STEP 4 - REFERENCE CONDITIONS

This step describes how ecological conditions have changed over time, resulting in current conditions as described in Step 3. A reference will be developed based on historic conditions for comparison with current conditions. This is an attempt to determine how the ecosystem adapted/developed using historical data. The time period will vary by ecosystem features due to data availability. Where actual data is lacking, descriptions of historical conditions will be constructed from a multitude of sources, inferences, and profes-sional judgement.

This step is organized by key questions presented in Step 2. These key questions are used to define the scope of the analysis.

AQUATIC RESOURCES

This section is organized into three subsections: **Watershed Health**, **Riparian Reserves**, and **Aquatic Species**. The Watershed Health subsection highlights the historical state of upslope erosion processes. The Riparian Reserves subsection discusses the morpho-logical characteristics of streams riparian vegetation. The Aquatic Species subsection indicates native aquatic species, introduced species, and past condi-tions of aquatic habitats.

WATERSHED HEALTH

Key Question 1- What were the erosion processes and rates previous to Euro-American settlement?

The Beaver Creek watershed was always subject to natural erosion, particularly during winter floods or severe summer thunderstorms. Landslides and debris torrents occurred with flooding periodically impacting streams. Wildfires frequently burned through the area impacting watershed conditions. They were generally low intensity fires with some patches of high intensity in upslope areas. Fires were less common and of lower intensity in riparian areas due to low slope position and moist conditions (see Fire Effects in the Terrestrial section). The increased landsliding rates in the high intensity burn areas were similar to increases associated with timber harvest as described in Step 3; nine to twenty times over undisturbed in granitic soils, and 1.2 to seven times greater in other geomorphic types.
Erosion rates previous to Euro-American settlement are difficult to quantify except in general terms or using modeling assumptions based on gross estimates. Basically, high erosion rates would have occurred dur-ing flood events, especially a flood following a fire with a significant portion of high intensity burn patches. At other times, erosion rates would have been low. Overall, erosion rates and sediment transport through streams were such that the riparian and stream system provided sufficiently healthy habitat to support populations of salmon, beavers, and other aquatic dependent species.

Key Question 2- What past human activities have contributed to current accelerated erosion?

Settlement by Euro-Americans increased watershed disturbances. Mining was probably the earliest activity to occur, starting about 1860. The initial activity was in the Hungry Creek/Four Corners area with access from Hilt, CA. By the early 1900s mining activity spread to the main channel of Beaver Creek and up West Fork to the Cinnabar Mine. Environmental damage was great, especially from the hydraulic mining of banks and inner gorges. An unknown quantity of sediment was added to streams

from mining of riparian areas. Some streams are still subject to increased channel erosion, as discussed in the Riparian section.

Livestock grazing had an early impact upon the water-shed. Large herds of sheep and cattle grazed the crest-zone along the headwaters of many Beaver Creek tributaries. No accurate records were kept on the true numbers, but thousands of animals grazed the range whenever it wasn't covered by snow. The season of use and number of animals were totally unrestricted until 1931 when the season was limited to nine months. Even then, an estimated 4,000 or more head were on the Crest annually. In the 1940s, a cooperative agreement was signed between the USFS and private land owners. Seasons were shortened and stocking numbers were reduced.

The effects of past grazing are difficult to quantify. Many areas of the Siskiyou Crest have poor vegetative stocking and growth, and have high rates of surface and gully erosion. Although it is not known for sure if this is a result of overgrazing or is a natural condition, the fact that this area cannot currently support 4,000 head indicates a degraded condition.

Railroad construction and large-scale logging began in the early 1900s, as described in the Human Dimension section. The effect of this disturbance on watershed conditions was an increase in erosion rates on the railroad grades and harvested areas. Railroad logging was discontinued in 1934, railroad grades were converted into roads, and additional roads were constructed for continued logging. The majority of roads in Beaver Creek were constructed in the 1960s to mid '70s and, because the highest road erosion rates occur immediately after construction, road erosion was probably highest during this time. Timber harvest and road construction continued to the present resulting in the existing road densities and disturbance level.

The 1964 flood had the largest impact on Beaver Creek of any flooding over the last 100 years. The rate of landsliding that occurred with this flood was certainly increased by roading and timber harvest, although, since landsliding has not been studied in detail in this watershed, the increase is unknown. The previously mined stream channels had not recovered from the mining activity by 1964, compounding the effects of the flood. Flooding since 1964 has not had a large impact on most streams in Beaver Creek. However, isolated thunderstorm induced flooding had impacts on tributary streams. The primary recent thunderstorm flood occurred in West Fork Grouse Creek in 1989. Debris scour originating in a recently harvest section impacted the Grouse Creek stream banks and deposited large quantities of sand in the main stem of Beaver Creek.

RIPARIAN RESERVES

Key Question 1- What were the riparian conditions prior to Euro-American settlement?

Little has been documented about the riparian conditions prior to Euro-American settlement, however some information can be derived from historical accounts. Apparently beaver were plentiful in the watershed, as noted by early trappers; hence the name Beaver Creek. The beavers would have enhanced wetlands and helped develop floodplains.

Outside of beaver-ponded areas, large conifers with an understory of riparian hardwoods would have been most common. The fires that periodically burned through would have had a light impact on riparian areas due to the low slope position and moister conditions. This would have allowed for greater conifer tree size, age, and density than on adjacent upslope areas. Occasional floods and debris torrents would have impacted the immediate streamsides and resulted in early-successional riparian hardwoods dominating some sites. Other sites, either naturally wet or flooded by beavers, would have supported wetland plants without conifers.

Key Question 2- How have past disturbances/ processes influenced riparian areas in this water-shed?

Early trapping in the watershed impacted beaver populations, although the effects upon riparian conditions are not known. Early mining activities had impacts that are better understood. The riparian area along the mainstem of Beaver Creek from the mouth to West Fork was greatly disturbed by placer mining. The entire floodplain was stripped of vegetation and the streams were hydraulically or mechanically worked to retrieve the deposited gold, leaving behind unvegetated, worked-over soil that slowly recovered. Other parts of Beaver Creek, upstream of West Fork up to Grouse Creek. Parts of Hungry and Grouse Creek also had stream deposits worked in the same fashion, although not as extensive as lower Beaver Creek.

