MID EVANS CREEK LANDSCAPE ANALYSIS

I. INTRODUCTION

The objective of this analysis is to look at a "landscape" and describe it's "ecosystem" structures and functions. A rudimentary understanding of landscape 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 principal objective of managing on a landscape level is to provide for and sustain ecological health and resiliency. This is accomplished through the restoration or maintenance of diversity and complexity within an ecosystem. Processes, levels, and patterns that were present prior to European settlement are used as reference points. Reconstructing what the "landscape" looked like prior to management and fire control provides insight to determine 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.

Landscape 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. LANDSCAPE LOCATION/ECOLOGICAL ZONE

The Mid Evans Creek landscape analysis unit (LAU) is located northwest of Medford and covers approximately 33,980 acres (53.1 square miles). This includes portions of T34S R4W, 3W & 2W and 35S R4W, 3W & 2W. The LAU lies within the Butte Falls Resource Area of the Bureau of Land Management (Map 1). The climate of this area is Mediterranean type with typically cool, wet winters and hot, dry summers. Summer temperatures range from the 80s to the high 90s. Occasional daytime temperatures in the summer may reach 100°+ fahrenheit (F). Winter lows drop regularly to 10° to 20° F. Annual precipitation ranges from 35 to 45 inches. Typically, most precipitation occurs as rainfall in the late fall, winter, and early spring, with the exception of the upper ridges where snow may accumulate. Elevation ranges between 1200 ft. on the valley floor to 3982 ft. on the highest peak (Bald Mountain).

Bureau of Land Management (BLM) ownership within this landscape analysis unit is approximately 14,520 acres (Table 1). Delineation of the landscape analysis unit boundary is based upon similar topography, soil types and vegetative conditions.

Table 1. Mid Evans Creek LAU Ownership

BLM	KOGAP	MEDITE	BOISE CASCADE	WOODLOT	FARM
42 percent	<1 percent	12 percent	7 percent	25 percent	13 percent
14,520 Acres	160 Acres	4080 Acres	2400 Acres	8450 Acres	4370 Acres

III. IDENTIFICATION AND DESCRIPTION OF CURRENT LANDSCAPE CONDITIONS

A. VEGETATION

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

1. White oak-ponderosa pine/manzanita-wedgeleaf/grass, approximately 20 percent of the landscape analysis unit.
2. Mixed conifer/interior valley/grass, approximately 80 percent of the landscape analysis unit.

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).

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

Two special status plant species are found within the boundaries of the LAU (Table 2).

Table 2. Special Status Plants in the Mid-Evans Creek Landscape Analysis Unit

SPECIES	STATUS	LOCATION
Cypripedium fasciculatum (Clustered lady slipper)	Federal Candidate	T34S, R03W, Section 5 & 7 T34S, R04W, Section 11
Ranunculus austro-oreganus (Southern Oregon buttercup)	Federal Candidate	T35S, R02W, Section 21

B. ROADS

Approximately 187 miles of road are present in the LAU. Of these, 83 miles are "system" roads in the Mid-Evans LAU. A large sample of these roads has been field inventoried to determine current conditions.

Roads in the Mid-Evans LAU are potential sediment producers and may be a risk to aquatic resources. This risk is most pronounced during major storm events.

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

1. Unblocked, natural surface roads that are being rutted by 4X4's and OHVs and the runoff water channelized.

2. Eroding crushed rock surfacing, due in some cases to poor crown and in other cases to inadequately spaced water dips. Erosion of the water dips themselves is largely due to no armoring.

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

4. Lack of 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 to 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 "rechannel" 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 are sometimes on headwall topography, with occasional concentrations of fill slope failures, which seem to start within the road prism, and are often graphic evidence of less than full bench construction on topography exhibiting >70 percent side slopes.

Especially steep sideslopes in parts of the McConnville-Murphy compartment of this LAU have played a role in fill slope stability problems which have degraded water quality.

The overall risk for roads to produce sediments is at a moderate level for the Mid-Evans Creek sub-LAU, due primarily to the predominance of moderately erosive soil types.

Most road alterations to the Mid-Evans Creek Landscape have occurred over the last 50 years. The only significant exception is some county roads, which probably existed in some form of "traveled-ways" since settlement of the Rogue Valley.

C. STREAMS/FISH

Table 3. Stream Ownership Miles

Stream Reaches	Total Miles	BLM administered miles
Perennial stream reaches	83.66	26.37
Intermittent stream reaches	141.77	63.04
Fish bearing stream reaches (Salmonid)	26.85	3.35

The mainstem Evans Creek runs through the middle of the landscape analysis unit (LAU) area. East Fork Evans, Sykes, May, and Ramsey creeks are the main tributaries to Evans Creek in the Mid-Evans Creek LAU analysis area.

1. FISH PRESENCE IN THE MID EVANS CREEK LAU

    a. Evans Creek--Coho, steelhead, cutthroat
    b. East Fork Evans Creek--Coho, steelhead, cutthroat
    c. Sykes Creek--Steelhead and cutthroat trout
    d. May Creek--Steelhead and cutthroat trout

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)

3. INSTREAM FACTORS LIMITING FISH PRODUCTION

    a. limited salmon habitat due to lack of large woody debris in the stream (rearing)
    b. high water temperatures (rearing)
    c. spawning gravels sedimented (spawning)
    d. pools aggraded due to granitic sands (rearing & migration)
    e. lack of accessibility for juvenile and adults to migrate throughout the drainages (spawning, rearing, migration)
    f. lack of winter coho refugia/side channels
    g. lower insect production and quality

Most of the land adjacent to Evans Creek is private agricultural land. Some unfenced riparian areas are present along the creek. Livestock in some of these areas have been observed standing in the creek, and in some places, the banks are bare earth where the vegetation has been trampled. This is a source of instream sediment. Water diversions and pumps for irrigation are present along the creek.

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 Mid Evans Creek LAU. The only recreation documented was the Bybee Springs Resort, located along Evans Creek Road (T34S, R3W, Sec 34). The resort was built in 1892 and was a two story house featuring a nearby sulphur springs. Other than the resort, there were numerous homesites in this area. Hunting and fishing were probably popular in the 1930s and 1940s.

2. EXISTING SITUATION

The Mid Evans Creek LAU is generally not a destination area for recreation. People pass through the area on their way to West Fork Evans Creek and Galesville Reservoir. There are two dispersed recreation sites located within the Mid Evans Creek LAU. These sites are located along the creek and have a pull-in for camping. They are undeveloped, except for fire rings.

Recreation Site	Location
1. Hull Mountain	T34S, R2W, Sec. 19
2. E. Evans Creek Wayside	T34S, R2W, Sec. 19

There have been no data collected on other recreation activities that occur in the Mid Evans Creek LAU. 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

See Appendix A for a more complete discussion of special status species habitat needs.

Table 4. Special Status Species - Mid Evans Creek Landscape Analysis Unit

Species	Status[1]	Presence[2]	Inventory[3]
Peregrine Falcon	FE,ST	T	N
Gray Wolf	FE, ST	A	N
Bald Eagle	FT, ST	T	N
Northern Spotted Owl	FT, ST	D	4
Western Pond Turtle	FC, SC	D	3
Del Norte Salamander	FC, SV	U	N
Cascades Frog	FC, AS, SC,	U	N
Mtn. Yellow-legged Frog	FC, SU	U	N
Red-legged Frog	FC, SU	U	3
Spotted Frog	FC, SU	U	N
Northern Goshawk	FC, AS, SC	D	3
Mountain Quail	FC	D	N
Townsend's Big-eared Bat	FC, SC	D	3
White-footed Vole	FC, SP	U	N
Fisher	FC, AS, SC	U	N
Wolverine	FC, ST	U	N
Coho	Proposed	P	3
Burnell's False Water Penny Beetle	FC	U	N
Denning's Agapetus Caddisfly	FC	U	N
Green Springs Mtn. Farulan Caddisfly	FC	U	N
Schuh's Homoplectran Caddisfly	FC	U	N
Obrien Rhyacophilan Caddisfly	FC	U	N

Siskiyou Caddisfly	FC	U	N
Alsea Ochotrichian Micro Caddisfly	FC	U	N
Franklin's Bumblebee	FC	U	N
Oregon Pearly Mussel	FC	U	N
Fringed Myotis Bat	BS, SV	U	N
Clouded Salamander	AS, SC	U	N
Tailed Frog	AS, SV	U	N
Black Salamander	AS, SP	U	N
California Slender Salamander	AS, SP	U	N
California Mountain Kingsnake	AS, SP	S	N
Common Kingsnake	AS, SP	S	N
Pileated Woodpecker	AS, SC	D	N
Black-backed Woodpecker	AS, SC	U	N
Three-toed Woodpecker	AS, SC	U	N
Flammulated Owl	AS, SC	U	N
Great Gray Owl	AS, SC	U	N
Purple Martin	AS, SV	U	N
Western Bluebird	AS, SV	D	N
Pacific Pallid Bat	AS, SC	U	N
Pine Marten	AS, SC	U	N
Sharptail Snake	SV	U	N
Northern Pygmy Owl	SU	U	N
Acorn Woodpecker	SV	U	N
Lewis' Woodpecker	SC	U	N
White Headed Woodpecker	SC	U	N
Ringtail	SU	U	N

[1] Status:
FE - Federal Endangered
FT - Federal Threatened
FP - Federal Proposed
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

[2] Presence:
D - Documented
S - Suspected
U - Uncertain
A - Absent
T - Possibly transitory

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

2. NORTHERN SPOTTED OWL

All of the suitable habitat in the Mid Evans Creek LAU has been surveyed to U.S. Fish and Wildlife Service protocol for the Northern spotted owl (six times in two years). Residual Habitat Areas of 100 acres have been designated around the nine known Northern spotted owl sites in the LAU. Suitable habitat has been mapped.

3. SNAGS, DOWN WOODY MATERIAL/CAVITY NESTERS

Little inventory data is available on snag numbers and down woody material. More information is needed. Wildlife trees provide important habitat for numerous cavity nesters. Among the species on the Oregon State Sensitive Species list, which could be present in the area, 9 are cavity dependent for some part of their life cycle, and three are known to make use of available cavities.

4. GAME ANIMALS

Information from Oregon Department of Fish and Wildlife (ODFW) regarding numbers of big game present in the Mid Evans Creek LAU indicate that approximately 250 elk are present in the western 1/3 of the Butte Falls Resource Area. Sixty three elk have been observed at the mouth of May Creek. The herd is non-migratory, but transient, covering an estimated 15 square mile home range. ODFW goals for the area are to increase the herd numbers in this 1/3 of the Butte Falls Resource Area to 400. ODFW would like to minimize damage complaints by keeping the elk out of the agricultural areas near Evans Creek.

A three year blacktail deer study, conducted by ODFW, began in spring 1994. The objective of this study will be to examine age structure of the population, adult deer mortality rate and survival, reproductive success of adult does, areas of use, and movements of the migratory deer population. This study will be conducted, in part, in the Mid Evans Creek, West Evans, and East Evans LAU areas.

Poaching levels in the area are 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 Mid Evans Creek LAU on Hull Mountain and Sprignett Creek. Management suggestions for managing turkey would be to maintain oak-savannah woodlands and roost trees. Quail and grouse are present in the LAU. Planting beneficial shrub species in wildfire areas can be a management tool for healthy game bird populations. Only a remnant population of pheasants in the Mid Evans Creek LAU is present.

5. 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.

6. SPECIAL HABITATS

Caves, cliffs, talus slopes, ponds, springs, meadows, and corridors all are considered special wildlife habitats. The presence of these special habitats in the Mid Evans Creek LAU is poorly documented. These unique habitats are important to the survival and reproductive success of some species. Caves, mine adits, and shafts are all important for Townsend's big-eared bats, and are used as roosts,

hibernacula, and maternity sites. Some specific locations are known. More information needs to be collected and special habitats mapped.

F. GEOGRAPHIC FEATURES

1. GEOLOGICAL FEATURES

The Mid Evans Creek Creek LAU is located within the Klamath Geomorphic Province and is characterized by partially weathered metamorphosed sedimentary rocks of the May Creek Schist formation (145 million years). There are several small plutons (intrusions) of unmetamorphosed granodiorite (decomposed granitics) in the eastern and northern portions of the unit. Along the periphery of these intrusions are decomposed schistic rocks that are also unmetamorphosed. Extensive geologic erosion over many millions of years has created steep canyons with sideslopes ranging from 50 to 80 percent. The major ridges are aligned primarily east to west with the resulting predominant north and south aspects. The valley bottomland is typically narrow (less 1/2 mile wide) and winding.

2. SOILS

The dominant soil types occurring in this LAU are the Beekman-Colestine and the Josephine-Speaker soil complexes. Both the Beekman and Colestine soils are moderately deep (20-40") to highly fractured bedrock and are most commonly found on the steeper sideslopes. The Beekman soil is skeletal (>35 percent rock fragments in the subsoil), which limits water and nutrient supplying capacity, whereas the Colestine is nonskeletal. The Josephine-Speaker soils are relatively deep (20 to 60") and are generally found on slopes less than 60 percent. In general, both these soil complexes are relatively stable in terms of slope stability and erodibility.

About 25 percent of the soils in this LAU unit have formed in highly decomposed granitic and schistic parent materials. These soil types are highly erodible and very difficult to stabilize after disturbance. These soils have a high potential to produce sediments in nearby streams. They are located in the upper reaches of Sykes and May creeks and in the Ramsey Canyon area.

In regards to soil management in this LAU, there are several areas particularly in the Murphy Gulch compartment that are classified by timber production capability classification (TPCC) as fragile, due to slope gradient. This means that the steepness of the slopes makes these soils unstable.

For detailed soils maps of this LAU, contact the Butte Falls Resource Area soil scientist or Jackson County Soil Conservation Service Office.

G. CULTURAL/HISTORICAL

The following information is presented as an historical reconstruction of the Mid and West Evans LAUs to help analyze current conditions, as well as identify the range of possibilities for this ecosystem. This section will identify the human/cultural processes that have shaped the landscape through time. The recurring theme throughout this process is change. The existing situation is not static. The current look of the landscape - that of a forested environment is probably not the way it looked in the past.

According to informants interviewed at the Siletz Reservation at the turn of the century, this area was within the ethnographic homeland of the Upland Takelma. These people were hunter/gatherers who exploited a wide variety of food resources. Main staples of the Takelma vegetable diet were acorns, camas bulbs, sugar pine nuts, manzanita berries, and tarweed. Generally the principal

source locations for oaks are low elevation hills and southern aspects of higher elevations (Gray 1987). There is ample evidence that prehistoric people modified the landscape through the use of fire. The Wilkes/Emmons Exploring Expedition of 1841 passed through southern Oregon on the Hudson's Bay Company trail and gave an eyewitness account of aboriginal burning. Reasons for burning included deer hunting through the use of herding fires, removal of cover for attacking enemies, maintenance of small patches of open prairie, harvesting of tarweed, and collection of grasshoppers, hazelnuts, acorns, berries and root crops (Agee 1993).

Ethnographic records and cross-cultural inferences about the importance of habitat burning in southwestern Oregon indicate that valley grasslands and surrounding oak-grass savannah would have been burned July through September to initiate early growth. Higher elevation chaparral burned in the fall resulted in a mosaic of young-to-mature stands of brush and provided for a succession of important plants and animals. Tobacco growing plots were cleared with fires set in the spring. Forests dominated by Douglas fir and ponderosa pine were fired to maintain an open understory of grass. Frequent burning would prevent a buildup of fuel and maintain areas of preferred plants that would attract game (Lewis 1990).

It is likely that fires ignited near known village sites along the Rogue River and Bear Creek spread through the landscape area. Historic accounts of native camps within the analysis area include "one ... about six and a half miles from present day Wimer. Bordered by Evans Creek and May Creek, it was situated on a grassy flat and became a preferred camp of the Indians....Another camp visited by white men is situated on Evans Creek near the mouth of Sykes Creek." (Boulter 1992). The character of the landscape in terms of vegetation and cover condition around the date of 1800 was far more open than present. Relatively frequent fires reduced undergrowth and promoted the growth and spread of grasses, resulting in savannah or park-like vistas.

A goal of the Hudson's Bay Company was to create a fur desert in Oregon by trapping out all the beaver, thereby buffering the Columbia country to the north from American settlement. The period of the 1820s through the early 1840s saw European and American interaction with the Upper Rogue River Valley through a system of trapper trails connecting the settlements of the Willamette Valley with California (Follansbee and Pollock 1978). No information exists to illustrate the changes that trapping may have induced on the local flora and fauna. However, the main stem of Evans Creek was trapped the first season white trappers entered the valley with Peter Skene Ogden in 1826 (Lalande 1987).

Removal of beaver would have had a substantial impact on the watercourses and biology of associated plants and animals for succeeding decades. The pools created behind beaver dams offer habitat for cutthroat trout and increase water storage capacity of stream banks. This increase in storage can result in higher, cooler flows during summer. Long-term siltation of pools over time can lead to formation of grassy meadow habitat. Eradication of beaver would allow dams to be breached, increasing downcutting and bank scouring through beaver meadows. Riparian vegetation could shift toward more willow and alder.

