

Green tree retention requirements can be used to meet long term (greater than 3 decades) snag requirements. However, sufficient snags must be left on site at the time of harvest to meet short term (less than 3 decades) snag requirements.

5 **Coarse Woody Debris:** The objective is to meet the needs of species and provide for ecological function by providing for a renewable supply of down logs well distributed across the matrix. Interim guidelines are a minimum of 120 linear feet of logs per acre, greater than 16 ft. long and 16" in diameter. It is anticipated that watershed analysis will establish a permanent guideline.

6. **Protect Remaining Late Successional Stands in 5th Field Watersheds:** The definition of 5th field watersheds equals our analytical watersheds as mapped for the RMP. The guideline (subject to change) is to retain at least 15% of federal land within analytical watersheds in a late successional condition at any point in time. There is no additional breakdown. All land allocations (riparian reserves, LSR, recreation sites, etc.) are to be used when calculating the 15%. Also, the 15% applies to each analytical watershed, not an average across the Resource Area or District. Late successional stands include mature and old-growth stands which are 80+ years old.

7. **Riparian Reserves & Management Activities**

Riparian areas - Human activities have altered vegetative communities within the riparian zones along all of the creeks. Ownership patterns influence the presence or absence of buffer areas (width) adjacent to the creeks. In some areas, timber harvesting activities have occurred down to the edge of the creeks with all conifer removed. In other areas, scattered trees less than 8" to 10" dbh have been left. Early seral conifer, vine maple, shrubs, and other hardwoods are the dominant vegetative type within these areas. In other areas, no-cut riparian buffers were left. Riparian buffers in the area are generally less than the new requirements of the ROD. The resulting pattern of buffered and nonbuffered areas along each creek has led to broken, poorly connected riparian corridors in the part of the WAU with BLM lands. The USFS lands have contiguous ownership along the streams, and the result is less broken connectivity along the riparian areas.

Large woody debris is generally lacking in most of the intensively managed riparian areas. Projects in the riparian areas may occur in the riparian buffer zone which will lead to short term disturbances, but will be designed to enhance and increase the growth rate of conifers to return the buffer to a more natural condition. These projects may include (but are not limited to) thinning of densely stocked stands to encourage development of large conifers, releasing young conifers from overstory hardwoods, reforesting shrub and hardwood stands with conifers, scarification of existing roads, etc. A site specific recommendation and Environmental Assessment will be completed before any activity occurs in the riparian buffer. Riparian Reserve boundaries for intermittent streams may be variable, and will be determined in a site specific analysis of hydrological, geological, biological, and ecological processes before an action occurs. Slope and soil stability, hydrological processes, wildlife dispersal corridor needs, natural disturbance processes, and endemic species considerations are some of the processes which taken into account in making recommendations to determine riparian buffer widths.

Hazard trees may be salvaged from Riparian Reserves only when present and future coarse woody debris amounts are met (ROD pg C-32) and the action will not adversely affect the area. The amounts necessary are ___ per acre/mile of stream of ___ size. Sites not meeting the down/woody amounts will have hazard trees felled and left in place.

Road locations and landings in riparian reserves and stream crossings will be avoided whenever possible. These actions will only be allowed after soil and rock conditions in riparian zone and stream have analyzed to determine there will be been no long term negative impacts on the system and no other alternatives exist. The action will be designed to minimize disruption of natural hydrological flow paths, including diversion of stream flow and interception of surface and subsurface flow, and restricting sidecasting as necessary to prevent the introduction of sediment into the stream. The action will only be allowed if it is determined that the action will not reduce the ability to attain aquatic conservation strategy and riparian reserve objectives as outlined in the ROD and will follow management action direction outlined in the RMP, pg 2-53 & 54.

8. **Salvage:** Salvage must meet the guidelines for all land use allocations that occur within the matrix. For example, if there is an established or proposed recreation site within the area, timber management and salvage guidelines must meet the management objectives for that allocation, i.e. hazard tree reduction and overall site maintenance.

   Salvage within owl activity centers must meet the same standards and guidelines for Late Successional Reserves. Salvage harvest within the matrix must ensure that standards and guidelines for coarse woody debris, snags, and green tree retention guidelines are not violated.

9. **Fire:** See Appendix B-8, p. B-133, for fire management standards and guidelines for all land use and general management guidelines for all land use and general management guidelines. Some of the major points are as follows.