Logging and road construction had major impacts upon riparian areas. Large trees were harvested from riparian zones when trees were reachable. Most important in the long-term was road construction, especially those roads paralleling Beaver Creek, West Fork, and Hungry Creek. Initial construction entailed vegetation removal, stream channel rerouting, and parts of the floodplain were filled in and

altered, causing major impacts to the affected streams. Continued erosion of road surfaces, cuts, and fills provides a chronic source of sediment to the streams. Periodic flooding triggers large sediment inputs to streams through increased landslide rates and plugged culvert induced fill failures. Vegetation, snag, and downed wood removal necessary for public safety and road maintenance, deplete certain elements beneficial to riparian area health. Large woody material is removed from the existing road system adding to the impacts.

AQUATIC SPECIES

Key Question 1- What are the past and potential conditions of the aquatic habitat?

It is difficult to determine the historical population size of salmon and steelhead in the Beaver Creek watershed, however fish numbers were sufficient to supply the primary subsistence food and be the basis for the economy of the indigenous people prior to 1850. Villages of the Shasta Tribe existed near the mouth of Beaver Creek, on Cottonwood Creek, and Bear Creek. After 1850 and the discovery of gold in the area, fish populations were subject to additional human impact including mining, commercial timber harvest, water diversions and dams, artificial propaga-tion, and other historical activities.

Stocks and species of salmonids that existed at the time of cannery development on the Klamath in 1912 included spring and fall run chinook salmon, coho salmon, and steelhead trout. Three fish canneries were operating at the mouth of the Klamath River which was heavily fished for salmon with no limits. Steelhead trout were an incidental catch since migration times coincide with the salmon. Both Snyder and R.D. Hume in Snyder's (1931) report state that historically the spring run of chinook salmon was the "main run" of salmon and the population was very pronounced. "These spring salmon have now come to be limited" and "practically extinct" while the fall run was reduced to "very small proportions" (Snyder 1931). Suggestions during the early 1930's to determine the decline of the spring run chinook included mining operations, overfishing both in the river and ocean, irrigation, and the building of Copco Dam. A hatchery was in operation on Beaver Creek from 1927 until 1936. California Department of Fish and Game records show annual numbers of 46,000 to almost 100,000 chinook salmon (California Conservationist 1936).

Little, if anything, is known about fish habitat conditions prior to mining operations. It is assumed the habitat was in good condition to support the salmon and steelhead populations that are exclaimed to exist by miners and R.D. Hume in Snyder's (1931) report. The extent of damage mining had on the physical characteristics of the streams including pools, fine sediments, riparian vegetation, and stream channels is unknown, however can probably be considered extensive. In 1886, Patterson worked 25-30 men in the main channel of Beaver Creek, above Hungry Creek. Other mining occurred in Flystain and Deer Creeks in 1912 and in West Fork Beaver at the Cinnabar Mine. Hungry Creek was mined in the 1860s, '80s, and 1930s. Moffett and Smith (1950) state that the Klamath River and many of its tributaries "ran silty".

Mining had other impacts to the Klamath fishery. "During the period of placer mining, large numbers of salmon were speared or otherwise captured on or near their spawning beds, and if credence is given to the reports of old miners, there then appeared the first and perhaps major cause of early depletion" (Snyder 1931). Taft and Shapovalov (1935) studied occurrence of benthic invertebrates in Klamath River tributaries and found mined areas had consistently fewer organisms than non-mined areas. Many dams were built in the Klamath system to divert water for mining, agriculture, and domestic use. These dams and diversions blocked salmon and steelhead from more than 200 miles of spawning and rearing habitat along Klamath River tributaries (CDWR, 1960 from CH2MHill). Unscreened or poorly screened water diversions and ditches resulted in a significant loss of juvenile fish in which Taft and

Shapovalov (1935) reported as the "most serious present loss of trout and salmon". During their review of Klamath River ditches, most were found to contain juvenile fish. In a survey of diversions in the Klamath basin, Beaver Creek was reported to have three diversions. All three were screened, however two of the screens needed repair. They were located 0.3, 2.9, and 3.0 miles up from the mouth and used for mining, irrigation, and domestic use (Taft and Shapovalov 1935). The Three C Picket Dam near an abandoned CCC camp on Beaver Creek was removed in September of 1949. California Department of Fish and Game, 1953 reports "This small dam probably did not prevent upstream migration of fish".

Artificial propagation began within the Klamath River Basin in 1896 when eggs taken from a tributary to the Sacramento were raised to fry and introduced into the upper Klamath. Eggs from the Sacramento River were also taken in 1907, 1911, 1913, and 1917 for a total of 4,950,000; these were released in the Klamath River. A small hatchery was established at the mouth of the Klamath River in the 1890s that released fry originating from the Rogue River. After Copco Dam was established, a hatchery was developed at Fall Creek (Snyder 1931). The affects these historic hatcheries and resulting fish had on Beaver Creek is unknown. A hatchery was also built to mitigate the affects Iron Gate Dam would have on the salmonid fishery. Releases of Irongate hatchery fish within the Beaver Creek analysis area were 254,000 chinook between 1974 and 1983, 262,000 coho between 1984 and 1987, and 1,800 steelhead in 1983.

REFERENCE CONDITIONS

Existing habitat conditions have been, and will continue to be shaped by ecological processes and events such as fire, floods, and drought as well as past and present management activities. Although the factors affecting aquatic habitat quality may vary from stream to stream, the physical and biological components that create and maintain aquatic habitat are similar. These components are important within the aquatic, semi-aquatic, and surrounding riparian and upslope areas, and are able to sustain the character of a stream corridor. They are continually changing as ecological processes within the watershed modify and reshape the habitat. Together, these components maintain and restore productivity and resilience in a fully functioning aquatic ecosystem. The following describes how these components should function in a healthy watershed.

Upslope processes are critical in providing and maintaining suitable amounts and intensities of water flow, and natural delivery mechanisms of sediment without accelerated rates of erosion and sediment yield. Headwater areas are important for exchange of water, sediment, and nutrients. The timing, magnitude and duration of peak and low flows is critical to sustaining aquatic habitat and patterns of sediment, nutrient, and wood routing.

Riparian areas are essential in maintaining stream temperatures, dissolved oxygen levels, and other elements of water quality. They ensure large wood recruitment, stabilize the channel, provide for filtration of sediment, and increase habitat diversity.

Forested riparian ecosystems should have a diversity of plant communities. Late-seral stages in a community should predominate and consist of endemic conifer and hardwood species, with intermingled areas of early seral stages such as grasses and forbs. Ideally, this should be a multi-layered canopy including signs of decadence such as standing and fallen dead trees. An overstory of conifers should provide future recruitment of large wood, and shade and thermal cover of the streams and lakes. An intermediate layer of mixed deciduous and coniferous vegetation should provide thermal buffering, nutrient cycling, bank stability, and recruitment of terrestrial insects as an aquatic food source. The vegetative canopy should provide stream surface shading during the summer and should be at site potential.