The most significant stimulus for settlement and development of the Rogue Valley was the discovery of gold in 1851. Evans Valley's first white settler was William Peck Hillis who found gold and settled near the Indian camp at the junction of Sykes and Evans creeks (Liles 1992). He was able to live in peaceful co-existence with his neighbors even though the Gold Rush of the 1850s brought open hostilities between whites and Indians. Both had conflicting ways of exploiting the environment. The seasonal nature of mining offered early settlers the time for farming. Land clearing, farming, mining and stock raising were at odds with native hunting and gathering customs. Farming resulted in the loss of native grass seeds, camas and acorns. Deer and elk were hunted by both Indians and whites, and the supply of large game animals, especially elk, was eventually

depleted. Mining debris interfered with annual fish runs the Indians depended upon. The treaty resulting from numerous battles led to the formation of the short-lived Table Rock Reservation, which included that portion of the Mid Evans Creek LAU south of Evans Creek. Final removal of the tribe to the Grande Ronde Reservation occurred in January 1856 (Follansbee and Pollock 1978).

Both placer and hydraulic mining occurred in Evans Creek; rich deposits were found on Sykes and May Creeks, as well as Murphy and McConnville gulches. Chinese laborers worked in the Sykes Creek area during two periods, around 1856 and the late 1880s. Caved in tunnels remain in the area (Liles 1992). Hydraulic mining relied upon seasonal water from winter run-off. At a time when it was needed by spawning anadramous fish, water was diverted into contour ditches above deposits where it was then released in high pressure streams through pipelines. Blasting water tore gravel banks down and pushed the loosened gravel through sluice boxes (Follansbee and Pollock 1978). Anadramous fish were undoubtedly heavily impacted by sedimentation and loss of spawning habitat. A second period of mining occurred during the Great Depression. Much of the gold extraction in the Mid Evans Creek LAU during the 1930s and 1940s was lode mining in the McConnville-Murphy compartment of the Mid Evans Creek LAU.

Cinnabar (mercury ore) was discovered in the Meadows District in 1878. Cinnabar mining in the Hull Mountain compartment started in 1916 for production of quicksilver. The War Eagle, Dave Force and Chisholm claims were operated until the 1950s (Schuette 1938). Minerals washed downstream as byproduct of cinnabar mining deteriorated galvanized metal irrigation flumes and caused lily bulbs raised in the Evans Valley to wither after harvest (Boulter 1992). Riparian systems must have been adversely affected. Several of the mine adits are now habitat for a variety of bat species.

The Donation Land Law of September 27, 1850 encouraged settlement of Indian lands in Oregon by granting a half-section of land to a prospective settler (Beckham 1991). The Homestead law passed on May 20, 1862, gave settlers the right to enter 160 acres and receive title after 5 years of residence. The Timber and Stone Law of 1878 provided for the entry and sale of 160 acres of timberland (Muhn and Stewart 1988). The General Land Office (GLO) Township survey maps in the Mid Evans Creek LAU are dated 1857 and 1858. The West Evans survey was done in 1885. The survey provides a snapshot of the landscape showing a "Gilbert" cabin at the junction of Sykes and Evans Creeks, "Weirs" barn and house at the junction of West Fork and Evans Creek, and a wagon road along the two creeks to the salt spring along Salt Creek. Evidence of human habitation is very sparse throughout the analysis area during the mid 1850s. Corridors follow old Indian trails, along ridges or in the majority of cases, confined to the main stem of Evans Creek.

After the transcontinental railroad routes were extended to the Pacific Northwest, interested parties recognized a connection between the main ports of California and Oregon was desirable for the lumber trade. Congressional acts passed in 1866 and 1869 to promote rapid completion of the Oregon segment of the project set aside 3.7 million acres of the public domain land within a strip 30 miles on each side of the right of way. Parcels of 20 odd-numbered sections within a 20 mile strip formed the primary land grant. Alternative sections within a strip 10 miles beyond the primary grant were indemnity lands added to make up for fertile farmlands already pioneered. The Oregon & California (O&C) Railroad failed to carry out its terms required in the Act of 1869, and forfeiture proceedings eventually ended with a revestment bill, the 1916 Chamberlin-Ferris Act. The General Land Office hired surveyors and timber cruisers to inventory the revested lands in that year. The 1916 O&C revestment surveys are sources of information for this period. Much of the area now forested was described at that time as open grazing land with little timber.

The first national timberlands were established in 1891 when Congress created forest reserves in western states, two of which were in Oregon. Many attempts to homestead on marginal land

continued during 1890 to 1920. In order to meet legal requirements for improving homesteads, settlers burned off timber if there was less than 300,000 board feet per forty acre subdivision (Richardson 1980). Homestead exam files for this LAU are missing.

In 1906, the newly created U.S. Forest Service initiated controlled resource management in the forests of southern Oregon. By the late 1920s forest fire suppression received greater emphasis. The Civilian Conservation Corps (CCC) was established in the early 1930s, and fire suppression was one of the major missions. Fire suppression forced changes in forest species and stocking to occur over time. Open country once lightly forested with fire resistant ponderosa pine and oak have become overstocked with dense understories of Douglas fir.

The period of the 1940s through the 1980s saw the greatest human influences on the landscape to date. Logging increased during World War II. Sustained yield forestry was practiced on the federal land including clearcuts, herbicide treatments, slash burning, fenced progeny test sites and conifer plantations.

As the forest became more accessible by auto roads, recreation use began to increase. Hunting, fishing, and swimming are forms of outdoor recreation popular in the area.

H. NON-BLM ELEMENTS

1. AGRICULTURAL LANDS

The agricultural lands (13 percent of the LAU) are positioned around the valley floor adjacent to Evans Creek and are all non-BLM. 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 (20 percent), woodlot (non-industrial) forest lands (25 percent), and federal forest lands (42 percent). 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, theses stands become available for harvest.

The road system on agricultural and forest lands are a combination of rocked and natural surfaced roads. 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

1. EXISTING SITUATION

Prior to 1993, there were portions of four allotments within the Mid Evans Creek sub-watershed. After 1993, only a portion of one allotment was included in the Mid Evans Creek LAU.

Allotment Name	Total Allotment Acres	Allotment Acres Within Watershed	Allotment acres after 1993
Roundtop-Evans	47,739	1,819	0
Antioch Road	40	40	0
Longbranch	27,153	1,700	0
Meadows (formerly Straus)	2,746	799	799
Total acres	77,678	4,358	799

On May 3, 1993, a decision was issued to cancel the grazing lease on the Roundtop-Evans allotment in total (110 AUMs) for failure to make substantial use. On January 12, 1993, a decision was rendered to cancel the grazing lease on the Antioch Road allotment in total (4 AUMs), for failure to submit an application.

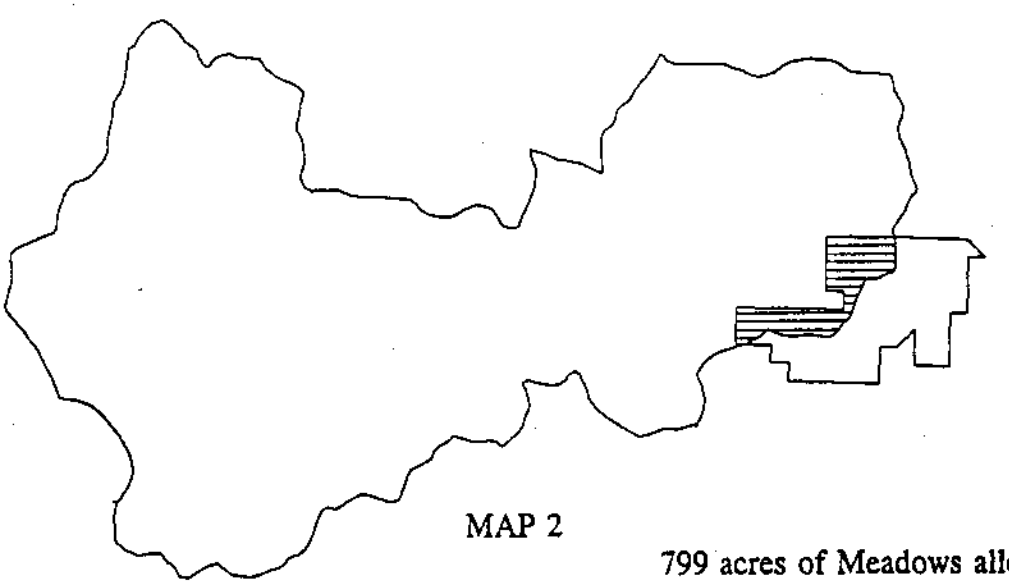
The two remaining allotments and their respective livestock use, are:

Allotment Name	Allotment Acres Within Watershed	Authorized Use
Longbranch	1,700	20 cows 4/16 to 5/15 93 AUMs

The lessee uses only 320 acres in the west half of section 29 in T34S, R1W, and therefore does not use the portion of the allotment that lies within the Mid Evans Creek watershed.

Meadows Allotment 799 acres 20 cows 4/01 to 6/30 90 AUMs

Utilization studies conducted over the past 10 years have shown no signs of over-utilization in any areas within these two allotments. Proper livestock management has resulted in even utilization of forage species. (See Map 2)



MAP 2

799 acres of Meadows allotment within Mid Evans LAU

J. CUMULATIVE WATERSHED EFFECTS

1. Summary of cumulative effects analysis as of October, 1992:

Total Acres:	33,980
BLM Acres:	14,520
Percent BLM Ownership:	42
Non-BLM Acres:	19,460
Total Miles of Existing Roads:	187
Road Density:	3.5 miles/section
Total Existing ECA (equivalent clearcut acres):	3,522 = 10.4 percent
Total Existing Compacted Acres:	1,930 = 5.7 percent
Total Acres in TSZ (transient snow zone):	none

In summary, the cumulative impacts to this LAU 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 livestock grazing along Evans Creek.

K. MINERALS

Erosion has exposed a large variety of valuable minerals, especially in the contact zone between these igneous and sedimentary rocks in the Mid Evans Creek LAU area. There are currently 2,560 BLM acres under 9 active mining claimants. Minerals present on both existing and past claims include mercury, copper, gold, silver, and cinnabar. Most existing claims are lode claims as opposed to placer claims.

Future projections for mining activity in the area are that more mining activity will occur in the Mid Evans Creek LAU, especially placer mining with small suction dredges under 5".

L. REALTY

EXISTING REALTY SITUATIONS:

There is one withdrawn area for the Rogue River Reclamation Project BLM Order 1-24-1956 within the NE1/4 NE1/4 and SW¼NE¼ of Section 20, T. 34 S., R. 2 W.. This withdrawal segregates that f2deral land from mining.

The Boise Cascade Road Use Right-of-Way Agreement OR 48747 blankets most of this LAU.

Ten road easements have been acquired across private land for the United States within the LAU.

Five power lines exist within the LAU. The most prominent one is Pacific Power and Light Company's 500 Kv line.

Two telephone lines exist. One is AT&T's buried fiber optic line along the Evans-Ramsey Road, and the second is United Telephone service line.

The United States has granted five nonexclusive road access right-of-ways to various individuals within the LAU.

One water pipeline nonexclusive right-of-way has been granted within this LAU.

The Medford District has established five community rock pits within the Mid Evans Creek LAU. This amounts to a de facto withdrawal from mining for these areas.

This LAU has experienced some heavy unauthorized use by the public. Forty-one illegal trash dump sites have been discovered since 1993.

IV. DESCRIPTION OF LANDSCAPE ELEMENTS

Three structural elements within a forest ecosystem are critical in maintaining ecological diversity and complexity. These elements are matrix, patches, and corridors. The structure, amount, and spatial arrangement of the **matrix, patches,** and **corridors** determine the function, resiliency, and species diversity of a forest landscape.

The following text describes each element in detail.

A. MATRIX

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

The matrix of the Mid Evans LAU is defined as early successional forest. Two size classes cover approximately 45 percent of the LAU landscape and provide the strongest influence over landscape flows (Table 5).

Table 5. Mid Evans Creek Size Classes

Grass/forb to seedling/sapling-5" dbh	Pole 5"- 11"dbh	Small sawtimber 11"-21"dbh	Large sawtimber 21"+	Old Growth large dbh or >200 yrs, multi-layer.
21%	24%	7%	12%	1%
7295 Acres	8158 Acres	2447 Acres	4020 Acres	345 Acres

Note: These acres do not include farmland or withdrawn lands (35 percent of landscape).
Percent and acres shown are approximate

a. **Grass/forb to seedling/sapling,** 0 - < 5" diameter. "From disturbance to the time when crowns close and conifers or hardwoods dominate the site. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly, gradually replacing grasses, forbs or brush as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting brush communities" (DRMP, 1992). Douglas fir and ponderosa pine are the principal planted species.

b. **Pole,** 5"-11" diameter. "From the time crown closure occurs to the time when conifers would begin to die from competition. Stands are dense and dominated by conifers, hardwoods or dense brush. Grass, forbs and herbaceous vegetation is decreasing. Hiding cover for big game is usually present" (DRMP 1992).

1. ORIGIN

The early successional matrix was initiated through fires and to a lesser amount, logging. The composition, structure and function of these early successional forests are somewhat different from those that would be initiated by natural causes. These differences include:

- fewer number of snags remaining, particularly larger diameter classes.
- more soil disturbance from logging, road building, and site preparation affecting post disturbance plant succession.
- reduction in the amount, size, and distribution of down woody debris.
- planted species (12'X12') spacing grid vs. natural (random) spacing. Douglas fir and ponderosa pine are the principal species planted. Under natural conditions, the species mix would also include hardwoods and a higher proportion of shrub species. Trees are planted all at once vs. natural regeneration which occurs over time.
- the rate of physical/structural change is more rapid due to intensive silvicultural treatments.
- large fire tolerant remnant trees are not present as a scattered stand component.

2. STABILITY

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

3. PATTERN

The matrix pattern is largely determined by the checkerboard ownership boundaries. Approximately 20 percent of the Mid Evans Creek landscape is managed by private timber industry. On these lands, the majority of merchantable overstory trees have been removed, leaving younger, unmerchantable Douglas fir with lesser amounts of ponderosa pine, incense cedar and scattered hardwoods. Approximately 26 percent of the land within Mid Evans is in private woodlots and has been harvested. Conditions are similar to those found on industrial lands. BLM managed lands (43 percent) have undergone harvest practices ranging from fire salvage to clearcuts, resulting in 32 percent of BLM ownership in seedling/sapling and pole sized stands.

B. PATCHES

Patches are areas distinctly different from the landscape around them. As a result of logging and fires, small sawtimber, large sawtimber, and old growth stands have become the "patches" within the Mid Evans landscape matrix. Four types of forest patches and one nonforested patch type can be identified and described. The descriptions for small sawtimber, large sawtimber, and old growth stands apply to unentered/unmanaged stands. Where management has occurred stand conditions will vary.

a. **Small sawtimber**, 11"-21" diameter - 7 percent of the landscape. "Stand growth slows. Forest stands are dominated by conifers and hardwoods; canopy closure approaches 100 percent with stand growth decreasing. Stand diversity is minimal; conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions" (DRMP 1992).

b. **Large sawtimber**, 21"+ diameter - 12 percent of the landscape. "Forest begin to develop structural diversity. Conifer and hardwood growth gradually declines. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover and some forage are present. With slowing growth, insect damage increases and stand breakup may

begin on drier sites. Understory development is significant in response openings in the canopy created by disease, insects and windthrow. Vertical diversity increases. Larger snags are formed."

c. **Old growth**, generally 200 years+, multi-size classes, and multi-layered - approximately 1 percent of the landscape. "This stage represents the potential plant community capable of existing on a site given the frequency of natural disturbance events. Structure, species composition, and age distribution is dependant upon fire frequency. As mortality occurs, stands develop greater structural diversity. Replacement of individual trees lost to fire results in the creation of a multi-layered canopy." (DRMP 1992)

d. **White oak/Pine/Manzanita**, approximately 20 percent of the landscape. These are classified as withdrawn lands on BLM. The remaining 4000+ acres occurs on private woodlots. These lands are generally located in the east half of the Mid Evans landscape.

e. **Altered patches**
Pasture/farms - 4370 acres - 13 percent of landscape.

1. ORIGIN

The small sawtimber stands are the result of a stand replacement fire approximately 80 years ago. Scattered larger diameter ponderosa pine, Douglas fir, and incense cedar remained following the fire.

The large sawtimber and old growth stands show evidence of historic underburning and partial stand replacement fires. The frequency of underburns can be determined by the amount of seedling and saplings in the understory. In stands that have not experienced recent underburns, a well established sapling to pole size second growth Douglas fir stand is present. A light logging entry has also occurred in some of these stands within the past 30 years. Individual trees were removed, representing approximately 20 percent of the basal area per acre. In the larger canopy holes, Douglas fir has naturally regenerated.

Other agents of change such as windthrow, flood, and disease, have not played a major role as stand replacing events. Insects are currently an active change agent within the LAU.

2. STABILITY

Compared to the landscape matrix, all three forest patch types are considered stable, with old growth stands having the highest degree of stability. The older the stand, the less likelihood that the structure and compositional elements will change significantly over time, and any change that does occur is slow.

3. PATTERN

The majority of the small sawtimber, large sawtimber and old growth patches within the Mid Evans landscape are located on federally managed lands. The checkerboard ownership pattern has resulted in a highly fragmented landscape. The patches are generally square or rectangular in shape due to the checkerboard ownership patterns and rectangular shaped logging units.