   One objective of ecosystem analysis and management is to identify disturbance regimes, and to manage the watershed within that context. Thus, fire is inherently neither "bad" nor "good," and should be used or suppressed in the context of achieving ecosystem management objectives at the watershed level.

   The goal of wildfire hazard reduction in all land allocations is to reduce the risk of large-scale, high intensity wildfires which would prevent land managers from meeting resource management objectives. The judicious use of prescribed fire (underburning) for hazard reduction has the potential to restore ecosystem processes, lower smoke emissions from wildfires, limit the size of wildfires by facilitating fire suppression (while using methods that have a lower environmental impact), and reduce the costs of wildfire suppression.

Prescribed burning must adhere to smoke management and air quality guidelines described in the FSEIS, Chapters 3 and 4, the Air Quality section, p. B-83 through B-103. The Introduction to Air Quality Analysis contains the following:

"This FSEIS emphasizes incorporating ecosystem principles into forest management, where fire is valued as a natural and necessary ecosystem process. Under ecosystem management, certain types of prescribed fire, such as under burning, will be emphasized.

"The goal of prescribed burning, other than hazard reduction and site preparation, is to maintain or restore ecosystem processes or structures. Natural fire and American Indian use of fire played an important role in the development of these ecosystems. Consequently, land managers should strongly consider the use of prescribed fire when developing alternatives to restore or maintain ecosystem process or structures in these areas.

"Deviations from the standards and guidelines may be necessary due to local fuel-loading conditions. Also, the wide natural variability in provinces and individual stand histories may lead to fuels management prescriptions that are inconsistent with the standards and guidelines, yet necessary to achieve the overall goal of reducing the threat of large-scale fire.

"The goal of wildfire hazard reduction is to modify fuel profiles in order to lower potential fire ignition and the rate of spread.

"Specific standards and guidelines for each major land use allocation are discussed on page B-134."

B. CONSISTENCY WITH RMP

Fragile nonsuitable woodlands will not be available for timber harvest and other surface disturbing activities will be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

Surface-disturbing activities will be limited on all lands dominated by fragile granitic, schistic, and pyroclastic soils to maintain site productivity, reduce soil erosion, and minimize water quality degradation. Restrictions to meet objectives could include, but are not limited to, no facility construction, shelterwood retention harvest systems, minimal impact or no road construction and minimal impact rights-of-way disturbance, no tractor yarding, seasonal restrictions on surface disturbing activities, and only broadcast burning when cool burns could be assured. Cutslopes, ditchlines, and fill slopes will be stabilized where appropriate on roads that are to remain open for public and administrative use.

IX. PUBLIC INVOLVEMENT SUMMARY

A. PUBLIC INVOLVEMENT SOLICITATION

During this process attempts were made to seek input and involvement of the public in the identification of issues, concerns and the development of objectives for the Lower Evans watershed unit. The initial effort was to mail over 300 letters to landowners within the watershed, along with interested publics and seek input as to what they identify as issues, concerns, or opportunities within the landscape unit. (Sample letter in appendix) Thirteen responses to this letter were received. The majority of respondents indicated that they would like to be kept informed.

The issues and concerns identified in this initial effort are summarized below. Included are responses to the District RMP that were determined to be related to the Lower Evans Watershed Unit. It should be noted that the responses

are for the Mid and West Evans Watershed Units and some issues may be specific to West Evans. This document addresses only the Lower Evans Unit.

Those responding who requested to be kept informed will be included in the review of our "DRAFT" Lower Evans Watershed Analysis. A public meeting will be held to meet persons interested in further identifying issues, concerns and developing a cooperative effort in meeting objectives within this watershed.

B. ISSUES AND CONCERNS IDENTIFIED BY PUBLIC RESPONSE

1. SOILS

a. Erosion resulting from culverts which are undersized and in poor repair.
b. Fisheries/Stream Sediment from excessive road density and unstable soils.
c. Sediment bedload in the upper reaches.
d. Erosion - Culverts are undersized
e. Excessive road density and unstable soils has resulted in extreme stream sediment which has seriously impacted fish
f. Density management of overstocked conifers so what remains will be supported by soils

2. RECREATION

a. Area is ugly due to overcutting - clean-up and replant with nitrogen fixing species such as Red Alder.