Wet meadow areas should have stable overhanging banks with herbaceous vegetation and or woody vegetation providing canopy cover, bank stability, and sediment filtration. The water table should be near the meadow surface, with the stream meandering through the meadow. Few signs of gullying or compaction should be apparent.

Diverse and complex instream habitats are essential for all life stages of aquatic species and should include large, deep pools for holding and rearing. Large woody material is critical for maintenance of these diverse habitats as it maintains stream channels and provides a source of cover through a range of flows and seasonal conditions. A diverse substrate is necessary with small percentages of fines and embeddedness for successful egg and alevin development. Sub-surface interstitial areas are also critical for invertebrates and juvenile fishes. An abundance of cool, well-oxygenated water, free of excessive suspended sediment, is important for aquatic species production and survival.

TERRESTRIAL RESOURCES

VEGETATION

Key Question 1- What was the historic distribution and structure of plant communities in the watershed?

The historic distribution of plant communities in the Beaver Creek watershed was probably similar to the current distribution. There is no evidence of a dramatic shift from one plant community to another. There have been small scale changes in distribution, due to the occurrence of large fires, logging, and fire suppression.

The most dramatic changes have taken place in the structure of some communities, mainly mixed conifer. Logging and fire suppression are the major agents responsible for structural changes in this community.

Prior to European settlement, the majority of the watershed was a late-seral mixed conifer forest. Ponderosa pine and sugar pine were the dominant conifers found in open stands on south and west aspects. Douglas-fir and white fir were most prevalent on moister sites, especially on north and east aspects. Due to the historic fire regime, north and east aspects supported denser stands than south and west, but were less dense than current stands. True fir was found on frigid sites above 5,000 feet elevation and the mixed fir blended into hardwoods below 3,000 feet.
Endemic levels of insect/disease infestations have always been present in the watershed. The types and scale of these infestations probably were different prior to active fire suppression activities. Insects/diseases that attacked oak, pine, and Douglas-fir were probably more prevalent. The high number of sugar pines in the watershed indicates that blister rust was much less prevalent than today. Since this disease was intro-duced around 1900 and tends to be fatal for seedlings/saplings, and just damage limbs on mature trees, it was probably not an issue until recently. With lower stocking levels, and less inter-tree competition for moisture/nutrients, vegetation remained more vigorous overall and less susceptible to large scale insect/disease epidemics.

Hardwood Community - Historically, this community was found in about the same areas as today. These hardwood species have adapted to harsh sites and frequent fires. With frequent fires, this community maintained more of a large tree character, it was kept more open, with understory vegetation of scattered shrubs (manzanita, poison-oak) and a few forbs.

Except for some areas near drainage bottoms, little human disturbance occurred in this community.

Hardwood/Conifer Community - Historically, this community occupied the same general areas as today and had a higher percentage of conifers (ponderosa pine, incense-cedar). Past logging selectively removed conifers and the large fire occurring in 1955 removed most vegetation. The hardwoods resprout-ed, grew quicker, and have dominated the community.

Mixed Conifer Community - This community has had the most change as a result of human activities in the watershed. The area occupied by this community has changed little, but species composition has changed dramatically from logging activities and fire suppres-sion. Ponderosa pine and sugar pine were originally more common. Ponderosa pine and sugar pine comprised up to sixty percent of the conifers in stands on south and west aspects. Douglas-fir was found mostly on the lower one-third of these south and west aspects, and dominated the north and east aspects along with white fir. This community was adapted to frequent low to moderate intensity fires.

Fruit Growers Supply Company provided 1925 cruise data for a portion of the watershed which was analyzed to determine the approximate number of trees/acre by species. This cruise data was for all trees in the stand >21" dbh. Table 4-1. Large Overstory Trees, is the interpretation of this data into trees/acre by species. This is a reference condition for the condition of the overstory in stands with large trees. These data were not broken out by aspect, so are averaged over all aspects. Photo interpretation for some of these areas from the 1944 photos indicates that north and east aspects supported denser stands of smaller diameter trees.

Table 4-1. Large Overstory Trees

Species	Avg. Range Trees/Acre
Ponderosa Pine	5-12
Sugar Pine	4-8
Douglas-Fir	3-6
White Fir	1-3
Species	Avg. Range Trees/Acre
Red Fir	1-2
Incense-Cedar	0-1

This community provided the commercially valuable conifers that drew loggers to the watershed; sugar and ponderosa pine being the most sought-after species in the early years of logging. These two trees were almost completely removed from areas accessible to railroad and steam-donkey logging in the eastern half of the watershed. After the harvestable pine species were depleted, Douglas-fir and true fir were harvested.

Two regimes of partial cutting contributed significantly to changes in species mix and stand structure. Unit area control in the 1950s through early '60s and Klamath partial cuts of the '70's altered the species composition, overall stand structure, health, and vigor. Similar to railroad logging, generally the largest trees were removed; however, all species were cut as opposed to primarily pine species. Some cut areas were planted, but the majority were left to naturally reseed. These areas are currently stocked with trees that seeded in from the suppressed and intermediate size-classes. Overall stand vigor is deteriorating,

due in part to logging damage of the residual trees, and that much of the in-growth is mistletoe infected. In general, most logging slash was left untreated.

The fire suppression era, beginning about the same time as the first commercial harvest activities in the watershed, allowed dense conifer stands to develop. The lack of fire favored regeneration of Douglas-fir and white fir over pine species. The introduction of white pine blister rust has hampered the reestablishment of sugar pine. Currently dense stands of Douglas-fir and white fir are found in areas that were historically open, pine dominated stands. With eighty years of fire suppression, stands are denser, and litter and downed woody material accumulations are greater than that maintained under the historic fire regime.

True Fir Community - This community is adapted to high elevation, frigid soils, and short growing seasons. The area occupied by true fir has not significantly changed from historic times. The natural patterns and stand structure of even-aged groups of trees maintained by lightning fires, windthrow, and insect outbreaks has been replaced by logging as the most common source of disturbance.

Railroad logging was much less prevalent in this community. Partial cutting occurred during the same period as the mixed conifer community, resulting in similar stand conditions, however, fewer acres were entered as species value was not as great. Conversely, damage to residual trees was more severe as true fir species are more prone to rot when injured than those of the mixed conifer community. Larger openings created by logging reduced structural diversity in these stands.

With eighty years of fire suppression, true fir stands are denser. Litter and downed woody material accumulations are greater, and openings between patches of trees have become smaller than what was maintained with the historic fire regime.