The location and amount of patches within the matrix has created a high degree of contrast, porosity, and edge effect across the Mid Evans landscape. Edge represents the interface area between two distinctive vegetative/size classes. Environmental conditions (temperature, light, wind, and humidity) are different within this area, resulting in a drier, windier microclimate along the stand edge. Generally a 500-foot wide strip adjacent to the edge is affected. The altered microclimate in this area causes a successional change in the species mix and density of herbaceous vegetation and shrub species. Patches 25 acres or less are in effect all edge.

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 Mid Evans landscape.

1. Riparian areas - Human activities have altered vegetative communities within the riparian zones of all of the creeks. Ownership patterns influence the presence or absence of buffer areas adjacent to the creeks. In some areas, harvesting activities have occurred down to the edge of the creeks with scattered trees less than 8 to 10" dbh left. Early seral herbaceous and shrub species are the dominant vegetative type within these areas. In other areas, no-cut riparian buffers were left. The width of the buffer corresponds to the stream class of each of the creeks. The resulting pattern of buffered and nonbuffered areas along each creek has led to broken, poorly connected riparian corridors.

2. Roads -Evans Creek Road, a Jackson County road, extends through the middle of the LAU. This road parallels Evans Creek throughout the landscape area. Private access roads, private logging roads, and BLM roads are all present in the area.

3. Powerlines -The Pacific Power 500 Kv line extends north and south through Ramsey Canyon in the west-central part of the LAU. A corridor 175 foot wide exists beneath the transmission towers. This corridor will be maintained in early successional condition.

4. Streams -Evans Creek flows through the central portion of the LAU. Major tributaries within the LAU boundaries are Sykes, May, Ramsey, and lower East Fork Evans creeks.

V. LANDSCAPE FLOWS

"Flows" are those factors or elements that move across the landscape. Flows that will be critical to the future landscape and are most likely to be affected by human activities are of the greatest concern. Four major flows considered to be important within the Mid Evans Creek LAU are fire, wildlife, people, and water.

A. 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 Mid Evans Creek LAU 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 LAU, 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.

B. WILDLIFE/FISH

Wildlife flows 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 landscape as the temperatures and seasons change. Adult Northern spotted owls are resident, but juveniles disperse across the landscape. Game species such as elk, deer, bear, turkey, quail, and grouse are present in the LAU 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. In the spring, cow elk move to calving areas to give birth. Birds, snakes, lizards, and salamanders all flow through the area in a much smaller scale. Coho and steelhead migrate into and through Evans Creek and travel up the tributaries to spawn. For a more complete discussion of wildlife and habitat interaction, see Appendix. Analysis was limited to major flows which occurred throughout the LAU and across the landscape boundaries.

C. PEOPLE

People are an important flow across the Mid Evans Creek landscape. The people move along roads, with heaviest activity occurring in areas with roads which are open throughout the year. People use the area for activities such as timber removal, tree planting, recreation, residences, farmland, water diversion, etc. Highest recreational use occurs from spring through fall. The majority of the landscape (58 percent) in the LAU is under private ownership.

D. WATER

Water was identified as another important flow through the Mid Evans Creek analysis area. Quantity and quality of water is an important issue in the area. Coho, a fish which has been petitioned for listing as a "Threatened" species, migrate through Evans Creek and into West Fork Evans Creek. Resident trout and steelhead also move through the area. High sedimentation, high summer temperatures, degraded riparian areas, and lack of large woody debris are all issues which interact with the flow of water.

VI. INTERACTIONS

The interaction of the major flows and the landscape elements contained in the matrix, patches, and corridors will help identify how the different flows affect and are affected by the environment. (Table 6)

A. GRASS/FORB - Seedling/Sapling, 0-5" diameter (Matrix)

1. FIRE: In this size class the potential exists for large fast moving fires that cause little damage. Fuels are generally light and flashy. These fuels are highly susceptible to outside environmental influences such as drying by wind and high temperatures. From an ecological perspective these fuels are unstable. The conifers are highly susceptible to any fire activity, with species composition being a variable in the equation. Any fires that occur in this fuel type have low resistance to fire control activities. Access and topography play a major role in fire control. This fuel type is easily ignited.

2. WILDLIFE: This size class provides a higher abundance of shrubs and forbs for elk and deer forage. Berries and fruits are usually more abundant in these areas, which provide forage for bear, birds, and small mammals. Elk and deer forage in the fields along Evans Creek and move throughout the area. Improving upland forage quality may draw elk away from the fields and reduce damage complaints.

3. PEOPLE: Low commercial value in these areas for human use.

4. WATER: Rapid runoff with an increase in soil movement and low interception of precipitation are identified as the major flows of concern occurring in this size class.

B. POLE, 5"-11" diameter (Matrix)

1. FIRE: In this class of vegetation conifers are still susceptible to fire effects. Pine species become more evident in their resistance to fire. As vegetation changes, a reduced flammability begins to occur as brush replaces grass. This will remain constant until the brush matures and the ratio of live-to-dead biomass changes. Then there is a reduced risk of ignition. However, once the ignition point is reached, fires will burn with increasing intensities as biomass increases. Vegetation communities may begin to stabilize. The fuel profile is extremely sensitive to management activities at this time. Any fuel that is left from previous disturbances (logging or thinning slash) will begin to decay provided it is three inches or less in diameter. The larger material will take much longer to decay to the point that it no longer contributes significantly to the fire hazard.

2. WILDLIFE: This size class provides forage and hiding cover for elk and deer. These areas are of low value to the Northern spotted owl.

3. PEOPLE: Recreation and commercial timber values are limited. A higher risk from fire may be present due to the presence of people in the area.

4. WATER: Runoff, interception, and erosion potential are moderate as the vegetation is reestablished.

C. SMALL SAWTIMBER, 11"-21" diameter (Patches)

1. FIRE: Vegetation is continuing to stabilize. At this point the vegetation is moderately sensitive to fire. As conifer canopies continue to close the site is less prone to high intensity fires. The ladder fuels (intermediate vegetation layer) are the wildcard in this equation. If continuous fuels from ground to the canopy exist or heavy fuel loadings are present on the ground, this site is at extreme risk from stand replacement wildfires. When these fires occur, fast moving, highly destructive crown fires usually occur. These fires will have long range spotting potential and may not be contained within the confines of the LAU.

2. WILDLIFE: This size class provides dispersal habitat for the Northern spotted owl.

3. PEOPLE: High commercial timber values with limited recreation values are characteristic of this size class.

4. WATER: High interception, low runoff and low erosion potential protect water quality.

D. LARGE SAWTIMBER 21"+ diameter (Patches)

1. FIRE: Characteristics of this size class fall between small sawtimber stands and old growth and have some of the characteristics of both.

2. WILDLIFE: These stands have high value to the Northern spotted owl and the Northern goshawk, providing nesting, roosting, and foraging habitat. The areas also provide thermal cover for big game animals.

3. PEOPLE: Commercial timber opportunities (both volume and value) are high. The potential for recreation is increased and aesthetic values are enhanced as the timber becomes established.

4. WATER: High interception, low runoff, and low erosion potential protect water quality.

Table 6. LANDSCAPE FLOWS MID EVANS LAU

		WATER	WILDLIFE	PEOPLE	FIRE
MATRIX	SEEDLING / SAPLING	-Increase rapid runoff -Increase soil movement -Low interception	-Provides forage for elk and deer -Rehab of fires can draw elk away from human population areas	-Low commercial timber value & recreation value -Opens up area to development	-High potential for large, fast moving fire - low intensity -Easy to control
	POLE	-Moderate interception -Moderate runoff -Moderate erosion potential	-Provides forage and hiding cover for deer and elk	-Recreation & commercial timber values limited -Higher risk from fire on developed lands	-Same as PEOPLE -Most intensive fires -Potential for large fires -Sensitive to mgt. activities
PATCHES	SMALL SAW TIMBER	-High interception -Low runoff -Low erosion potential	-Spotted owl dispersal habitat	-High commercial timber opportunities -Recreation opportunities limited	-Vegetation moderately sensitive to fire -Potential for large, moderate to high intensity fires
	LARGE SAW TIMBER	-Same as late seral	-High value to spotted owl (nesting, roosting, foraging habitat)	-Higher commercial timber opportunities (both volume & value) -Potential for increased recreation values -Increased aesthetic values	-Characteristics of late and old growth seral stages
	OLD GROWTH	-Same as late seral	-Optimal spotted owl habitat (nesting, roosting, foraging) -Goshawk habitat -Thermal cover for big game -Optimal for most salamanders	-High commercial timber opportunities -Highest aesthetic value -Greatest recreational value -(very little available in watershed)	-Less potential for large fires -Low intensity fires
	WHITE OAK P.PINE MANZANITA	-Same as Mid seral	-Habitat for deer, turkeys, quail -Habitat for Acorn woodpecker and Lewis woodpecker	-Urban encroachment -Good recreation opportunities (hunting)	-Same as mid seral
	ALTERED	-Increased demand on water -Increased overland flow	-Fields provide forage for deer, elk and turkeys	-Increased altered lands -Fragments the landscape -Conflict for a desire for natural appearing landscape	-Increased starts -Potential increase in value loss -Increased complexity of fire suppression -Serves as potential fire break
CORRIDORS	ROADS	-Evans Creek road alters function of riparian zone -Increase intensity & frequency of peak flows -Increase potential for erosion	-Open roads increase disturbance to wildlife (poaching, traffic, noise)	-Increase need for roads -Conflict over need for roads	-Access for controls -Fire break (potential) -Increase starts
	RIPARIAN	-Increase storage -Regulates flows & temp	-Nesting, roosting, foraging habitat for wildlife -Cool summer temperatures offer refuge for elk and deer -Important salamander habitat	-Increase use & alter riparian corridors -Reduce the connectivity -Increased recreation opportunities	-May act as fire break -High potential for alteration by fire
	POWER LINES	-Same as early & mid seral	-Loss of habitat -May provide some forage and travel corridors for big game	-Increase access -Decrease aesthetic values & property values -Potential increased management constraints	-Same as early and mid seral -Increase value at risk -Increase starts -Increase complexity of fire suppression
	STREAMS	-Regulates stream flows -Sedimentation -Provides for movement out of system -Collectors of water -Water quality	-Existing low water quality limits cold water fish habitat	-Reduces & alters flows -Influences water quality & quantity -Destabilize stream structure	-Alters stream morphology -Same as PEOPLE

E. **OLD GROWTH - generally 200+ years, multi-size classes, and multi-layered** (Patches)

1. FIRE: These patches have a significantly reduced susceptibility to wildfire. They are less susceptible to outside environmental influences such as wind and rapid drying. As a general rule, these sites are less likely to suffer from catastrophic effects of wildfire. When fires occur, they are generally low intensity ground fires. These patches are at risk in the Mid Evans LAU primarily from the large proportion of earlier successional stages present in the LAU.

2. WILDLIFE: Old growth stands provide optimal habitat for Northern spotted owl. Goshawk prefer mature and old growth stands. Thermal cover for big game animals is present and they can move into the stands during periods of cold or extreme heat.

3. PEOPLE: Old growth stands have highest commercial timber values and high aesthetic values. Recreation values are high.

4. WATER: High interception, low runoff, and low erosion potential protect water quality.

F. **WHITE OAK AND PONDEROSA PINE** (Patches)

1. FIRE: These stands are fire generated and maintained. This vegetation can potentially be classified as climax species on xeric sites. Because of the frequency of disturbance on these sites, climax can only be inferred. Currently, the majority of these stands are being colonized by conifers due to fire exclusion. The stands have much more live fuel present than at any other time in recent history. These stands are ready for replacement fires at any time.

2. WILDLIFE: These stands have high value for deer, turkey, quail, and grouse. Acorn and Lewis' woodpeckers are present in the oak stands. There is increasing concern by biologists throughout western Oregon over the decline in acreage of oak woodlands due to encroaching conifers and developing homesites.

3. PEOPLE: Urban encroachment is impacting these stands. Recreational opportunities, such as hunting, are high.

4. WATER: Runoff, interception, and erosion potential are moderate as the vegetation becomes established.

G. **ALTERED** (Patches)

1. FIRE: Due to the proximity of the altered patches in the Mid Evans Creek LAU to human presence, higher risk of fire starts, increased potential value loss, and increased complexity of fire suppression are all factors that must be considered. Some of the fields and open areas may serve as a potential fire break.

2. WILDLIFE: Deer, elk, and turkeys forage in the fields. Fields and open areas are also important forage sites for raptors.

3. PEOPLE: Altered patches, most frequently homesites and fields, in the Mid Evans Creek LAU create a highly fragmented landscape. One conflict identified is a desire for a natural appearing landscape in the highly fragmented area.

4. WATER: Agricultural use in the area increases the demand for water. Increased overland flows also occur in the altered patches.

H. **ROADS** (Corridors)

1. FIRE: Roads provide access for fire control and can be potential fire breaks. Increased fire starts from cigarettes and hot mufflers can also occur.

2. WILDLIFE: Open roads increase disturbance to wildlife through poaching, traffic, noise, and increased roadkill mortality.

3. PEOPLE: Values conflict over the need for, and the management of roads. This conflict will intensify as more people move into the area and higher use occurs.

4. WATER: The Evans Creek Road alters the function of the riparian zone. Roads can also increase the intensity and frequency of peak flows and increase potential for erosion.

I. **RIPARIAN** (Corridors)

1. FIRE: Riparian areas may act as a fire break. Fire may have a high potential to alter riparian vegetation.

2. WILDLIFE: Riparian areas provide nesting, roosting, and foraging habitat for wildlife. They can serve as dispersal corridors for herptiles, birds, and mammals. Cooler summer temperatures offer refuge to elk, deer, bear and other animals. Forage values are high for many animals.

3. PEOPLE: The presence of people and settlement may reduce the connectivity of riparian areas. People use and alter the riparian areas through camping, woodcutting, tree removal, and other activities. Riparian areas offer increased recreation opportunities.

4. WATER: Riparian areas influence flow and temperature, provide large woody debris, and increase water storage to regulate flows.

J. **POWERLINES** (Corridors)

1. FIRE: The Pacific Power 500 Kv line right-of-way vegetation is maintained in the early successional size class. The spread of fire through these areas is the same as those listed above in the discussion of these stages. Powerlines increase the complexity of fire suppression.

2. WILDLIFE: The seedling/sapling & pole size classes may provide forage and travel corridors for big game animals. Habitat is altered when lines are constructed.

3. PEOPLE: Powerline roads increase access to the area. The lines affect aesthetic values and may reduce property values. Increased management constraints are present in powerline areas.

4. WATER: Same as seedling/sapling & pole size classes.

K. **STREAMS** (Corridors)

1. FIRE: Fire can alter stream morphology, alter flows, and destabilize stream structures which can influence water quality and quantity.

2. WILDLIFE: Existing low water quantity and quality can limit cold water fish habitat, and may interfere with movement of fish throughout the landscape.

3. PEOPLE: Several water diversions in the area reduce and alter stream flow. People can also influence water quantity and quality and destabilize stream structure.

4. WATER: The amount of water present regulates stream flows and quality. Streams act as collectors of water. Water provides movement of sediment through the landscape.

VII. DISTURBANCES/SUCCESSION

A. PRE-SETTLEMENT LANDSCAPE 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 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 Mid Evans Creek LAU must be based on the assumption that it resulted from human intervention. There is no specific information about the pattern of vegetation in southwestern 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 landscape were mentioned in the cultural/historic overview already prepared for this LAU. Disturbances led to a landscape that where forested, supported widely scattered (4 to 6 trees per acre) large diameter Douglas fir and ponderosa pine with an understory of grass. Based on the 1916 Revestment Survey records, the majority of the area (92 percent) was grass covered or oak/grass savannah.

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 LAU 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 or catastrophic stand replacement fires regulated stand density. Stand conditions in the white oak, pine, 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 landscape. This species mix provided "natural" barriers that restricted the spread of insects and disease.

4. FIRE

Prior to European settlement, fire played a major role in the disturbance regime in the Mid Evans LAU. In this report, American Indian practices of burning will be considered as part of the natural process. The resulting fire and vegetation patterns before European settlement will be considered part of the natural system.

About 65 percent of the landbase is classified as southerly aspect in this watershed. Under TPCC classifications south aspect ranges from 90° to 315° F. The remaining 35 percent is classified as north aspect. This information is important in determining both fire history and distribution of seral states. Based on this information, 40 to 60 percent of this watershed is expected to be maintained in an early seral state, with 5 to 15 percent in the mid-seral category and late seral ranging from 20 to 30 percent. Approximately 20 percent of the watershed would have been in white oak woodland series, with 80 percent in the Douglas fir series.

Accurate data on fire occurrence and intensities for the last 25 years are available. Prior to this fire scars and age classes of reproduction are used to establish fire return intervals. In addition, vegetation types recorded in various documents, such as the 1916 Revestment surveys and survey notes can be used. Historical references can be used to establish fire occurrence rates.

In the Mid Evans watershed the "natural return interval" would have been 10 to 20 years in the white oak woodlands. On the south aspects, a 10 to 20 year return interval is anticipated. 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 not have had sufficient time to accumulate to provide for high intensity fires. Fire originating on the south slopes would have raced up these 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 conifer stands to occur.

The north slopes would have had a 15 to 40 year fire return interval. With longer time frames between fire return, conifers would have had a better chance to become established. 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 been some pockets that would have survived, these pockets of refuge would provide today's old growth. In the areas that were subjected to moderate intensity underburns, stand densities were considerably less than they are today. With the advent of fire suppression stand species composition changed. In the absence of fire more fir would be present.

