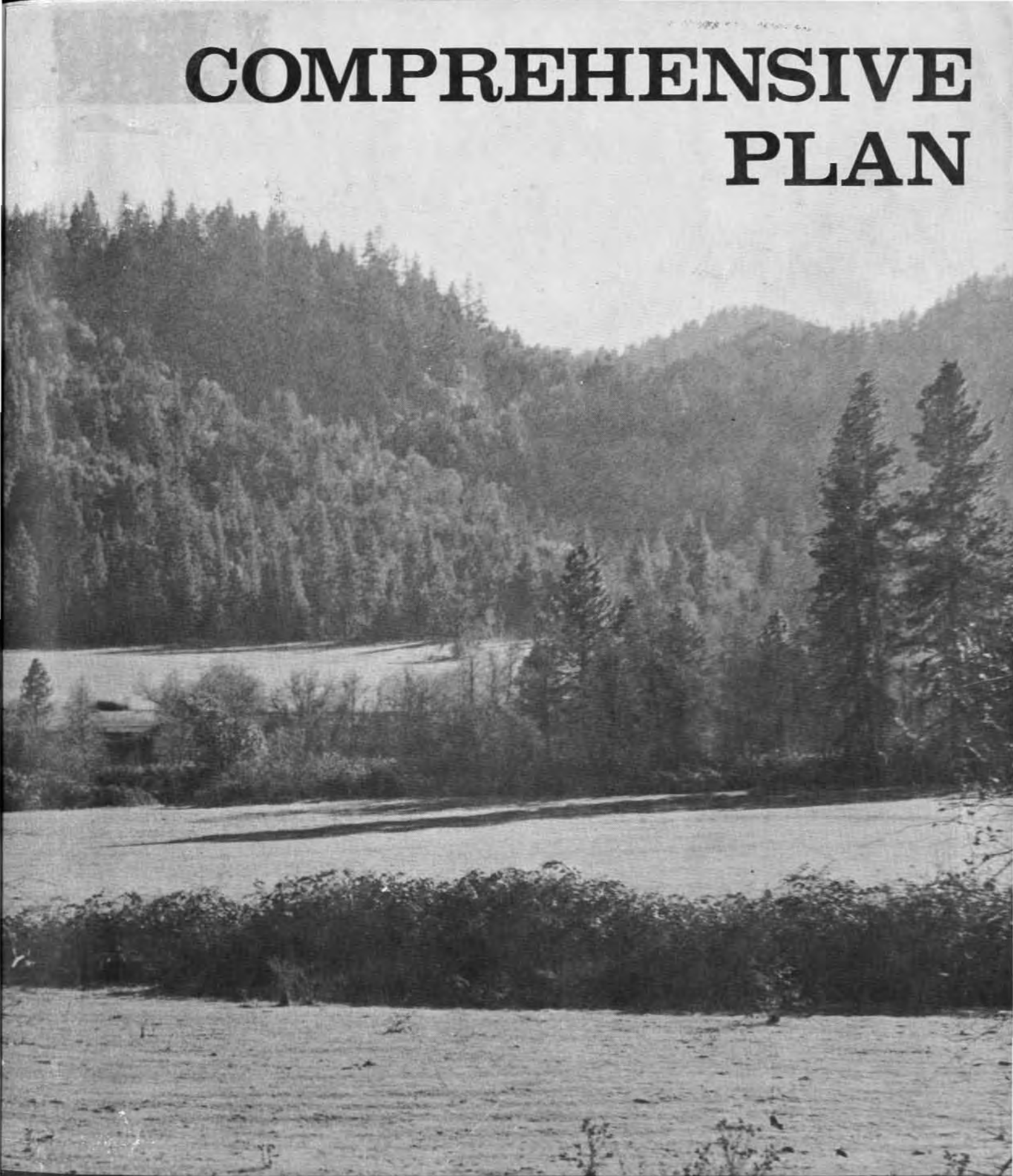
COMPREHENSIVE PLAN



JOSEPHINE COUNTY

COMPREHENSIVE PLAN

FOR

JOSEPHINE COUNTY

APRIL 1981

This document was prepared by the Josephine County Planning staff in cooperation with the Board of County Commissioners, Planning Commission and Zoning Commission.

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INTRODUCTION

In the 1800's Josephine County was still undeveloped territory. As settlers moved into the area houses were built, roads were developed, farms were cleared and settlements began. Eventually roads criss-crossed the land; schools were built; government was instituted; and people found work.

People have continued to move into the area--it's a good place to live. Everyone wants homes, schools for their kids, a job to make ends meet and provide for the good things in life, a place for recreation, fresh air to breathe, and enough good water to drink and irrigate a crop. There is nothing wrong with that. But resources and dollars are limited, and more people are competing, today, for the same land that existed 50 years ago.

A lot of things have changed since the early settlers came to the virgin lands of Oregon. To accommodate these changes, people of the community have had to set up some basic guidelines to live in harmony with one another and with the resources of the area. These interrelationships, guidelines and rules are the basic building blocks of comprehensive planning.

This document is designed to be a summary of information on a variety of factors over time, including population, economics, forest lands, recreation, public facilities, and natural resources. As such, it represents a commitment to organize and coordinate these complex interrelationships in such a way as to guide development and protect the future health, safety and welfare of the general public.

HISTORIC DEVELOPMENT

The art of development planning is known to have been practiced by the ancient Greeks and Romans. In the United States, planning (functional design) was a major influence in shaping early cities such as Washington D.C., Philadelphia, Boston, Annapolis and Savannah during the 18th Century.

Formal planning and zoning ordinances were enacted throughout the United States in the early 1900's. In Oregon, the city of Portland adopted zoning in 1918, and in 1947, enabling legislation for county planning was passed.

In 1969, mandatory regulations for comprehensive planning and zoning were adopted with the passage of Senate Bill 10. In 1973 Senate Bill 100 was passed creating the Land Conservation and Development Commission (LCDC). These laws were incorporated into Chapter 197 of the Oregon Revised Statutes (ORS).

LEGAL DEFINITION OF COMPREHENSIVE PLANNING

As technology and public desires changed through history, so did the role of planning. While the end product is still basically land use patterns, a wide range of physical, social and economic concerns are now considered. Chapter 197 of the ORS addresses these comprehensive planning concerns. The basic concepts and definitions are as follows:

> 197.005(1) Uncoordinated use of lands within this state threatens the orderly development, the environment of this state and the health, safety, order, convenience, prosperity and welfare of the people of this state.
>
> 197.010 The Legislative Assembly declares that, in order to assure the highest possible level of livability in Oregon, it is necessary to provide for properly prepared and coordinated comprehensive plans for cities and counties, regional areas and the state as a whole. These comprehensive plans:
>
> (1) Must be adopted by the appropriate governing body at the local and state levels;
>
> (2) Are expressions of public policy in the form of policy statements, generalized maps and standards and guidelines;
>
> (3) Shall be the basis for more specific rules, regulations and ordinances which implement the policies expressed through the comprehensive plans;
>
> (4) Shall be prepared to assure that all public actions are consistent and coordinated with policies expressed through the comprehensive plans; and

(5) Shall be regularly reviewed and, if necessary, revised to keep them consistent with the changing needs and desires of the public they are designed to serve.

197.015(4) "Comprehensive plan" means a generalized, coordinated land use map and policy statement of the governing body of a state agency, city, county or special district that interrelates all functional and natural systems and activities relating to the use of lands including, but not limited to sewer and water systems, transportation systems, educational systems, recreational facilities, and natural resources and air and water quality management programs.

"Comprehensive" means all-inclusive, both in terms of the geographic area covered and functional and natural activities and systems occurring in the area covered by the plan.

"General nature" means a summary of policies and proposals in broad categories and does not necessarily indicate specific locations of any area, activity or use.

A plan is "coordinated" when the needs of all levels of governments, semi-public and private agencies and the citizens of Oregon have been considered and accommodated as much as possible.

"Land" includes water, both surface and subsurface, and the air.

THE PROCESS

The Comprehensive Plan is divided into basically three sections: (1) the data base--this document, (2) the goals and policies, and map and (3) implementation or use of the plan. The data base generally reviews each topic for its:

a. historic occurrence and influence
b. existing status
c. projected status
d. interrelationship to other factors
e. interrelationship with human desires and needs
f. alternative directions and solutions, if available.

Based on this information, goals, policies and implementation for community development have been established. This portion of the plan outlines:

a. the direction of development (overall and specific) -- what will this community be like in the next 10 to 20 years, and

b. specific methods of fulfilling these goals -- how will this community grow and develop to be what it wants to be.

The greatest single problem between comprehensive planning and real-world activities is timing. Many of the ideas and goals suggested in the plan can happen only sometime in the future. Once the groundwork is laid out, orderly changes can begin to occur. It rapidly becomes obvious that the comprehensive plan cannot be a static document, but should rather be accepted as an on-going, forward-moving process.

Comprehensive planning is designed to meet the basic needs of the people. As these needs change (and the means of providing for these needs change) the plan must change. Any changes that are made, however, must be made for the good of the community and must follow the guidelines originally agreed upon.

The comprehensive plan will, therefore, be totally reviewed every two years (although specific portions may be updated, changed, or implemented more frequently). Balance and harmony of the parts will be the underlying theme of the plan, and decisions should be carefully considered in terms of the overall effect on the entire community.

To summarize, the purpose of the plan is to look to the future. The benefits of the plan are that it is:

...Long-range - looks ahead as far as is practical to anticipate growth and resulting community needs;

...Comprehensive - relates and integrates various physical, social and economic factors;

...General - identifies general locations and identifies relationships in regard to the population served; and

...Responsive - able to adjust to changes in conditions, unforseen circumstances, or new local and regional trends.

The comprehensive plan and its implementation is obviously not a simple process. It requires active participation by all levels of government and private

concerns to maintain a safe, healthful, and productive community that we can all be proud of.

The basic precept of this plan is to continue the concepts embodied in the County's 1970 Comprehensive Plan:

> 'In this time of population explosion, enormous urban complexes and seemingly endless sprawl, our County is still basically a beautiful and natural area. But the disjointed pattern of growth has begun. All that separates Josephine County and Grants Pass from the blight and ugliness of haphazard development is time and the attitudes of its people. Time will pass and development will come, and the community of tomorrow will reflect the attitudes and commitments of its residents today. May it never be said that no one tried, but above all, may it never be said that no one cared.'

HISTORY AND SETTLEMENT PATTERNS

PRE-HISTORY

Prior to the coming of the white man, the area encompassed now by Josephine County was inhabited by native peoples. The Takelman Indians, who numbered approximately 500 individuals in 1851, were the principal inhabitants of the area. A few members of the Na-Dene tribe of the Rogue Indians also lived in the area. The Takelman culture was a unique association of elements of the Pacific Northwest and Coastal Indian cultures. Unfortunately very little excavated evidence remains of this culture's existence. Bits of physical evidence, records kept by early pioneers, and recollections of long-time residents, suggest life in southwestern Oregon prior to the settlement of the region by the white man. Because of the extensive deposits of archaeologic evidence which remain buried in the County, however, the potential exists to add substantially to our knowledge of the regions' prehistory.

The Takelman people spoke a language which was different from other southern Oregon and northern Californian tribes. The Takelmans lived according to reports by early white explorers, in small, usually family-related groups of fifteen to one hundred individuals. The permanent camps were few in number and very limited in size. Semi-permanent villages did exist at the mouth of Applegate and near the present city of Grants Pass. Migration for food gathering, however, generally made large, permanent colonies unfeasible.

The dwellings contained in the villages were made by excavation of a small to medium room-size pit, two to four feet deep. The walls of this pit were lined with cedar or pine planks which extended higher than the pit and supported a brush or bark covered roof.

Nutritional needs were generally satisfied with the gathering of plant foods such as acorns and camas bulbs. Salmon fishing with spears, nets and clubs provided a supplement to the predominantly vegetarian diet of the Takelmans. The trapping and hunting of deer and small game also provided a meat source.

Conflicting testimony by early white explorers indicates that the Takelman people were either disorganized and easily preyed upon for slaves by neighboring tribes, or were a cunning and organized tribe that raided the neighboring tribes. Regardless of which perception is true, the Takelman's did possess a unique culture and inhabited a fairly isolated region.

Occasional skirmishes occured between the Indians and the early fur traders, explorers, and military expeditions. These skirmishes increased as the Oregon-California Trail was established in the late 1830's. The current location of Interstate 5 through Josephine County closely approximates the trail used by early explorers to the region. The attitude of the early whites was that the Indians could not be trusted, and it is alleged that the name of the Rogue River is derived from the nature of the Indian bands.

With the discovery of gold in Josephine County, conflict between the Indians and the miners, who intruded into the Indian territory, became inevitable. The miners frequently displayed an attitude that the Indians should be eliminated whenever possible. Quasi-military raiding parties from as far south as Yreka, California, intruded into the Takelman domain. Retaliatory ambushes by the Indians were common, and slowly the Indians were pushed into the most remote areas of the region. As the hostilities increased, companies of "exterminators" from Jacksonville and other mining camps formed to completely eradicate the struggling Indian population. This led to the outbreak of a series of bloody Indian wars resulting in the massacre of both white settlers and Indian people.

In response to the outbreak of hostilities, Army troops under the command of General Lane and other early military leaders engaged the Indians in a series of battles. When the wars climaxed in 1855 and 1856, most of the Takelmans had either been killed or captured. The captive Indians were then removed to the Grande Ronde and Siletz Indian reservations in northwestern Oregon. The dramatic change in climate between the Oregon coast and the Rogue Valley, plus the introduction of smallpox and other diseases for which the Takelmans had no natural immunity, resulted in the slow death and decimation of the tribe. A few individuals remained hidden in the Rogue Valley, but the Takelmans, as a people, were exterminated.

SETTLEMENT

Land use in Josephine County has been determined by two primary factors: 1) the capability of the resources and 2) the availability of transportation. The existing land use pattern of the County has been created as the result of decisions that were made in response to these factors. The natural features of the region influenced the location of agricultural areas, mining operations, logging operations and transportation routes. Transportation routes and agricultural lands determined the location of human settlement.

MINING

The first settlement activities in Josephine County resulted from the discovery of gold in the Illinois Valley in 1851. As a result of the rich discoveries in southwestern Oregon, a gold rush occurred. A tremendous influx of miners from the California gold fields spread throughout the hills, seeking "color". Beginning in 1851, these miners began searching the streams and mountainsides. The earliest mining techniques focused on the panning and sluicing of stream gravels. These gravels were called placer deposits.

Placer mining involved minimal equipment and minimal investment, and sometimes yielded spectacular profits. As the stream placer deposits became exhausted, however, the miners turned to more sophisticated and destructive techniques to mine the older, less accessible ore-bearing gravels. Hydraulic mining was introduced in which huge nozzles forced a powerful stream of water against a gravel bar wearing away the gravels, which were then collected and run through sluice boxes. Hydraulic mining companies were formed. The companies constructed elaborate ditches and piping systems to collect water under pressure to be forced through the nozzles. Portions of these old ditches and the eroded remains of these old mines remain as mute testimony to the intense mining activities that once occurred in these areas.

The deeper placer deposits located within streamways were also mined through the use of floating dredges. These dredges, which consisted of barges with steam operated mining equipment, scooped up the gravels in the front and deposited the gravel behind as they advanced along the stream bed. In effect, the dredges dug their own lakes to float in as they moved along. The dredge-deposited gravels are called tailings. Extensive deposits of tailings remain on a number of streams including Graves Creek and Althouse Creek.

TYPICAL EARLY HYDRAULIC MINING

The development of hard-rock mining in Josephine County required the introduction of technology and large scale capitalization that only mining companies were capable of providing. Slowly the individual prospector was replaced by large, organized mining companies which constructed both mines, mills and access roads.

As the individual prospectors disappeared from the County, either to be employed by a mining company or to join gold rushes such as the Idaho gold rush, their place was taken by large groups of Chinese. Hostility between white settlers and the Chinese population was extreme and the Chinese often banded together in their own camps and villages. Discriminatory laws were passed against the Chinese such as a poll tax for obtaining medicine or medical treatment.

Most of the rich mining areas of the County were worked, at one point in time, by Chinese miners. Very little evidence, however, of the once extensive Chinese population of Josephine County remains. A Chinese cemetery exists to the south of Waldo Road but the bones, apparently, were long ago exhumed and sent to China.

While gold was the impetus of the original mining activities in Josephine County, other valuable minerals have been discovered and have been mined in the County. Of the 400 mines and prospects known to have been located in Josephine County, (Oregon State Department of Geology and Mineral Industries, 1979,) 282 mines produced gold and other metals, 47 produced copper and 135 produced chromium. The major hard rock mines in Josephine County include the following:

Benton: Located on Whiskey Creek (north of Galice). Gold was mined in quartz veins with about 18,500 ounces being removed between 1934 and 1942. There are over 10,000 feet of workings on six levels of the mine. A cyanide plant handled up to 60 tons of ore per day.

Gold Bug: Located about two miles east of the Benton mine. In the late 1800's and early 1900's, 37,500 ounces of gold were produced at this mine.

Alameda: The Alameda Mining Company, one of the most extensively capitalized mining ventures of Josephine County, was located adjacent to the Rogue River, downstream from the town of Galice. The most easily accessible deposits were mined in the 1860's and 1870's, but extensive hard-rock mining began after the turn of the century.

Greenback: This mine is located just north of the town of Placer. In the early 1900's approximately 175,000 ounces of gold were mined from this site. The mine also supported a small town called Greenback which at one time contained as many as 235 people.

Marble Mountain: Between three and five tons of high-quality limestone were hauled from this mine between 1938 and 1980 primarily for use in the manufacture of concrete and cement products. The mine is located on the side of Marble Mountain approximately fifteen miles southwest of Grants Pass.

Deep Gorge: Located approximately 10 miles west of Selma, near the Illinois River. This mine is located in an area rich in chromite. Within a four mile radius are located an additional 35 recorded chromium prospects and mines. The Deep Forge mine yielded 2,000 long tons of chromite prior to 1938. Recent exploration of chromite and nickle laterite is detailed in the section entitled Earth Resources.

Llano de Oro: The Llano de Oro, or easterly mines, and Logan's Sailors' Gulch claims are representative of the many profitable gold mining operations in the Waldo area southeast of Cave Junction. These mines were active in the 1800's and produced platinum in addition to gold.

Queen of Bronze: The Queen of Bronze was the most productive copper mine of Josephine County. The mine and smelter was located east of Takilma and produced more than 6,000,000 pounds of copper and 6,000 ounces of gold in the early 1900's.

Cowboy: The Cowboy mine located southeast of the Takilma area, near Page Creek, tapped a large copper deposit. In the early 1900's approximately 1.5 millions pounds of copper was refined.

Associated with the mining activities were the first communities of Josephine County, including Waldo which was the first county seat. Ironically, Waldo, which owed its existence to the mining of the adjoining hills, was ultimately obliterated by the hydraulic mining of land on which the town stood. Other communities which grew up as a result of adjoining activities included Kerby, Leland, and Placer. These towns remain in various forms to the present day. Other mining towns, however, have completely disappeared including Williamsburg, Allentown, Hogtown, Frenchtown, Browntown and Yankville.

FARMING

As the earlier miners probed the hills for the recovery of valuable ore, a different type of settler began moving into Josephine County. The mining activities resulted in the concentration of large groups of men in selected areas of the County. In order to supply the needs of these miners both merchants and farmers moved into the community. In our modern day age of nationwide food distribution, it is sobering to remember that at one time almost all of the food needs of the residents of this County were produced in southern Oregon. Under the provisions of the Homestead Act earlier settlers laid claim to the best bottom land in the County.

The original farming activities existed to supply the miners in the mining camps with food. Because of the difficulties of transportation the market was confined to local needs. In the 1880's, however, the coming of the railroad made possible the transportation of food products to greater markets and the agricultural industry was measurably stimulated. Farmers began to specialize and produce crops for shipment outside of the Rogue Valley. Early specialty crops included hops, fruits, and grapes. Other crops were found that were well adapted to the generally warm climate and long growing season.

Hop fields were planted as the pine forest was cleared. In 1878 hop-growers produced over 70,000 pounds of hops in Josephine County (Sutton, 1967). Many of the hop yards, however, were taken out of production and replanted into orchards around the turn of the century. After World War I, however, many of the orchards were torn out and replanted to hops. By 1945 twelve percent of Oregon's production of hops occurred in Josephine County.

The most successful orchards in Josephine County were the apple orchards. Unfortunately, dramatic increases in rail freight costs, resulting from the World War I hostilities, made apples and other exported crops, such as melons, uneconomical to farm. By the end of World War I only ten percent of the apple orchards that had existed before the war remained in production.

Tokay grapes and other varieties became popular in the Grants Pass area in the early 1900's. They were grown, often without irrigation, in the red soils of south-facing slopes. Again market limitations and transportation costs contributed to the decline of grape production and nearly all vineyards were out of production by the end of World War II.

For a brief period of time gladiola bulbs became an important specialty crop in Josephine County. Soil

problems and market conditions, however, also led to the decline of production of this speciality crop.

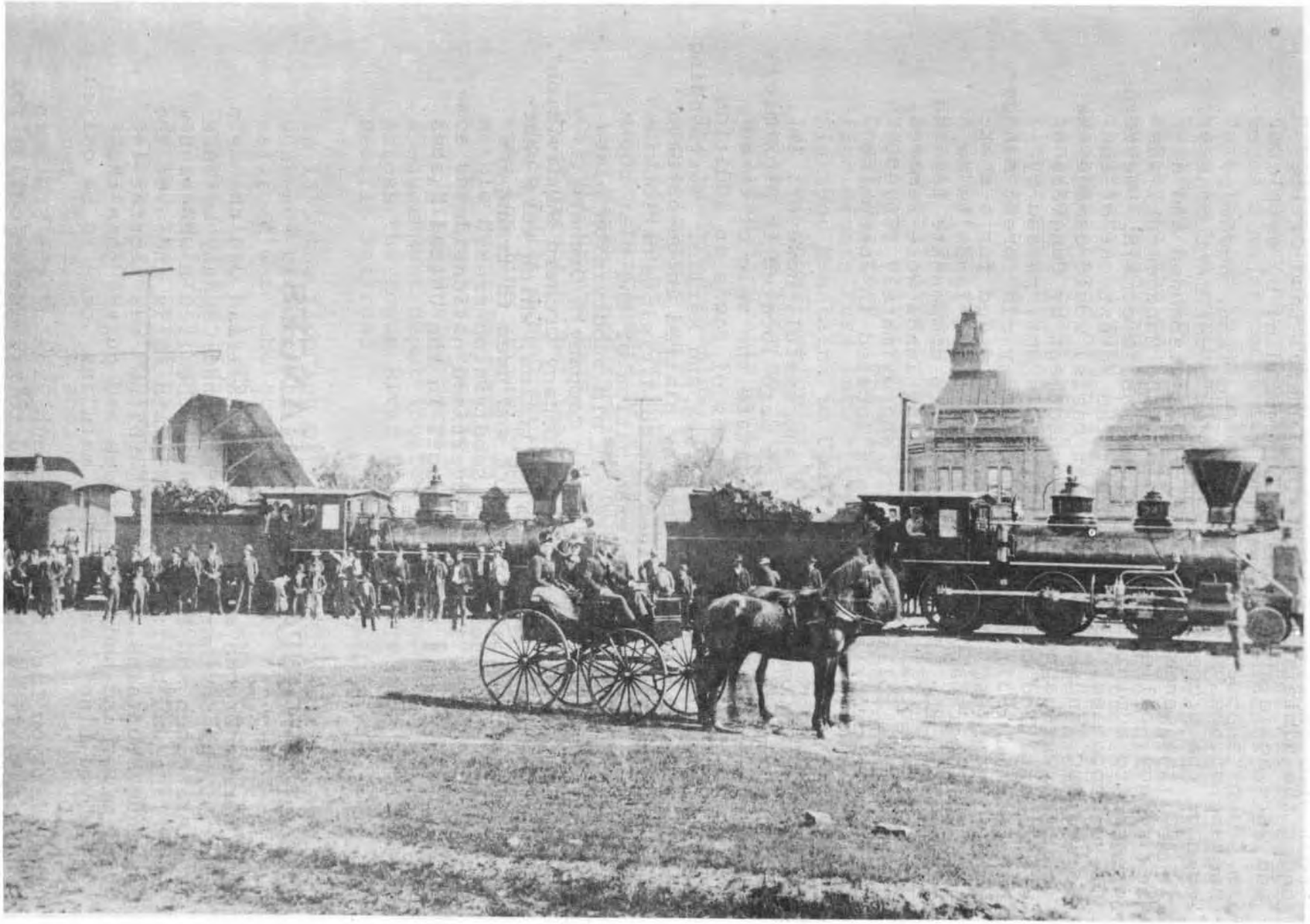
EARLY TRANSPORTATION

The railroad brought the most dramatic change to the settlement pattern of Josephine County. The railroad made it possible to transport mining ores and open new markets for agricultural products. The railroads also attracted other settlers to Josephine County and provided the nucleus of modern urban life.

The Oregon and California Railroad was constructed south through Josephine County in 1884. The railroad company selected the best agricultural area in the area, located in neighboring Jackson County as the site of a major freight station for the shipment of agricultural products. Surrounding the station, the railroad platted a new town called Grants Pass. The early town consisted of a few stores and saloons constructed across the tracks from the railroad depot.

Prior to the introduction of the railroad most settlement activity in Josephine County had been concentrated in the Illinois Valley. Because the rail line did not extend into the Illinois Valley the Legislature of the State of Oregon, in 1885, annexed three townships into Josephine County, from neighboring Jackson county, including the new town of Grants Pass, to establish a county railhead. Thus originally platted Grants Pass was not part of Josephine County but was located in Jackson County.

The Oregon & California Railroad was completed to California in 1887 and was eventually absorbed into the corporate structure of the Southern Pacific Railroad. The Oregon & California (O&C) Company, however, had a special status in addition to the physical plant of the railroad. As an incentive to the construction of the railroad the Congress of the United States had awarded a grant of land, consisting of the odd numbered square mile sections for twenty miles on each side of the railroad right-of-way. The provisions of the grant required the O&C Company to sell these lands to bonifide settlers at a maximum price of $2.50 per acre. The Southern Pacific Company, however, violated these terms (largely because the grant lands consisted of steep, heavily timbered country not desired by the settlers at that time). In 1913 the United States District Court ruled the land grant invalid and required that the remaining, unsold lands were to be forfieted by the rail-



OREGON AND CALIFORNIA "DOUBLE HEADER" AT GRANTS PASS, 1890.

road. The lands were revested to the federal government under the administration of the General Land Office and were again available for homesteading by settlers.

Because of the undesirability of the land, however, most of the property remained under government control. In 1937 the General Land Office was disbanded and a new agency, called the Bureau of Land Management, was created to administer the former public domain. Western Oregon counties, concerned that the revestment of the former O&C lands on a permanent basis would damage the tax base,were appeased by the enactment by Congress of a bill entitled the "O&C Act". This act, passed by Congress in 1937, mandated sustained yield forest management of the "O&C" lands. The Act provided for a share of the timber harvest returns from these lands to be returned to the affected counties to compensate for the loss of potential revenues when the lands were removed from the tax rolls. There are approximately 350,000 acres of appropriated O&C lands located in Josephine County.

The Railroad Company had been successful, however, in selling some of the lands which were located in proximity to the right-of-way. To facilitate the sale of these lands the Company platted a series of towns in addition to Grants Pass, such as Wolf Creek and Merlin. Surrounding these towns the Railroad Company platted large-acreage subdivisions and advertised the subdivisions nationwide as "orchard tracts". An examination of the plat books of Josephine County will reveal old subdivision plats with names such as "Rogue River Company's Orchard Tracts" and the "Chicago Land Company Orchard Subdivision". The railroad assembled special trains, which were chartered to real estate promoters and used to transport potential purchasers to the subdivision areas. Josephine County land was advertised nationwide as some of the best fruit producing soil in the United States.

TRANSPORTATION CHANGES

The former Oregon and California Railroad was the main line of the Southern Pacific Railroad Company between San Francisco and Portland until the 1920's when a new main line was built through Klamath Falls and over the Cascade Mountains. The new mainline was shorter in rail miles and had fewer grades and curves than the "Siskiyou Line", as the old mainline came to be called.

The Siskiyou Line became a branch line of the Southern Pacific Railroad, but continued to provide an outlet for

products developed in Josephine County. At the turn of the century the construction of railroads was perceived to be a major community need. The residents of Grants Pass located in an inland valley, had access to the markets to the north and south over the Southern Pacific Railroad. There was at that time, however, no direct access to the coast. Transportation to coastal towns such as Brookings, Gold Beach or Crescent City was restricted to very inadequate mountain trails. Community boosters began organizing efforts to establish a rail link to the coast, thus facilitating the shipment of timber products and other county products to major markets by sea.

A number of organizational meetings were held at the Grants Pass Opera House to promote the construction of a new rail line. These efforts resulted in the capitalization by private promoters, of the California and Oregon Coast Railroad. The C&OC was projected to build westward from Grants Pass into the Illinois Valley and over the Siskiyou Mountains to Crescent City. Bids were actually let for construction of the railroad, and work progressed on the line from an interchange with the Southern Pacific Railroad in Grants Pass toward the Applegate River.

The railroad eventually extended as far as Waters Creek, approximately ten miles to the southwest of Grants Pass. At this point, however, financial difficulties resulted in the foreclosure of the operation. Ultimately, the line passed into receivership and was taken over by the City of Grants Pass. The City did not operate the railroad directly, but leased the railroad to mining companies which built a spur up Cheney Creek. The cement company used the line primarily to transport limestone from the Marble Mountain quarry to Grants Pass for interchange on the Southern Pacific Railroad. In its final years the railroad also served to shuttle chrome deposits from a government depot located to the south of Grants Pass across the Rogue River to interchange with the Southern Pacific Railroad.

In 1955 the flooding of the Rogue River tore out the weakened bridge, and a petition for abandonment of the railroad was submitted to the Interstate Commerce Commission. In 1957 approval for abandonment was received and the line was scrapped. Although the line operated for 55 years, and five locomotives were used during its operation, the railroad did not dramatically affect surrounding land use as long as it was operated as a railroad.

When the line was abandoned, however, the right-of-way was dedicated to Josephine County and the State of Oregon for highway purposes. The Redwood Highway into Grants Pass was located on a portion of the old railroad right-

of-way as well as the County road called Demaray Drive. Finally, the construction of the Redwood Highway, nearly sixty years after the inception of the railroad, and after the railroad abandonment, fulfilled the original dream of a modern transportation artery from the interior valley to the coast.

LOGGING

The timber products industry of Josephine County is now the major economic base of the region. Surprisingly the importance of timber to the economy is a relatively recent development in the area. Prior to the turn of the century most logging done in Josephine County was limited to supplying local demands and needs only. Timber was cut for housing, construction, and for supplying industrial boilers. The cost of transportation from the Rogue Valley to principal markets, such as Portland or San Francisco was not competitive. Coastal regions which could load finished lumber on ships for transport to the major cities enjoyed tremendous cost advantages over isolated interior valleys.

The construction of the railroads did allow, however, for the logging of the select specialty woods which were not available in coastal forests. The most highly-demanded lumber produced in Josephine County before the 1930's was sugar pine.

The first major mill erected in Grants Pass was the Sugar Pine Door and Lumber Company. This company was capitalized by U.S. Senator J.H. Miller, and produced finished products which were transported over the Southern Pacific Railroad.

Early logging was limited to the low elevation, relatively flat land of the County, due to the lack of machinery to move the logs from the felling site to the mill. Early mills were powered by muscle, water, and in some cases by steam. The more advanced mills were steam powered. Most timber harvest was accomplished adjacent to the right-of-way of the Southern Pacific Railroad, and it was not until the 1920's and 1930's that logging became significant in the economy of the Illinois Valley. Among the long established logging and milling companies of the County is the Spalding and Sons Mill which is located to the east of Grants Pass. The company originated as Spalding Brothers which logged and milled lands located to the west of Wonder in 1907. It had expanded by World War I to a mill in Kerby and one at Wonder.

Historically timber operations in the County involved small operations which felled the timber and rough-hauled the logs to small, local mills. These mills were located in diverse areas of the County (i.e. Three Pines, Merlin, Wilderville) and in other locations deep in the woods no longer bearing place-names.

The original logging "shows" involved mules or oxen which pulled huge log buggies, consisting of immense wheels with a frame under which the logs were suspended by cables. Steam tractors later replaced the oxen, and more refined log buggies allowed for cutting operations at greater distances from the railroad. After World War II, wood-burning steam engines were replaced by gas-powered donkeys and trucks which made harvest of all but the most rugged and inaccessible lands of the County possible.

The Williams Valley was the site of the first furniture factory in Oregon. The Caldwell Furniture Factory was built in Williams in the late 1800's. Activity also occurred in northern portions of the County. The Three Pines Lumber Company was responsible for the platting of the townsite of Three Pines and the construction of a mill adjacent to the railroad in 1909.

In 1922 the Krauss Brothers Lumber Company was formed in the Selma area and later expanded to include lands south of Cave Junction. The operation is known as the Rough and Ready Lumber Company with a large mill located on the Rough and Ready Flat and a railhead in Grants Pass.

The Murphy Lumber Company built one of the largest mills in the southern portion of the County in 1945. In 1955 the mill was sold to the Mountain Fir Lumber Company of Salem.

NEW TOWNS

Transportation was a major factor in the location of communities in the County. Grants Pass owed its existence to the coming of the railroad. Cave Junction, which is one of the newest towns in Josephine County, owes its existence to the junction of two state highways and the attraction of tourists to the Oregon Cave National Monument. The original settlement consisted of crossroads development, including a gas station and stores. Because of its location, Cave Junction quickly became the center of the Illinois

Valley economy, surpassing the old town of Kerby to the north in population within a few years. Cave Junction continues to attract new residents as a retirement center.

ARCHAEOLOGICAL AND HISTORICAL SITES

Two resources that are underutilized or unprotected in Josephine County are archaeological and historical sites. The archaeological sites provide opportunities for understanding the peoples who once inhabited this land, where and how they lived. Sites vary from locations of scattered items to burial sites and homesites. These sites are located on both public and private lands. Due, however, to the checkerboard pattern of ownership, land use activities on private land could directly affect sites on public lands. Historic sites range from structures still in use to locations of major events.

A hazard associated with the publication of archaeologic or historic sites is that they may be disturbed by souvenir seekers ("pot hunters") or novice historians. If this occurs, the value of the site may be lost forever. For this reason, a listing of archeological sites is not published here; it is on file in the Planning Office.

The Josephine County area was the home of Indians consisting of both Takelma groups and Rogue River Na-Dene groups. Recent work at Applegate Reservoir in neighboring Jackson County indicates that sites as early as 8000 years BC can be found and that a continuous record of human occupation can be located right up to Takelma Winter Village sites that date to the 1830's or 1850's.

The survey at Applegate produced data on 27 archaeological and historic sites of which 15 were selected for testing. This resulted in a potential nomination or determinations of eligibility for the National Register of Historic Places for four sites. These sites include: A Takelma Winter Village dating to 1830-1850, a site with periodic occupation from the year 4000 BC that included other materials as late as the 1800's Takelma Village, a site dating between 4000 and 7000 years BC, and a site dating between 6000 and 8000 years BC.

HISTORIC SITES

The following list was provided by the Bureau of Land Management (BLM):

TABLE AHR-1

BLM INVENTORIED SITES IN JOSEPHINE COUNTY

Historic Sites

35-HS-11-7	33-8-27	Private	Extensive remains of early 20th century mining site. Low interpertive value.
35-HS-11-8	40-7-15	BLM	1850's mining town, was fairly intact until a few years ago when it was occupied by trespassers who largely destroyed it.
35-HS-11-10	35-9-13	BLM	Hansen Mine. Occupied until the 1930s. Picturesque buildings with hand hewn beams give site some interpertive value. Serious occupancy trespass problem.
35-HS-11-20	40-8-28	BLM	Waldo Cemetery. Site is currently maintained. Interpretation is being considered. Dates to early 1850s.
35-HS-11-5	40-8-34	BLM	Allentown Cemetery (Cave Junction). Site of first Catholic Church in Josephine County. Currently maintained by BLM. Catholic Church interested in R & RR lease. Needs to be withdrawn from mineral entry. Lack of access limits interperative possibilities. Serious trespass problem in area.
35-HS-11-21	33-8-34	BLM	Whiskey Creek Cabin. National register site. Structural stabilization and interpretation are planned.
35-HS-11-54	40-7-13	BLM	Late 19th century mining site. Appears to have been built and operated by Chinese immigrants.
35-HS-11-55	40-7-13	BLM	Late 19th century mining site.

Following is a listing by the Oregon State Historic Preservation Office of historic sites in Josephine County:

TABLE AHR-2

JOSEPHINE COUNTY HISTORIC SITES

Josephine County Historic Sites

GRAVE CREEK COVERED BRIDGE LANDMARK-- Grave Creek, Sunny Valley, OR, T34-R6-Sec 11.

GRAVE CREEK COVERED BRIDGE--Old Highway 99 at Grave Creek, Sunny Valley, OR, T34-R6-Sec 11.

GALICE COMMUNITY CENTER--Galice Store, Galice Road, Galice, OR, T35 - R8 - Sec 1.

GALICE STORE--Barlow ( ) Store; Galice Road, Galice, OR; T34 - R8 - Sec 36.

GALICE CREEK LANDMARK -- (Same); Galice, OR; T35 - R8 - Sec 1.

GALICE CREEK MINE TAILINGS -- (Same); Galice Creek Watershed, Galice, OR; T35 - R8 - Sec 1.

GALLAGHER (PAT & ZORA) HOUSE--Spee's Resort; Box 11407 Galice Road, Merlin, OR; T35 - R8 - Sec 1.

HELLGATE CANYON LANDMARK--(Same); Hellgate, Grants Pass-Galice Road, Merlin, OR; T35 - T7 - Sec 10.

INDIAN MARY PARK LANDMARK--(Same); Merlin-Galice Creek Rd., 6 miles west of Merlin, OR; T35 - R7 - Sec 4.

KERBYVILLE MUSEUM--Naucke (William) House; P.O. Box 34 (east side of Highway), Kerby, OR; T39 - R8 - Sec 9.

SUCKER CREEK SCHOOL DIST. NO. 41 SCHOOL--Grimmet School; Kerby Museum, P.O. Box 34, Kerby, OR; T39 - R8 - Sec 9.

MASONIC TEMPLE--(Same); Kerby, OR; T39 - R8 - Sec 9.

I.O.O.F. HALL--(Same); Kerby, OR; T39 - R8 - Sec 9.

JONES (T.L.) MEMORIAL CHURCH--Wilderville Church; Wilderville, OR; T37 - R7 - Sec 1.

ROBINSON (SHUBAEL EDWIN) HOUSE--(Same); 3787 Fish Hatchery Rd, Wilderville, OR; T37 - R6 - Sec 17.

BASTIAN (GLENN & VIRGINIA)--Hayes (Lewis) House; 8318 New Hope Rd. Murphy, OR; T37 - R5 - Sec 18.

PROVOLT STORE--(Same); 14299 Williams Highway, Provolt, OR; T38 - R5 - Sec 12.

CARNAHAN (NAN SMITH) HOUSE--Smith (Herbert) House; 193 SW I Street, Grants Pass, OR; T36 - R5 - Sec 18.

SHERER ( ) & JUDSON ( ) BUILDING--(Same); west side of Sixth Street, Grants Pass, OR; T36 - R5 - Sec 18.

NEWMAN UNITED METHODIST CHURCH--(Same); southeast corner of NE B and NE 6th Street, Grants Pass, OR; T36 - R5 - Sec 17.

GRANTS PASS HOTEL--(Same); 127 SE G Street, Grants Pass, OR; T36 - R5 - Sec 17. (Razed in 1980)

SMITH (HERBERT) BUILDING--Dixon ( ) Building; 125 Southwest G Street, Grants Pass, OR; T36 - R5 - Sec 18.

GRANTS PASS CITY HALL--(Same); northwest corner of SW H and SW 4th Streets, Grants Pass, OR; T36 - R5 - Sec 18.

PALACE HOTEL--(Same); southwest corner of SW G and SW 5th Streets, Grants Pass, OR; T36 - R5 - Sec 18.

M & M APPLIANCE STORE--Kissinger (ED) Butcher Shop; southeast corner of SW G and SW 5th Streets, Grants Pass, OR; T36 - R5 - Sec 18.

UNION VETERANS MEMORIAL FOUNTAIN LANDMARK--(Same); Grants Pass City Park, Grants Pass, OR; T36 - R5 - Sec 19.

UNION VETERANS LANDMARK--(Same); Grants Pass City Park, Grants Pass, OR; T36 - R5 - Sec 19.

ALBERT ( ) BUILDING--(Same); 220 NE 6th Street, Grants Pass, OR; T36 - R5 - Sec 17.

AUTO & HARDWARE STORE--White House Grocery; 214 NE 6th Street, Grants Pass, OR; T36 - R5 - Sec 17.

STAR SEED & GROCERY CO. WAREHOUSE--(Same); sourthwest corner of Northwest F & Northwest 4th Streets, Grants Pass, OR; T36 - R5 - Sec 18.

THE BREWERY--Grants Pass Brewery; SW 3rd & SW G Streets, Grants Pass, OR; T36 - R5 - Sec 18.

HARRELSON (JOHN) HOUSE-- Unknown House; 724 NW 4th Street, Grants Pass, OR; T36 - R5 - Sec 18.

KIENSTRA (ED) HOUSE--Cramer (George) House; 716 NW 4th Street, Grants Pass, OR; T36 - R5 - Sec 18.

NEWMAN (RICHARD) HOUSE--Hall (L.B.) House; 751 NW 4th Street, Grants Pass, OR; T36 - R5 - Sec 17.

OLSON (JAMES) HOUSE--Unknown House; 750 Northwest Fourth, Grants Pass, OR; T36 - R5 - Sec 17.

SMITHSON (JAMES ALLEN) HOUSE--Croxton (Thomas F.)? House; 1002 NW Washington Blvd., Grants Pass, OR; T36 - R5 - Sec 17.

LANTERN CAFE-Atlantic Richfield Service Station; northwest corner of NW Morgan Lane and NW Vine Streets, Grants Pass, OR; T36 - R5 - Sec 5.

The Josephine County Historical Society has placed site markers at the following locations:

#1 This marker is located at the covered bridge on Old Highway #99 in Sunny Valley. Site of the burial place of Martha Leland Crowley, a member of the first wagon train to enter Oregon via the Applegate Trail in 1846. The land for this marker and for parking space was donated to the County by Frank and Genevieve Price of Sunny Valley. A wooden type sign suspended from a cross beam frame. Dedicated October 19, 1968.

#2 Waldo Historical Marker located near the site of the old Waldo school and gives some interesting date about the old town of Waldo. This is a bronze and brass monument type marker, mounted on native rock and cement. The land was donated by Phayo and Ruth Pfefferle. Dedicated May 18, 1969.

#3 Old town of Golden Marker (on Coyote Creek), located on County property, a large wooden sign, suspended from a cross beam frame and has local historical date inscribed tereon. Dedicated July 11, 1971.

#4. Savage Rapid's Dam marker on the property of the Irrigation System on the south side of the Rogue River. James and Margaret Savage, pioneers of 1853, took up a Donation Claim just east of here. Rededicated November 6, 1979.

#5 At the start of a "Dedication Tour" the south Manzanita Rest Stop, north of Grants Pass, at the site of the Harris Cabin where the Harris Massacre took place in October, 1855. A marker was dedicated, which included one of the same kind at the north stop. Both are wooden signs.

#6 One of the same type was dedicated at the Haines Apple Tree in the town of Merlin. This tree is over 100 years old, has been fenced and trimmed and supported. Members of the Haines family were also killed in October 1855.

#7 The site of the Old Fort Vannoy Ferry, located on the Lower River Road, on land donated for this purpose by the present owners, Mr. & Mrs. Walter Crouse. This marker is the same type as the Merlin one.

#8 Site of Old Fort Hay at the south approach to Hay's Hill, scene of bloody Indian battles in the early days. Later called the Anderson State Station. Same type as #6, only much larger.

#5 thru #8 dedicated April 7, 1973.

#9 Fort Briggs Marker at the location of Old Fort Briggs in the Illinois Valley. The same type as the others and has a smaller sign placed by Rogue Chapter D.A.R. some years ago attached to the reverse side. Dedicated November 11, 1975.

The only State Park with historical significance is the Wolf Creek Tavern. The State of Oregon has invested considerable funds in the renovation of this facility, and the tavern is open to the public.

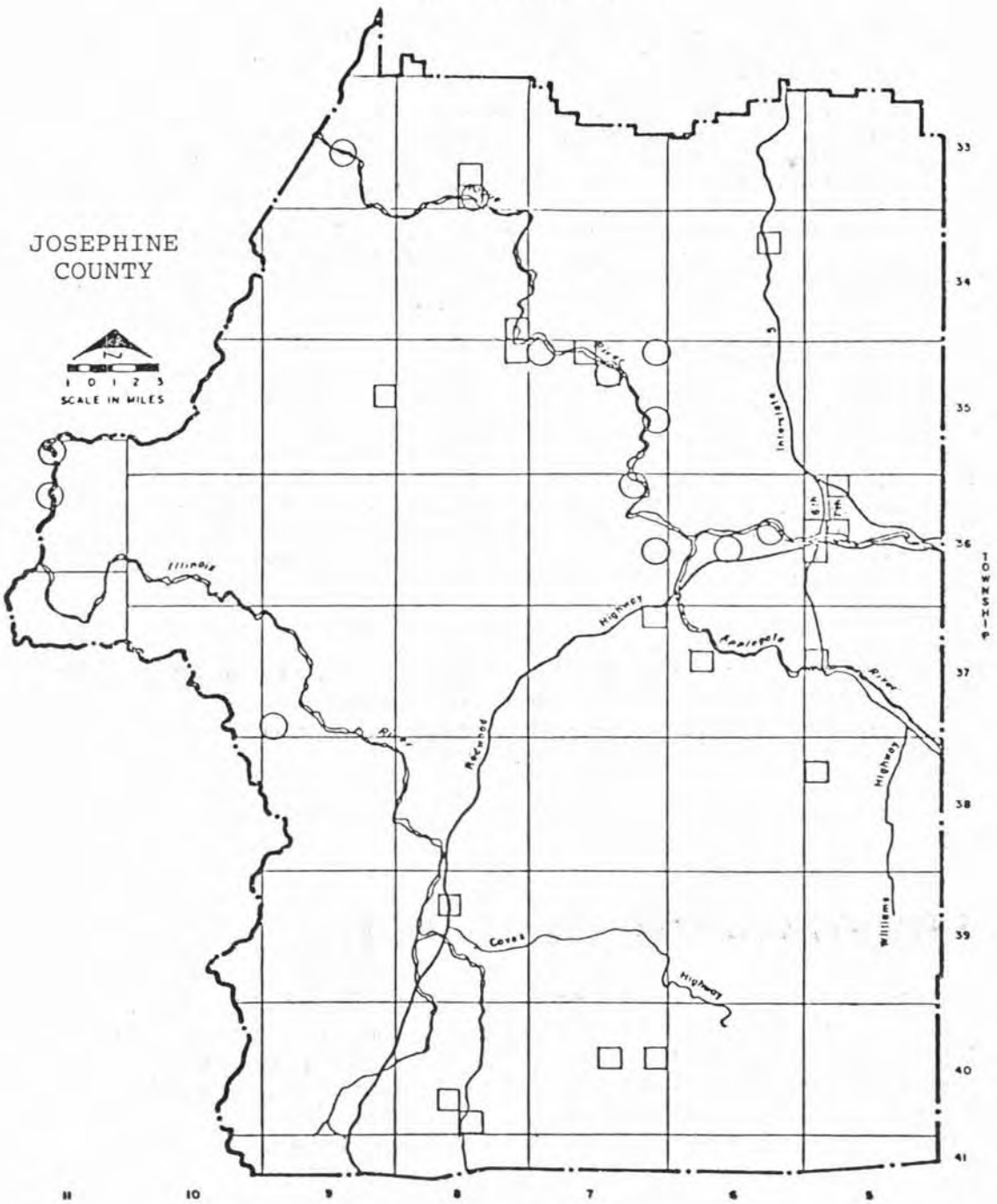
PRESERVATION AND USE

Josephine County apparently is rich in archaeological and historical sites. The Department of Archaeology at Oregon State University guesses that the County may be one of the richest in sites west of the Cascades, but only 3% of all suspected sites have been inventoried (Statewide Inventory of Historic Sites and Buildings, Department of Transportation, 1976).

MUSEUM

The primary historical museum in the County is in Kerby. Artifacts may be assembled in other places, but efforts have generally been limited.

MAP AHR-3



IDENTIFIED SITES

○ ARCHAEOLOGICAL

□ HISTORICAL

NOTE: AREAS MAY CONTAIN MORE THAN ONE SITE

Consideration may be given to further identification and preservation of sites so that they will be available for scientific study, and for public review and education. Interpretative centers, renovation of old buildings and sites and walking tours could be "developed" to facilitate preservation and study. Such preservation could add much to the historical, cultural, and economic growth of Josephine County.

Recognition of these resources and their potential is necessary One of the prime vehicles for this will be through zoning and the zoning ordinance. Again, for these to be effective it is necessary to have a complete inventory of the sites. It may take state legislative action for this to occur.

Illustration Overleaf; THE AHLF-HARBECK BUILDING AT 5th AND "G" STREET IN GRANTS PASS IS AN EXAMPLE OF THE ARCHITECTURE OF THE LATE 1800's.

EARTH RESOURCES

The geology of Josephine County is extremely complex. The Siskiyou Mountains are a unit of the Klamath Mountain Geomorphic Province, which extends from southwestern Oregon into northern California. The Klamath Mountain Province has been studied by Irwin (1966) and Hotz (1971). Their results show that the basic structure of the Province consists of four north-trending parallel belts of different rock types. The formation of these belts is explained by theories of plate tectonics and continental drift.

PLATE TECTONICS

The theory of continental drift postulates that at the beginning of Mesozoic times all the continents of the world were joined together to form a super-continent known as "Pangaea". By the close of the Mesozoic Era, the continents had drifed apart and had begun to assume different identities. The continents thus exist as dynamic and complex structures, embedded in plates of the Earth's crust. As the plates are moved across the mantle of the Earth, the continents may grow in size. This growth occurs as more sea floor material is rafted onto the continents and because of increased volcanism and upward movement of molten rock resulting from disruptions of the mantle.

It is speculated that the earliest rocks forming the Siskiyou Mountains were originally part of the Asian or East Pacific plates. These plates subsequently collided with the North American plate and rafted onto the North American continent. As the North American plate was shifted to the west, an active area of sub-duction (movement of one plate downward and beneath another plate) developed in the area of collision with the East Pacific plate. At the present time, the East Pacific plate is moving northwest relative to the North American plate. This movement can be traced in California along the strike of the San Andreas Fault.

Atwater (1970) postulated that much of the deformation of the western United States can be explained by the shearing between the more rigid central portions of the two plates. As subduction on the western side of the North American plate occurred, the oceanic crust and mantle of the East Pacific plate was forced downward and under the North American continent. The geologic units contained in the Siskiyou Mountains dip steeply to the east and are bounded by east-dipping thrust faults along which the older rock belts have overriden the younger rock units.

GEOLOGIC UNITS

Most of the rock formations in the Siskiyou Mountains are interpreted to have originally been formed under the ocean. Beaulieu (1972) indicates that the rocks of two units that occur in the Siskiyou Mountains, the Applegate Formation and the Rogue Formation conform to the types of rocks that are produced over active subduction zones in oceanic areas. In addition, Beaulieu notes that the siltstones and sandstones of the Galice Formation, overlying the Rogue Formation may represent the edges of a sea floor fan, spreading westward from the former continental slope. Medaris and Dott (1970) have observed that the ultramafic (very dense) rocks which occur in the Siskiyou Mountains (such as the serpentines) closely resemble ultramafics recovered from ocean ridges today. It is postulated that the ultramafic bodies represent blocks of material originally formed in the upper mantle of the Earth. These blocks may have been torn from the mantle during periods of active plate collision, and uplifted from beneath the ocean. Subsequent to uplift, the blocks of ultramafic rocks may have been rafted onto the North American continent. Coleman (1971) has speculated that the serpentines may have functioned as lubricating layers that allowed portions of the plates to slide over one another during periods of massive thrust-faulting.

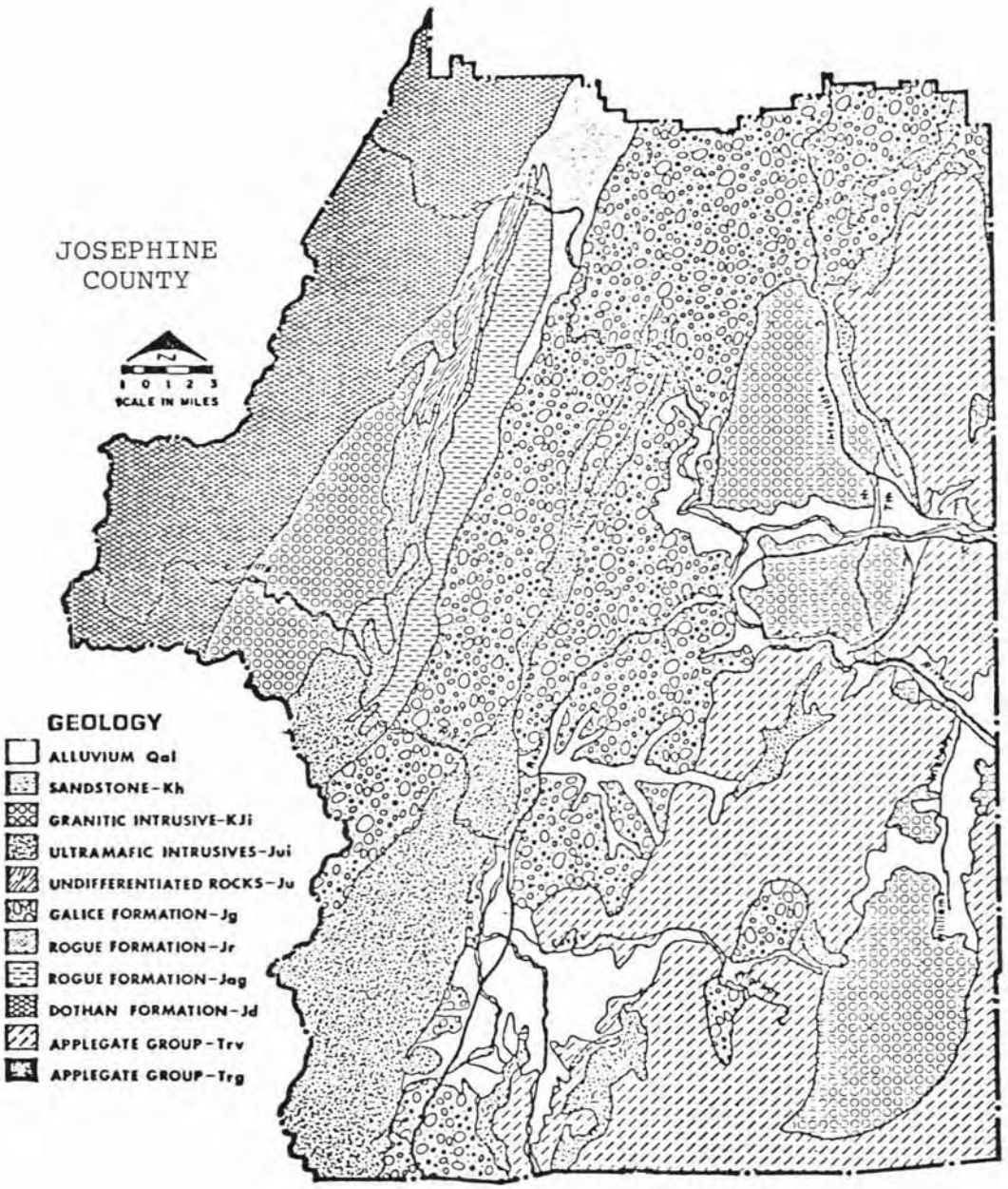
STRATIGRAPHY

The rock formations of the Siskiyou Mountains reflect the complex origin of the range (see Map G-1). The oldest rocks to occur within Josephine County are the metavolcanics and metasediments of the Applegate group. Rocks of the Applegate group are principally derived from volcanic activity occurring beneath the ocean. These rocks consist of pillow lavas, flow breccias and tuffs. The metasedimentary units of the group include argillite, slatey siltstone, chert, altered volcanic sediments, quarzite, conglomerate, and limestone. The age of the Applegate group is reported by Wells and others (1949) as upper-Triassic (200-230 million years ago). Hotz (1971) and Irwin (1966) suggest that these rocks may be older.

The Briggs Creek Amphibolite is a small outcropping consisting of a two-mile-wide belt of amphibolite, located west of Galice and extending toward Rainie Falls. Coleman and others (1976) and Garcia (1976) considered the amphibolite as a metamorphosed unit derived from the ocean crust.

The Rogue Formation is composed of fragmented rocks, including fine to coarse grained tuffs, agglomerates, and flow breccias. The Rogue Formation was mapped and described by Wells and Walker (1953) and Garcia (1976). The Formation is believed to be of island arc origin.

MAP G-1



SOURCE: United States Geological Survey.

Lying conformably on top of the Rogue Formation is the Galice Formation. The Galice Formation conists of volcanics with intervening beds of marine sediments. The Galice volcanics consist of thick andesite flows, flow breccias, and coarse conglomerates overlain by more siliceous tuffs and thin andesitic flows. The origin of the Galice Formation is also believed to be of island arc volcanoes, erupting in submarine environments. The sediments of the Galice Formation consist of shales or slates, small amounts of sandstone, and layers of grit and conglomerate. Graywacke sandstones, which grade into silty slatestones also occur in localized areas of the formation. The sediments are poorly sorted and are not tightly compacted. Drag folds (minor folds which are perpendicular to the direction of rock movement) are common in the sedimentary units and are evidence of relatively weak beds that are deformed when subjected to pressure (Wells, etal, 1949).

The ultramafic rocks of Josephine County, consisting of serpentine and peridotite are among the most unique formations in western Oregon. Many geologists postulate that these rocks were formed in the upper mantle, beneath the Earth's crust, and were injected into the crust during periods of tremendous plate collision. The Josephine ultramafic sheet in the southwestern edge of the County is one of the largest bodies of its type in North America, covering approximately 65,000 acres of land.

Serpentines and peridotites are extremely dense rocks, with the serpentines exhibiting greater alteration. Evidence would suggest that different ultramafic bodies may have been injected at different times, representing multiple ages of thrusting.

The Illinois-Chetco Igneous (gabbro-diorite) Complex has been described by Brooks and Ramp (1968) and Ramp (1977). The main outcropping of this unit occurs to the west of Chrome Ridge in the Silver Creek drainage and along the Illinois River west of Oak Flat. This complex includes olivine, gabbro, and hornblende diorite that has been intruded into surrounding rock units. Gabbros have also been identified with the Grayback diorite Pluton east of the Oregon Caves National Monument (Godchaus, 1969). Gabbro and diabase dikes also occur in the meta-volcanic rocks of the Applegate Group.

The two largest intrusive units in Josephine County consist of the Grants Pass Pluton and the Grayback Pluton, which consist of quartz diorite and differentiations of granite diorite, granite, aplite and pegmatite. The batholiths (a subsurface intrusion of

granitic rock) are fractured and the upper layers have been deeply weathered and in places are covered with alluvium. The Grants Pass Pluton is estimated to be approximately 136 million years old, and the Grayback Pluton may have been intruded between 140 and 150 million years ago.

The Dothan Formation consists of marine graywacke sandstones and inner-bedded siltstones, conglomerates, basalts and tuffs. In Jospehine County, the Dothan Formation is thrust upon older rocks, including the Illinois-Chetco Igneous Complex and the Rogue Formation. This thrust is one of the major structural features of the Siskiyou Mountains and has been described by Hotz (1969) as the Coast Range Thrust. This thrust is estimated to extend for over 250 miles from southern Douglas County into northern California.

Two small areas of Cretaceous sedimentary rocks have been identified in Josephine County. These rocks consist mainly of marine sandstone and conglomerates and were deposited unconformably on older rocks (Diller, 1914).

A formation of Tertiary sedimentary rock is found in a limited area between Indigo Creek and Collier Creek along the Illinois River. These rocks have been faulted along with older underlying rocks and are part of a thrust plate which structurally overlies the Dothan Formation. The Formation, according to Wells (1949), consists of sandstones and conglomerates with inner beds of shale.

ALLUVIAL/SEDIMENTARY DEPOSITS

Sedimentary deposits occur along the courses of the major streams of Josephine County. The largest areas of sedimentary deposits are in the Illinois Valley and along the Rogue and Applegate Rivers and Jump Off Joe Creek. These deposits are unconsolidated and may have been formed during a temporary interruption of the main drainages due to faulting and landsliding and consist of gravels, sand and fairly coarse boulder deposits.

Schlicker, etal (1975) identified seven categories of alluvial deposits in Josephine County: bench, high terrace, low terrace, floodway, point, and bar gravels, and dredge tailings. Quaternary sediments, equivalent to bench gravels, contain less than 40% gravel and are composed of unconsolidated sand, silt and clay. These sediments are erosional remnants of deposits formed

during previous river levels. Bench gravels consist of clayey or silty gravel, as much as 50 feet thick, with a gravelly-clay overburden two to six feet thick. These gravels are not considered appropriate for extractive purposes, due to high concentrations of dirt, which require extensive washing.

High terrace gravels are located between low terrace gravels which are subject to annual flooding, and higher bench gravels which are not subject to current floodwater levels. High terrace gravels are located through extensive areas of the County, and underlie the principal irrigated bottomlands and agricultural areas. These gravels vary from a few feet to about 30 feet in thickness, and often have one to three feet of silty, sandy overburden. High terrace gravels are usable for aggregate sources, but often represent a higher value for agricultural use than for extractive purposes.

Low terrace gravels compose the principal floodplain of the major streams of the County. These gravel deposits extend from the stream channel to the edge of the high terraces. Because of frequent flooding, a mantle of silty sand, two to four feet in thickness, overlies the low terrace in most places. Low terrace gravel is of good quality and is a major source of aggregates in Josephine County.

Floodway gravels occur within the floodway of a stream channel and are normally stripped of silt and sand cover by erosive flood waters. The floodway gravel represents a good source of aggregate and can be mined during periods of low water.