Shrub Community -The high elevation riparian shrubs are in the same areas and much the same condition as they were historically. Montane chaparral communities are fire dependent. Areas of montane chaparral are less prevalent today than historically. Patches of montane chaparral occurred throughout the mixed conifer community as a result of small pockets of high intensity fire. The areas that are still montane chaparral are in an older and denser condition than they were prior to fire suppression.

Grass/Forb Community - This community consisted of riparian meadows, dry meadows or glades, and harsh sites with little vegetation. The meadows and glades along the Siskiyou Crest were heavily impacted by livestock grazing from the early 1900s until the late '40s. Species composition is believed to have changed, but no record of the original species composition for these areas exist. With overgrazing, some areas that were dry meadows have become barren. With fire suppression, red fir is denser than historically. Red fir has filled in some areas that were maintained in a more open character. Rocky outcrops and areas of thin droughty soil have not changed.

FIRE

Key Question 1- What was the past fire regime for the watershed?

The fire regime prior to European settlement, within the watershed can be described as having frequent fires; 1-25 year intervals. Lightning and American Indian burning were causes of ignition. This pre-settlement fire regime can be described as having mostly low to moderate intensity fires, with small areas burning at high intensity. Fire return intervals averaged approximately twenty years in the

watershed; shorter on exposed sites and longer on sheltered sites. Fire worked as both a thinning agent and an agent of decomposition.
The steepness of the slopes and vegetation that had adapted to a history of frequent fires, contributed to the varying intensities. Stand replacing events occurred in some areas, although most vegetation (mixed conifers) in this watershed promoted lower intensities when burned at frequent intervals.

Higher intensities occurred when vegetative conditions were susceptible, and ignition and weather conditions were favorable. These stand replacing events, or runs of high severity, were usually limited to the susceptible vegetation during conducive weather conditions. The southern exposures and drier sites tended to burn with higher frequency. Fire would burn into the crowns in some locations and burn only in ground fuels in others. This created a mosaic of vegetation types, sizes and age classes within the watershed. During this fire regime, south slopes were usually in a more open condition. Fire-created openings were larger on south slopes than on north slopes. Also, the lower on the slope the fire started, the larger the opening was created. Previous to the fire suppression era, fires generally burned with low intensities in riparian areas. Frequencies were similar to upslope areas, but fires tended to back into the riparian areas and smolder or creep.

Lightning fires have been a source of disturbance since the development of vegetative biomass. Being influenced by weather, vegetation, and topography, lightning fires burned uninterrupted by humans until early in this century.

American Indians used fire to influence vegetative conditions within watersheds on the Klamath for possibly thousands of years. Until the early part of this century, they ignited fires to enhance landscape values that were important to their culture. American Indian burning from around camps near the mouth of Beaver Creek kept the lower elevations in an open condition (Blackburn and Anderson 1993). With frequent burning, the majority of the lower elevations were probably maintained as grass/forbs, young shrubs, and hardwood communities.

Early Euro-American settlers to this area used fire to improve grazing, expose rock and soil for mining, and improve travel routes.

Two fire history studies completed on the Klamath looked at fire regimes for two vegetation types found in the analysis area. Wills (1991) did a fire history study on Notelling Ridge on the Salmon River Ranger District. It revealed a pre-suppression fire return interval of 10-17 years in Douglas-fir/hardwood stands. In the Thompson Ridge area on the Happy Camp Ranger District, Taylor and Skinner (1994) have estimated pre-suppression fire return intervals for Douglas-fir/sugar pine to be between 15 and 25 years.

The Klamath National Forest was established in 1905. One of the main charges for the Forest was management of timber reserves. Uncontrolled fires were believed to be detrimental to growing trees. In the early years, Rangers were spread thin and fire suppression conflicted with local interests; many fires were allowed to burn unchecked. This practice continued until after World War I, when more personnel were available to fight fires. After 1920, as fire suppression forces grew and with the ability to aggressively enforce fire prevention policies, suppression of all fires was attempted .

The fire history database for the Forest has fire information from 1922-1994. This database has 473 fire starts for the watershed in the 72-year period. Lightning fires have accounted for 79% of these starts and human-caused fires for 21%. Since 1922, approximately 17,500 acres burned in the watershed. This total includes areas that burned more than once.

WILDLIFE

Key Question 1- What was the distribution of key species in the watershed?

The "key" wildlife species dependent on dense late-seral conifer forests (spotted owl, goshawk, and fisher) would most likely have had less nesting/denning type habitat in the past. Prior to the extensive logging and subsequent fire suppression, the mixed conifer zone was significantly different than current conditions. The pre-logging, mixed conifer stands were more open pine dominated on south and west aspects with dense Douglas-fir and white fir limited to cooler north and east aspects. Suitable spotted owl nesting/roosting habitat would have been limited to the Douglas-fir/white fir areas. The pine dominated areas would provide good foraging/dispersal habitat.

Goshawks prefer north and east aspects for nesting, so little change would be expected in nesting habitat. Under the natural fire regime and conifer species mix, good goshawk foraging habitat would have extended over a large area with few areas of dense understory to limit goshawk foraging.

High quality fisher habitat would have been limited to north and east aspects with the corresponding high stand densities and greater amounts of course woody material.

American marten habitat, which is primarily above 5,000 ft. in the true fir zone, was similar in distribution to current conditions. The true fir zone has had less extensive logging than the mixed conifer, so there has been less habitat degradation. The past grazing practices severely impacted the meadow habitat crucial to many of the marten's prey species. This could have reduced or eliminated marten from the watershed.

From all indications, black-tailed deer, elk, and black bear were common in the watershed. Population densities fluctuated with the natural disturbance regime (fire, flood, drought, and insect and disease outbreaks) that rejuvenated shrubfields and created openings in the forest for early seral vegetation. Animal population numbers are not known, but they must have been fairly high because historical accounts indicate the watershed was a popular hunting area. Market hunting during the late 1800s through early 1900s extirpated elk from the watershed and dramatically reduced deer and bear numbers. Hunting regulations have helped populations of all three species to increase and logging practices of the 1940s and '50s created conditions that allowed deer populations to expand, reaching a peak in the mid '60s.

Habitat needed by great gray owls (large meadows interspersed with dense late-seral forests) was found all along the Siskiyou Crest. The long-term extensive grazing in these habitats removed vegetative cover needed by rodents that made up the owl's prey. Without a sustainable prey base, great gray owls would not be able to survive in the watershed.