The white oak woodland was burned on a 10 to 20 year fire return interval. The majority of the white oak woodland would have been on the valley floor and the midslope and lower elevations 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 by humans. This series would be classified as early successional.

Most stands of oaks and pines were open savannah with a grass/brush understory. This fuel type would have produced fires that caused minimal long-term losses to site productivity. Most Douglas fir occurred on the north slopes and in clumps in the draws that served as pockets of refuge from the many fires that occurred. The Douglas fir that did occur was open grown with low commercial value. There were few incense cedar and probably no white fir present due to fire frequency. 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 current weather conditions.

B. POST SETTLEMENT LANDSCAPE 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 higher frequency and 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 to 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"

Initial European disturbances in the Mid Evans Creek LAU probably began in 1826. Beaver trappers could have impacted stream morphology if the region supported animals of high enough quality to warrant heavy harvest. Riparian vegetation would shift toward more willow and alder, and fewer conifers.

Hydraulic gold mining changed the channel of Evans Creek where it flows through the LAU. Cinnabar and lode mining adits are now habitat for bats.

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 has allowed development of dense understories of Douglas fir to occur in stands that were historically more open. There is little likelihood of achieving an equilibrium state with present conditions. A single disturbance event can negatively impact a large portion of the landscape - such as the Sykes Creek fire of 1987, which burned 10,000 acres.

Logging became the greatest human disturbance influence on this landscape during World War II. From the time of the O&C Act of 1937 until the mid-1950s, BLM harvest activities were partial cuts. The O&C Act called for implementation of a sustained yield cutting program so continuous forest production could be assured. A salvage timber sale followed a fire in Sykes Creek in 1956. Murphy Gulch was tractor logged in 1966. Access road construction and a system of three-stage shelterwood cutting became the preferred logging treatment in the early seventies. Small clearcuts, most less than 20 acres, were logged in the mid-seventies. For most of the Medford BLM District, this practice didn't become widespread until 1979, when a Management Framework Plan was signed. New guidelines in this plan included clearcut size limitations, stream buffer width guidelines, and impetus for intensive forest management.

A fenced progeny test site plantation was installed in Murphy Gulch in 1989, which was near the time when the last remaining merchantable BLM timber was salvaged from the Sykes Creek fire area.

Garbage disposal of domestic trash and abandoned vehicles at dispersed recreation sites is becoming a problem. Trampling of soils and compaction results in bare ground conditions near the streams at these sites. The potential for out-of-control campfires increases likelihood of disturbance . Nonnative weed species may be carried with soil on logging equipment. The spread of nonnative weeds is also associated with horse-back riding (seeds present in hay and manure). Stream contamination may occur through human and livestock waste entering the stream.

b. Livestock

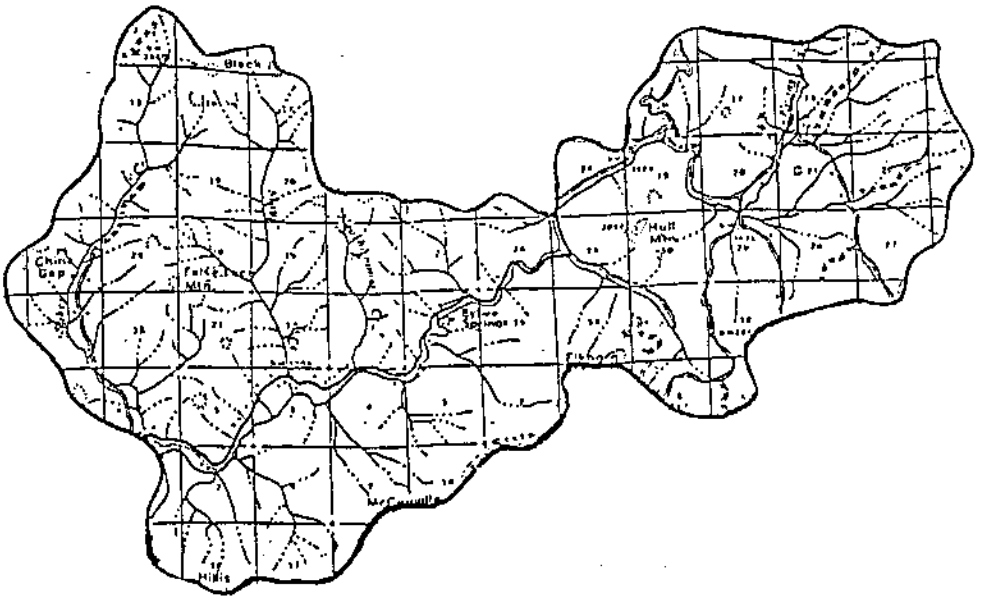
It is difficult to say how much of an impact domestic livestock have had on the vegetation within the Mid Evans Creek LAU since the advent of human settlement. Livestock may have contributed as much to the spread of noxious weeds as earth moving or fire fighting equipment, however. In addition, they may have altered small portions of vegetation, but probably not much in this LAU. Although in some parts of the west, livestock have drastically altered the vegetative community, there is no indication that they have done so here.

c. Noxious Weeds

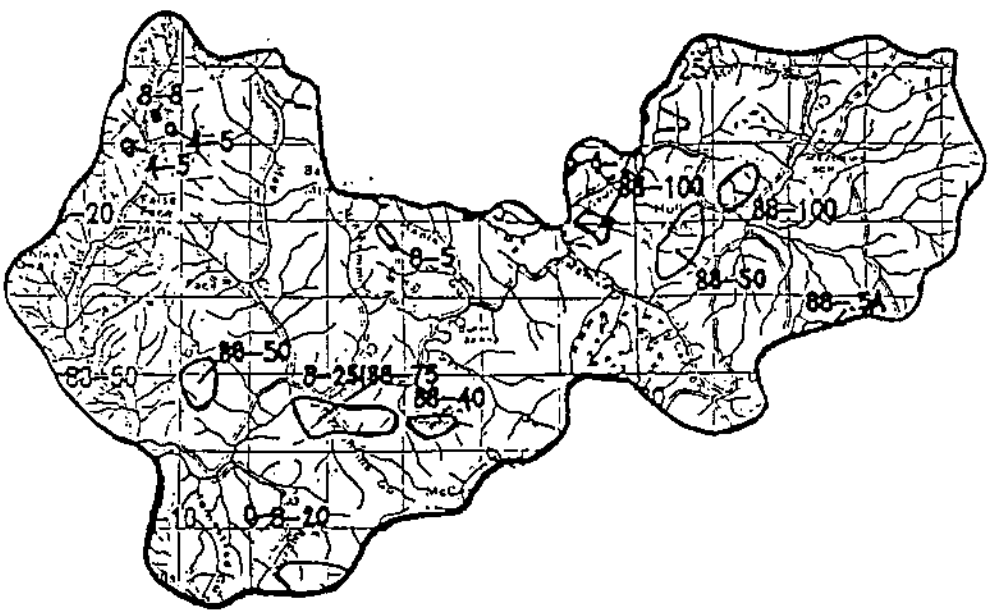
During and after the time of white settlement, exotic plant species became established on all mid-latitude continents. Other forms of introduction were probable. This includes livestock bedding and forage, wool, and seeds imported for rootstocks for early gardens and herb beds. Without their natural 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 LAU.

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 the extent they have disrupted the Mid Evans Creek landscape is difficult to say.

Figure 1. Maps of 1986 and 1993 Aerial Insect and Disease Surveys



1986 - No detectible areas of insects or disease.



1993 - The bark beetle populations are increasing and affecting predominantly ponderosa pine. The first number "88" indicates western pine beetle affecting second growth ponderosa pine. The "8" indicates western pine beetle affecting larger diameter ponderosa pine. The second number represents the number of trees affected.

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 Mid Evans Creek landscape 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 Mid Evans Creek landscape, conifer mortality due to drought and bark beetles is occurring on ridgelines and south and west aspects in the Douglas fir series (refer to Figure 1). In the white oak series and pine series, conifer mortality is occurring throughout all topographic features.

Western pine beetle (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 percent+) epidemic levels of insects may occur and would affect all vigor and size classes. Stand replacement may occur, shifting stands toward an earlier successional state. Bat and bird populations can provide buffering effect on severity of insect outbreaks.

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

The maps shown in Figure 1 indicate an increase in bark beetle populations due to low tree vigor. The low vigor is attributed to high stand densities and a prolonged drought that began in 1986.

5. FIRE

Currently a large portion of the Mid Evans LAU is at high risk for wildfire. Fire records show this watershed has averaged 13 fire starts per year for the last 25 years. Seventy five percent of the fire starts are human caused. Two large fires in this LAU have occurred in the last 38 years. Both burned in the Sykes Creek drainage. The first was a 5,000 acre fire in 1956 and the second a 10,000 acre fire in 1987. In both cases these stands appear to have been 20 to 30 years old. Currently, 67 percent of this watershed falls into this age group. Historically (over the last 25 years) we can show that 61 percent of the fires that occur in this LAU fall into the 10 to 100 acre size class. Due to the high percentage of early age classes and the high number of starts, this LAU is placed in both high risk and high hazard categories (hazard is defined as the amount of fuel present on the site).

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 percent 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 FM 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 FM 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 that 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, otherwise 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.

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 Mid Evans landscape 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 an 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 Mid Evans landscape. 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 (Figure 4). Snags and downed logs are generally rare as many are/were consumed by repeated fire.

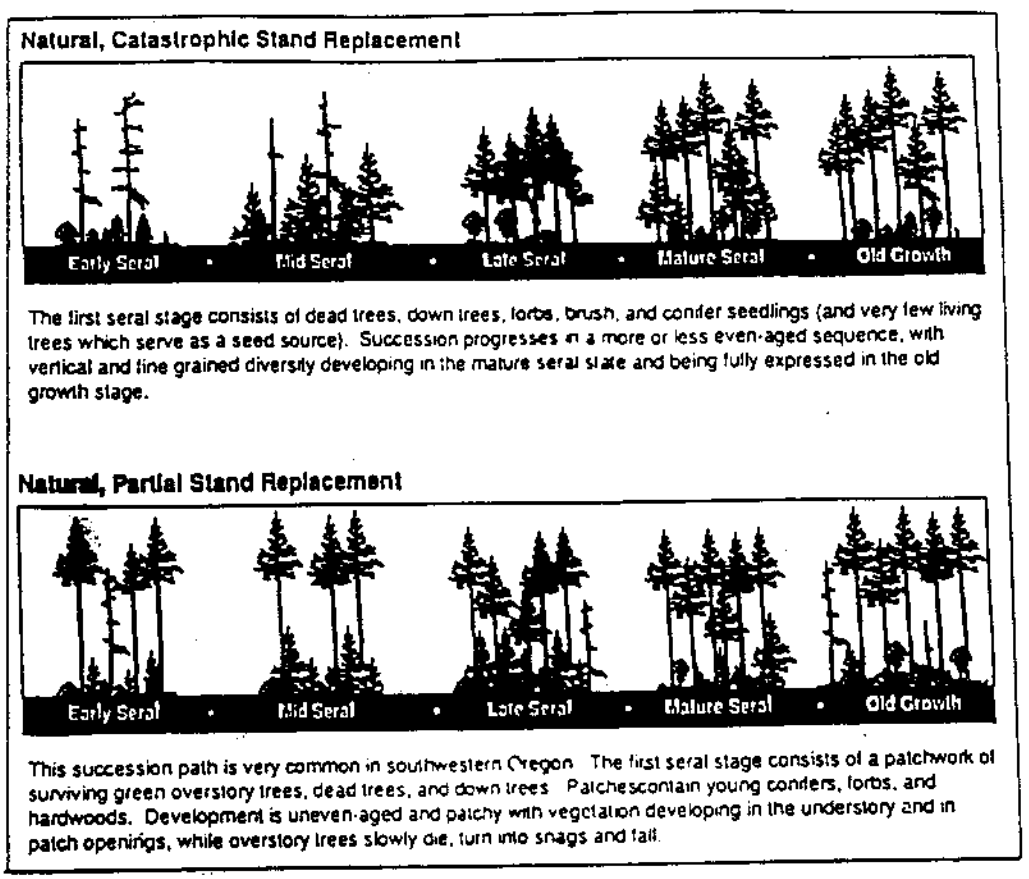
SUCCESSIONAL PATTERNS

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.

Figure 2.



GRASS --- OAK SAVANNAH --- OAK FORESTS --- OAK/PINE FORESTS

GRASS - incidental amounts of hardwoods or shrubs.
OAK SAVANNAH
- Widely spaced/open grown white oak (driest sites) and black oak
- Canopy closure less than 25 percent
- 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 may represent minor "climax species or an incidental tree which occurs on favorable microsites 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 principal 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 microsites.

3. DOUGLAS FIR SERIES

Depending upon the severity of disturbance, Douglas fir follows the successional trends illustrated in Figure 2. 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 species. Herbaceous vegetation may include baldhip rose, western starflower, fern, lupine, hairy honeysuckle, and strawberry.

VIII. LINKAGES

A. FIRE

Fires may move from one watershed to another if weather conditions are conducive to large fires. Fires will only 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 these 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 landscape. Often these storms create many fires that may burn together, linking several drainages into one conflagration.

B. WILDLIFE

Elk, deer, and turkeys move among Mid Evans Creek and the surrounding watersheds. Elk move into Sams Valley to forage and into the thermal and hiding cover of the forests in the Mid Evans Creek area. Elk are present in Sardine Creek to the south, and move north into the Mid Evans Creek area. Deer and turkeys move in and out of the watershed in a random pattern.

Neotropical birds 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 landscape in 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 landscape is an important "linkage" that should not be overlooked.

C. PEOPLE

People flow in and out of this LAU 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, with other special forest products secondary.

Recreation use within the LAU is low with some hunting, fishing, and swimming. People generally pass through Mid 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 domestic and agricultural uses. Continued settlement into this LAU has occurred not only along the creek, but moved up onto the hillside and into tributary drainages.

D. WATER

Evans Creek is a link from the Rogue River to spawning habitat in other landscapes. Adult and juvenile coho salmon, steelhead, and cutthroat trout migrate from the Rogue River through the Mid Evans Creek landscape. Fish spawn in the tributaries. Juvenile fish migrate throughout the landscape seeking food and cool waters in springs and tributaries. Steelhead and salmon smolts migrate through the area to reach the ocean. Fish may also move from the Rogue River into Evans Creek 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.

IX. 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 landscape analysis. This includes, among others, riparian management area (RMA) widths, coarse woody debris requirements, the role of fire, identification of species/habitats that will require survey to protect identified species.

1. **Riparian Management Area:** RMAs generally parallel the stream network, but also include areas necessary for maintaining hydrologic, geomorphic, and ecological processes. RMAs occur throughout the landscape 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 landscape analysis (LA) 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 LA may change the distance of these RMAs based upon individual area characteristics. The distances are horizontal 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 RMAs 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 BLM Geographical Information System (GIS) as of January 1, 1994) 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 be protected.

3. **Green Tree Retention Guidelines:**

A. Northern General Forest Management Areas (GFMA): Leave 6 to 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 to 18 green trees per acre in harvest units, and 25 to 30 percent of <u>each</u> C/D block must be in a late successional forest condition at any point in time.

C. Southern GFMA: Leave 16 to 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 landscape analysis.

4. **Snag Retention Guidelines:** Retain snags, live cull trees, and green merchantable trees to provide a minimum of approximately 40 percent 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 three decades) snag requirements. However, sufficient snags must be left on site at the time of harvest to meet short term (less than three 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 landscape 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. This would include national forest land where appropriate. The guideline (subject to change) is to retain at least 15 percent of federal land within analytical watersheds in a late successional condition at any point in time. There is no additional breakdown. All land allocations (RMAs reserves, LSR, recreation sites, etc.) are to be used when calculating the 15 percent. Also, the 15 percent 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. **Others:** These are other pertinent guidelines that apply to operations within the matrix that are important. These include survey requirements: protection of wildlife habitat from overgrazing, bat roosting, protection of soil and litter-dwelling organisms, etc. These are detailed in the FSEIS, particularly in the "B" appendices. Also, the Aquatic Conservation Strategy contains many objectives that need to be complied with during any activity within the RMA, not just timber harvesting.

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, such as 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 FSEIS appendix B-8, p. B-133, for fire management standards and 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 landscape 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 landscape 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 principals 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, schist, 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.

X. PUBLIC INVOLVEMENT SUMMARY

A. PUBLIC INVOLVEMENT SOLICITATION

During this process attempts were made to seek input and involvement with the public in the identification of issues and concerns and the development of objectives for the Mid Evans landscape unit. The initial effort was to mail over 300 letters to landowners within the landscape, along with interested public, and seek input as to what they identify as issues, concerns, or opportunities within the LAU (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 Mid Evans Creek Landscape Unit. It should be noted that the responses are for the Mid and West Evans Landscape Units and some issues may be specific to West Evans. This document addresses <u>only</u> the Mid Evans Creek LAU.