Riverwash is composed of channel and point bar gravels. These gravel deposits are generally less than 10 to 15 feet thick, but may rest on older gravel deposits which may extend a total depth of 60 feet. Riverwash is a suitable source for aggregate extraction, but requires washing and crushing. These deposits occur within the stream channels and can be dredged only during limited periods of low water.

A special form of alluvial deposit in Josephine County is represented by dredge tailings, created by hydraulic gold mining operations. Dredge tailings are most extensive adjacent to Grave Creek and Coyote Creek, but also occur in portions of the Illinois Valley. The gravel tailings are six to twelve feet in thickness and require crushing for aggregate use, because of the extensive presence of cobbles and large rocks. The largest dredge tailing deposit in Josephine County is located on Grave Creek and occupies an area 300 to 400 feet wide and nearly two miles long.

STRUCTURAL DEFORMATION

The intense pressures that have been placed upon the rock formations in Josephine County have resulted in structural deformation. Broad folds occur consistently throughout the major geologic belts. These folds are relatively uniform with all Pre-Tertiary rocks. The folds trend to the north and northeast, with the fold axial planes dipping to the east. Folding patterns also occur in rocks of Cretaceous age; however the angles of the fold dip are less than in Pre-Tertiary rocks.

In addition to structural folding, the geology of Josephine County has been subjected to extensive faulting. The occurrence of several geologic units are in part due to thrust-faulting, in which rock units have been slid on top of other units. There are at least three main thrust-faults in Josephine County:

1. The oldest thrust-fault borders the Applegate group. The Galice Formation and the Grants Pass Pluton are thrust under these older rocks along this thrust-fault.
2. The contact surrounding the ultramafic rocks of the County consitute a second fault-plane, which has been off-set by north-trending, high-angle faults that modify the boundaries between the ultramafic and surrounding geologic units.
3. The youngest thrust-fault located in Josephine County forms the eastern boundary of the Dothan Formation. This fault, previously mentioned, extends north into Douglas County and south into northern California, and is referred to as the Coast Range Fault. The Dothan Formation along this fault has been thrust under the Rogue Formation, and the gabbro-diorites of the Illinois-Chetco Igneous Complex.

Additional high-angle faults are located in Josephine County. The age of most of these faults is coincident with the formation of many of the major geologic units. These faults are believed to be caused by deep-seated tectonic forces and include highly-sheared zones of serpentine. There is no evidence that any recent faulting has occurred and there are no historically recoreded earthquakes originating in Josephine County.

MINERAL AND AGGREGATE DEPOSITS

Extractive resources in Josephine County may be classified under three categories: metallic mineral commodities, non-metalic minerals, and sand and gravel deposits. Aggregate resources, consisting of sand, gravel and crushed rock, are the most highly consumed extractive resource currently produced in Josehine County. In 1973, 460,000 cubic yards of aggregate were consumed in Josephine County (Schlicker, 1975). The Grants Pass area consumes approximately 350,000 cubic yards of aggregate annually, and Schlicker (1975) estimated that the amount of gravel needed to supply the Grants Pass area between 1960 and 1990 would be equivalent to an area of gravel covering 320 acres to a depth of 20 feet. The majority of this aggregate volume is currently produced from alluvial deposits adjacent to the Applegate River.

Aggregates are produced from either alluvial deposits (as previously discussed) or from quarries. Schlicker estimated that in 1975 there were 212 quarries in Josephine County. The largest number of quarries are located in metavolcanics of the Applegate Formation and involve extraction and crushing of lava, breccias, and agglomerates. Aggregates are also produced from the Dothan Formation and from the Rogue Formation, and base rock for road construction only is derived from quarries in the Galice Formation. Fill materials are derived from 35 quarries located in intrusive granitics (Schlicker, etal, 1975).

Valuable metallic minerals occur in several of the formations composing the bedrock geology of Josephine County. The Department of Geology and Mineral Industries estimates that the historic production of gold, silver, copper and chromite in Josephine County is at least $16,000,000. A realistic figure could, however, exceed that amount by two or three times. Gold, copper, zinc and silver have been discovered in prospects located in the Applegate Formation. Gold mineralization occurs in veins penetrating several different types of rocks which are intrusive to the Formation. Gold and cinnabar have been identified in the Briggs Creek Amphibolite, along with limited copper-bearing quartz veins. The volcanic rocks of the Rogue Formation include mineralization which has resulted in gold-bearing quartz fissures and massive sulphides. The ultramafic rocks contain a variety of valuable minerals, including chromite, nickel, platinum, copper, asbestos and soapstone. Gold has also been located in the sheared zones between serpentines and surrounding rock units.

The Board of County Commissioners for Josephine County has contracted with the State Department of Geology and Mineral Industries for the production of a detailed mineral resource reconnaisance for Josephine County. This report is currently in production, and will be published during the summer of 1979.

Josephine County was originally settled as a result of gold and silver mining in the 1850's. Most of the lode gold deposits of Josephine County are located in quartz-filled fissure veins which have been intruded into surrounding parent rocks. Small concentrations of free gold have also been found in Josephine County. These deposits were the original pockets that attracted gold-seekers in the previous century. According to the State Department of Geology and Mineral Industries (1979), most of the 470 individual mines located in Josephine County were gold or silver producing. The majority of gold mines are located in metavolcanic rocks located in the Applegate Group or the Rogue Formation. The largest gold-producing mine in Josephine County is considered the Greenback Mine, located to the northeast of Grants Pass. It is estimated that the Greenback produced approximatley $3.5 million in gold during production.

Historic gold mining also involved placer mining. Placer deposits accumulated in many streams in Josephine County and it is estimated by the Department of Geology and Mineral Industries (1979) that as much as 75% of the total gold production of the County was recovered from a variety of placer-type deposits. Major deposits were located in Grave Creek, Wolf Creek, Coyote Creek, Williams Creek, Althouse Creek, Sucker Creek, and Louse Creek. With the stablilized and increased price of gold, resumption of gold mining activities may be economically feasible in the future. The most likely methods of gold recovery will be deep-lode mining and placer mining. Resumption of placer mining, however, may be severely limited by environmental concerns and previously appropriated water rights.

Nickel latorite occurs in association with ultramafic rocks. Josephine County nickel latorite deposits occur in what is distinguished as the Eight-Dollar Mountain, Josephine Creek, Rough and Ready and Woodcock Mountain deposits. The Cedar Springs deposit is located adjacent to the old McGrew wagon road, west of O'Brien. A second major deposit of latoritic soils in Josephine County is the Eight-Dollar Mountain latorites. This deposit appears to be second in size and importance in the development of nickel mining in Josephine County. The first exploration activity in this area was accomplished in 1942 by the Freeport Sulfur Company.

The Eight-Dollar Mountain deposit is near the northeastern extremity of the Josephine ultramafic sheet, and consists of nickel-bearing latoritic soils which occur on the flanks of the Mountain from about 1,200 feet to about 4,000 feet. Eight-Dollar Mountain is an erosional land form of peridotite and serpentine, which has weathered to form soils that are rich in nickel-bearing latorite.

The Free and Easy latorites consist of a deposit on the east-sloping ridge, approximately five miles from Kerby. The area was originally located in 1942 and consists of an erosional remnant of an old landslide of mixed peridotites and serpentine materials.

The Josephine Creek latorites consist of several small deposits located on the slopes west of Josephine Creek at elevations between 1,700 and 3,000 feet.

The Rough and Ready group consists of latoritic deposits located in out-wash deposits and bench gravels. These deposits occur in scattered locations over a 19-square mile area. The first systematic exploration of these deposits was accomplished between 1968 and 1970. The area is underlain by partly-serpentinized rocks with out-wash deposits forming the overburden.

The largest known deposit of nickel-bearing latoritic soils is known as the Woodcock Mountain deposit. Woodcock Mountain is located approximately three miles southwest of Cave Junction. The latoritic soils appear to be residual deposits of an old upland weathering surface, most of which has been eroded away. The main southern deposit covers an area of approximately 138 acres. The area was first identified in 1942 and was first systematically mapped in 1947 and 1948.

The development of nickel mining in Josephine County is contingent upon favorable economic conditions for the production of low-grade ore and the extraction of the nickel will most likely necessitate the construction of a centrally-located processing plant. While detailed testing is currently being accomplished by the United States Bureau of Mines, the expansion of the nickel mining industry in Josephine County is dependent upon a variety of national economic trends and conditions. Such conditions include national political policy regarding the domestic production of strategic metals and the technology to develop an efficient, inexpensive, and non-polluting refining process.

Chromite was mined in Josephine County during the first and second World Wars and during a special governmental stockpiling program from 1955 to 1958. Ramp (1961)

concluded that production of chromite in Josephine County from the Chrome Ridge and Central Illinois River deposits produced a total of at least 48,941 tons of metallurgical grade chromite. The Oregon Chrome Mine is the largest producer in Josephine County and is estimated to have contributed 38,701 tons to the total County production. The occurrence of chromite is associated with the intrusion and implacement of serpentinite materials into rocks of younger origin. Chromite is believed to be of magmatic origin and formed from molten rock deep within the Earth's crust. The two major deposits in Josephine County are the Central Illinois River area, located to the west of Selma, and the Chrome Ridge area, located approximately four miles north of the Central Illinois River area. Resumption of chrome mining is dependent upon economic incentives for the competitive production of these materials.

The Waldo-Takilma area includes known deposits of copper, which were mined between 1900 and 1920. Copper production is feasible only when economic conditions permit higher prices for mined ore. The largest producer of copper in Josephine County was the Queen of Bronze Mine, which produced over 20,000 tons of ore.

A variety of miscellaneous metals also occur in Josephine County, normally in association with other mineralizations. These metals include lead and zinc, which has been mined at the Alameda Mine and the Oak Mine; manganese, which occurs in scattered deposits mainly in association with quartzite in various gold mines; mercury, which is found in cinnabar occurrences in the Pickett Creek-Briggs Creek areas; molybdenum, which has been located along the thrust-fault contact with the Dothan Formation; platinum, which occurs in association with serpentinized ultramafic rocks; berite and barium sulfate, which have been located in the Alameda Mine; and soapstone, which is found as an altered product of serpentine in numerous small deposits.

Limestone and marble deposits have also been mined in Josephine County. Several small moderate sized bodies of white limestone or marble occur in the Applegate group formation. The Jones marble quarry near Williams produced monumental stone, including a block that was quarried as the Oregon inclusion in the Washington Monument. The largest production of limestone has come from the Marble Mountain quarry, where deposits were quarried for the manufacture of portland cement. Currently, limestone is being quarried for refining as lime additive for agricultural products. The largest deposit of limestone in Josehine County contains the Oregon Caves and is reserved from mineral entry by the designation of National Landmark status.

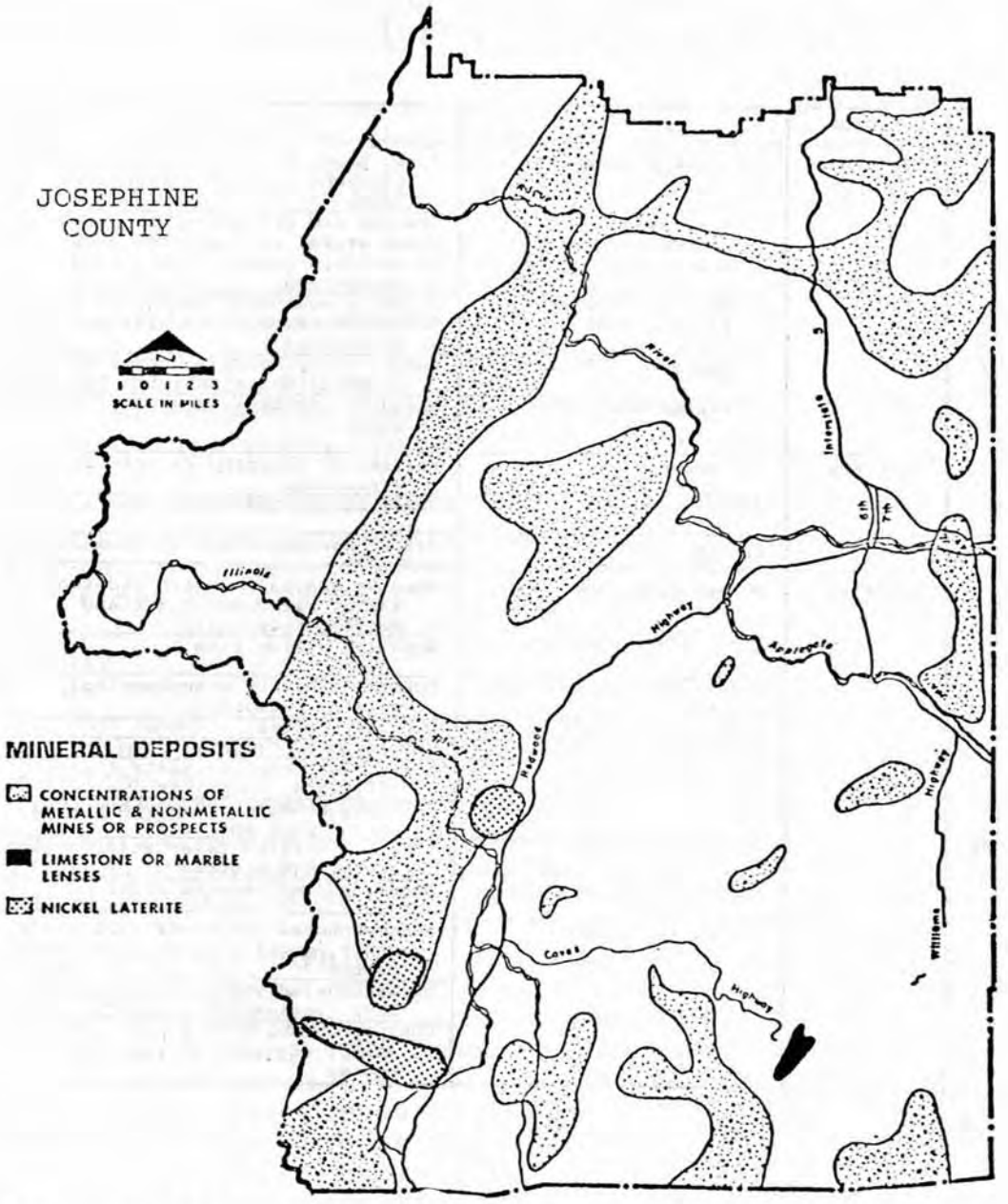
CHART G-2

JOSEPHINE COUNTY

STRATIGRAPHIC COLUMN
(After Schlicker, Etal, 1975)

Era	Period	Formation	Description
CENOZOIC	Quaternary	Alluvial deposits	River sand, silt, gravel on benches, terraces and at or near river level
		Riverwash Floodway gravel Low terrace gravel	Channel and bar gravel in stream bed Fresh gravel in flood channels Flood-plain gravel; silty sand overburden
		High terrace gravel Bench gravel	Slightly weathered gravel on terraces Weathered gravel with silt and clay on benches
		Quaternary sediments	Sandy, silty, clayey phases of alluvial units, chiefly bench gravel
		Dredge tailings	Boulders, cobbles, gravel from placer mines
	Tertiary	Old gravels	Weathered, cemented gravels at high elevations
		Intrusive rocks	Small bodies and dikes
MESOZOIC	Cretaceous	Myrtle Group	Marine sandstone and conglomerate
	Jurassic	Dothan Formation	Massive graywacke, with mudstone, shale, siltsone, chert and conglomerate
			Basaltic pillow lava
		Grants Pass Pluton and Grayback Pluton	Quartz, diorite, granodiorite, aplite, pegmatite
		Illinois-Chetco Complex	Diorite, gabbro, olivene
		Ultramafic rocks	Serpentine, peridotite
		Galice Formation	Sedimentary member: slaty shale, siltstone, sandstone
			Volcanic member: flows, breccia, agglomerate and tuff
		Rogue Formation	Greenish altered lava; tuff, agglomerate, and breccia
		Briggs Creek Amphibolite	Metamorphosed oceanic crust
	Triassic	Applegate Group	Metamorphosed sediments (argillite, chert, quartzite, conglomerate, marble
			Metamorphosed volcanics (basaltic lava, agglomerate, breccia
			Contact aureoles of gneiss and schist adjacent to igneous bodies

MAP G-3



Resource Analysis -- 1967 -- Extension Service (OSU).

SOIL FORMATION

The geology of Josephine County has directly affected the formation of various soils due to the composition of bedrock materials, topography and the influence of geologic structures on climatic patterns. In addition to these three factors, soil development is dependent upon plant and animal life and time. The influence of each factor varies with different soil types and the morphology of the soils will reflect a combination of different influences.

The chemical and physical reactions that occur within soils, for instance, are greatly modified by climatic conditions. Moisture and temperature influence soil formation by affecting the rate of chemical reactions and the rate of physical break=down of parent materials. The Soil Conservation Service has identified four major climatic zones in Josephine County that influence the creation of soils: (1) areas receiving less than 35 inches of rain, with hot dry summers and cool moist winters; (2) areas receiving more than 35 inches of rain with hot dry summers and cool moist winters; (3) areas receiving more than 35 inches of rain with warm dry summers and cold moist winters; and (4) areas receiving more than 35 inches of rain with cool dry summers and cool moist winters.

Plant and animal life also influence soil formation by contributing to the differentiations of the soil profile. Living organisms contribute to soil formation through the accumulation of organic matter, profile mixing, nutrient cycling, soil structure stabilization, and the addition of nitrogen. Topography and parent materials contribute to the chemical content of soil horizons and to the depth and erodability of soil types.

Although no detailed geomorphic mapping has been accomplished in Josephine County, it is believed that erosion surface in the County correspond to geomorphic surfaces studied and mapped in Jackson County. The first erosion unit consists of steep, rugged topography, composed of the mountainous areas of the County. Soils that have formed in this unit vary considerably, and erosion is very active. Soils in this unit are normal associated with parent materials of the Applegate, Rogue and Galice Formations. This unit may also include soils that are derived from ultramafic rocks, such as peridotite and serpentine. Soils derived from serpentines are characterized by a high content of magnesium and a low ration of exchangeable calcium. Serpentine soils also have low available phosphorus and potassium, and tend to be more sterile than other soil types.

A second erosion unit is composed of dissected flats, underlain by weathered gravel, clay deposits, or bedrock, occurring above the main river valley floors. Soils in this unit exhibit more development than soils on other geomorphic surfaces due to the greater age of the surface, and, therefore, the time available for soil formation. Soils in this geomorphic surface, which have developed from ultramafic rocks, have a serpentinitic minerology.

One of the most extensive erosion surfaces in the Rogue, Applegate and Illinois River valleys consists of alluvial terraces with low-relief bar-channel topography. Soils developed in this erosional surface are derived from sedimentary materials and are underlain by sand and gravel deposits.

A fourth erosional surface consists of the higher of the two floodplains of the Rogue, Illinois and Applegate Rivers. This surface is typically composed of low hills and ridges, with a maximum relief of six feet. This erosional surface is subject to periodic flooding and may have high contents of silt and sand.

The final surface in Josephine County is the lower of the two floodplains of the Rogue, Illinois and Applegate Rivers and many other smaller tributaries. Floodwater inundation over this surface is very common, and as a consequence the surface is characterized by low-relief and includes the river channel, point bar deposits, and channel fillings. This surface is normally underlain by sand and gravel deposits, with occasional outcroppings of bedrock materials.

SOIL SERIES

The soils of Josephine County are characterized by a variety of series. The Abegg series consists of deep, well-drained soils located on high stream terraces. The series is formed in alluvium and colluvium, weathered from altered sedimentary and extrusive igneous rocks. Slopes are typically 2 to 20 percent. The A horizon will extend from 0 to 9 inches, the B horizon from 9 to 56 inches, and the C horizon from 56 to 60 inches.

The Althouse series is composed of deep, well-drained soils formed on steep mountainous slopes. These soils were formed in colluvium and residium, weathered from altered igneous and sedimentary rocks. Slopes normally exceed 35%. The A horizon will extend from 0 to 9 inches; the B horizon from 9 to 31 inches; and the C horizon from 31 to 50 inches.

The Banning series consists of deep, somewhat poorly-drained soils formed on level to nearly-level alluvial fans and drainages. The A horizon of the Banning series may extend to 14 inches; the B horizon from 14 to 50 inches; and the C horizon from 50 to 60 inches.

The Barron series is formed on toeslopes and alluvial fans and consist of deep, somewhat excessively-drained soils. These soils are formed in alluvium and colluvium, weathered from granitic rocks. Slopes under the Barron series are generally 2 to 12 percent. The A horizon may extend from 0 to 9 inches; the B horizon from 9 to 35 inches; and the C horizon from 35 to 60 inches.

The Beekman series are formed in steep mountainous regions and consist of moderately deep well-drained soils. These soils are derived from altered sedimentary and extrusive igneous rocks and are formed in colluvium, overlying bedrock. Slopes normally exceed 35 percent. The A horizon may extend from 0 to 14 inches. The B horizon may extend from 14 to 25 inches, and is underlain by fractured bedrock.

The Bigelow series consists of deep well-drained soils located on steep mountain slopes and glacial basins. These soils are formed in colluvium weathered from granitic rocks and overlying glacial till. Slopes may vary from 5 to 65%. The A horizon extends from 0 to 26 inches and the C horizon from 26 to 67 inches.

The Brockman series consists of soils formed on alluvial fans and are characterized by deep, moderately well-drained soils. These soils are weathered from parent materials of serpentine and peridotite. Slopes are commonly 2 to 20%. The A horizon extends from 0 to 9 inches; the B horizon from 9 to 16 inches; and the C horizon from 16 to 60 inches.

High stream terraces form soils of the Brockman variant. These soils are formed in alluvium of predominantly serpentine and peridotite origin and consist of deep well-drained horizons. Slopes are commonly less than 3%. The A horizon may extend to 12 inches and the B horizon from 12 to 62 inches.

Deep excessively drained soils of the Camas series have formed on gravelly alluvium within river floodplains. Slopes are less than 3%, and the A horizon may extend to only 10 inches; with the C horizon extending from 10 to 60 inches.

The Central Point series includes deep, somewhat excessively-drained soils, formed in alluvium on low stream terraces and alluvial fans. Slopes are less than 3%. The A layer may extend from 0 to 15 inches; the B layer from 15 to 36 inches; and the C layer from 36 to 60 inches.

The Clawson series consist of somewhat poorly-drained soils, which are formed on alluvial fans from weathered granitic rocks. Slopes vary from 2 to 7%. The A horizon may consist of less than 3 inches, with the B horizon extending to 16 inches. The C horizon may extend from 16 to 60 inches.

The Colestine series consists of moderately-deep, well-drained soils formed in colluvium, weathered from altered sedimentary and extrusive igneous rocks on steep mountain slopes. Slopes may vary between 20 to 80%. The A horizon may extend from 0 to 12 inches with the B horizon extending to 34 inches. The B horizon is underlain by fractured bedrock.

The Copsey series consists of deep, poorly-drained soils, formed in alluvium from serpentine or peridotite parent materials. Slopes are normally less than 7%. The A horizon may extend to 40 inches, with the C horizon extending from 40 to 60 inches.

The Cornutt series includes deep, well-drained soils, formed in alluvium and colluvium, weathered from mixed ultramafic and altered sedimentary and extrusive igneous rock sources. Slopes may vary between 7 and 55%. The A horizon may extend from 0 to 11 inches; the B horizon from 11 to 41 inches; and the C horizon from 41 to 45 inches.

The Cove series consists of deep, poorly-drained soils developed in drainage bottom-lands and in basins. Slopes are normally less than 2%. The A horizon may extend to only 8 inches, with the B horizon extending from 8 to 42 inches and the C horizon from 42 to 60 inches.

The Crannler series are formed in colluvium and residium weathered from granitic rocks on very steep mountain slopes, and consist of moderately-deep, somewhat excessively-drained soils. The A horizon may extend to only 4 inches, with the C horizon extending from 4 to 32 inches. Below 32 inches, fractured quartz-diorite is encountered.

The Cryumbrepts series is composed of very shallow to moderately-deep, excessively-drained and well-drained soils located on mountainsides. These soils are derived from weathered granitic rocks and are formed on colluvium. Slopes may vary from 20 to 75%. The A horizon extends for only 2 inches; while the B horizon may extend from 2 to 12 inches and the C horizon from 12 to 25 inches. Below 25 inches, fractured granitic bedrock is encountered.

The Debenger series were formed in colluvium and alluvium, weathered from sedimentary rocks, and consists of moderately-deep, well-drained soils occurring on hillslopes and alluvial fans. Slopes may vary from 7 to 20%. The A horizon may extend to 11 inches; the B horizon from 11 to 28 inches; and the C horizon from 28 to 40 inches.

The Dubakella series consists of moderately-deep, well-drained soils formed on mountain sideslopes and ridgetops. These soils are derived from serpentine parent materials. Slopes are 5 to 65%. The A horizon will extend to only 2 inches, while the B horizon may extend from 2 to 28 inches. Below 28 inches, fractured and partially decomposed serpentine is encountered.

The Eightlar series involves deep, moderately well-drained soils formed on alluvial fans and mountain sideslopes from weathered peridotite or serpentine materials. Slopes may vary from 5 to 65%. The A horizon extends from - to 10 inches; the B horizon from 10 to 44 inches; and the C horizon from 44 to 61 inches.

The Evans series was formed in recent alluvium, and consists of deep, well-drained soils located on floodplains. Slopes are normally less than 3%. The A horizon may extend to 23 inches, with the C horizon extending from 23 to 64 inches.

The Fantz series consists of moderately-deep, well-drained soils, derived from olivine-gabbro parent rocks on steep mountainslopes. Slopes may exceed 35 to 85%. The A horizon may extend from - to 12 inches, the C horizon from 12 to 29 inches, with the soils underlain by highly-fractured olivine-gabbro beneath 29 inches.

The Foehlin series is formed in alluvium, derived from mixed parent materials, and consists of deep, well-drained soils located on alluvial fans and low terraces. The A horizon may extend from - to 13 inches; the B horizon from 13 to 60 inches; and the C horizon from 60 to 66 inches.

The Goodwin series are derived from weathered granitic rocks, and are formed in colluvium on steep mountain

slopes. This series consists of deep, well-drained soils, with slopes varying from 5 to 80%. The A horizon may extend to 16 inches, with the B horizon extending from 16 to 40 inches, and the C horizon from 49 to 60 inches.

The Jayar series are formed in colluvium, weathered from altered sedimentary and extrusive igneous rocks. This series consists of moderately-deep, well-drained soils, located on mountain sideslopes and rounded ridge-tops. Slopes vary from 20 to 70%, and the A hormay extend to less than 3 inches. The B horizon may extend from 3 to 31 inches, with fractured metamorphic volcanic bedrock being encountered below 31 inches.

The Jerome series is formed in alluvium, weathered from granitic rocks over buried soils. These soils on alluvial fans and in drainageways. Slopes are normally less than 3%. The A horizon may extend to 10 inches; The B horizon from 10 to 17 inches; and the C horizon from 17 to 64 inches.

The Josephine series consists of deep, well-drained soils formed in moderately fine colluvium and residium, weathered from altered sedimentary and igneous rocks on mountain sideslopes and rounded ridgetops. Slopes may vary from 20 to 55%. The A horizon may extend to only 3 inches; the B horizon from 3 to 51 inches; and the C horizon from 51 to 70 inches.

The Jump-Off series consists of deep, moderately well-drained soils, formed in colluvium, weathered from tuff and volcanic breccia on hollsopes. Slopes vary from 7 to 50%. The A horizon may extend from 0 to 12 inches; the B horizon from 12 to 55 inches and the C horizon from 55 to 60 inches.

The Kerby series was formed on alluvium and consists of deep, well-drained soils located on stream terraces. Slopes are normally less than 3%. The A horizon may extend from 0 to 7 inches; the B horizon from 7 to 40 inches; and the C horizon from 40 to 60 inches.

The Knapke series consists of deep, well-drained soils formed on steep mountainslopes. These soils are formed in colluvium weathered from olivine-gabbro rocks. Slopes may vary from 35 to 85%. The A horizon may extend from 0 to 13 inches, with the C horizon extending from 13 to 62 inches.

The Manita series consists of soils formed in colluvium and alluvium, weathered from altered sedimentary and extrusive igneous rocks on hllslopes and mountain sideslopes. This series includes deep, well-drained soils with slopes varying from 2 to 50%. The A horizon may

extend from 0 to 11 inches; the B horizon from 11 to 50 inches; and the C horizon from 50 to 55 inches.

The McMullen series is derived from altered sedimentary and extrusive rocks located on ridges and mountainslopes and consist of shallow and somewhat excessively drained soils. Slopes vary from 30 to 60%. The A horizon may extend to 7 inches and the B horizon from 7 to 14 inches. These soils are underlain by fractured bedrock at depths greater than 14 inches.

The Newberg series consists of deep, somewhat excessively-drained soils located on floodplains. Slopes are normally less than 3%. The A horizon may extend to 15 inches, with the C horizon extending from 15 to 61 inches.

The Pearsoll series consists of shallow, well-drained soils located on mountainslopes. These soils are derived from parent materials weathered from serpentine and peridotite rocks. Slopes may vary from 20 to 90%. The A horizon may extend to only 5 inches, with the B horizon extending from 5 to 14 inches. Fractured serpentine bedrock occurs below 14 inches.

The Perdin series consists of moderately-deep, well-drained soils formed in colluvium, weathered from serpentine and peridotite rocks on mountainslopes. Slopes are normally 30 to 50%. The A horizon may extend from 24 to 27 inches. Weathered serpentine bedrock occurs beneath 27 inches.

The Pollard series consists of deep, well-drained soils located on high stream terraces, saddles and hillslopes. These soils are formed in alluvium and colluvium, weathered from altered sedimentary and extrusive igneous rocks. Slopes may vary from 2 to 50%. The A horizon may extend from 0 to 7 inches; and the B horizon from 7 to 60 inches.

The Rogue series are formed in colluvium, weathered from granitic rocks and consists of deep, somewhat excessively-drained soils on mountainslopes. Slopes vary from 35 to 70%. The A horizon may extend to only 4 inches; the B horizon from 4 to 30 inches; and the C horizon from 30 to 56 inches.

The Ruch series consists of soils formed in alluvium, derived from altered sedimentary and extrusive igneous rocks. These soils are located on footslopes and alluvial fans, and consist of deep, well-drained soils. Slopes may vary from 2 to 12%. The A horizon may extend from 0 to 13 inches; the B horizon from 13 to 48 inches; and the C horizon from 48 to 60 inches.

The Selmac series consists of deep, moderately well-drained soils located on nearly level to sloping drainage basin lands. These soils are formed in stratified loamy and clayey alluvium. Slopes are from 2 to 20%. The A horizon may extend to 6 inches; the B horizon from 6 to 18 inches; and the C horizon from 18 to 60 inches.

The Siskiyou series are formed in colluvium and residium, weathered from granite-diorite, quartz-diorite or granitic rocks. The series consists of moderately-deep, somewhat excessively-drained soils, located on hillslopes and mountainslopes. Slopes vary from 20 to 70%. The A horizon may extend to only 4 inches, with the B horizon extending from 4 to 19 inches; and the C horizon extending from 19 to 46 inches.

The Speaker series includes moderately-deep, well-drained soils located on mountainslopes. The soil is formed in colluvium, weathered from altered sedimentary and extrusive igneous rocks. Slopes may vary from 35 to 55%. The A horizon may extend from 0 to 6 inches; the B horizon from 6 to 30 inches; and the C horizon from 30 to 33 inches.

The Takilma series is formed in cobbly and gravelly alluvium and is composed of deep, well-drained soils located on low stream terraces. Slopes are normally less than 3%. The A horizon may extend from 0 to 6 inches; the B horizon from 6 to 18 inches; and the C horizon from 18 to 60 inches.

The Takilma Variant consists of deep, well-drained soils located on low stream terraces. These soils are formed in material weathered from serpentine and periodotite sources. Slopes are normally less than 3%. The A horizon may extend to 5 inches; the B horizon from 5 to 18 inches; and the C horizon from 18 to 63 inches.

The Tethrick series is composed of deep, well-drained soils located on mountain sideslopes. These soils are formed in colluvium, weathered from quartz-diorite or gabbro rocks. Slopes may vary from 45 to 70%. The A horizon may extend from 0 to 9 inches; the B horizon from 9 to 30 inches; and the C horizon from 30 to 60 inches.

The Vannoy series is formed in colluvium, weathered from altered sedimentary and extrusive igneous rocks. The series consists of moderately-deep, well-drained soils, located on mountainslopes. Slopes may vary from 20 to 55%. The A horizon may extend from 0 to 14 inches; with the B horizon extending from 14 to 33 inches; underlain by weathered and highly-fractured metamorphic bedrock.

The Vermisa series consists of shallow, somewhat excessively drained soils, located on mountain sideslopes. The parent materials for these soils consisted of sedimentary and extrusive igneous rocks. Slopes may vary from 60 to 100%. The A horizon may extend to only 3 inches; the B horizon extending from 3 to 15 inches. The soils are underlain by fractured, metavolcanic bedrock below 15 inches.

The Voorhies series is formed in colluvium, derived from altered sedimentary and extrusive igneous rocks. This series is composed of moderately-deep, well-drained soils located on mountainslopes. The slopes may vary from 35 to 55%. The A horizon may extend from 0 to 15 inches; the B horizon from 15 to 36 inches, with fractured metamorphic bedrock occurring below 36 inches.

The Wapato series includes deep, poorly-drained soils located on bottomlands and basin-like areas. Slopes rarely exceed 2%. The A horizon may extend from 0 to 17 inches, with the B horizon extending from 17 to 60 inches.

The Witzel series consists of shallow, well-drained soils located on mountainslopes. These soils are formed in colluvium and residium, derived from altered sedimentary and extrusive igneous rocks. Slopes may vary from 3 to 75%. The A horizon may extend from 0 to 7 inches. Partially weathered and fractured bedrock is encountered at depths greater than 14 inches.

The Woodseye series consists of shallow, well-drained soils on mountainslopes. The soils are formed in colluvium, weathered from altered sedimentary and extrusive igneous rocks. Slopes may vary from 20 to 90%. The A horizon may extend from 0 to 8 inches, with the B horizon extending from 8 to 18 inches. Fractured metavolcanic bedrock is encountered at depths greater than 18 inches.

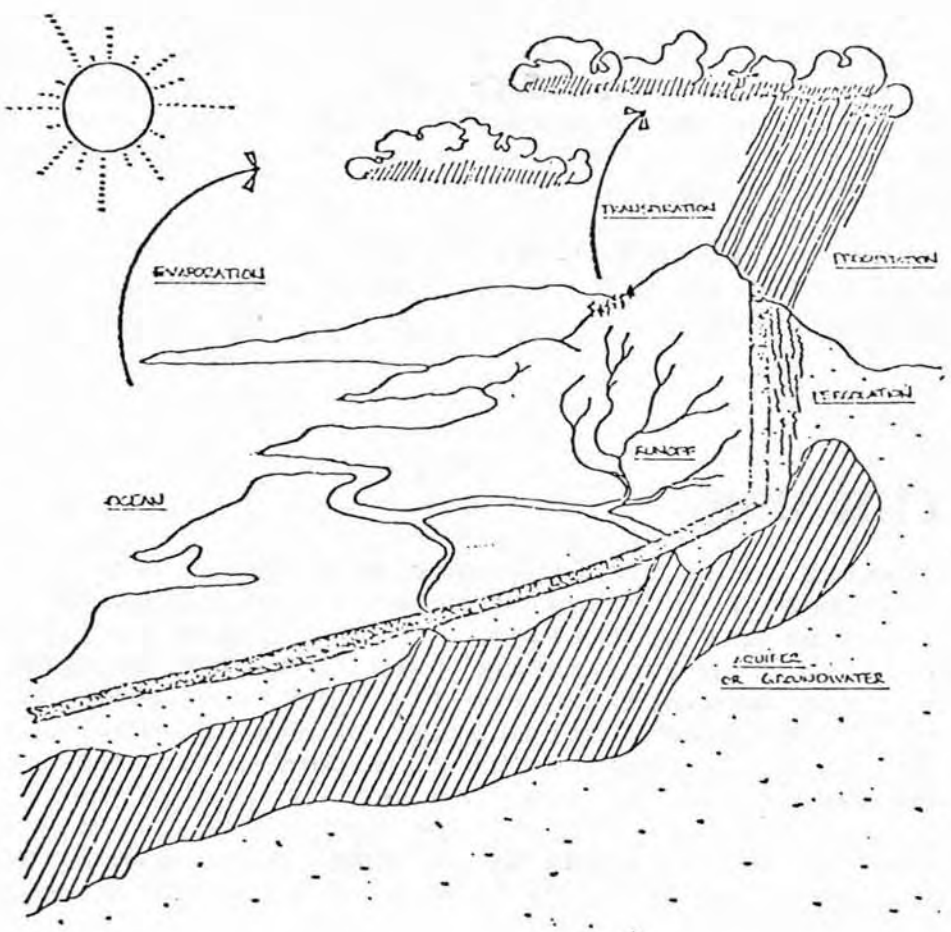
Soils have various properties for development and utilization. The best soils for building site development include the Barron series, the Brockman Variance, the Foehlin series, the Holland series, the Kerby series and the Ruch series. The best soils for forest production include the Abegg series, the Beekman series, the Colestine series, the Holland series, the Jayar series, the Josephine series, the Pollard series, the Ruch series and the Vannoy series. The best soils for road fill are the Abegg, Camas, Newberg, Central Point, Evans, Barron and Kerby. The best soils for sand removal are the Camas series, and the best soils for gravel are the Camas and Takilma series. Soils which are subject to periodic flooding include the Camas series, the Newberg series, the Evans series and the Wapato series. Soils which are characterized by high water tables include the Banning series, the Brockman series, the Central Point series, the Clawson series, the Copsey series, the Cove series, the Jerome series, the Jump Off Joe series, the Selmac series and the Wapato series (Soil Conservation Service, 1978).

WATER RESOURCES

Water is indispensable to all life forms, and it plays a vital role in planning due to its complex cycling and sensitivity to environmental change. Generally, there is a broad cycling of water from the atmosphere to the land and seas and back to the atmosphere. This is identified as the water cycle.

FIGURE W-1

WATER CYCLE



The following is a simplified explanation of the cycle and associated terminology.

Precipitation is water falling as rain, hail, sleet or snow. Once precipitation falls to the ground, four natural processes begin to operate-percolation, absorption, evaporation and runoff.

Percolation or the seepage of water into the ground, is the means by which water is transferred and stored in fractures and/or porous layers of rock or earth. This stored groundwater (water in the ground) is called an aquifer and is often tapped (with wells) as a water source.

If groundwater is absorbed by plant roots it is converted to other substances or released to the atmosphere through small pores in the leaves. This process is somewhat similar to animal perspiration and is termed transpiration.

If precipitation does not percolate into the soil, but flows downhill on the surface, it becomes runoff. Some runoff eventually percolates and becomes groundwater, and, conversely, some groundwater surfaces and becomes runoff. Water which is exposed to the atmosphere may evaporate if high temperature and/or low pressure cause liquid water to become gaseous. This invisible gas is called water vapor. If inverse circumstances of low temperature and/or high pressure occur, the water vapor becomes visible in the form of clouds, fog or dew. When air becomes saturated with water, precipitation occurs.

This cycle of precipitation, runoff and percolation, and evaporation is continuously occurring in all phases across the planet.

WATER USE

Use of water falls into two general categories: 1) consumptive uses, which require water removal from the ground or surface sources (e.g. domestic use and irrigation), and 2) non-consumptive uses (e.g. hydroelectric power generation, boating and fish ladders) which do not require displacement of water or reduce available quantities. The following is an expanded discussion of water use:

1) Biotic: (Fish, Wildlife, Plants) The abundance and quality of water plays a major role in determining

distribution of plant and animal species. Water not only supplies fish with a habitat, but also provides other animals with drinking water and plants (for food and cover). Riparian habitat (shores of lakes, streams and rivers) is therefore extremely valuable to wildlife and is sensitive to disturbance. See chapter on Biotic Resources: Wildlife for a listing of water-related species.

2) Human: The various ways which human beings use water can be categorized into six groups as follows:

A) Agricultural Irrigation: Appropriations for irrigation account for 40% of total U.S. water consumption (Wagner, 1972) making it the largest single consumptive use. See chapters on Water Rights and Vegetative Resources: Agriculture for a further explanation of irrigation in Josephine County.

B) Recreation: Uses of water for recreation in Josephine County include fishing, boating and rafting, swimming, aesthetic appreciation, and snow and water skiing. See chapter on Recreation for further details.

C) Domestic: Domestic water uses (household and commercial) comprise less than 10% of the total used in the United States (Wagner, 1972). Domestic uses include drinking, flushing toilets, cooking, baths/showers, watering plants and lawns, washing cars, dishwashing and laundering. For example:

Toilet, per flush	3-10 gallons
Shower	10-30 gallons
Bath	20-50 gallons

As calculated in earlier studies and reported in CH_2M Hill (1979), the U.S. average domestic water use per person per day is approximately 148 gallons. Another figure cited in the same source (for the Grants Pass study area) determines an average of 253 gallons per person per day. This higher figure for our area could reflect the local rural lifestyle (which may require more water per capita for such things as watering large lawns) and of the general abundance and availability of water (which may encourage higher use). Using the higher figure, the annual use is calculated to be approximately five billion gallons per year (for Josephine County) if current per capita use is maintained.

Most of the County's wells provide water for household use. Such use fluctuates, with peak demands occurring during the day. Water use varies seasonally as well, with watering of gardens and lawns creating a demand in warm, dry months which is several times that of colder months. Thus, a well that is adequate in winter may not be adequate in summer months. A yield of 5 to 10 gpm is usually sufficient for a single household; smaller yields may suffice if a storage tank or reservoir is used. See the chapter on Public Services for details on public water usage.

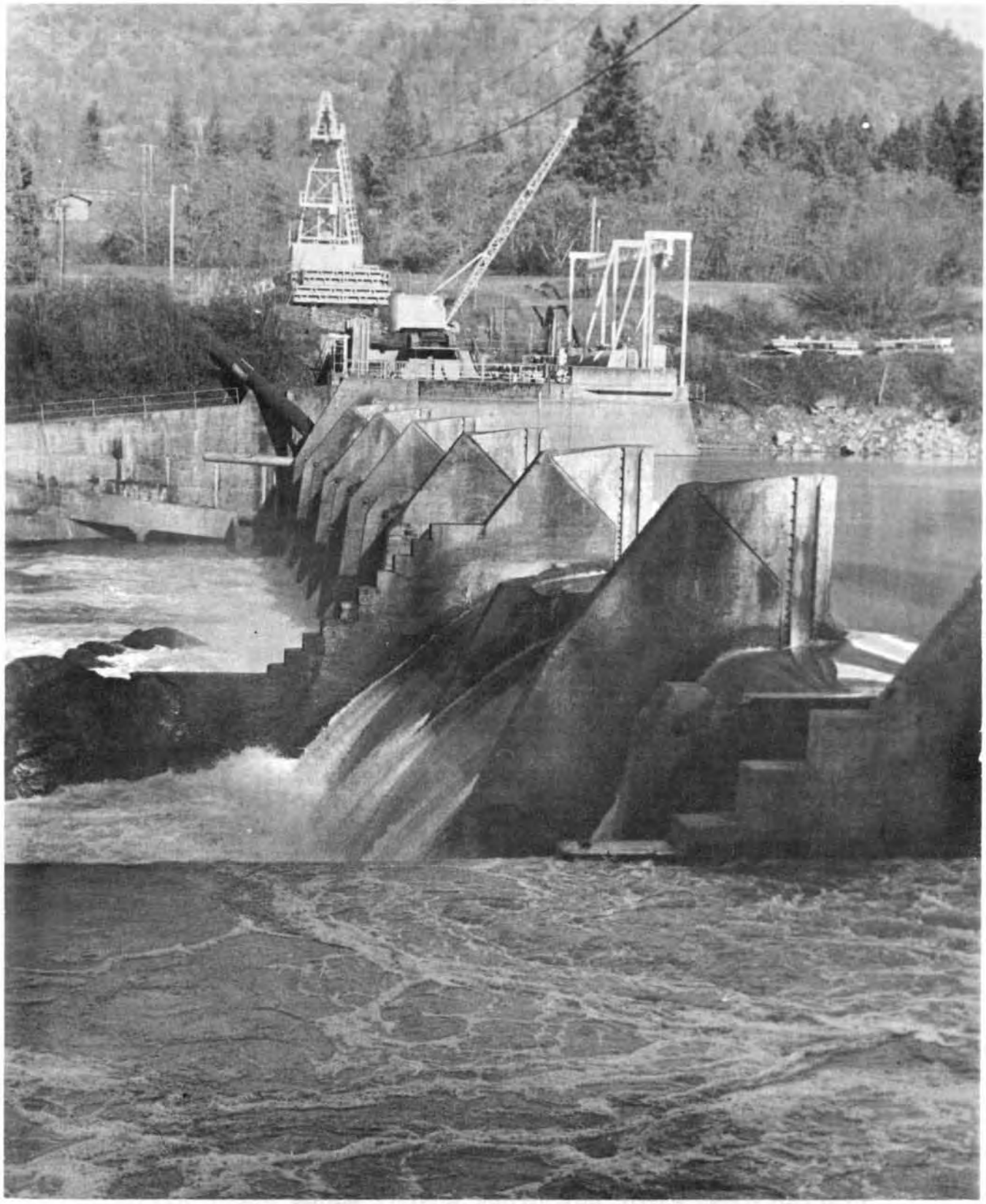
D) Industrial: Industrial rights in the whole Rogue River basin total less than 67 cfs and are concentrated primarily in the Medford and Grants Pass areas. While the present need is small, mainly for mill ponds and boilers, it nevertheless must be met with adequate quantity and acceptable quality of water. This factor is also important in the expansion of existing industries.

Nearly every mining operation requires water, the amount depending upon the specific process involved. Presently, there are not many permanent, active mining operations in the area, yet the total mining rights to the use of water (most of which were filed many years ago) is 3,995 cfs for the whole basin, or 25 percent of all water rights. These rights are located in every part of the basin and a large number of them were established during early gold mining operations following the gold rush of the 1850's. Many rights are for placer operations which have seasonal restrictions.

E) Power Generation: Currently, there are no hydroelectric power generation facilities in the County. Some water wheels and hydraulic dams are in operation, but these are generally used for pumping water--not as electrical power generation facilities. See chapter on Energy for hydro alternatives.

F) Transportation: Water is not significantly utilized for transpotation in the County other than for recreational purposes.

The Oregon Water Resources Board has developed a water resource management program for the Rogue River Basin. The program is comprehensive in nature and establishes beneficial uses for the basin waters and minimum flows required for certain critical areas.



SAVAGE RAPIDS DAM -- Currently under consideration for hydro-generation conversion.

TABLE W-2

BENEFICIAL USES FOR THE ROGUE BASIN

Beneficial Uses	Applegate River Basin	Middle Rogue River Basin	Illinois River Basin
Fish and Wildlife	X	X	X
Recreation	X	X	X
Mining	X	X	X
Industrial	X	X	X
Power	X	7½*	X
Temperature Control		X	
Irrigation	X	X	X
Municipal		X	X
Livestock	X	X	X
Domestic	X	X	X

*Theoretical Horsepower

SOURCE: Oregon State Water Resources Board

Specific uses of water that alter water quantity and/or quality will inevitably affect all other uses. Careful far-sighted judgment by decision makers and coordination with neighboring cities and counties in the Rogue Basin will hopefully insure that a beautiful and majestic river will continue to flow into the Pacific.

SURFACE WATER

The Rogue River is the dominant water feature in the region. There are two major tributaries of the Rogue in Josephine County, the Applegate and the Illinois Rivers, although numerous small streams also contribute to the streamflow. Several of these small streams do, however, dry up in the summer months. Lakes of the County are limited in number and small in size, the largest being Lake Selmac (man-made) east of Selma. The scarcity of lakes in the area cultivates an attitude of sensitivity towards preserving their natural uniqueness and water quality.

SUB-BASIN DESCRIPTION

(The following sub-basin descriptions have been extracted from Water Resources Board, Rogue River Basin, 1959.)

The total land area of Josephine County lies within the Rogue River drainage basin. The Rogue River drainage basin can be divided into seven sub-basins of which one (the Illinois River sub-basin) is mainly contained within the boundaries of Josephine County. Two others (the Middle Rogue and Applegate sub-basins) are largely within Josephine County, and one (the Lower Rogue sub-basin) is contained only in part. (Map W3)

1) The Illinois Sub-Basin:

The Illinois Valley is the second largest of the seven sub-basins with 788 square miles in Josephine County. About 20 percent of the sub-basin is drained by the East Fork, 11 percent by Deer Creek, 10 percent by Sucker Creek, and the remainder by many other small tributaries. There are 1,140 miles of streams in the Illinois Valley with the Illinois main stem contributing five percent of this total, Sucker Creek two percent, and Deer, Althouse, East Fork and West Fork each approximately one percent, the remainder made up by the many small tributaries.

Ninety percent of the area is mountainous and unsuitable for farming and the remaining 10 percent is mostly agricultural land located primarily in the drainage basins of Deer, Sucker and Althouse Creeks, along the Illinois East Fork, and on its main stem above mile 50. Most of the agricultural lands lie near the elevation of 1,200 feet.

Stream gradients vary from 20 feet of drop per mile on the Illinois main stem to 248 feet per mile on Grayback Creek.

The stream beds of the major tributaries of the Illinois and the upper main stem consist of recent alluvium, while the lower main stem flows directly over bedrock. The main stem bed is composed of massive sandstone and thin layers of shale for the first 20 miles. Above that point, the stream bed consists of granitoid rock which in part contains mineral deposits such as feldspar, pyroxene, olivine, hornblende, biotite and visible quartz.

The average annual yield for the Illinois River at its mouth for the years of record (1929 to 1956) is 1,986,000 acre-feet. Peak runoff in the Illinois River occurs in the month of January as the result of winter rains. Flows are also relatively high in December and February of the average year.

2) The Applegate Sub-Basin:

The Applegate sub-basin includes all of the Applegate River and its tributaries, and encompasses the southern half of the central portion of the Rogue River Basin. Major tributaries of the Applegate are Williams Creek, the Little Applegate River and Carberry Creek. The Applegate River main stem extends to the limits of the Rogue River National Forest located at the summit of the Siskiyou Mountains in California. (Confluence of the Applegate and Rogue Rivers is at Rogue River mile 95.)

The Applegate Valley area (768 square miles) ranks fourth in size among the sub-basins. It makes up 15 percent of the total Rogue Basin and has 260 square miles in Josephine County. There are nearly 700 miles of streams in the valley consisting in part of 51 miles of Applegate River main stem, with the remainder being composed of many shorter tributaries.

Elevations along the Applegate River range from 850 feet at its mouth to approximately 2,000 feet at the California-Oregon border. There are many peaks in this drainage basin with elevations above 5,000 feet. Stream slopes are relatively mild in the bottom lands, 24.3 feet of drop per mile for the Applegate River and 33 feet per mile for Williams Creek. The headwater streams have much steeper slopes.

Most of the rock formations in this sub-basin consist of volcanic and sedimentary rocks. Fairly large regions of quartz diorite and related rocks exist in the southwest and northwest corners of the Basin. The larger valley areas consist of extensive alluvium deposits. Stream beds, where the slopes are mild, are composed of stratified gravel, sand and silt, and waterworn alluvium. In the steeper regions stream beds are composed primarily of a sandstone structure.

The southern boundary of the sub-basin includes the Siskiyou Mountains which run in a generally east-west direction.

The average yield (1929 through 1955) of the Applegate River (at its mouth) is computed at 580,000 acre-feet. Peak runoff in this sub-basin occurs during the months of January and February as the result of winter rains.

3) The Middle Rogue Sub-Basin:

The Middle Rogue sub-basin is an arbitrary subdivision of the Rogue main stem. The portion lying within Josephine County includes the northern half of the central portion of the Rogue Basin which encompasses the drainage areas of Grave and Jump Off Joe Creeks.

The Rogue Range is the northern boundary of the Middle Rogue sub-basin. The western boundary is formed by the divide which separates drainage into other streams or into the Rogue below mile 68. The southern boundary is the divide separating drainage into the Rogue main stem from drainage into either the Applegate River or Bear Creek. The eastern boundary is formed by the divide separating the drainage between Evans and Trail Creeks above mile 149 and between the Rogue main stem and Evans Creek below mile 149.

This is the third largest of the sub-basins and contains 943 square miles, of which 500 square miles are in Josephine County. About 23 percent of the sub-basin is in the Evans Creek drainage (Jackson County), 18 percent in the Grave Creek drainiage, 12 percent in Jump Off Joe Creek drainage, and the remainder is drainage into other tributaries or directly into the Rogue.

There are approximately 870 miles of streams in this sub-basin of which the Rogue main stem comprises 65 miles, 36 miles each for Grave and Evans Creeks, 21 miles for Jump Off Joe Creek, and the remainder distributed among many shorter tributaries varying in length.

Nearly all of the valley lands lie below 1,300 feet of elevation. King Mountain, elevation 5,265 feet, located in the Grave Creek drainage near the northern boundary of the sub-basin, is the highest point. In addition, there are several other peaks above elevation 4,000 feet in the area.

Stream gradients vary widely from tributary to mouth throughout the Basin with the Rogue averaging approximately 9 feet of drop per mile; Evans Creek dropping 270 feet per mile in its headwater areas and then leveling off to an average of 30 feet of drop per mile below river mile 28; Jump Off Joe Creek averaging approximately 120 feet per mile; Grave Creek 159 feet per mile in the headwater region and approximately 38 feet per mile below river mile 20.

The Rogue main stem flows in a westerly direction to mile 95 and then travels generally northward through the remainder of the sub-basin. Both Grave and Jump Off Joe Creeks travel in a westerly direction, and parallel the Rogue in its central section. Evans Creek begins from the northern divide (separating the Rogue Basin from the Umpqua Basin) and travels in a generally south or southwesterly direction to its junction with the Rogue main stem.

The average of annual yields for all years of record are: Rogue River at Grants Pass, 2,310,000 acre-feet; at Raygold, 2,080,000 acre-feet; Jump Off Joe Creek, 111,000 acre-feet; and Grave Creek, 210,000 acre-feet.

Mean monthly discharges are for the same points. Peak runoff at the three locations occurs in the months of January and February as the result of winter rains, and flows of the main stem at Grants Pass remain relatively high through May due to snow melt in the headwater areas on the western slopes of the Cascades.

4) The Lower Rogue Sub-Basin:

The Lower Rogue sub-basin includes all of the Rogue River drainage system downstream from mile 68 with the exception of the Illinois Valley which is treated as a separate sub-basin. There are no major tributaries in this section.

The sub-basin contains 503 square miles of which 98 are in Josephine County. There is a total of 550 miles of stream in this sub-basin including the 68 miles of the Rogue main stem.

This area is substantially mountainous with no significant blocks of agricultural land. The highest point in the sub-basin is Brandy Peak, 5,316 feet, which is located in the northeast part of the sub-basin at the head of Shasta Costa Creek. There is only one other peak in the sub-basin above 4,000 feet.

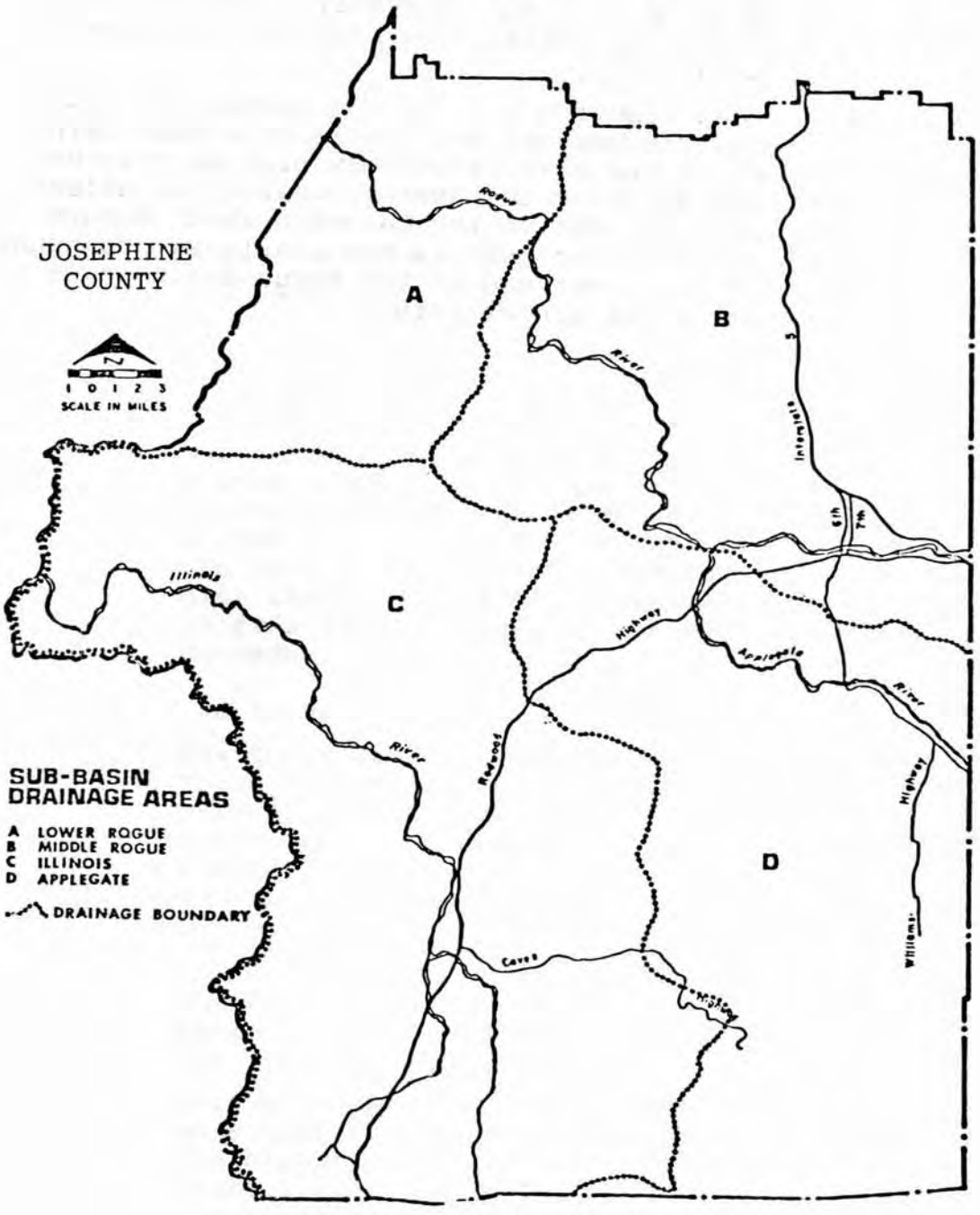
The Rogue River has its flattest gradient in this section, dropping a little more than nine feet per mile.

The only geological information available for the Lower Rogue Basin covers the northeastern portion which has rock formations consisting of predominantly sandstone, with intervening layers of mudstone, shale or

siltstone. The stream bed from mile 57 to mile 58 is composed mainly of massive lava flows and tuffs, flow breccias and conglomerates.

Peak runoff occurs in the months of January and February as the result of winter rains. Flows are also relatively high in December and March of the average year. The effect of snow melt in the Cascades which occurs later in the year is not nearly as pronounced at the lower end of the Rogue Basin as is the effect of winter rains.

MAP W-3



A Lower Rogue Sub-basin

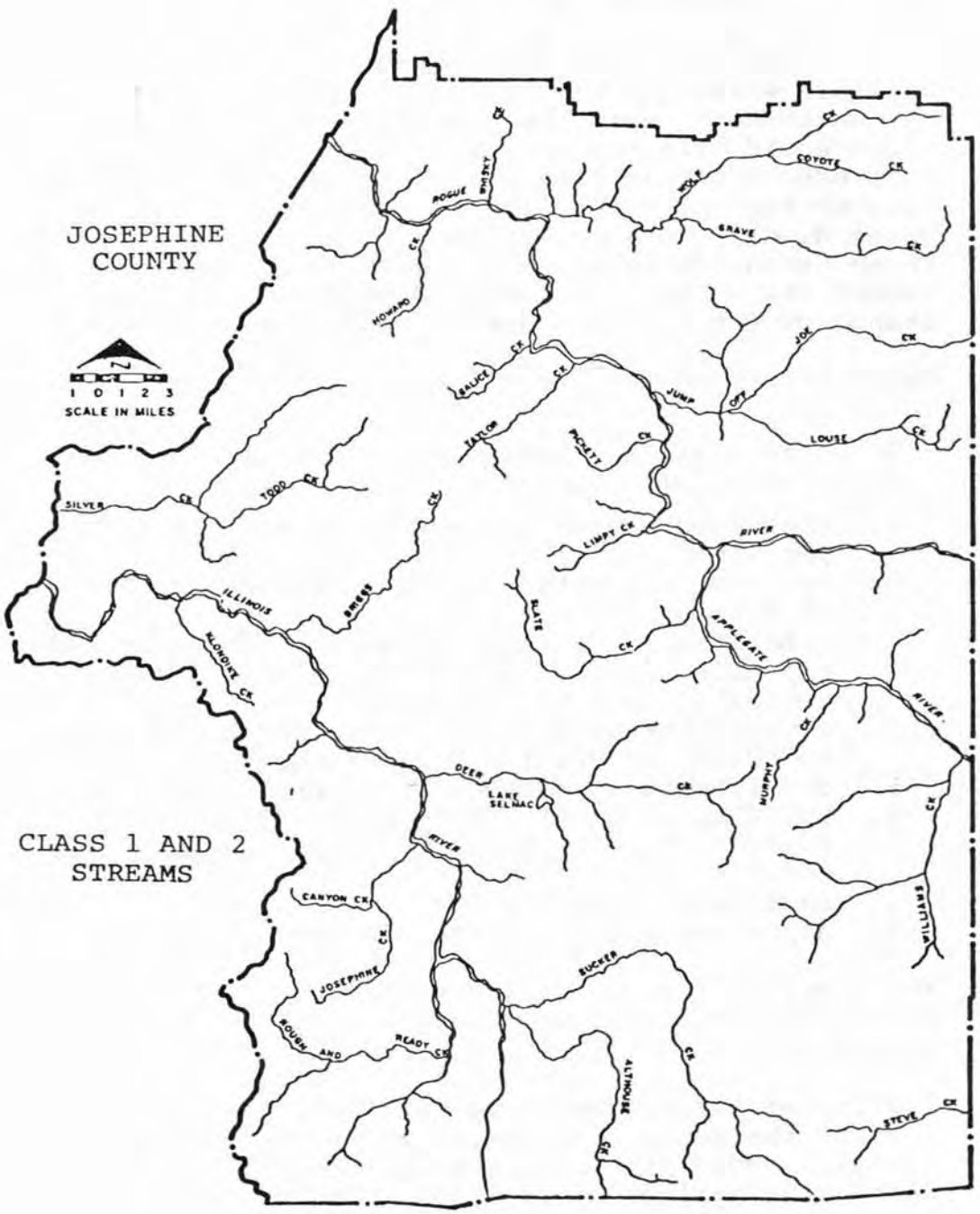
B Middle Rogue Sub-basin

C Illinois Sub-basin

D Applegate Sub-basin

SOURCE: Water Resources Board, Rogue River Basin 1959.