HUMAN DIMENSION RESOURCES

HERITAGE (CULTURAL) RESOURCES

Key Question 1- What were the historical uses of the lands within the watershed?

Previous prehistoric archaeological excavations within the study area are nonexistent. Information on prehistoric and ethnographic use of the area is based primarily upon ethnographic research.

The analysis area falls within the ethnographic boundary of the Klamath River Shasta Indians. Permanent Shastan village settlements were located on flat areas along the Klamath River or at the confluence of major tributaries or small streams. Silver (1978, pg. 213) states that "along the Klamath River, the favored Shasta village site was at the mouth of a creek into the main river." According to Heizer and Hester (1970), three villages were located near the mouth of Beaver Creek (one on the north side of the Klamath River and two on the south side) as well as being dispersed at points along the Klamath River. There were a few villages located among the oaks, situated near large springs (Holt 1977, pg. 308).

Dwelling houses were semi-subterranean with dirt sidewalls and split-board pine or cedar) end walls. These houses were only occupied during the winter. In the spring, they were abandoned for brush shelters located closer to a shady water source. Temporary camps, associated with seasonal hunting and gathering were either open-roofed brush shelters or single-family bark houses, and constructed near a potable water source. Later in the fall, during hunting expeditions, they camped in the open.

Subsistence strategies relied on seasonal exploitation of a variety of animal and vegetal resources. The mountainous terrain was utilized during summer and fall for seasonal hunting and gathering of plant foods. Pine nuts from the sugar and ponderosa pines were gathered in addition to acorn and hazelnuts, berries, and bulbs. Hunting blinds established along game trails were constructed for the acquisition of deer, for example. The Shasta also hunted bear, mountain lion, wildcat, beaver, otter, turtles, salmon, trout, suckers, coyote, raccoon, porcupine, ground and gray squirrel, rabbit, and various birds, nuts, seeds, and numerous berries.

The material culture of the Shasta that may be evident in surface and/or subsurface deposits may include a variety of locally obtained material such as stone, wood, and fiber. Worked stone may consist of cylindrical pestles, serpentine pipe tips, soapstone receptacles, and obsidian knives and scrapers. Wood implements may include pipes, digging sticks, carved and plain mush paddles, spoons, and bows. Although basketry items were imported, the Shasta made a variety of their own. Wild hemp was used for cordage and netting; deer snares were made from iris.

Trail systems incorporating trade routes linked villages to the higher, mountainous areas and were probably part of trans-Siskiyou mountain travel. The Klamath River Shasta traded with the Karuk, Hupa, Yurok, and Oregon peoples and also acted as middlemen for the Shasta Valley Shasta. Trade items received from the Karuk, Hupa, and Yurok include: baskets, acorns, dentalia, haliotis and other shells, pepperwood gourds, dried fish, and canoes. Items traded to these peoples include wolf skins, woodpecker scalps, white deerskins, and buckskin, pine nuts, flint blades, juniper beads, and salt.

Land management practices included burning for better wild seed and tobacco crops. Tobacco plants were pruned and watered by hand, using a basket, in dry weather.

Existing literature does not address the use of high mountain spiritual or ceremonial areas. Holt (1977, pg. 335), however, does mention that "during a certain moon each year...boys and young men went alone on dark, stormy nights to a certain rocky point and piled stones. This was to make them brave..."

By the 1820s, the first Euro-Americans exploiting a resource in the area were Hudson Bay Company fur trappers. Although Beaver Creek drainage was not their primary travel route, they did utilize the area for trapping beaver.

The discovery of gold in the 1860s along Beaver and Hungry Creeks led to an evolutionary and sometimes concurrent sequence of resource exploitation and extraction on a larger scale. Several mining operations continued well into the depression years. These activities were, at times, performed by ethnically diverse groups such as American Indians, Euro-Americans, Chinese, and Pacific Islanders.

Early placer mining activities were generally concentrated along rivers, creeks, and streams. Placer mining could be performed by one individual and did not require a large expenditure of capital especially when compared to later mining technologies. In 1886, an operator named Patterson employed 25 to 30 men to work the main channel of Beaver Creek above Hungry Creek. Access to these early diggings was by wagon road from Hilt to the Mayflower Ranch on Nicklewaite Creek and then by trail to the various mine sites. During the Depression Era, many of these placer mines were worked as people moved into the rural areas to fish and hunt.

By the late 1890s, hard rock mining had been introduced. Gold mines such as Mt. Bullion and Sterling Mill were active during this period. It is also a time when the Siskiyou Copper Mine began operations. By 1912, the Flystain and Deer Creek areas were producing gold and shortly after that, the wagon road was extended down Hungry Creek, up the Cinnabar Springs Road to the Cinnabar Springs Resort. Local sawmills supplied miners with wood for the construction of cabins and associated mining materials such as flumes. Sawmills later supplied lumber to shore up adits and tunnels and to construct stamp mills.

Hydraulic mining began in the area in the 1890s and operations were concurrent with that of hard rock mining. This form of mining existed for a brief time along Soda and Beaver Creeks. Gold dredging hydraulic mining had taken place along Soda and Beaver Creeks. In all, mining activities continued into the Depression Era.

By the 1940s, chromium exploration was encouraged as part of the war effort. As a result, chromite mines such as the Snowy Ridge and Starveout; however, their existence was short-lived.

Following the initial gold rush, miners along the Klamath River corridor began grazing livestock around the mouth of Beaver Creek. The increased demand for meat encouraged commercial ranching which was started in the areas of Hilt and Colestine. By the 1890s, large numbers of sheep and cattle were grazing the Crest zone. No accurate records were kept of the actual numbers, however, it is believed that thousands of animals were kept on the range whenever it wasn't covered by snow. Range management was totally unrestricted until 1931 when the season was limited to nine months. By this time, 4,000 or more head were on the Crest annually and disputes among ranchers became more frequent. In the 1940s, a cooperative agreement was signed between the USFS and private landowners. An ear tag program was introduced, seasons were shortened, and stock numbers reduced. By this time, the range was severely depleted, but even then, livestock interests fought hard to resist the much needed improvements.

Trail systems, initially developed by Native Americans, were later used and expanded through these stock raising activities and Forest Service land management activities such as fire suppression, timber manage-ment, and range management. Today, range allotments still exist within the watershed.