Those respondents that requested to be kept informed will be included in the review of our "DRAFT" Mid Evans Creek Landscape Analysis. A public meeting will be held for further identification of and concerns to work toward 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. Quality of Recreational Areas irreversibly impacted by irresponsible logging practices.
b. 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. Restore Sykes/May Creek watershed from impacts of past logging, fire and drought
b. Too many roads - put unneeded roads to bed

5. WATER

a. Water quantity, East 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 1992)

XI. LANDSCAPE MANAGEMENT OBJECTIVES

An objective is defined as something towards which management effort is directed, or the desired outcome. Well written objectives should clearly state what is needed, why it's needed, where it's needed, how much or how many are needed, and how to determine when it is accomplished. These sound like easily answered questions, but the more time spent developing objectives, the more one realizes how cumbersome these tasks 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 fish 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: INCREASE NATURAL PRODUCTION OF SALMON, STEELHEAD AND TROUT.

RATIONALE: To prevent listing coho and steelhead as a "Threatened and Endangered" species and to improve fishery in the stream.

POSSIBLE ACTION: Improve/increase fish passage in Evans Creek by:

1. Stabilizing streambanks
2. Removing or modifying barriers (dams, culverts, etc.)

POSSIBLE ACTION: Improve fish habitat in Evans, Sykes, and May creeks by:

1. Creating properly functioning riparian buffers
2. Stabilizing streambanks and flows
3. Reducing sediment loading from adjacent watersheds and tributaries
4. Improving stream structure (riffle-pool ratio, large woody debris, etc.)
5. Create and maintain diverse vegetation component in RMA

MEASUREMENT/MONITORING: Fish population census, redd counts, stream survey data collection

SUCCESS: Increased salmon and steelhead production with higher numbers of salmon, steelhead and trout in Evans Creek. Return of population levels to numbers present prior to need for establishment of Oregon Forest Practices Act.

B. OBJECTIVE: PROVIDE FOR A SUSTAINABLE HARVEST OF FOREST COMMODITIES. FOREST COMMODITIES INCLUDE TIMBER, FIREWOOD, AND SPECIAL FOREST PRODUCTS (boughs, mushrooms, burls, etc...).

RATIONALE: Provide for a regulated flow of forest products for economic stability. Maximize growth and yield of timber resources to insure sustainable harvest levels.

POSSIBLE ACTION:

1. To enhance tree vigor and growth, a variety of silvicultural treatments will be utilized, including: site preparation, tree planting, mulching, tubing, scalping, brushing, fertilization, gopher baiting, thinning, etc.

2. Identify potential timber harvest areas. Conduct stand exams to assess current stand conditions and management needs. Use exam information to prioritize treatment areas. Proposed harvest areas will be compatible with landscape and management plan objectives.

3. On harvested areas, maintain long-term site productivity and biological legacies by retaining coarse woody debris, snags, and green trees.

4. Identify current and potential areas for special forest products. Manage special products to prevent excessive use or unacceptable impacts to the resource or site. Develop management plans.

MEASUREMENT/MONITORING: Utilize permanent 5-point inventory plots to monitor forest growth and to adjust or develop probable sale quantities. Develop a monitoring plan for special forest products.

SUCCESS: Demonstrated sustainability of commodities.

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 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, identify late successional patches (>150 years and at least 50 acres in size) that are suitable to maintain or enhance for interior forest conditions.

3. Design management activities to provide edge-to-area ratios that 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 landscapes are 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, and 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. Prioritize stands that are less than 150 years old with relative densities greater than 50 percent. Utilize underburning to thin where appropriate.

3. Improve horizontal and vertical diversity in even-aged plantations, create canopy gaps, encourage species diversity and maintain unthinned clumps. Current opportunities exist in sapling to pole size stands and the Sykes Creek fire area.

4. Shift areas of the white oak plant community to early successional oak savannahs through the use of prescribed fire. Low elevation sites in the eastern portion of the landscape would be the primary areas for treatment.

5. Stabilize soil by reducing compaction and 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 expansion of weeds from surrounding watersheds by use of native species of grasses, forbs, and shrubs whenever possible.

8. Maintain a diversity of age/size classes throughout the landscape. Utilize historic range of natural variability to determine target acres.

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 to 50 percent (stand vigor and growth are maximized). Diversity of plant and animal species is increasing. Annual insect and disease aerial surveys.

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

E. OBJECTIVE: INCREASE LATE SUCCESSIONAL FOREST CONDITIONS, PARTICULARLY OLD GROWTH CONDITIONS, IN THE DESIGNATED CONNECTIVITY BLOCK, SECTION 17, T34S R3W.

RATIONALE: Connectivity blocks and late successional stands provide for movement and dispersal of plant and animal species. The blocks provide for biological and ecological flows.

POSSIBLE ACTION:

1. Manage even-age plantations to accelerate the development of stand structure. Create canopy gaps, favor development of a variety of tree species (conifer and hardwood). Thin to differing residual density levels; dependant upon topographic position and aspect. Leave clumps of un-thinned trees. Target stands adjacent to May Creek and on northerly aspects for initial treatments.

2. Maintain and protect stands that are currently greater than 150 years old.

3. Conduct stand exams to describe existing vegetative condition and structure in pole size and larger stands.

4. Manage fuel loadings to increase or maintain late successional forest condition.

MEASUREMENT/MONITORING: Use stand exam data to compare with stand growth models.

SUCCESS: A minimum of 25 to 30 percent of the connectivity block closely resembles old growth systems in composition, structure and function.

F. OBJECTIVE: REDUCE POTENTIAL FOR CATASTROPHIC FIRE.

RATIONALE: The Mid Evans LAU has a presently high fire occurrence rate, and large fires have occurred in the past.

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

1. Reintroduction of fire to promote ecosystem health
2. Reduce existing fuel load and stand density
3. Create fuel breaks to reduce fire size
4. Target rural interface area for fuel reduction
5. Promote fire awareness
6. Reduce fuel loads from BLM management activities
7. Use 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, in fire intensities, and reduction in number of catastrophic fires.

G. OBJECTIVE: COORDINATE WITH ODF&W TO MANAGE ELK HABITAT AWAY FROM RURAL INTERFACE AREAS.

RATIONALE: Some damage complaints are received due to elk. Improving elk habitat away from rural interface areas may encourage hunting away from these areas and maintain hunting opportunities.

POSSIBLE ACTION: Provide habitat in other areas. Explore opportunities for road closure to protect areas important to elk.

MEASUREMENT/MONITORING: Checking damage reports. Radio collar elk to determine movement/habitat use. Decreased complaints.

SUCCESS: Increased number of elk using areas away from urban interface.

XII. SPATIAL DESIGN

Spatial design provides a landscape view of desired conditions and vegetation patterns. The design provides direction and defines trends necessary to accomplish the stated landscape objectives.

The first step in spatial design is defining which biological and physical conditions are sustainable. Four factors that play a significant role in ecological sustainability and diversity in the Mid Evans Creek LAU are:

1. Human occupation and distribution

2. Natural disturbance regimes, particularly fire.

3. Topography/landform
   * north/south aspects
   * ridges/mid-slope/riparian areas
   * soil types
   * elevation

4. Plant communities and successional stage (dependant upon 1&2 above.)

Future desired conditions need to be consistent with the ecological capabilities of the landscape. Incorporating the three factors above are essential in planning management actions and projecting target landscape conditions.

Forest ecosystems are complex, dynamic, and always changing. No single condition can be maintained permanently. Instead, a range of "natural variability" occurs over time. Ecosystems within this range of variability are considered functional and sustainable. Ecosystems that fall outside this range are potentially unstable, and may not be sustainable naturally.

To establish the range of natural variability for the Mid Evans Creek landscape, a point in time was chosen to reconstruct what the landscape looked like prior to significant management activities (logging and fire control). The 1916 O&C revestiture survey notes, the earliest documentation inventory available, were used to reconstruct how the landscape looked 78 years ago. These notes provide a picture very different from today's conditions.

A. HISTORIC CONDITION SUMMARY (based on 1916 O&C Revestment Survey)

The Government Land Office hired surveyors and timber cruisers to inventory revested O&C Railroad lands in the fall of 1916 (see page 10). At this time, each section of O&C property was inventoried by 40-acre subdivision. Land was classified as to suitability for agriculture or timber production. Merchantable timber volume was cruised utilizing the standards of the day. Soils were evaluated for suitability for producing various agricultural crops. Ground cover vegetation was evaluated for its value for forage (grass and browse). The "remarks" section included general information such as natural grass, dense brush, conifer reproduction, fire history, etc. In general, there were two classifications of land: agricultural land, and timber land.

1. <u>Timber lands</u>

Approxoximately 8 percent of the O&C revested lands in the Mid Evans Creek watershed were classified as forest lands, with an average stem diameter of 28 inches, average number of trees per acre of 9.5 and an average volume per 40 acres of 13.14 thousand board feet. Review of this data, indicates that open park-like stands of timber existed with low stocking levels, and

low volumes per acre. In general, the pine was of high quality, the Douglas fir low quality, and some non-merchantable cull old growth.

Native grasses and light brush species dominated the understory. Frequent, low intensity fires set by settlers are mentioned. No "remarks" suggest heavy concentrations of seedlings, saplings, or pole stands. Since this inventory took place during the homestead entry period, high emphasis was placed on potential agricultural endeavors. Open ground, small amounts of brush, and presence of native grasses suggest a more frequent, less intense fire interval than currently exists. Also, grazing by cattle, sheep, and goats was common. The 1916 data collection period pre-dates major disturbance from commercial logging activities. If visibility was poor, if an area was brushy, or if reproduction of conifers were present, it was documented. Low value was placed on the timber due to low volumes, high logging costs, and distance from markets (mostly economic and engineering constraints).

2. Agricultural lands

Approximately 92 percent of the surveyed lands in the mid-Evans watershed were classified as agricultural (predominately grazing). These lands have a similar average stem diameter (28 inches) with only 2 - 5 trees per acre, and much lower volumes per acre than the timber lands. These agricultural lands are lower in elevation, closer to roads, have less vertical topography, and are in closer proximity to water. Understory vegetation was dominated by natural grasses and light brush. As in the timber lands, little mention was made of reproduction or presence of non-merchantable size conifers. When oaks and other hardwoods were present, estimates of cordwood were made. Estimates and stocking levels of hardwood species are difficult to reconstruct with any accuracy.

3. Summary

This information, combined with knowledge of fire frequency, and present stand ages and structure, would suggest a landscape that historically had high amounts of early successional forests. Older trees occurred as a widely scattered stand component, providing minimal overstory canopy closure, typically less than 40 percent. These stands generally functioned as early successional forests. Where aspects were favorable, and fire intensity was low to moderate, small pockets of older trees (>80 years) were present. There was minimal acreage of stands with old growth characteristics. These were probably less than 5 percent of the landscape (see map 3).

B. CURRENT CONDITION

Seventy-eight years have elapsed since the 1916 inventory. In looking at today's data, it is evident that most of the Mid Evans Creek watershed (O&C land) is forested with either oak/pine woodlands or pine/fir conifer forests. Open, park like stands of conifer timber have been replaced with dense sapling, pole, and mature trees. Open oak savannahs have been replaced by dense oak woodlands dominated by dense brush with little grass. In contrast to 1916, visibility is reduced, foot or horse travel is difficult, native grasses are scarce. Dense brush is dominant. Where timber management activities have occurred, well-stocked conifer plantations exist.

Seral diversity is discussed in chapter 4 of the RMP (Environmental Consequences), pg. 23. It states, "Because the planning area contains large amounts of privately-owned land, an optimum mixture of seral stages on BLM administered land may not be optimum for the landscape." (RMP, 1992)

Comparing the information from the 1916 revestiture survey and the existing conditions, it

appears there is little chance that the Mid Evans Creek sub-watershed LAU will ever contain the seral diversity and percentages as stated in the RMP.

C. DESIRED FUTURE CONDITION

The intent of the landscape design is to identify land management direction that will best meet the resource objectives. The design team has recognized that ownership within the landscape is fragmented, and implementing this design on only BLM lands will not fully meet the identified objectives. If landowners embrace these objectives, future desired conditions will include partnerships that can work together towards these objectives.

1. Fire Management

The affects of fire on the watershed has been determined to be the most limiting factor in managing the landscape. To minimize the spread of catastrophic (stand replacing) fires, it is suggested that vegetation on ridgetops separating drainage compartments be managed as fuel breaks (control lines). Stand structure within the strip would be widely scattered large trees with low shrub and grass component making up the understory. This structure would slow the spread of a major fire and provide a logical control line. Protection of ponderosa pine as the scattered large trees on the ridgeline would contribute to maintenance of the pine species as a major seral stage. These strips should also provide improved elk foraging areas that will encourage elk movement to higher elevations. When conflicts with specially regulated lands (such as Northern spotted owl core areas) arise, a suitable modified fuel break would be designed.

Prescribed underburns to reintroduce fire into the white oak/ponderosa pine series would move this type towards the oak savanna and away from current conditions that are resulting in high fuel loadings and high risk of catastrophic stand replacement fires. The open oak savannas would act as fuel breaks within the landscape, aiding in the protection of valuable resources within the rural interface and across the landscape, while improving wildlife habitat and contributing to the diversity within the landscape.

Moving down the watershed onto the side slopes, stand density, vegetative species diversity, and fuels reduction would be used to manage the spread and intensity of wildfire within the watershed. High emphasis would be placed on fuel reduction within and surrounding the rural interface area. The flow of fire between private and public land will be the most demanding management problem in the watershed. Cooperative management projects between private land owners and public land managers would yield the best opportunity for success.

2. Forest Health

Healthy forest stands would consist of a diversity in species, size, and age classes. Stands would be thinned to reduce current dense conditions and encourage diversity. Regeneration harvest within the landscape would meet the Southern General Forest Management Area regime in order to protect sensitive soils, moderate temperature extremes, create diversity, and reduce fire intensities. Emphasis for timber harvesting would be in the matrix lands within the landscape.

3. Forest Commodities

Harvesting of forest commodities would occur throughout the landscape where opportunities exist. Inventories would indicate opportunities for sustainable harvest levels of forest products. Consideration would be made to utilize those forest products which become available in meeting other resource objectives.

4. Fisheries, Aquatic, and Riparian Conditions

The need to prevent the listing of coho salmon and steelhead as a T & E species and the observed low reproduction rates on the streams within or influenced by this watershed demonstrate a need for restoration. Streams with unimpeded fish passage, stable banks, and properly functioning riparian buffers would create improved habitat for these species. Stream buffer widths may vary due to site specific conditions. The desired stream condition is to have streams with stabilized flows, at levels adequate for spawning, rearing, and genetic linkages throughout the system.

Properly functioning riparian buffers would consist of a continuous stable vegetative component (late successional) that would help regulate stream flows, temperature, increase storage, and provide natural recruitment of down woody material adding structure to streams.

5. Connectivity

Connectivity within and between watersheds would increase by maintaining existing late successional reserves and increasing late successional stages in riparian buffers, designated connectivity blocks, and owl core areas. This will provide a buffering of microclimates, nutrient retention, carbon storage, and nutrient recycling, along with protection of a diversity of late successional dependent species.

XIII. CONCLUSIONS

Based on the preceding analysis, the following conclusions can be drawn for the Mid Evans Creek sub-watershed Landscape Analysis Unit:

1. Human habitation and activity play a major role in this LAU.

2. The control of major fires is crucial to the private landowners and major land managers within this LAU.

3. This sub-watershed, based on soils, aspect, and past fire history, will never meet the goal of desired forest seral stages identified for the Southwest Oregon Ecosystem as described in Chapter 4 (Environmental Consequences) of the RMP.

4. Without partnerships between private landowners and public land managers, the landscape management objectives listed in this document will be difficult, if not impossible, to achieve.

5. There are no short cuts or easy remedies to some of the resource objectives in this LAU. It will require a long term commitment from all those involved to resolve many of the identified problems.

6. Some of the issues addressed in this document have little available inventory information. The need for more in-depth surveys has been identified. Such issues as presence of sensitive wildlife species, neotropical birds, amount of snags and down woody material, and vegetative condition on private lands are but a few of the issues which need more data to support the decision making process before informed management decisions can be made.

7. This is a dynamic document which is open to change as more information is gathered.

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AND

GLOSSARY

BIBLIOGRAPHY

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GLOSSARY OF TERMS

Adit - A horizontal entrance to a mine

Analytical Watershed - For planning purposes, a drainage basin subdivision of the planning area used for analyzing cumulative impacts on resources.

Anadromous Fish - Fish that migrate as adults from the ocean into fresh water streams to reproduce young that return to the ocean to grow to maturity.

Animal Unit Month (AUM) - The amount of forage necessary for the sustenance of one cow or its equivalent for one month.

Big Game - Large mammals that are hunted, such as Roosevelt elk, black-tailed deer, and black bear.

Biological Diversity - The variety of life and its processes.

Biological Legacies - Components of the forest stand (e.g., large trees, down logs, and snags) reserved from harvest to maintain site productivity and to provide structure and ecological functions in subsequent forest stands.

Broadcast Burning - A controlled fire that burns within defined boundaries to achieve management objectives.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed, or Bureau-sensitive species.

Bureau-Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Cambial - A layer of cells in the stems and roots of vascular plants that generates phloem and xylem.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

> Category 1. Taxa for which the FWS has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.
>
> Category 2. Taxa for which the FWS has information to indicate that listing is possibly appropriate. Additional information is being collected.

Cavity Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Cavity Excavator - A wildlife species that digs or chips out cavities in wood to provide a nesting, roosting, or foraging site.

Cavity Nester - A wildlife species that nests in cavities.