3. PEOPLE

a. Difficult to manage with checkerboard ownership and getting cooperation with all landowners.
b. Demonstrate Ecosystem Based Management to the Public
c. Identify projects and seek public support (i.e. SOTIA, Headwaters) so injunction will be released
d. Prescribed fire will scare people
e. Smoke in Rogue Valley will be unacceptable
f. Dislikes past logging and clear cutting.
g. Sufficient timber removed - no longer economically feasible to consider logging a viable land use

4. CUMULATIVE EFFECTS

a. Too many roads - put unneeded roads to bed

5. WATER

a. Water quantity, Evans Creek drying up.
b. Streams/Fisheries have be affected by too much logging
c. Fisheries/Stream sediment from excessive road density and unstable soils
d. Sediment bedload in upper reaches
e. Stream temps. elevated due to loss of riparian cover
f. Stream sediment loads are heavy
g. Large trees/logs removed from riparian areas - resulting in scoured stream beds and few deep pools

6. WILDFIRE

a. Fire Protection
b. Recommend density management and thinning of overstocked conifers

c. Rural Interface Area (RIA) - rising fire protection costs
d. RIA - need to reduce threat of wildfire
e. Should study the effects of wildfire on wildlife (i.e. cavity nesting species) and on erosion
f. Practice uneven age management to reduce exposure to disastrous single canopy fires (i.e.Evans Creek Fire)

X. DESIRED FUTURE CONDITION (SPATIAL DESIGN)

Future desired condition will reflect the current landscape pattern. The WAU is a broad basin with residential and agricultural lands in the valley bottom along Evans Creek, the matrix being mixed-age pole and small sawtimber, interspaced with hardwoods on the midslopes, and patches of old growth connected by small sawtimber and mature forest on the ridgetops. Streambank and riparian conditions in the uplands, which have inadequate stream vegetation due to past forest practices, will be restored to properly functioning condition with buffers adequate to protect environmental conditions. Appropriate tree species will be planted in the areas which are currently lacking. Thinning and vegetation manipulation to increase growth of existing conifers and favor larger hardwoods will be undertaken.

Where human activities have had significant impacts (old clearcuts, single age stands, etc), forest health will be improved by maintaining and restoring natural conifer and hardwood species. The matrix conditions will reflect natural processes and disturbance with a healthy and biologically diverse landscape. Healthy native conifer and hardwood understory will reflect natural conditions. White oak woodlands will be treated to maintain the character of the stands and reduce encroachment of conifers.

In the mid-slope matrix lands, management practices will be designed to restore age, size, and species diversity to existing stands. The highest level of organic material practical will be left on harvested units and project areas to reduce nutrient loss and to act as a host for important microorganisms, invertebrates, and small vertebrates. Through management actions, snag densities will be increased to provide more habitat for cavity dependent species. More natural stand conditions will result in improved visual quality, less risk of catastrophic fire, less incidence of severe insect outbreaks, and increased wildlife diversity.

Economic benefits will occur as commercial thinning and stand density treatments take place in the WAU. Opportunities for special forest products will be enhanced and improved as a result of the management activities. However, because public ownership is low (26%) in the WAU, the size and scope of projects in the watershed will be small. Overall spatial design patterns will not be greatly influenced by BLM actions.

XI. WATERSHED MANAGEMENT OBJECTIVES

An objective is defined as something towards which management effort is directed. Stated in another way, objectives are the desired outcome. Well written objectives should clearly state what is needed, why it's needed, where it's needed. These sound like easily answered questions, but the more time spent developing objectives, the more one realizes how cumbersome these task can become.

The more control there is over any given situation, the quicker and easier the objective can be accomplished. With scattered land ownership patterns, such as the situation in southwest Oregon, the task becomes more complicated, more costly, more time consuming, and can be more difficult to achieve. Even if local objectives are achieved, regional objectives may not be realized until adjacent land management objectives are fulfilled. For example, all the physical barriers on Evans Creek could be removed in this sub-watershed, but unless downstream land managers do the same, salmon will never reach the upper portions of this watershed. This dilemma points to several obvious, if somewhat time consuming solutions, the most widely accepted of which is partnerships with the other landowners or participants in the task of land management. With dedicated partnerships, control over the situation is increased,

more broadly based decisions can be made, action plans have a wider acceptance, results are realized sooner, and more people have a sense of ownership and pride in the results.

The best written plans, objectives, or intentions have several unforseen obstacles that are difficult to mitigate. These include such things as funding constraints, natural occurrences (fire, flood, etc), political impulses, and overriding priorities outside the influence of the project team. Even with these stumbling blocks, the challenge of accomplishing proper land management objectives should be continued.