The evolution of the timber industry within the watershed is equally as diverse as mining. Ownership of a large portion of land within the Beaver Creek basin was initially with the Southern Pacific Railroad. To access the developing resources of Northern California and to finance construction of a railway, the federal government, in 1868, deeded the company every other section of land, in a checkerboard pattern, extending 36 miles on each side of the tracks. As the company sold or traded much of this land to finance its operations, small sawmill operations began producing milled wood. An early mill, owned

and constructed in the 1860s by William Smith, was located on the West Fork of Cottonwood Creek. The mill, operating on water power, supplied shakes and lumber to the local community. John Hilt, in 1877, bought the mill from Smith. After running the mill for a few years, Hilt moved the mill approximately two miles up the creek to a location now known as the Circle P Ranch. It appears that Hilt also sold his lumber locally.

By 1901 or 1902, John Hilt sold his sawmill to the Hilt Sugar Pine Company. It has been stated that "the new owners also brought in a larger mill and increased the output to 35,000 board feet per day" (Graves 1975). Early technology included the use of steam donkeys, log chutes, horses and big wheels, and oxen to transport logs. Lumber was hauled by wagons to Hilt and the lumber yard west of the Southern Pacific depot. This same company began the town of Hilt, naming it in honor of the previous land owner.

In 1906 the Hilt Sugar Pine Company sold the mill to the Northern California Lumber Company. Operations expanded to included chutes and steam donkeys, a McGiffert loader and railroad system to the sawmill on Cottonwood Creek, a three-wheeled Best Steam Tractor, and Climax engines. The company completed four miles of standard-gauge railway connecting the mill and the Sugar Pine mainline. A box factory was constructed along with three dry kilns for the factory. The company also put in the water and sewer systems for the town. The water system, about 4.5 miles long, took water from the West Fork of Cottonwood Creek.

By 1910, subsequent financial problems forced the operations of the Northern California Lumber Company to be assumed by Fruit Growers Supply Company of Southern California. Fruit Growers Supply Company extended the mill's railroad system into Hungry Creek, Grouse Creek, to the head of Nicklewaite and Cottonwood Creeks, to Long John Creek, Red Mountain Creek, and to the head of Beaver Creek. Several camps were located along the line with Camp 22 being the last, on Long John Creek. Switchbacks were constructed which allowed the track to be constructed up steep slopes instead of going around mountains. Before beginning operations in 1913, the company also constructed a sawmill and lumber yard.

Logging operations increased dramatically under Fruit Growers' management and by 1921, the company had a total of 21 donkey engines working in the woods. As
many as four engines could access steep slopes using a ground lead system whereby logs were moved from spar pole to spar pole until the log was near enough to the railroad where it was placed on a flatcar by a combination yarder/loader. Yarders were introduced to drag logs to the grade from up to 800-1,000 feet away. According to Grifantini's logging map (see Figure 4-1 Historic Railroad Grades and Travelways, contained in the Map Packet located at the end of this document), hundreds of "star-burst" designs are evident where logs were brought in from all directions and deposited at one location. A problem developed, however, when a large number of logs would come in without a means to stack them out-of-the-way. To alleviate the problem, another donkey or yarder was used to "swing" the logs to the railroad track, away from the next incoming log. By using a series of engines, logs could be transported for a total reach of approximately one mile. This technique created deep gouges between six to ten feet deep as the logs were dragged along the same line from spar to spar or from spar to yarder. Since donkeys were mounted on wooden sleds, logging crews worked through the winter months. Eventually donkeys were relegated to steeper slopes as the use of caterpillar tractors increased.

Fruit Growers maintained a grading and steel crew of 20-25 men to make all the railroad grades. The crew went out in the spring and worked all season. They maintained a separate camp from that of the logging camps and the company moved them as needed. A total of 20 bridges were constructed; all

except three bridges were constructed on curves. Thirteen of the twenty trestles referenced by Graves (1975, pg. 34) have been located in both the 1939 and 1944 aerial photographs.

Large sugar pine and ponderosa pine were the preferred logs because they were straight grained soft wood that was easy to mill. The mill was a large log mill designed to only accommodate logs over 20 inches in diameter. By the 1950s, wooden crates were replaced with corrugated cardboard. The mill was then refurbished to cut dimensional lumber instead. Now the previously avoided fir trees became desirable and re-entry into the previously cut units occurred.

Timber management within the Beaver Creek Watershed by the Forest Service from 1911 to 1930 has been documented by R. W. Bower, a former USFS-KNF Supervisor. In his journal (1979, pg. 18) Bower states that there was very little reported on timber activity in 1911 but that a timber survey was completed for the Beaver Creek watershed. In January, 1912, a timber reconnaissance report was filed on the Beaver Creek unit which included a total acreage of 46,000 acres; 26,000 acres were on private land and 20,000 acres were National Forest. The total timber stand was 413,381,000 ft. BM (Board Mea-surement); 245,000,000 ft. BM on private lands and 167,465,000 ft. BM on National Forest lands. Volume removed from National Forest land is displayed in Table 4-2. First Cut on National Forest Lands.

Table 4-2. First Cut on National Forest Lands

Species	Ft. BM
Douglas-Fir	32,686,700
Yellow Pine	20,743,000
Sugar Pine	23,001,700
Red Fir	3,391,500
Incense-Cedar	7,388,700
White Fir	24,968,100
Total	112,179,700

There was 25 miles of railroad from Hornbrook to a mill on Beaver Creek for lumber haul and 14 miles of logging railroad from the mill to upper Beaver Creek for log haul. Logging cost from woods to mill was estimated at $4.90/MBM

In 1918, a 22MMBM timber sale was made to Fruit Growers Supply Company in the Beaver Creek area. The timber sale was active during 1919-1921. In 1920 the only other activity was small ranger sales to woodcutters and gold mines, and a few circular mills. A cruise of 8,000 acres in upper Beaver Creek was completed. In 1921, small sales were made to local small mill in all Districts. No additional cruising. There was one active large sale to Fruit Growers Supply Company in 1922 and 1923. Other activity was confined to ranger sales for wood and small local sawmills. The bulk of the timber cut in 1924 was on the continuing Fruit Growers' sale in Beaver Creek. The larger sales on the Klamath were confined to the areas applied for by Fruit Growers when they reached an area where public lands intermingled with their lands. No sales were made in 1925. In 1926, the Supervisor's annual report showed 551MBF sold and 595MBF cut. There were 80 sales and all under $500.00 in value. Two large sales were made in 1930. Timber cut was 8,168MBF and timber sold was 26,470MBF. There were 107 sales under $500.00; one sale was from $1,000 to $5,000 and two sales were over $5,000 in value.

As steam donkeys were replaced with steam engines and railroad track, timber was now being transported longer distances. The demise of railroad logging took place in 1934 and railroad grades were converted to road systems for logging trucks. Prior to this date, however, Fruit Growers began using trucks to haul logs from various timber areas in Siskiyou County and southern Oregon. In 1933, the Civilian Conservation Corps constructed a road to Beaver Creek and Cow Creek.