MAP W-3a



SOURCE: Department of Environmental Quality.

QUALITY

Water Quality Standards have been established for the waters of Oregon by the Department of Environmental Quality. The State requires that the highest and best practicable treatment and control must be used to maintain water quality at the highest possible levels. All waste discharges, both municipal or industrial, which would affect the waters of the State of Oregon must have a permit from the State, and secondary treatment or equivalent control is required for all wastes being discharged into any public water of the State. These standards apply to all waters of the State, except where they are modified by Special Water Quality Standards for specific surface water areas.

Major points of the General Water Quality Standards include:

No waste shall be discharged into waters of the State which will cause:

1. dissolved oxygen content below 6.0 milligrams per liter,
2. hydrogen concentration (pH) outside the range of 6.5 to 8.5,
3. liberation of dissolved gases which cause objectionable odors or damage to aquatic life or other desirable uses of the water,
4. development of aquatic plants which are injurious to health or desirable water uses,
5. development of tastses and odors,
6. build up of harmful bottom deposits,
7. discoloration or films to appear on or in the water,
8. bacterial pollution, or
9. appreciable temperature changes.

The complete text of Oregon Water Quality Special Standards for the Rogue River Gain can be found in the Appendix.

Quality of surface water is generally good in Josephine County, the Rogue River being renowned for its good water quality. Most problems occur principally in late summer during periods of low flow. Occasional discharge of inadequately treated sewage effluent and other organic and chemical point source discharges (occurring at specific places) have been known to cause significant fish mortalities.

> "Recurring cases of these forms of pollution have taken place on Filbert, Jones and Skunk Creeks (near Grants Pass). Other less severe cases of chemical pollution occur regularly in populated sections of the Rogue Basin." (Oregon Department of Fish and Wildlife, 1970)

Regulations enforced by the Oregon Department of Environmental Quality have more recently reduced instances of inadvertent and illegal pollution.

Agricultural and logging operations also alter water quality, but it is more difficult (compared to point source discharges) to say where and to what extent these occur. The effect of herbicides on water quality depends on variables such as type and amount applied and proximity to streams or lakes. In agricultural areas, problems often arise when surface runoff occurs over lands which have been fertilized or treated with herbicides or pesticides, or have significant animal wastes deposited on them. Runoff from these areas can substantially degrade water quality. The effects of logging on water quality are discussed under Erosion.

"Industrial waste sources in Josephine County are almost entirely wood products industries, and all are located in the Grants Pass area. The wood products produced are saw lumber and plywood. These industries have done a good job of eliminating all wastewater discharges. The only wastewaters discharged are either cooling waters or log pond overflows. The mills in Grants Pass discharge all of their wastes to the Grants Pass Sewage Treatment Plant. The one wastewater source listed which is not a wood products industry is a sand and gravel operation at Cave Junction. There has been no difficulty in meeting required DEQ discharge standards, because the operation is located such that wash water return flows are relatively clean when they reach the Illinois River." (Stevens, Thompson and Runyan, 1972)

TABLE W-4

INDUSTRIAL WASTE SOURCES

JOSEPHINE COUNTY

Source	Location	Type of Waste
Spalding & Sons, Inc.	Grants Pass	Cooling water
Carolina Pacific Plywood	Grants Pass	Wastes to Grants Pass
Agnew Plywood	Grants Pass	Wastes to Grants Pass
Southern Oregon Plywood	Grants Pass	Wastes to Grants Pass
Vancouver Plywood Co.	Grants Pass	Wash water
Murphy Creek Div., Mountain Fir Lumber Co.	Murphy	Log pond overflow
Bate Plywood Div., Fiberboard Corp.	Merlin	Log pond overflow
Clyde's Redimix & Gravel	Cave Junction	Gravel washing

Source: State of Oregon, Department of Environmental Quality as printed in Stevens, Thompson and Runyan, 1972.

Disposal of wastewater from sewage treatment facilities is by permit from the DEQ and EPA. See chapter on Public Facilities: Water.

QUALITY STANDARDS

The following descriptions detail specific water quality terminology and characteristics of the Rogue Basin. Tables W-5 and W-6, immediately following, summarize this narrative.

Dissolved Oxygen Saturations. The dissolved oxygen standard for the Rogue River Basin calls for 90% saturation during the seasonal low (summer period) and 95% of saturation during the remainder of the year. These standards are generally met except on occasions when violated by one or more percent of the established value.

Turbidity. Turbidity in water is caused by the presence of suspended matter such as clay, silt, plankton, and finely divided organic matter. The turbidity levels in the Rogue River and tributaries are generally related to flow. During periods of low flow, the low levels of

turbidity in the rivers are predominantly composed of plankton, giving the waters a light greenish hue. During the rainy season, the turbidity is mainly of silt origin resulting from erosion.

MPN Coliform Bacteria. The standards for the coliform group of bacteria in the Rogue River Basin are: (MPN) 1,000 organisms/100 ml of sample in the mainstem Rogue River downstream from Dodge Park to saltwater intrusion near River Mile 4 and in Bear Creek.

The coliform group of bacteria is ubiquitious in the environment, being present in the intestinal tract of all warm-blooded animals, in soil, and on vegetation. Coliform organisms are almost always present in water to some degree, even in areas absent of human activities. These bacterial populations are generally higher in concentration during periods of increased surface runoff.

The coliform standard is occasionally exceeded on a year-round basis in the mainstem Rogue River upstream from Dodge Park and downstream from Grave Creek to Lobster Creek Bridge. The observed coliform populations in the Illinois River are generally within the established standard on a year-round basis. The highest percentage of violation of the coliform standard occurs at Gold Ray Dam (RM 125.7) and at 2.5 miles west of Grants Pass (RM 99.2) during both the dry and wet seasons.

In the Applegate River, a higher percentage of coliform standard violations occur during the dry season (44.5%) than during the normal wet period (26.4%).

pH. The Rogue Basin standard for pH is between 7.0 and 8.5. This instream standard is generally met in the Rogue River and tributaries, except in Jackson County's Bear Creek.

Deer Creek, a tributary to the Illinois River at River Mile 46.5, has a natural Ph range of 6.7 to 6.9 which is below the established standard. The water in the Deer Creek drainage is apparently low in bicarbonates and carbonates, having alkalinity and total hardness concentrations about one-half of that in the Illinois River, thus the reason for the lower pH.

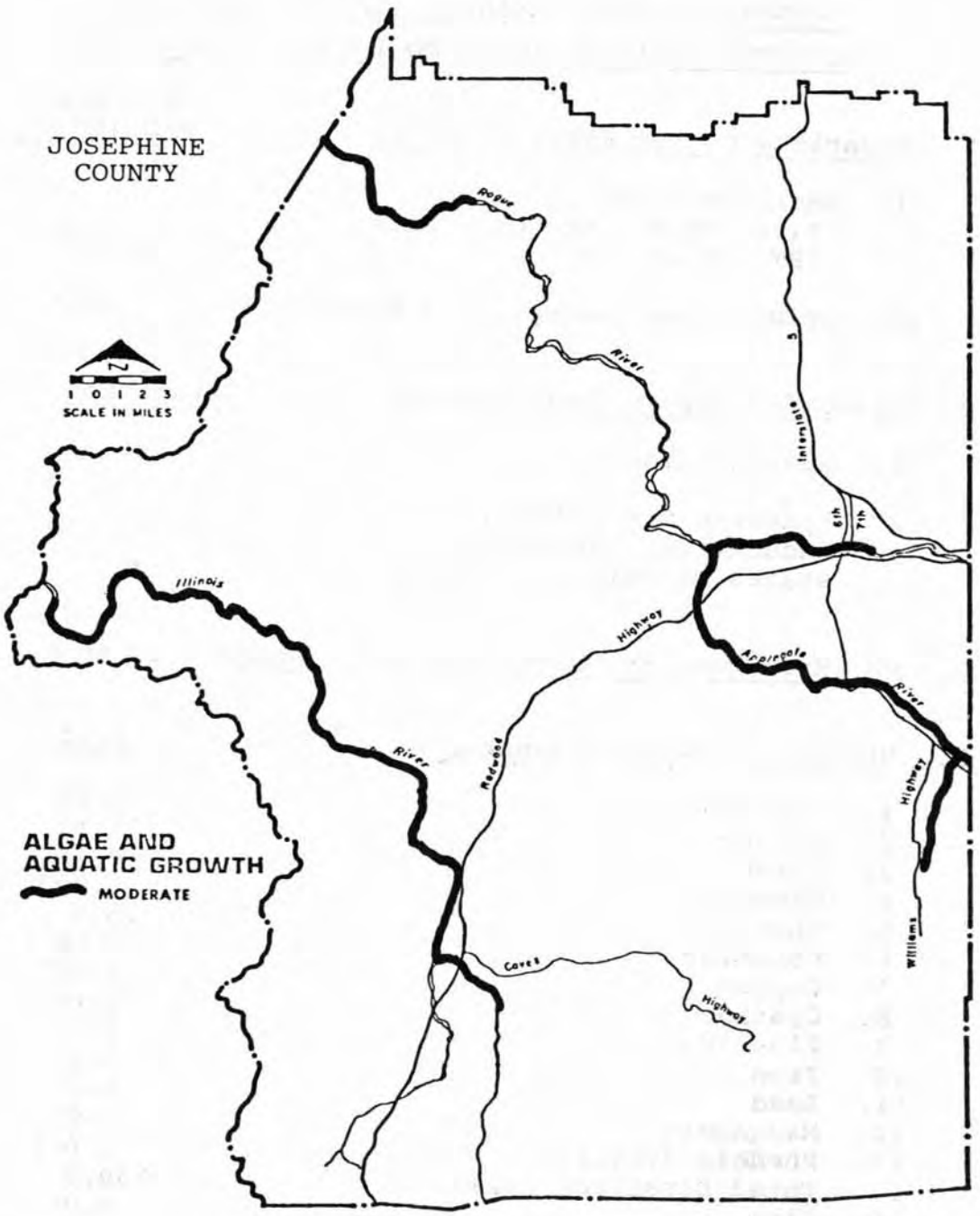
Chloride. The Rogue Basin chloride (Cl) standard is mg/l. An unverified chloride concentration of 46.2 mg/l occurred in Applegate River at Applegate between 1960 and 1965.

Total Dissolved Solids. The Rogue Basin standard for total dissolved solids (TDS) is 111 mg/l. This

standard is occasionally exceeded in the mainstem Rogue River during the low flow season. The tributaries of the Rogue River normally have TDS exceeding 100 mg/l. The rises in TDS, especially in the tributaries, result from the discharge of groundwater as the main source of flow in the waterways during the dry season. During periods of rain and snowmelt (when surface runoff constitutes a large part of these base flows), the tributaries and mainstem Rogue River will generally meet the established standard.

Algae and Aquatic Growth. An occurrence of algae and aquatic growth is often a good indicator of increases in water temperatures in combination with the presence of pollutants (nutrients) in surface waters.

MAP W-7



SOURCE: Department of Environmental Quality.

TABLE W-5

SUMMARIZED SPECIAL WATER QUALITY STANDARDS
FOR ROGUE RIVER BASIN RELATIVE TO INSTREAM WATER QUALITY

		Average MPN/100 ml
A.	Organisms of the Coliform Group	
	1. Mainstem Rogue River River Mile 4 to Dodge Park (RM 138.4)	1,000*
	2. Tributaries (except Bear Creek)	240*
B.	Dissolved Oxygen Concentration	Saturation, %
	1. Seasonal low	90
	2. Spawning areas during spawning, incubation, hatching and fry stages of salmonid fishes	95
C.	pH (Hydrogen Ion Concentration) Range	7.0 to 8.5
D.	Dissolved Chemical Substances	mg/l
	1. Arsenic	0.01
	2. Barium	1.0
	3. Boron	0.5
	4. Cadmium	0.003
	5. Chloride	25.0
	6. Chromium	0.02
	7. Copper	0.005
	8. Cyanide	0.005
	9. Fluoride	1.0
	10. Iron	0.1
	11. Lead	0.05
	12. Manganese	0.05
	13. Phenols (Total)	0.001
	14. Total Dissolved Solids	100.0
	15. Zinc	0.01

*Except during periods of high runoff

Source: Department of Environmental Quality

TABLE W-6

SUMMARIZED WATER QUALITY STANDARDS VIOLATIONS[a/]

ROGUE RIVER AND MAJOR TRIBUTARIES

Stations	River Mile	DO Saturation				MPN Total Coliform				Total Dissolved Solids			
		June-Oct.		Nov.-May		June-Oct.		Nov.-May		June-Oct.		Nov.-May	
		Obser.,[b/] #	Viol.,[c/] #	Obser. #	Viol. #	Obser. #	Viol. #	Obser. #	Viol. #	Obser. #	Viol. #	Obser. #	Viol. #
Rogue River													
Grants Pass	101.3	32	1	19	1	29	10	16	9	13	0	1	0
2.5 mi. west of Grants Pass	99.2	33	2	19	0	29	19	18	17	11	1	1	0
Robertson Bridge	86.0	35	2	24	0	29	11	22	13	36	7	23	1
Below Grave Creek	68.0	11	1	1	0	11	2	1	1	12	0	1	0
Applegate River (Rogue 94.8)													
1. Applegate	24.8	31	3	17	1	28	14	16	5	31	22	17	6
2. Wilderville	2.6	35	5	20	2	28	10	18	4	21	15	6	0
Total Observ.		66	8	37	3	56	24	34	9	52	37	23	6
% of Total Observ.			12%		8.1%		44.5%		26.4%		71%		26%
Illinois River (Rogue 27.1)													
1. Kerby	53.9	30	3	17	1	28	6	16	1	31	7	18	0
2. Mouth	0.1	14	0	3	0	13	0	2	0	12	2	3	0
Total Observ.		44	3	20	1	41	6	18	1	43	9	21	0
% of Total Observ.			6.8%		5%		14.6%		5.5%		21%		0%

a/ Data Period:

1. Rogue River stations from 1960-1975, except as follows:
   a. Grave Creek (1965-1970)
   b. Agness & Lobster Creek Bridge (1966-1975)
2. Applegate River (1960-1972)
3. Illinois River, Kerby (1960-1974), mouth (1966-1974)

b/ Number of observations

c/ Number of violations

Source: Department of Envirnomental Quality.

TEMPERATURE

Increased water temperature lowers the dissolved oxygen content (critical to fish and other aquatic life) and increases disease virulence. Removal of streamside vegetation and/or reduced flow are two major causes of increased temperature. The lower Rogue and several tributaries have temperatures frequently exceeding 80°F in summer.

The Oregon Department of Fish and Wildlife has determined that prolonged exposure of 65° or greater will cause physiological stress to fish. Areas most susceptible to fish disease outbreaks such as columnaris and furunculosis are the middle and lower Rogue and the Applegate below Murphy. Those outbreaks occurring in the Applegate are primarily caused by extensive diversion of the river water (Oregon Department of Fish and Wildlife, 1970).

The following table, chart and map give greater detail to areas of current or potential thermal pollution.

TABLE W-8

Miscellaneous maximum water temperatures, Rogue Basin

Stream	Location	Temperature (F).
Rogue River	Mule Creek	85
Rogue River	Grants Pass	79
Illinois River	Fall Creek	83
Josephine Creek	Mouth	79
West Fork Illinois River	0.2 mi. below Rock Creek	84
Grave Creek	0.6 mi. above Boulder Crk.	80
Jumpoff Joe Creek	Mile 0.5	80
Louse Creek	Merlin	87
Applegate River	Mile 1.5	84
Applegate River	0.6 mi. above Copper	77
Slate Creek	Wilderville	79

SOURCE: Oregon Department of Fish and Wildlife.

FIGURE W-9

WATER TEMPERATURE PROFILE FOR JULY, ROGUE RIVER BASIN, 1947-62

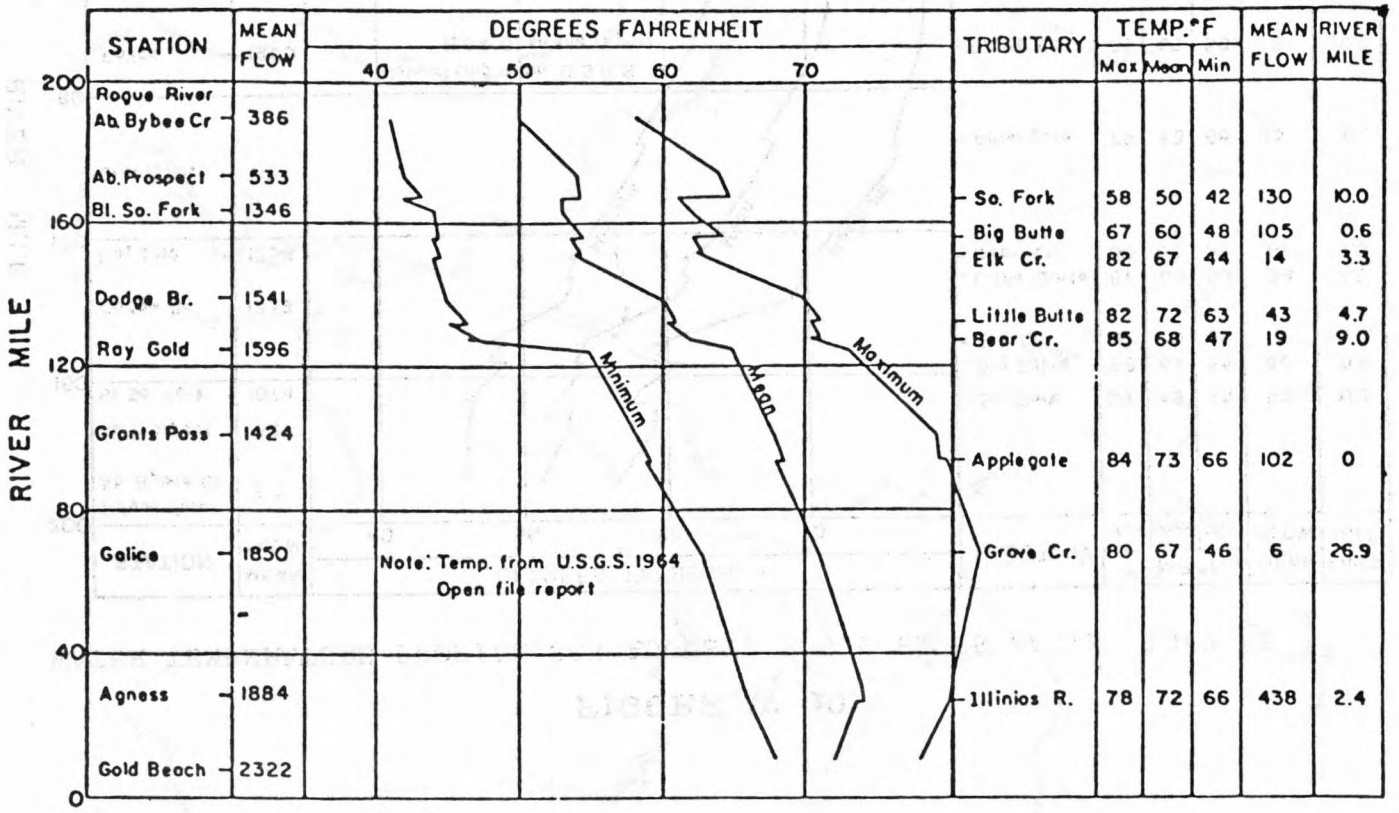
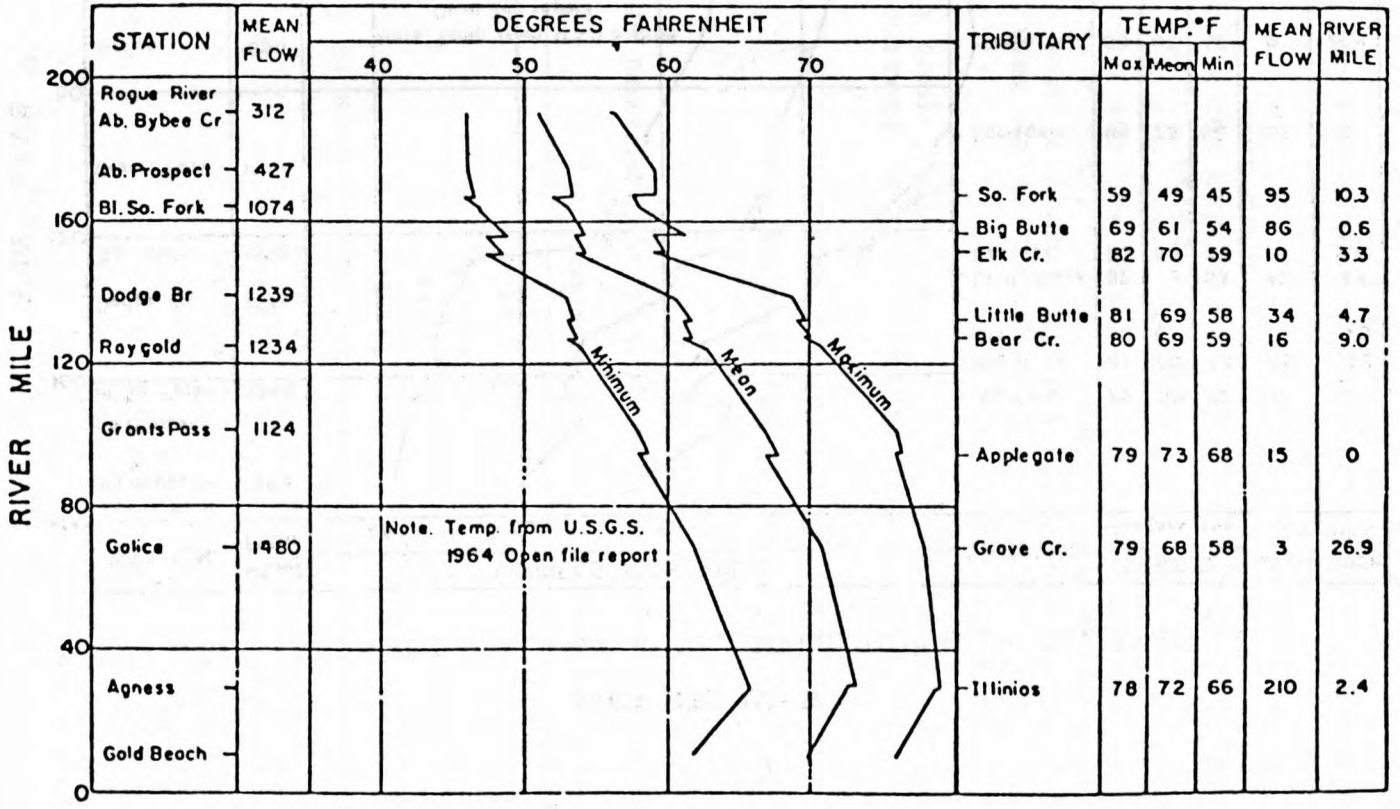
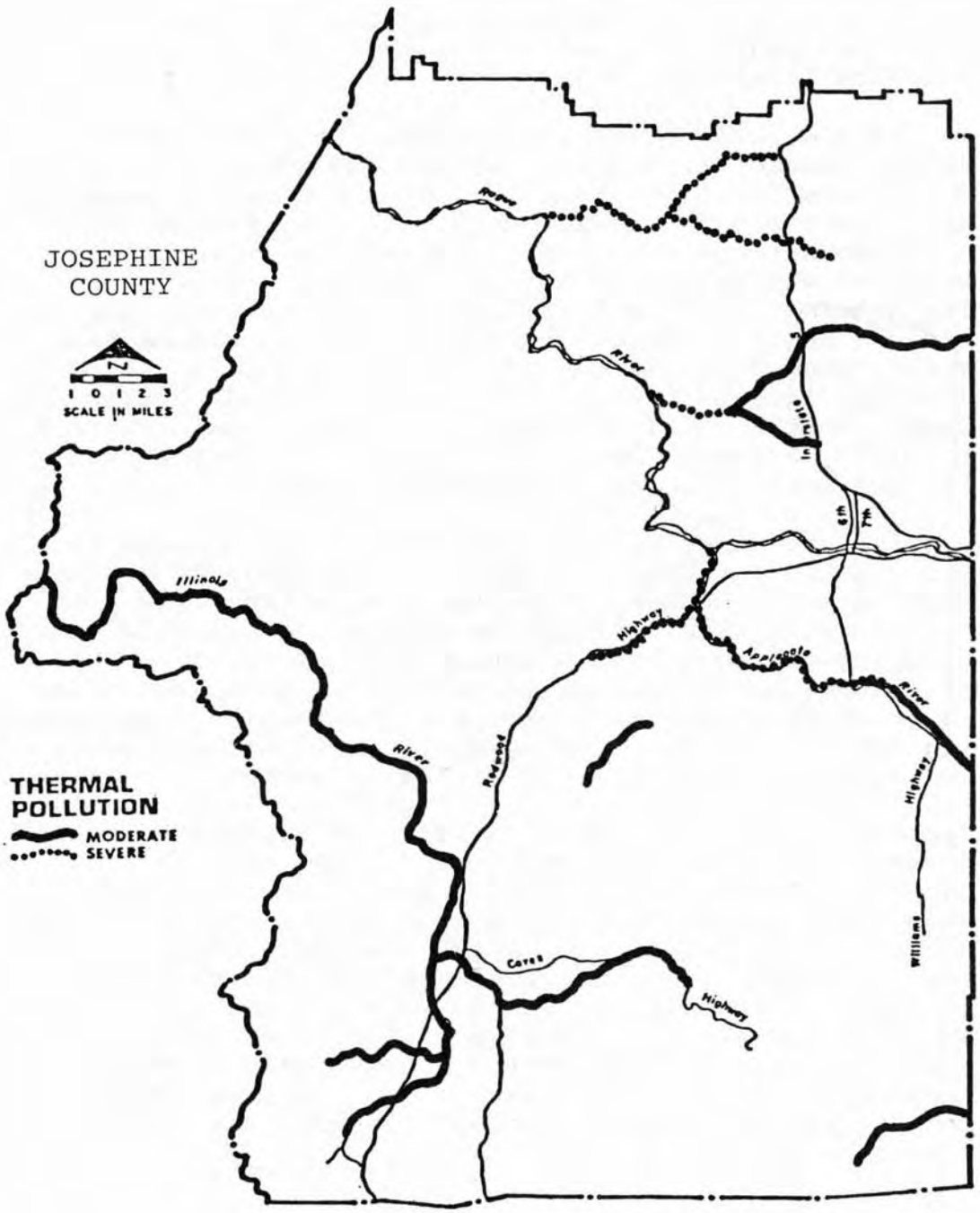


FIGURE W-10

WATER TEMPERATURE PROFILE FOR AUGUST, ROGUE RIVER BASIN, 1947-62



MAP W-11



SOURCE: Department of Environmental Quality.

EROSION

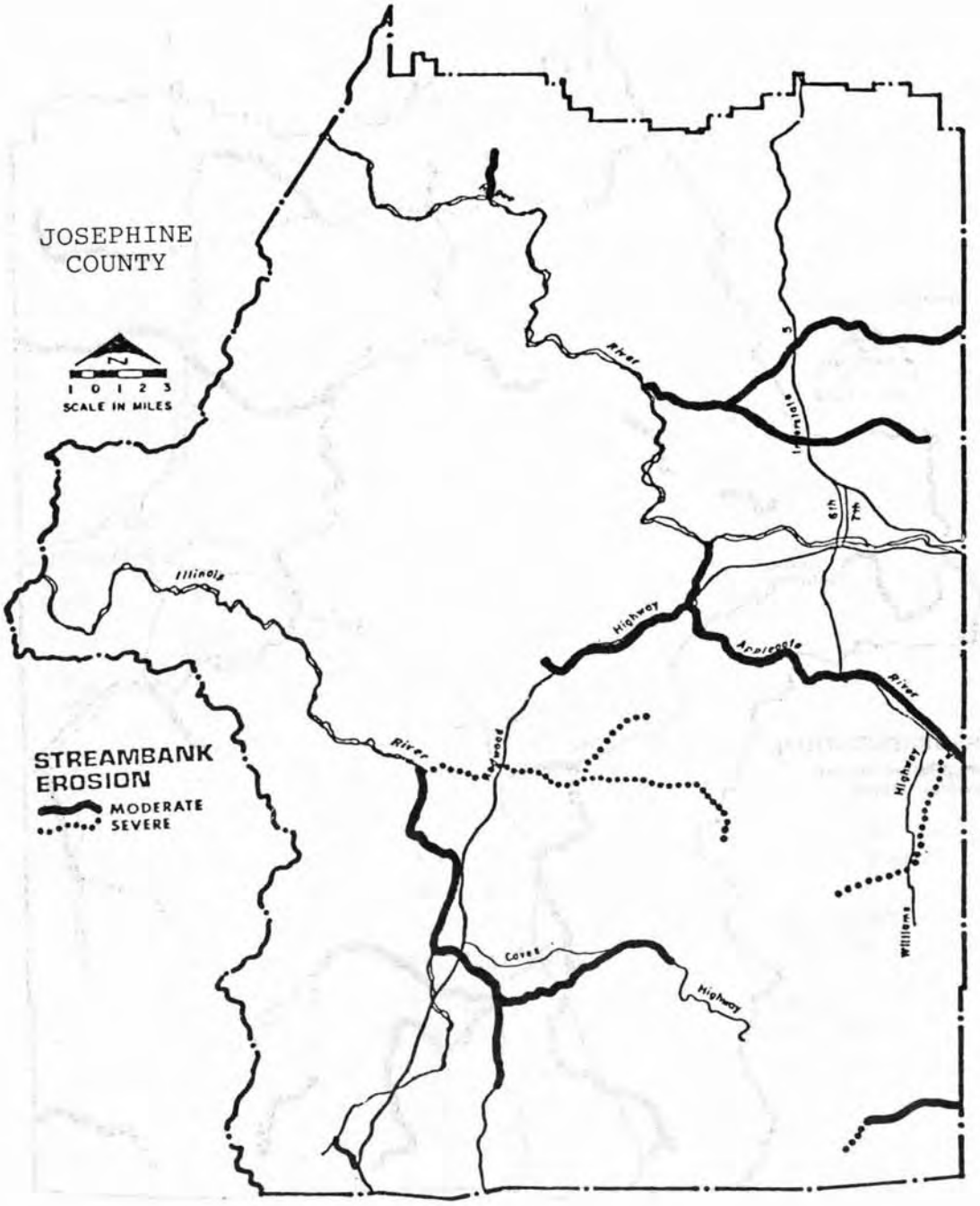
Erosion has many detrimental effects on water quality. The increased sediment levels resulting from erosion can clog the gills of fish, suffocate developing fish eggs, smother fish food producing areas, cement gravel together (reducing spawning grounds), fill reservoirs, and clog filtration systems.

Middle and lower elevation streams are most susceptible to man-caused erosion from mining and gravel removal operations, road construction, rechannelization and irrigation return flows. High turbidity in the Rogue River downstream from Bear Creek (Jackson County) has received substantial public concern not only because of its detrimental effect on fish habitat, but because it reduced angling success throughout the length of the River (Oregon Department of Fish and Wildlife, 1970). Flood irrigation often adds large silt loads during summer months when, 1) other activities causing high turbidity are most operative, and 2) streamflows are low and least able to dissipate sediment.

Logging practices have caused significant erosion in the past, but practices are improving and progress has been made in reducing soil disturbance resulting from poor road construction, streamside vegetation removal, and dragging of logs through stream channels. The practice of leaving buffer strips (intact streamside vegetation) in areas of clearcuts is extremely valuable in 1) reducing erosion, 2) maintaining cool stream temperatures, and 3) preserving valuable wildlife habitat.

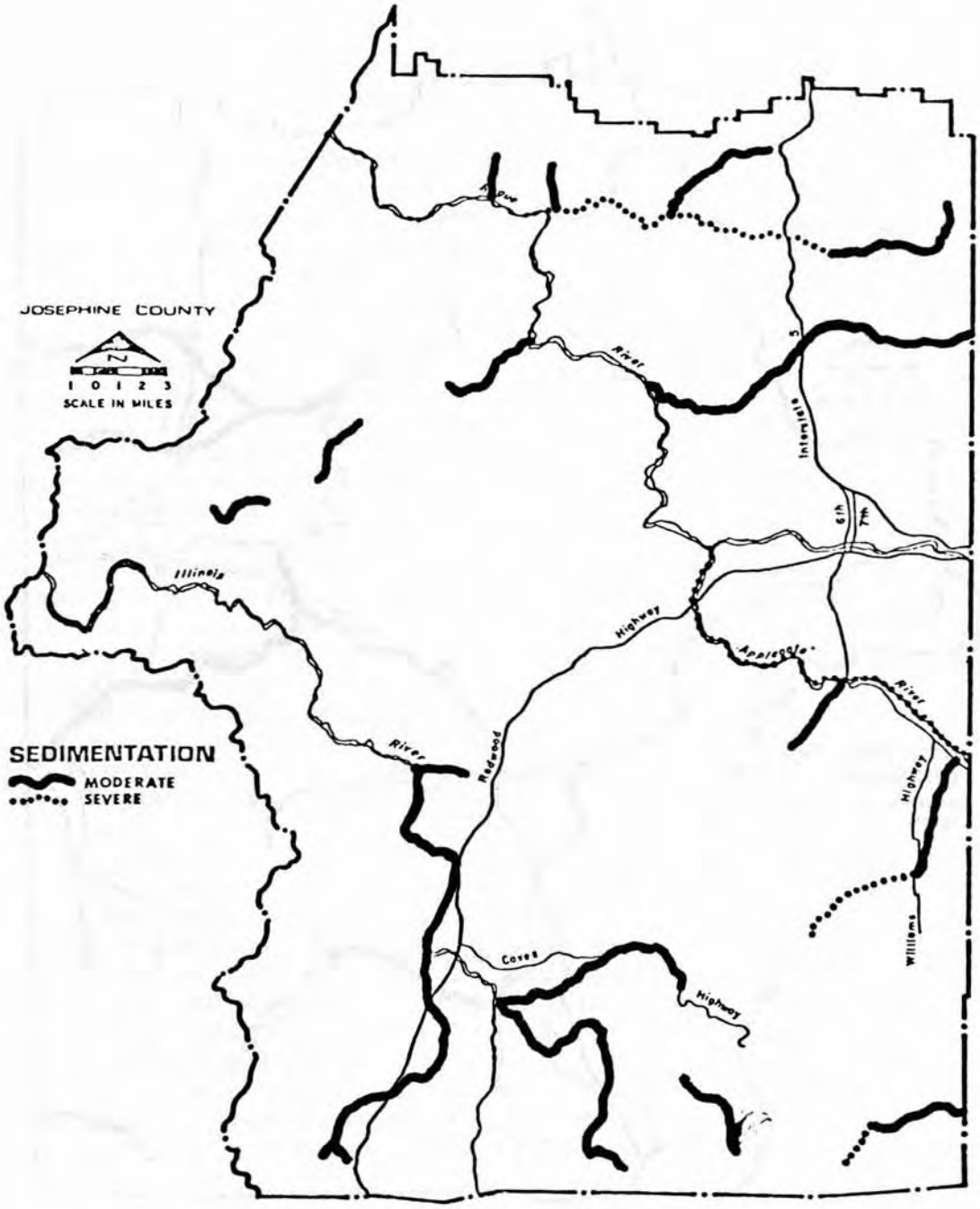
Specifically erosion and runoff are moderated by plant foliage, root systems, and ground cover (humus) produced by plants. Retention of trees decreases the force wind and precipitation would have upon impact with soil particles on the ground. By decreasing the impact, raindrops and wind are less capable of dislodging soil particles. Humus helps retain moisture and improves the absorption quality and holding capacity of the ground surface. This allows runoff to occur more gradually than would occur on bare soils. Root systems hold soil particles intact, thereby lessening the effects of flowing water.

MAP W-12



SOURCE: Department of Environmental Quality

MAP W-13



SOURCE: Department of Environmental Quality.

The following tables, W-14 through W-17, indicate average annual yields (discharges) of water for the Rogue and Illinois Rivers. Of particular significance is the differing amount of discharge during the early spring and late fall months.

TABLE W-14

OBSERVED ANNUAL MEAN DISCHARGE, IN CFS

Water Year	A	B	C	D
1929	1583	1843	6357	746
1930	1532	1932	7259	820
1931	970	1156	4621	576
1932	2243	2952	9616	1040
1933	2407	3031	11069	1250
1934	1312	1575	5027	586
1935	2350	3009	10568	1149
1936	2230	2924	10161	1066
1937	2057	2655	8649	874
1938	3026	4651	17987	1861
1939	2106	2468	6561	632
1940	2001	2639	11134	1217
1941	1075	2140	9926	1220
1942	2095	2797	10281	1176
1943	3560	4757	15213	1613
1944	1866	2141	5806	619
1945	2240	2660	9862	1062
1946	2874	3558	12669	1403
1947	2060	2375	8076	833
1948	2706	3510	12487	1363
1949	2428	2955	8857	891
1950	2638	3320	11591	1213
1951	3536	4931	16806	1810
1952	3471	4658	16257	1689
1953	3211	4318	16301	1671
1954	3320	4632	15604	1572
1955	1899	2259	6807	745
1956	3984	5938	21150	2088
1957	3093	4072	12566	1232
1958	3390	4928	19695	2039
Mean	2465	3235	11290	1208

A Rogue River at Dodge Bridge

B Rogue River at Grants Pass

C Rogue River at Gold Beach

D Illinois River near Kerby

SOURCE: Pacific N.W. Regional Comprehensive Framework Plan, Water Resources Division.

TABLE W-15

OBSERVED MONTHLY MEAN DISCHARGE IN CFS

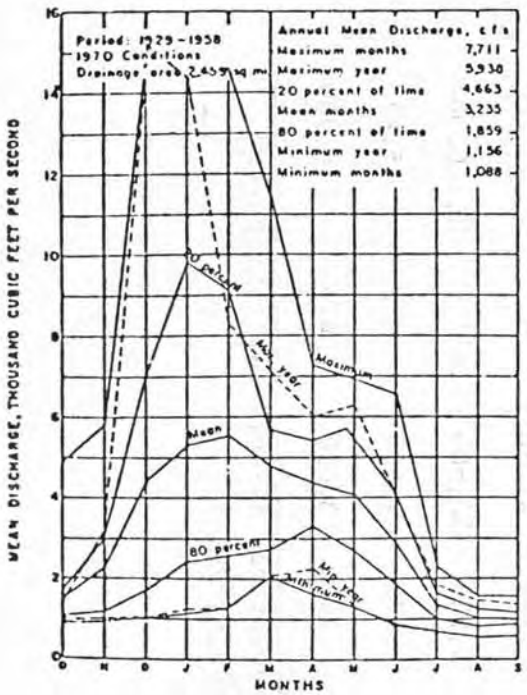
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
A.	3381	3672	3370	3372	3478	2587	1448	1134	1082	1222	1849	2991
B.	5306	5597	4814	4425	4141	2936	1358	1040	1014	1482	2280	4417
C.	3519	9147	20236	25049	22624	19188	13850	10938	5685	2322	1480	1439
D.	313	1180	2393	2840	2611	1993	1551	982	437	112	47	40

A. Rogue River at Dodge Bridge
B. Rogue River at Grants Pass
C. Rogue River at Gold Beach
D. Illinois River near Kerby

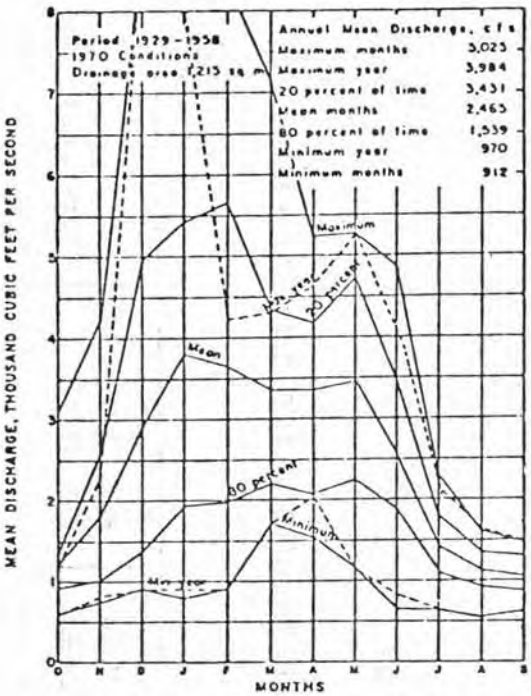
Source: Pacific N.W. Regional Comprehensive Framework Plan, Water Resources Division

TABLE W-16

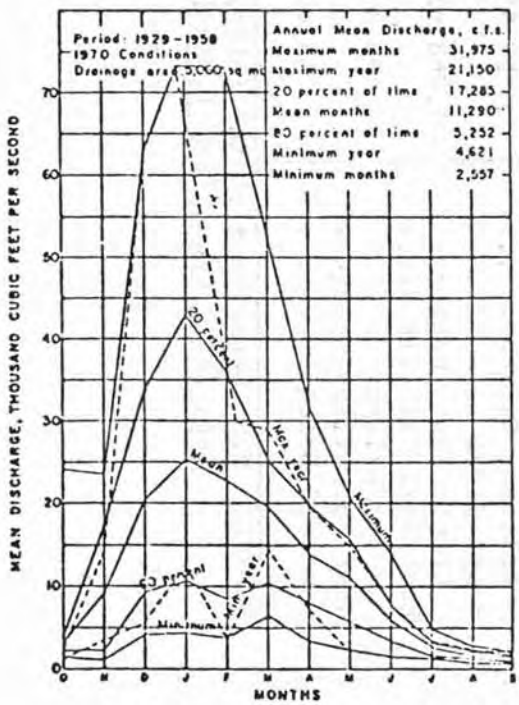
MONTHLY MEAN DISCHARGE OF ROGUE AND ILLIONIS RIVERS



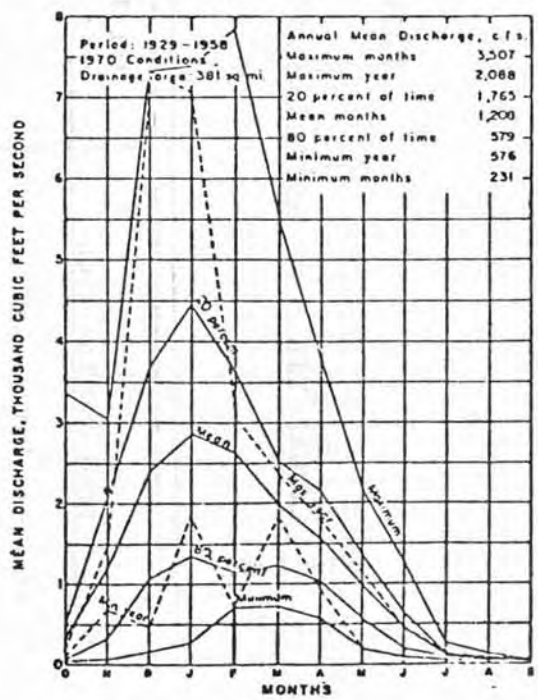
Monthly discharge, Rogue River at Grants Pass, Oregon.



Monthly discharge, Rogue River at Dodge Bridge



Monthly discharge, Rogue River near Gold Beach, Oregon



Monthly discharge, Illinois River near Kerby, Oregon

SOURCE: Pacific N.W. Regional Comprehensive Framework Plan, Water Resources Division.

TABLE W-17

ANNUAL YIELD OF REPRESENTATIVE STREAMS, JOSEPHINE COUNTY, 1968

Stream and Location	Total cfs	Mean cfs	Max. cfs	Min. cfs	Acre-Feet
Illinois River near Kerby, Oregon.....	387,497	1,062	18,400	31	768,600
Sucker Creek near Holland, Oregon.....	88,954	244	4,260	33	176,400
Rogue River at Grants Pass, Oregon....	1,068,610	2,928	30,600	1,010	2,120,000
East Fork Illinois River near Takilma.....	48,308.3	132	2,400	8.3	95,820
West Fork Illinois River near O'Brien.....	58,949.9	162	3,000	4.5	116,900

SOURCE: U.S. Department of the Interior, Geological Survey, Water Resources Data for Oregon, Part 1, Surface Water Record.

FLOODS

The earliest recorded flood in Josephine County occurred in 1861. This flood has been chosen to represent the "100 year flood", meaning a similar sized flood will have a 1% chance of occurring in any one year. The flood of 1964 is estimated to be a 50 year flood. The following chart lists major floods by year, and shows their relative magnitudes.

*The odds would indicate such a flood would occur approximately once every 100 years. However, this is fallacy as floods of such a magnitude could, in reality, occur one after another.

TABLE W-18

MAJOR FLOODS IN THE ROGUE RIVER BASIN

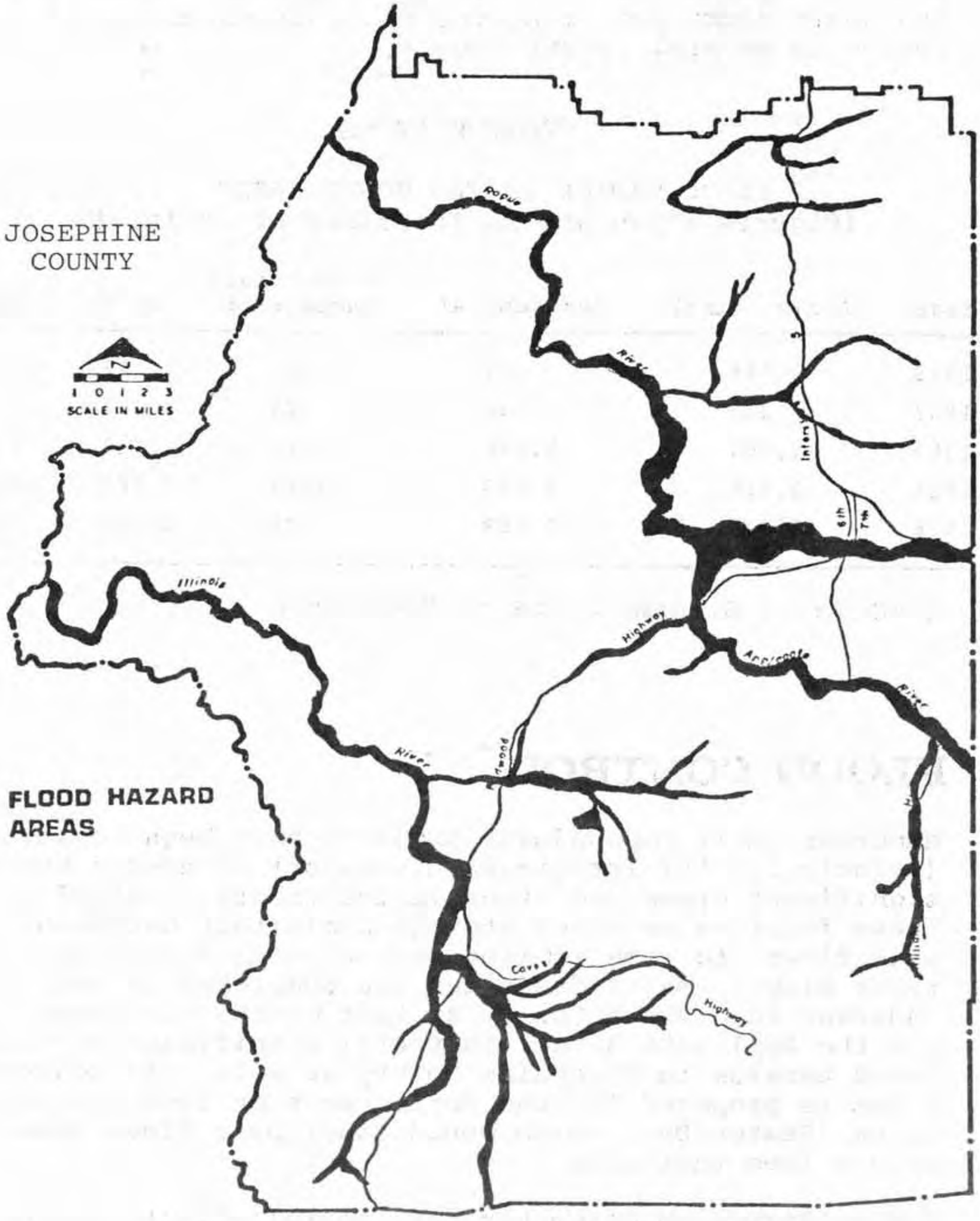
Flood	Rogue River at Raygold Peak Discharge cfs	Rogue River at Grants Pass Peak Discharge cfs
Nov. - Dec. 1861	131,000*	175,000*
Feb., 1890	120,000*	160,000*
Feb., 1907	60,000	60,500*
Nov., 1909	61,700	70,000*
Feb., 1927	110,000*	138,000*
Dec., 1942	40,500	54,400
Dec., 1945	48,000	70,000
Jan., 1948	46,200	59,900
Oct., 1950	43,100	65,400
Jan., 1953	56,500	77,000
Dec., 1955	110,000	135,000
Dec., 1964	129,000	152,000
1972	66,200	82,500
1974	63,600	96,400

*Estimated instantaneous discharge.

SOURCE: Army Corps of Engineers.

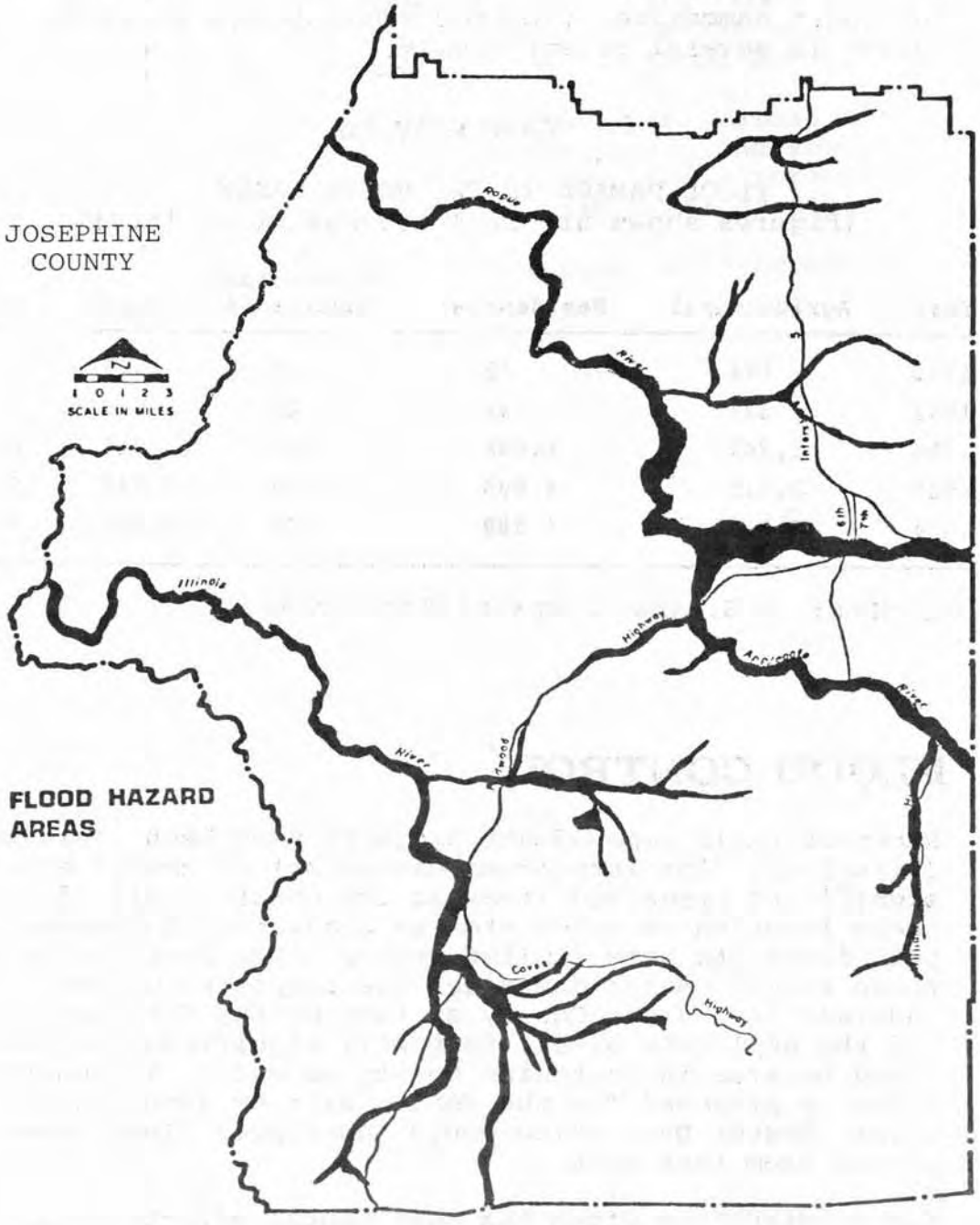
1964 FLOODING WEST OF GRANTS PASS: This picture was taken approximately nine hours after the Rogue River Crested.

MAP W-19


JOSEPHINE
COUNTY
N
1 0 1 2 3
SCALE IN MILES
FLOOD HAZARD
AREAS
Rogue
River
Illinois
River
Applegate
River
Highway
6th
7th
Caves
Highway

1964 FLOODING WEST OF GRANTS PASS: This picture was taken approximately nine hours after the Rogue River Crested.

MAP W-19



Damage resulting from flooding has occasionally been very significant in the Rogue Basin. Loss of life due to flooding has been minimal, but property damage and loss of topsoil have frequently occurred. The following chart summarizes reported flood damage costs incurred in several recent floods.

TABLE W-20

FLOOD DAMAGE IN THE ROGUE BASIN
(Figures shown are in Thousands of Dollars)

Year	Agricultural	Residential	Commercial/ Industrial	Other	Total
1945	144	13	250	12	419
1953	327	36	23	8	394
1955	1,367	1,098	883	701	4,,049
1965	3,315	4,805	3,102	5,160	16,382
1974	3,736	589	178	2,567	7,070

SOURCE: U.S. Army Corps of Engineers.

FLOOD CONTROL

Numerous small impoundment projects have been constructed (principally for irrigation diversion) on nearly every significant creek and river in the County. All of these function as water storage areas that decrease peak flows (to some limited degree) upon destruction of these sites. Major dam sites are completed or are underway in Jackson County at Lost Creek, Elk Creek and the Applegate River, that will significantly reduce flood hazards in Josephine County as well. In addition, a dam is proposed for the Merlin area on Jump Off Joe Creek (Sexton Dam) which would lower peak flows downstream from that site.

Dam construction often has detrimental effects which must be weighed against flood control, irrigation or other benefits. Loss of agricultural land, wildlife habitat and damage to anadramous fish runs are potential undesirable "side-effects".

Protection of vegetation, especially on streambanks and areas of steep slope, can greatly mitigate erosion problems and peak discharge volumes. Areas stripped

of vegetation may yield comparatively high volumes of runoff at rapid rates itensifying peak flows downstream.

Methods for reducing structural damage could include permits for building construction which require anchoring of a structure, use of flood resistant materials, and/or minimum flood heights (above flood elevation).

Generally, deposit of fill in floodplain areas will raise high water levels in other areas, and should be restricted. Regulations governing land alteration in floodplains are implemented by the State of Oregon.

The following chart explains various methods of floodplain management.

TABLE W - 21

An Overview of Flood Plain Management Tools

Tool	*Purpose*	*Approach to Flooding Threat*	*Incidence of Costs*	*Advantages*	*Limitations*
Land Use Regulations.	1. Foster health and safety. 2. Prevent nuisances. 3. Prevent fraud. 4. Promote wisest use of lands throughout a community.	1. Require individual adjustment of uses to the flooding threat.	1. Landowner must bear cost of adjustment. Community bears cost of adoption and administration of regulations.	1. Low costs. 2. Promote economic and social wellbeing. 3. Promote most suitable use of lands. 4. Can be put into effect immediately. 5. May remain effective for long periods if adequately enforced.	1. Must not violate state and federal constitutional provision. 2. Can't prevent all losses. 3. Generally do not apply to governmental uses. 4. Limited application to existing uses.
Dams, Reservoirs, Levees.	1. Reduce flood losses, protect safety, promote economic well-being. 2. Protect existing uses. 3. Promote navigation, water recreation. 4. Make new sites available for development, increase tax base.	1. Adjust flooding threat to land use needs.	1. Generally public at large pays for benefits which accrue to landowners, local communities.	1. Reduce wide range of flood losses. 2. Protect existing uses. 3. Promote navigation and recreation. 4. Permit regional approach to problems.	1. Federal subsidy leads to private gains. 2. High costs. 3. Construction may take many years. 4. May not be consistent with community plans, environmental quality. 5. Maintenance required. 6. Sedimentation may reduce effectiveness. 7. Catastrophic losses may result from failure of dam or levee. 8. No site may be available for dam, or levee; geology wrong.
Land Treatment (to retain precipitation).	1. Prevent future increases in flood heights. Reduce existing levels. 2. Promote water and soil conservation.	1. Reduce existing flood conditions, prevent future increases in flood heights in frequent floods.	1. Expense largely public; however, landowners may bear portion of costs.	1. Limited cost. 2. Attack flood problem where it begins. 3. May be consistent with broad community needs.	1. Not applicable in many instances. 2. Effectiveness limited to relatively frequent, small floods.

An Overview of Flood Plain Management Tools

Tool	*Purpose*	*Approach to Flooding Threat*	*Incidence of Costs*	*Advantages*	*Limitations*
Public Open Space Acquisition for Parks, Wildlife Areas, Floodways.	1. Reduce flood losses. 2. Achieve broader community recreation and conservation goals.	1. Adjust use to threat.	1. Public pays but receives multiple benefits.	1. Multiple benefits. 2. No problem of constitutionality. 3. Permanent. 4. Active public use of lands possible. 5. B.O.R. and other Federal grants may be available for open space acquisition. 6. Particularly attractive in urban areas.	1. Acquisition costly. 2. Flood losses to open space uses (e.g., campgrounds) remain. 3. Sites not always suitable for recreation, wildlife. 4. May create shortage of land needed for businesses, industry, etc. 5. Creates public land management requirements.
Flood Insurance (National Flood Insurance Program).	1. Promote flood regulations. 2. Promote long-term cost-bearing by individual occupant.	1. Require individual cost-bearing. 2. Adjust use to threat.	1. Public pays, in part, for subsidized insurance. 2. Private land owner pays for unsubsidized insurance.	1. Spread cost of flood losses. 2. Promote regulation. 3. Encourage consideration of flood costs in private decision-making.	1. Subsidized insurance may promote continued use at primarily public rather than private expense. 2. May undercut floodway regulations to abate existing uses.
Warning Systems	1. Warn property owners of impending threats. 2. Permit advance evacuation, installation of temporary flood abatement measures.	1. Adjust use to threat.	1. Public bears costs (usually).	1. Can permit adjustment to threat. 2. Useful in combination with regulations.	1. Of no use unless flood plain occupants are willing and able to take necessary protection measures. 2. Systems must be adequately operated and maintained.

These and other FPM tools such as permanent evacuation and relocation, flood proofing, and flood emergency and recovery measures are usually used in combinations.

SOURCE: University of Oregon Bureau of Governmental Research and Service, 1978.

FLOODPLAIN REGULATIONS

In order to qualify for participation in the National Flood Insurance Program (as provided by the Flood Disaster Protection Act of 1968, administered through the U.S. Department of Housing and Urban Development) a community must meet certain requirements. These include identification of the 100-year floodplain and adoption and enforcement of land use regualtions and other control measures to limit amount and type of development in flood-prone areas. Josephine County, in order to meet these requirements of minimizing flood damage, adopted a flood control ordinance in 1978. The County was, however, the first in Oregon to participate in the National Flood Insurance Programs in 1969.

The County flood control ordinance has three major purposes:

1. Restriction or prohibition of uses which are dangerous to health, safety, or property in times of flood, or cause excessive increases in flood heights or velocities;
2. A requirement that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Protection of individuals regarding purchase of lands which are potentially unsuitable for specific purposes because of flood hazard.

These are effectuated by requiring various types of review by the Planning Director, Planning Commission and Building Safety Director. Regulations governing placement of water, sewer, and septic systems; drainage provisions; structural modifications (e.g. anchoring, types of construction material, floor height above base flood level) construction methods and practices. (See Appendix - "An Ordinance for Land Use Control Measures of Flood Prone Areas for Josephine County, Oregon".)

At the state level, regulations affecting land fill and/or removal are administered by the Division of State Lands (see Appendix).

GROUNDWATER

Underground water flows through layers of water-bearing rock called aquifers. The groundwater supply is replenished at recharge areas where precipitation or surface water percolates into the soil. If the overlying soil and subsoil at recharge areas become contaminated by inadequate or poorly sited waste disposal systems or by chemical pollutants, the groundwater that percolates into the aquifers may also become contaminated. Supplies of high quality groundwater can be maintained only if use of recharge areas is carefully planned and waste disposal is properly controlled.

Soil microorganisms and plant roots are efficient natural filters of many contaminants, especially phosphates and nitrates (two nutrients that cause the most problems in aquatic systems).