Climax Plant Community - The theoretical, final stable, self-sustaining, and self reproducing state of plant community development that culminates plant succession on any given site. Given a long period of time between disturbances, plant associations on similar sites under similar climatic conditions would approach the same species mixture and structure. Under natural conditions, disturbance events of various intensities and frequencies result in succession usually culminating as sub-climax with the theoretical end point occurring rarely if at all.

Commodity Resources - Goods or products of economic use or value.

Community Stability - The capacity of a community (incorporated town or county) to absorb and cope with change without major hardship to institutions or groups within the community.

Concern - A topic of management or public interest that is not well enough defined to become a planning issue, or does not involve controversy or dispute over resource management activities or land use allocations or lend itself to designating land use alternatives. A concern may be addressed in analysis, background documents, or procedures or in a noncontroversial decision.

Connectivity - Habitat that provides components of older forest characteristics for spotted owl dispersal and other species' natural habitats.

Consistency - Under the Federal Land Policy and Management Act, the adherence of BLM resource management plans to the terms, conditions, and decisions of officially approved and adopted resource related plans, or in their absence, with policies and programs of other federal agencies, state and local governments and Indian tribes, so long as the plans are also consistent with the purposes, policies, and programs of federal laws and regulations applicable to BLM-administered lands. Under the Coastal Zone Management Act, the adherence to approved state management programs to the maximum extent practicable, of federal agency activities affecting the defined coastal zone.

Core Area - That area of habitat essential in the breeding, nesting, and rearing of young up to the point of dispersal of the young.

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

Cover - Vegetation used by wildlife for protection from predators to mitigate weather conditions or to reproduce.

Critical Habitat - (1) Specific areas within the geographic area occupied by a threatened or endangered species at the time it is listed. These areas must have physical or biological features essential to the conservation of the species and which may require special management considerations or protection. (2) Specific areas outside the geographical area occupied by a threatened or endangered species at the time it is listed determined by the Secretary to be essential for the conservation of the species.

Crucial Habitat - Habitat that is basic to maintaining viable populations of fish or wildlife during certain seasons of the year or specific reproduction periods.

Cull - A tree or log that does not meet merchantable specifications.

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cumulative Effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Diameter At Breast Height (dbh) - The diameter of a tree 4.5 feet above the ground.

Dispersed Recreation - Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are primarily for access and protection of the environment rather than comfort or convenience of the user.

Early Seral Stage - See Seral Stages.

Economically Feasible - Having costs and revenues with a present net value greater than zero.

Ecosystem - An interacting natural system including living organisms and the nonliving environment. Ecosystems may vary in size. For example, the community of microorganisms in water, the lake which contains the water, the watershed the lake resides in, and the mountain range containing the watershed.

Edge Effect - An ecologically important biological effect that occurs in the transition zone where two plant communities or successional stages meet and mix.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Endemic - belonging to or native to.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action.

Exotic Plants - Plants that are foreign to the watershed, not native.

Forest Health - A condition which expresses the forest's relative ability to remain productive, resilient, and dynamically stable over time and to withstand the effects of periodic natural or man-caused stresses such as drought, insect attack, climatic change and changes in management practice and resource demands.

Fragile Nonsuitable - A Timber Production Capability Classification indicating forestland having fragile conditions, which if harvested, would result in reduced future productivity even if special harvest or restrictive measures are applied. These fragile conditions are related to soils, geologic structure, topography, and ground water.

Green Tree Retention - A stand management practice in which live trees as well as snags and large down wood are left as biological legacies within harvest units to provide habitat components over the next management cycle.

> High Level - A regeneration harvest designed to retain the highest level of live trees possible while still providing enough disturbance to allow regeneration and growth of the naturally occurring

mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old growth dependant species.

Low Level - A regeneration harvest designed to retain only enough green trees and other structural components (snag, coarse woody debris, etc.) to result in the development of stands that meet old growth definitions within 100 to 120 years after harvest entry, considering overstory mortality.

Hiding Cover - Generally, any vegetation used by wildlife for security or to escape from danger. More specifically, any vegetation capable of providing concealment (e.g., hiding 90 percent of an animal) from human view at a distance of 200 feet or less.

Home Range - The area an animal traverses in the scope of normal activities; not to be confused with territory which is the area an animal defends.

Impact - A spatial or temporal change in the environment caused by human activity.

Indigenous - Living or occurring naturally in a specific area or environment.

Intermittent Stream - A stream that flows most of the time but occasionally is dry or reduced to pools.

Landscape - An area composed of interacting ecosystems that are repeated because of geology, landforms, soils, vegetation, climate, and human influences.

LAU - Landscape Analysis Unit.

Landscape Management - The application of ecosystem management practices to the specific area affected by the PRMP.

Late Seral Stage - See Seral Stages.

Late Successional Reserve - A forest in its mature and/or old growth stages that has been reserved.

Lode mining - Mining an ore vein deposit.

Long-Term - The period starting 10 years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

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

Mature Seral Stage - See Seral Stages.

Mid-Seral Stage - See Seral Stages.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multi-storied stands.

Neotropical Migrants - A wide variety of bird species, which breed in temperate North America but migrate to tropical habitats in Central and South America during winter.

Nonsuitable Woodland - All fragile nonsuitable forestland.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

Noxious Weed - See Noxious Plant.

Oak savanna - A grassland with an open and often sparse canopy of oak trees

Off-Highway Vehicle (OHV) - Any motorized track or wheeled vehicle designed for cross country travel over natural terrain.

Off-Highway Vehicle Designation-

> Open: Designated areas and trails where off-highway vehicles may be operated subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343.
>
> Limited: Designated areas and trails where off-highway vehicles are subject to restrictions limiting the number or types of vehicles, date, and time of use; limited to existing or designated roads and trails.
>
> Closed: Areas and trails where the use of off-highway vehicles is permanently or temporarily prohibited. Emergency use is allowed.

Old-Growth Seral Stage - See Seral Stages.

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

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year round basis.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Prescribed Fire - Introduction of fire under controlled conditions for management purposes.

Raptor - Any of the birds of prey, which includes eagles, hawks, falcons, and owls.

Redd - The spawning ground or nest for various fishes.

Residual Habitat Area - An area about 100 acres in size of nesting, roosting and foraging habitat encompassing the known activity center for a pair of owls or a territorial single owl.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Management Area - An area allocated in the plan primarily to protect the riparian and/or streamside zone.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Rotation - The planned number of years between the regeneration of an even-aged forest stand and its final cutting.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1 to 20-acre lots or that already have residential development.

Seral Stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage.
There are five stages:

> Early Seral Stage - The period from disturbance to the time when crowns close and conifers or hardwoods dominate the site. Under the current forest management regime, the duration is approximately 0 to 10 years. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or brush as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting brush communities.
>
> Mid-Seral Stage - The mid-seral stage occurs from crown closure to the time when conifers would begin to die from competition; approximately age 10 to 40. Stands are dense and dominated by conifers, hardwoods, or dense brush. Grass, forbs, and herbaceous vegetation decrease. Hiding cover for big game is usually present.
>
> Late Seral Stage - Late seral stage occurs when conifers would begin to die from competition to the time when stand growth slows; approximately age 41 to 100. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. Stand diversity is minimal; conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions.
>
> Mature Seral Stage - This stage exists from the point where stand growth slows to the time when the forest develops structural diversity; approximately age 101 to 200. Conifer and hardwood growth gradually decline. Developmental change slows. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover, and some forage are present. With slowing growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings in the canopy created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed.
>
> Old-Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. (Also see definitions of old-growth conifer stand and potential natural community.)

Short-Term - The period of time during which the RMP will be implemented; assumed to be 10 years.

Site Class - A measure of an area's relative capacity for producing timber or other vegetation.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment that is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil or microsite conditions using biological, mechanical, or manual clearing, prescribed burns, herbicides or a combination of methods.

Slope Failure - See Mass Movement.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least 10 inches in diameter at breast height (dbh) and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species.

Special Forest Products - Firewood, shake bolts, mushrooms, ferns, floral greens, berries, mosses, bark, grasses, and etc., that would be harvested in accordance with the objectives and guidelines in the PRMP.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):

- Threatened or Endangered Species,
- Proposed Threatened or Endangered Species,
- Candidate Species,
- State Listed Species,
- Bureau Sensitive Species
- Bureau-Assessment Species.

Species Diversity - The number, different kinds, and relative abundance of species.

Spotted Owl Habitat Sites - Sites monitored by BLM for spotted owl occupancy during some or all of the years 1985 through 1988, in accordance with BLM's spotted owl monitoring guidelines. These sites are known to have been inhabited by spotted owls at some time in the last dozen years but not necessarily during the 1985-1988 period.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

State Critical - Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Also considered critical are some peripheral species which are at risk throughout their range, and some disjunct populations.

State Peripheral or naturally rare - peripheral species refer to those whose Oregon populations are on the edge of this range.

State Threatened and Endangered - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

State Undetermined - Species for which status in unclear. They may be susceptible to population decline of significant magnitude that they could qualify for endangered, threatened, critical, or vulnerable status; but scientific study will be required before a judgment can be made.

State 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.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those which are significant for: 1) domestic use, 2) angling, 3) water dependent recreation, and 4) spawning, rearing, or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams are Class II streams that have a significant summertime cooling influence on downstream Class I waters, which are at or near a temperature at which production of anadromous or game fish is limited.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of 1/2 to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Succession - A series of dynamic changes following disturbance by which one group of plants succeeds another through stages leading to the potential natural community or to climax. The developmental series of plant communities is called a sere and defined stages are called seral stages.

Suitable Woodland - Forestland occupied by minor conifer and hardwood species not considered in the commercial forestland PSQ determination and referred to as noncommercial species. These species may be considered commercial for fuelwood, etc. under woodland management. Also included are low site and nonsuitable commercial forestland. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees that are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs, or trees at least 5 feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Production Capability Classification (TPCC) - The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Transpiration - The passage of water vapor from a living body through a membrane or pores.

Travel Corridor - A route used by animals along a belt or band of suitable cover or habitat.

Viable Population - A wildlife or plant population of sufficient size to maintain its existence in spite of normal fluctuations in population levels.

Water Quality - The chemical, physical, and biological characteristics of water.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that und
Wildlife Tree - A live tree retained to become future snag habitat.

Withdrawal - A designation that restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forestland producing trees not typically used as saw timber products and not included in calculation of the commercial forestland PSQ.

Xeric sites - Adapted to a very dry habitat.

Yarding - The act or process of moving logs to a landing.

APPENDIX

Appendix A. MID EVANS SPECIAL STATUS SPECIES ANALYSIS

THREATENED AND ENDANGERED SPECIES:

Northern spotted owl

Most of the area has been surveyed to interagency U.S. Fish and Wildlife Service protocol for the Northern spotted owl (six times in two years). Some of the northwestern areas have not been completed to protocol, having only received three visits. Three additional visits will be made in 1994 to complete protocol. One hundred acre owl "core" areas around the known sites have been designated and mapped. Suitable habitat (category 1, 2, 3, 4) has been mapped in GIS

American bald eagle

No known sites occur in the area, although the birds may forage from the Rogue River. Presence is incidental. One eagle was observed at the intersection of Meadows Road and E. Evans Creek Road during February 1994.

Peregrine falcon

No known sites occur in the area. Suitable cliffs are not present. Presence is unlikely, but migrating individuals may pass through.

FEDERAL CANDIDATE SPECIES (C2):

Western pond turtle

Western pond turtle are known to be present in Evans Creek. Western pond turtles live in most types of freshwater environments with abundant aquatic vegetation, basking spots, and terrestrial surroundings for nesting and over wintering. Some Western 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 five to six times in a winter in areas with little or no snow. General habitat characteristics of overwintering areas appear to be broad. There may be specific microhabitat requirements, which are poorly understood at this time. A research project is underway in the Umpqua National Forest which may provide more information on specific winter habitat needs.

Four ponds and/or pumpchances have been identified in the Mid Evans analysis area. Two have been surveyed with no turtles observed. Other ponds and streams need to be surveyed to determine if individuals and nesting habitat is present.

Red legged frog

Presence is undetermined. This frog prefers slack water of ponds and low gradient streams with emergent vegetation for reproduction. The frogs have been found up to 300 meters from standing water in humid, well vegetated forests and moist meadows. Four ponds, which could provide red legged frog habitat are present in the area. Two of the ponds have been surveyed, with no frogs observed.

Surveys need to be completed during spring and early summer.

Northern goshawk

One historic sighting, but no surveys have been undertaken. The goshawk is 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.

Limited surveys occurred in 1992. Complete surveys need to be done June through August.

Townsend's big eared bat

Townsend's big eared bats are present in Cinnabar and in Murphy Gulch mine adits. Removal of trees around the mine or cave may change airflow patterns and make the area less desirable as a hibernaculum, maternity, or roosting site. Conservation measures recommended in Draft RMP and FSEIS to protect the known sites include setting aside a 30 acre buffer around the site, and observing a seasonal restriction to protect maternity and hibernaculum sites. Summer and winter surveys have been done at known sites. These bats roost in mines, caves, trees, and attics of buildings. Bats consume large numbers of insects.

Mine adits and caves need to be surveyed as they become known.

Cascade frog

Presence is unlikely.

Del Norte salamander

Presence is undetermined. Habitat is rock talus in conifer forests and on forest floors under decaying downed snags and other litter from sea level to about 4000 ft. The salamander has a low temperature and moisture tolerance range, and usually needs moist forest with high canopy closure. Habitat is present, but no known populations have been recorded.

General herp surveys need to be done during warm wet periods in spring and fall.

White footed vole

Presence is unlikely.

Fisher

Presence is undetermined. Historic sighting includes Oregon Coast Range and the Klamath Mountains, and Cascade Mountains. No habitat studies have been done in Oregon. In a study done in Trinity County, California, a preference was shown for conifer forests with some hardwoods present. They seem to prefer 40 to 70 percent canopy cover. In northern California, they mainly use large living trees, snags and fallen logs for denning. Due to habitat fragmentation in the area, presence is possible, but unlikely.

Coho

Present in Evans Creek. South Coast coho was listed as depressed by the National Marine Fisheries Service in November 1993. Stream surveys have partially been completed. FEMAT management plans require 300 foot stream buffers on all fish bearing streams. Culverts that block movement are being examined and recommended to be replaced.

OREGON STATE SENSITIVE SPECIES

*(C=Critical, V=Vulnerable, P=Peripheral, U=Undetermined)

Clouded salamander (U)

Presence is undetermined. Habitat requirements are forest and forest edges from sea level to 1500 meters. 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 and under moss and leaf litter. General herptile surveys are recommended.

California mountain kingsnake (P)

Presence is undetermined. Undocumented sightings have been reported in the area. Habitat includes oak and pine forests. Found under or inside rotting logs and in talus areas. General herp surveys are recommended.

Common kingsnake (P)

Presence is undetermined. Historic sightings have occurred near Nugget Butte and along the Rogue River. Sightings also have occurred on Upper and Lower Table Rocks. These snakes inhabit oak and pine woods, open brushy areas, and river valleys, usually along streams and in thick vegetation. General herp surveys are recommended.

Sharptail snake (V)

Presence is undetermined. Habitat is conifer forests or oak grassland edges. Found in rotting logs, moist talus, under rocks, boards or other objects. General herp surveys are recommended.

Tailed frog (V)

Presence is undetermined. Habitat is cold, fast flowing permanent streams in forested areas. Temperature tolerance range is low, 41 to 61°F. General herp surveys are recommended.

Foothill yellow legged frog (V)

Presence is undetermined. Habitat is permanent streams with rocky, gravelly bottoms. General herp surveys recommended.

Spotted frog (C)

Presence is unlikely.

Acorn woodpecker (V)

Spotty distribution in the Rogue River valley. Presence in watershed has not been documented. Habitat is oak woodlands, riparian areas, and mixed conifer oak forests that 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. Recommend general cavity nester surveys.

Black-backed woodpecker (C)

Presence is undetermined. 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. Recommend general cavity nester surveys.

Flammulated owl (C)

Presence is undetermined. One detection occurred in 1992 near Sardine Creek, immediately south of this area. 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 nests. The presence of dense conifers for roosting may be a necessary habitat components. Recommend owl surveys.

Great gray owl (V)

Present in area. Habitat preference is open forest or forest with adjoining deep soiled meadows. 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. Recommend owl surveys.

Lewis' woodpecker (C)

Presence is undetermined. Breeds sparingly in the foothill areas of the Rogue and Umpqua river valleys in Douglas, Jackson, and Josephine counties. Breeding areas in the Rogue valley are uncertain. In other locales, the woodpeckers breed in riparian areas that have 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. Recommend general cavity nester surveys.

Northern pygmy owl (U)

Present in area. 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. Recommend owl surveys.

Pileated woodpecker (V)

Present in area. Population numbers are unknown. Found mainly in old growth and mature forests, but can feed in younger forests and clearcuts. Excavates a new nest each year. They use mainly dead trees that have the strength to handle a nest cavity that averages 8 inches wide and 22 inches deep. Studies show that the pileated woodpeckers need about 45 large trees to provide roosting cavities in the home range. Recommend general cavity nester surveys.

Western bluebird (V)

Presence is undetermined. In western Oregon nest in areas of small farms and in clearcuts in standing snags. Nest in natural cavities, woodpecker holes and in nest boxes. Recommend surveys.