There was always the risk of fires occurring in the woods. Graves (1975, pg. 43) states that sometime after 1895 a fire occurred west of Hilt within the proximity of Camp 6. Sparks from a donkey engine may have caused this fire. There was no effort to replant this area. In 1920, a fire started in Ditch Creek west of Hilt, and in the early '20s, a fire started in Bushy Gulch. It burned to the top of Cottonwood Mountain and moved on to Dutch Gulch. Fires on Soda and Smoky Creeks broke out at about the same time. In 1922 or '23, there was a large fire near the Four Corners area. Fires occurred again in 1926 and '27. The former fire was near Colestine on the east side of Cottonwood Creek; the latter fire was again near Colestine but on the west side of the creek; this burn area was logged that fall . In 1929, a fire started near Bear Canyon. The fire burned along the east side of Highway 99 and then turned east and burned to the California-Oregon Power Plant on the Klamath River. Fires continued to occur periodically within the watershed.

In 1932, a USFS survey was initiated for a large land exchange with Fruit Growers Supply Company. These exchanges continued into the 1970s. For every three sections of previously logged land, the USFS would give another section of virgin timber. This explains how the checkerboard pattern of land ownership was broken in some areas of the drainage.

The Forest Service wasn't really active in the timber harvest of Beaver Creek basin until after World War II when rebuilding the nation was a priority. Timber sales were designed and laid out by the Forest Service and offered for sale to the highest bidder. The Timber Department administered the harvesting and, in most cases, was responsible for post harvest rehabilitation and silviculture treatment. Most prescriptions called for partial cutting of units. Clear cutting of large units began in the 1960s and continued until the early 1970s when Congress yielded to public opinion and ordered a halt to the practice. Partial cutting in the 1970s and '80s produced large volumes of logs as the timber market boomed. A "Unit Area Control" prescription (markers' choice) was used in the basin and in the late 1980s, small clear cuts were again allowed (20-40 acres). The market dropped in the late '80s, leaving many contractors holding sales they could not afford to harvest. The last sales in the basin were negotiated in the early '90s as the spotted owl controversy brought a halt to logging the public lands in the basin.

In the late 1960s, Jaynes Canyon was logged on a select cut system. By 1970, the market had developed so that small diameter logs (<20" in diameter) became economical to harvest. As a result, the mill was refurbished once more to handle small logs. At about the same time, the demand for incense-cedar increased, thus facilitating a re-entry into previously logged areas. Soon after, the market fell and in 1973 the mill shut down for good. Since then, Fruit Growers entered into sustained yield forestry with a target of selling 15-20MBF of logs annually from their combined holdings to supply other mills. Altogether, 1,667,840,000 board feet was milled at the Hilt facility. The majority of that volume was hauled out of Beaver Creek Basin. Today it continues to produce a large portion of Fruit Growers' annual yield.

In 1988, Sierra Pacific Industries acquired property in the Beaver Creek Basin from the Santa Fe Timber Company (prior to 1984 it was the Southern Pacific Land Company). Management activity on these holdings began in the mid 1950s with the development of a system of access roads for timber harvest. Because of the checkerboard pattern of land ownership, cooperative agreements were formed between

Southern Pacific Land Company, Fruit Growers Supply Company, and the Forest Service. The agreements pertained to property boundaries, forestry practices, and road management. Timber harvest practices began with Timber Stand Maintenance which involved the harvest of dead, dying, and older decadent trees. Sterling Mountain was the first area of entry. By the 1960s, activities progressed to Dead Cow Creek, Jaynes Canyon, Dry Lake, Wards Gap, and Millers Glade. During the 1970s, development included Trapper Creek and Fat Doe Creek. Road development accompanied timber harvest. By the late 1970s, land management philosophy changed to a more intensive style that included precommercial thinning, commercial thinning, and clear cut operations. Road development was almost complete by this time. Since the 1988 land acquisition, Sierra Pacific Land Company has continued an intensive management program. More recently, Sierra Pacific lands have been purchased by Timber Products, Inc.

The history of land use within the watershed spans some of the most exciting times in local and national history. But within the span of 140 years, many miles of streambank have been destroyed and washed down through sluice boxes, range lands grazed to bare ground, and virtually every section intensively logged at one time or another. Beaver Creek basin has provided a bounty of wealth for the hardy miners, ranchers, and loggers. But now the cumulative effects of the combined activities are plainly apparent and reinvestment is needed to maintain the value of this rich resource.

ACCESS & TRAVEL

Key Question 1- Why and how was the road system developed?

Southern Pacific Railroad was given a land grant in 1866 to fund the construction of a railway that was needed to develop the resources of northern California. The arrangements were finalized in 1868 when Southern Pacific was deeded every other section in a checkerboard pattern extending 36 miles on each side of the tracks and included all of Beaver Creek drainage. The company sold or traded much of this land over the succeeding years.

By 1860 a wagon road from Hilt to Mayflower ranch on Nicklewaite Creek was used to access early diggings by miners. Shortly after 1912 the wagon road was extended down Hungry Creek and up West Fork to the Cinnabar Mine.

In 1910 Fruit Growers Supply Company acquired ownership of the sawmill in Hilt from Northern California Lumber Company. Fruit Growers seized the opportunity to supply their own fruit crates, rebuilt the mill for box shook production and extended the railroad system into Hungry Creek and Grouse Creek basins from Four Corners area. Railroad grades extended into Long John basin and Cow Creek by early 1930. There was approximately forty miles of railroad grades within the drainage. In 1934 railroad logging was discontinued and the railroad grades converted to roads for log trucks.

In 1932 a USFS survey was begun for a large land exchange with Fruit Growers. These swaps continued into the 1970's.

More substantial road development did not take place until the Works Program Administration projects were underway in the 1930s. During this period the old Beaver Creek Road 48N01 and 40S16, Siskiyou Crest Road 40S01 and 20, and other side roads that connected to the old railroad grades were built. These roads were often narrow which made it difficult for log haul. Most of these roads have been reconstructed to higher standards to accommodate modern vehicles used for log haul.

Extensive new road development and reconstruction of existing roads began in the late 1950s and continued to the mid '80s by private timber companies and Forest Service primarily for timber harvest.

In 1968 Fruit Growers Supply Company and Southern Pacific Land Company (now owned by Michigan California Lumber Company) entered into Road Right-of-Way Construction and Use Agreement to cooperate in the joint construction, use, and maintenance of certain roads within the watershed.