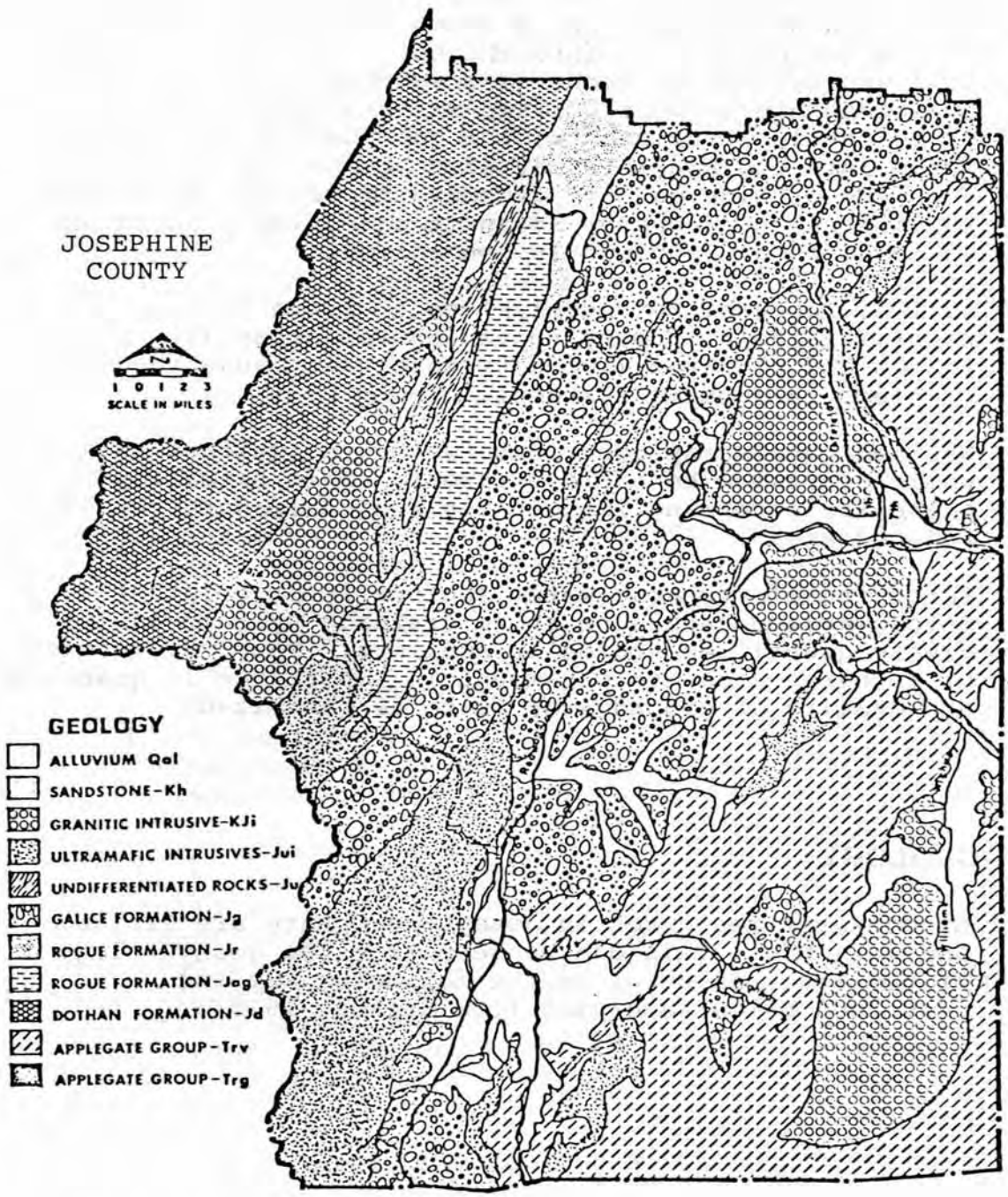
Unlined canals may contribute water to aquifers that would otherwise be surface runoff. This situation is presently occurring in both the Fruitdale-Harbeck and Redwood areas.

Rerouting of recharge water (before it percolates) into overland canals or storm drainage systems can decrease quantities stored in aquifers. Thus, protection of recharge areas is paramount in importance if quantity and quality of groundwater is to be maximized.

GEOLOGY

Groundwater resources in Josephine County are limited and variable. This can be seen from the geohydrology of the area, as shown on the following map and described below (exerpted from Hughes, 1979):

MAP W-22



SOURCE: U.S. GEOLOGICAL SURVEY

EXCERPT FROM HUGHES STUDY, 1979; Pages 4-40 through 4-53.

GEOLOGIC UNITS & THEIR WATER BEARING PROPERTIES

APPLEGATE GROUP - TRIASSIC PERIOD

Areal Extent

The Applegate Group of rocks is named after the Applegate River and is the dominant rock unit within the river basin. Regionally, the rock group has a northeast to southwest linear trend through the eastern part of Josephine County and the western part of Jackson County and extends southward into northern California. The Applegate Group of rocks is believed to be the oldest rock unit shown on the geohydrologic map which is part of this report.

Physical Characteristics

Applegate Group rocks are a thick assemblage of metamorphosed volcanic and sedimentary rocks. The altered sedimentary rocks are often interbedded with the volcanic rocks and include conglomerates quartzite, argillite (derived from siltstone), and marble.

Narrow zones of gneissic and schistose rocks of the Applegate Group lie adjacent to the later intrusion of granitic rocks. These zones of intense alterations were formed by contact metamorphism from the high temperature of the granitic intruding mass.

The rocks dip steeply to the southeast over most of the area of outcrop. Some westerly and southerly dips are known in the southwesterly part of Josephine County such as the Deer Creek drainage.

Water Bearing Properties

The metavolcanic and metasediments of the Applegate Group have a low permeability due to the mineral realignment and crystallization caused by various stages of metamorphism. Ground water occurs in the fractures, joints and cleavages which have been enlarged near the surface by physical and chemical weathering. A knowledge of the local geologic structure increases the probability of locating small quantities of ground water for domestic use. Areas in which the fracture and cleavage planes intersect the dipping bedding planes, at a relatively shallow depth are potential sources of ground water. Yields are generally less than 10 gallons per minute from wells drilled to depths less than 200 feet (refer to Ground Water Availability Map.) Water quality varies and will be discussed in a separate report.

The potential of obtaining sufficient water for domestic use is increased when the well site selection can be made on larger tracts of acerage.

DOTHAN FORMATION - JURASSIC PERIOD

Areal Extent

The Dothan Formation was named for a series of sedimentary rocks exposed near the Dothan postoffice on Cow Creek in Douglas County. Regionally, the formation has a northeast to southwest trend, forming the surface geology in a linear band from Douglas County southwesterly

to the Oregon Coast. Within the mapped area considered in this report, exposures of the Dothan Formation are limited to the northwest corner of the County.

Physical Characteristics

The Dothan Formation consists of a thick sequence of sandstones, siltstones, and shale with lenticular beds of chert and conglomerate. Near the top of the formation, layers of volcanic rock are in evidence.

This rock unit has been strongly affected by tangential forces forming folds and thrust faults which have a northeast to southwest linear trend. The sedimentary beds dip to the east and southeast.

Water Bearing Properties

No ground water data is available from drillers logs within Josephine County. Small quantities of ground water likely occur within the fractures and bedding planes of the rock unit.

ROGUE FORMATION - JURASSIC PERIOD

Areal Extent

The Rogue Formation is exposed in a linear northeast to southwest trending band parallel to and immediately east of the exposures of the Dothan Formation in northwestern Josephine County. This series of interbedded altered volcanics, are in part intensely metamorphosed to gneissic rocks and extend from northern California into Curry,

Josephine and Douglas counties.

Physical Characteristics

This formation consists of a thick sequence of metavolcanic flows and tuffs. The volcanic flows have a wide range of rock types including basalts, dacites and rhyolites. The basalt flows, which are predominant near the base of the formation, are a green to greenish gray color in contrast to the light colored siliceous rocks (rhyolites & dacites) which predominate near the top of the formation. Clastic rock units interbedded with the metavolcanics include thick beds of tuffs and thin layers of cherty material.

The metamorphic facies of the Rogue Formation consists of foliated gneissic rocks, green schistose rocks derived from the basalts or metaquartzites and mica schists derived from the silicic rhyolites and dacites.

Structurally, the strike of the Rogue Formation is northeasterly and the beds dip steeply to the southeast.

Water Bearing Properties

Both the metavolcanics and the intensely metamorphosed gneissic and schistose rocks have a low permeability due to mineral re-alignment. Openings within the rocks capable of transmitting ground water to a well are therefore mostly secondary in origin. Small quantities of ground water are available from storage in geologic faults, fractures, joints and between bedding planes.

Outcrops of the Rogue Formation are in a sparsely populated area and therefore very few wells are known to exist. Though yield from wells are generally less the 5 gpm (?). One well (35-9-11) is reported to be capable of producing 20 gpm from a depth of 10 feet.

GALICE FORMATION - JURASSIC PERIOD

Areal Extent

The Galice Formation forms a narrow linear band which trends northeast to southwest. This formation extends beyond the boundary of Josephine County to the north and northeast into Douglas and Jackson Counties, and southward into California. It is one of the most prominent rock units within the County.

Physical Characteristics

This formation was deposited on the pre-existing surface of the Applegate Group of rocks. The Galice Formation consists of two members, a basal group of predominately volcanic rocks overlain by sedimentary rocks.

The volcanic rock member is estimated to be 10,000 feet in thickness. Predominately the rocks consist of agglomerates, tuffs and flows which are rhyolitic and andesitic in composition.

The sedimentary rock member is estimated to be 15,000 feet thick. These rocks are a black to dark gray slaty shale with some

interbeds of sandstone and conglomerate. Cementation of the sedimentary rocks with siliceous material has rendered most of the member impermeable.

Structurally, the rocks of the Galice Formation have been subjected to compressionable forces which have developed a slaty texture to the fine-grained sediments. Fractures and several joint systems have developed in the rocks. The beds dip, generally at a high angle to the southeast and east.

Water Bearing Properties

With a few exceptions, the production of ground water from the Galice Formation is limited and unpredictable. The accumulation of water within the slaty shales is limited to fractures, joints and shear zones. Structural deformation of the formation has resulted in the beds dipping at a high angle toward the southeast and east. Wells drilled in the high angle dipping beds remain in the same lithologic unit.

The production of water is generally limited to less than 10 gallons per minute. Dry holes are common and salt water is known to occur in some areas.

UNDIFFERENTIATED ROCKS - JURASSIC PERIOD

Areal Extent

The undifferentiated rocks are located within a narrow northeast-southwest trending band in the northwest quarter of the County.

Physical Characteristics

The rocks included in this grouping are a complex mixture which likely are not of the same age. The rock types apparently include both igneous and metamorphic varieties.

Water Bearing Properties

There is no available information of wells within this unit.

ULTRAMAFIC INTRUSIVES - JURASSIC PERIOD

Areal Extent

The ultramafic rocks occur throughout the county with exposures in all of the river drainage basins. The outcrops are generally elongate in a northeast-southwest direction which is the major structural trend of the older rocks and suggests that the intrusive masses are located along fault zones.

Physical Characteristics

The intrusive rocks are peridotites or their altered product serpentine. The term serpentine is commonly used to cover all rock types within the intrusive masses. Ultramafics are mineral assemblages which contain high amounts of magnesium and iron. On the fresh surface the rocks are generally some shade of green. In many localities, the rock surface is curved and shines as if polished.

The ultramafic rocks are widespread in the Applegate Group and

the volcanic rock member of the Galice Formation. The intrusives occur in linear masses and in lenticular or horizontal tabular bodies in the volcanic rocks.

Water Bearing Properties

The potential of developing water from the ultramafic intrusive masses is poor. Possibly a few wells produce water from this formation. The high iron and magnesium content of the rocks would have an undesirable effect upon the water quality.

GRANITIC INTRUSIVE - CRETACEOUS & JURASSIC PERIOD

Areal Extent

Crystalline intrusive rocks of granite, diorite and granodiorite are exposed at the surface at two major localities within the county. A large oval-shaped exposure is located between the Applegate River and the community of Hugo, a distance of 16 miles. At its widest point, parallel to the Rogue River, the intrusive measures 8 miles in width.

In the Williams Creek drainage exposures of the granitic rock extend from the headwaters to the confluence with the Rogue River, a distance of 14 miles within the mapped area, and extends southward into unmapped federal lands. Small irregularly-shaped exposures occur at several places near the eastern boundary of the county. These isolated exposures are assumed to be connected to the larger exposed outcrops at some depth below the surface.

Physical Characteristics

Due to popular useage the term granitic intrusive is used although the most abundant rock types are quartz diorite and diorite having little quartz. The rocks are medium to coarsely crystalline. The light-colored minerals consist of quartz and feldspar with lesser amounts of dark-colored minerals consisting of biotite and hornblende.

The surface exposures are generally weathered to material consisting of granular to clay-sized particles. Weathering is most pronounced along joint planes. Some jointing is horizontal and therefore there is a layering of fresh rock and weathered water bearing material. The clay size particles are the weathering product of the feldspars. These fine particles fill the voids between the coarser fragments which reduces the permeability of the weathered rock.

Water Bearing Properties

Aquifers within the Granitic Intrusive yield more water to wells than aquifers in all other geologic units. Of the more than 8,500 wells within Josephine County, it is estimated that 50 percent of the total number are producing from the granitic rocks. Up to 200 gallons per minute has been reported though the average yield is less than 20 gallons per minute for all wells. Water quality is generally good although a high iron content is a common local problem.

Ground water production is generally from zones of weathering and fractures within the rock. Wells producing from shallow perched aquifers having limited quantities of water are less reliable than wells drilled to deeper aquifers.

SANDSTONE - CRETACEOUS PERIOD

Areal Extent

The sandstone is limited to a small area south of Cave Junction in Township 40 South, Range 8 West and within the West Fork drainage of the Illinois River. The outcrop is approximately 5 miles in length and 1½ miles in width.

Physical Characteristics

The formation consists of a basal conglomerate overlain by an arkosic sandstone. Though limited in areal extent, it is estimated that the formation is 5,000 feet thick. The term Horsetown Formation was formally used for this sequence of rocks.

Water Bearing Properties

The capability of this unit to yield water to wells is not known.

ALLUVIUM - QUATERNARY PERIOD

Areal Extent

Extensive deposits of alluvium sediments eroded from pre-existing rocks form the surface in the major river valleys (Rogue,

Applegate & Illinois) and the larger tributary streams. No attempt has been made to separate the various alluvial deposits on the basis of age, origin, or topographic position.

Physical Characteristics

The valleys of the major streams are underlain by deposits of clay, silt, sand, gravel and boulders. These deposits are estimated to be up to 150 feet thick locally. Some of the older alluvial deposits are cemented with minerals such as iron oxide and carbonates. The permeability of the coarse sands and gravels is often low due to the interstitial filling of finer-grained material.

Water Bearing Properties

The occurrence and availability of ground water in the alluvial deposits is little understood except in a few local areas. The alluvium is an important source of ground water in the vicinity of Grants Pass and Cave Junction, and the Cave Junction water system is supplies from ground water.

Wells with the capability of yielding up to 450 gpm have been reported. In areas where the gravels are cemented, the availability of ground water is generally limited to quantities sufficient for limited domestic use.

Many of the gravel outcrops are located on terraces and slopes above the regional water table and are therefore not a reliable source for even small domestic supplies.

RECOMMENDATIONS

Decisions concerning ground water resources requires a data base which is kept current with selective data acquisition and analysis. The following list of studies should be considered to insure an adequate data base:

1. Local Area Studies

Within the past year, most ground water studies have been limited to areas adjacent to Grants Pass. Within the Harbeck-Fruitdale area, it has been determined that under present conditions, additional wells can be drilled before a proposed limit of one well per acre is reached. Within the Redwood District, the ground water potential was reported to be superior to the potential within the Harbeck-Fruitdale area. However, there is not sufficient ground water within either area to supply a community water supply distribution and and storage system to meet the proposed zoning density of the Comprehensive Plan.

Additional local studies should be conducted at Merlin, Cave Junction, and Murphy. As ground water will continue to be the source of potable water in these communities, the adequacy of the supplies should be investigated.

2. Observation Well Program

In order to collect data pertinent to future water use decisions,

it is suggested that the observation well program be reviewed as to location and number of existing wells used for this purpose. Ideally, observation wells should be used solely for that purpose. Unless accurate records are kept as to periods of pumping, it is difficult to separate the effects of ground water withdrawal from other factors which cause water level fluctuations. Automatic recordings which measure water level changes in reference to clock time yield the best results. It is our understanding that the U.S. Geological Survey may supply one or two automatic recorders for use within Josephine County.

3. Aquifer Testing Program

The yield and drawdown of well over a measured period of time is determined by a test program which is commonly termed a pumping test. The testing of a well has two objectives - one is to obtain data as to the performance and efficiency of the well in order to properly select the pumping equipment and the second is to determine the aquifer performance and its ability to supply a reliable quantity of water over an extended period of time. Aquifer tests of community wells should be required, especially in new subdivisions, prior to approval of the final plat.

4. Graphic Display of Ground Water Data

Josephine County is one of two counties within the State having computer facilities for the storage and display of well data. In

RELATIONSHIP BETWEEN SURFACE AND GROUND WATER

Groundwater is effluent to streams nearly everywhere in the region throughout the year. (In a few broader reaches in some of the larger valleys, groundwater may temporarily be prevented from entering the stream during flood stages.) Groundwater effluent makes up more than 80 percent of the average flow of streams draining the younger volcanic rocks as indicated by records of streamflow in the Rogue River. No stream drains an area underlain exclusively or even mostly by the alluvial deposits so the relation of groundwater to surface water could not be determined. For all other aquifer units, the goundwater component is between 15 and 30 percent of the average annual discharge of the streams draining them. However, the groundwater component at any particular instant ranges from a few percent during flood flows to 100 percent during some periods of dry weather.

The rate of decrease in groundwater discharge during periods of no recharge is least in the younger volcanic rocks. During a 120-day recession, groundwater discharge declines to about 30 to 35 percent of the discharge at the beginning of the period, where the beginning rate is near the maximum. In contrast, the rates of decrease in groundwater discharge in other aquifer units is much greater. Usually during a 120-day recession, from near the maximum rate, groundwater discharge declines to 10 to 20 percent of the discharge at the beginning of the period. (Pacific N.W. Regional Comprehensive Framework Plan, page 869.)

QUANTITY AND QUANTITY

While groundwater in Josephine County will remain the primary source for rural domestic use, the groundwater supplies will not support urbanizing areas or large amounts of agricultural irrigation. In addition, the interrelated nature of groundwater, unlined irrigation ditches, flood irrigation and sanitary sewers must be taken into account. As mentioned earlier, unlined irrigation ditches, such as those of the Grants Pass Irrigation District (GPID), contribute seepage to shallow wells nearby during the summer months when the ditches are full. Within the Grants Pass Irrigation

District, water losses from canals are in the order 7% to 8% of the total flow (Hughes Report, 1979). Withdrawal of water from such ditches, for whatever reason, would most certainly negatively impact a great number of domestic wells in the area served by GPID.

Flood irrigation, moreso than sprinkler-type irrigation, is also responsible for contributing to recharge in areas of larger farm tracts.

Sanitary Sewers may adversely affect shallow wells as they act as conduits for runoff that may have otherwise become groundwater.

Thus, groundwater must be considered in light of the rate and type of development dependent upon it, as well as in terms of the "artificial" effects of irrigation, septic tank effluent, and sanitary sewer lines. It is clear that groundwater limitations in Josephine County pose a serious concern relative to continued growth, requiring planning for the most efficient use of available supplies, along with foresight in obtaining future water supplies.

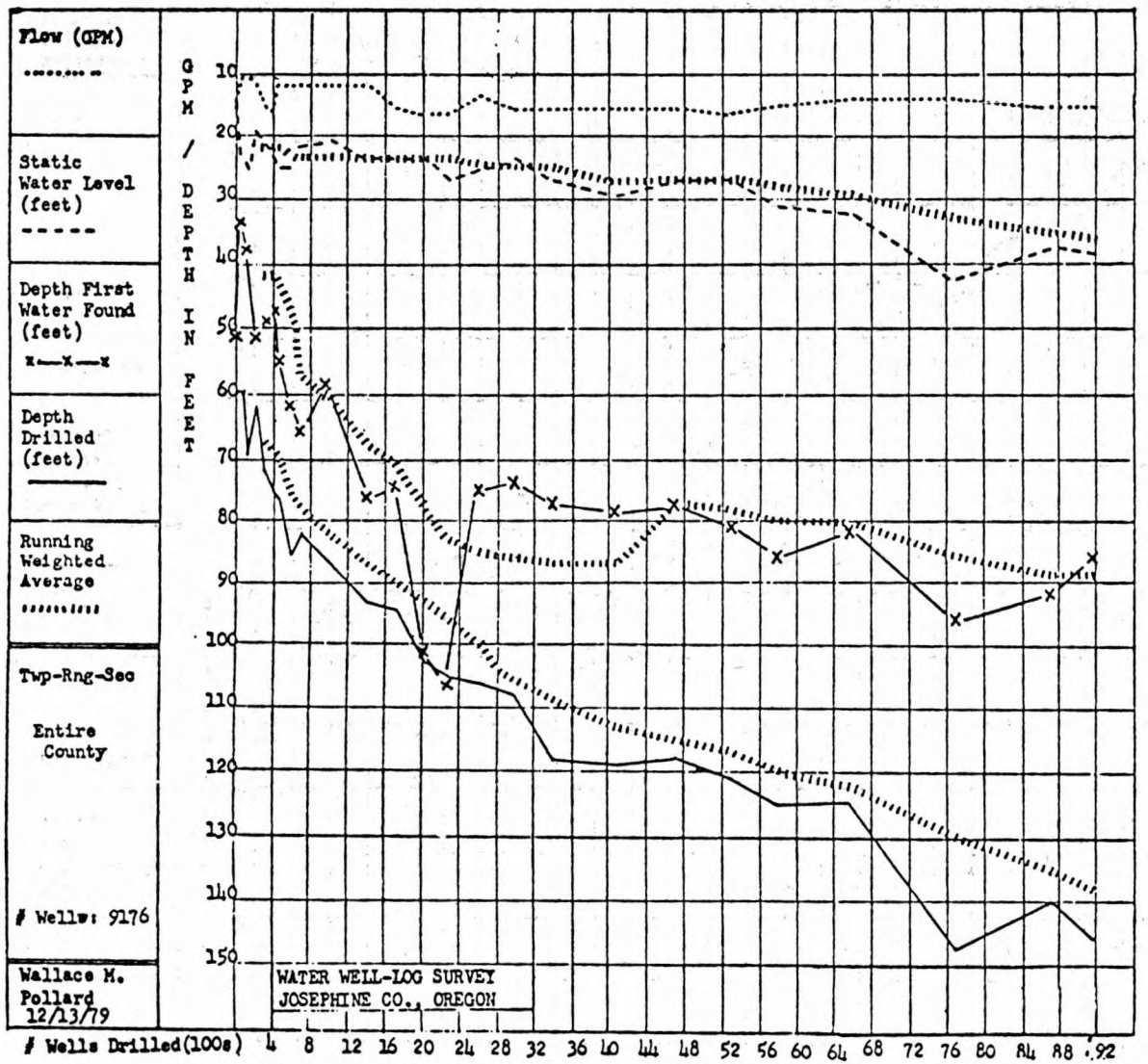
Water level fluctuations have been monitored in the County for about 16 years through observation wells and indicate no regional depletion of the watertable. However, the large number of wells being constructed in the granitic areas south of Grants Pass (Fruitdale-Harbeck, Cloverlawn areas) has led to a concern for overdevelopment of the available local groundwater supply. Local depletion of shallow well supplies and intrusion of salt water have recently been experienced in the area. (One square mile in this area had 129 wells drilled from 1965 through 1977, with other nearby areas averaging 90 wells each.)

Additional observation wells are being constructed in the area to monitor water level, but it will take several years of observation before accurate assessment can be made of the groundwater depletion. Dr. Paul W. Hughes has been engaged to study the water situation in the Fruitdale-Harbeck and Redwood areas. His preliminary conclusions are that well densities at this time should not exceed one well per acre in the Fruitdale-Harbeck area and two to three wells per acre in the Redwood area. These statistics would indicate a need for a public water system (see chapter on Urban Growth Boundary).

The Josephine County Watermaster's Office has about 9,000 wells on record. Records compiled from 1955 through early 1979 show an overall increase in the number of wells drilled, average depth, depth to first

water, and depth of static water level. (See Table W-23.) The following graphs (Graphs W-24 and W-25) present a visual display of these changes. (Statistics and graphs for specific areas are detailed in an unpublished paper by Wallace Pollard.)

There are several differing explanations for these decreases, possibly indicating that a detailed, County-wide study may be necessary.



GRAPH W-25

WATER WELL LOGS BY THE NUMBER OF WELLS DRILLED

WATER RIGHTS

The Water Resource Director controls water rights appropriations in Oregon for both surface and groundwater. Water rights may be acquired for ten beneficial uses as recognized by the State of Oregon. These are: domestic, municipal, irrigation, power, industrial, mining, recreational, fish life, and pollution abatement. A distinction is made between consumptive uses and non-consumptive uses: domestic, municipal, irrigation and industrial uses being classified as consumptive, the other uses as non-consumptive.

Initial use of water is granted by a permit, which is not an actual water right. A water right is established by actual use (as designated by permit), and by issuance of a water rights certificate. This water right is termed "perfected", and remains valid as long as beneficial use of the appropriated water is continued without a lapse of five or more consecutive years of non-use.

GROUNDWATER

A permit is not necessary if groundwater is to be used for 1) stock watering, 2) irrigation of one-half acre or less (non-commercial), 3) single or group domestic use not exceeding 15,000 gpd (gallons per day), and 4) single industrial or commercial purposes not exceeding 5,000 gpd. Some of the wells on record in the County do have substantial irrigation rights.

SURFACE WATER

Approximately 95% of surface water rights in Josephine County are appropriated for agricultural use. The largest single agricultural user is the Grants Pass Irrigation District (GPID), which currently holds permits for diversion of up to 9,694 cfs (cubic feet per second) from the Rogue River (and ten smaller streams in the area) for irrigation purposes. In addition, the GPID is alloted up to 800 cfs for power generation (pumping) and operation of fish ladders (non-consumptive uses).

On the following page is a table of the existing water rights in Josephine County.

TABLE 26

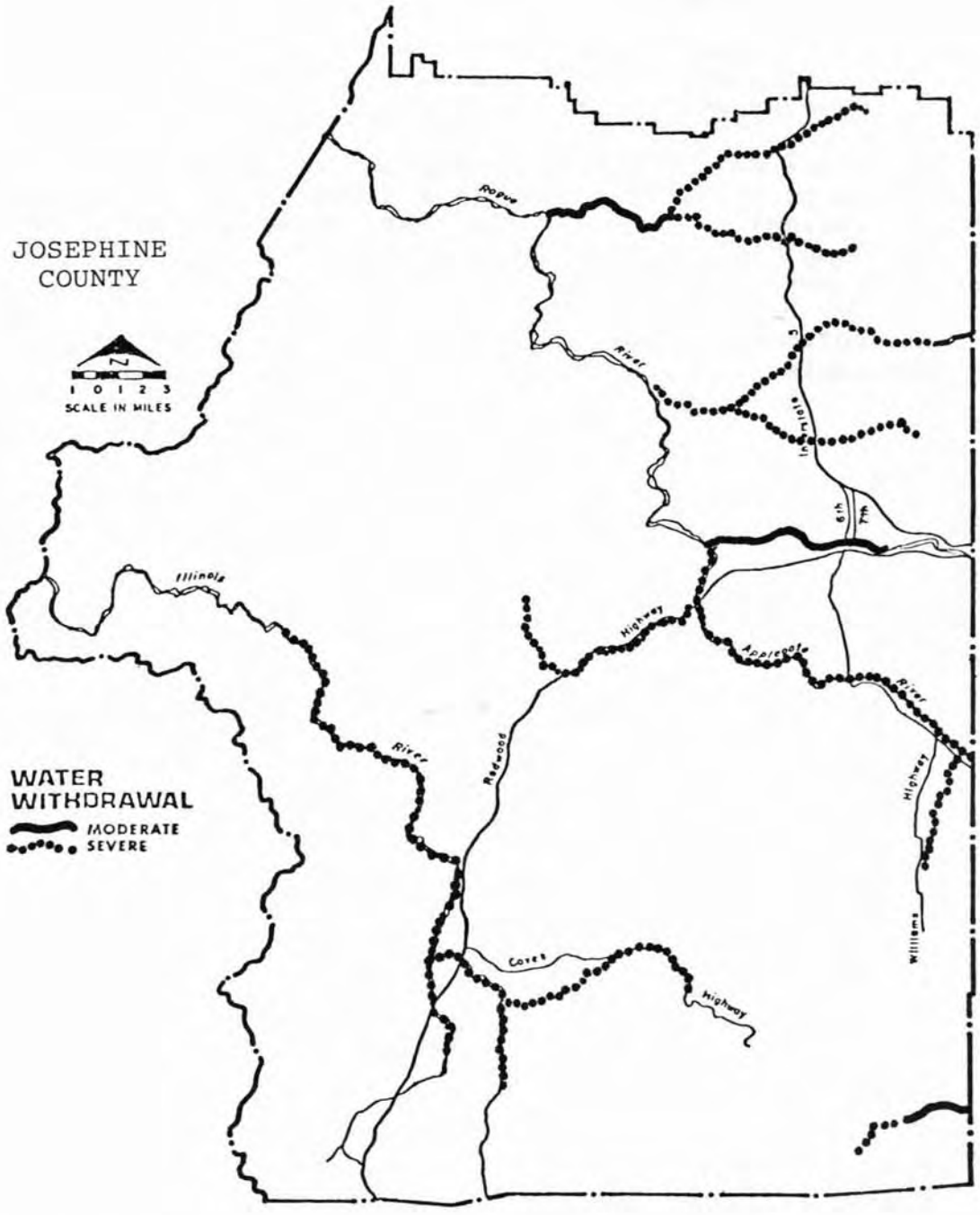
WATER RIGHTS OF RECORD ---- JUNE, 1980

STREAMS:	CFS (rounded)
Applegate River & minor tributaries	79
Williams Creek & tributaries	63
Slate Creek & tributaries	9
TOTAL APPLEGATE RIVER AND TRIBUTARIES.....	151 cfs
Illinois River & minor tributaries	114
Sucker & Althouse Creeks	73
Deer Creek & tributaries	26
TOTAL ILLINOIS RIVER AND TRIBUTARIES.....	213 cfs
Jump Off Joe Creek & tributaries.....	23 cfs
Wolf Creek	28
Grave Creek	15
Other tributaries to Grave Creek	35
TOTAL GRAVE CREEK AND TRIBUTARIES.....	78 cfs
Rogue River	336 cfs
(no figures on other tributaries to Rogue)	

****
These are rounded numbers, not exact.
****

SOURCE: Josephine County Watermaster, 1980

MAP W-27



SOURCE: Department of Environmental Quality.

The City of Grants Pass holds water rights to 37 cfs from the Rogue River, and the City of Cave Junction has rights to approximately 1 cfs from the Illinois River (Stevens, Thompson and Runyan, 1972).

Resulting from a petition by area residents in 1934, application for permits and water rights to Sucker and Althouse Creeks and their tributaries are not accepted.

The Water Policy Review Board is considering the increase of recommmended minimum flows in both forks of the Illinois, Deer Creek, Sucker Creek, Williams Creek, and Jump Off Joe Creek, and potentially the Rogue River, which may affect water rights in those areas.

The following table identifies agencies responsible for administration of various waterway alterations.

TABLE 28

Waterway Development Control Matrix/1

		CHANNEL AND BANK ALTERATIONS						WATERWAY STRUCTURES				CONSUMPTIVE USES			Misc.
		✻ Channel Maintenance	✻ Channel Alignment	Erosion Control	Filling	Underwater Blasting	✻ Dredging	Bridges and Causeways	Sewer Outfalls	Submerged Cable and Pipelines	Boathouses	Water Withdrawal	Permanent Occupancy of Water Surface	Aggregate Mining	Effluent (Discharge)
* LAKE		1C	1C	1C	1C		1C	1C	1C	1C					
				9B	9A 9F	7B 4A	9A	9A 9D	9A 9D 6B 6D	2A 9A 9D	3A 3B 9F	8A	9F	9A 9C	6C 6A- 6B 6D 6E
RIVER		1C	1C	1C	1C		1C	1C	1C	1C					
	(Nonnavigable)	9A	9A	9B	9A	7B 4A	9A	9A	9A 6B 6D	2A 9A		8A	9F	9A	6C 6A 6B 6D 6E

✻ Matrix Presumes Removal and Disposal Occurs in the Same Waterway

* Lakes determined to be federally navigable have the same controls as navigable rivers.

/1 See following key.

SOURCE: Oregon Department of Economic Development.

Waterway Control Key

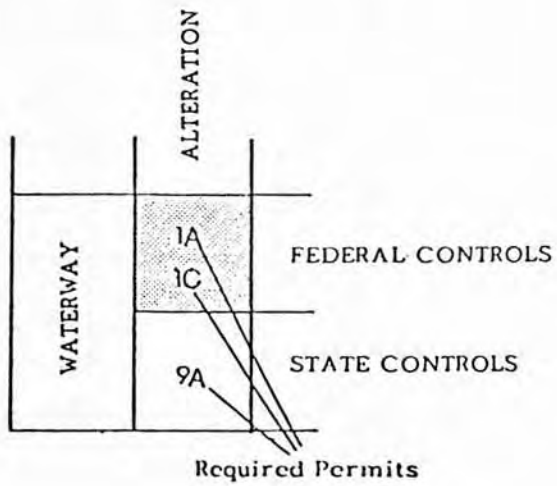
STATE:

1. DEPARTMENT OF TRANSPORTATION
   - A. Permit - ocean shore development
   - B. Permit - place cable or conduit across ocean shore
2. PUBLIC UTILITIES COMMISSION
   - A. License - certificate of public convenience for power lines
3. DEPARTMENT OF COMMERCE: BUILDING CODES
   - A. Approval - building plans review
   - B. Approval - plan review for fire and life safety
4. DEPARTMENT OF COMMERCE: FIRE MARSHAL
   - A. License - certificate of possession for explosives
   - B. Permit - installation to distribute flammable liquids
5. WORKMAN'S COMPENSATION BOARD
   - A. License - certification of shore-based material handling devices
6. DEPARTMENT OF ENVIRONMENTAL QUALITY
   - A. Approval - evaluation of suitability for proposed sewage disposal
   - B. Approval - plans for sewage and industrial waste disposal systems
   - C. Permit - indirect source
   - D. Permit - NPDES discharge and state water discharge permit
   - E. Permit - special, short-term air, water or solid waste
7. DEPARTMENT OF FISH AND WILDLIFE
   - A. License - propagation of wildlife
   - B. Permit - place explosives and harmful materials in waters
   - C. Permit - salmon hatchery
   - D. Ownership - oyster plat lease
8. WATER RESOURCES DEPARTMENT
   - A. Permit - appropriate public water
9. DIVISION OF STATE LANDS
   - A. Permit - fill/removal, flood repair or erosion control
   - B. Permit - riprap
   - C. Ownership - royalty lease
   - D. Ownership - easement over submerged or submersible land for facilities necessary for water use
   - E. Ownership - kelp lease
   - F. Ownership - lease submerged and submersible lands

FEDERAL:

1. CORPS OF ENGINEERS
   - A. Permit - transportation of dredged material to dump in ocean (Section 103)
   - B. Permit - obstruction or alteration of navigable waters (Section 10)
   - C. Permit - discharge of dredge or fill material in nation's waters and associated wetlands (Section 404)
2. FEDERAL POWER COMMISSION
   - A. Permit - (Presidential) import or export natural gas
3. COAST GUARD
   - A. Permit - bridges, causeways and overhead pipe lines
4. ENVIRONMENTAL PROTECTION AGENCY

   Note: Environmental Protection Agency controls are administered by Oregon Department of Environmental Quality and shared with the Corps of Engineers



AIR RESOURCES

"Oregon's weather shares a common record-breaking habit with weather everywhere...The usual thing about the weather is that it is unusual in some place or another..."Normal" weather is mostly a mathematical fiction. Vagaries are normal." (Decker, 1960) This statement is particularly true for the Josephine County area.

During the winter months, southwest Oregon is affected by the Aleutian low pressure system which generates cyclic storms that buffer the Pacific Northwest area, bringing clouds and winter rains. This effect is slightly modified in southwest Oregon where inland high pressure areas create a semi-barrier to further eastern movement of storm fronts.

During the summer, the effect of a reversed high pressure existence in the North Pacific Ocean brings warm summer to land areas.

LOCAL CLIMATIC CONDITIONS

The climate of Josephine County is in a transition (as is vegetation and geology) between the Mediterranean climate to the south and the Marine Mesothermal climate to the north.

The Mediterranean climate is characterized by a very dry, warm (hot) summer alternating with a wet, mild winter.

This often places a severe stress upon plants and animals during the almost rainless summer. With the normal air movement at this latitude from the west, the ocean exerts a major influence on the County's climate.

The Marine-Mesothermal climate regime which brings cool, moist polar air masses to the area in the form of winter storms, is characterized by significant cloudiness

and precipitation. In late fall, winter, and early spring, major storms, spawned in the wide reaches of the Pacific, frequently move on to Oregon's coast. The air masses reaching Oregon's coastline have already been conditioned by several days travel across the Pacific Ocean. In that time their temperatures, at least in the lower levels, have become near that of the water over which they have been traveling and their moisture content is near the saturation point.

The influence of these storms is, however, considerably modified by the passage of the incoming marine air over the intervening mountain range, whose crest is mostly between 3,000 and 4,000 feet above sea level.

Josephine County is slightly south of the main storm paths. This, plus the buffer effects provided by the Coast Range, spares Grants Pass much of the storm violence that occurs farther north and in the more exposed coastal areas.

TEMPERATURE AND PRECIPITATION

Even though the main path is to the north, winter storms still exert a profound effect on the area's rainfall pattern. Grants Pass has a very definite winter season. Almost 75% of the average annual precipitation occurs during the five months of November through March in frequent long-duration, low-intensity storms less than 5% during the three summer months, June through August.

Most of the precipitation that occurs, even in the winter, is in the form of rain. Snowfall generally occurs above 2,500 feet with the lower elevations and valleys receiving only minor amounts of snow. In the 83 years records have been maintained for Josephine County, an average of about one year in five has had as much as ten inches in an entire winter. This usually occurs in falls of one to three inches and melts in a few hours. Freezing temperatures may be expected from mid-October through mid-May at Grants Pass and correlate with the development of the snow pack above 3,000 feet. Lowest temperatures usually do not fall below 16°F.

TABLE A-1

U. S. WEATHER BUREAU

CLIMATOLOGICAL SUMMARY - JOSEPHINE COUNTY (1889-1972)

Month	Temperature (°F)							Precipitation Totals (Inches)					Mean number of days					Month
	Means			Extremes							Snow, Ice Pellets		Precip. .10 inch or more	Temperatures				
														Max.		Min.		
	Daily maximum	Daily minimum	Monthly	Record highest		Record lowest		Mean	Greatest daily	Year	Maximum monthly	Greatest daily		90° and above	32° and below	32° and below	0° and below	
Jan.	46.3	32.2	39.3	71		0		6.59	3.33	1907	36.1	9.0	11	0	*	16	0	Jan.
Feb.	54.1	33.7	43.9	78		5		3.86	4.30	1956	34.0	8.0	7	0	*	13	0	Feb.
Mar.	60.1	34.7	47.4	86		15		3.09	2.64	1907	9.0	9.0	7	0	0	11	0	Mar.
Apr.	67.6	37.7	52.7	98		20		1.66	2.00	1937	0.9	0.9	5	*	0	6	0	Apr.
May	75.1	43.3	59.2	101		24		1.64	1.61	1942	T	T	5	3	0	1	0	May
June	81.8	48.6	65.2	108		30		0.83	1.78	1893	T	T	3	7	0	0	0	June
July	90.4	51.9	71.2	114		33		0.27	1.52	1947	0.0	0.0	1	18	0	0	0	July
Aug.	89.0	50.8	69.9	108		30		0.31	1.45	1907	0.0	0.0	1	16	0	0	0	Aug.
Sep.	83.6	45.6	64.6	105		24		0.69	2.05	1895	T	T	2	8	0	*	0	Sep.
Oct.	68.4	40.9	54.7	99		20		2.89	5.27	1950	T	T	6	*	0	3	0	Oct.
Nov.	53.5	37.1	45.3	76		12		4.67	3.55	1910	2.8	2.8	9	0	0	8	0	Nov.
Dec.	46.6	34.1	40.4	77		-1		5.90	4.07	1965	14.8	7.5	10	0	*	12	*	Dec.
Year	68.0	40.9	54.5	114	July 1928	-1	Dec. 1972	32.40	5.27	Oct. 1950	36.1	9.0	67	52	1	70	*	Year

T Trace, an amount too small to measure
* Less than one half.

Means: 1941 - 1970
Extremes: 1889 - 1972

Sunny days are abundant in the spring, summer, and fall months. Highest temperatures occur in July and August, often exceeding 90°F and occasionally reaching over 100°F for periods of two weeks.

As mentioned earlier, the word "variety" best describes the County's weather. The following map and table clearly demonstrate the climatic differences in various sections of the County. Whereas Grants Pass receives 30.2 inches average annual precipitation and experiences an average 90°F July temperature, Cave Junction receives 79.4 inches average annual precipitation and experiences average mid 80°F July temperatures.

TABLE A-2

MAP MEAN ANNUAL PRECIPITATION • IN INCHES
SOURCE: Pacific Northwest River Basins Commission, 1970

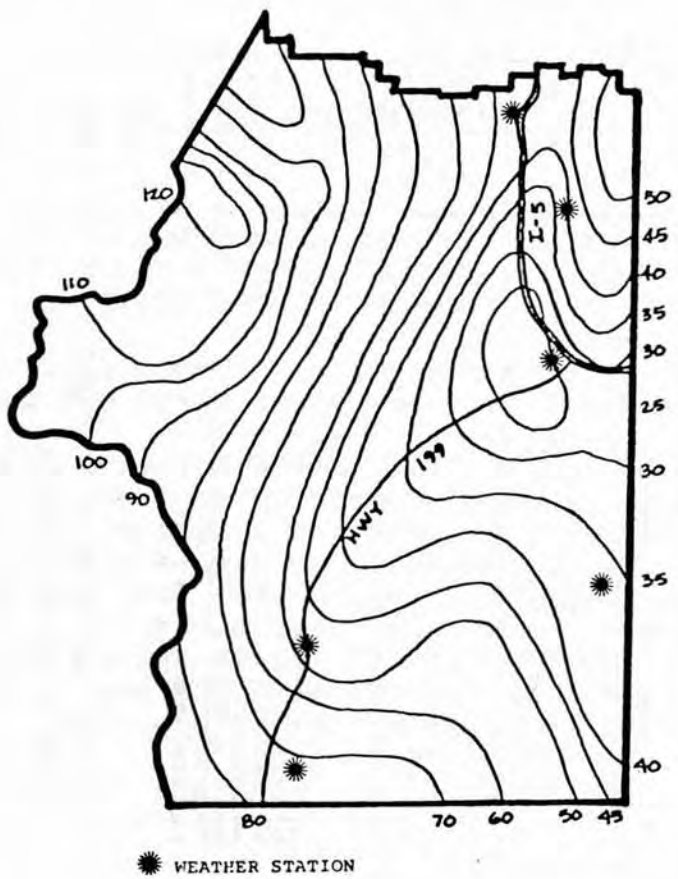


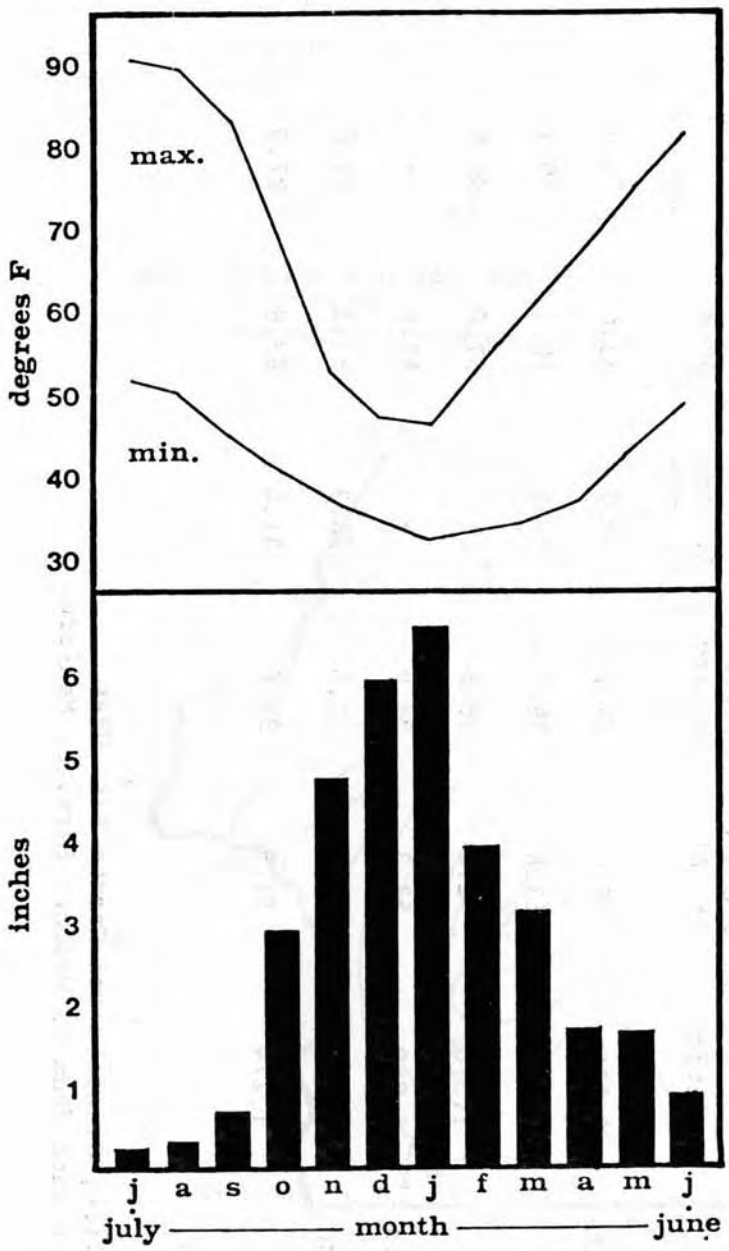
TABLE A-3

Temperatures and Precipitation for Selected Stations in Josephine County

Station	Elevation	Temperatures (°F)					Precipitation (in.)	
		Average Annual	Average January	Average January Minimum	Average July	Average July Maximum	Average Annual	June thru August
Sexton Summit	3,836	48.0	34.1	30.0	63.6	76.4	33.1	2.1
Grants Pass	925	53.8	39.0	31.5	70.2	90.1	30.2	1.2
Williams	1.370	52.0	38.6	29.7	67.0	86.6	32.3	0.3
Cave Junction	1,280	53.3	38.9	--	69.6	--	79.4	0.3
Waldo Station	1,650	50.6	36.6	28.3	67.3	88.0	52.1	1.2
Wolf Creek	1,274	52.9	38.6	31.4	67.8	87.5	40.9	1.5

Source: Galice, Glendale and Grants Pass URAs
File data from US Weather Service, Medford

TABLE A-4



AVERAGE DAILY TEMPERATURE

AVERAGE MONTHLY RAINFALL

SOURCE: U.S. Weather Bureau

These differences are in great part due to the differences in altitudes, aspect and wind patterns.

Each valley has a unique micro-climate in regard to temperature, precipitation, winds, and sunshine. In regard to slopes, north aspects have less sun and more rainfall; and south slopes are warmer and drier. In addition, west facing slopes are generally wetter than east facing slopes.

STORMS AND WINDS

Storms in the County are concentrated during the period from October to April. Severe storms have hit this area in irregular cycles, bringing high winds and floods.

Significant flooding has occurred in 1861, 1989, 1927, 1955, 1964, and 1974 (see Chapter on Water Resources). Flood stage has been reached in several other years.

Winds of very light intensity (0-5 mph) usually dominate during the summer.

Winds of 10 to 30 mph are commonly indicated by frontal systems during the winter months. Preceding severe winter storms, high winds in excess of 40 mph can blow constantly for twelve or more hours. Higher gusts sometimes occur during passage of the front. Moist unstable air may cause brief thundershowers and winds variable in direction and intensity. Periodic winter storms, accompanied by high winds, regularly break or uproot trees throughout the area. Occasionally, extremely high winds, 60+ mph, such as those created in the Columbus Day storm of 1962, strike the area.

GROWING SEASON

According to the State Climatologist, Grants Pass has an average growing season of 163 days (based on the average date of the last temperature of 32° in spring, and the first date of its occurrence in fall). Probabilities for last in spring and first in fall freeze occurrences (and 28° and 24° temperature occurrences) are presented in the following table:

TABLE A-5

STATISTICAL LIKELIHOOD (IN PERCENT) THAT VARIOUS TEMPERATURES WILL OCCUR IN SPRING AFTER DATES INDICATED

Tempt.	90%	80%	70%	60%	50%	40%	30%	20%	10%
24°*	3/29	3/18	3/9	3/2	2/23	2/15	2/7	1/27	-
28°*	4/26	4/18	4/12	4/7	4/2	3/29	3/24	3/18	3/10
32°*	5/22	5/16	5/11	5/7	5/3	4/29	4/25	4/20	4/13

STATISTICAL LIKELIHOOD (IN PERCENT) THAT VARIOUS TEMPERATURES WILL OCCUR IN FALL BEFORE DATES INDICATED

Tempt.	10%	20%	30%	40%	50%	60%	70%	80%	90%
32°**	9/26	10/3	10/9	10/13	10/18	10/22	10/26	11/1	11/8
28°**	10/17	10/24	10/31	11/5	11/10	11/16	11/20	11/27	12/3
24°**	11/1	11/8	11/15	11/20	11/26	12/1	12/8	12/23	-

SOURCE: U.S. Weather Bureau

The City Chamber of Commerce has developed the following table to demonstrate the County's weather in relation to other areas of the State. Although this area is often described as having a relatively long growing season, the table does point out that other areas in the state have longer growing seasons.

TABLE A-6

AVERAGE ANNUAL CLIMATE DATA FOR SELECTED OREGON CITIES

CITY	RAIN (INCHES)	TEMP (°F)	SNOW (INCHES)	GROWING SEASON (DAYS)
Brookings	80.98	53.5	.09	238
Corvallis	38.66	53.6	8.1	183
Eugene	40.55	53.1	5.8	205
Grants Pass	29.64	54.4	3.2	163
Klamath Falls	13.83	48.6	38.1	134
Medford	20.70	51.9	3.9	160
Portland	42.32	53.7	9.3	251
Roseburg	32.46	52.7	6.7	217
Salem	39.26	52.7	7.2	213

The growing season is, however, greatly affected by the amount of rainfall experienced in the area. Drought years, such as 1976, can bring as little as fifteen inches of rain, severely taxing growing ability in this area. (See chapter on Vegetative Resources: Agriculture.)

AIR POLLUTION

Note: The majority of the next thirteen pages has been extracted from Ballanti, Donald, and HKS Associates, "Grants Pass Air Shed Study", prepared for the City of Grants Pass, 1978.

POTENTIAL

The air pollution potential of an area is its relative ability to dilute and disperse pollutants, based on topography and climate (primarily atmospheric stability and winds).

Winds: Grants Pass is surrounded by mountains that generally shelter the County from wind and protect it from the strong seabreezes that affect the Oregon Coast. At night, drainage flows (cool air flowing down mountain canyons) generally prevail. During summer, winds are generally light and from the west, while in winter winds generally flow from the southeast. Overall winds in the Grants Pass area are generally light, with an annual average wind speed of 3.3 miles per hour.

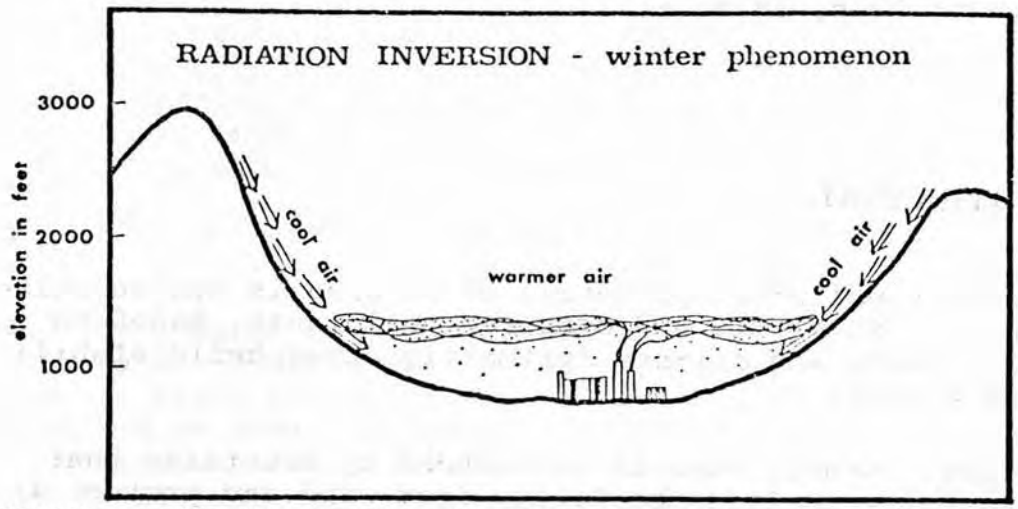
Atmospheric Stability: A stable atmosphere is one in which the variation of temperature with height acts to suppress vertical air motions. Under such conditions, vertical dilution of pollutants is reduced. Extremely stable conditions often occur as inversions, where temperature increases with height, rather than decreases, as is normal in the atmosphere. Inversions act as barriers to pollutants, and in mountainous areas form a "lid" under which pollutants are trapped.

In the Grants Pass area, there are two mechanisms which are responsible for the formation of inversions. During winter, temperatures near the ground decrease rapidly after sunset due to radiational cooling (loss of heat to the atmosphere). This cooling is enhanced in the nearby hills, and flows of cold air move downward along canyons into the valley. A "pool" of cold air forms in the valley, with warmer air above. This "radiation inversion" may have a depth of several thousand feet. Cooling within this layer is often sufficient to cause water vapor to condense, forming fog.

Winter radiation inversions usually begin to dissipate after sunrise as the fog burns off, the ground warms,

and breezes start to blow. However, during stagnant air conditions, the inversion and fog may remain for many successive days, as in December, 1976.

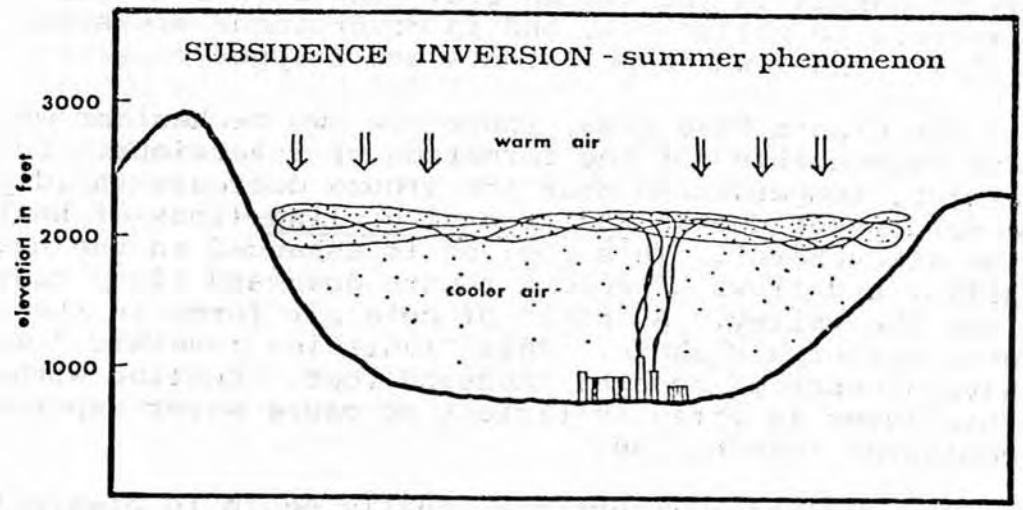
FIGURE A-7



SOURCE: Ballanti, Donald, Air Shed Study, 1978.

The second mechanism responsible for inversions in the Grants Pass area is summertime subsidence. Unlike winter inversions, these inversions occur several thousand feet above the ground. They are formed by subsiding air which is warmed by compression, and are associated with high pressure areas that periodically affect the area in summer. These inversions may last several days, and are associated with periods of stagnant air.

FIGURE A-8



Inversion occurrence information is not specifically available for the Grants Pass area, but it is available for the Medford area which has a similar climate and terrain. Percentages of inversions should be similar for these two areas, thereby indicating a high frequency of inversions.

TABLE A-9

FREQUENCY OF INVERSIONS OF MEDFORD, OREGON
At or Below 1000 Meters in Percentage

Month	Morning	Afternoon
Jan	38 %	22 %
Feb	40	11
Mar	35	4
Apr	33	1
May	37	1
June	39	*
July	42	1
Aug	42	*
Sept	43	1
Oct	45	*
Nov	38	18
Dec	38	24

*less than 0.5% of the time

Source: Ibid.

TOPOGRAPHY

Grants Pass is located in a relatively wide, circular valley almost completely surrounded by mountains with a few high and narrow gaps. This results in light winds, and also limits the horizontal dilution of air pollutants.

In a nationwide survey of air pollution potential, Southern Oregon, and particularly the Rogue River Valley, were singled out as having one of the highest potentials for pollution in the United States. By examining relationships between emissions density (amount of emitted pollutants, per unit area) to resulting concentrations, it was found that the potential for pollution was about four times greater in the Rogue River Valley than in Los Angeles, well-its severe air pollution problems.

In summary, the air pollution potential of the Grants Pass area is very high. Wind movement in the area

is low, (horizontal dilution) and inversions (that limit vertical dilution) combine to frequently limit the ability of the atmosphere to transport or dilute pollutants.

AIR QUALITY AUTHORITY AND STANDARDS

Under the Clean Air Act Amendments of 1970, Oregon has been divided into five Federal Air quality control Regions (AQCRs) on the basis of pollution concentrations, geography, and economics. Josephine County lies in the Southwest Oregon AQCR. In 1969, the Regional Air Authorities and the predecessor of the Oregon Department of Environmental Quality (ODEQ) established an Emmissions Inventory (EI) for the entire state. It contains information on the types and quantities of air contaminants emitted into the airshed (BLM, 1978). Table A-10 indicates that slash burning, wood processing, motor vehicle, and industrial combustion fuels are the greatest sources of pollutants in Josephine County.

TABLE A-10

SUMMARY OF ESTIMATED ANNUAL EMMISSIONS (TONS/YEAR) BY SOURCE CATEGORY --'SOUTHWEST OREGON INTRASTATE AIR QUALITY CONTROL REGION

TOTAL PARTICULATES

SOURCE CATEGORY	ENTIRE AQCR (TONS/YEAR)	JOSEPHINE CTY (TONS/YEAR)
A. FUEL COMBUSTION SOURCES:		
1. RESIDENTIAL FUEL COMBUSTION	116	13
2. COMMERCIAL FUEL COMBUSTION	164	19
3. INDUSTRIAL FUEL COMBUSTION	8,507	226
TOTAL FUEL COMBUSTION	8,789	258
B. PROCESS LOSS SOURCES:		
1. CHEMICAL INDUSTRIES	8	0
2. FOOD/AGRICULTURE INDUSTRIES	84	1
3. METALLURGICAL INDUSTRIES	927	0
4. MINERAL PRODUCTS INDUSTRIES	168	30
5. PETROCHEMICAL INDUSTRIES	0	0
6. WOOD PROCESSING INDUSTRIES	5,562	376
7. OTHER INDUSTRIES	0	0
TOTAL PROCESS LOSS	6,752	407
C. TRANSPORTATION SOURCES:		
1. MOTOR VEHICLES	1,877	279
2. OFF-HIGHWAY FUEL USE	121	8
TOTAL TRANSPORTATION	1,998	287
D. SOLID WASTE SOURCES:		
1. INCINERATION	11	0
2. OPEN BURNING	120	0
3. WIGWAM WASTE BURNERS	900	179
TOTAL SOLID WASTE	1,033	179
E. MISCELLANEOUS AREA SOURCES:		
1. FIELD BURNING	4	0
2. FOREST FIRES	2,375	109
3. SLASH BURNING	6,585	469
4. OTHER	305	21
TOTAL MISCELLANEOUS	9,269	599
SUMMARY BY SOURCE CLASS:		
1. AREA SOURCES	11,556	924
2. POINT SOURCES	16,286	813
3. TOTAL OF ALL SOURCES	27,842	1,737

SOURCE: ODEQ (1976) as printed in BLM, Timber Management Environmental Statement, 1978.

The Clear Air Act established air quality standards for several pollutants. These standards are divided into primary standards (designed to protect the public health) and secondary standards (intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance and other types of damage). Additionally, the State of Oregon has adopted its own standards which, where applicable, are identical to the most stringent federal secondary standards. The standards are durations for specific contaminant levels that are designed to avoid adverse effects with a margin of safety (Table A-11).

TABLE A-11

FEDERAL AND OREGON AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Standards Primary	Federal Standards Secondary	Oregon Standards
	Annual geometric mean	75 $\mu g/m^3$	60 $\mu g/m^3$	60 $\mu g/m^3$
Suspended Particulates	24 hours[2]	260 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
	Monthly[3]	--	--	100 $\mu g/m^3$
Carbon Monoxide	8-hour[2]	10 $\mu g/m^3$	10 $\mu g/m^3$	10 $\mu g/m^3$
	1-hour[2]	40 $\mu g/m^3$	40 $\mu g/m^3$	40 $\mu g/m^3$
Photo-chemical oxidants	1-hour[2]	160 $\mu g/m^3$	160 $\mu g/m^3$	160 $\mu g/m^3$
Nitrogen Dioxide	Annual average	100 $\mu g/m^3$	100 $\mu g/m^3$	100 $\mu g/m^3$
Non-methane hydro-carbons	3-hour[2] (6-9 a.m.)	160 $\mu g/m^3$	160 $\mu g/m^3$	160 $\mu g/m^3$

[1] Standards for lead and sulfur dioxide not shown

[2] not to be exceeded more than once per year

[3] 24-hour average not to be exceeded 15% of the time

$\mu g/m^3$ = micrograms per cubic meter

mg/m^3 = milligrams per cubic meter

SOURCE: Ballanti, Donald, Air Shed Study, 1978.

At this time, a review of the general categories for emitted pollutants could be helpful.

SUSPENDED PARTICULATES (TSP)

Suspended particulates are solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for long periods of time. A portion of the total particulate matter in the air is due to natural sources such as wind-blown dust and pollen. Man-made sources include

combustion, automobiles, field and slash burning, factories, and unpaved roads.