A. OBJECTIVE: IMPROVE WATER QUALITY AND QUANTITY

RATIONALE: Low flows, high summer temperatures, and sedimentation in Evans Creek can affect the ability of the stream to provide habitat for fish (including coho, which are proposed for listing as a T&E species) and other species which depend on the water resources.

POSSIBLE ACTION:

1. Stabilize streambanks and flows
2. Create properly functioning riparian buffers by creating and maintaining diverse vegetation component in riparian reserve
3. Improve upland conditions to reduce sediment loading
4. Improve road conditions through road density reduction, surfacing, culvert upgrades, cutbank stabilization, etc.
5. Increase amounts of large woody debris in riparian areas

MEASUREMENT/MONITORING: Stream stability surveys, road inventory surveys.

SUCCESS: Reduced sedimentation reaching perennial streams in the valley, cool stream temperatures and more stable flows.

B. OBJECTIVE: REDUCE POTENTIAL FOR CATASTROPHIC FIRE

RATIONALE: The Lower Evans WAU presently has a high fire occurrence rate and a history of large fires.

POSSIBLE ACTION: Reduce existing fuel load and stand density to promote ecosystem health by:

1. Reintroducing fire to promote ecosystem health
2. Reducing existing fuel load and stand density
3. Targeting rural interface area for fuel reduction
4. Promoting fire awareness
5. Reducing fuel loads from BLM management activities
6. Using alternatives to burning, such as biomass utilization to reduce fuels

MEASUREMENT/MONITORING: Observed overall fuel reduction. Measure fuel loadings. Analyze fire records.

SUCCESS: Reduction in number of human caused fires. Reduction in fire intensities. Reduction in the number of catastrophic fires.

C. OBJECTIVE: ON MATRIX LANDS, CREATE AND MAINTAIN CONNECTIVITY BETWEEN LATE SUCCESSIONAL RESERVES (LSR) AND PROVIDE REFUGE/HABITAT FOR A VARIETY OF ORGANISMS ASSOCIATED WITH LATE SUCCESSIONAL FORESTS.

RATIONALE: Late successional forests provide a variety of benefits, including: buffering of microclimates during seasonal climate extremes, nutrient retention, carbon storage and nutrient recycling. They also are a source of arthropods, salamanders, lichen, mosses and other organisms beneficial to ecosystem functions. Late successional forests also stabilize soil and provide habitat for late successional dependent species, especially for those with limited dispersal capabilities.

POSSIBLE ACTION:

1. Identify existing and potential connectivity corridors of late successional forest in riparian and upland areas.

2. In upland areas, maintain late successional patches (>150 years and at least 50 acres in size) which are suitable to maintain or enhance for interior forest conditions.

3. Design management activities to provide edge-to-area ratios which are needed to achieve desired interior forest conditions

4. Develop surveys for lichens, arthropods, etc., to determine habitat requirements.

MEASUREMENT/MONITORING: Identifiable connectivity patches and corridors that provide late successional forest conditions. Dispersal and travel routes between adjacent watersheds is evident.

SUCCESS: Riparian corridors in late successional condition. Plant and animal diversity maintained. Diversity of forest stands with differing sizes and structures.

D. OBJECTIVE: IMPROVE FOREST ECOSYSTEM HEALTH, DIVERSITY AND RESILIENCY.

RATIONALE: Improving forest ecosystem health, diversity and resiliency increases stand resistance and tolerance of climatic extremes/fluctuations, reduces potential for major insect and disease outbreaks, reduces potential for large fires, reduces erosion, increases soil productivity.

POSSIBLE ACTION:

1. Promote and improve species diversity by encouraging natural levels of diversity found in native plant communities.

2. Thin dense conifer stands to enhance tree vigor and growth. Prioritize stands with relative densities greater than 50%. Utilize underburning to thin where appropriate.

3. Improve horizontal and vertical diversity in even-aged plantations, create canopy gaps, encourage species diversity and maintain un-thinned clumps. Current opportunities exist in sapling to pole size stands on harvested areas. Maintain long-term site productivity and biological legacies by retaining coarse, woody debris, snags, and green trees.

4. Utilize fire to shift areas of the white oak plant community to early successional oak savannahs. Low elevation sites in the eastern portion of the watershed would be the primary areas for treatment.

5. Stabilize soil by reducing erosion.

6. Reduce detrimental impacts to important invertebrates, fungi, mosses, lichens by minimizing litter and topsoil disturbance during management activities.

7. Reduce existing populations of noxious weeds and prohibit the expansion of weeds from surrounding watersheds by use of native species of grasses, forbs, and shrubs whenever possible, as well as possible release of biological control agents where applicable.