Beaver Creek Road between Hungry Creek and Hilt was reconstructed at its present location around 1960 under a special-use permit to Fruit Growers Supply Company. The road was constructed to a high standard with good alignment and with an average 24' width to accommodate off-highway logging trucks.

In 1994 segments of this road were reconstructed to narrow the travel width. The road was out sloped and rocked to reduce sedimentation caused from erosion.

Beaver Creek road between Highway 96 and West Fork was constructed at its present location about 1968. Some segments of the old alignment still exist, and are used primarily by residents to access their property.

COMMUNITY VALUES &
PRIVATE LAND USES

Key Question - What were the historical uses of the lands within the watershed? Refer to Cultural Overview section.

RECREATION

Key Question 1- What were the historic recrea- tional uses in the watershed?

Historic recreational uses included camping, fishing, hiking and hunting. Camping for recreation was limited, occurring mostly along the Siskiyou Crest, Dry Lake - Deer Camp area and in the lower portion of Beaver Creek. Developed camping began with the construction of the Beaver Creek Campground in 1934. Fishing, hiking, and hunting also occurred as a recreational activity, but occurred primarily as a substance to living.

COMMODITIES

Key Question 1- When and how were resources in the watershed used?

Historically the land was used for mining, timber production, and grazing. Timber harvesting began in 1909 and continues through today within the watershed. The early logging was done by railroad to remove high value pines from the most accessible lands. Douglas-fir was also remove but only for the purpose of building the railroad.

The product of the day for this area was packing boxes, specifically orange crates. Orders for this product varied depending upon demand and as the depression progressed the box industry moved to the forefront. The best sawlogs went into the construction of packing boxes. Employment was intermittent. Woods operations produced logs only when orders arrived at the mills.

In 1934 the first major inventory of the Beaver Creek area was taken. At this same time railroad logging gave way to tractor and truck logging, much as it is done today. As the wars came and went the demand for lumber increased. By the end of World War II the demand for housing drove demand for sawlogs up to a level never experienced in the nation. Communities developed around this industry and a network of roads replaced the railroad grades, making the National Forest accessible for the collateral forest industries of the present day.

Timber continued to be in high demand into the 1960s, '70s, and early '80s. Realizing the Forest could not keep up this demand, production declined to the present level. Harvest methods have changed over the years. Twenty years ago, the typical harvest prescription consisted of overstory removals, designed to release suppressed understory, and regeneration harvest designed to restock areas where the overstory was becoming decadent and understory was lacking.

Fuelwood- Early fuelwood fired boilers at saw mills, in locomotives, and heated homes. Rails, posts, and poles were and are used by local ranching and farming industry during the same time period. What has changed over the years is the permit system by which these are obtained. Up until the enactment of the *National Forest Management Act* (1976), fuelwood for home heating and rails, posts, and poles were available to local community residents under a free-use system of the *Organic Act*, which permitted $20 of free-use to residents living within a given radius of the National Forest. The fees were calculated at a

minimal rate of $0.50 per cord and a few cents per foot for posts and rails with the proviso that this was for personal use and not for resale.

Special Forest Products- It has only been in the last ten years that the Forest Service has started to charge for these special products. Historically the people have just gone out and cut their Christmas tree, harvested mushrooms and what ever other products they gathered.

Mining- The earliest detection of mining in the watershed was in the 1870s. Reports indicate mining was very primitive but strikes were of a somewhat substantial amount. The Corbett Mine in the Bullion Mountain area showed a $30,000 strike. There were seven other mines in that area but nothing that produced a strike that large.

World War I started in 1914 and miners began to leave the area to work in war-related factories in the cities. Mining declined sharply in the 1920s and communities were reduced to a core of established families.

As the depression deepened in the country during the 1930s many people too proud to accept charity moved back to the area to extract a living from the land and wait until economic times improved. Most residents gave considerable effort to non-monetary forms of subsistence such as fishing, hunting, gardening, and animal husbandry, as well as placer mining.

As we entered World War II, by Presidential Order mines were closed so efforts could again be placed where needed the most. The pumps were turned off and people moved back to the cities for the war effort. As a result of this inactivity, many shafts filled with water or collapsed, never to reopen.

Mining, from World War II to present, has been sporadic and recreational-oriented. Interest from larger mining companies has been intermittent to date, due to economic feasibility limiting large-scale operation profitability.

Grazing- Domestic livestock were brought to northern California over 150 years ago. Miners and homesteaders raised livestock to supply food for local residents. Cattle and sheep were moved into the adjacent mountains to forage. In the early 1900s grazing was largely unregulated and livestock numbers were as much as five times higher than currently permitted on National Forest lands. Roving bands of sheep, cattle, horses, pigs, and goats utilized the area year-round. The longer grazing seasons of February through November, as compared to the present April through October grazing seasons, allowed animals to graze plants in the more phenologically sensitive times of early spring and early winter. This grazing period tends to reduce vigor of palatable shrubs and favored herbaceous plant species. The continued high use of the mountain rangelands created degraded conditions in some areas; thus forage production was reduced.

The *Forest Reserve Act* divided grazing lands into allotments. Historic users were permitted to graze their livestock within these traditional areas. The early allotment areas were larger than they are today. Livestock numbers and seasons of use were established. Since 1947, overall numbers have declined to provide recovery to damaged rangelands. Allotment boundaries were reduced and improvements including fencing were implemented to regulate livestock use and improve management.

Dry Lake and East Beaver Allotment History - Live- stock use began in this area in the 1860s. Cattle numbers varied from 100 to 500 during 1910 to 1920. During World War I, thousands of sheep were grazed in this area by the Great Western Sheep Co. In 1944, a reduction in numbers began due to

overgrazing. By 1950, the present capacity was reached and has been maintained since. An increased trend in range condition has been observed up to present.

Livestock drift across Forest boundaries along the Siskiyou Crest has been an ongoing problem since earliest documented Forest records. The open nature of the crest area, along with numerous roads in recent years have made fencing an infeasible solution to the problem. For many years a minimal amount of drift both ways was tolerated by both permittees and the agency. In recent years, issues of excess use and unauthorized use have escalated.

Areas of concern identified in the Siskiyou Crest Strategy in conjunction with the East Beaver Allotment are East Long John meadow and McDonald Basin (on the Rogue N.F.). Both are outside the allotment boundary and excess use and unauthorized use has been a problem (for more detailed information see Horse Creek/Dry Lake Allotments --Horse Creek/Beaver Creek/Haystack Watershed Analysis Area Report).