The effects of high particulate concentrations on humans include aggravation of chronic diseases and heart and lung disease symptons. Non-health effects include reduced visibility and soiling of surfaces.

NITROGEN DIOXIDE (NO_2)

Nitrogen dioxide is a reddish-brown toxic gas. It is one of the oxides of nitrogen (NOX) that result from combustion. It is the only oxide of nitrogen which is toxic; however, other oxides of nitrogen, particularly nitric oxide, are converted to nitrogen dioxide in the presence of sunshine. Major sources of oxides of nitrogen are automobiles and industrial emissions.

The health effects associated with this pollutant are an increase in chronic bronchitis and lung irritation.

CARBON MONOXIDE (CO)

Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels, and its main source is automobiles. Health effects are related to the affinity of carbon monoxide for hemoglobin in blood. At high concentrations carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

PHOTOCHEMICAL OXIDANTS (XO)

Photochemical oxidants are a variety of oxidizing substances formed in the atmosphere, the most prevalent of which is ozone, a colorless gas. Photochemical oxidants, often referred to as "smog" and most often associated with Los Angeles, are found in virtually every major urban area in the United States.

Photochemical oxidant is a result of a number of complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Photochemical reactions, however, result in the formation of gases (other than ozone), particulates and free radicals. Unlike other pollutants, photochemical oxidants are not emitted directly into the atmosphere from any sources. The major sources of oxides of nitrogen and hydrocarbons, known as oxidant precursors, are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.

The health effects of photochemical oxidants are eye irritation and damage to lung tissues. Photochemical oxidants also damage various materials (such as rubber) and numerous plants (ornamental, agricultural and timber).

HYDROCARBONS

Hydrocarbons are a large family of compounds consisting of hydrogen and carbon. Sources include autos, evaporation of fuel and solvents, industry and combustion.

There are no health effects associated with hydrocarbons; however, certain types of hydrocarbons readily participate in the formation of photochemical oxidants which affect both humans and vegetation. The standard for hydrocarbons specifies a three-hour period from 6:00 to 9:00 a.m. This reflects the importance of morning hydrocarbon concentrations in determining afternoon photochemical oxidant concentrations.

JOSEPHINE COUNTY INVENTORY

The following table delineates the air pollution source categories considered by the "Grants Pass Airshed Study" along with an explanation of the source and types of emission. Sources not shown include wind blown dust, pollen, forest fires, slash burning, construction sites, and vegetative hydrocarbon release.

CHART A-12

AIR POLLUTION SOURCE

Source	Pollutants Emitted TSP	NOX	HC	Comments
1. Paved Road Dust[1]	x			Dust raised by vehicles on paved roads
2. Unpaved Road Dust[1]	x			Dust raised by vehicles on unpaved roads
3. Motor vehicle exhaust[2]	x	x	x	
4. Residential heating, oil	x	x	x	Combustion of oil for heating
5. Residential heating, gas	x	x	x	Combustion of gas for heating
6. Commercial/industrial space heating, oil	x	x	x	Combustion of oil for heating and industrial processes
7. Commercial/industrial space heating, gas	x	x	x	Combustion of gas for heating and industrial processes
8. Open burning and on-site incineration	x	x	x	Refuse combustion
9. Residential heating, wood[1]	x			Combustion of wood for heating
10. Orchard Pruning	x			Burning of pruning refuse
11. Railroads	x	x	x	Exhaust from trains
12. Agricultural Tilling	x			Dust from tilling
13. Off Highway Vehicles	x	x	x	Exhaust from agricultural and commercial vehicles not used on roads
14. Fugitive Dust Sources[1]	x			Dust from unpaved lots, aggregate storage
15. Point Sources	x	x	x	Factories, mills, smokestacks
16. Gasoline Marketing			x	Evaporation of gasoline during storage and transfer
17. Dry Cleaning			x	Release of dry cleaning solvents into the air
18. Surface Coatings			x	Evaporation of solvents in paints

[1]These sources are not included in the DEQ emissions inventory and were estimated independently.

[2]This source was recalculated for the study area using a more sophisticated methodology.

SOURCE: Ibid.

JOSEPHINE COUNTY PROJECTED POLLUTION EMISSIONS

Several assumptions concerning basic lifestyles are implicit in the Airshed Study. They are, specifically:

1. The automobile will continue to be the major mode of transportation in the future.

2. The schedule for Federal control of auto emissions will proceed as now planned.

3. No new major mass transit facilities will be built.

4. Gasoline supply will not be a limiting factor, and no new major technological advances in automobile fuels or engines are anticipated.

5. Housing types, driving habits and lifestyles will be similar in the next twenty years to what they are nc

6. No new major heavy industrial growth will occur in the Grants Pass Airshed, and that any new industry would be clean.

7. Road maintenance and paving program will continue as scheduled.

It is recognized that economic conditions, and fuel costs and supply, may change in the future, so that reality may deviate from these assumptions. It is more reasonable to assume a continuation of current trends rather than to speculate upon future technological breakthrough or economic changes. The air quality forecasts based on these assumptions represent a picture of where the area is now headed.

Future year inventories were, therefore, obtained by multiplying 1976 emissions by a growth factor, using four future growth assumptions as defined in the population chapter.

SUSPENDED PARTICULATES

TABLE A-13

Summary of Total Suspended Particulates for Grants Pass*

Year	Number of Samples	Number of Samples Exceeding: 150 µg/m³ (secondary value)	260 µg/m³ (primary value)	Annual Geometric Mean in µg/m³
1970	103	4	0	58.0
1971	87	3	0	59.1
1972	75	1	0	61.3
1973	41	0	0	53.8
1974	46	0	0	49.6
1975	47	2	0	56.8
1976	42	7	2	80.8
1977	67	4	0	64.0

*Oregon Department of Environmental Quality, Oregon Air Quality Report 1976.

SOURCE: Ibid.

The Grants Pass area currently does not exceed the federal primary standard for particulates. During an adverse weather year, however, the secondary standard is exceeded. Future particulate air quality appears to depend on whether or not unpaved road dust, the largest single source in the emissions inventory, is controlled. If unpaved road dust is not controlled, future air quality will degrade for all population growth assumptions, and violations of the secondary standard (related to visibility, rather than health effects) will continue for adverse weather years through the year 2000.

If unpaved road dust is controlled, improvement in particulate air quality will occur for all growth assumptions. For adverse weather years, violation of the secondary standard would continue through about the year 1995.

TABLE A-14

PARTICULATE INVENTORIES BY SOURCE CATEGORY, TONS/YEAR (G.P. area)

	Point Sources	Unpaved Road Dust	Paved Road Dust	Motor Vehicles	Open Burning	Res. Heating Wood	Other	Total
1970	3197	2425	502	116	80	36	116	6472
1976	727	3291	719	174	109	229	110	5359
1980 Low Growth	709	3078	826	178	125	286	108	5310
1980 Midrange Growth	709	3105	833	180	126	288	108	5349
1980 High Growth	709	3159	847	183	128	295	108	5430
1980 Worst Case	727	3187	855	185	130	314	109	5505
1990 Low Growth	664	1941	1085	201	148	339	116	4494
1990 Midrange Growth	664	2010	1125	209	153	350	116	4627
1990 High Growth	664	2040	1197	222	163	373	116	4775
1990 Worse Case	727	3817	1284	238	175	426	123	6791
2000 Low Growth	619	142	1250	232	161	369	123	2893
2000 Midrange Growth	619	142	1342	249	173	396	122	3043
2000 High Growth	619	142	1528	283	197	451	122	3342
2000 Worse Case	727	3817	1722	319	222	538	146	7496

SOURCE: Ibid.

OXIDES OF NITROGEN

Three sources - motor vehicles, point sources, and commercial/industrial space heating and fuel combustion - dominate the inventories, comprising about 95 percent of the total. Motor vehicles are and will continue to be the greatest single source of this pollutant in the future.

TABLE A-15

Oxides Of Nitrogen Emmissions Inventories, Tons/Year

	Motor Vehicles	Point Sources	Comm./Ind. Heating,Gas	Rail-roads	Open Burning	Other	Total
1976	1725	623	56	48	41	67	2560
1980 Low Growth	1817	608	61	48	47	70	2651
1980 Midrange Growth	1833	608	61	48	47	70	2668
1980 High Growth	1865	608	61	48	48	71	2700
1980 Worst Case	1881	623	62	48	49	73	2736
1990 Low Growth	1616	569	72	48	56	86	2446
1990 Midrange Growth	1675	569	72	48	58	85	2508
1990 High Growth	1782	569	72	48	61	86	2619
1990 Worst Growth	1913	623	81	48	66	98	2830
2000 Low Growth	1432	530	77	48	60	106	2255
2000 Midrange Growth	1539	530	77	48	65	107	2367
2000 High Growth	1752	530	77	48	74	108	2590
2000 Worst Case	1974	623	98	48	83	140	2975

SOURCE: Ibid.

HYDROCARBONS

The majority of these emissions come from four sources: motor vehicles, point sources, gasoline marketing and open burning.

Open burning and gasoline marketing are related to population and are not subject to future emission controls. It is estimated they will increase steadily between 1976 and 2000. Point sources are related to the timber industry, and their importance diminishes as the timber yield in the area declines. Motor vehicle exhaust emissions are expected to increase between the years of 1976 and 1980 as the increase in VMT (vehicle miles traveled) regionally outstrips the reduction in per-mile emissions brought about by emission controls.

By the year 1990 projected emissions for all assumed growth rates drop below 1976 levels.

TABLE A-16

HYDROCARBON EMISSION INVENTORIES, TONS/YEAR

	Motor Vehicles	Point Sources	Open Burning	Gas Marketing	Surface Coatings	Dry Cleaning	Other	Total
1976	1446	206	204	200	50	42	26	2174
1980 Low Growth	1569	200	235	230	57	48	29	2368
1980 Midrange Growth	1583	200	237	323	58	48	29	2387
1980 High Growth	1610	200	241	236	59	49	30	2424
1980 Worst Case	1624	206	243	238	59	50	29	2448
1990 Low Growth	826	188	277	272	68	57	32	1719
1990 Midrange Growth	856	188	288	282	70	59	32	1781
1990 High Growth	911	188	306	300	75	62	32	1874
1990 Worst Case	978	206	322	322	80	67	33	2014
2000 Low Growth	718	175	302	296	74	62	34	1656
2000 Midrange Growth	771	175	325	318	79	66	34	1769
2000 High Growth	878	175	369	362	90	75	34	1984
2000 Worst Case	989	206	416	408	101	85	37	2243

SOURCE: Ibid.

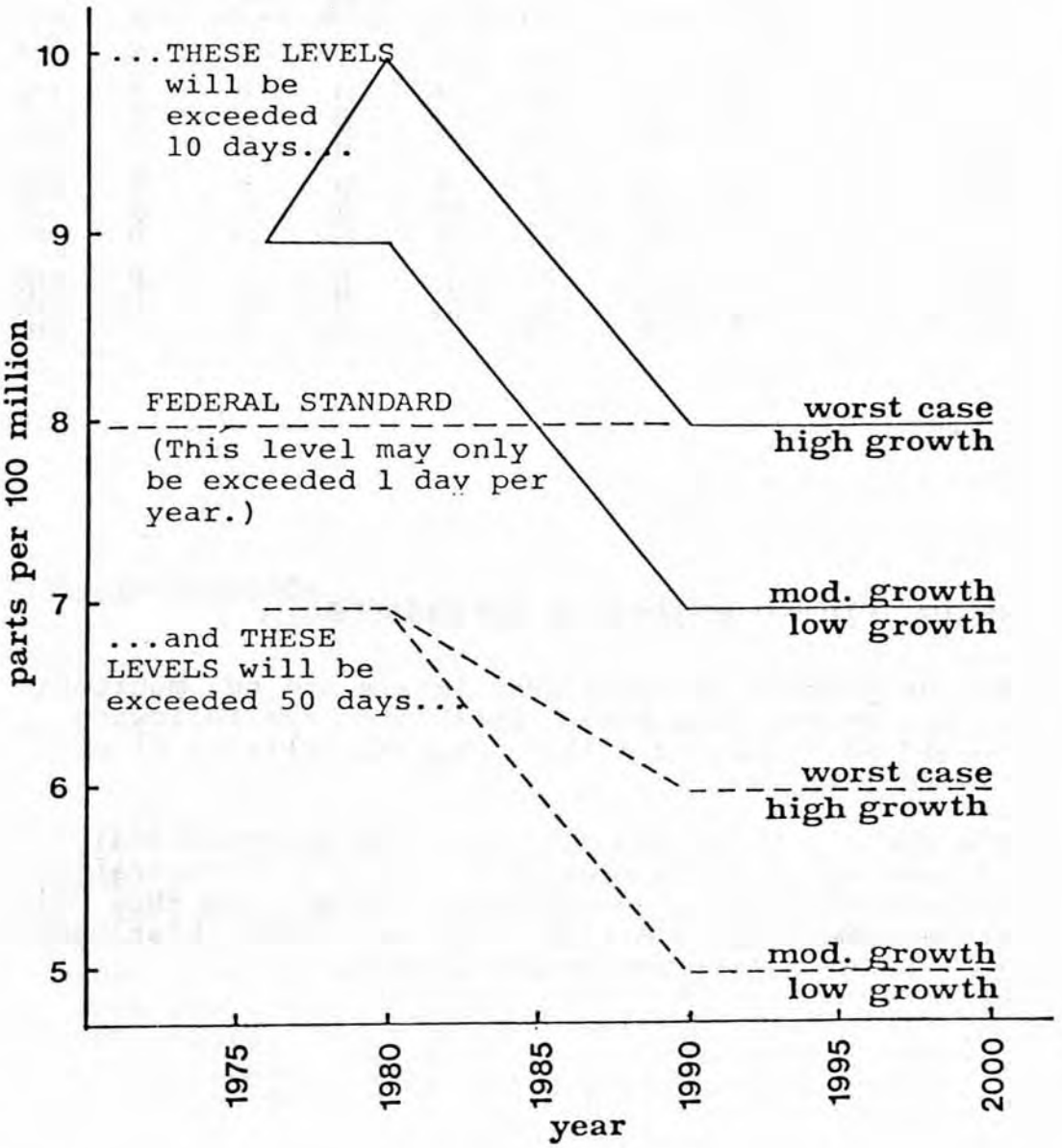
SMOG: PHOTO CHEMICAL OXIDANTS

At the present time, oxidant levels are not monitored in the Grants Pass area. Therefore, the following should be viewed as a first (rough) estimate of predicted levels.

The prediction methodology used for photochemical oxidant is based on predicting morning concentrations of oxides of nitrogen and hydrocarbons, and then using a semi-empirical (observation/experience) relationship to predict afternoon oxidant levels.

GRAPH A-17

GRANTS PASS AIRSHED PREDICTED OXIDANT LEVELS (SMOG)



Graph A-17, a simple photochemical oxidant model, suggests that the federal standard for oxidant is currently exceeded in the Grants Pass area with 10% of summer days in 1976 exceeding federal standards. It is estimated this will continue to be violated through the year 2000, even though some improvement will occur. Under worse case and high growth assumptions, concentrations will increase from 1976 to sometime beyond 1980, then will decrease until the year 1990 due to increased effectiveness of auto

exhaust controls and improved oxidant air quality. Levels will remain static through the year 2000.

Under low and mid-range growth assumptions, oxidant air quality in the year 1980 will be similar to that of the year 1976, will improve between the year of 1980 and 1990, and then remain static at a level below that for the worst case assumption.

When natural sources of hydrocarbons are considered, it is apparent that the model may underpredict oxidant levels. This natural source is difficult to ascertain because the process by which these emissions occur is poorly understood at this time.

The importance of a natural source of hydrocarbons, vegetation, is only now being examined. Vegetation emissions were not included in the emissions inventory because the rate of emission is dependent on sunlight, temperature, soil moisture and other factors which cannot be accurately specified, and becuase of difficulty in obtaining the leaf biomass within the study area. Nevertheless, natural hydrocarbon levels have been measured within Pacific Northwest forest areas, and have been found to range between 10 and 40 parts per hundred million. If it is assumed that natural levels of hydrocarbons are similar in Grants Pass, this natural background level could increase the predicted oxidant levels in Graph A-17 by between one and three parts per hundred million.

ENFORCEMENT OF AIR QUALITY STANDARDS

The State of Oregon's Department of Environmental Quality (DEQ) was created in 1969 and is charged with statewide responsibility of control for air quality and other environmental areas such as water quality, noise pollution, and solid waste disposal.

The Department, since 1971, has controlled stationary sources through a permitting process. The Department enforces emissions limitations through this process, and requires polluters to keep records on the amount of pollution emitted.

In addition, Department activities include control of open burning, motor vehicle inspections, enforcement of

performance standards for new sources, review of new indirect sources and planning for air pollution emergencies.

Much of the effort in recent years has been focused on Air Quality Maintenance Areas (AQMA's). These are areas where the air quality standards are not currently met and are not expected to be met in the future. The Medford-Ashland area has been designated an AQMA, requiring that a long-term comprehensive strategy for meeting and maintaining air quality standards (known as the Air Quality Maintenance Plan) be developed and implemented.

Grants Pass has not been designated as an Air Quality Maintenance Area. This is not based on actual air quality monitoring except for total suspended particulates, but is based on the assumption that other pollutants are not present in sufficient quantity. Prior to late 1976, this assumption was also thought to be true of the Medford-Ashland area, until air quality monitoring showed frequent violations of the standards for oxidant and carbon monoxide, as well as the standards for suspended particulates.

The Board of County Commissioners is presently reviewing monitoring of air quality within the County. Litton Industries, the Josephine County Environmental Health Department and the Department of Environmental Quality are involved in minor monitoring of air quality within the County. Three air quality measurements are taken for this area: ozone during the summer, carbon monoxide during the winter, and particulate is measured year round.

Creation of air quality ordinances on a local level and application of DEQ standards would potentially preclude serious pollution problems in this area. Development of clean industry and mass transit, and correlation of services and schools, and population would further aid in maintaining air quality levels.

AGRICULTURE

The climate of Josephine County is a major influence on agricultural efforts. All of the factors that comprise the climate determine the uses that can be made of the land. Josephine County's climate is transitional between the mediterranean climate of California to the south and the marine mesothermal climate of northern Oregon. As a result the Rogue River Valley and the Illinois Valley are the hottest and driest valleys in western Oregon. The following table illustrates climatic conditions in selected area of the County.

TABLE AG-1

JOSEPHINE COUNTY WEATHER

Station	Elevation	TEMPERATURE					PRECIPITATION	
		Temperatures (°F)					Precipitation (in.)	
		Average Annual	Average January	Average January Minimum	Average July	Average July Maximum	Average Annual	June thru August
Sexton Summit	3,836	48.0	34.1	30.0	63.6	76.4	33.1	2.1
Grants Pass	925	53.8	39.0	31.5	70.2	90.1	30.2	1.2
Williams	1.370	52.0	38.6	29.7	67.0	86.6	32.3	0.3
Cave Junction	1,280	53.3	38.9	--	69.6	--	79.4	0.3
Waldo Station	1,650	50.6	36.6	28.3	67.3	88.0	52.1	1.2
Wolf Creek	1,274	52.9	38.6	31.4	67.8	87.5	40.9	1.5
Glendale	1,390	52.7	39.5	31.8	68.1	88.1	37.7	1.5

SOURCE: Bureau of Land Management, 1978.

GROWING SEASON

The County's Chamber of Commerce has developed the following table to demonstrate the weather in relation to other areas of the State. Although this area is often described as having a relatively long growing season, the table does point out that other areas in the State do have a longer growing season, though probably fewer sun-days.

TABLE AG-2

STATE WEATHER

City	Rain	Temp.	Snow	Growing Season
Brookings	80.98	53.5	.09	238 days
Corvallis	38.66	53.6	8.10	183 days
Eugene	40.55	53.1	5.80	205 days
Grants Pass	29.64	54.4	3.20	163 days
Klamath Falls	13.83	48.6	38.10	134 days
Medford	20.70	51.9	3.90	160 days
Portland	42.32	53.7	9.30	251 days
Roseburg	32.46	52.7	6.70	217 days
Salem	39.26	52.7	7.2	213 days

IRRIGATION

Because of the drier condition, the availability of irrigation water is essential to many agricultural enterprises during periods of pronounced drought in southern Oregon. Lacking irrigation, most Class IV or better agricultural lands are incapable of producing more than a spring crop of currently planted varieties unless such lands have natural sub-irrigation. Consequently this area is ideal for crops such as grasses. Specialty crops such as mint are particularly demanding of extensive irrigation supplies.

The principal sources of irrigation water are the Rogue, Applegate and Illinois rivers. Irrigation benefits are also obtained from major creeks such as Williams Creek and its tributaries, Jump-Off-Joe, Grave, Sucker, Althouse, and Deer creeks.

Irrigation rights in Josephine County date back to 1859. According to the County Watermaster, approximately 57,000 acres in Josephine County have water rights. It is significant that during the dry summer period many of the more recent rights must be temporarily sacrificed to older, more established rights. During the drought of 1977, the County Watermaster's Office estimates there was sufficient water for irrigation purposes in Josephine County to irrigate only 1,400 acres of agricultural land for the duration of the irrigation season.

Delivery of irrigation is accomplished by individual farms or by irrigation districts. Many of the old ditches dug by miners have been appropriated for conducting irrigation water for farming purposes. In addition, several special districts have been created for the express purpose of providing irrigation.

The largest irrigation district is the Grants Pass Irrigation District, which provides service to lands adjacent to the City of Grants Pass from the Jackson County line to near the mouth of the Applegate River. A significant portion of the territory of the Grants Pass Irrigation District has been urbanized or is committed to non-commercial, hobby-type farm activities. The District does, however, provide irrigation to the largest single area of agricultural land occurring in Josephine County. The Fort Vannoy Irrigation District also provides substantial benefits to commercial farm activities in the Grants Pass area. In addition, approximately ten major ditches and ten minor ditches provide irrigation services.

AGRICULTURAL LAND USE

Agricultural enterprises in Josephine County may be classified into two broad categories. The first consists of commercial farm activities, characterized by dairies, hop yards and mint fields, and larger ranches devoted to the production of beef cattle. These operations provide a primary or substantial source of income to the operators. Commercial farm activities are largely contained within areas zoned for Exclusive Farm purposes, pursuant to the State Agricultural Goal and ORS 215.

The second category includes areas which are dominated by hobby-type farms in which the operator is principally employed elsewhere and farm activities provide only a supplemental income. Hobby-farm activities usually

occur in areas characterized by extensive rural residential development and parcel sizes ranging from 5 to 20 acres. Grading between the two categories are larger farm units which are insufficiently capitalized to provide a primary income and necessitate the owner to obtain additional employment.

In addition to providing a major source of income to the County, agricultural use provides additional benefits to the community. The rural atmosphere of Josephine County in many areas is characterized by a mix of forest land and small farms. Agricultural uses of land are providers of "productive" open space. Lands utilized for agriculture provide open space to areas committed to urban uses and more intensive rural residential uses.

AGRICULTURAL LAND

Josephine County contains the lowest ratio of agricultural land to the total area of the County of all the counties in the State of Oregon. In 1969 Josephine County contained less than 2.7% of the farm land in the entire State of Oregon. Current estimates by the Josephine County Planning Department indicate that less than 3% of the County is devoted to commercial farm use. Based on data developed by the Bureau of Census and on current land use, 67,000 acres of land were taken out of agricultural use between 1954 and 1979.

While the amount of acreage devoted to farm use has been reduced, the size of farming operations has also changed (Table A-3). In 1954 there were 26 farms larger than 500 acres in size; in 1974, there were only 12 farms larger than 500 acres. In 1954 there were 297 farms in Josephine County containing more than 100 acres; in 1969, only 114 farms involved more than 100 acres of land (Bureau of the Census, 1976).

TABLE AG-3

FARMS IN JOSEPHINE COUNTY

	1954		1959		1964		1969		1974	
	ACRES	%	ACRES	%	ACRES	%	ACRES	%	ACRES	%
Number of Farms	1443	--	931	--	823	--	395	--	394	--
Average Size of Farm	47.3	--	83.6	--	92.3	--	97.4	--	103.4	--
Size of Farm										
Under 10 Acres	431	29.9	176	18.9	122	14.8	51	12.9	73	15.5
10 - 49	569	39.4	412	44.3	379	46.1	166	42.0	150	39.5
50 - 179	306	21.2	232	24.9	232	28.2	122	30.9	109	27.7
180 - 499	111	7.7	94	10.1	70	8.5	43	10.9	43	10.9
500 - 999	22	1.5	11	1.2	14	1.7	8	2.0	8	2.0
1,000 - 1,999	4	0.3	5	0.5	4	0.5	5	1.3	4	1.0
2,000 and over	--	--	1	0.1	2	0.2	0	0.0	1	0.3
TOTAL	1443	--	931	100.0	832	100.0	395	100.0	394	100.0

SOURCE: U.S. Bureau of Census, Census of Agriculture, 1976.

TABLE AG 4

LAND IN FARMS

	1959		1964		1969		1974	
	ACRES	%	ACRES	%	ACRES	%	ACRES	%
Total Land Area	1,050,000	---	1,040,050	---	1,040,064	---	1,040,064	---
Proportion in Farms	---	7.40	---	7.30	---	3.70	---	3.90
Acres in Farms	76,878	100.00	75,948	100.00	33,473	100.00	40,755	100.00
Cropland Harvested	11,575	15.06	12,070	15.89	8,076	20.99	8,844	21.70
Cropland Pasture	12,126	15.77	11,482	15.12	9,210	23.94	7,562	18.55
Other Cropland	2,861	3.72	2,507	3.30	1,949	5.07	993	2.44
Woodland (including woodland pasture)	39,275	51.09	37,266	49.07	14,286	37.13	18,174	44.59
Other Land	11,041	14.36	12,607	16.60	4,952	12,87	5,182	12.72
Irrigated Land	18,376	23.90	16,871	22.21	11,924	30.99	11,393	27.95

SOURCE: Ibid

Conceptually, agricultural land has generally been defined as those lands which are designated class I through IV by the Soil Conservation Service. Consequently, the following chart indicates the amount of potential agricultural acreage in Josephine County.

TABLE AG-5

SCS AGRICULTURAL SOIL ACREAGES

CLASS	ACRES IRRIGATED	ACRES NON-IRRIGATED	
I	4,645	-0-	
II	31,463	2,173	
III	27,158	13,897	
IV	78,404	101,123	
			117,193
V	NA	-0-	
VI	NA	338,257	
VII	NA	534,920	
VIII	NA	47,718	
Water		1,912	
TOTAL	141,670	1,040,000	

SOURCE: Compiled from SCS soil data for Josephine County, 1980.

It must be noted, however, that the number of "acres irrigated" is idealistic, as these lands would be so classed only if irrigation were available. Further, many of the prime agricultural areas of the County have already been developed with non-resource uses.

A new agriculture land rating system has been developed by Josephine County (see Appendix D for a complete discussion of this system. This system includes the criteria used by the Soil Conservation system with information regarding productivity and management techniques/ costs. Based on this system, the following chart indicates the amount of potential agricultural acreage in Josephine County. The limitation of irrigation and use also apply.

TABLE AG-6

JOSEPHINE COUNTY AGRICULTURAL SOIL ACREAGES

PRIORITY	ACRES IRRIGATED*	ACRES NON-IRRIGATED
High	31,184	40,371
Moderate	56,016	52,329
Low	36,512	26,927
TOTAL	123,712	119,627

SOURCE: Josephine County Planning Office and County Soil Scientist, 1980.

In reviewing these charts, it should be realized that production on non-irrigated soils will generally be limited to grasses, hay, open pasture, grass seed and other small grains. Irrigated soils with a "low" rating have major cultivation problems and are limited to one or two kinds of crops.

AGRICULTURAL LAND USE ALTERNATIVES

In order to preserve commercial farm lands, Exclusive Farm districts have been expanded as required by law. Exclusive Farm zoning is established by statute, enacted by the Legislature of the State of Oregon. These statutes (contained in ORS Chapter 215) define "farm use" which is permitted outright; identify permitted and conditional non-farm uses; require public review of all divisions of land resulting in parcels under 10 acres in size; and prohibit any restrictions upon accepted farming practices. The statutes also provide that agricultural lands, when devoted exclusively to farm use, are to be assessed for tax purposes upon the basis of farm values, rather than market values, and exempts the landowner from certain special district tax assessments.

As an alternative to rural residential zoning, lands that are not appropriate for Exclusive Farm classification may be considered for a general agricultural classification which would allow a mix of rural residential and hobby-farm activities. The Board of County Commissioners has adopted findings which support the position that such zoning would comply

with the intent of the Statewide Agricultural Goal. Although originally identified as a procedural requirement, the Board has determined that an exception to the Statewide Agricultural Goal is not required.

Examination of the zoning records of the Josephine County Planning Department reveals that Exclusive Farm lands designated in compliance with State Goal #3 occur in 11 of the 17 Citizen Advisory Committee areas of Josephine County. The total acreage of Exclusive Farm lands by Citizen Advisory Committee area is given in the following table.

TABLE AG-7

TOTAL ACREAGE OF LAND

ZONED EXCLUSIVE FARM

BY CAC AREA

JUNE 1979

Williams	5383
Murphy-New Hope	2515
Lower Applegate	909
North Valley	1875
Shan Creek	2340
Jumpoff Joe	205
Selma	2161
Central Illinois Valley	9611*
Takilma	456
O'Brien	370
Hugo	298

*Note: Some of the lands originally zoned Exclusive Farm in the Illinois Valley contain serpentine or dioritic soils, not subject to the Statewide Planning Goal on Agriculture.

AGRICULTURAL PRODUCTION

The decline in land committed to agricultural uses is accompanied by a decline in production. According to the recorded value of agricultural products of Josephine County made by the Josephine County office of the Oregon State University Extension Service, the decline in total production between 1961 and 1975 was approximately 13.8% with a 11.4% decline in total livestock production and a 11.1 decline in crop production. It is significant to note, however, that the declines in real production are less than the decline in acreage being farmed. During the same period, there was a 34.1% decline in the area being farmed from 49,928 acres to 32,915 acres.

Declines in agricultural production were mitigated, in part, by increases in the dairy products industry. It is estimated that total agricultural production in Josephine County was $12,833,000 in 1978 (Extension Service, 1979). Of this, dairy products constituted the largest agricultural enterprise in Josephine County. In 1975, dairy products constituted 49.5% of the total agricultural activity. In 1978, production of dairy products constituted 40.1% of total agricultural production, yielding $5,145,000 (Extension Service, 1979).

In 1978, grains, hays and silage resulted in production totals of $2,000,699, making this the second-largest agricultural income-producer. A significant portion of these field crops is used in support of both the dairy industry (the third major agricultural commodity). and cattle and calves (both dairy and beef). The latter industry totaled $1,836,000 in 1978 (Extension Service, 1979).

The Extension Service (1979) estimates that specialty crops produced $1,004,000 worth of products in 1978, consisting chiefly of hops and mint. Mint was planted on 740 acres, and hops were produced on an estimated 300 acres.

Other major agricultural products include poultry with production totals of $264,000, specialty horticultural crops (such as gladiola bulbs), and nursery plants, totaled $250,000. Although Josephine County historically contained extensive vineyard and orchard tracts, production of tree fruits, nuts and berries amounted to only $173,000 in 1978.

FUTURE OF AGRICULTURE

Recent developments in southern Oregon have resulted in the formation of a small local wine industry. This is important as extensive areas of Josephine County are suited to the cultivation of vineyards. Capitalization of vineyards, however, represents a relatively long-term investment, with the grower facing a 7 to 8 year lag before an initial return is made.

The production of berries may also represent a market which is locally underfilled. It is estimated that less than 60 acres are currently in commercial berry production in Josephine County (Extension Service, 1979). Such activities may be suited and well-adapted for smaller farm parcels.

Josephine County is also suited for the production of fruits such as apples, cherries, and peaches. Pear production is feasible due to the presence of canning markets in neighboring Jackson County. Development of orchards, however, would most likely be in competition with already existing crops on irrigated land. Josephine County historically produced substantial crops of fruits and grapes, but orchard and vineyard districts are no longer a significant element of the agricultural community. The loss of the once-extensive orchards has been attributed to the disadvantages of competition with orchard districts located closer to metropolitan markets. Virtually no land is devoted, in Josephine County, to commercial production of vegetable crops. Expansion of agriculture in these areas will be dependent upon the development of better marketing opportunities.

Currently there are only two processing plants in southern Oregon, both located in Jackson County. In 1964, the Oregon State University Extension Service studied the economic potential for an additional food processing plant in southern Oregon. The Extension Service (1964) estimated that a return of between 4.27% and 6.20% could be obtained with the construction of an additional plant. With this data, interests of major packing firms were solicited. Several firms examined the feasibility of operation in southern Oregon, but concluded that the difficulties in managing a plant and coordinating a large number of growers in the production of required crops would not produce satisfactory production. It could, therefore, be assumed that expansions of agricultural production in the immediate future should be limited to fulfilling the needs of existing processors. As mentioned earlier, future changes in marketing may eventually

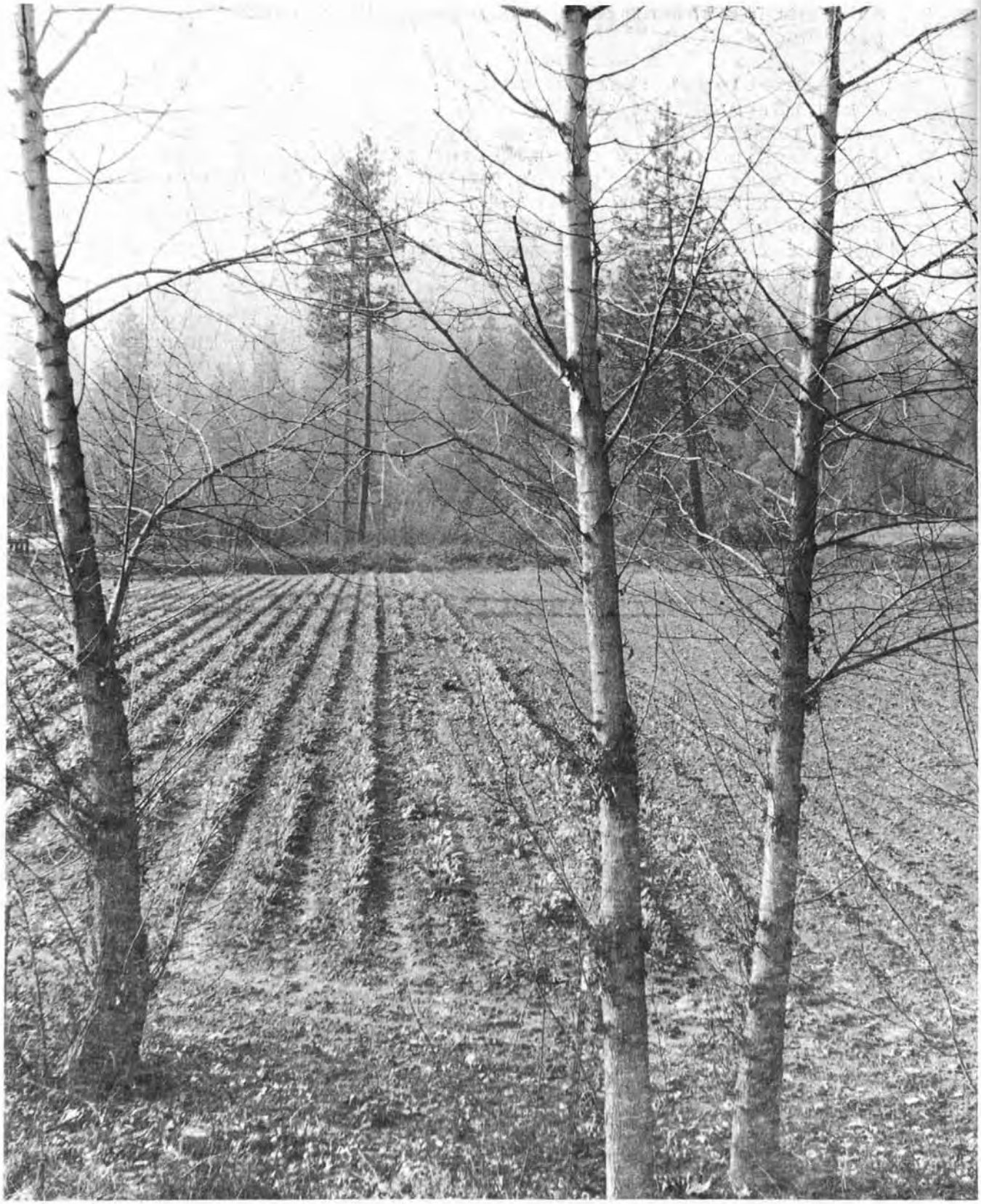
make establishment of a local plant more attractive to processors.

Considerable interest has been developed in exploring local markets that could be filled by increased agricultural production. The majority of food products sold in Josephine County are marketed through large nationwide chains. These chains contract for food products and distribute them over large geographic regions. Because of the economies of scale, local products cannot enter the market in competition with these types of distribution systems.

Local agriculture provides stability to local markets, and assures local availability of food, should changes in marketing conditions produce regional shortages. Local agricultural production could become more economically attractive as transportation and energy (for shipping and handling) become more costly.

A realistic impediment to expanded agricultural activity in Josephine County is the extremely high cost of capitalization of many types of farming operations. While the prices of agricultural commodities have risen, the increase has not been comparable to the increases in equipment and petroleum. Cost of agricultural land and necessary equipment and supplies may result in adverse mortgages which reduce the profitability of marginal activites. The large acreages necessary to maintain economically profitable farm units represent substantial investments, even if the land is purchased at farm land prices (with little or no regard to development potential for non-farm activities).

There may be only a limited number of individuals that can enter farming on a full-time basis because of the high initial entry costs. Expansion of agricultural activity in Josephine County is most likely to occur in hobby-farm activities. The objectives of the hobby-farm activities may include not only economic profit through the production of agricultural crops, but also the maintenance of a desired lifestyle. Stabilizing and expanding the agricultural community in Josephine County may necessitate prevention of incompatible land use intrusions in commercial farm areas and allocation of specific areas for hobby-farm activities.



HOBBY FARMS ARE USUALLY SINGLE CROP OPERATIONS ON SMALL PLOTS CARVED OUT OF MARGINAL FOREST LANDS.

FOREST LANDS

DEFINITION OF FOREST LANDS

Defining, identifying and mapping forest lands is a formidable task. As presented in the LCDC Goals and Guidelines, "forest lands" are defined as:

1. lands composed of existing and potential forest lands which are suitable for commercial forest uses;
2. other forested lands needed for watershed protection, wildlife and fisheries habitat and recreation;
3. lands where extreme conditions of climate, soil and topography require the maintenance of vegetative cover irrespective of use; and
4. other forested lands in urban and agricultural areas which provide buffers, wind breaks, wildlife and fisheries habitat, livestock habitat, scenic corridors and recreational use.

As is evidenced in the LCDC definition, forest lands include much more than commercial timber production lands. Forest lands are generally determined to be commercial or non-commercial on the basis of potential production (whether or not they are currently producing). Commercial forest lands are considered by the Oregon State Department of Forestry to be those lands capable of producing 20 cubic feet per acre per year (this volume includes sawlogs and pulp wood, and excludes firewood).

Non-commercial forest land may be further categorized into two sub-units: productive and unproductive. Unproductive lands are generally incapable of producing 20 cubic feet per acre per year of usable wood products. Examples would include sparse stands on rocky shallow-soil dry sites at the lower elevations. Lands with wite indexes below 40 for ponderosa pine or below 60 for Douglas-fir are generally incapable of producing 20 cubic feet per acres per year, and are considered to be unproductive. Forest lands which are not commercially productive include lands which have a capability for commercial forest production, but which

are not stocked or are occupied by non-commercial species. Examples would be chaparral vegetation and oak-madrone woodlands. Chaparral areas are characterized by a crown canopy composed of brush species in which more than 50% of the ground is covered. Unless re-stocked with commercial timber species, chaparral communities only have a primary value for watershed protection and wildlife habitat. Oak-madrone woodlands are areas in which the canopy is dominated by oaks.

Additional non-commercial forest associations existing in Josephine County are forest lands formed on serpentine or dioritic soils. Serpentine areas are characterized by unusual forest associations which are characteristically sparse. Canopy vegetation is often dominated by scattered Jeffery pine and knobcone pine, although stunted examples of Douglas-fir, incense-cedar and sugar pine may also occur.

FOREST COMPOSITION

The forests of Josephine County contain some of the most diverse associations of forest species to be found on the Pacific coast. The dominant commercial conifer species are:

COMMON NAME	SCIENTIFIC NAME
Douglas-fir	Pseudotsuga menziesii
ponderosa pine	Pinus ponderosa
white fir*	Abies concolor
grand fir	Abies grandis
sugar pine	Pinus lambertiana
incense-cedar	Libocedrus decurrens
Port-Orford-cedar	Chamaecyparis lawsoniana
Jeffrey pine	Pinus jeffreyi

*White fir and grand fir frequently hybridize in this region.

Other conifers which occur in Josephine County include:

COMMON NAME	SCIENTIFIC NAME
Shasta red fir	Abies magnifica shastensis
noble fir	Abies procera
Englemann spruce	Picea engelmannii
knobcone pine	Pinus attenuata
lodgepole pine	Pinus contorta
western white pine	Pinus monticola
western hemlock	Tsuga heterophylla
mountain hemlock	Tsuga mertensiana
Alaska yellow-cedar	Chamaecyparis nootkatensis
western red-cedar	Thuja plicata
whitebark pine	Pinus albicaulis
Brewer spruce	Picea breweriana
Pacific yew	Taxus brevifolia
Baker cypress	Cupressus bakerii

Softwood species occur in mixed stands in association with numerous hardwood species. A partial list of hardwood species includes:

COMMON NAME	SCIENTIFIC NAME
red alder	Alnus rubra
golden chinkapin	Castanopsis chrysophylla
tanoak	Lithocarpus densiflorus
canyon live oak	Quercus chrysolepis
Oregon white oak	Quercus garryana
California black oak	Quercus kelloggii
bigleaf maple	Acer macrophyllum
vine maple	Acer circinatum
Pacific madrone	Arbutus menziesii
Oregon ash	Fraxinus latifolia
California laurel	Umbellularia californica
black cottonwood	Populus trichocarpa
willows	Salix spp.

Occurring in the shrub layer are numerous species, including:

COMMON NAME	SCIENTIFIC NAME
poison-oak	Rhus diversiloba
wild blackberry	Rubus vitifolius
scotch broom	Cytisus scoparius
Pacific red elderberry	Sambucus callicarpa
blue elderberry	Sambucus glauca
Pacific rhododendron	Rhododendron macrophyllum
western azalea	Rhododendron occidentale
salal	Gaultheria shallon
hairy manzanita	Arctostaphylos columbiana
green manzanita	Arctostaphylos patula
twinflower	Linnaea borealis
devilsclub	Oplopanax horridium
Pacific dogwood	Cornus nuttalii
western (or Douglas) spirea	Spiraea douglasii
multiflora rose	Rosa multiflora
Pacific serviceberry	Amelanchier florida
red-flowering currant	Ribes sanguineum
prickly currant	Ribes lacustre
wax currant	Ribes cereum
dwarf Oregongrape	Mahonia nervosa
evergreen huckleberry	Vaccinium ovatum
sadler oak	Quercus sadleriana

SUCCESSION

The passing of time will show a natural transition (on rock or bare soil) from establishment of small, "primitive" plant species to a climax of large, "advanced" species. This progression is called succession.

Natural succession is often altered by natural and/or human activities. It is difficult to predict exact successional progressions in Josephine County due to these alterations and to the uniqueness of geographic and climatic conditions. The Josephine County Forestry Department, however, has made an effort to define successional progressions on three different site types in the County:

TABLE F-1

PLANT SUCCESSION IN JOSEPHINE COUNTY

	Exposed, dry site	Normal site	Water site
1.	Rock or bare soil	Rock or bare soil	Standing water
2.	Lichens, mosses	Annuals	Submerged water plants
3.	Annuals	Forbs, grasses	Floating plants
4.	Forbs, grasses	Shrubs (deerbrush)	Emergents
5.	Shrubs (manzanita)	Hardwoods (madrone)	Sedges, sphagnum
6.	Hardwoods (oaks	Intolerant conifers (ponderosa pine)	Shrubs (willows)
7.	Intolerant conifers (knobcone pine, Jefferey pine, ponderosa pine)	Midtolerant conifers (Douglas-fir, sugar pine)	Hardwoods (black cottonwood, red alder)
8.	Midtolerant conifers (May skip, otherwise Douglas-fir, sugar pine	Tolerant conifers (incense-cedar, grand fir, Port Orford-cedar)	Intolerant conifers (May skip, otherwise ponderosa pine)
9.	Tolerant conifers (May skip, otherwise incense-cedar)		Midtolerant conifers (Douglas-fir, sugar pine)
10.			Tolerant conifers (incense-cedar, grand fir, Port Orford-cedar)

SOURCE: Bernstein, 1978

The final stages of succession result in a stable climax of shade-tolerant species. Trees which are considered to be shade-intolerant will shade out their own seedlings, and tolerant species (such as incense-cedar, Port Orford-cedar, or grand fir) will eventually dominate. The complete progression from lichens, mosses, or grasses to a climax of tolerant tree species may take hundreds or even thousands of years. Again, it must be emphasized that succession of plant species is often altered by fire, herbicide spraying, logging, or other occurrences that may return the progression to an earlier stage, maintain a middle or early stage, or bypass middle stages.

Excessive overstory removal, whether by harvesting practices or by wildlife (i.e. procupines), often results in vegetative conversion of forested lands to brush fields. McDonald (1976), in a study conducted in north-central California, determined that shrub species are notably prolific in clear-cut ponderosa stands with densities exceeding 6,500 brush seedlings per acre. Gratkowski and Lauterbach (1974) reported that while brush fields composed of such species as Ceanothus act as a nurse crop (provide shade) for coniferous seedling establishment, such shrubbery eventually out-competes the conifers for light, soil moisture and nutrients once the trees are established.

ASSOCIATIONS

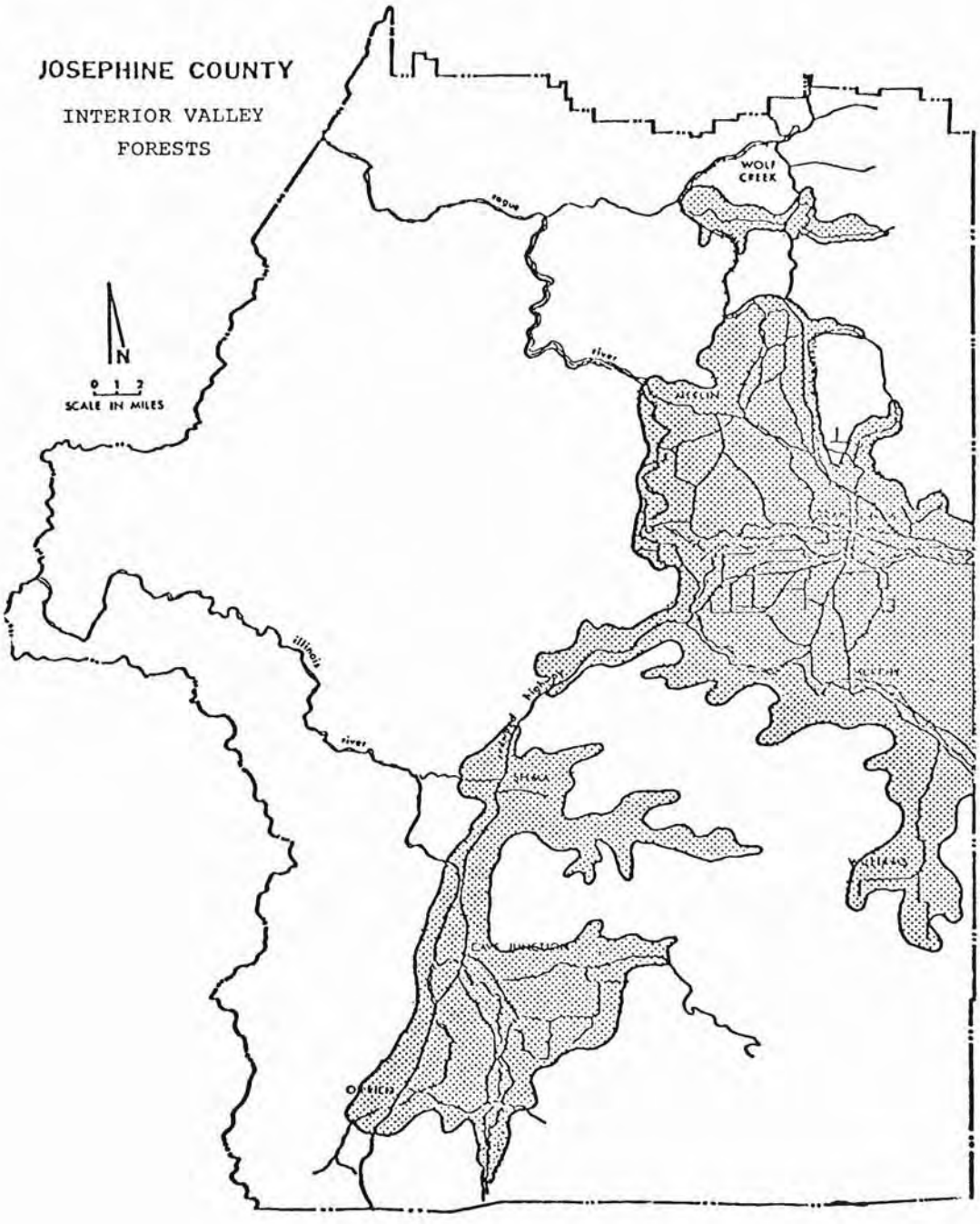
Plant species are often found in association with geographical regions, certain topographical features (e.g. slope), elevations, geological formations and soil types, climatic conditions, unique areas (e.g. river banks or burned areas), combinations of any of these.

Very little research has been conducted in Josephine County on the forest types. Whitaker (1960, 1961) has suggested that two principal units may be distinguished: a lower elevation forest, classified as an "Interior Valley Forest", and a second forest environment, located at higher elevations, which has been classified as a "Mixed Evergreen Forest". The existence of these forest zones, however, is disputed by some observers, who suggest that Whitaker and other investigators may have confused the apparent oak-pine dominance of the lower Rogue Valley with the true oak-pine-grass climax of the Medford area. While the existence of distinct ecologic zones may be subject to conjecture, most published literature recognizes Whitaker's suggestions. Investigations have been limited, however, and little published research exists.

The Interior Valley Zone in Josephine County has not been accorded any significant research. The successional relationship of plant communities within the Interior Valley Forests of Josephine County and the Rogue Basin has been compared to the Interior Valley types occurring in the Willamette Valley. Several distinct differences, however, must be noted. The Interior Valley Forest in Josephine County normally involves a mixed association of California black oak, ponderosa pine, and a scrub layer of Arctostaphylos and Ceanothus. The Interior Valley Forests of Josephine County possess vegetational characteristics which more closely resemble those of the Sierra Nevada foothills than those of the Willamette Valley.

The Interior Valley Forests are also related to the presence of fire. The successional sequences that have occurred in this area may be in a large part attributed to the maintenance of the sub-climax stands by periodic catastrophic fire. Barring repeated fire, it is possible that black oak will be replaced by Douglas-fir and sugar pine on the dryer sites, with better sites at the upper elevations of the zone forming a transition to the Mixed Evergreen Forest. The Interior Valley Zone is also characterized by the association of Pacific madrone.

MAP F-2


JOSEPHINE COUNTY
INTERIOR VALLEY
FORESTS
N
0 1 2
SCALE IN MILES
WOLF CREEK
Illinois
river

Stratification of the Mixed Evergreen Zone has been studied by Whitaker (1961). According to Whitaker, the upper canopy level is dominated by Douglas-fir, although sugar pine is frequently present. The lower tree canopy often consists of tanoak, California black oak, Pacific madrone, and chinkapin. The shrub layer may account for as much as 30% of ground coverage and is typically composed of such species as dwarf Oregon grape, blackberry, salal, rhododendron and poison oak. Whitaker has also described communities occurring on drier dioritic sites as characterized by an overstory with less than 50% coverage of Douglas-fir and a closed canopy of hardwoods, including tanoak, Pacific madrone and black oak.

These two zones are perhaps local manifestations of three large ecologic/geographic regions that overlap in this area. They are the Pacific Northwest (to the north), the Pacific Coastal (to the west), and the Sierra Nevada (to the south) regions. (The Mixed Evergreen Zone perhaps is comprised of elements of the Pacific Northwest and Coastal regions; the Interior Valley Zone resembles the Sierra Nevada region).

Elevational associations for the County have been described by the Josephine County Forestry Department, reflecting this overlap of ecologic regions:

JOSEPHINE COUNTY FOREST ASSOCIATIONS

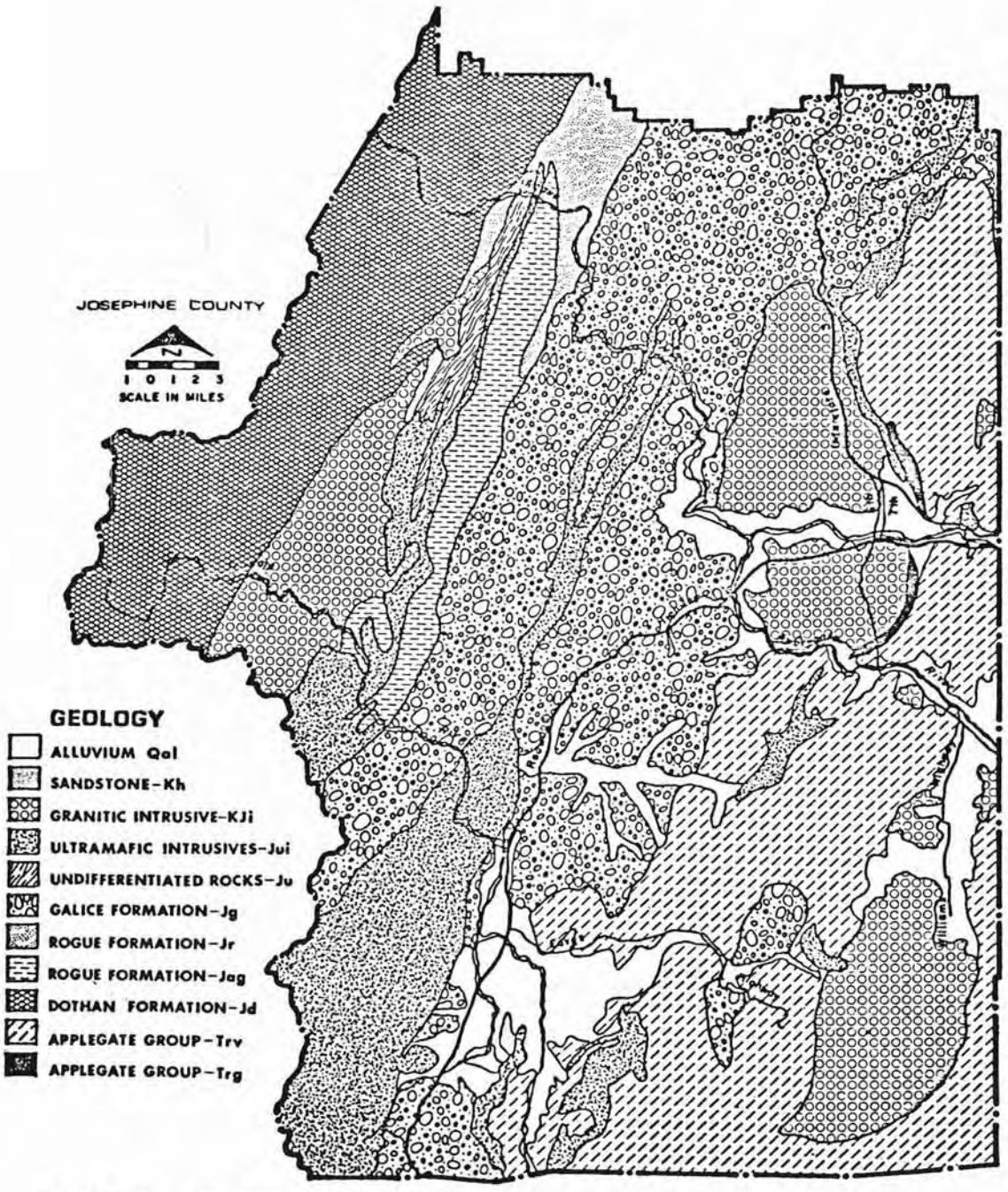
Approximate Elevation	
500 to 4000 feet -	Douglas-fir, black cottonwood (all regions), ponderosa pine, sugar pine, California black oak, incense-cedar (Sierra), Oregon white oak, bigleaf maple, Pacific madrone, alder, Oregon ash (Northwest), Pacific yew (Coastal).
1500 to 4000 feet -	Douglas-fir (all regions), sugar pine, white fir, incense-cedar, California black oak, canyon live oak, ponderosa pine (Sierra), grand fir, alder, bigleaf maple, Pacific madrone (Northwest).
2000 to 5000 feet -	Douglas-fir, grand fir (Northwest), incense-cedar (Sierra), Port Orford-cedar, tanoak, golden chinkapin (Coastal), knobcone pine (unique to this area).
4000 to 7000 feet -	Douglas-fir, whitebark pine, subalpine fir, mountain hemlock (Northwest), Brewer spruce, Shasta red fir, Baker cypress (unique to this area).

Source: Bernstein, 1978

MIXED FOREST ASSOCIATION AT THE 2000 - 5000 FOOT LEVEL. PREDOMINANTLY DOUGLAS FIR WITH SCATTERED PINE AND OAK

Many of the geologic units that form the center of the County contain relatively droughty soils which have limitations for forest management due to the long dry summers. Granitic soils are generally a Class 5 forest land, except on favored north-facing slopes where the soil capability may reach cubic foot Class 4 for Douglas-fir. The granite soils often result in higher sites for pine species than for Douglas-fir. Decomposed granite that may be cubic foot Class 5 for Douglas-fir may form soils capable for cubic foot Class 2 or cubic foot Class 3 production of ponderosa pine.

MAP F-3



SOURCE: Department of Geology and Mineral Industries.

A specialized association in Josephine County that occurs following a fire is called chaparral. Plant communities in chaparral areas commonly consist of manzanita, tanoak, Ribes spp., Ceanothus spp., bullthistle and lupine.

Following a fire, the woodier(brush) species sprout freely from stumps, whereas tree seedlings may be completely eliminated from the burn site. Brush species then have a definite advantage, and may be a stable community on dry sites with shallow soils on eastern or southern slopes (Gratkowski, 1961). On moister slopes, the chaparral vegetation is eventually succeeded by coniferous species.

Another unusual forest association occurs in the serpentinite areas of Josephine County. Serpentinite is an altered form of peridotite. Peridotite originates in the upper mantle deep in the earth and arrives at the surface through geologic and tectonic processes that are complex and not well understood. Serpentinite is not generally considered to be a common rock type, but is widely distributed throughout Josephine County. It underlies 100 to 125 square miles mainly in the southwest part of the County. Plant communities that develop in serpentinites are characteristically unusual and sparse. The dominant timber species on serpentinite sites is Jeffrey pine. Quite often Jeffrey pine forms pure stands in open grassland savannahs with occasional association of incense-cedar. Forests occurring on serpentinite soils are not amenable to timber management. Forests on serpentinite at lower elevations in areas surrounded by the Mixed Evergreen Forest are typified as being more sparse and xerophic (arid) than surrounding forest lands and may be dominated by a mixture of conifers, including Jeffrey pine, stunted Douglas-fir, incense-cedar, and sugar pine. Such areas usually include a dense layer of shrubs including tanoak, huckleberry, California laurel and Ceanothus.

Comparison of geologic units to tree growth demonstrates a strong correlation between the parent soil material and the soil capability. Lands of Josephine County that are underlain by rocks of the Applegate Formation or the Galice Formation demonstrate greater potential for commercial timber production than lands that are formed by the central granitic batholith. Lands that are formed by serpentinite parent materials have no value for commercial timber management, and the influence of serpentinite on surrounding soil areas may significantly retard and restrict potential for commercial yield from those lands.

PRODUCTIVITY AND DISTRIBUTION

Several methods exist for classifying productivity of forest lands. Perhaps one of the more traditional methods is an on-site evaluation of board-feet per acre. (A board foot is equivalent to 1" x 12" x 12"). This measurement includes only millable sawtimber, whereas a method currently being discussed for use in estimating economic value of lands for timber production, cubic feet per acre, includes all wood volume--pulpwood and sawtimber (Bernstein & Witcher, 1979).

The soils for Josephine County have been mapped by the Soil Conservation Service, U.S. Forest Service, and Bureau of Land Management. Site index ratings are given for all soils, which can be converted to a cubic foot site class. Site index is a determination of site capability for timber growth, expressed in a number representing a tree height-to-age ratio. A given aged tree will grow taller on some soils than on others, and these higher-growth lands will have a higher site index (and cubic foot per acre production). As shown in the following chart, these production measurements are grouped into classes: site indexes, site classes and cubic foot site classes.

CHART F-4

DOUGLAS-FIR SITE CLASSES AND SITE INDEX TABLE
COMPARED WITH CUBIC-FOOT SITE CLASSES (FOREST SURVEY)

	Site Class V			Site Class IV		Site Class III			Site Class II		Site Class I		
	Site Index												
	50	60	70	80 90	100	110 120	130	140 150	160	170 180	190	200	210
Potential Yield Cubic Feet/Acre	20	20-49		50-84		85-119		120-164		165-224			
Cubic Foot Site Class	7	6		5		4		3		2			

Source: Oregon State Department of Forestry, 1979.