8. Maintain a diversity of age/size classes throughout the watershed. Utilize historic range of natural variability to determine target acres. Regulate the harvest of forest commodities (wood, mushrooms, etc.) to prevent excessive use or unacceptable impacts to the resource or site.

9. Maintain pine species as a major seral stand component, principally on ridgelines and southerly aspects.

10. Provide environmental conditions that are beneficial for insect predators (salamanders, bats, birds, etc.) by leaving woody debris, down logs and snags for habitat.

MEASUREMENT/MONITORING: Measurement of relative densities of managed stands are 35-50% (stand vigor and growth are maximized). Diversity of plant and animal species increasing. Annual insect and disease aerial surveys. Develop a monitoring plan for all forest products.

SUCCESS: The type, amount and distribution of seral stages within watershed are within desired range. Increased stand vigor and growth rates, endemic levels of insect and disease, viable populations of a variety of plants and animals.

XII. APPENDIX

Appendix 1. Habitat and Occurrence of Special Status Wildlife Species on the Butte Falls Resource Area

THREATENED AND ENDANGERED SPECIES

Gray wolf (Canis lupis)

The gray wolf is believed to be extinct in Oregon. Purported sightings have created controversy as to whether they actually do exist in southern Oregon. Until confirmed sightings occur, they are considered to be extinct in the Medford BLM district.

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.

American bald eagle (Haliaeetus leucocephalus)

Five nest sites are known in the Medford BLM district, with 2 on adjoining private lands. Three 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.

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.

FEDERAL CANDIDATE SPECIES (C1)

Spotted frog (Rana prettiosa)

Spotted frogs are likely extirpated from the Medford district BLM lands. Their habitat is marshy edges of ponds, lakes, or slow moving streams with permanent water where the bottom is soft and muddy. The nearest known population is the Wood River in Klamath County.

FEDERAL CANDIDATE SPECIES (C2)

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.

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.

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.

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.

Northwestern 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 micro-habitat 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.

Northern sagebrush lizard (Sceloporus graciosus graciosus)

Most common in sagebrush areas, but it also occurs in open forests of ponderosa and lodgepole pine that have open brushy understories. The lizards are ground dwellers, but may occasionally be seen resting on larger branches of sagebrush, but never more than a few inches above ground level.

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.

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.

Western burrowing owl (Speotyto cunicularia)

A viable population no longer exists in the Rogue River Valley, where they were formerly present. May occasionally be present in winter. Habitat is sagebrush steppe, grasslands, pastures, and airports where vegetation is sparse and terrain is level.

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.

Long eared myotis (Myotis evotis)

A crevice dweller which is 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.

Pacific Townsend's big-eared bat (Plecotus townsendii 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.

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.

California red tree vole (Arborimus pomo)

An arboreal vole which lives in Douglas fir, spruce and hemlock forests. Food consists entirely of leaves 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.

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.

California wolverine (Gulo gulo luteus)

Wolverine use Douglas fir, mixed conifer forests. Historic sightings near Medford BLM lands have occurred at White Rock Creek near Oregon Caves (1975) and near Dry Creek, east of Medford, in 1970. Recent wolverine sightings have been reported by fur trappers in the Rogue River National Forest lands adjoining BLM lands. Large areas of medium or scattered mature timber and ecotone areas around cliffs, slides, swamps, and meadows are important habitat components. They appear to prefer remote areas away from humans. Wolverines may use higher elevations in summer and lower elevations in winter.

Coho salmon (Oncorhynchus kisutch)

Coho are present in most of the larger lower elevation rivers and larger perennial streams on the district. South Coast coho was listed as depressed by the National Marine Fisheries Service in November, 1993.

Summer and winter steelhead trout (Oncorhynchus mykiss)

Steelhead are present in most of the larger streams on the district in the Rogue River drainage system.

Pacific lamprey (Lampetra tridentata)

Present in the Rogue River and larger tributaries. Migrates up river from the ocean and reproduces in the Rogue, Illinois, and Applegate rivers and larger perennial tributary creeks. Little habitat information is available.

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.

Denning's agapetus caddisfly (Agapetus denningi)

This species has not been found in Medford BLM district, but could be present here. 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.

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.

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.

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 Calif. 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.

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 Co., perhaps part of northern California.