White headed woodpecker (C)

Presence is undetermined. Occurs in ponderosa pine and mixed ponderosa forests. Forage for insects mainly on trunks of living conifers for insects. Nest cavities are within 15 feet of ground in dead trees that have heart rot. Standing and leaning snags and stumps are used. Area is in periphery of known range. Recommend general cavity nester surveys.

Fringed myotis bat (V)

Presence is undetermined. Individuals have been captured in mist nets in the surrounding areas. Susceptible to human disturbance at roosts and colonies. Roosts in caves, mines, buildings and similar sites. Recommend continuation of bat surveys, mist netting suitable ponds to document presence.

Pallid bat (V)

Presence in undetermined. Individuals have been captured in mist nets in the surrounding areas. This bat is a crevice rooster. 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 historic observation records a colony of pallid bats observed roosting in a hollow tree. Recommend continuation of bat surveys, mist netting suitable ponds to document presence.

Ringtail (U)

Presence is undetermined. Historic records indicate sighting in Sardine Creek headwaters just south of Mid-Evans watershed. Most common in areas having cliffs, rocky terrain near water and riparian hardwoods and sometime conifers. May nest in hollow trees, brush piles and caves. Historic records indicate sighting in Sardine Creek headwaters, immediately south of Mid-Evans watershed.

Note: Of 16 Oregon state sensitive species which could be present in the area, 9 are cavity dependent for some part of their life cycle, and 3 are known to make use of cavities on a opportunistic basis. Any salvage plans should proceed with this in mind.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Medford District Office
3040 Biddle Road
Medford, Oregon 97504

IN REPLY REFER TO

1614(11581)
G2037(JB:fna)

Dear Interested Party:

In an effort to improve our job of managing the public lands, the Bureau of Land Managements, Butte Falls Resource Area, is in the initial phases of implementing Ecosystem Based Management. This process is designed to analyze the "total environment" on a landscape basis within a watershed. Our initial effort in this landscape analysis is in the Mid-Evans and West Evans watershed (see enclosed map). The intent of this analysis is to gain a greater understanding of the existing conditions of the many resources within this watershed and the past influences on this watershed. From this analysis, and with a thorough understanding of local issues, we will be developing the management objectives to accomplish the desired future condition of the watershed. At this early stage of the analysis process it is critical that the public join with us in identifying issues, concerns, or opportunities within this watershed.

Some of the issues within this watershed which we have identified include: wildfire, recreation, wildlife, forest health, streams, soils, forest products, special forest products, cultural sites, and air quality. We encourage you to comment on concerns, on these or any other issues, you would like considered during this analysis phase. If you have any suggestions for opportunities within this area to improve the watershed condition we would be greatly interested in hearing from you.

Our intent is to keep all interested people informed and involved throughout this process. We encourage you to submit your suggestions and comments. If you do not have any specific comments at this time, but wish to be kept informed of the progress, please let us know.

Please send your comments to Jean Williams at the above address or call Jean at 770-2385 by March 21, 1994.

Sincerely,

Lance Nimmo
Butte Falls Area Manager

1 Enclosure (as stated)

LANDSCAPE ANALYSIS OF

MID EVANS CREEK

May 1994

Butte Falls Resource Area

Summary: The Mid Evans Creek Landscape 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.

Mid Evans Creek Landscape Analysis Team Members and Contributors: John Bergin, Bob Budesa, John Dinwiddie, Randy Fiske, Bob Fowler, Dale Johnson, Jim Keeton, Jeanne Klein, Don Kreitner, Linda Hale, Jim Harper, Dave Orban, John Osmanski, Phil Ritter, Bob Smith, Jerry Trotta, Ken Van Etten, Jean Williams, Kate Winthrop, Juanita Wright, Bill Yocum

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BUREAU OF LAND MANAGEMENT
Butte Falls Resource Area
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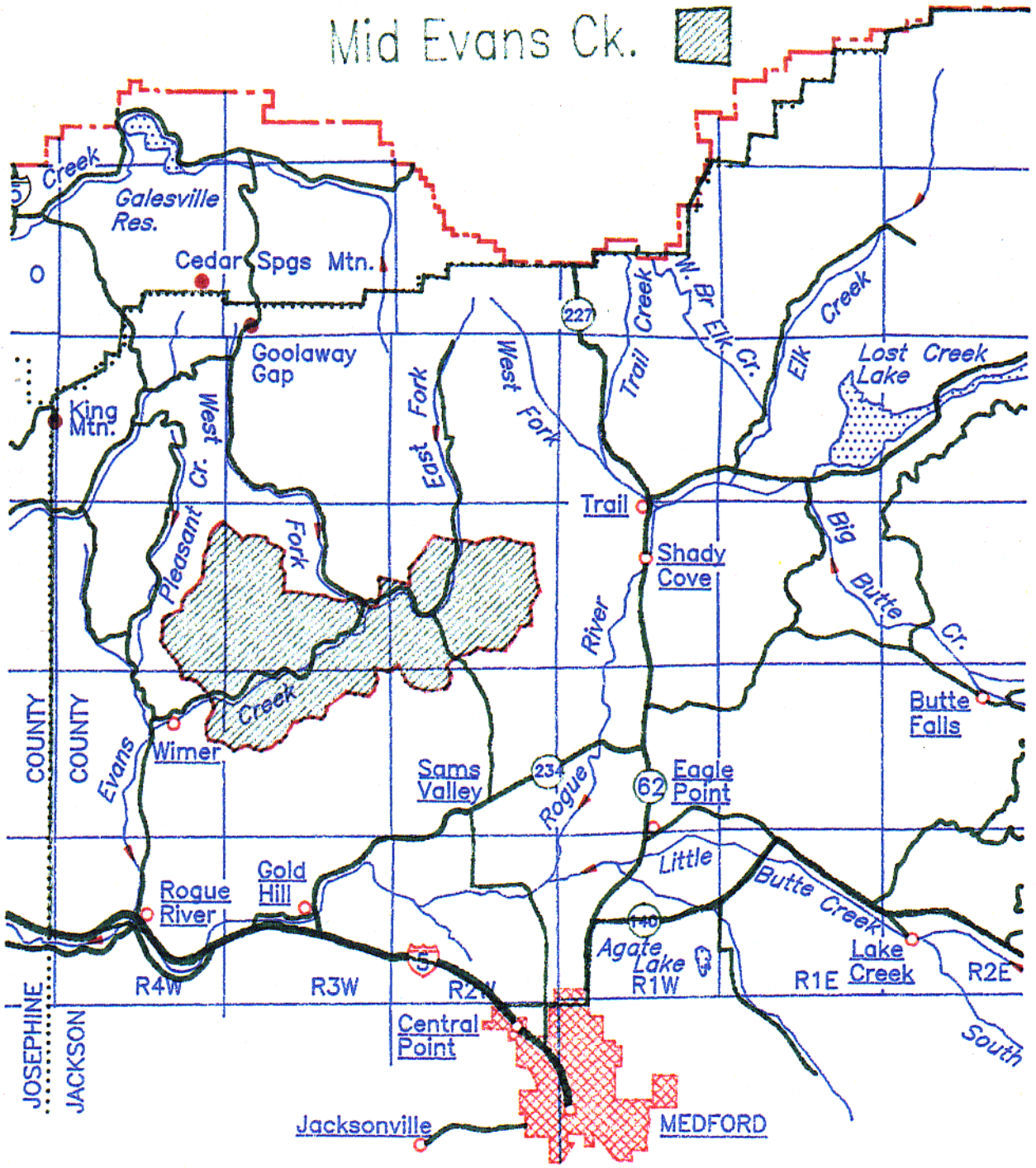
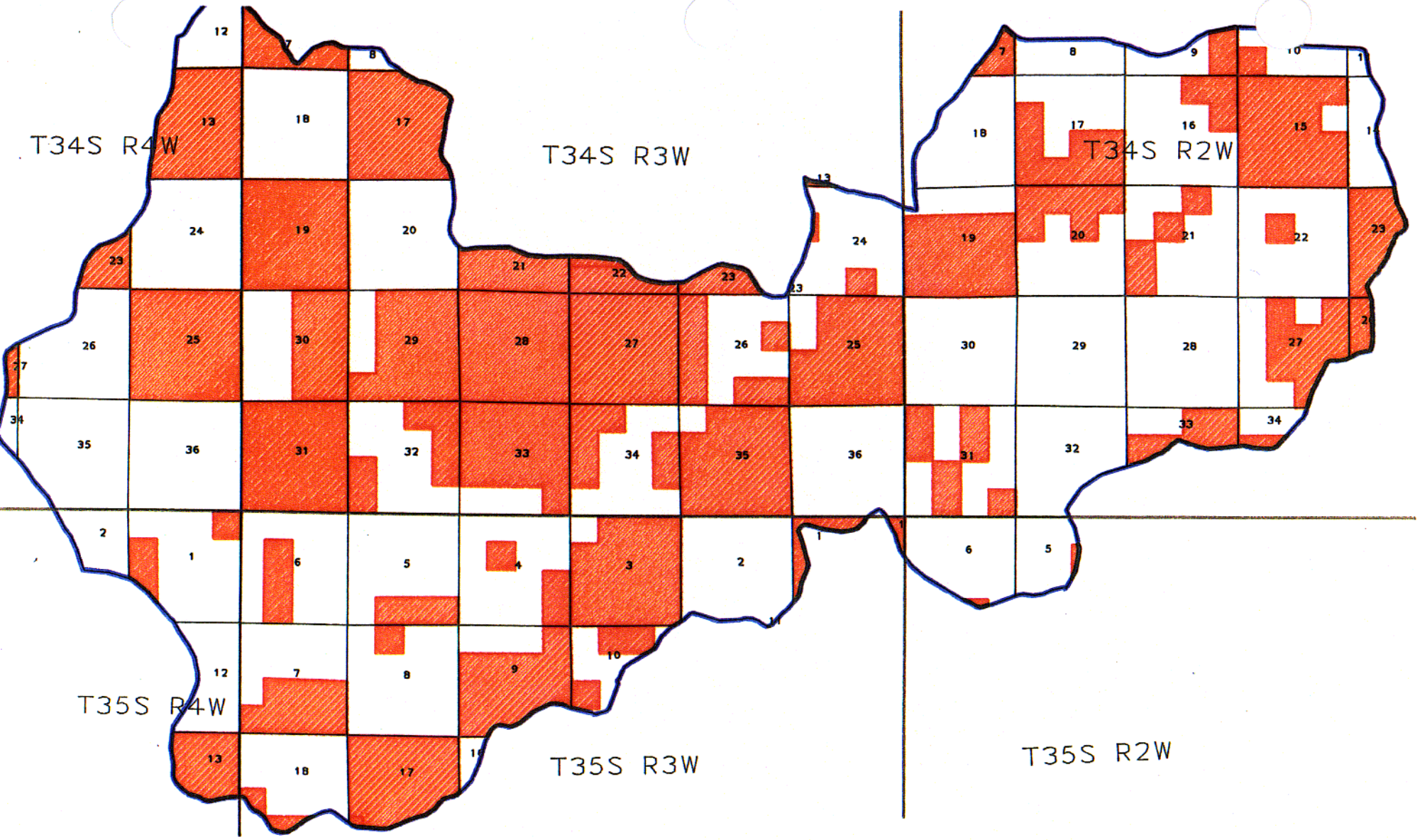
Mid Evans Ck.





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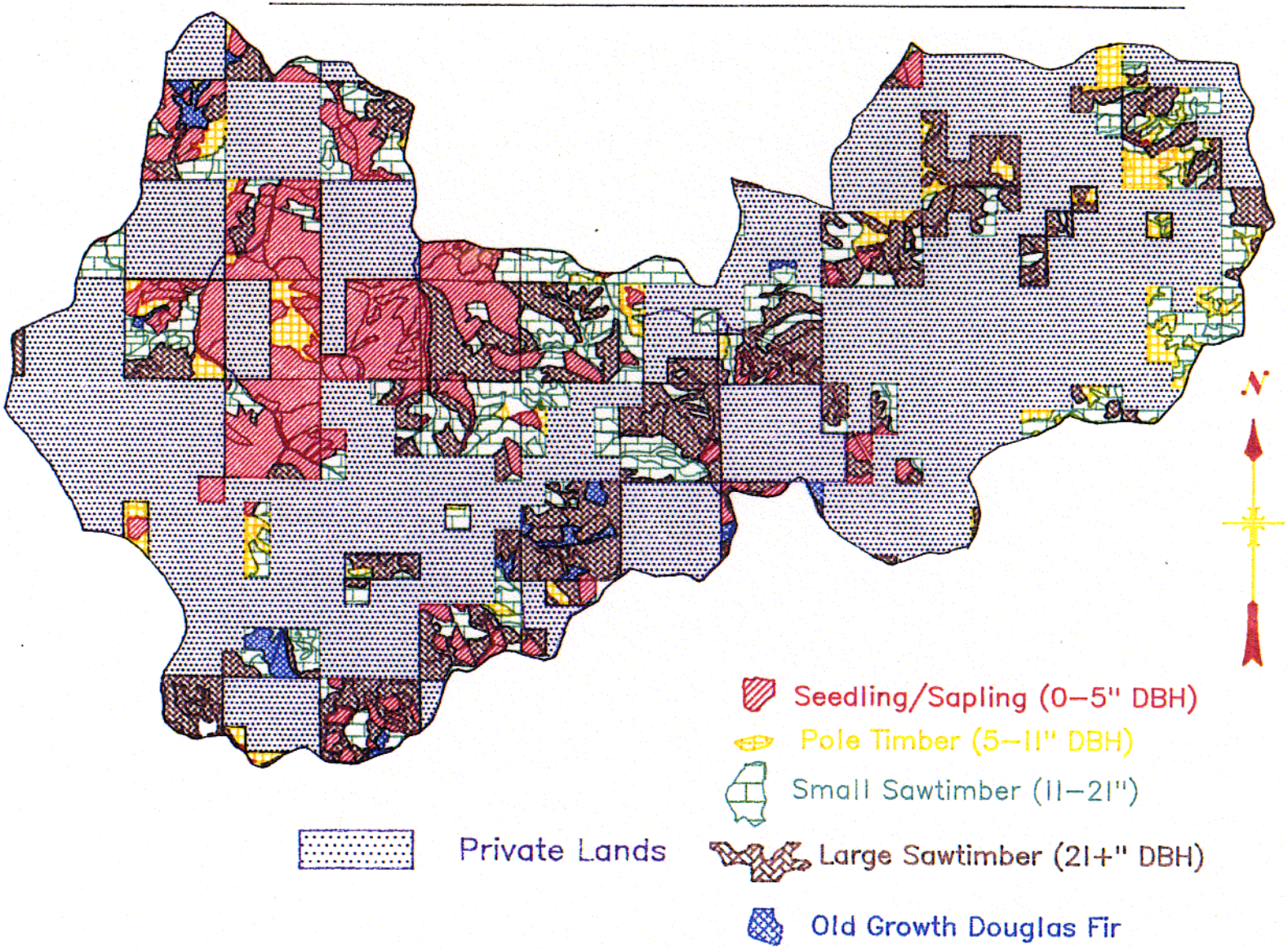
MID EVANS L.A.U.