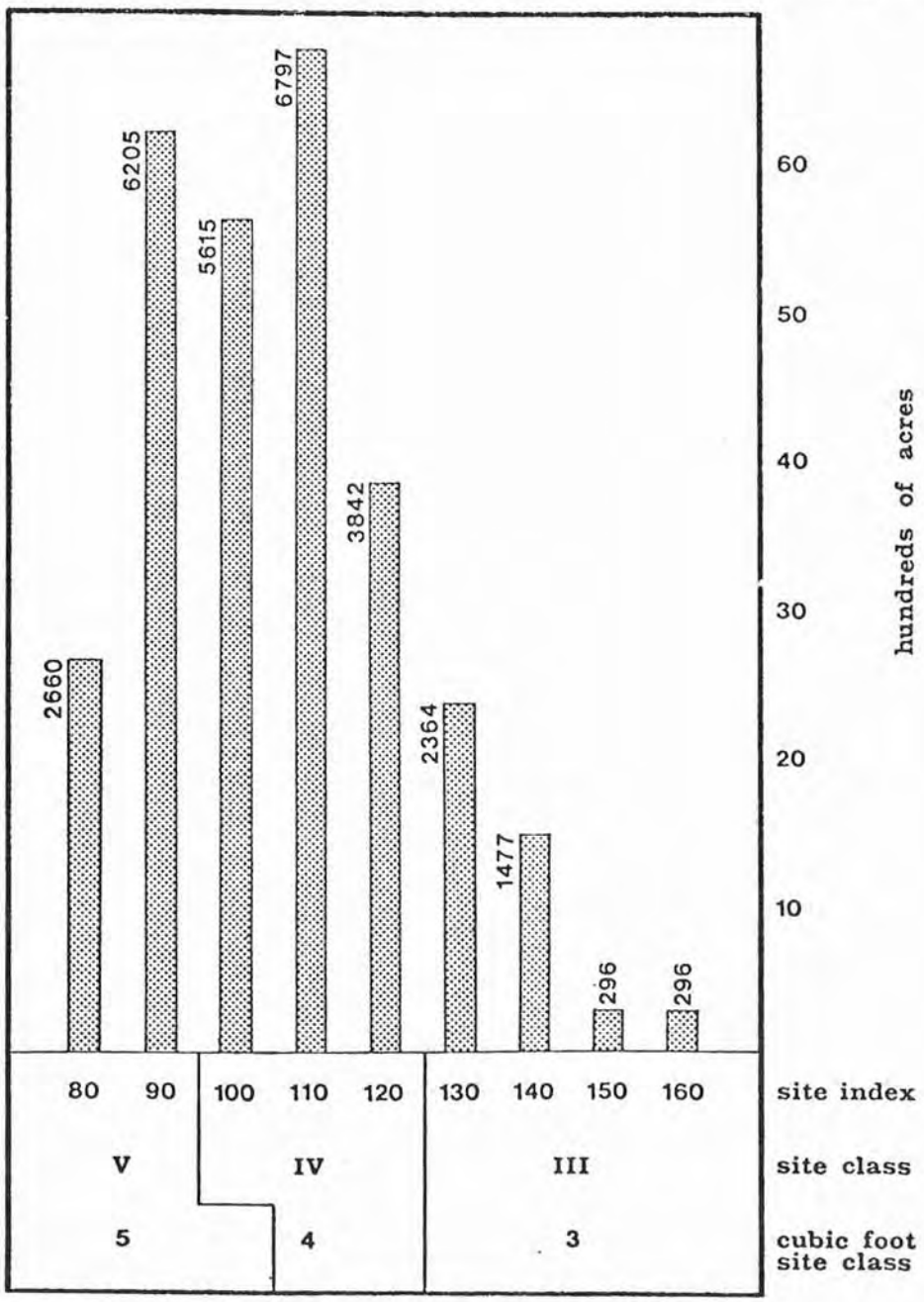
The average site index for commercial forest lands (Douglas-fir) in Josephine County is 100. The average site index for the Siskiyou National Forest (which includes Curry County lands as well) is 110 (U.S.F.S., 1978). The Josephine County average is low when compared to all of western Oregon, but high in comparison to the United States as a whole.

The following table is a summary of Douglas-fir site classes for lands managed by the County Forestry Department. Because County-owned forest lands are intermixed with other private landholdings, the percentages may be representative of many private forest lands as well:

GRAPH F-5

COUNTY - OWNED FORESTS

SUMMARY OF SITE CLASS BY ACRES —— DOUGLAS-FIR



(From: McCullough, Bryant and Assoc. 1970)

Josephine County (as calculated from previous chart) owns and manages approximately 29,562 acres of Cubic Foot Site Class 5 or better lands. Of this total, 14,480 acres are Class 5, 10,639 acres are Class 4, and 4,433 acres are Class 3.

According to the Secretary of State's office, Josephine County contains, 1,040,000 acres. Of that total, approximately 935,000 acres is fores land (about 90%), of which 731,000 acres is classified as commercial.

The following chart has been developed to show forest soil capabilities in Josephine County.

SITE CLASS	ACRES	% TOTAL COUNTY ACREAGE
1	-0-	-0-
2	7,394	.9
3	116,474	11.2
4	446,222	42.9
5	219,726	21.1
TOTAL	789,816	75.9%

There are, therefore, an estimated 789,816 acres in Josephine County that produce 20 cubic feet of wood per acre per year.

Josephine County has developed a new rating system which has a comprehensive approach for classifying the potential for forest productivity, as related to management needs. (Appendix D contains a complete discussion of this system.) The following chart shows the forest capability according to this system.

RATING	ACRES	% TOTAL COUNTY ACREAGE
High	139,097	13.4
Moderate	232,463	22.4
Low	418,816	40.2
TOTAL	789,816	76.0%

Soils rated for low priority are generally suited to woodlot development.

Percentages of forest land ownership are given in the following table (Stevens, Thompson & Runyan, 1972):

TABLE F-6

GOVERNMENT CONTROLLED FOREST LAND
JOSEPHINE COUNTY

	Acres	Per Cent of Total County Acreage
BLM		
O & C Lands	258,992	24.9 %
Public Domain Lands	41,256	4.0 %
FOREST SERVICE		
Siskiyou National Forest	282,068	36.0 %
Rogue National Forest	30,574	3.0 %
NATIONAL PARK SERVICE		
Oregon Caves National Monument	480	.05%
STATE OF OREGON	8,021	.8 %
JOSEPHINE COUNTY	35,170	3.5 %

The Oregon State Department of Forestry (1977) estimates that 118,880 acres of forest land in Josephine County is owned by 1,411 non-industrial landowners. This results in a ratio of one owner per 84 acres of land. The major industrial landowners in Josephine County are the Boise Cascade Corporation, Longview Fibre Corporation, Mountain Fir Lumber Company, J.H. Baxter Company, Robert Dollar Lumber Company, and the Rough and Ready Lumber Company. Industrial ownerships are scattered among federal, county and non-industrial ownerships.

COMMERCIAL SPECIES AND IMPACT

Commercial forest land includes lands which may or may not be economically operable. Twenty cubic feet per acre per year corresponds to cubic foot class 7 lands; and, although classified as commercial, such lands are considered marginal timber sites. Commercial forest lands are further classified, therefore, to recognize productivity. Commercial forest land, for the evaluative purposes of this document, are limited to cubic foot class 3, 4 and 5 lands. Cubic foot class 5 lands are capable of producing 50 to 84 cubic feet of wood per acre per year.

Douglas-fir is the principal commercial species in Josephine County. Due to its comparatively high yield

and desirable wood quality, most harvesting and regeneration techniques have developed to favor Douglas-fir. In northern Oregon large clearcuts have favored regeneration of Douglas-fir (as it is generally intolerant of shade). Site conditions, however, in certain areas of Josephine County (notably on south slopes) are often so harsh that Douglas-fir seedlings need at least partial shade to survive. Due to additional recent research, regeneration harvests have been shifted away from standard large-acreage clear-cutting to shelterwood harvest or small linear clear-cuts. While Douglas-fir, throughout most of its range, is recognized as a sub-climax species, the ponderosa pine-Douglas-fir associations of Southern Oregon may represent stable communities.

The second most important timber species in Josephine County is ponderosa pine. Ponderosa pine has a greater ability to withstand drought than does Douglas-fir. It is also more successful in resisting high surface temperature than is Douglas-fir or other species, and therefore it tends to dominate the more arid sites in the County. Ponderosa pine is classified as shade-intolerant and normally regenerates following periodic ground fire which clears away competing vegetation. Ponderosa pine is closely related to Jeffery pine, the two species being easily distinguishable only by difference in their cones. Ponderosa pine and Jeffrey pine may be distinguished in Southern Oregon most commonly by differences in where they occur; Jeffrey pine being associate with serpentinite soil types.

Another major timber species of Josephine County is sugar pine. Sugar pine is rarely found in purestands, but is usually associated with Douglas-fir and ponderosa pine. Sugar pine is classified as more shade-tolerant than ponderosa pine or Jeffrey pine. It is considered that sugar pine is of approximately the same level of tolerance as Douglas-fir, differing primarily in its greater ability to withstand high soil temperatures. Sugar pine is unusual in that it maintains a high growth rate to a larger size than is common for its associates.

Dunning (1923) reported that on Site Class II land, sugar pine will maintain a growth range of 2.5% in the basal area to a diameter of 30 inches. Although sugar pine is highly suited for the climatic conditions existing in much of Josephine County, silvicultural management of the species has been limited due to the susceptibility of sugar pine to the white pine blister rust, Cronartium ribicola. Recent advancements in breeding have nearly produced a disease-resistant strain of sugar pine, which would vastly increase its commercial importance.

Due to reduced acreage of lands managed for timber production (resulting from conversion to other uses) and an overall cut rate exceeding the rate of growth, the quantity of standing timber managed for wood fiber is apparently decreasing.

The data which exists relative to timber harvesting and processing in Josephine County shows that the County both exports and imports timber. In 1968 the wood products industry processed an amount of wood almost equivalent to the amount harvested on lands within Josephine County: 229,114,000 board feet processed versus 229,932,000 board feet harvested. By 1972, the wood products industry was harvesting over 25% more wood than was being processed in the County: 242,709,000 board feet and 189,969,000 board feet, respectively. This shows a net export of timber from the County, which amounted to 52,740,000 board feet in 1972.

The destination of harvested logs and sources of the logs processed in Josephine County are illustrated in the following table:

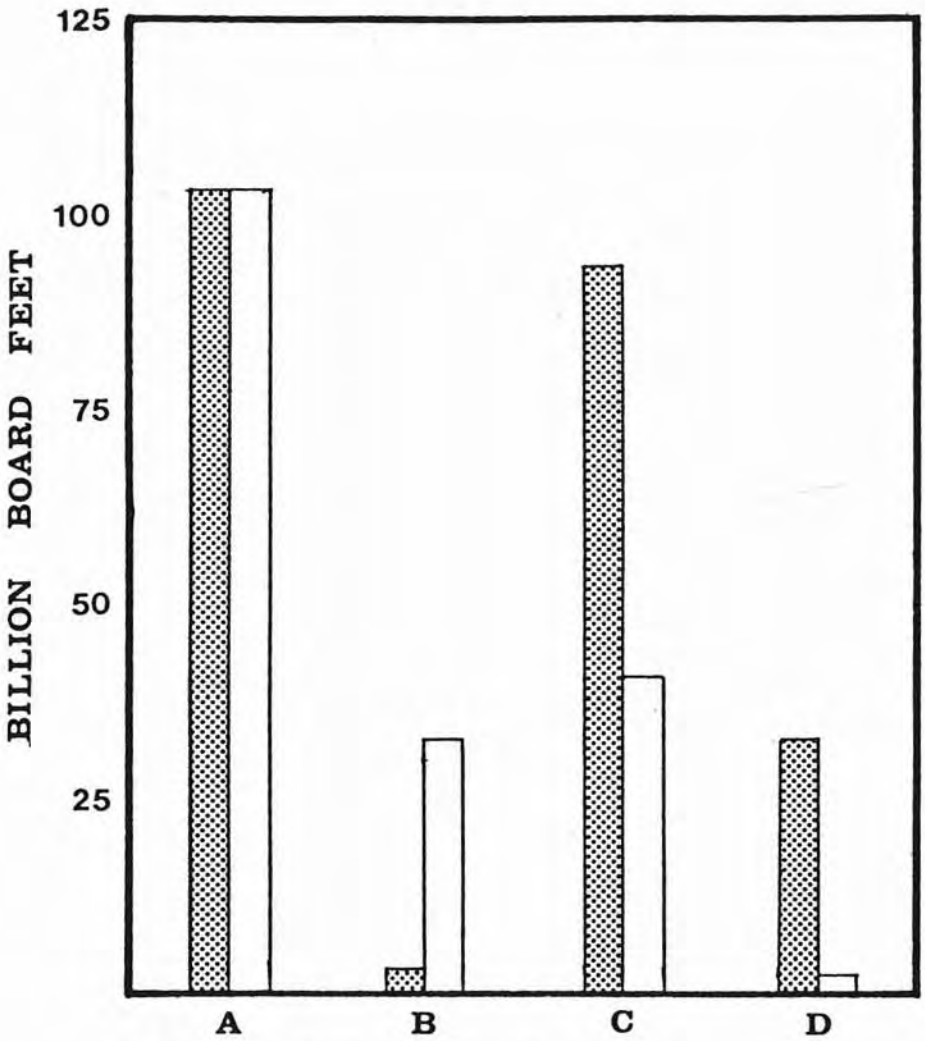
TABLE F-7

DESTINATION OF LOGS HARVESTED
IN JOSEPHINE COUNTY - 1972

Processing Destination	Million Board Feet	Percentage
Josephine County	113,141	47
Douglas County (Export)	3,609	1
Coos, Curry and Jackson Counties (Export)	92,987	38
Elsewhere (Export)	32,972	14
TOTAL HARVEST	242,709	100
TOTAL EXPORTED	129,568	53

GRAPH F·9

LOG IMPORTS & EXPORTS
JOSEPHINE COUNTY



A JOSEPHINE COUNTY
B DOUGLAS COUNTY
C COOS, CURRY, & JACKSON COUNTIES
D OTHER COUNTIES

▒ DESTINATION OF LOGS HARVESTED*

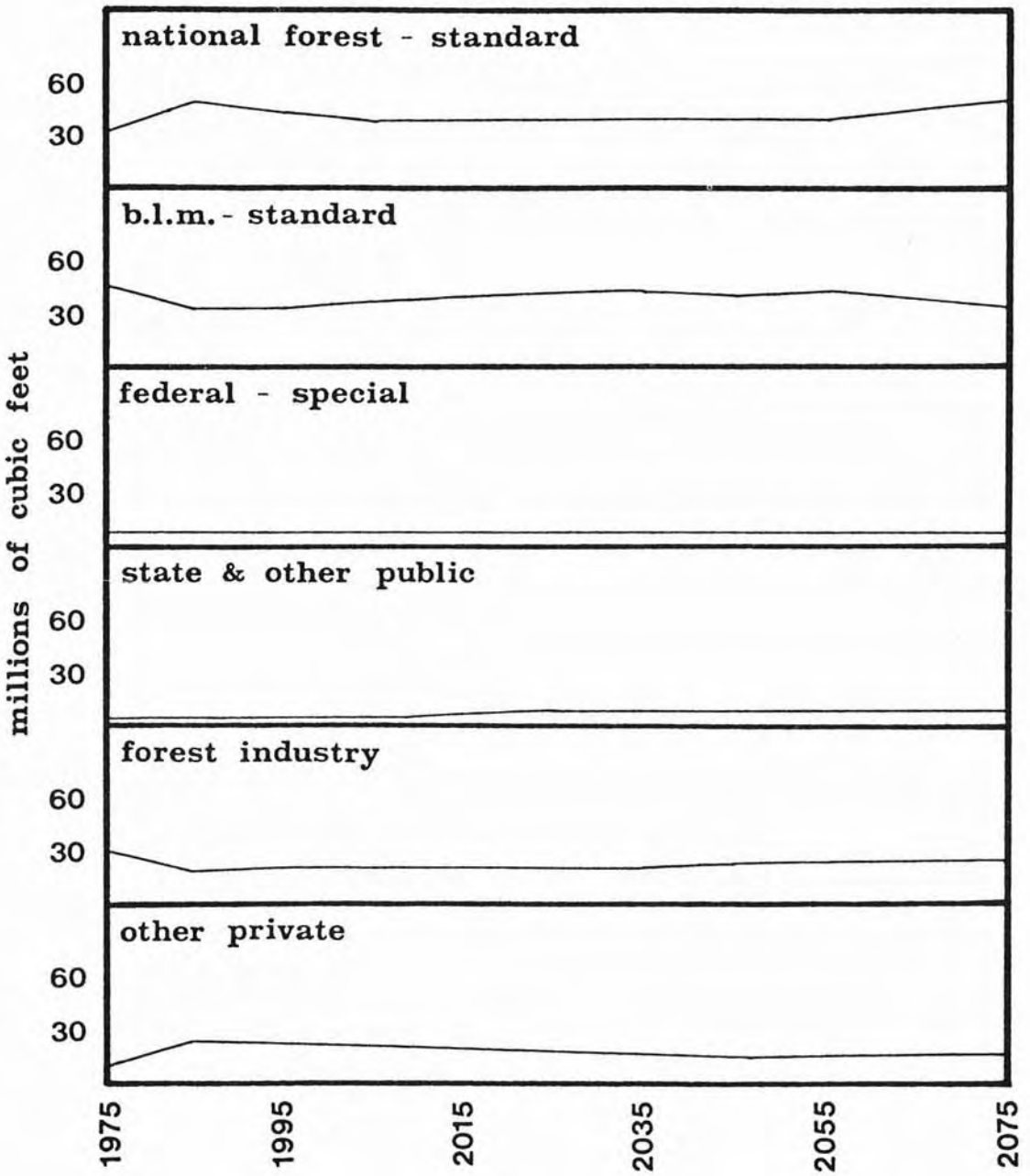
□ SOURCE OF LOGS PROCESSED*

* IN JOSEPHINE COUNTY

GRAPH F · 10

PROJECTED WOOD PRODUCTION : 1980 - 2050

JOSEPHINE COUNTY



Harvest levels for 1974 and 1975, which represented lower cutting levels due to the temporary recession, nevertheless, included substantial cutting of both public and private land, as indicated in the following table:

TABLE F-11

TIMBER HARVEST BY OWNERSHIP
JOSEPHINE COUNTY
1974 and 1975

Land Ownership	Million Board Feet	PERCENT
1974		
Private	12,972	8.9
State	2,710	1.9
BLM	70,566	48.6
USFS	55,880	38.5
Other Public	3,071	2.1
TOTAL	145,199	100.0
1975		
Private	10,492	10.0
State	1,269	1.2
BLM	37,682	35.8
USFS	51,474	49.0
Other Public	4,165	4.0
TOTAL	105,082	100.0

Source: USDA Forest Service, 1974 (1975 Oregon Timber Harvest, Resource Bulletin PNW-63 (69), January 1976 (December, 1976).

SILVICULTURE

Silviculture is defined simply as the science of growing trees. The principal applications of silviculture are related to the management of timber for the production of wood fiber. Timber management practices are most feasible within the Mixed Evergreen Forest zone, but they have historically occurred within the Interior Valley Zone. The severe regeneration problems associated with Interior Valley Zone lands during the long summer drought, however, are a significant impediment to sustained-yield timber production. Lands within the Interior Valley Zone are commonly Site Class V or lower for Douglas-fir, but may approach Class IV or Class III for ponderosa pine. The majority of private forest lands

in Josephine County are held in fragmented ownerships. Management of these lands for timber production has historically involved little silvicultural practice other than periodic harvesting.

The three most widely applied silvicultural techniques in this area are harvesting, reforestation and brush control. Disease and insect control is also practiced, although infections are not extremely significant. The Siskiyou National Forest manages Douglas-fir on a rotation of approximately 90 years (Millet, 1979); simply meaning that areas managed for Douglas-fir production will be cut and replanted every 90 years to maximize yield. Impediments to improved silvicultural practices on non-industrial lands have been summarized by the U.S. Department of Agriculture (Forest Service correspondence on Draft Data Base, 1979):

1. Lack of general landowners information on basic forest management such as tree planting and the removal of competing vegetation, pre-commercial thinning, rotation ages, site productivity, soils, logging methods and costs, investment potentials, fire problems, capital gains and tax impacts.
2. Lack of cooperative forest management ventures between neighboring landowners.
3. Lack of low-cost or free technical advisory assistance on all aspects of forest management.
4. Before 1977, the ad valorum tax placed an annual tax burden on the standing timber, sometimes resulting in early or immature harvesting. This tax was replaced by the severance tax which taxes the timber at harvest--an aid to a sustained yield program.
5. Lack of knowledge of cost-sharing programs available to offset up to 75% of the costs of tree planting, pre-commercial thinning, or brush removal.
6. Lack of reforestation tax credits, which were provided by the 1979 legislature, to promote planting of underproductive forest lands.
7. Lack of local seed zone seedlings available for non-industrial private forest landowners to plant.
8. Prior to 1970, a historically low stumpage value for all species, especially pines.
9. Lack of written long-range management planning outlining specific objectives for individual land ownerships.

Row (1978) documented the disadvantages of small parcel size in increasing costs, reducing revenues, and increasing

risks of investments. Major disadvantages between timber management of small parcels and larger tracts of land appear to come from the spreading of fixed transaction costs and contracting for treatments or selling timber over larger areas. Small timber sales may be so costly to harvest that the price paid for the stumpage will be considerably less than the purchase of comparable timber at higher volume. Row also documented that a major effect of small parcel size is the reduction of cash flow which reduces the incentive of the land owner to apply silvicultural practices to improve the stand.

HARVESTING

Accelerating regeneration of forest on land in the Siskiyou Mountains is a difficult task. The method of harvest may have profound effects on the ability of a site to regenerate naturally, and it may necessitate manual stocking. Clearcutting is simply the cutting of all trees on a given site. This is generally accomplished with a cable logging system, and is usually followed by slash burning to eliminate fire hazards of left-over refuse. Ideally, these areas are then replanted with seedlings.

Logging of south and west facing slopes will result in significant temperature changes. Forest researchers have documented that in Southern Oregon, on west facing slopes of clear-cut land, soil temperatures may reach 140 to 165 degrees Farenheit. Unless modified by shade from over-story vegetation, such temperatures will be lethal to sensitive vegetation such as seedlings. Measurements of soil temperatures two inches below the ground on cut-over lands also indicate substantial daily variations. Daily extremes of soil temperatures may change from an average of 20 degrees variation in a normal forest stand to as much as a 70 degree variation when such a stand is logged over. Annual variations may be altered by as much as 25 degrees due to increased exposure to direct summer sunlight and radiation cooling during the winter by the movement of cold air drainage.

Cleary and Greaves (1974) stated:

> "Clear-cutting on the Siskiyou Mountains can cause such extreme changes that the seedlings are unable to survive in the environment created by the complete removal of the overstory. Partial

cutting is the only suitable technique for obtaining regeneration. Even with partial cutting, the time required and the difficulty in obtaining good reforestation are considerably increased."

Regeneration harvests have been shifted to shelterwood harvests or small linear clear-cuts which will promote the establishment of Douglas-fir seedlings. Such cuts are also more conducive to natural seeding and regeneration. Shelterwood harvests involve repeated entries into the timber stand. Unlike clearcutting, shelterwood techniques leave a residual overstory after initial entries. This overstory provides shade and a seed-source for regenerating the timber stand. Upon successful restocking and establishment of the site, a final entry to remove the leave trees may be made. Shelterwood harvests are accomplished by both cable and tractor logging.

An alternative to cable or tractor logging is the utilization of helicopters for yarding (removal) of logs. This method can be used to minimize soil damage experienced in ground-based methods, and to log in areas where rugged terrain prohibits operation of conventional logging machinery. The Siskiyou National Forest (Millet, 1979) reports that in the recent past, up to 10% of logging on the Forest was by helicopter. This amount is declining, apparently due to rising fuel costs. In addition, noise is a potential problem with helicopter yarding.

A particular success was reported in a recent helicopter logging project on the Forest. Mixed stands of trees in a certain area were logged by helicopter, and they regenerated naturally in previous (before logging) proportions. This preserved the diversity of species in the area, as well as saved costs of artificial restocking. Logging by helicopter lends itself particularly well to partial cuts (cutting only some trees in a given area), which may promote establishment of seedlings on an arid site (e.g. a south slope). Partial cuts are also less visually obtrusive than clearcuts and are more compatible with scenic management.

Tractor or "cat" logging (removal of trees with diesel tractors) is the method most widely used by the Josephine County Forestry Department (Bernstein & Witcher, 1979), as yields are too low (2000-5000 board feet per acre) to finance a cable or helicopter system. Viewed on a long-term basis, however, tractor logging can degrade the soil approximately one to two Site Classes per rotation due to compaction and erosion (Millet, 1979). Only about 5% of Siskiyou National Forest logging uses this method (Millet, 1979.

REFORESTATION

Planting of seedlings is used to enhance reproduction and regeneration in an area after a cut, or to restock a suitable site that is not naturally in forest cover. Douglas-fir is the species most commonly planted, although some ponderosa pine is being stocked on more arid sites. Disease-resistant sugar pine seedlings may increase the commercial importance of that species. Commercial importance of other species (such as tan-oak) may increase in the future if pulp wood (as opposed to plywood and lumber) becomes a more desired commodity (Millet, 1979). The Siskiyou National Forest is 95% current on replanting of clear-cuts; however, they have a 150,000 acre backlog on burned and/or brush-covered areas that need restocking (Millet, 1979). Forest Service budget allocations are facing potential cut-backs for reforestation in 1979-80.

BRUSH CONTROL

Spraying of herbicides is a common, but controversial method of controlling deciduous species such as brush. Advantages of herbicide spraying include: (1) relative ease of application in rugged terrain, and (2) relative low cost. Disadvantages include: (1) possible health hazards to humans (may be carcinogenic or incite mis-carriages in humans; long-term effects are uncertain), and (2) possible damage to wildlife and/or non-target plant species.

The Environmental Protection Agency has prohibited (at the time of this writing) the use of two widely used sprays (2,4,5,-T and Silvex, both containing the chemical component dioxin) due to their potential hazardous health effects. As a result of this action, the herbicide 2,4-D has largely replaced the banned chemicals. The Siskiyou National Forest suggests that 2,4-D is more appropriate than 2,4,5-T for most needs on their lands (Millet, 1979).

Aerial spray application on small, scattered forest ownerships, and near edges of large ownerships, are infeasible due to potential drift and contamination of adjacent land and/or people. Alternatives to spraying would, therefore, be especially desirable in those areas, but also have accompanying problems.

Hand application of chemicals for brush control is an effective tool used by several private forest landowners.

To insure survival of planted seedlings in areas of grass competition, the application of Simizine, Atrizine, Dalapon, or similiar chemicals is often used. On some small ownerships, chemicals are applied at the same time a spray company is flying on nearby federal, state, or industrial private forests.

Controlled burns will efficiently clear land of undesirable species and allow for easy re-stocking with commercial species. Fire will effectively return nutrients to the soil, but hazards exist with potential escape from prescribed boundaries, air pollution, and destruction of wildlife.

Another method of clearing brush is with manual labor. This can be a very effective way of reducing environmental damage and increasing employment. The major draw-back is higher cost, as compared with spraying. Chemical application costs generally range between $10 to $25 per acre, using phenoxy herbicides (e.g. 2,4-D). Manual eradication costs range from $300 to $1,000 per acre (Bernstein, 1978). Regrowth of brush species is also more rapid after manual eradication as compared with chemical application (Millet, 1979). Significant acreages of forest land in Josephine County are brush-covered (adapted from Gratkowski, 1973), but as is evidenced, brush-clearing techniques pose a serious dilemma.

DISEASE / INSECTS

Disease and insect damage is a serious problem in Josephine County. An important silvicultural practice relating to prevention of disease or insect infestation is the removal of unhealthy or damaged trees. According to the Josephine County Forestry Department, dwarf mistletoe is the most serious of the following forest diseases or insects (Bernstein, 1978):

Common Name	Scientific Name
white pine blister rust	Cronartium ribicola
western gall rust	Peridermium harknessii
Douglas-fir needle cast	Rhabdocline pseudotsugae
dwarf mistletoe	Arceuthobium spp.
fungus rots	Fomes spp.
fungus rots	Polysporus spp.

White pine blister rust is a disease introduced to North America from Europe and is especially lethal to white pines and sugar pines. Sugar pines and species of the genus Ribes are the hosts of the blister rust. Attempts

at mechanical erradication of Ribes from forest stands to prevent the spread of the disease have proven ineffective. Attempts are being made at the Sprague Seed Orchard to develop rust-resistant variants of the sugar pine for use in forest regeneration.

Common insect types associated with tree damage include: sapsucking, defoliating, inner-bark boring, wood-boring, bud-, twig-, and seedling-damaging, and cone- and seed-destroying insects.

INTRODUCED VEGETATION

Introduced ornamental vegetation is increasingly significant in Josephine County with increased urbanization.

Urban vegetation may be used to produce dramatic benefits. Plants may be employed for erosion control, noise reduction, pollution abatement, traffic control, glare reduction, temperature control, aesthetic enhancement, wind control, privacy enhancement and architectural development.

In an increasingly urbanized and artificial environment, vegetation is the greatest natural component of the Josephine County urban area. Unfortunately, historic (and careless) removal and mutilation of vegetation at construction sites, along telephone lines, at road highway right-of-ways, along stream banks, and in developing areas has resulted in little consideration of vegetative function. Commonly, plants must compete with man-made structures and designs without regard to functional systems.

The topography of the Grants Pass airshed basin often results in temperature inversions which may trap pollutants close to ground level. Studies have indicated that plants may be utilized to remove pollutants from the atmosphere and to serve as indicators of hazardous concentrations. Bach and Matthews (1969) indicated that 25 acres of beech trees are capable of removing four tons of dust per year from the air. A 200 foot wide green area may be capable of reducing sulfur concentrations by 70%. Odum (1971) has suggested the economic feasibility of establishing "waste management parks" as elements of planned industrial parks. These "waste management areas" would consist of greenbelt areas, designed and planted with specific species to mitigate the adverse effects of industrial pollution. Such parks may also be designed as linear units to reduce impacts between line sources, such as major highways, and residential areas.

Vegetation may also be employed for glare reduction and climate modification. Studies have demonstrated that temperatures in cities and urban areas are invariably higher than in surrounding rural areas (Aloys, 1966). Deciduous trees have long been employed to provide shade

in the summer without interfering with winter sunlight. The benefits of these trees also include reduced temperature variations as plants absorb solar radiation during the day and release heat during the night, reduced heat radiation, and reduced glare reflection. Vegetation, thus, may be used to mitigate the adverse reflecting surfaces of streets and buildings. In Grants Pass, where temperatures may exceed 100 degrees Fahrenheit during the summer, provision of extensive shade trees may greatly improve the relative comfort of residents.

Plants may also be used to reduce noise. Studies conducted by Cook and Van Haverbeke (1970), Weiner and Keast (1959), and Embleton (1936) document the effectiveness of vegetation in reducing undesirable sound levels. Acoustical modification is accomplished by sound-absorption, sound-deflection and sound-masking. The ability of plants to absorb noise is pronounced. One hundred feet of grass will reduce noise at 500 cycles per second by three decibels. Dense foliage will reduce noise at 5000 cycles per second by five decibels (Moore, 1966). Embleton (1963) determined that noise could be reduced by seven decibels for 100 feet of planting. The combinations of plantings and source separations can increase the effect of noise control. The energy of a sound measured at the source and at a distance of 100 feet will be reduced by 20 decibels. If the separation includes 100 feet of planting, the reduction will total 27 decibels. Lacking the planting, and additional 150 feet of distance would be required to achieve the same sound reduction (Robinette, 1972).

A partial list of common yard and shade trees includes:

COMMON NAME	SCIENTIFIC NAME
black locust	Robinia pseudoacacia
weeping willow	Salix babylonica
Chinese tree of heaven	Ailanthus altissima
Colorado blue spruce	Picea pungens
juniper	Juniperus occidentalis
lodgepole pine	Pinus contorta
western redcedar	Thuja plicata
sierra redwood	Sequoiadendron giganteum
coastal redwood	Sequoia sempervirens
American elm	Ulnus americana
black walnut	Juglans nigra
paper birch	Betula papyrifera
maples	Acer spp.
apricot	Prunus mune
black cherry	Prunus serotina
Italian cypress	Populus nigra

Norway spruce	Picea abies
Alberta spruce	Picea glauca
Austrian pine	Pinus nigra
scotch pine	Pinus sylvestris
Japanese black pine	Pinus thunbergi
cedar	Chamaecyparis spp.
arborvitae	Thuja supp.
magnolia	Rustica rubra
cypress	Cupressus sempervirens
ash	Fraxinus spp.

Introduced grasses include:

COMMON NAME	SCIENTIFIC NAME
Kentucky bluegrass	Poa pratensis
bent grass	Agrostis spp.
fescues	Festuca spp.
rye grass	Lolium multiflorum
orchard grass	Doctylis glomerata
pampas grass	Cortaderia selloana

A partial list of ornamental shrubs includes:

COMMON NAME	SCIENTIFIC NAME
Camellia	Camellia japonica
box wood	Buxus microphylla
arborvitae	Thuja spp.
photinia	Photinia fraseri
euonymus	Euonymus spp.
hawthorne	Raphiolepis indica
palms	Trachycarpus spp.
cotoneaster	Cotoneaster spp.
acuba	Fructo alba
fradesi	Escallonia fradesi
English ivy	Hedera helix
English holly	Ilex aquifolium
Oregon grape	Mahonia aquifolium
dwarf Oregon grape	Mahonia nervosa
rhododendrons	Rhododendron spp.
azaleas	Rhododendron spp.
dogwood	Cornus spp.
fuchsias	Fuchsia magnellanica
magnolias	Magnolia spp.
roses	Rosa spp.
lilacs	Syringa spp.
jasmine	Jasminum spp.
honeysuckle	Lonicera spp.
bamboo	Phyllostachys spp.
junipers	Juniperus spp.

Weed species were historically introduced along railroad or highway right-of-ways. Introduced vegetation in Josephine County includes:

COMMON NAME	SCIENTIFIC NAME
Cheatgrass	Broumus tectorum
yellow starthistle	Centaurea solstitalis
diffuse knapweed	Centaurea diffusa
Canada thistle	Cirsium arvense
puncturevine	Trivulus terrestris
sand burr	Cenchrus pauciflorus
St. John's wort	Hypericum perforaturm

These weeds, generally native to Europe, may be extremely damaging to indigenous vegetative associations. Concentrations of non-native vegetation may provide seed sources for dispersion onto agricultural lands, with consequent environmental degradation.

ANIMAL RESOURCES

It is the purpose of this element to first identify fish and wildlife species, and their associated habitats and carrying capacities, within Josephine County. It then becomes possible to identify associated land use decisions and pertinent protective measures.

Animal populations are basically affected by two factors:

1) the rate at which the species can increase, and,
2) the sum of forces which cause death or lower reproduction.

Birth and death rates are intimately linked to amount of available habitat, indicating that the protection and management of fish and wildlife populations can be greatly dependent on protection of habitat.

WILDLIFE RESOURCES

HABITAT

The land-animal relationship is direct. Without land (or specific habitat areas), wildlife cannot exist. In addition, every habitat has its carrying capacity (wildlife support capability), determined by the availability of food, cover, water and other essentials of life. Each unit of habitat is capable of maintaining a certain animal population. If specific land areas are withdrawn, wildlife populations must compete with other populations for suitable habitat. Obviously, when competition is great and resources are limited, there is little room for wildlife production and promotion.

The Oregon Department of Fish and Wildlife (ODF&W) has stated the issue succinctly: "Man is in direct competition with wildlife. More people equals less wildlife.

And since the human population of Josephine County is growing rapidly, it is a fact that wildlife resources in the County are shrinking. As the human population replaces the wildlife population, a predictable sort of evolution occurs as, one by one, the birds and animals disappear." (Hostick, 1977).

Areas of particular importance for maintenance of wildlife resources are called sensitive habitat areas. These are areas important to the survival of a species or group of species with limited habitats and/or range. The ODF&W has defined sensitive wildlife habitat areas within Josephine County as deer and elk winter ranges, pond and streamside vegetation, drainageways, wet and dry meadows, bogs and swamps, and heron rookeries. Sensitive areas and habitats of endangered and threatened species are crucial areas of concern, but is important to consider impacts of land and water use on all habitats and species.

TERRESTRIAL HABITATS

1.	Commercial	Areas with business buildings and associated surfaced and fenced land, usually within city limits and classes as "commercial" on city and county zoning maps.
2.	Residential	Areas with more than one residential dwelling per 5 acres, using 50 acre plots for averaging. Usually classed as "residential" on city and county zoning maps.
3.	Agricultural	Areas of more than 5 acres which are managed from commercial production or open range grazing. Usually in river or stream valleys, such as Bear Creek Valley.
4.	Grassland	Open grassland with no trees (not agricultural).
5.	Savanna	Grassland or rocky shrub land with scattered trees.
6.	Riparian	Terrestrial habitat within 20 meters of permanent streams, lakes, or intermittent water courses or basins which contain water at least 6 months of the year.
7.	Woodland	Conifer, Deciduous, or mixed forests.

AQUATIC HABITAT

1.	Riparian	As above, including shallows, floating weeds and debris, islands, snags projecting above water.
2.	Intermittent	Water basins and courses which contain water 6-11 months of the year. Including grasslands or agricultural fields which are flooded 6-11 months of the year.
3.	Streams	Water channels less than 10 meters wide.
4.	Rivers	Water channels more than 10 meters wide.
5.	Lakes	Water basins or reservoirs more than 5 acres in size.
6.	Ponds	Water basins less than 5 acres in size.

SPECIES

Wildlife management expert, Lee Talbot, has indicated that "...wildlife can be used as an index to the condition of wildlife and plants. Where wildlife is abundant, other renewable resources are usually well preserved. A scarcity of wildlife accompanies destructive exploitation of resources with all of its unfortunate consequences" (Dasmann, 1968).

Wildlife species which occur in Josephine County are as follows:

FISH AND WILDLIFE CHECKLIST FOR JACKSON AND JOSEPHINE COUNTIES

SECTION A TERRESTRIAL WILDLIFE

SPECIES		HABITAT						
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
BIRDS								
Acorn Woodpecker	Melanerpis formicvorus					X	X	X
Allen's Hummingbird	Selasphorus sasin		X			X	X	
American Goldfinch	Spinus tristis		X	X	X	X	X	
American Kestrel	Falco sparverius		X	X	X	X	X	
American Redstart	Setophaga ruticilla						X	
American Robin	Turdus migratorius		X	X	X	X	X	X
Anna's Hummingbird	Calypte anna		X			X	X	
Ash-Throated Flycatcher	Myiarchus cinerascens				X	X		
Bald Eagle	Haliaeetus lencocephalus					X	X	X
Band-Tailed Pigeon	Columba fasciata					X	X	X
Barn Owl	Tyto alba			X	X	X		
Barn Swallow	Hirundo rustica		X	X			X	
Bewick's Wren	Tryomines bewickii		X	X		X	X	X
Black-Backed Three-Toed Woodpecker	Picoides arcticus							X
Black-Billed Magpie	Pica pica			X		X	X	
Black-Capped Chickadee	Parus atrecapillus					X	X	X
Black-Chinned Hummingbird	Archilochus alexandri		X			X	X	
Black-Chinned Sparrow	Spizella atrogularis					X		
Black-Headed Grosbeak	Pheucticus melanocephalus		X	X			X	X
Black Phoebe	Sayopnis nigricans						X	
Black-Throated Cray Warbler	Dendrocia nigrescens						X	X
Black-Throated Sparrow	Amphispiza bilineata					X		
Blue Grouse	Dengraphapus obscurus					X	X	X
Blue-Gray Gnatcatcher	Polioptila caerulea					X		X
Brewer's Blackbird	Euphagus cyanocephalus	X	X	X		X	X	
Brown Creeper	Certifia familiaris					X	X	X
Brown-Headed Cowbird	Molothrus ater		X	X	X	X	X	X
Brown Towhee	Pipilo fuscus		X	X			X	X
Burrowing Owl	Speotyo cunicularia			X	X	X		

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT						
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
California Quail	Lophortyx californious		X	X	X	X	X	X
Calliope Hummingbird	Stellula calliope							X
Canyon Wren	Catherpes mexicanus					X		X
Cassin's Finch	Carpodacus cassinii					X	X	
Cedar Waxwing	Bombycilla cedrorum		X	X		X	X	
Chestnut-Backed Chickadee	Parus rufescens					X	X	X
Chipping Sparrow	Spizella passerina		X	X	X	X	X	
Cliff Swallow	Petrochelidon pyrrhonota		X	X			X	
Clark's Nutcracker	Nucifraga columbiana					X		
Common Bushtit	Psaltriparus minimus					X	X	X
Common Crow	Corax branchyrhynchos	X	X	X	X	X	X	X
Common Nighthawk	Chordeiles minor	X	X	X	X	X	X	X
Common Raven	Corax					X		X
Common (Red-Shafted) Flicker	Colaptes cafer		X	X		X	X	X
Common Yellowthroat	Geothlypis trachas		X				X	X
Cooper's Hawk	Accipter cooperi		X	X	X	X	X	X
Dark-Eyed Junco	Junco oreganus		X	X	X	X	X	X
Downy Woodpecker	Dendrocopus pubescens		X	X		X	X	X
Dusky Flycatcher	Empidonax oberholseri						X	
Eastern Kingbird	Tyrannus tyrannus		X	X		X	X	
Evening Grosbeak	Hesperiphona vespertina							X
Ferruginous Hawk	Buteo regalis			X	X	X		
Flammulated Owl	Otus flammeolus					X		X
Fox Sparrow	Passerella ilixa			X			X	X
Golden-Crowned Kinglet	Regulus satrapa					X	X	
Golden-Crowned Sparrow	Zonotrichia atricapilla				X	X	X	
Golden Eagle	Aquila chrysaetos				X	X	X	
Goshawk	Accipiter gentilis							X
Great Gray Owl	Strix nebulosa							X
Great Horned Owl	Bubo virginianus		X	X	X	X	X	X
Green-Tailed Towhee	Chlorura chlorura					X		
Hairy Woodpecker	Dendrocopus villosus		X	X		X	X	X
Hammond's Flycatcher	Empidonax hammondii							X
Harris' Sparrow	Zonotrichia querula				X	X	X	
Hermit Thrush	Hylocichla guttata		X				X	X
Horned Lark	Eromophila alpestris				X	X		
House Finch	Carpodacus mexicanus		X	X		X	X	
House Sparrow	Passer domesticus	X	X	X	X	X	X	X
House Wren	Troglodytes aedon		X	X		X	X	X
Hutton's Vireo	Vireo huttoni							X
Lark Sparrow	Chondestes grammacus				X	X	X	
Lazuli Bunting	Passerina amonena					X	X	
Lesser Goldfinch	Spinus psatria		X	X	X	X	X	
Lewis Woodpecker	Asyndesmus lewis					X	X	X
Lincoln's Sparrow	Melospiza lincolnii			X		X	X	X

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT						
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
Loggerhead Shrike	Lanius ludovicianus				X	X	X	
Long-Billed Marsh Wren	Telmatodytes palustris						X	
Long-Eared Owl	Asio otus					X	X	X
MacGillivary's Warbler	Opornis tolmici						X	X
Marsh Hawk	Circus cyareus			X	X		X	
Mockingbird	Mimus polyglottos		X	X	X	X		X
Mountain Bluebird	Sialia currucoides				X	X		
Mountain Chickadee	Parus gambeli					X	X	X
Mountain Quail	Oreortyx picta					X	X	X
Mourning Dove	Zenada macroura		X	X	X	X		
Nashville Warbler	Vermivora ruficapilla						X	X
Northern Oriole	Icterus bullockii		X				X	X
Northern Shrike	Lanius excubitor				X	X	X	
Northern Spotted Owl	Strix occidentalis (threatened[1])							X
Northern Three-Toed Woodpecker	Picoides tricactylus							X
Olive-Sided Flycatcher	Nuttallornis borealis							X
Orange-Crowned Warbler	Vermivora celata						X	X
Osprey	Fandion haciaeuts						X	
Peregrine Falcon	Falco peregrinus (endangered[1])				X	X		
Pigeon Hawk	Falco columbarius				X	X		
Pileated Woodpecker	Dryocopus pileatus							X
Pine Siskin	Spinus pinus					X	X	X
Plain Titmouse	Parus inornatus					X	X	X
Poor-Will	Carprimulgius carolinensis				X	X		
Prairie Falcon	Falco mexicanus				X	X		
Purple Finch	Carpodacus purpureus		X	X		X	X	
Purple Martin	Progne subis		X	X			X	
Pygmy Nuthatch	Sitta pygmaea					X	X	X
Pygmy Owl	Glaucidiium gnoma						X	X
Red-Breasted Nuthatch	Sitta canadensis					X	X	X
Red-Tailed Hawk	Buteo jamaicenis			X	X	X	X	
Red-Winged Blackbird	Agelaius phoeniceus		X	X	X		X	
Ring-Necked Pheasant	Phasianus colcicus		X					
Rock Dove (Domestic Pigeon)	Columba livia	X	X	X	X	X	X	
Rock Wren	Salpinctes obsoletus					X		X
Rough-Legged Hawk	Buteo lagopus			X	X	X		
Rough-Winged Swallow	Steligidopteryx ruficollis						X	
Ruby-Crowned Kinglet	Regulus calendula					X	X	

[1]See "Threatened or Endangered Oregon Wildlife" Chart

FISH AND WILDLIFE CHECKLIST, CONTINUED

HABITAT

SPECIES		COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
COMMON NAME	SCIENTIFIC NAME							
Ruffed Grouse	Bonasa umbellus						X	X
Rufous Hummingbird	Selasphorus rufus		X			X	X	
Rufous-Sided Towhee	Pipilo erythrophtha lmus		X	X			X	X
Savannah Sparrow	Passerculus sandwichensis					X	X	
Saw-Whet Owl	Aegolius acadicus					X	X	X
Say's Phoebe	Sayopnis saya				X	X		
Screech Owl	Otis asio		X	X		X	X	X
Scrub Jay	Aplelocoma coerulescens		X	X		X	X	X
Sharp-Shinned Hawk	Accipiter striatus			X	X	X	X	X
Short-Eared Owl	Asio flammeus			X	X			
Solitary Vireo	Viero solitarius						X	
Song Sparrow	Melospiza melodia		X	X	X	X	X	X
Starling	Sturnus vulgaris	X	X	X	X	X	X	X
Steller's Jay	Cynocitta steueri		X	X		X	X	X
Swainson's Hawk	Buteo swainsoni			X	X	X		
Swainson's Thrush	Hylocichla ustulata		X				X	X
Townsend's Solitaire	Myadestes townsendi				X	X		
Townsend's Warbler	Dendroica townsendi						X	X
Tree Swallow	Iridoprocne bicolor						X	
Tricolored Blackbird	Agelaius tricolor		X	X	X	X	X	
Turkey Vulture	Cathartes aura			X	X	X	X	X
Varied Thrush	Ixoreus naevius		X	X	X	X	X	X
Vaux's Swift	Chaetuda vauxi				X	X	X	X
Vesper Sparrow	Pooecetes gramineus				X	X		
Violet-Green Swallow	Tachycineta thallassina		X	X			X	
Warbling Vireo	Vireo gilvus						X	
Western Bluebird	Sialia mexicana				X	X		
Western Flycatcher	Empidonax difficilis						X	
Western Kingbird	Tyrannus verticalis				X	X		
Western Meadowlark	Sturnella neglecta		X	X	X	X	X	
Western Tanager	Piranga ludoviciana		X	X			X	X
Western Wood Peewee	Contopus sordidulus						X	
White-Breasted Nuthatch	Sitta carolinensis					X	X	X
White-Crowned Sparrow	Zonotrichia leucophrys		X	X	X	X	X	
White-Headed Woodpecker	Dendrocopus alrolavatus							X
White-Throated Sparrow	Zonotrichia albicollis		X	X	X	X	X	
Williamson's Sapsucker	Shyrapicus thypoideus							X
Willow Flycatcher	Empidonax spp.						X	
Wilson's Warbler	Wilsonia pusilla		X				X	

FISH AND WILDLIFE CHECKLIST, CONTINUED

HABITAT

SPECIES								
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
Winter Wren	Troglodytes troglodytes		X	X		X	X	X
Wrentit	Chamaea fasciata		X	X		X	X	X
Yellow-Bellied Sapsucker	Spyrapicus varius		X	X		X	X	X
Yellow-Breasted Chat	Icteria virens		X				X	
Yellow-Headed Blackbird	Xanthocephalus xanthocephalus			X	X		X	
Yellow-Rumped Warbler	Dendroica auouboni		X				X	X
Yellow Warbler	Dendroica petechia		X				X	
MAMMALS								
Ashland Shrew	Sorex triginirostris						X	X
Badger	Taxidea taxus			X	X	X		
Beechey Ground Squirrel	Otospermophilus beechyi		X	X	X	X	X	X
Big Brown Bat	Eptesicus fuscus		X	X		X	X	X
Black Bear	Ursus americanus					X	X	X
Black Rat	Rattus rattus	X	X	X			X	
Black-Tailed Hare	Lepus californicus			X	X	X		
Black-Tailed Deer	Odocoileus hemionus columbianus					X	X	X
Bobcat	Lynx rufus					X	X	X
Botta Pocket Gopher	Thomomys bottae		X	X	X	X	X	X
Broad-Handed Mole	Scapanus latinanus			X	X	X		X
Brush Rabbit	Sylvilagus bachmani		X	X			X	X
Bushy-Tailed Woodrat	Neotoma cinerea		X			X	X	X
California Meadow Vole	Microtus californicus			X	X		X	
California Myotis	Myotis californicus		X	X		X	X	X
California Red-Backed Vole	Clethrionomys californicus							X
Coast Mole	Scapanus orarius			X	X	X		X
Coyote	Canis latrans			X	X	X	X	X
Deer Mouse	Peromyscus maniculatus		X	X		X	X	X
Douglas' Squirrel	Tamiasciurus douglasi						X	X
Dusky-Footed Woodrat	Neotoma fucipes					X	X	X
Dusky Shrew	Sorex obscurus					X	X	X
Fisher	Martes pennanti							X
Fringed Myotis	Myotis thysanodes		X	X		X	X	X
Gray Fox	Urocyon cineregargenteus					X		
Great Basin Pocket Mouse	Perognathus parvus					X		
Golden-Mantled Ground Squirrel	Spermophilus bateralis					X	X	X
Gray Wolf	Canis lupis							X
Hairy-Winged Myotis	Myotis volans		X	X		X	X	X
Harvest Mouse	Reithrodontomys megalatis			X	X			

FISH AND WILDLIFE CHECKLIST, CONTINUED

HABITAT

SPECIES		COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
COMMON NAME	SCIENTIFIC NAME							
Heather Vole	Phenacomys intermedius							X
Heerman's Kangaroo Rat	Dipodomys heermanni					X		
Hoary Bat	Laziurus cinereus							X
House Mouse	Mus musculus	X	X					
Little Brown Myotis	Myotis lucifugus		X	X		X	X	X
Long-Eared Myotis	Myotis evotis		X	X		X	X	X
Long-Tailed Vole	Microtus longicaudus			X	X		X	
Long-Tailed Weasel	Mustela frenata			X		X	X	X
Marten	Martes americanis							X
Mazama Western Pocket Gopher	Thomomys mazama		X	X	X	X	X	X
Mexican Free-Tailed Bat	Tadarida brasiliensis		X	X		X	X	X
Montana Vole	Microtus montanus			X	X			
Mountain Beaver	Aplodontia rufa						X	X
Mountain Lion	Felis concolor					X		X
Northern Flying Squirrel	Glaucomys sabrinus						X	X
Northern Pocket Gopher	Thomomys talpoides							X
Norway Rat	Rattus norvegicus	X	X	X			X	
Opossum	Didelphis marsupialis		X	X		X	X	X
Oregon Vole	Microtus oregoni					X	X	X
Pacific Jumping Mouse	Zapus trinotatus				X		X	
Pacific Shrew	Sorex pacificus						X	
Pallis Bat	Antrozous pallidus		X	X		X	X	X
Pika	Ochotona princeps				X	X		
Pinyon Mouse	Peromyscus truei					X		
Porcupine	Erethizon dorsatum					X		X
Raccoon	Procyon lotor		X	X		X	X	X
Red Bat	Laziurus borealis		X	X		X	X	X
Red Fox	Vulpes fulva			X	X	X		
Red Tree Vole	Phenacomys longicaudus							X
Richardson's Vole	Microtus richardsoni			X			X	
Ringtail	Bassariscus astutus					X	X	X
Rocky Mountain Mule Deer	Odocoileus hemionus hemionus					X		X
Roosevelt Elk	Cervus canadensis roosevelti							X
Short-Tailed Weasel	Justela erminea			X		X	X	X
Shrew Mole	Neupotpichus gibbsii						X	X
Silver-Haired Bat	Lasionyoteris noctivagans		X	X				X
Small-Footed Myotis	Myotis leibii		X	X		X	X	X
Snowshoe Hare	Lepus americanus							X
Spotted Skunk	Spilogale putorius					X	X	X
Striped Skunk	Mephitis mephitis		X	X	X	X	X	X

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT						
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
Townsend's Big-Eared Bat	Plecotus townsendii		X	X		X	X	X
Townsend's Chipmunk	Eutamius townsendii		X			X	X	X
Townsend's Mole	Scapanus townsendii			X	X	X		X
Townsend's Vole	Microtus townsendii			X	X		X	
Trowbridges Shrew	Sorex trowbridgii							X
Wandering Shrew	Sorex vagrans					X	X	X
Western Gray Squirrel	Sciurus griseus		X	X			X	X
Western Jumping Mouse	Zapus princeps				X		X	
White-Footed Vole	Arborimus albipes							X
Yellow-Bellied Marmot	Marmota flavnentris			X	X	X	X	
Yellow-Pine Chipmunk	Eutamius ameonus					X	X	X
Yuma Myotis	Myotis yumanensis		X	X		X		
REPTILES								
Common Garter Snake	Thamnophis sirtalis		X	X		X	X	X
Common King Snake	Lampropeltis getulus			X	X	X	X	X
Gopher Snake	Pituophis melanolecus		X	X	X	X	X	X
Mountain King Snake	Lampropeltis zonata					X	X	X
Northern Aligator Lizard	Gerrmonotus coeruleus		X	X		X	X	X
Northwestern Garter Snake	Thamnophis ordinoides			X	X	X	X	X
Racer	Coluber constrictor		X	X		X	X	X
Ring-Necked Snake	Diadophis punctatus						X	X
Rubber Snake	Charina bottae					X	X	X
Sagebrush Lizard	Sceloporus graciosus					X	X	X
Sharp-Tailed Snake	Contia tenius						X	
Southern Alligator Lizard	Gerrmonotus multicarinatus		X	X		X	X	X
Striped Whipsnake	Masticophis taenipitus				X	X	X	X
Western Fence Lizard	Sceloporus occidentalis		X	X		X		X
Western Garter Snake	Thamnophis elegans		X	X	X	X	X	X
Western Rattlesnake	Crotalus viridis					X	X	X
Western Skink	Eumeces skiltonianus		X	X		X	X	X
AMPHIBIANS								
Black Salamander	Aneides flavipunctatus (undet.)		X	X	X	X	X	X
Bullfrog	Rana catesbeiana						X	
Cascades Frog	Rana cascadae						X	

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT						
COMMON NAME	SCIENTIFIC NAME	COMMERCIAL	RESIDENTIAL	AGRICULTURAL	GRASSLAND	SAVANNA	RIPARIAN	WOODLAND
Clouded Salamander	Ancides ferreus						X	X
Del Norte Salamander	Plethodon elongatus						X	X
Ensatina	Ensatina escholtli						X	X
Foothill Yellow-Legged Frog	Rana boylii						X	
Long-Toed Salamander	Macropactycum		X	X	X	X	X	X
Northwestern Salamander	Ambystoma gracie						X	X
Oregon Slender Salamander	Batrachoseps wrighti (undet.)							X
Pacific Giant Salamander	Dicamptodon ensatus						X	X
Pacific Tree Frog	Hyla regilla		X	X			X	X
Red-Legged Frog	Rana aurora						X	
Rough-Skinned Newt	Taricha granulosa		X	X			X	X
Siskiyou Mountain Salamander	Plethodon stormi (undet.)						X	X
Spotted Frog (Threatened)	Rana pretidsa						X	
Tailed Frog	Ascaphus truei (undet.)							
Western Toad	Bufo boreas		X	X		X	X	X

(Amphibians added under terrestrial habitats, May 31, 1976)

SECTION B: FISH AND AQUATIC (OR AQUATIC ASSOCIATED) WILDLIFE

SPECIES		HABITAT					
COMMON NAME	SCIENTIFIC NAME	RIPARIAN	INTERMITTENT	STREAMS	RIVERS	LAKES	PONDS
BIRDS							
American Coot	Fulica americana	X	X	X	X	X	X
American Widgeon	Maraca americana	X	X	X	X	X	X
Barrow's Goldeneye	Bucephala islandica				X		
Belted Kingfisher	Megaceryle alcyon	X					
Black-Crowned Night Heron.	Nycticorax nycticorax	X					

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT					
COMMON NAME	SCIENTIFIC NAME	RIPARIAN	INTERMITTENT	STREAMS	RIVERS	LAKES	PONDS
Black Tern	Chlidonias niger					X	
Blue-Winged Teal	Anas discors	X	X	X	X	X	X
Bonapartes Gull	Larus philadephia				X	X	
Bufflehead	Bucephala albeola			X	X	X	X
California Gull	Larus californicus	X	X		X	X	X
Canada Goose	Branta canadensis	X			X	X	
Canvasback	Aythya valisneria				X	X	
Caspian Tern	Hydroprogne caspia					X	
Cinnamon Teal	Anas cyanoptera	X	X	X	X	X	X
Common Goldeneye	Bucephala clangula	X		X	X	X	X
Common Merganser	Mergus merganser				X	X	X
Common Snipe	Capella gallinago	X	X				
Dipper	Cinclus mexicanus	X		X	X		
Double-Crested Cormorant	Phalacrocorax auritus				X	X	
Dunlin	Erolia alpina	X	X				
Eared Grebe	Podiceps caspicus				X	X	X
Forster's Tern	Sterna forsteri				X	X	X
Gadwall	Anas strepera	X	X	X	X	X	X
Great Blue Heron	Ardea herodias	X					
Great Egret	Casmerodius albus	X					
Greater Yellowlegs	Totanus melanoleucus	X	X				
Green Heron	Butorides virescens	X					
Green-Winged Teal	Anas crecca carolinensis	X	X	X	X	X	X
Hooded Merganser	Lophodytes cucullatus			X	X	X	X
Horned Grebe	Podiceps auritus				X	X	X
Least Sandpiper	Erolia minutilla	X	X				
Lesser Scaup	Aythya affinis				X	X	
Long-Billed Dowitcher	Limnodromus sclopaceus	X	X				
Long-Billed Marsh Wren	Telmatodytes palustris	X					
Mallard	Anas platyrhynchos	X	X	X	X	X	X
Northern Phalarope	Lobipes lobatus	X	X	X	X	X	X
Northern Shoveler	Anas clypeata	X	X	X	X	X	X
Osprey	Pandion haliactus	X					
Pectoral Sandpiper	Erolia melanotos	X	X				
Pied-Billed Grebe	Podilymbus podiceps				X	X	
Pintail	Anas acuta	X	X	X	X	X	X
Redhead	Aythya americana				X	X	X
Red-Necked Grebe	Podiceps griseqena				X	X	X
Red-Winged Blackbird	Agelaius phoeniceus	X					

FISH AND WILDLIFE CHECKLIST, CONTINUED

SPECIES		HABITAT					
COMMON NAME	SCIENTIFIC NAME	RIPARIAN	INTERMITTENT	STREAMS	RIVERS	LAKES	PONDS
Ring-Billed Gull	Larus delawarensis	X	X		X	X	X
Ring-Necked Duck	Aythya collaris				X	X	X
Ruddy Duck	Oxyura jamajcensis			X	X	X	X
Sanderling	Crocethia alba	X	X				
Semipalmated Plover	Charadrius semipalamtus	X	X				
Spotted Sandpiper	Actitus macularia	X	X				
Tricolored Blackbird	Agelaius tricolor	X					
Virginia Rail	Railus limicola	X					
Water Pipit	Anthus spinoletta	X					
Western Grebe	Aechmophorus occidentaus				X	X	X
Western Sandpiper	Ereunetes mauri	X					
Whistling Swan	Olor columbianus	X			X	X	
White-Fronted Goose	Anser albifrons	X	X		X	X	X
White Pelican	Pelecanus erythrorhynchus				X	X	
Wilson's Phalarope	Steganopus tricolor	X	X	X	X	X	X
Wood Duck	Aix sponsia	X	X	X	X	X	X
MAMMALS							
Beaver	Castor canadensis	X		X	X	X	X
Mink	Mustela vison	X		X	X	X	X
Muskrat	Ondatra zibethica	X		X	X	X	X
River Otter	Lutra canadensis	X		X	X	X	X
Water Shrew	Sorex palustris	X					
REPTILES							
Western Aquatic Garter Snake	Thamnophis couchi	X	X	X			X
Western Pond Turtle	Clemmys marmorata	X		X	X	X	X
AMPHIBIANS							
Black Salamander	Aneides flavipunctatus	X	X				
Bullfrog	Rana catesbeiana	X		X	X	X	X
Del Norte Salamander	Plethodon elongatus	X	X				
Ensatina	Ensatina eschscholtzi	X	X				
Long-Toed Salamander	Ambystoma macrodactylum	X	X	X			
Olympic Salamender	Rhyacotriton Olympias		X	X			
Pacific Giant Salamander	Dicamptodon ensatus	X	X	X	X	X	X
Pacific Tree Frog	Hyla regilla	X	X	X		X	X
Red-Legged Frog	Rana aurora	X		X			
Rough-Skinned Newt	Taricha granulosa	X	X	X	X	X	X
Siskiyou Mountain Salamander	Plethodon stormi	X	X				
Western Toad	Bufo boreas	X				X	X
Yellow-Legged Frog	Rana boylei	X		X			

POPULATIONS

The ODF&W annually reviews specific species within the big game, upland game, waterfowl, furbearer, and non-game categories, some of which are located in sensitive habitats. The following information has been taken from ODF&W local reports (Hostick, 1977, with March, 1978, update).

Black-tail Deer are considered to be numerous in the County, with the 1970 population estimated at 21,600. Deer have been generally on the increase since the severe winter of 1968-1969, but the long-range outlook is for a steady decline in deer numbers due to the loss of habitat. Deer are present in nearly all timbered or brushy habitat in the County, including lowland valleys and suburban areas. During winter months, deer on high elevation ranges move to "sensitive", lower elevation habitats (defined as mountainsides and foothill areas with southern exposure under elevations of 2,500 feet) and river and stream valleys.