FEDERAL CANDIDATE SPECIES (C3)

Mountain quail (Oreortyx pictus)

Commonly found in forests above the interior valleys in the Medford district. These quail use a variety of habitats, including open meadow, shrub fields, other openings, and forested stands. Mountain quail are more common than originally thought and unless a downward population trend is observed, will likely be removed from the USFW sensitive species list within the next two years.

OREGON STATE SENSITIVE SPECIES
*(C=critical, V=vulnerable, P=peripheral, U=undetermined)

Clouded salamander (Aneides ferreus) <U>

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.

California mountain kingsnake (Lampropeltis zonata) <P>

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.

Common kingsnake (Lampropeltis getulus) <P>

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.

Sharptail snake (Contia tenuis) <V>

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

Acorn woodpecker (Melanerpes formicivorus) <V>

Found in the Rogue river valley and surrounding foothills. Preferred habitat is oak woodlands, riparian areas, and mixed conifer oak forests which have high canopy closure. Excavates nests and nest cavities in oaks and other trees. Store acorns in holes excavated in thick bark or other soft dead wood.

Black-backed woodpecker (Picoides arcticus) <C>

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.

Flammulated owl (Otus flammeolus) <C>

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.

Grasshopper sparrow (Ammodramus savannarum) <U>

Grasshopper sparrows inhabit grasslands which have some shrubs. Populations have been reported near White City and Eagle Point in Jackson County.

Great gray owl (Strix nebulosa) <V>

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) <V>

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.

Lewis' woodpecker (Melanerpes lewis) <C>

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.

Northern pygmy owl (Glaucidium gnoma) <U>

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 saw-whet owl (Aegolius acadicus) <BLM assessment>

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.

Pileated woodpecker (Dryocopus pileatus) <V>

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 ($\geq$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.

Pygmy nuthatch (Sitta pygmaea) <V>

Habitat is mature and old growth ponderosa pine, especially open stands with less than 70% canopy. The birds will forage in young ponderosa pines. It nests and roosts in cavities more than 20 feet from the ground that are located in large dead or decaying ponderosa pines which usually exceed 20 inches dbh. It excavates its own nest cavities which are often started in a fissure in a soft snag. Found in the Cascade mountains. Pygmy nuthatch populations drop significantly with timber harvest and snag removal.

Three toed woodpecker (Picoides tridactylus) <C>

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 overmature mixed conifer forests. Bark beetle larvae are primary food source.

Western bluebird (Sialia mexicana) <V>

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.

White headed woodpecker (Picoides albolarvatus) <C>

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.

Pallid bat (Antrozous pallidus) <V>

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.

American martin (Martes americana) <C>

Martins 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.

Ringtail (U) (Bassariscus astutus) <U>

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.

***C** = Critical-species for which listing as threatened or endangered is pending.
V = Vulnerable-species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring
P = Peripheral-species whose Oregon populations are on the edge of their range.
U = Undetermined-species whose status is unclear. They may be susceptible to decline.

Appendix 2. Geology

The rock types identified by the 1977 Preliminary Reconnaissance Geologic Map of the Wimer Quadrangle indicate 3 dominant rock types in the watershed, and one minor rock type, as well as, Quaternary alluvial fan deposits, terrace gravel deposits and alluvium. The oldest rocks occur in the southwestern portion of the watershed. They include the Triassic to Paleozoic metamorphosed porphyritic augite andesite and andesitic basalt rocks of the Applegate Group. Locally these metavolcanic rocks may be interbedded with metasedimentary rocks. This group has produced considerable amounts of gold in other areas of the Rogue Valley.

The second oldest rock type in the watershed is part of the Ophiolite of the Sexton Mountains and includes Jurassic metavolcanic and shallow intrusive rocks. These rocks are characterized by pillow basalt and metagabbro dikes and sills (Page, et.al, 1977). These rocks occur in the Bear Branch area.

The minor rock unit, serpentinite, occurs in the Northwest portion of the watershed. This is also a sheer zone containing highly deformed rocks. The protolith for this serpentinite is dunite and peridote, with local concentrations of chromite, as well as gabbro metagabbro, diabase dikes, and amphibole derived from diabase dikes may also be present (Page et.al., 1977). This is also part of the ophiolite assemblage associated with the ancient valley floor. A deeply weathered quartz diorite, Late Jurassic to Cretaceous, occurs in the eastern and central portions of the Watershed. These rocks range in composition and include monzonite, granodiorite, quartz monzodiorite, diorite, but predominately tonalite and quartz diorite. Landslides and extreme erosion is common to this rock unit.

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