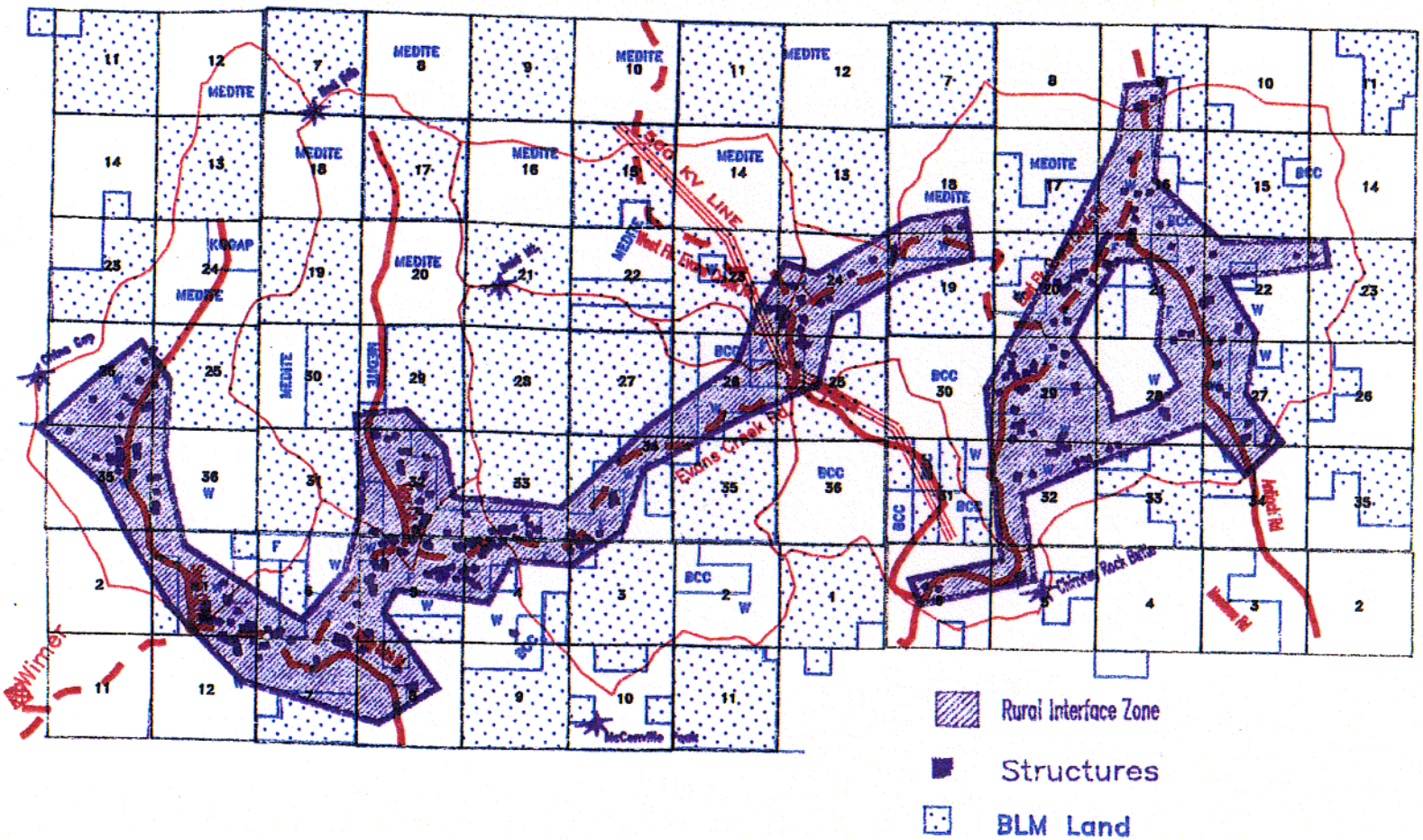
TOWNSHIP BOUNDARIES

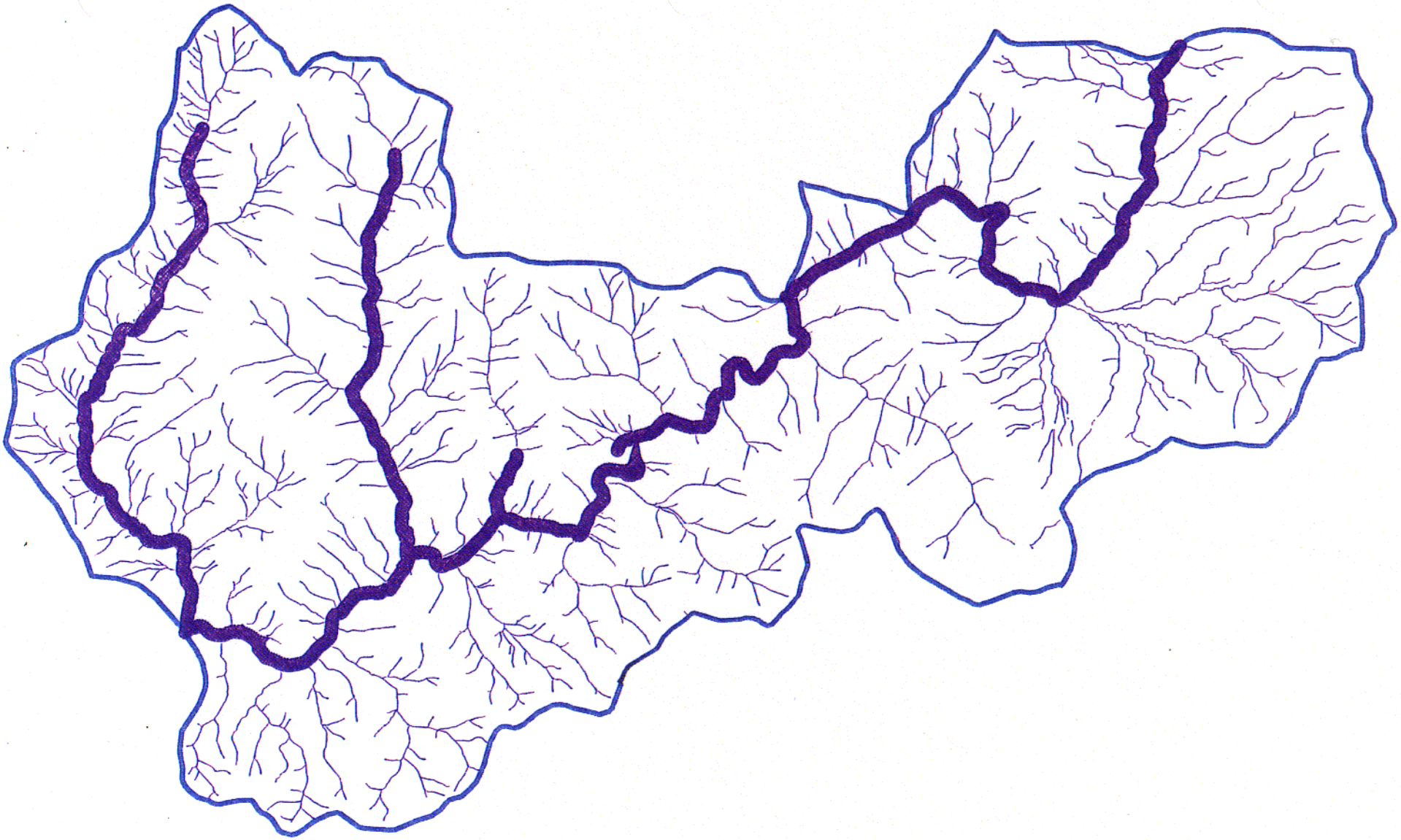
FEDERAL LAND

CONIFER STAND TYPES ON BLM LANDS



MID EVANS RURAL INTERFACE





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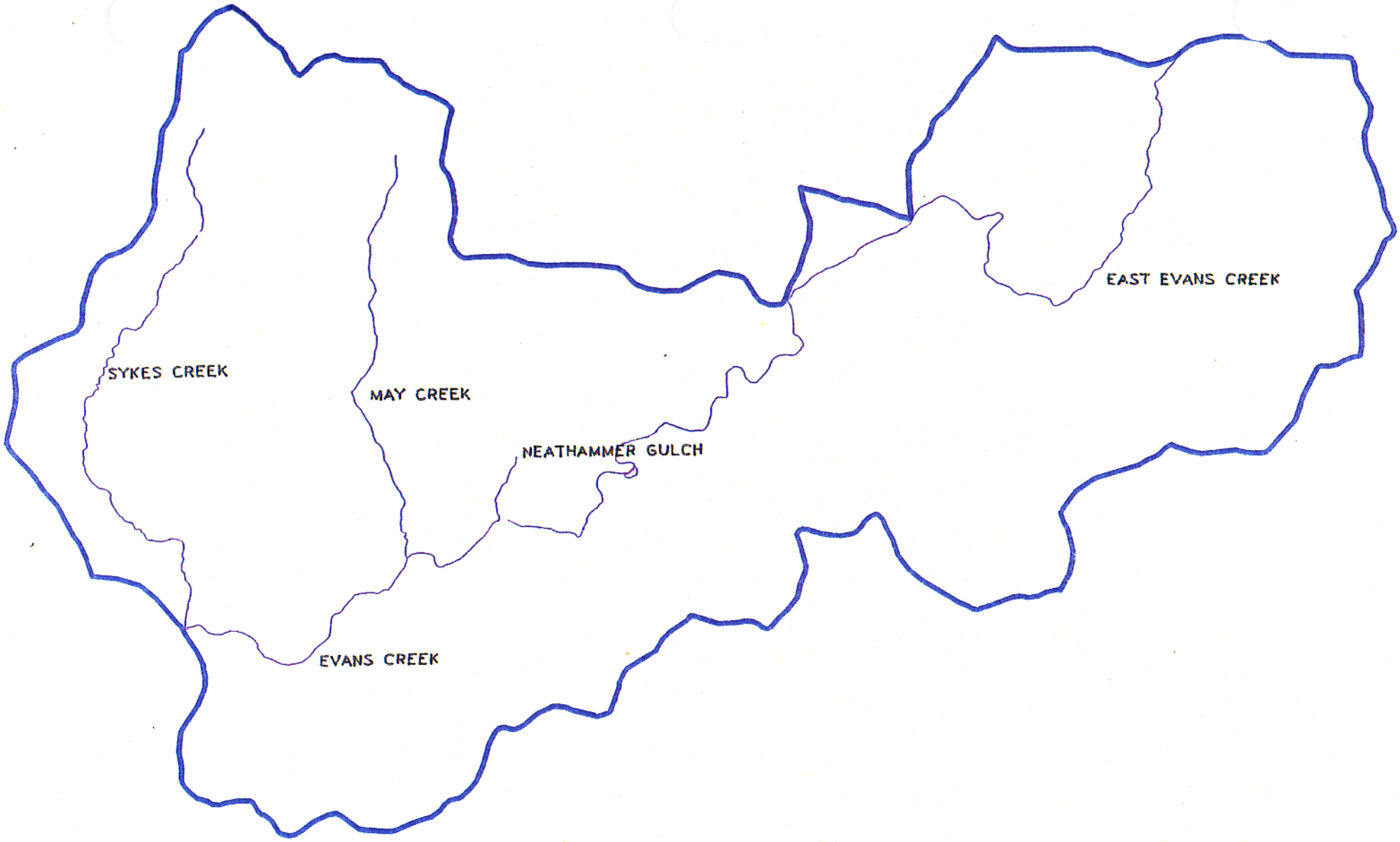
MID EVANS L.A.U.

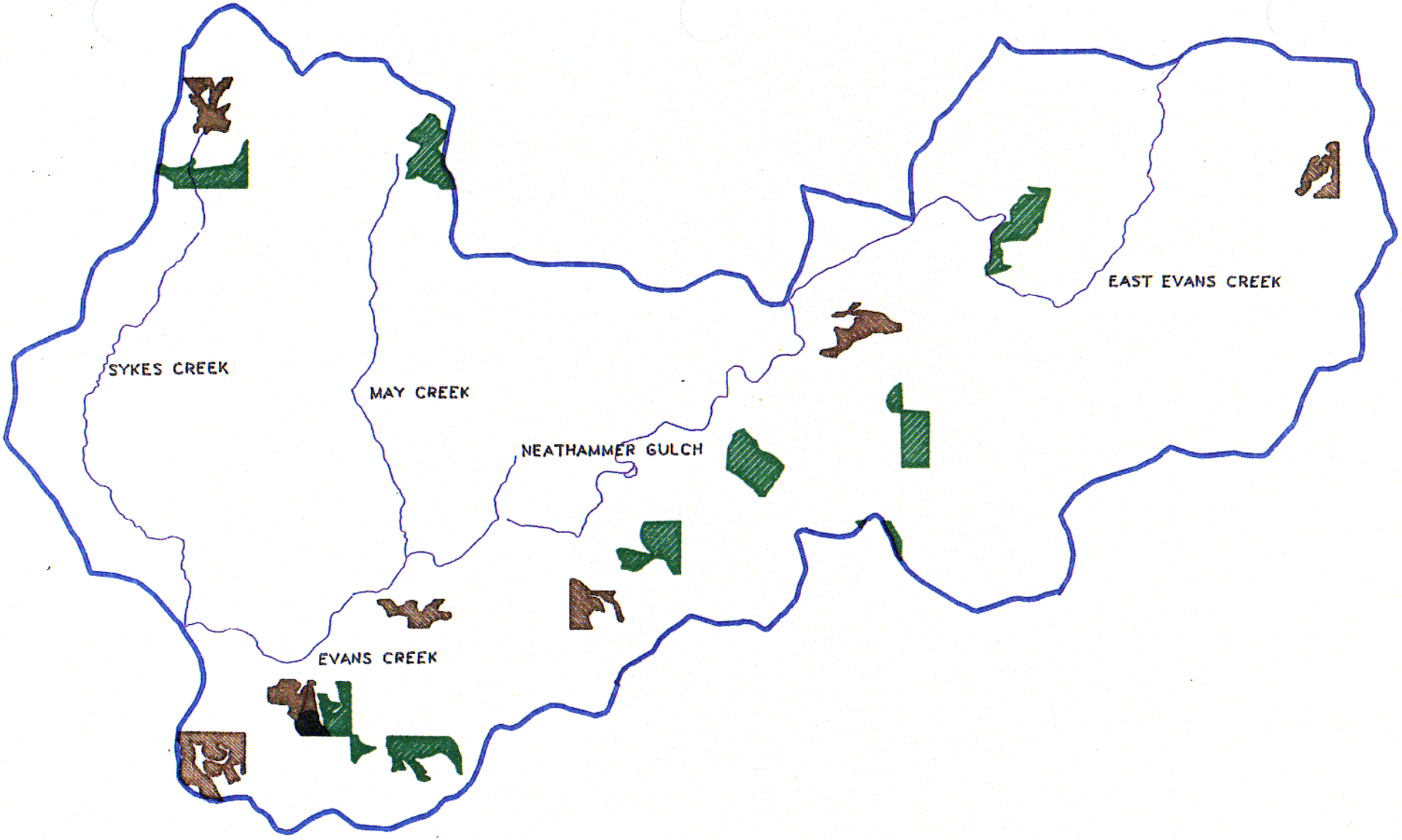
FISH STREAMS (300' BUFFER)
PERRENNIAL AND INTERMITTENT



SCALE 1: 78000

MID EVANS L.A.U.

FISH STREAMS

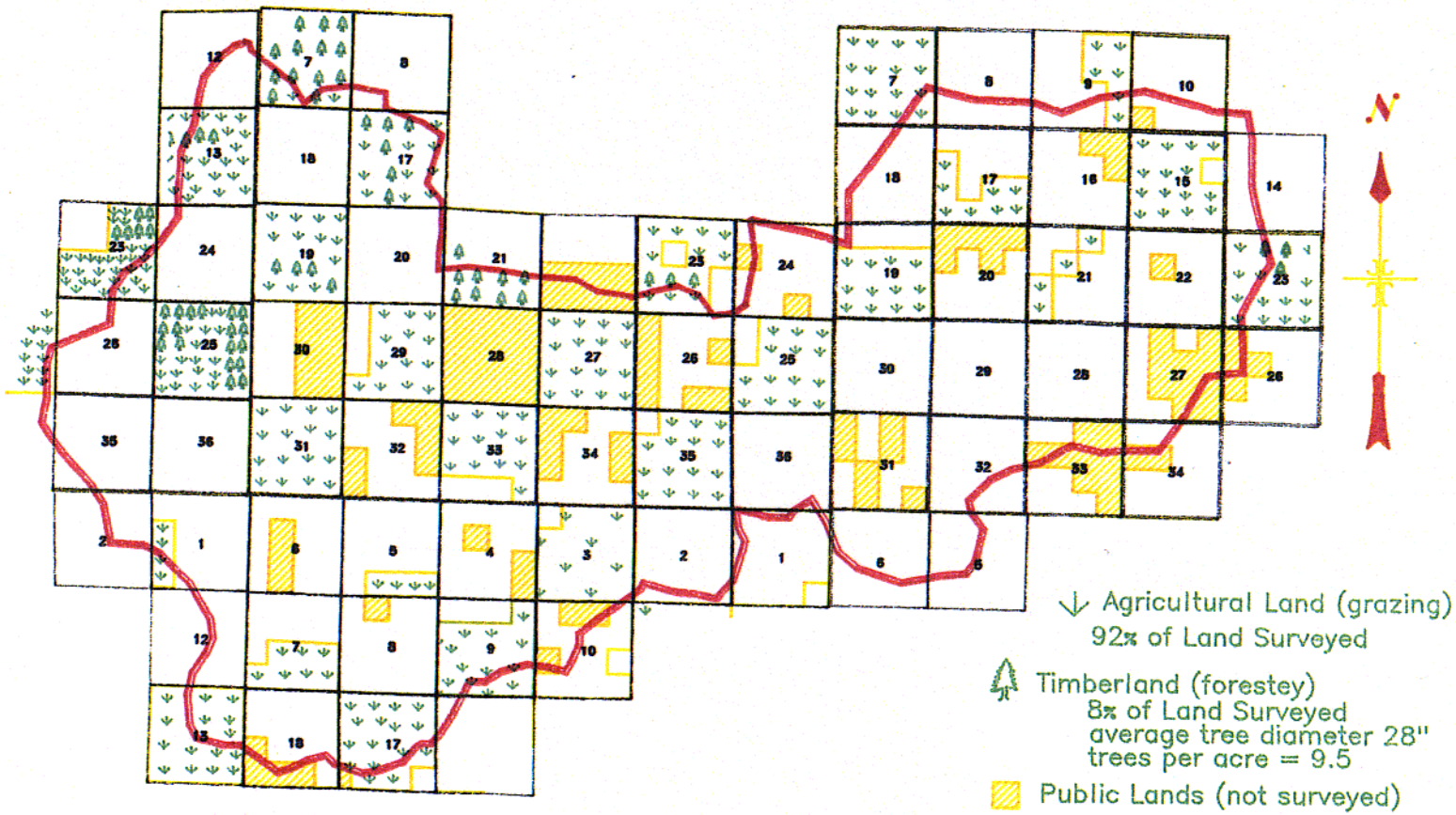


SCALE 1: 78000

MID EVANS L.A.U.

FISH STREAMS
100 ACRE OWL CORE
LATE SUCCESSIONAL INTERIOR

Mid Evans Historical Vegetation Map
1916 O&C Inventory Land Classification



SCALE 1: 78000

MID EVANS SPATIAL DESIGN

RIPARIAN BUFFERS
MIDSLOPE
FUEL BREAKS
CONNECTIVITY BLOCK