Intense vegetation management practices which speed up or by-pass early plant successional stages such as brush spraying, and continued construction of houses and roads on low-elevation winter ranges severely affects habitat. Deer habitat areas have been decreasing while the number of hunters has been increasing yearly.

Compatible uses on deer winter ranges include regulated livestock grazing and certain forest management practices. Other uses which would have minimal impact on the habitat would include fencing, some clearing, and access roads, if closed from November to April. If deer winter range areas are developed for homesites the carrying capacity will be damaged. It is estimated that habitats are substantially affected at levels of development of one dwelling per 60 acres of range. The carrying capacity may be drastically reduced when development exceeds one dwelling per 40 acres. According to Gary Hostick (ODF&W), subdivision of previously undivided land (utilized by deer as winter range) into lots of 40 acres in size will result in a 50% decrease in deer population (estimated).

Roosevelt elk were introduced into the publicly owned, northwest portion of the County in 1967. An estimated 100 animals were present in the area in 1977, with increases occurring to fill still available habitat. Elk require a mixture of tall conifer trees, brush feeding areas, and meadows on summer and winter ranges (they may also utilize meadows). According to the

ODF&W, the future of elk herds in the County depends, primarily, on forest management activities carried out by agencies such as U.S. Forest Service and Bureau of Land Management. Summer and winter range areas include the upper and lower Galice Creek area, Briggs Valley-Taylor Creek area, and the Peavine Mountain area.

Compatible uses for elk range lands are similar to deer range lands. If elk winter ranges are developed for homesites, it is estimated that one dwelling per 320 acres will reduce the carrying capacity of 10 to 25 percent and one dwelling per 160 acres will reduce the carrying capacity by 25 to 50 percent.

Black bear were at a population of 1,200 in 1977, and Mountain lions remained stable at a population of 80. These two species are present in nearly all forested or brush habitat in the County, but prefer unpopulated, forested mountainous terrain. No sensitive habitat areas have been defined. Although the status of the animals is relatively static, the future of such populations in Josephine County is uncertain due to their intolerance of encroaching human activities.

The Department of Fish and Wildlife has inventoried various species of upland game and waterfowl, determining population levels as follows:

Ring-necked Pheasant	5,000	
Mourning Dove	624,400	(in migration)
Valley Quail	42,000	
Blue Grouse	12,600	
Ruffed Grouse	1,000	
Mountain Quail	18,100	
Western Gray Squirrel	7,000	
Band-tailed pigeon	100,000	(in migration)
Ducks (all)	1,500	
Coots	No Estimate	

According to the ODF&W, "quail, grouse, squirrels, and ducks have generally remained at a static level of relatively low numbers except for scattered areas of suitable habitat where a single species may be especially abundant. These animals should be recognized as a supplementary benefit on agricultural, floodplain, open, public and timber lands."

The Department of Fish and Wildlife has inventoried various species of furbearing animals. Populations are estimated as follows:

Beaver	1,012
Muskrat	23,010
River Otter	101
Mink	846

Coyote	12,859
Red Fox	150
Gray Fox	998
Bobcat	1,014
Raccoon	No Estimate

Coyote populations are apparently increasing within the County while other furbearers have remained at relatively static levels. Habitat requirements vary from these animals. Otter, mink, beaver, raccoon are associated with water areas; skunk, fox, bobcat and coyote with agricultural, foothill and mountain habitats. Furbearers are a supplementary benefit in these areas. Eagles, hawks and owls are classified as "raptors" (birds of prey), and they occur in low numbers only under the best of conditions. They are often subject to wanton killing by humans, and are generally intolerant of disturbances. Except for endangered species, population numbers and trends are not known. Numerous other birds, mammals, amphibians and reptiles (listed in Appendix) inhabit Josephine County and are not considered game animals. These non-game animals do not significantly affect land use decisions.

Special concern, however, is noted for species classed as endangered or threatened. For example, the American peregrine falcon, Northern bald eagle, Northern spotted owl, and Western spotted frog are endangered or threatened species in Josephine County. A list of endangered or threatened and undetermined status species within the County would include the following species:

THREATENED OR ENDANGERED OREGON WILDLIFE
IN JACKSON AND JOSEPHINE COUNTIES
(OREGON TASK FORCE, 1975)

Mammals - None

Amphibians and Reptiles - Western Spotted Frog (Rana pretiosa)

Birds - Peregrine Falcon (Falco pedegrinus anatum)
Northern Spotted Owl (Strix occidentalis cavrina)

Fish - None

WILDLIFE OF UNDETERMINED STATUS IN OREGON
(OREGON TASK FORCE, 1975)

Mammals - Ashland Shrew (Sorex trigonirostris)
Mexican Free-Tailed Bat (Tadarida braziliensis)
Red Fox (Vulpes fulves cascadensis and macrovara)
Ringtail (Bassariscus astutus raptor)
Marten (Martes americana subsp.)
Fisher (Martes pennanti pacifica)

Amphibians -
Oregon Slender Salamander (Batrachoseps wrighti)
Siskiyou Mountain Salamander (Plethodon stormi)
Black Salamander (Aneides flavipunctatus)
Tailed Frog (Ascaphus truei)

Reptiles - Sharp-tailed snake (Contia
Common King Snake (Lampropeltis getulus)

Birds - Goshawk (Allipiter gentilis atricapillus)
Sharp-shinned Hawk (Accipiter straitus velox)
Swainson's Hawk (Buted swainsoni)
Ferruginous Hawk (Buted Regalis)
Merlin (Falco columbarius bendirei)
Flammulated Owl (Otus flammeouls)
Burrowing Owl (Speotyto cunicularia hypugaea)
Great Gray Owl (Strix nebulosa)
White-Headed Woodpecker (Picoides albolarvatus albolarvantus)
Pileated Woodpecker (Dryocopus Pileatus Picinus)

Fish - California Roach (Hesperoleucus symmetrkus)

MANAGEMENT ALTERNATIVES

Humans need animals for a number of reasons, including aesthetic, spiritual, and recreational aspects. Protection of animal species is therefore, an integral part of man's responsibility. In order to maximize its carrying capacity of wildlife habitat in Josephine County, the following management alternatives have been recommended:

1. Deer winter ranges should be classified for forest uses.
2. Elk winter ranges, specifically the northwest portion of the County, should be classified for forest uses.
3. When rezoning, the County should consider carrying capacity figures for deer and elk winter range areas.

4. Unpopulated forested areas should be retained as public, open and timber lands.
5. Agricultural and floodplain areas should be restricted from intensive development.
6. Raptor nesting areas and trees should be protected and preserved.
7. Habitats of threatened species should be protected and preserved.
8. Streamside and pondside vegetation should be designated as floodplain or open spaces to protect waterfowl.
9. Dead or diseased trees that do not represent a danger to nearby dwellings or human habitat should be preserved to provide wildlife habitat.

FISHERY RESOURCES

SPECIES

Fish have naturally high rates of reproduction. "Given adequate spawning grounds, proper water conditions for hatching, adequate food, and enough weedy cover for protection, reproduction will produce increasing numbers of catchable fish...If the habitat is protected and improved, nature will supply the fish" (Dasmann, 1968). The following species occur in Josephine County:

SPECIES		HABITAT					
COMMON NAME	SCIENTIFIC NAME	RIPARIAN	INTERMITTENT	STREAMS	RIVERS	LAKES	PONDS
FISH							
Black Crappie	Pomoxis nigromaculatus			X	X	X	X
Bluegill	Lepomis macrochirus				X	X	X
Brook Trout	Salvelinus fontinalis			X	X	X	X
Brown Bullhead	Ictalurus nervlosus			X	X	X	X
Brown Trout	Salmo trutta			X	X	X	X
Carp	Cyprinus carpio			X	X	X	X
Chinook Salmon	Onchorhynchus tshawyscha			X	X		
Coho Salmon	Onchorhynchus kisutch			X	X		
Cutthroat Trout	Salmo clarki			X	X	X	X
Goldfish	Carassius auratus			X	X		X
Klamath Smallscale Sucker	Catostomus virniculous			X	X		X
Largemouth Bass	Micropterus salmoides			X	X	X	X
Pacific Lamprey	Lampetra tridentata			X	X		
Pumpkinseed	Lepomis gibrosus				X	X	X
Rainbow Trout	Salmo gairdneri			X	X	X	X
Redside Shiner	Richardsonius bacteatus			X	X	X	X
Reticulate Sculpin	Cetus perplexus			X	X		X
Sea-Run Cutthroat Trout	Salmo clarki			X	X		
Speckled Dace	Rhinichthys spp.			X		X	
Steelhead	Salmo gairdneri			X	X		
Three-Spined Stickleback	Gasterosteus aculeatus				X		
Tui Chub	Gila bicolor					X	
White Crappie	Pomoxis annularis			X	X	X	X

HABITAT

Early fish management programs throughout the United States showed that where habitat factors were reduced or limited, no amount of stocking would produce increased numbers of healthy, large fish. Fish management (as with wildlife), is primarily concerned with habitat protection.

The Rogue River basin supports some of the largest runs of anadromous salmonids (fish which migrate from fresh water streams to the ocean) on the West coast.

"These include summer and winter steelhead, spring and fall chinook, coho, cutthroat, shad and sturgeon, with an average of nearly 100,000 salmon and steelhead spawning here annually. In addition, about 124,000 adult salmonids use the Rogue and Applegate Rivers in Josephine County as highways to Jackson County spawning streams". (Jennings, 1977).

Table An-1 provides estimated numbers of adult salmonids annually spawning in the Rogue River Basin streams.

The following tables present information on fish population, distribution, and spawning periods. Table AN-2 identifies spawning and migratory periods while Table AN-3 lists and identifies spawning distribution and abundance of anadromous species by stream.

TABLE AN-1

Estimated number of adult anadromous salmonids annually spawning in Rogue River Basin stream systems 1/

Stream system	Chinook Spring	Chinook Fall	Coho	Chum	Steelhead Summer	Steelhead Winter	Sea-run Cutthroat
Rogue River (main stem and unlisted tributaries)	44,275	41,850	2,085	50	36,950	20,150	2,400
Lobster Creek	-0-	1,100	50	-0-	-0-	2,000	200
Illinois River	-0-	20,000	1,400	-0-	-0-	30,000	2,500
Applegate River	-0-	12,000	1,400	-0-	13,000	19,000	200
Bear Creek	25	-0-	25	-0-	300	2,000	-0-
Little Butte Creek	-0-	50	20	-0-	800	1,600	-0-
Big Butte Creek	1,200	-0-	20	-0-	200	750	-0-
Total	45,500	75,000	5,000	50	51,250	75,500	5,300

1/ Estimates by Oregon Game Commission biologists.

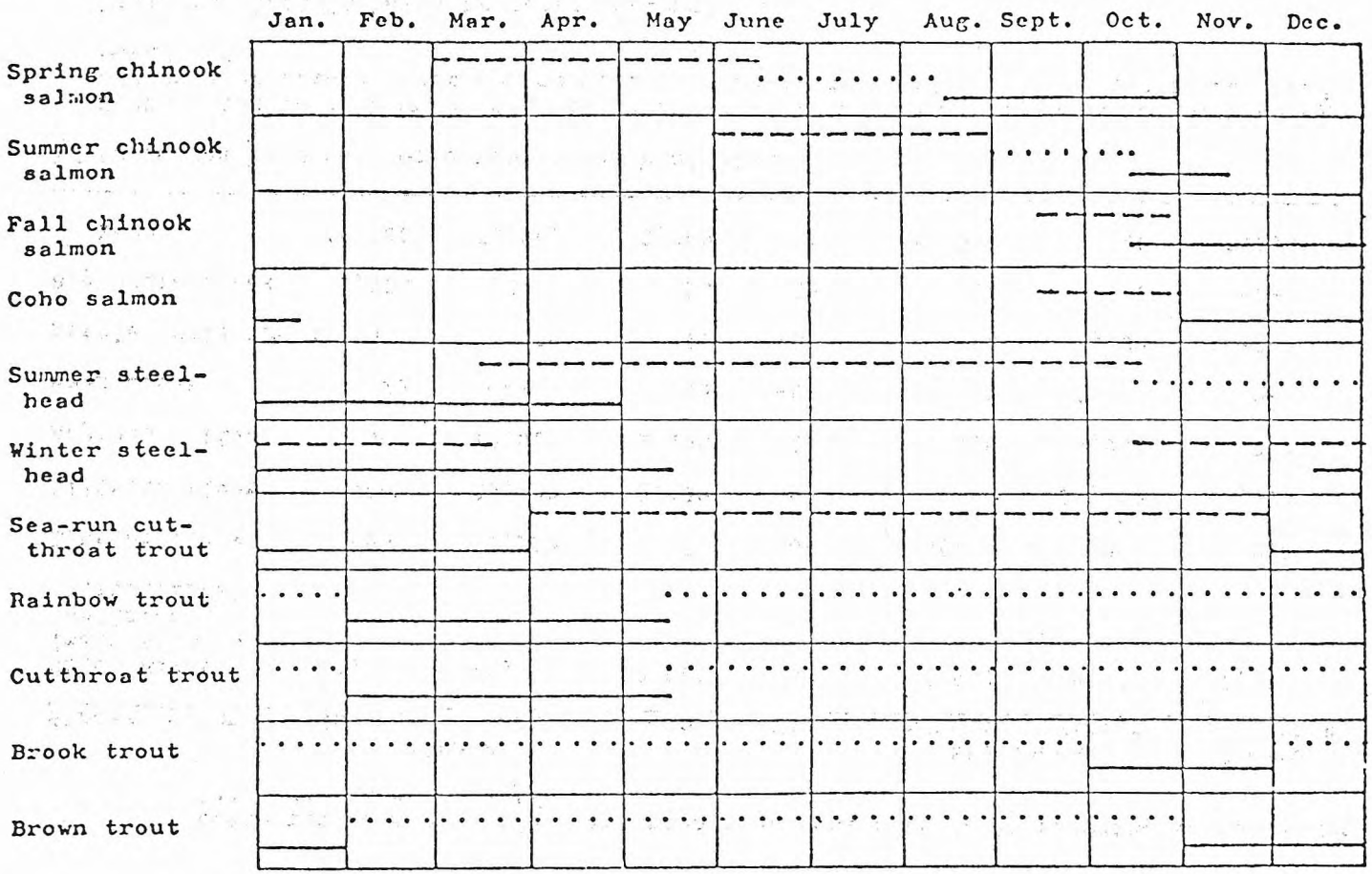
Numbers indicate spawning escapement of adult fish; total run would be computed by adding appropriate sport and commercial harvest data, plus runs of jacks and "half-pounders".

Estimates include hatchery contributions.

Approximately 100,000 "half-pounder" summer steelhead enter the basin each summer. The main stem Rogue and Illinois Rivers accommodate the majority of these fish.

TABLE AN-2

SPAWNING AND MIGRATION PERIODICITY, ROGUE BASIN



Dotted lines indicate presence of adult fish in the streams. Dashed lines denote migration period. Spawning occurs when indicated by a solid line.

TABLE AN-3

SPAWNING DISTRIBUTION AND ABUNDANCE
OF ANADROMOUS SPECIES BY STREAM

Stream	StS	StW	ChS	ChF	Co
Rogue River, section 2		3		1	2
Kelsey Creek		4			
Jenny Creek	4	4			
Big Windy Creek	4				
Bunker Creek	4				
Waters Creek	3	4		3	4
Salt Creek	4			4	
Bear Creek	4			4	
Butcherknife Creek	3				4
Ramsey Creek	4				
Cheney Creek	2			3	4
Little Cheney Creek	4				
Jackson Creek	4				
Murphy Creek	3			4	4
Grays Creek	3				
Board Shanty Creek	4				
Williams Creek		3		3	3
Powell Creek	3			4	4
Williams Creek, W. Fk.		4		4	4
Munger Creek	3	4		4	4
Righthand Fork	4	4			
Bill Creek	4				
Williams Creek, E. Fk.		4		4	4
Rock Creek	4				
Thompson Creek	4			4	
Sand Creek	3				
Allen Creek	3				
Gilbert Creek	4				
Fruitdale Creek	3				
Jones Creek	3	4			4
Illinois River				1	
Indigo Creek		3		3	
Silver Creek		2		2	
N. Fk.		2			
S. Fk.		2			
Klondike Creek		3			
Yukon Creek		4			
Pine Creek		4			
Clear Creek		4			
Nome Creek		4			
Labrador Creek		4			
Panther Creek		4			
Briggs Creek		3		3	4

TABLE AN-3 (CONTINUED)

Stream	StS	StW	ChS	ChF	Co
Soldier Creek	3			4	
Horse Creek	3				
Swede Creek	4			4	
Onion Creek	3			4	
Secret Creek	4			4	
Brush Creek	4				
Dutchy Creek	4				
Myers Creek	4				
Horse Creek	4			4	
Dailey Creek	4				
Howard Creek	4	3			
Rum Creek	4				
Whiskey Creek	4	4			
Whiskey Creek, E. & W. Fk.	4				
Grave Creek	3	3		4	4
Reuben Creek	4				
Rock Creek	4				
Poorman Creek	3				
Butte Creek	4				
Wolf Creek	3	3			
Coyote Creek	4				
Rat Creek	4				
Tom East Creek	4				
Galice Creek	4	4		4	4
Galice Creek, N. Fk.	3	4			
Blanchard Gulch	4				
Taylor Creek	4	4		4	4
Taylor Creek, S. Fk.	4	4			
Burned Timber Creek	4	4			
Lone Tree Creek	4	4			
China Creek	4				
Minnow Creek	4	4			
Stratton Creek	4	4			
Hog Creek	4				
Jumpoff Joe Creek	3	3		4	4
Quartz Creek	4				
Bummer Creek	4				
Louse Creek	3	4			4
Soldier Creek	4				
Harris Creek	4				
Bannister Creek	4				
Schoolhouse Creek	4				
Pickett Creek	4	4			
Shan Creek	4				
Slate Creek	4				

TABLE AN-3 (CONTINUED)

Stream	StS	StW	ChS	ChF	Co
Rogue River, section 3		3		1	3
Applegate River (mouth to Jackson		1		1	2
Slate Creek Co. line)	2	3		1	4
Round Prairie Creek	4				
Round Prairie Creek, R Fk	4				
Round Prairie Creek, S Fk	4				
Elliott Creek	3				4
Rancherie Creek		4			
Fall Creek		4			4
Sixmile Creek		4			
Deer Creek		1		2	3
Clear Creek		3		4	4
Anderson Creek		3		4	4
Draper Creek		4			
McMullen Creek		4			4
Thompson Creek		3			4
Crooks Creek		3			4
North Fork		4			
South Fork		3			
White Creek		4			
Josephine Creek		2		2	3
Canyon Creek		3			
Reeves Creek		4			
Holton Creek		4			
Illinois River, West Fork		1		1	
Woodcock Creek		4			
Mendenhall Creek		3		3	4
Rough & Ready Creek		3		3	4
North Fork		3		4	4
South Fork		3		4	4
Wood Creek		1		1	3
Fry Gulch		3		3	
Elk Creek		1		1	3
Trapper Creek		3		4	
Dwight Creek		4		4	
Whiskey Creek		4			
Parker Creek		4		3	
Illinois River, East Fork		1		1	
Chapman Creek		4			
Sucker Creek		1		1	3
Bear Creek		4			
Little Greyback Creek		3			
Bolen Creek		4			
Althouse Creek		1			4
Elder Creek		4			
Page Creek		4			

TABLE AN-3 (CONTINUED)

StS - summer steelhead
StW - winter steelhead
ChS - spring chinook
ChF - fall chinook
Co - coho

Number of Spawning Adult Salmonids

Class 1 - over 1000
Class 2 - 500-1000
Class 3 - 100-500
Class 4 - 0-100

A major problem facing fish managers is the deterioration of fish habitats from misuse and erosion. Forest mismanagement can increase sediment levels in creeks and streams; agricultural lands and mining operations in watershed areas can contribute heavily to the silting and chemical pollution of aquatic areas. Sewage from homes and industries can be dangerous to fish as basic pollutants and as mediums of increased production of detrimental algae or bacteria.

Other disturbances of fish habitat can occur through the construction of dams and inadequate fish ladders. Increase water temperatures and rechanneling, whether occurring naturally or artificially, can create detrimental, even fatal, situations for fish populations.

Sensitive aquatic areas for fish production are identified as lakes and reservoirs, rivers and streams, and usable headwater areas. The Department of Fish and Wildlife has identified sensitive areas as:

Lakes and Reservoirs:

Lake Selmac, Bolan Lake, Babyfoot Lake, Tannen Lake, East Tannen Lake, Fish Lake, Miller Lake, and numerous private ponds.

Headwater Areas (of particular concern):

Deer Creek, Grave Creek, Galice Creek, Sucker Creek, Jump Off Joe Creek, and Whiskey Creek.

Rivers and Streams (spawning areas for salmon, steelhead and trout):

Sections of the Rogue, Illinois and Applegate Rivers; Deer Creek, Elk Creek, Wood Creek, Sucker Creek and Slate Creek. (See Table AN-2.)

Protection of fish habitat is not, however, necessarily detrimental to, or restrictive of, human activities. The aquatic habitat can be protected while permitting most other desirable uses in the adjacent land area.

Development of roads, housing, timber harvests, land fills, recreation and other activities can be designed to cause minimal impact to the water environment and its immediate land perimeter. Examples of actions that could be taken to protect fishery resources include:

1. Construction in streamside vegetation zones (25 feet from stream edge where appropriate) should be minimal.
2. Streamside vegetation should be maintained on 85% of stream bank areas.
3. Channelization or diking, excessive removal of streamside vegetation and filling into stream channels, should be minimized and discouraged to maintain desirable stream integrity.
4. Buildings that would require protection from a meandering stream or flooding should be located outside of the stream corridor.
5. Specific gravel removal sites should be established on the Rogue, Applegate and Illinois Rivers.
6. Preventive measures should be undertaken to insure that present and future industries and high density residential areas do not impair water quality.
7. Special efforts should be made to improve streamside vegetation, esthetics and water quality in Jones, Skunk, Gilbert, Sand and Allen Creeks.
8. All Forest Practice Act rules and Fish Management policies established by State and Federal agencies should be followed.
9. Development and road construction in sensitive areas should be kept to a minimum and should insure soil stability and lessen erosion.

NATURAL AREAS

The State of Oregon became formally involved in setting aside natural areas in 1973 with the passage of the Oregon Natural Area Preserves Act. The State Natural Area Preserves Advisory Committee, authorized by the legislation and consisting of seven voting members, was appointed November 21, 1973. This committee secures information, coordinates the State's efforts in natural area preservation, and makes recommendations to the State Land Board (comprised of the Governor, Secretary of State, and State Treasurer) concerning establishment of specific preserves. The authority to establish preserves is vested in the State Land Board. The Natural Area Preserves Act stipulates that State Preserves are established for scientific and educational benefits, as well as to encourage the appreciation of natural features.

In cooperation with federal land management agencies, the State of Oregon has participated in analysis of statewide needs for representative ecologic units. Research Natural Areas are established not simply to preserve unique ecological features, but to insure a representative sampling of the ecologic associations of the State for scientific research. These areas, maintained in their natural condition and serving as "controls", permit comparative investigation of the effects of land management practices on disturbed sites.

Josephine County has been classified into two ecologic provinces (Forest Service, 1975). The first province is the Western Oregon Interior Valley, and the second is the Siskiyou Mountain Province. The general characteristics of these provinces and needs for establishing additional research natural areas were summarized by the Pacific Northwest Forest and Range Experiment Station (1975).

WESTERN OREGON INTERIOR VALLEYS PROVINCE

The Western Oregon Interior Valleys Province includes the valley bottoms and lowlands enclosed by the Cascade Range on the east and the Coast Ranges or Siskiyou Mountains on the west. The major units within the province are the Umpqua, Rogue and Willamette River valleys. Because of their location in the rain shadow of the Coast Range or the Siskiyou Mountains, the valleys are relatively warm, dry regions, especially in comparison with the remainder of western Oregon.

MAP NA-1

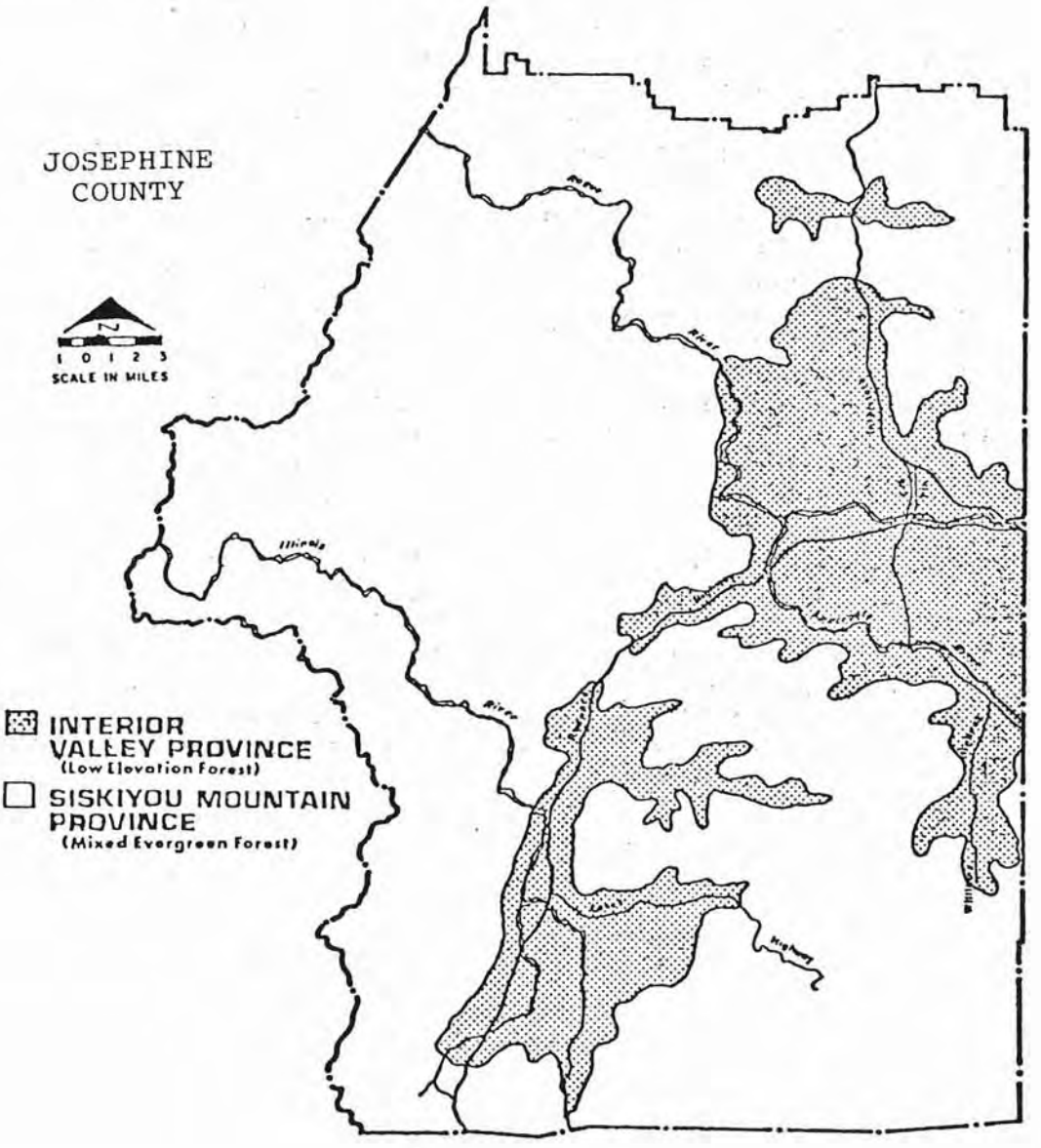


TABLE NA-2

ADDITIONAL RESEARCH NATURAL AREAS IDENTIFIED IN THE WESTERN OREGON INTERIOR VALLEYS PROVINCE

Ecosystem or Community	Remarks and possible locations	Priority[1]	Lead agency[2]
1. Mixed coniferous forest in the Rogue River Valley		High	BLM
2. Oregon white oak and oak-madrone forest mixed with grassland, Rogue Valley		High	BLM Private
3. California black oak in the Rogue River Valley		Medium	BLM
4. Chaparral (Ceanothus-Arctostaphylos) in the Rogue Valley	Possibly with oak or ponderosa pine	Low	BLM
5. Riparian woodland along a major stream in the Rogue Valley	To provide comparison with west-side riparian type	Medium	State BLM
6. Mineral spring in valley fringe area frequented by band-tailed pigeons		High	Private BLM
7. Valley bottom marsh in the Umpqua or Rogue Valley		High	BLM State Private
Natural areas for protection of rare or threatened species:			
8. Table Rock area north of Medford--for protection of rare plant species. Should include vernal ponds and stony flats	Located just north of Rogue River. Species to be protected include Pilularia americana, Limnanthes floccosa, and Mimulus tricolor	High	Private State County BLM

[1] Based mainly upon how endangered areas of that type are believed to be, not how extensive the type is, i.e., the danger that all examples of that type will be lost to other uses. Acquisition urgency.

[2] Agency or institution most likely to have or to be able to acquire a tract of the desired type based on land ownership.
BLM = Bureau of Land Management, FWS = Fish and Wildlife Service

SISKIYOU MOUNTAINS PROVINCE, SOUTHWESTERN OREGON

The Siskiyou Mountains Province is largely a region of extremely rugged, deeply dissected terrain. The ecosystems and biota are extremely diverse. Environmental complexity - bedrock geology, climatic gradients from the ocean across the range to the eastern slopes, physiography - added to a history of frequent, severe fires produces a unique array of ecosystems. Contributing to complexity are numerous plant and animal species which are a mixture of endemic types with Californian and northwestern species at their northern and southern limits, respectively.

Forest ecosystems predominate, with conifers dominant along the coast at higher elevations, and in some inland areas. The "mixed evergreen" forest of Douglas-fir with tanoak, Pacific madrone, and other evergreen hardwoods forms perhaps the most distinctive body of forested ecosystems. Serpentine areas have open forests or savanna communities of Jeffrey pine and other tree species. Other ecosystems include forests, brush fields, chaparral, knobcone pine stands, and mountain balds.

Streams and rivers are the most characteristic aquatic ecosystems, although small lakes, ponds, vernal pools, and bogs occur over a wide range of elevations and on both serpentine and normal rock types.

There are five Federal Research Natural Areas in the Siskiyou Mountains Province with three of these along the coastal margin of the mountains. Aside from Research Natural Areas, the Kalmiopsis Wilderness and several botanical (such as Big Craggies) and other special areas provide protection for many of the plants of special interest.

Addition of 24 Research Natural Areas should provide for minimal representation of all of the terrestrial, aquatic, and animal cells identified in the province; this number should also provide for representative populations of many of the plants of special interest. Ten of the Research Natural Area needs are mainly for terrestrial ecosystems, including two focused on unusual tree species--Baker cypress and Brewer spruce. The only Research Natural Area need in the region exclusively aimed at rare and endangered vertebrates

is a moist talus area in the Applegate River valley for two species of salamanders. Finally, two areas are identified to protect concentrations of special interest vascular plants.(PNW Range and Experiment Station, 1975)

TABLE NA-3

ADDITIONAL RESEARCH NATURAL AREAS IDENTIFIED IN THE SISKIYOU MOUNTAINS PROVINCE, SOUTHWESTERN OREGON

	Ecosystem or Community	Remarks and possible locations	Priority[1]	Lead agency[2]
	Combined terrestrial and aquatic natural areas:			
1.	Mixed evergreen forest (Douglas-fir-evergreen hardwoods) and major stream drainage	Proposed Store Gulch RNA or Dry Creek in Sixes River drainage	Medium	FS State
2.	Pacific ponderosa pine with Douglas-fir in the western Siskiyous	Myers Flat (Galice District, Siskiyou National Forest)	High	FS
3.	Canyon live oak type		Low	FS
4.	Riparian hardwood forest along a major west-side stream	Containing alder, big leaf maple, myrtle	Low	FS BLM
5.	Baker cypress (Cupressus bakeri)	In eastern Siskiyous near California border	Low	BLM FS
	Predominantly aquatic natural areas:			
6.	Low-elevation lake		High	BLM FS
7.	Mid to high-elevation lake (subalpine)		High	FS BLM
8.	Cave with large, cold springs	Near Oregon Caves	High	State Private
9.	Typical marsh area		High	State Private FS
	Natural areas for protection of plant species of special interest:[3]			
10.	Illinois River Valley including bog area--for protection of a large number of serpentine and serpentine bog plant species	Near Rough and Ready Creek. Species protected to include Erythronium howellii, Lilium rubescens, Cypripedium montanum, Isopyrum hollii, Viola occidentalis, Gentiana bisetaea, Castilleja elata, and Microseris howellii	High	FS
11.	Hobson Horn area--includes Sadler oak, Brewer spruce, and a variety of rare plants	Siskiyou National Forest, west of Galice. Species protected to include Sophora leachiana, Tauschia glauca, Tauschia howellii, and Sarcodes sanguinea	High	FS

[1] Based mainly upon how endangered areas of that type are believed to be, not how extensive the type is, i.e., the danger that all examples of that type will be lost to other uses. Acquisition urgency.

[2] Agency or institution most likely to have or to be able to acquire a tract of the desired type based on land ownership.
BLM = Bureau of Land Management, FS = Forest Service

[3] There are several outstanding sites with concentrations of special interest plants. Waldo, near O'Brien in Josephine County, has the largest group. "Hanging Bog" above Josephine Creek, Eight Dollar Mountain, and Limpy Creek are other major sites in Josephine County.

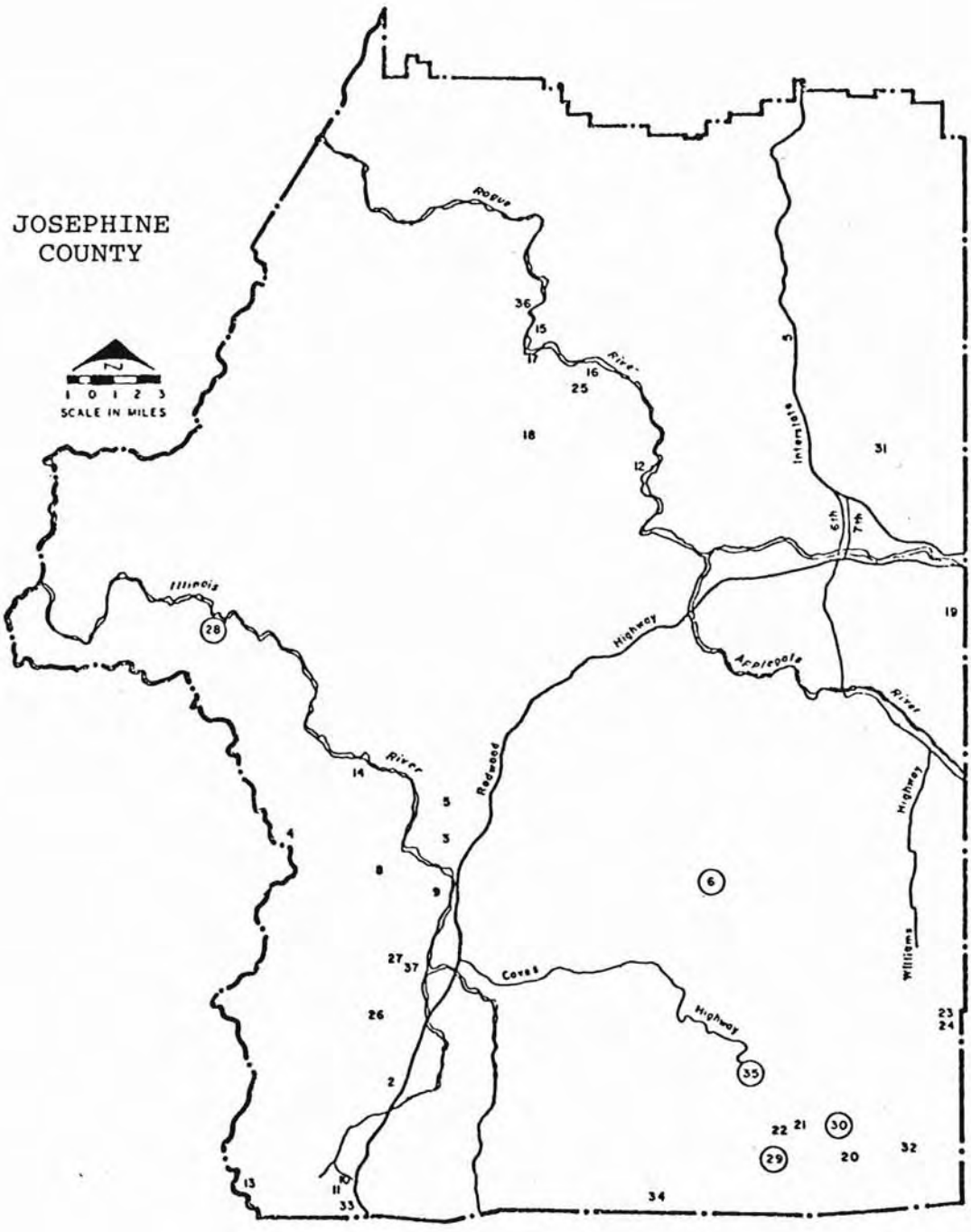
The Nature Conservancy, a non-profit organization established to encourage land preservation, conducted a natural areas survey of Josephine County in 1976 under a grant from the Oregon Department of Land Conservation and Development. While previous surveys of outstanding natural areas had been confined to federal and state lands, the survey conducted by the Conservancy was inclusive of the entire County. Special consideration was given by the Conservancy to serpentine bogs. The following list includes sites identified by the Nature Conservancy as containing outstanding natural characteristics.

LEGEND FOR PRECEDING MAP

(10) PROTECTED AREA 10 UNPROTECTED AREA

Site #	Name	Township	Range
1	Jumpoff Joe Creek	34S	6W
3	Rough & Ready Botanical Wayside	40S	8W
6	Eight Dollar Mountain	38S	8W
8	Onion Camp	38S	9W
9	Star Flat	38S	8W
(10)	Brewer Spruce Research Natural Area	39S	6W
11	Serpentine Mountain Lookout Bog	37S	8W
12	Days Creek Bog	38S	9W
13	Eight Dollar Road Bogs	38S	8W
15	Rock Creek Wildflower Area	40,41S	9W
16	Old Stage Coach Road Bogs	41S	9W
17	Everton Riffle Heronry	35S	7W
18	Siskiyou Pines	41S	10W
19	Store Gulch	38S	9W
20	Galice Old Growth	34S	8W
23	Hellgate Heronry	35S	7W
24	Galice Heronry	35S	8W
26	Pickett Creek	35S	8W
28	Savage Creek	36S	5W
30	Whiskey Peak	41S	5W
31	Fish Lake Forests	40S	5W
32	Bigelow Lakes	40S	6W
33	Little Humpy Peak	39S	5W
34	Humpy Mountain	40S	5W
35	Buckhorn Mountain	35S	7W
36	Woodcock Creek	39S	9W
37	Heronry and Bog West of Cave Junction	39S	8W
(38)	York Creek Botanical Area	36,37S	10W
(39)	Craggy Mountain Scenic Area	40S	6W
(40)	Miller Lake Botanical Area	40S	5W
42	Granite Hill Road	35S	5W
43	Steve Peak Grove	40S	5W
44	West Fork Illinois Bog	41S	9W
47	Bolan Lake	41S	6W
(48)	Oregon Caves National Monument	40S	6W
49	Rand Bend	34S	8W
50	Pomeroy Dam	39S	8W
51	Babyfoot Lake Botanical Area	38S	9W

MAP NA-4



IDENTIFIED NATURAL AREAS

○ PROTECTED SITE

SOUTHWEST OREGON SERPENTINE BOG ANALYSIS

Summary and Recommendations

Of the bog sites surveyed, only a few have the combination of quality, size, and protectability required of a Research Natural Area (RNA). The inland bogs other than those at Woodcock Creek and Eight Dollar Mountain are too small, too disturbed, or too accessible to allow adequate protection for research operations. Eight Dollar Mountain has outstanding potential because of the quality and diversity of the rare plants and both serpentine and non-serpentine upland vegetation. Woodcock Creek has springs and a stream, not found on Eight Dollar Mountain, as well as high quality upland vegetation. The RNA potential of these two areas will be evaluated this year, after the Woodcock Creek bog is surveyed. The small Cedar Creek bog will also be surveyed this year. The remainder of the site has outstanding vegetation plus rare plants not well represented at other serpentine sites.

(Excerpted from: Oregon Natural Heritage Program, 1977).

(See Forest Element for Interior Valley Forest Map)

The following bog descriptions have been excerpted from the Josephine County Data Summary of Oregon Natural Areas (Oregon Natural Heritage Program, 1977):

TABLE NA-5

BOG DESCRIPTIONS

	Description	Quality	Site Information
Josephine County JO-6 Eight Dollar Mountain Sec. 8,9,15,22,27-30,16 T38S, R8W Several bogs averaging 2-3 acres each; at least one is 10 acres. Private, BLM, State, USFS Unprotected	Eight Dollar Mtn. is a large, mostly peridotite and serpentine mass near Cave Junction between the Illinois River and Deer Creek. Its slopes harbor a number of small quality darlingtonia bogs. Two types of bogs are present: one type formed in depressions, where standing water is a factor, and the other on steeper slopes fed by springs, where there is no standing water. The climate differs from that at the Curry County bog sites in having less rainfall and greater temperature extremes. Common species include Narthecium californicum, Erodiaea hyacinthina, Scirpus criniger, Carex (2 spp.) Sisyrinchium bellum, Sanguisorba microcephala, Habenaria sparsiflora, and Rhodedendron occidentale. Species of concern include Cypripedium californicum, Rudbeckia californica var. glauca, and Darlingtonia californica.	All together the Eight Dollar Mtn. bogs represent the largest amount of darlingtonia bog in one site in the state. 2400 acres of the mountain, including many of the bogs, has been proposed for registration as a National Natural Landmark, primarily to recognize and protect the bogs, but also because of the high quality upland serpentine forest present. High diversity in species and in species composition is the hallmark of the bogs. No one of the bogs alone would cover the diversity or be large enough to withstand visitor pressure. The difficulties attendant with attempts to protect sufficient acreage to adequately cover the community and species diversity present are unknown.	Excellent bog diversity and quantity; high quality bog and upland vegetation; numerous species of concern. The 2400 acres proposed for National Natural Landmark status is unsurpassed for the variety of serpentine vegetation. Some grazing in past but little sign at present. Deer habitat. The mountain is also the original collection locality (Thomas Howell 1884) for at least one and likely three species of concern. Timber potential is low, but mining may be a threat.

TABLE NA-5 (CONTINUED)

Josephine County JO-36 Woodcock Creek Bog Sec. 36, T39S, R9W Sec. 31, T39S, R8W (bog) State and BLM Unprotected	At this time a complete description of the bog has not been made. The State Natural Area Preserves Advisory Committee visited this bog as well as the Josephine Creek bog and a couple of the lower Eight Dollar Mtn. bogs and considered it an excellent candidate. None of the weedy forbs found in many other bogs and little sign of other disturbances were observed. Further survey is needed to determine species composition and see if the graminoids reveal lack of disturbance, as have the forbs. Known species of concern are Darlingtonia californica and Cyprpedium californicum.	The bog needs comparison with the better hillside bogs on Eight Dollar Mtn. Many more rare plants are to be expected.	The State-owned Section 36 includes most of the headwaters of the small spring-fed Woodcock Creek several springs, excellent examples of moist dry serpentine vegetation, and at least two additional species of concern, Castilleja elata and Lomatium howellii. The Lomatium, a Siskiyou endemic, has been found at only one other site surveyed by ONHP. Mining may have occurred in the past, and a primitive road crosses Woodcock Creek near the bog. Present disturbance is minimal.

These bogs may be preserved for research and educational purposes in a state or federal natural area. A variety of other protection programs such as botanical areas, national natural landmarks, state registry of natural areas, open space designation, and protection techniques such as acquisition of conservation easements or development rights, critical area overlay zones, can be used to protect bog types and rare plants as well. (Oregon National Heritage Program, 1977)

PLANT SPECIES

The 1973 Endangered Species Act required consideration of plant species. To do so, our inventory must be developed and effort made to mention activities that may endanger them.

One of the common geographic deviations is bogs or marshy land. Thus, any time wet or low lands are addressed, consideration of this list should be made, and BLM and the State Land Board contacted.

In 1978, Joan Fevers of the Bureau of Land Management, Medford District, completed a Botanical Field Inventory. The following is a listing from this BLM study.

TABLE NA-6

PROPOSED ENDANGERED PLANTS IN JOSEPHINE PLANNING AREA FOUND ON BLM ADMINISTERED PUBLIC LANDS

1. Arabis modesta
2. Calochortus howellii
3. Cypripedium fasciculatum
4. Dicentra formosa var. oregana
5. Gentiana bisetaea
6. Sedum moranii

PROPOSED THREATENED PLANTS IN JOSEPHINE MASTER UNIT

1. Antennaria suffrutescens
2. Arabis aculeolata
3. Castilleja brevilobata
4. Cypripedium californicum
5. Darlingtonia californica
6. Erigeron bloomeri var nudatus
7. Erythronium oregonum
8. Lewisia cotyledon var howellii
9. Lewisia oppositifolia
10. Microseris howellii
11. Monardella purpurea
12. Sanicula peckiana
13. Schoenolirion bracteosum
14. Sophora leachiana
15. Thlaspi montanum
16. Vancouveria chrysantha
17. Viola lanceolata ssp occidentalis

PLANTS ON THE STATE PROVINCIAL LIST

1. Adiantyn hirdabuu
2. Allium amplectens
3. Allium falcifolium
4. Allium siskiyouense

TABLE NA-6 (CONTINUED)

5. Allium validium
6. Arabis breweri
7. Arnica cernua
8. Asarum caudatum var. viridiflorum
9. Calochortus uniflorus
10. Calypso bulbosa
11. Cypripedium montanum
12. Dentaria gemmata
13. Epilobium rigidum
14. Erythronium citrinum
15. Erythronium hendersonii
16. Fritillaria glanca
17. Fritillaria recurva
18. Galium ambiguum
19. Hemitomes congestum
20. Horkelia congesta
21. Iris bracteata
22. Iris innominata
23. Isoetes nuttallii
24. Leucothoe davisial
25. Lilium bolanderi
26. Lilium pardalinum
27. Minalus doglasii
28. Picea breweriana
29. Pleuricospora fimbriolata
30. Poa piperi
31. Quercus sadleriana
32. Rudbeckia californica
33. Sarcodes sanguinea
34. Trillium albidum
35. Trillium rivale
36. Viola ohallii
37. Woodwardia fimbriata
38. Zauscheria latifolia

WILDLIFE SPECIES (See Wildlife Chapter)

Animal habitats of special significance in Oregon are (Oregon Natural Heritage Program, 1977):

waterfowl wetlands

shorebird/marshbird habitat

great blue heron rookery

band-tailed pigeon mineral area

Several great blue heron rookeries are on the Programs Inventory for Josephine County.

Animals that are considered to be endangered, threatened, or of special interest in this region are (Oregon Natural Heritage Program, 1977):

American peregrine falcon

northern spotted owl

northern bald eagle

Siskiyou mountain salamander

sharp-tailed snake

western rattlesnake

American osprey

northern purple martin

red tree vole

Several of the Natural Areas inventoried in Josephine County contain suitable habitat for the above mentioned species.

PROTECTED AREAS

There are several protected natural areas in Josephine County. These are listed in the following table:

TABLE NA-7

PROTECTED NATURAL AREAS

Area	Administering Agency
Brewer Spruce Research Natural Area	BLM
Wild & Scenic Rivers	
Illinois	State
Rogue	Federal & State
York Creek Botannical Area	USFS
Craggy Mountain Scenic Area	USFS
Miller Lake Botannical Area	USFS
Kalmiopsis Wilderness	USFS
Babyfoot Lake Botanical Area	USFS
Oregon Caves National Monument	NPS

Research Natural Areas are protected by dedication through administrative procedures of a federal landowning agency. No legislation mandates establishment of RNA's--each landowning agency has the power to create or anull RNA's.

National Parks, Monuments, and Wilderness areas are created by acts of Congress.

WILDERNESS

According to psychological theory, pressure-laden urban living is producing a need for escape and respite to a less artificial environment. This amplified desire is resulting in increased usage of natural environments such as Wilderness areas for day-hiking, backpacking, camping, fishing, hunting, amateur botany, bird- and wildlife-watching, and spiritual renewal.

Many areas suitable for Wilderness classification are endowed with some timber and mineral resources potentially suitable for harvest and extraction. Because recreational/spiritual and economic needs and uses tend to be mutually exclusive, allocation of areas to the Wilderness system or to commodity production tend to be controversial. Both sides of the controversy will perhaps agree that the situation must be perceived from a holistic perspective, while reviewing long-term effects and human needs.

In 1964, the Congress of the United States created the National Wilderness Preservation System. The act defined wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain". Criteria for legally designated Wilderness Areas are:

1. Generally "natural in character--imprint of man substantially unnoticeable".
2. Outstanding opportunities for solitude or a "primitive, unconfined type of recreation".
3. At least 5,000 acres, or of a sufficient size to manage practically.
4. Areas may also contain ecological, geological, or other features of scientific, scenic, or historic value.

Logging, roads, permanent structures, and motorized vehicles are prohibited in Wilderness Areas.

A rare ericaceous plant (i.e., in the heath family; related to rhododendrons) called Kalmiopsis leachiana, or simply kalmiopsis, is found only in small areas in this region. Prior to 1964, a Kalmiopsis "Wild Area" was designated toprotect the kalmiopsis, as well as rare

serpentine and bog features. The Kalmiopsis "Wild Area" (77,000 acres at that time) was then included as one of the initial areas officially designated "Wilderness" after the 1964 Wilderness Act. The Wilderness was entirely outside of Josephine County at that time, though two of three primary access points were through this County. Additions to the Wilderness in 1978 from the Endangered American Wilderness Act have increased the acreage of the Kalmiopsis Wilderness to 179,000 acres, of which 43,000 acres are in Josephine County.

Usage figures for the original 77,000 acres are as follows:

Year	Visitor Days of Use*
1978	9700
1977	9200
1976	9200
1975	8300
1974	8700
1966	400

*Visitor-day: 1 visitor/12 hours

Source: Wood, Don. Recreational Officer - Siskiyou National Forest, Interview, 1979.

Use figures for the recent expansion area are not yet available.

The Endangered American Wilderness Act also created the Wild Rogue Wilderness in Curry County (just northwest of Josephine County).

RARE II

The Forest Service has recently completed the second Roadless Area Review and Evaluation, or "RARE II" process. This project entailed review of all significant roadless areas for allocation to Wilderness, Further Planning, or Non-Wilderness categories. Of the 17 areas involving 331,432 acres evaluated in the Siskiyou National Forest in Oregon, no areas are being recommended to Congress for Wilderness allocation. This is due primarily to the mineral and timber harvest potentials in these areas.

Descriptions of these areas are as follows (including two roadless areas in the County being evaluated by the Bureau of Land Management for Wilderness potential):

1. South Kalmiopsis (111,315 acres, about two-thirds in Josephine County). The Josephine County portion of this unit can be divided into three segments. First is the slope between the Kalmiopsis Wilderness Area, the Illinois River, Chetco Pass Road and Fiddler Mountain Road. The second area, known as the Canyon Creek-Josephine Creek area, is almost entirely serpentine deposits (nickel laterite) exist in the area. Finally, the Buckskin Peak-Rough and Ready Lake area, a highly scenic serpentine ridge, is included in this area. It is, however, bisected by a primitive road.

2. Briggs Valley (5,762 acres). This is a heavily timbered area with some serpentine and an attractive and popular creek running through it. It contains no significant peaks, and is surrounded by roads and logging encroachment.

3. Squaw Mountain (8,064 acres). This peak is surrounded by logging roads, and one road crosses through its center. It is heavily timbered except for a band of serpentine. The area highlights some good vistas.

4. North Kalmiopsis (113,632 acres, about half in Josephine County). Two areas in Josephine County can be identified. The first is a small portion of the slopes above the Illinois Canyon on either side of Briggs Creek. This area is mostly serpentine, with mineral potential. There are no outstanding peaks in the area, but portions of the area are visible from the Illinois River.

   The second, larger area consists mainly of the Silver Creek drainage. By way of description this area can be divided into three bands.

   The first band is the Flattop Chrome Ridge area of mostly serpentine, surrounded by roads, and has a high mineral potential. This band is quite small. The middle band is a wide strip of quartz-diorite with jagged peaks, outcroppings, and steep, rugged topography. Silver Falls is located in this band. Despite its topography, there is logging encroachment in some areas. The creek itself, due to its sheer cliffs, will remain inaccessible regardless of its designation. The remaining band is Dothan formation sedimentary rock,

5. Kangaroo (14,192 acres). This area contains the County's highest peaks, most of its alpine lakes and most of its snow country. It also contains two steelhead streams and much timber.

6. Brewer Spruce Natural Area (Approximately 2500 acres of BLM land). This tract includes lands between private, County and Forest Service ownership in the vicinity of Little Grayback and Kerby Peaks. It does not include Kerby Peak itself. This small area is exceedingly scenic, includes the highest peak visible from Grants Pass, and contains some excellent examples of old growth Brewer Spruce.

7. Zane Grey. Data on this area is not yet available from BLM. The County Forestry Department has estimated the area's acreage to be at least 20,000 acres along both sides of the Rogue River Canyon, east of the Wild Rogue Wilderness Area. Ninety percent of the unit is in Josephine County. It is comprised chiefly of Dothan formation sedimentary rocks and metamorphic schists, with small areas of Galice formation metavolcanics and serpentine.

   Except for the Rogue River Canyon, this is an area of gentle slopes. Prominent peaks such as Mount Peavine, Bear Camp, Nine-Mile Mountain and the extremely jagged Saddle Ridge are all outside the unit. There are some historic points of interest, including trappers' cabins and an old trail from Trappers Camp to the Rogue.

8. Red Buttes. This area is being evaluated for its wilderness potential. The area would include the high ridge between Tannen Mountain and Grayback Peak in Josephine County.

JOSEPHINE COUNTY RESPONSE TO RARE II

In its RARE II report to the Board of Commissioners, the County Forestry Department, recognizing the possibility of a need for added preservation through Wilderness designation in some areas, developed five criteria for evaluating roadless areas. This was based on the four-part definition of wilderness given earlier. The criteria are as follows:

1. Is the area really remote, or merely roadless?

2. Are similar ecological, scenic, etc., features already represented in nearby Wilderness Area?

3. If so, are the features more or less outstanding than those in existing nearby Wilderness Area?

4. If an area contains significant recreation, scenic, or scientific features, will Wilderness Area designation adequately preserve them?

5. If an area contains such features, what would be the economic and recreational sacrifice of Wilderness designation, of what magnitude, and on whose part? If the sacrifice is great, the priority of wilderness over non-wilderness would be based on the answer to question #2.

Thus, for instance, in evaluating Silver Creek, the area was judged to be quite scenic, wild, and one of the last remaining complete drainages of uncut, old-growth Douglas-fir in the County. However, on inspecting the area by following Bald Mountain Ridge, which forms the boundary of the Kalmiopsis Wilderness Area above Silver Creek, it was observed by the Forestry Department that the Kalmiopsis side contained old-growth timber identical to the Silver Creek side.

Furthermore, the Kalmiopsis side was determined to be more scenic because it was transected by the Illinois River and was surrounded by rocky pinnacles such as Granite Butte and the Big Craggies. Thus, withdrawal of the immense timber volume of Silver Creek from Siskiyou National Forest's timber inventory was viewed as unjustifiable.

The Josephine County Forestry Department, however, also urged extreme sensitivity in penetrating and harvesting the area. This must be done very gradually, with roads and harvest units kept small and designed for minimal visual impact.

The Forestry Department also urged protected status with buffers for Silver Creek (to protect water quality and fishery populations) in addition to the creation of a Research Natural Area around Silver Falls.

Regarding the North Siskiyous, the County noted that the Klamath-Siskiyou geological province is the largest ultramafic batholith in the United States, contains many rare tree and plant species, and is highly scenic. Thus, it is of national significance.

Because the County felt wilderness to be over-represented in the Klamath-Siskiyou region, and because of the fortuitous location of Oregon Caves National Monument within Josephine County, the County presented a plan to the Forest Service to preserve and manage the scenic highlights of the North Siskiyous in a manner other than by Wilderness designation (Josephine County, 1977). Specifically, the plan recommended creation of 13 Special Interest Areas encompassing the scenic highlights of the region. Three of these are in Josephine County--Grayback Peak, Miller Lake, and Tannen Lake. Management strategy within each area would vary according to its specific situation. Eight would have road access, five would not.

The County also felt that in some situations other means of designation, not involving acts of Congress, large acreage, and the full spectrum of Wilderness restrictions, could offer more appropriate protection than a Wilderness designation.

SOCIAL CHARACTERISTICS

The quantity and quality of growth are primary concerns of every planning process. Information regarding the population characteristics of an area is a keystone for determining the present and future needs of the populace. In Josephine County, where the rate of population increase exceeds that of the State of Oregon and the nation as a whole, there is an acute need for good planning to provide a safe and healthy environment.

POPULATION GROWTH

Josephine County was created as an act of legislature January, 1856, and blossomed to a population of 712 by 1858. The population maintained a slow but steady increase throughout the late 1800's and early to mid 1900's. During the first 70 years of this century, the population increased steadily from 7,517 people in 1900 to 35,744 people in 1970--an increase of 28,231 individuals. Since 1970, the County has realized a dramatic surge of growth that has produced a population gain of 20,254 people. This ten year increase is equal to 72% of the previous 70 year population gain!

TABLE S-1

JOSEPHINE COUNTY POPULATION GROWTH

YEAR	COUNTY POPU-LATION	% INCREASE	# INCREASE	CITY POPU-LATION	% INCREASE	# INCREASE	CITY AS % OF CO.
1900	7,517	---	---		---	---	30.0
1910	9,567	27.3	2,050	3,897	70.2	1,607	41.0
1920	7,655	-25.0	-1,912	3,151	-19.1	- 746	41.0
1930	11,498	50.2	3,843	4,666	48.1	1,515	41.0
1940	16,301	41.8	4,803	6,028	29.2	1,362	37.0
1950	26,543	62.8	10,242	8,116	34.6	2,088	31.0
1960	29,917	12.7	3,374	10,118	24.7	2,002	34.0
1970	35,746	19.5	5,829	12,271	21.3	2,153	34.0
1978	56,000	56.7	20,254	15,000	22.2	2,729	26.8
1980	58,885			15,032			

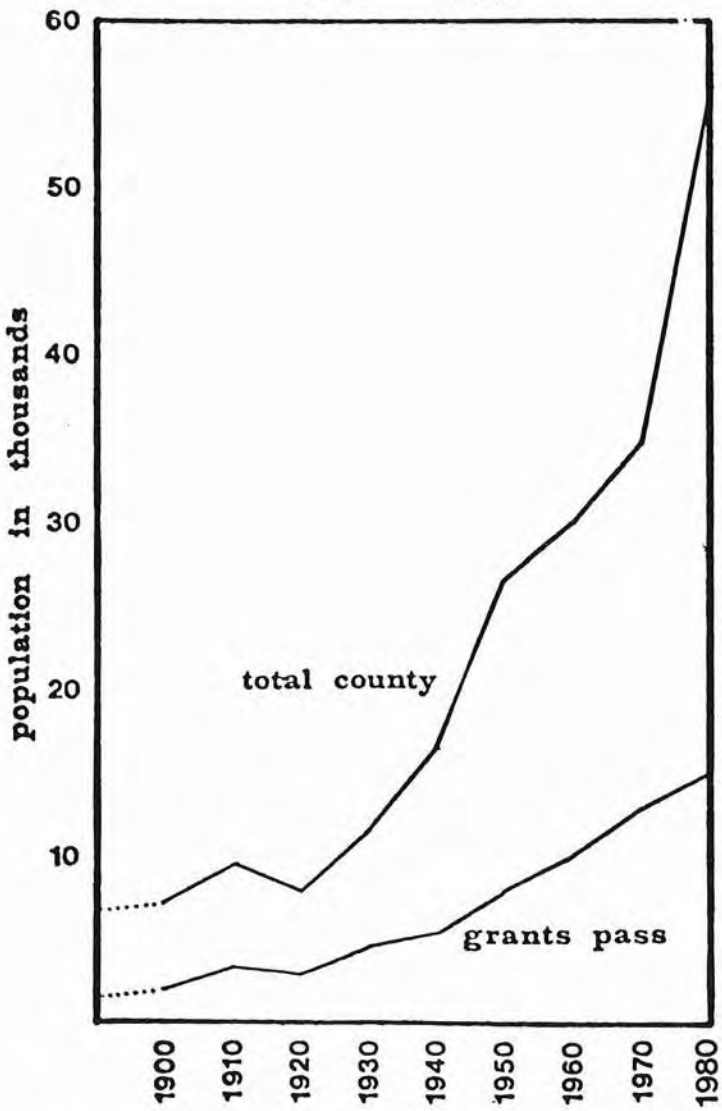
SOURCE: U.S. Bureau of Census. (The 1980 population estimate figure has been proposed by the County as the preliminary census figures show a population of 56,000.)

Population growth within the County has been closely related to local historic events. During the late 1800's and early 1900's, population growth is attributed primarily to mining activity, and therefore, fluctuated with the depletion of ore and the discovery of new sites. As the mining industry declined during the early forties, a new industry--logging--found its place in the County's economy. As a result of rapid industrial growth in the lumbering and wood products industry, Josephine County's greatest percentage of population change occurred during the late 1940's.

GRAPH S-2

JOSEPHINE COUNTY POPULATION GROWTH

1900 - 1980



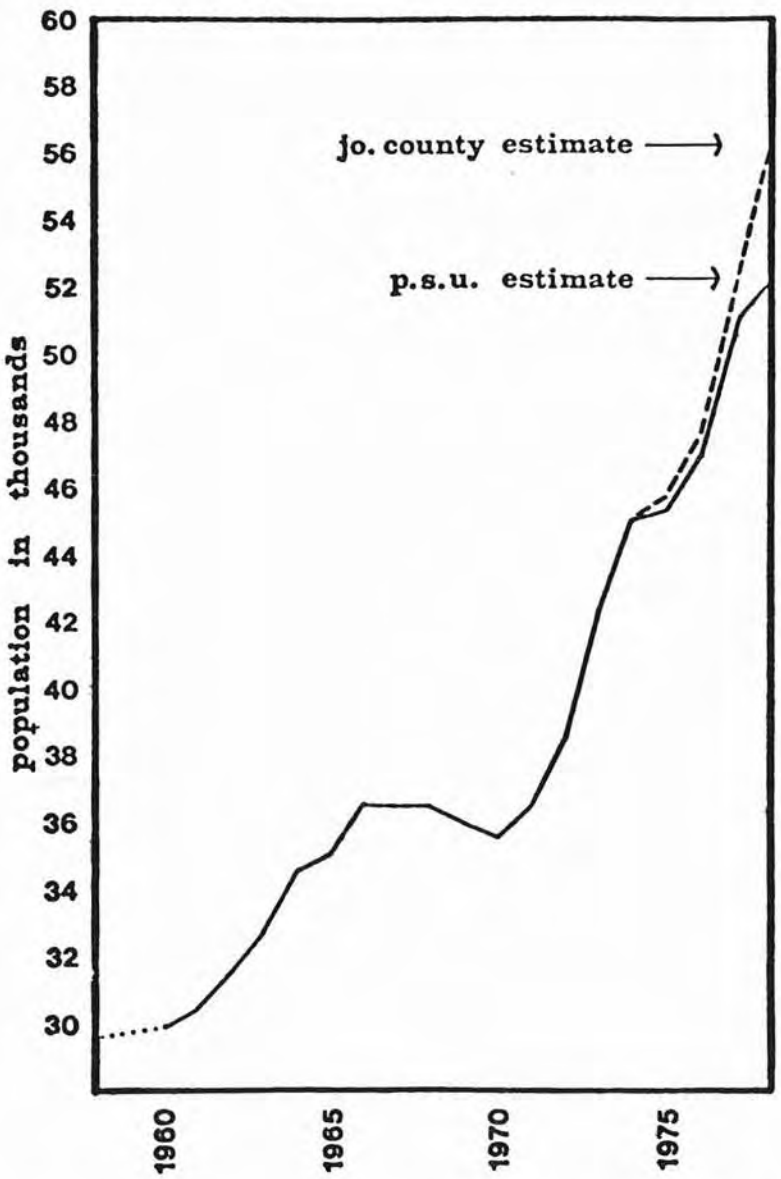
SOURCE: United States Bureau of Census.

The County's population continued to accelerate steadily to 1967, leveled off for about five years, and then began the dramatic surge of growth that has continued for the last eight years, slowing only for the 1974-75 recession years.

GRAPH S-3

JOSEPHINE COUNTY POPULATION GROWTH

1960 - 1978



SOURCE: U.S. Bureau of the Census provided figures for 1960 and 1970. Mid-decade projections were supplied by Portland State University.

POPULATION COMPARISONS

During the past 38 years, population growth rates for Josephine County have substantially exceeded those for both the State of Oregon and the United States. Only during the 1950 - 1960 period did the growth rate slow down.

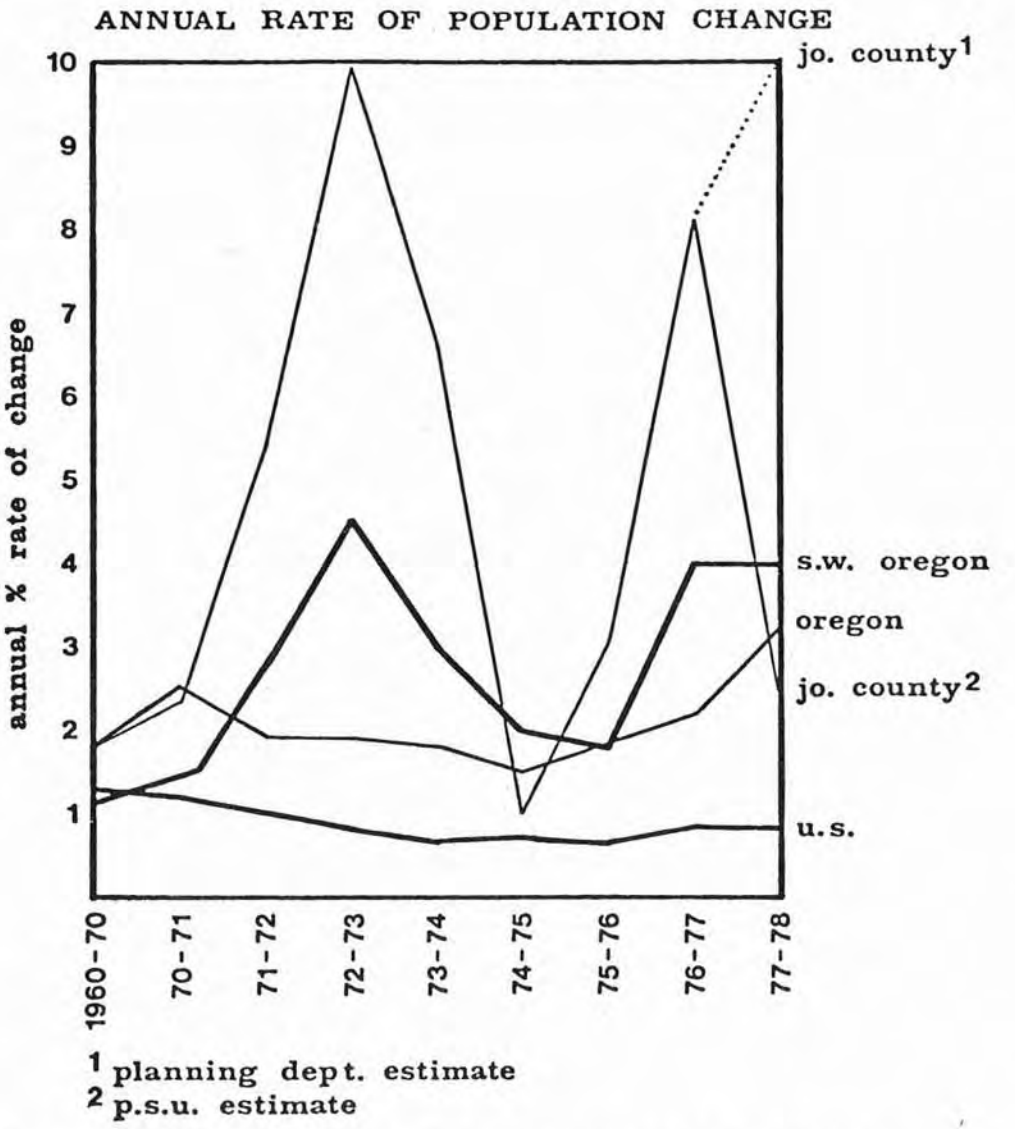
TABLE S-4

	Population Number				Percent Change		
	1940	1950	1960	1970	1940-1950	1950-1960	1960-1970
Josephine County	16,301	26,542	29,917	35,746	62.8	12.7	19.5
Oregon	1,089,684	1,521,341	1,769,361	2,091,385	39.6	16.3	18.2
U.S.	132,163,560	151,325,798	179,323,175	203,235,298	14.5	18.5	13.3

SOURCE: United States Bureau of the Census.

The dramatic population increases of the seventies maintain this historic comparison. Note, however, that the recession years of 1974-1975 are more clearly reflected in the Josephine County population than in that of Oregon or the United States as a whole.

GRAPH S-5



SOURCE: Bureau of Land Management, Final Timber Management Environmental Statement, 1978 from: U.S. Data: U.S. Bureau of Census, Current Population Reports, series P-25 (various), 1960 PC(1)·39C, and 1970 PC(1)·C39 State and County Data: Portland State University, Population Research and Census Center, estimates 1970 - 1978.

In comparison, Josehine County has recently been considered one of the fastest growing counties in Oregon, second only to Deschutes County.

TABLE S-6

OREGON COUNTIES POPULATION COMPARISON

	Estimate by County 1977	% of State Pop.	Change, 1976 to 1977	% of Change
STATE TOTAL	2,396,100		54,350	
BAKER	16,050	0.7	+ 100	0.6
BENTON	67,400	2.8	+1,800	2.7
CLACKAMAS	211,000	8.8	+5,200	2.5
CLATSOP	29,800	1.2	+ 300	1.0
COLUMBIA	33,300	1.4	+ 900	2.8
COOS	61,100	2.5	+ 900	1.5
CROOK	12,100	0.5	+ 150	1.3
CURRY	14,500	0.6	+ 200	1.4
DESCHUTES	46,800	2.0	+5,000	12.0
DOUGLAS	83,700	3.5	+2,100	2.6
GILLIAM	2,100	0.1	- 100	4.5
GRANT	7,500	0.3	+ 70	0.9
HARNEY	7,700	0.3	+ 200	2.7
HOOD RIVER	14,600	0.6	+ 150	1.0
JACKSON	118,500	4.9	+5,500	4.9
JEFFERSON	10,100	0.4	+ 200	2.0
JOSEPHINE	50,900	2.1	+3,900	8.3
KLAMATH	56,500	2.4	+1,000	1.8
LAKE	6,680	0.3	+ 60	0.9
LANE	252,500	10.5	+6,500	2.6
LINCOLN	28,700	1.2	+ 600	2.1
LINN	85,000	3.5	+1,600	1.9
MALHEUR	25,000	1.0	+ 400	1.6
MARION	177,000	7.4	+4,400	2.5
MORROW	5,550	0.2	+ 200	3.7
MULTNOMAH	556,400	23.2	+3,400	0.6
POLK	42,000	1.8	+ 600	1.4
SHERMAN	2,200	0.1	+ 10	0.5
TILLAMOOK	18,800	0.8	+ 200	1.1
UMATILLA	52,100	2.2	+2,100	4.2
UNION	22,600	0.9	+ 400	1.8
WALLOWA	6,900	0.3	+ 20	0.3
WASCO	20,400	0.9	+ 100	0.5
WASHINGTON	200,800	8.4	+4,800	2.4
WHEELER	1,920	0.1	- 110	5.4
YAMHILL	47,200	2.0	+1,500	3.3

SOURCE: Kohl, Socio-Economic Indicators, 1978.

TABLE S-7

POPULATION CHANGE BY DIVISION 1960 - 1970

DIVISION	1960 POPULATION	1960 % OF COUNTY POP.	1970 POPULATION	1970 % OF COUNTY POP.	% CHANGE
1. Granite Hill	2,133	7.13	2,119	5.93	-.66
2. Fort Vannoy	1,924	6.43	2,175	6.08	13.05
3. Grants Pass	10,118	33.82	12,455	34.84	23.10
4. Jerome Prairie	4,776	15.96	5,540	15.50	16.00
5. Fruitdale	4,292	14.35	5,379	15.05	25.33
6. Williams	1,028	3.44	1,314	3.68	27.82
7. Cave Junction	2,659	8.89	2,866	8.02	7.78
8. Cave Junction (City)	248*	.83	415*	1.16	67.34*
9. Wilderville	1,468	4.91	1,893	5.30	28.95
10. Merlin	1,519	5.08	2,005	5.61	31.99
TOTAL	29,917		35,746		19.48

SOURCE: U.S. Bureau of the Census data.
NOTE: *Cave Junction (City) is tabulated as part of the Cave Junction Division.

Portland State University Center for Population Research and Census has estimated the County's 1978 population to be 52,100. This is an estimate founded on the 1970 Census with yearly estimates determined through observation of various statistics which are related to population numbers, i.e. school attendance, medicare recipients, vehicle registration and voter registration. It is, however, understood that as the amount of time increases from the original base population figure, the deviation from accuracy also increases. The U.S. Bureau of the Census has determined that the 1980 County population is 56,000. However, based on the number of utility service connections, assessed dwelling units, and correlation to employment in the trade industry, the County has determined the 1978 population to be 56,000 and the 1980 population to be over 58,000. This issue is yet to be resolved.

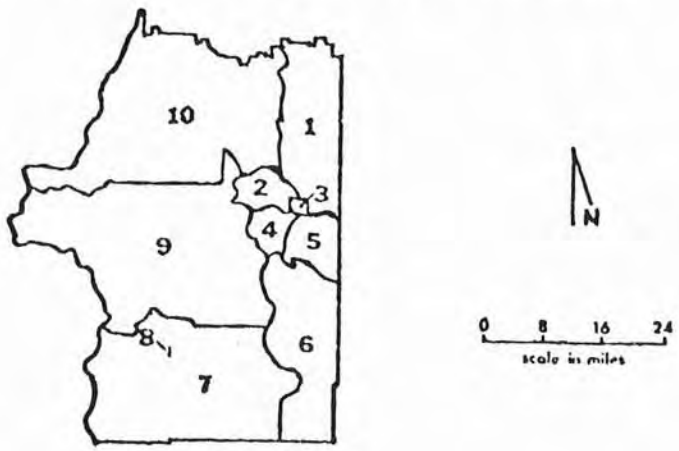
POPULATION DISTRIBUTION

The following County Census Division Map and Table indicate that a large portion of the County's population has been concentrated in or near Grants Pass for at least the last 20 years.

MAP S-8

JOSEPHINE COUNTY

CENSUS DIVISIONS 1960 and 1970



In 1960, map divisions 2, 3, 4, 5, and a portion of 1 encompass a population of approximately 22,100 people, or 73.9% of the County residents, located within approximately 8 miles of central Grants Pass. In 1970 these figures had increased to approximately 26,550 or 74.3% of the population located within approximately 8 miles of central Grants Pass.

Trends established during the 1960's and 1970's have continued with development centers being Grants Pass, Merlin, and Cave Junction. A rough estimate indicates that in 1978 approximately 78% of County residents were located within approximately 8 miles of central Grants Pass.

The population increases in the urban area are probably due largely to the availability of services, easy access to urban conveniences, proximity to places of work, terrain and the predominance of public land ownership surrounding the basin.

It is assumed that establishment of an Urban Growth Boundary for Grants Pass would further enhance the development of the urbanizing areas and consequently decrease the percentage of population in outlying areas. (See Chapter on Urban Growth Boundary.) This potential increase could, however, be offset by the stated preference of residents to live on rural size lots. The 1979 Consumer Attitude Research survey indicates that approximately 36% of existing residents would prefer a 2.5 acre or larger building lot. (See Tables S-25 and S-26 and the Housing Chapter.)

Statistics for 1980 are available only for Josephine County as a whole. District distribution figures will be discussed in a supplemental publication in late 1981.

At present the statistics in Table S-9 would appear to indicate that there is a decline in city residents. This is, however, an improper conclusion.

TABLE S-9

PERCENTAGE CHANGE IN POPULATION

1970 - 1978

	1970	1975	1978	% Change 1970-1978
Josephine County	35,746	45,600	56,000*	56.66
Grants Pass	12,271	13,400	15,000	22.24
as % of County	34.3%	29.4%	26.8%	
Cave Junction	415	650	840	102.4
Oregon	2,091,385	2,299,000	2,472,000	18.20

SOURCE: P.S.U. Center for Population Research and Census

*County Planning Department estimate.

Development of Grants Pass has been impacted by two basic situations. One restriction on further city expansion has been imposed by limited availability of facilities (see Chapter 12 on Public Facilities and Chapter 16 on Urban Growth Boundary). As facilities are expanded, it is expected that the city's land area would also be expanded. The second factor is basically psychological; the people moving to this area are interested in living a perceived rural lifestyle (see Housing Chapter).

The difference in percentage increase of growth between Cave Junction and Grants Pass graphically points out the varying impact rapid county growth rates can have on cities. This can be due to a number of factors, including amount of developable land within a city, annexations, services available outside each city, and cost factors in and outside the city.

AGE AND SEX CHARACTERISTICS

Differences in population composition for city and County are clearly demonstrated by 1970 census data for Grants Pass, Cave Junction, and Josephine County as a whole.

TABLE S-10

1970 CENSUS DATA - POPULATION

		CAVE JUNCTION		GRANTS PASS		JOSEPHINE COUNTY	
		NUMBER	PERCENT OF TOTAL	NUMBER	PERCENT OF TOTAL	NUMBER	PERCENT OF TOTAL
Population:		415	1.16	12,455	34.84	35,746	
By Sex:	Male	208	50.1	5,935	47.6	17,575	49.2
	Female	207	49.9	6,520	52.3	18,171	50.8
By Race:	White	411	99.0	12,354	99.2	35,400	99.0
	Black	0	0.0	6	0.0	8	0.0
	All Other	4	1.0	95	0.8	338	0.9
By Age:	0-5	28	6.8	1,099	8.8	3,050	8.5
	6-17	81	19.5	2,683	21.5	8,503	23.8
	18-24	37	8.9	1,026	8.2	2,582	7.2
	25-44	66	15.9	2,445	19.6	7,362	20.6
	45-64	123	29.6	2,883	23.1	8,721	24.4
	65 and Over	80	19.3	2,319	18.6	5,528	15.5
Median Age (In Years)		43.8		36.8		35.3	

SOURCE:League of Oregon Cities, 1972

The following chart reveals three important trends which occurred in Josephine County during 1950-1970. First, the national decline in birth rates was clearly reflected in the percentage decline in the age 0-4 category. Second, in Josephine County, and even more conspicuously in Grants Pass, the age 65 and over group grew at a far greater rate than that for the state. Third, the working population, age 15-24, increased more slowly for Josephine County than for the state, whereas the working population, age 25-44, decreased more rapidly within the County as compared to the state rate.

TABLE S-11

JOSEPHINE COUNTY AGE CHARACTERISTICS

1950 - 1970 (%)

Age Groups as % of Total Population

	0-4	5-14	15-24	25-44	45-64	65+	Median Age
Grants Pass:							
1950	9.6	15.0	12.1	28.9	21.1	13.3	34.0
1960	9.3	19.3	11.5	23.5	21.5	14.9	34.5
1970	7.5	17.0	14.1	19.6	23.1	18.6	36.8
Josephine County:							
1950	10.2	17.4	12.2	28.2	22.5	9.4	32.6
1960	11.6	18.4	11.8	23.0	23.0	12.3	33.1
1970	6.9	19.3	13.4	20.6	24.4	15.5	35.3
1977	8.2	15.5	16.2	20.0	23.3	16.8	-.-
Oregon:							
1950	9.9	16.6	13.3	30.1	21.4	8.7	31.6
1960	---	---	12.8	24.8	21.2	10.4	30.8
1970	7.8	19.4	17.5	23.0	21.4	10.8	29.0

SOURCE: U.S. Census. *Oregon Employment Division, Research and Statistics, 1978.

Considering the tremendous surge of growth experienced during the 1970's, the following table has been included.

TABLE S-12

JOSEPHINE COUNTY
AGE CHARACTERISTICS
. . .
Population

AGE COHORTS	APRIL 1, 1970	JULY 1, 1975	JANUARY 1, 1977 (Projected)	%	CHANGE 1970 - 1977 #	%
0-4	2483	3723	3967	8.2	+1484	+59.8
5-9	3125	3068	3270	15.5	+145	+4.6
10-14	3745	3982	4247		+502	+13.4
15-19	3098	4573	4875	10.0	+1777	+57.4
20-24	1684	2816	3002	10.3	+1318	+78.3
25-29	1806	1873	1996		+190	+10.5
30-34	1821	2508	2673	10.8	+852	+46.8
35-39	1777	2424	2583		+806	+45.4
40-44	1958	2333	2486	10.6	+528	+27.0
45-49	2178	2487	2651		+473	+21.7
50-54	2075	2745	2925	11.7	+850	+41.0
55-59	2275	2589	2760		+485	+21.3
60-64	2193	2786	2970	6.1	+777	+35.4
65-69	1946	2636	2808	16.8	+862	+44.3
70-74	1560	2207	2351		+791	+50.7
75+	2022	2850	3036		+1014	+50.1
TOTAL	35746	45600	48600	100.0	+12854	+36.0

NOTE: 1970 data are derived from the U.S. Census of Population for Oregon. Estimates for 1975 and 1977 were developed by the Oregon Employment Division, Research and Statistics section, and are consistent with the area totals published by the Center for Population Research and Census, Portland State University, Portland, OR.

In comparison the 1977 percentage of people 0-24 years of age has fluctuated; however, actual numbers have greatly increased. The 25-64 age group has remained relatively constant (declining very slightly) and the 65 and over population has continued to increase. Table S-12 indicates that the greater population increases since 1970 have occurred in the 15-24 age group--including the high school student, college student and young worker.

The age composition of Josephine County is indeed unique in that it has a very high percentage of people over age 60. Within Oregon, 15.4% of the total 1977 population is age 60 or older. In Josephine County, this statistic jumps to 22.9% of the population being age 60 or older. The "senior citizen" play a definite role in the social make-up of this County.

The majority of Josephine County residents, approximately 98% of the population, are caucasian. The remaining 2% minority population is primarily Spanish American and American Indian.

Further, the population is sexually balanced, consisting of an approximately equal number of men and women with 50.8% of the population being female.

TABLE S-13

1970 COUNTY POPULATION BY RACE AND SEX

Minority Status	Number		Percent Distribution		
	Total	Female	% Female	Total	Female
Total	35,746	18,171	50.8	100.0	100.0
White	35,400	17,988	50.0	99.0	99.0
Black	8	4	50.0	0	0
American Indian	235	119	50.6	0.7	0.7
Oriental	79	46	58.2	0.2	0.3
Other Races	24	14	58.3	0.1	0.1
Spanish-American	628	321	51.1	1.8	1.8
Minority Group*	974	504	51.7	2.7	2.8

1/ Includes American Indian and Oriental.

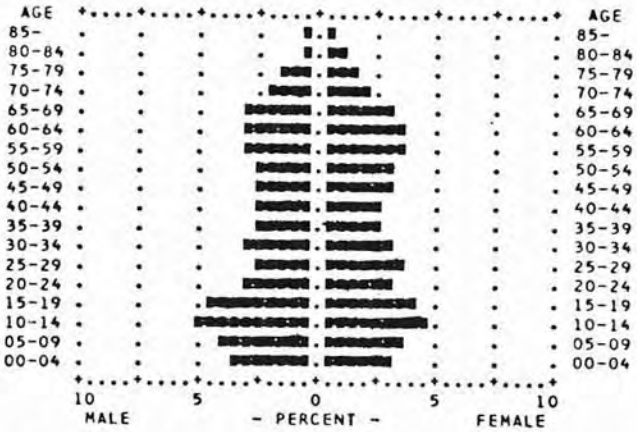
Notes: NA=Not Available.
*Sum of Spanish American and all races except white. Some duplication possible since Spanish-American may include nonwhite races as well as white.

Sum of individual items may not equal totals because of rounding.

SOURCE: Census of Population 1970.

TABLE S-14

1977 COUNTY POPULATION BY AGE AND SEX



SOURCE: Kohl, Socio-Economic Indicators, 1978.

HOUSEHOLD SIZE

As with population projections, there is considerable discrepency as to what is the actual household size within Josephine County. In 1960, the average household size in Oregon was 3.09 while Josephine County's average was 3.02. The state figure had decreased to 2.94 by 1970 and the County's had declined to 2.90 (U.S. Census and Oregon State Housing Division).

The State Housing Division has estimated the July 1978 household size in Jospehine County to be 2.81 and projects a further decline to an average to be 2.81 and projects a further decline to an average of 2.73 by 1980. This reflects the Bonneville Power Administration's 1979 household size estimate for Oregon of 2.72 people. Preliminary estimates from the Bureau of Census indicate a 2.65 household size for 1980.

The BPA estimates there will be 2.47 persons per household for Oregon in 1995.

TABLE S-15

ESTIMATED AVERAGE HOUSEHOLD SIZE

	1960	1970	1980	1995
Josephine County	3.02	2.90	2.65	2.47
Oregon	3.09	2.94	2.70	2.47

SOURCE: Josephine County Planning Department, 1980.

A recent market survey of the area in an around Grants Pass (Grants Pass, Redwood, Fruitdale/Harbeck, Jerome Prairie, North Valley and Colonial Valley) indicates the actual percentage of households of a specific size.

TABLE S-16

PERSONS PER HOUSEHOLD

(Grants Pass and Vicinity)

One Person	11.6%
Two People	41.7%
Three People	16.5%
Four People	18.1%
Five or More	11.8%
No Answer	1.0%
Average Household	2.81 people

SOURCE: Consumer Attitude Research, Attitude and Awareness Study for Grants Pass, 1979.

Whereas this indicates a majority of two person households, a large percentage (34.6%) of three and four person households exist.

In association with this, it is to be expected that most households would have no children. Again the survey showed this to be true.

TABLE S-17

CHILDREN PER HOUSEHOLD

(Grants Pass and Vicinity)

None	56.5%
One	15.9%
Two	17.5%
Three	6.6%
Four	1.9%
Five or More	.7%
No Answer	.9%

SOURCE: Consumer Attitude Research, 1979.

BIRTHS AND DEATHS

A very small percentage of the population increase in this County has been due to natural increase over the last 10 years. The following table indicates that in 1977, the County had more live births, but also had more deaths than the state average.

TABLE S-18

BIRTHS AND DEATHS - 1977

		LIVE BIRTHS		UNWED MOTHERS		INFANT DEATHS		ALL DEATHS	
	POPULATION	NUMBER	/1000*	NUMBER	/1000*	NUMBER	/1000*	NUMBER	/1000*
State	2,396,100	37,467	15.6	4,596	122.7	453	12.1	20,457	8.5
Josephine County	50,900	826	16.2	105	127.1	10	12.1	549	10.8

SOURCE: Oregon State Health Service, Oregon Vital Statistics, 1978.

* rate per 1000 population.

The chart shows that in 1977, the natural increase of Josephine County was approximately 316 people. Statistics, however, show a 1977 population increase of approximately 3,000 people. Obviously, migration has a significant impact on the population of Josephine County.

MIGRATION

Migration has played a major role in the 1970-1979 population increase. Using statistics for 1970-1977, the Bureau of Governmental Research and Service has subtracted the crude death rate of 3,528 from the crude birth rate to determine a natural increase of 1,312 people in Josephine County. By subtracting this from the Portland State University estimated population of 50,900 the Bureau has determined that 91.5% of Josephine County's net population increase from 1970 to 1977 has been due to in-migration. Kohl (1978) has also determined that in 1976-1977, 92.9% of the net population increase was due to migration.

Using the same process, but working with the County's 1980 population projection of 56,000, it has been determined that from 1970 through 1980, this County acquired 92.11% of its population through in-migration. Correspondingly, in 1976-77, 68.7% of the state's net population increase was due to in-migration.

SOCIAL DISRUPTIONS

Any characteristic or situation that causes a change in "normal" social behavior is defined as social disruption. This can include situations such as divorce, alcoholism, crime, physical or mental disability, lack of education and general low income.

An attempt will be made to cover these subjects lightly at this time to present a more complete picture of the social element. A majority of these items will, however, be more fully discussed in other chapters, notably Social Services, Law Enforcement, Economics, Housing and Education.

EDUCATION

Working from the 1970 census, statistics show that 2.2% of the County's adults have a 4th grade education or less; 26.9% have an 8th grade education or less; and 49.6% have not finished high school. The average educational level of the County is approximately 12.1 years of education, with women having an average 12.3 years of education. The County's average years of education is equal to the state's 12.1 year average and is consistent with national levels.

MARRIAGE

The average rate of marriages appears to be consistent with the state average with 8.2 people per thousand population (415 couples) being married in 1977. Unfortunately, this area has a high rate of divorces and annulments; in 1977, 407 couples dissolved their marriages. Accordingly, in 1977 Josephine County had the sixth highest rate of divorce within the state. Potentially, these divorces would create single parent households, monetary difficulties and other social disruption.

HEALTH

Kohl (1978) estimates that 10.8% of the population are physically "at risk", meaning partially or completely limited in their ability to carry on activity. He also estimates that 21% are "at risk" for developmental disablement, 2.2% "at risk" for alcohol and drug dependency and 2.9% "at risk" for personal and interpersonal maladjustment problems. Further, a large percentage of assault, child abuse, and other crimes have been shown to be alcohol related.

INCOME

The 1970 census shows that 16.6% of the County was at or below the poverty level. In 1977, Josephine County: 1) had by far the highest rate (8.4% of County population) of aid to dependent children within the state, 2) had the highest rate (10.6%) of food stamp recipients within the state, and 3) as could be expected, had the second highest percentage of poverty population within the state.

It is interesting to note that 30% of all 1978 Income Tax Returns filed in Josephine County showed total incomes of less than $4,999. The following table indicates a high poverty level (see Economic Chapter for detailed discussion of income).

COMMUNITY SERVICES ADMINISTRATION PROVERTY GUIDELINES*

Family Size	Nonfarm Family		Farm Family	
	1970	1978	1970	1978
1	$1,840	$3,140	$1,569	$2,690
2	$2,383	$4,160	$2,012	$3,550
3	$2,924	$5,180	$2,480	$4,410
4	$3,743	$6,200	$3,195	$5,270
5	$4,415	$7,220	$3,769	$6,130
6	$4,958	$8,240	$4,244	$6,990
7 or more	$6,101	$9,260	$5,182	$7,850

*For all states except Alaska and Hawaii.

The following table gives comparable statistics for all counties within Oregon.

	Poverty Population, per 1970 Census		Median Family Income	SSI Payments: Total No. Recipients	% of Co. Pop.	ADC: Mo. Avg. of Persons	% Co. Pop.	Food Stamps: Total No. Recipients	% Co. Pop.
	Number	% of Co							
STATE TOTAL	234,848	11.2	16,768	23,911	1.0	121,956	5.1	149,335	6.2
BAKER	2,467	16.5	12,893	248	1.55	703	4.4	821	5.1
BENTON	7,093	13.2	17,663	312	0.46	1,574	2.3	2,536	3.8
CLACKAMAS	13,648	8.2	19,052	1,154	0.55	6,973	3.3	8,113	3.8
CLATSOP	3,814	13.4	17,516	282	0.95	1,296	4.3	1,362	4.6
COLUMBIA	3,141	10.9	17,119	236	0.71	1,467	4.4	1,499	4.5
COOS	5,736	10.1	16,557	578	0.95	4,363	7.1	4,516	7.4
CROOK	1,089	10.9	15,012	120	0.99	522	4.3	503	4.2
CURRY	1,718	13.2	14,794	90	0.62	729	5.0	796	5.5
DESCHUTES	3,591	11.8	15,779	352	0.75	1,538	3.3	1,810	3.9
DOUGLAS	9,447	13.2	15,312	612	0.73	3,965	4.7	4,496	5.4
GILLIAM	198	8.5	13,317	16	0.76	133	3.3	121	3.0
GRANT	895	12.8	14,192	60	0.80	300	4.0	393	5.2
HARNEY	656	9.1	15,910	50	0.65	301	3.9	285	3.7
HOOD RIVER	1,800	13.6	14,662	180	1.23	302	2.1	520	3.6
JACKSON	11,515	12.2	14,404	978	0.83	7,262	6.1	10,690	9.0
JEFFERSON	1,257	14.7	14,263	68	0.67	436	4.3	507	5.0
JOSEPHINE	5,922	16.6	13,015	648	1.27	4,256	8.4	5,376	10.6
KLAMATH	6,057	12.1	16,122	426	0.75	2,452	4.3	3,018	5.3
LAKE	952	15.0	15,395	54	0.81	244	3.7	357	5.3
LANE	23,259	10.9	16,618	1,904	0.75	15,174	6.0	20,889	8.3
LINCOLN	3,782	14.7	14,118	298	1.04	1,546	5.4	2,236	7.8
LINN	8,152	11.3	16,068	852	1.00	5,326	6.3	5,952	7.0
MALHEUR	4,588	19.8	13,411	332	1.33	1,261	5.0	1,767	7.1
MARION	18,642	12.3	15,977	3,288	1.85	8,720	4.9	11,344	6.4
MORROW	513	11.5	14,910	42	0.76	163	2.9	147	2.6
MULTNOMAH	61,558	11.1	17,914	7,406	1.33	36,211	6.5	42,198	7.6
POLK	4,656	13.2	15,675	488	1.16	1,711	4.1	1,892	4.5
SHERMAN	326	15.2	15,066	28	1.27	648	2.9	945	4.2
TILLAMOOK	2,376	13.3	13,363	178	0.95	883	4.7	905	4.8
UMATILLA	5,722	12.7	14,903	748	1.44	1,889	3.6	2,044	3.9
UNION	2,023	10.4	15,821	194	0.86	720	3.2	1,057	4.7
WALLOWA	976	15.6	13,203	102	1.48	207	3.0	329	4.8
WASCO	2,147	10.7	15,864	214	1.05	648	2.9	945	4.2
WASHINGTON	9,876	6.3	20,448	834	0.42	6,118	3.0	6,766	3.4
WHEELER	201	10.9	12,735	14	0.73	133	3.3	121	3.0
YAMHILL	5,055	12.6	15,256	474	1.00	2,563	5.4	3,145	6.7

SOURCE: Kohl, Socio-Economic Indicators, 1978.

TABLE S-19

FAMILY ECONOMIC SITUATION - 1977

POPULATION PROJECTION

Population projections for Josephine County are exceedingly varied. At present, at least 7 estimates exist for this County's 1978 population, ranging from 52,100 (Portland State University) to 70,000 (private company survey). Population projections for the year 2000 are just as varied.

In 1976, Portland State University published three sets of projections for each Oregon county. Each of these projections has been developed utilizing the Cohort Survival Model and is based primarily on births, deaths in- and out-migration, age and sex characteristics, and fertility rates. The three projections vary as each of these items has been adjusted for increases or decreases in each of the addressed items, particularly, migration.

TABLE S-20

JOSEPHINE COUNTY POPULATION PROJECTION - I
(Using Cohort Survival Model)*

YEAR	(1)	(2)	(3)
1975	45,500	45,500	45,500
1980	55,700	56,200	56,800
1985	62,100	63,500	65,500
1990	66,300	69,000	73,100
1995	69,700	74,100	81,200
2000	71,600	78,300	89,200

SOURCE: Portland State University, 1976.
*Explanation of columns 1, 2 and 3 on the next page.

COLUMN 1: Population Projections for Oregon and Its Counties, 1975-2000 (Low), Portland State University, Center for Population Research & Census, February 1976. This projection also uses the Cohort Survival Model as a base, but determines in-migration as function of actual in-migration to each Oregon County for 1970-75. The age and sex structure of this in-migration is also determined. The Low projection then assumes that the 1970-75 migration pattern will taper to a zero net exchange by the year 2000. The mortality rates were derived from actual Oregon conditions in 1969, 1970 and 1971, thus adjusting for Oregon's ethnic mix. Fertility rates and timing of childbearing were likewise adjusted, and a replacement childbirth level was projected for 1980 to the year 2000.

COLUMN 2: Population Projections for Oregon and Its Counties, 1975-2000 (Mid-Range), P.S.U. This projection is based on the assumptions as the Low projection above, except that in-migration begins with the 1970-75 pattern and tapers to the 1960-70 pattern by the year 2000.

COLUMN 3: Population Projections for Oregon and Its Counties, 1975-2000 (High), P.S.U. This projection is based on the same assumption as the Low projection above, except that in-migration would continue at the 1970-75 rates until the year 2000.

Two other projections have been developed by the Oregon Department of Economic Development economic consultant.

TABLE S-21

JOSEPHINE COUNTY POPULATION PROJECTIONS - II

YEAR	STRAIGHTLINE*	MIGRATION MODEL*
1980	62,649	56,800
1985	82,932	64,812
1990	109,784	75,283
1995	145,328	85,970
2000	192,381	96,643

SOURCE: Oregon Department of Economic Development Economic Consultant, 1979.
*See Text

The straightline projection, based on population data from 1970 to 1978, indicates that if the population for Josephine County continues to increase as it has for the past eight years, it could reach 192,381 people by the year 2000. The migration model is also based on historic population data but has been modified by assumed decreases in migration and, as such, determines the lower projection of 96,643 people by the year 2000. Considering the high percentage of migration (92%) to this county over the past eight years, this projection could definitely be an accurate reflection of potential population increase within Josephine County.

The County reviewed each of the methodologies used and selected to utilize the modified migration model (Table S-21).

Population distribution within the county is also projected to change within the next 20 years. In 1960, approximately 64.5% of all county residents lived outside the city limits of Grants Pass or Cave Junction. (Table S-22) During the 1970's, the county experienced a high migration influx.

This resulted in a substantial impact on the city of Grants Pass, the most significant being that vacant land became scarce and public facility capacities became strained. Consequently, as people found less expensive and more readily available housing in the rural areas, the percentage of rural residents increased to 71.4%

With the development of Urban Growth Boundaries for Grants Pass and Cave Junction, it is expected that urban populations will show an unprecedented increase to approximately 43% (with rural residency consequently dropping to approximately 57%).

TABLE S-22

URBAN/RURAL POPULATION DISTRIBUTION

	Josephine Co.		Grants Pass		Cave Junction		TOTAL
	Number	%	Number	%	Number	%	Number
1970	23,060	64.5	12,271	34.3	415	1.2	35,746
1980	40,000	71.4	15,000	26.8	1,000	1.8	56,000
2000*	54,900	56.6	36,600	37.7	5,500	5.7	97,000

*For the year 2000 it is assumed that city limits will be comparable to 1980 Urban Growth Boundaries.

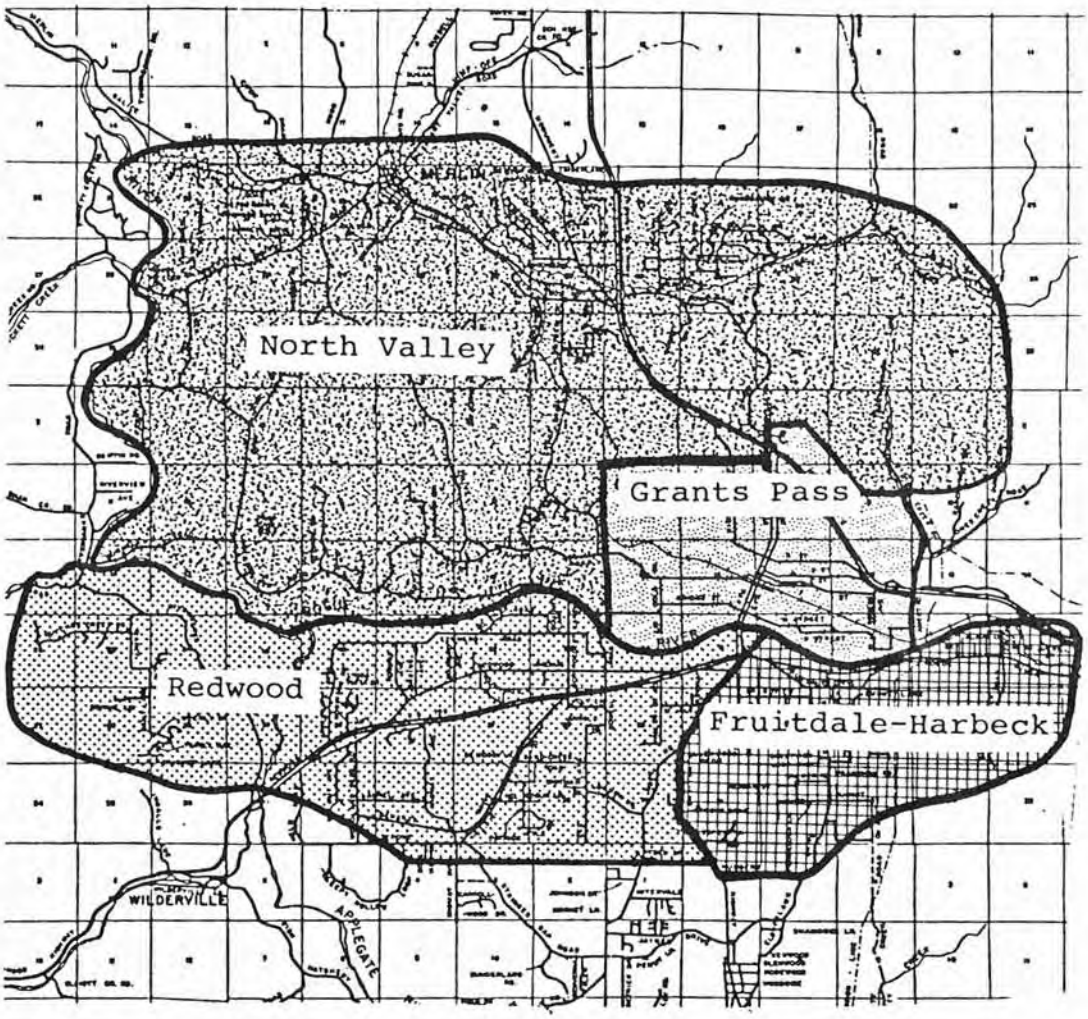
SOURCE: Josephine County Planning office from U.S. Census data and local projections, 1980.

LENGTH OF RESIDENCE

Although the County has sustained considerable growth over the last eight years, a consumer survey indicates that the majority (65.7%) of residents in Grants Pass and its vicinity (Map S-23) have lived here for six years or longer.

MAP S-23

CONSUMER STUDY AREA--GRANTS PASS AND VICINITY



SOURCE: Consumer Attitude Research, Attitude - Awareness Study for Grants Pass, 1979.

More recent residents have apparently located primarily in the Merlin/Colonial Valley area, the Fruitdale/ Harbeck area, and in various outlying areas.

REASONS FOR LOCATING

As a discussion on the social characteristics or nature of the population of Josephine County, This chapter could not be complete without a probing of the desires of the people who have chosen to live here.

In December, 1977, Dr. Joe Stevens completed a study inter-relating trade, income and migration. A portion of his questionnaire produces a picture of the people who are moving into Josephine County. In general these new residents are 2 to 3 person families who have moved here primarily from California (80%) because they are seeking a better life here (60%). Sixty-five percent have had more than 12 years of education. Many of these people came to Oregon without a job waiting for them (61%) and about 40% of them said they had to make an economic sacrifice to move here. And, of course, over half (53%) now live in a rural area and 40% were retired.

TABLE S-24

CHARACTERISTICS OF RECENT IN-MIGRANTS TO JACKSON AND JOSEPHINE COUNTIES

	JACKSON CO.		JOSEPHINE CO.	
	PPL* (n=102)	EMPL. DIV.* (n=49)	PPL* (n=49)	EMPL. DIV.* (n=17)
ORIGIN				
Region:				
Southern California	27%	29%	45%	59%
All of California	56%	50%	80%	76%
From Metro Area (census designation as SMSA):	68%	68%	79%	88%
Population of Previous Community:				
Less than 10,000	33%	40%	40%	12%
Less than 50,000	61%	51%	67%	41%
More than 250,000	16%	11%	19%	29%
DEMOGRAPHIC				
Age of Head:				
Median	34.9 yrs	29.4 yrs	49.5yrs	31.0 yrs
Less than 35	52%	76%	19%	65%
More than 60	23%	0%	29%	6%
Education of Head:				
Median	12.3 yrs	12.2 yrs	12 yrs	13 yrs
More than 12 years	80%	78%	65%	82%
More than 16 years	23%	16%	10%	18%
Marital Status:				
Couple	78%	53%	86%	65%
Single Person	22%	47%	14%	35%
Children at Home:				
Yes	52%	47%	49%	53%
No	48%	53%	51%	47%
Location of Current Residence:				
City	44%	55%	20%	19%
Small Town	34%	16%	27%	12%
Rural Area	22%	29%	53%	69%

SOURCE AND METHOD: This is a preliminary report on a very interesting study completed in December, 1977, by Professor Joe B. Stevens, of the Department of Agricultural and Resource Economics, Oregon State University, Corvallis, Oregon. The breakdown of data is by county and source, showing among other things, the importance of the name source. Professor Stevens says in his accompanying letter of March 8, 1978, that "for planning purposes, I would say that the PPL lists come closest to defining the 'typical' in-migrant."

TABLE S-24

	JACKSON CO.		JOSEPHINE CO.	
	PPL * (n=102)	EMPL. DIV.* (n=49)	PPL * (n=49)	EMPL. DIV.* (n=17)
EMPLOYMENT				
Job Waiting in Southern Oregon (excludes retirees):				
Yes	38%	19%	39%	29%
No	62%	81%	61%	71%
Head of Household:				
In Labor Force	68%	98%	54%	88%
Retired	27%	2%	40%	6%
In Labor Force but Unemployed at Time of Interview	14%	31%	27%	13%
Spouse Working:				
Yes	24%	37%	17%	50%
No	76%	63%	83%	50%
INCOME				
Sacrifice to Move to Southern Ore:				
Yes	47%	59%	40%	62%
No	53%	41%	60%	38%
Family Income Last Year:				
Median	$13,500	$9,500	$15,100	$11,500
Less than $10,000	32%	50%	18%	44%
More than $20,000	27%	4%	28%	25%
QUALITY OF LIFE**				
Quality in Southern Oregon:				
Mean	6.88	6.42	7.76	7.24
Less than 4 (very poor)	13%	10%	2%	6%
More than 9 (very good)	19%	12%	31%	18%
Quality in Previous Community:				
Mean	6.13	6.06	6.10	4.82
Less than 4 (very poor)	26%	18%	24%	53%
More than 9 (very good)	21%	8%	14%	18%
Quality Change:				
Mean Difference	+.82	+.29	+1.65	+2.41
Better Here	49%	44%	60%	82%
Same	17%	23%	20%	0%
Worse Here	34%	33%	20%	18%

SOURCE AND METHOD: Grants Pass Urbanizing Area Population Predictions, Appendix - March 1978.

This is a preliminary report on a very interesting study completed in December, 1977, By Professor Joe B. Stevens, of the Department of Agricultural and Economics, Oregon State University, Corvallis, Oregon.

A second survey completed in September of 1979 lists the reasons that current residents in Grants Pass and its vicinity had for moving to Josephine County.

TABLE S-25

REASONS FOR LOCATING	
Slower Pace of Daily Life	35.9%
Clean Air	29.5%
More Rural Environment	29.4%
Came Here with Family	28.1%
Fewer People	27.0%
Less Congestion	25.6%
Nice Place to Raise Children	25.5%
Friendly People	25.0%
Good Water	14.3%
Born & Raised Here	14.1%
Better Employment Opportunities	14.1%
Safety From Crime & Violence	12.1%
Lower Taxes	10.1%
Better Schools	5.9%
Better Health Care	2.0%

SOURCE: Consumer Attitude Research, Attitude and Awarness Study for Grants Pass.

In reviewing the chart it should be noted that of the approximately 39,000 people surveyed, 14% were born and raised here and 28% came here with their families. The remaining responses all indicate people come here for "the quality of life"--the slow, peaceful, outdoor, country lifestyle in a rural, small town atmosphere.

ECONOMIC ELEMENT

Economics -"...a specialized science focused primarily upon man's efforts to earn a daily living - upon his attempts to provide himself and his dependents with food, shelter, clothing, and, if fortune smiles, a few luxuries." (Thoman, 1968) This is a simple explanation of a not so simple process. Economics is a formidable topic which is interwoven into many aspects of human existence in the form of monetary activities, exchange of goods and services, use of resources and products, and the maintenance of a happy, healthy home and community.

This chapter on the economic condition of Josephine County will attempt to satisfy two basic objectives. The first is to understand the unique characteristics of the labor force, employment trends, and economic base. Once a firm understanding of the existing situation is acquired, it becomes possible to make assumptions regarding the future economic environment of the County, including projected number of jobs needed in future years, potential areas of economic stimulation, and conditions which may restrict or enhance economic activity.

These two objectives, understanding and projection, then become the basic elements of good economic planning.

LABOR FORCE

The fundamental concept of economic activity is that "to satisfy his needs, man consumes. To consume, he must first produce", thereby becoming a member of the labor force. (Ibid.)

The potential labor force is made up of all individuals of working age, usually designated as those sixteen years and older. All of these individuals may not, however, be interested in, or capable of being employed for wages. This unemployed group often includes students, the socially or physically handicapped, senior citizens,

teenagers, and women (who often fill a traditional role within the home).

Economic concern is, therefore, focused on the actual labor force which consists of those individuals who are either employed or presently jobless and actively seeking employment. The percentage of this group within the potential labor force is known as the labor force participation rate (LFPR) - a figure which is often used in comparison studies.

Historically, Josephine County has experienced a low LFPR with increases beginning to occur during the late 1960's (Table E-1). In reviewing the recent employment situation (Table E-2) it is noted, however, that in 1977 Josephine County still had the second lowest labor force participation rate in the State of Oregon. Only Gilliam County, a rural area with no large towns, has a lower participation rate. To carry this further, it is noted that only 35.2% of Josephine County's population was employed in 1977, as compared with the State percentage of 43.5%.

TABLE E-1

JOSEPHINE COUNTY LABOR FORCE PARTICIPATION

YEAR	POP.	LABOR FORCE* (LF)	JOSEPHINE COUNTY		OREGON LF PART. RATES
			POPULATION OVER 16 YEARS OF AGE	LF PART. RATES	
1978	52,100	21,280	40,372	52.7	64.4
1977	50,900	20,220	38,372	53.2	63.8
1976	47,000	19,070	--	--	--
1975	45,600	18,050	--	--	--
1974	45,100	16,840	33,457	50.3	61.2
1973	42,300	16,710	31,169	53.6	62.0
1972	38,500	15,600	28.156	55.4	62.0
1971	36,560	14,110	26,515	53.2	59.0
1970	35,746	13,050	--	--	--
1969	36,000	13,890	--	--	--
1968	36,500	13,140	--	--	--
1967	36,500	11,730	--	--	--
1966	36,600	11,910	--	--	--
1965	35,100	12,220	- NOT AVAILABLE -		
1964	34,700	11,510	--	--	--
1963	32,800	10,990	--	--	--
1962	31,600	10,200	--	--	--
1961	30,500	9,950	--	--	--
1960	29,917	10,590	--	--	--

* LABOR FORCE is defined as all individuals employed or actively seeking employment as calculated by the Oregon Employment Division.

SOURCE: Compiled from Portland State University, Oregon Employment Division, and U.S. Bureau of Census data.

TABLE E-2

OREGON RESIDENT LABOR FORCE, EMPLOYMENT AND UNEMPLOYMENT,
BY COUNTY 1977 ANNUAL AVERAGE

	Estimated Population	Civilian Labor Force	LFPR	Total Employment	Percentage Employed	Unemployment	Percent Unemployed
State Total	2,396,100	1,126,000	47.0	1,043,000	43.5	83,000	7.4%
Baker	16,050	6,440	40.01	5,950	37.1	490	7.6%
Benton	67,400	26,850	39.8	25,330	37.6	1,520	5.7%
Clackamas*	211,000	85,412	40.5	89,785	42.6	6,497	1.2%
Clatsop	29,800	14,340	48.1	13,070	43.8	1,270	8.9%
Columbia	33,300	14,510	43.6	13,160	39.5	1,350	9.3%
Coos	61,100	25,830	42.3	23,540	38.5	2,290	8.9%
Crook	12,100	5,560	46.0	5,000	41.3	560	10.1%
Curry	14,500	6,120	42.2.	5,580	38.5	540	8.8%
Deschutes	46,800	23,680	51.0	21,900	46.8	1,780	7.5%
Douglas	83,700	37,150	44.4	33,770	40.3	3,380	9.1%
Gilliam	2,100	790	37.6	740	35.2	50	6.3%
Grant	7,500	3,320	44.3	3,050	40.7	270	8.1%
Harney	7,700	3,840	50.0	3,510	45.6	320	8.4%
Hood River	14,600	7,700	52.7	6,860	47.0	840	10.9%
Jackson	118,500	52,310	44.1	48,110	40.6	4,200	8.0%
Jefferson	10,100	4,550	45.1	4,260	42.2	290	6.4%
Josephine	50,900	20,220	39.7	17,950	35.3	2,270	11.2%
Klamath	56,500	23,890	42.3	22,060	39.0	1,830	7.7%

TABLE E-2 (CONTINUED)

Lake	6,680	2,910	43.6	2,670	40.0	240	8.2%
Lane	252,500	118,100	46.8	108,500	43.0	9,600	8.1%
Lincoln	28,700	14,270	49.7	13,250	46.2	1,020	7.1%
Linn	85,000	36,120	42.5	33,070	38.9	3,050	8.4%
Malheur	25,000	11,060	44.2	10,410	41.6	650	5.9%
Marion*	177,000	85,800	48.5	79,967	45.2	5,833	5.5%
Morrow	5,500	4,580	83.3	4,330	78.7	250	5.5%
Multnomah*	565,400	307,627	54.4	323,378	57.2	23,401	4.3%
Polk*	42,000	20,121	47.9	18,753	44.7	1,368	1.3%
Sherman	2,200	(See Wasco)					
Tillamook	18,800	8,250	43.9	7,680	40.9	570	6.9%
Umatilla	52,100	24,470	47.0	22,900	44.0	1,570	6.4%
Union	22,600	9,810	43.4	8,990	39.8	820	8.4%
Wallowa	6,900	3,250	47.1	2,920	42.3	330	10.2%
Wasco-Sherman	20,400	9,780	47.9	8,960	43.9	820	8.4%
Washington*	200,800	85,460	42.6	89,835	44.7	6,501	1.2%
Wheeler	1,920	840	43.8	760	39.5	80	9.5%
Yamhill	47,200	22,820	48.3	21,220	45.0	1,600	7.0%

SOURCE: Oregon Employment Division

*Computed on basis of "census share" technique from 1970 census.

This low participation could be a result of several factors, including a high percentage of those who (a) do not desire employment, (b) have a lower level of skills than those desired by an employer, (c) cannot find employment due to lack of jobs. Each of these factors plays a role in the employment situation within Josephine County. A variety of additional factors can be used to explain the low LFPR for Josephine County, including a sizeable senior population, an increasing juvenile population, and a high in-migration rate. (See Social Characteristics Chapter.)

In January, 1977, the County's potential labor force (age 15 and over) consisted of about 37,100 individuals, of which approximately half were female and half were male.

TABLE E-3

JOSEPHINE COUNTY WORK FORCE AND EMPLOYMENT
BY SEX AND MINORITY STATUS
April 1977

Sex and Minority Status	Work Force	Employed	Unemployed	Percent Distribution			Unemployment Rate
				Work Force	Employed	Unemployed	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Both Sexes							
TOTAL	19,450	16,950	2,500	100.0	100.0	100.0	12.9
White	19,336	16,856	2,480	99.4	99.4	99.2	12.8
Black	0	0	0	0	0	0	xxx
Other Races	114	94	20	0.6	0.6	0.8	17.5
Spanish American	377	304	73	1.9	1.8	2.9	19.4
Minority Group*	491	398	93	2.5	2.3	3.7	18.9
Female							
TOTAL	7,159	6,474	685	100.0	100.0	100.0	9.6
Percent of Both Sexes	36.8	38.2	27.4	xxx	xxx	xxx	xxx
White	7,110	6,425	685	99.3	99.2	100.0	9.6
Black	0	0	0	0	0	0	xxx
Other Races*	49	49	0	0.7	0.8	0	0
Spanish American	144	129	15	2.0	2.0	2.2	10.4
Minority Groups**	193	178	15	2.7	2.7	2.2	7.8

*Blacks have been included in this group to promote confidentiality due to the relatively small percentage of Black people in the county.

**Sum of Spanish American and all races except white. Some duplication possible since Spanish American may include some white races in addition to non-white races.

SOURCE: Oregon Employment Division. This table was compiled for equal employment opportunity purposes and are not necessarily comparable with revised labor force data published elsewhere.

The preceding table delineates the County's labor force by sex and minority status. The white male dominates the labor market, constituting approximately 62% of the mid-1977 work force. The white female population accounts for about 36% of the total work force, potentially indicating: 1) a less intense desire for employment, 2) decision not to work or 3) high female, senior population. But, whereas fewer women than men are employed, they would appear to have greater job stability. The unemployment rate for working women (9.6%) was much lower than that for working men (14.8%).

As is noted, minority populations accounted for only 2.5% of the work force and had a substantially higher unemployment rate of 18.9%.

UNEMPLOYMENT

The number of people within the labor force has slowly increased, doubling over the last 20 years, but, as noted earlier, the County's labor force participation rate has remained one of the lowest in the state. Although a low participation rate does not necessarily indicate a depressed economic environment this low rate does cause concern when viewed in relation to the high unemployment rate experienced in Josephine County (Graph 5), consequently, the highest experienced by any county in Oregon.

Initial review of employment statistics indicates a strong correlation between the number of unemployed and the rapid population growth experienced within the County over the last seven years. Data from Tables E-1 and E-4 has been plotted on Graph E-5 to better show the relationship of population growth, employment and unemployment.

As the County's population slowly increased from 1958 to 1971, so did employment, generally following a similar trend. Unemployment also increased, but with a very unpredictable, oscillating pattern, bearing little or no relationship to employment patterns, but relating in an exaggerated fashion to population figures. During periods of high in-migration (as experienced in 1972-1973) employment figures soared, indicating employment opportunities have consistently lagged behind population increases.) This veritable see-saw of percent unemployed has ranged from a low of 7.4% (1959) to a high of 16.1% (1975), with an average of 10.3%.

A significant rise in population became evident during 1971, and correspondingly, unemployment also increased, rising sharply for approximately two years. From 1973 to 1975, unemployment was heightened by further increase in population and by a minor recession occurring nationally. In late 1975, unemployment began to drop, principally as a result of a stabilization of County population during 1974-1975 and the creation of jobs in various sectors, primarily trade and service.

TABLE E-4

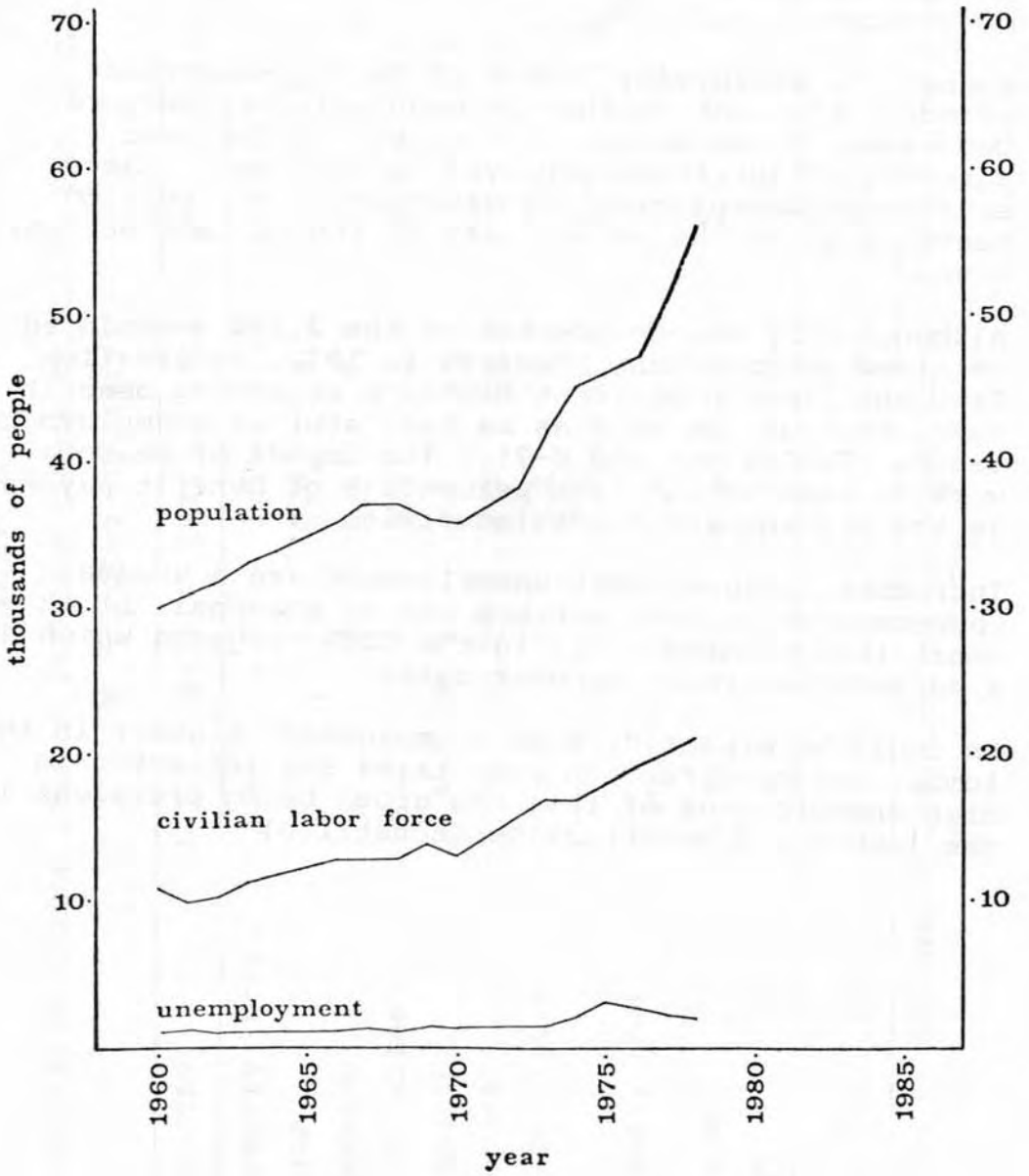
JOSEPHINE COUNTY UNEMPLOYMENT

YEAR	POP.	UNEMP.	% LABOR FORCE UNEMPLOYED
1978	52,100	1,880	8.8
1977	50,900	2,270	11.2
1976	47,000	2,620	13.7
1975	45,600	2,910	16.1
1974	45,100	2,050	12.2
1973	42,300	1,520	9.1
1972	38,500	1,410	9.0
1971	36,560	1,440	10.2
1970	35,746	1,340	10.3
1969	36,000	1,480	10.7
1968	36,500	1,120	8.5
1967	36,500	1,350	10.3
1966	36,600	1,130	8.7
1965	35,100	900	8.0
1964	34,700	940	8.2
1963	32,800	920	8.4
1962	31,600	960	9.4
1961	30,500	1,330	13.4
1960	29,917	1,090	10.3
1959	--	780	7.4
1958	--	1,180	11.4

SOURCE: Compiled from Portland State University and Oregon Employment Division data.

GRAPH E·5

POPULATION - EMPLOYMENT RELATIONSHIP



Review of employment through the calendar year indicates consistently higher unemployment during winter months and lower rates during summer months. This is due mainly to the seasonality of the lumber and wood products industries, trade/sales sector, and tourism. Summer sees both the height of tourist traffic and activity in the wood products industry; weather conditions have a great impact both on the ability to harvest timber during the winter months and on the flow of interstate visitors.

Changes in employment levels of basic industries affect employment in the non-manufacturing sectors. Decreases in the amount of tourist traffic most directly affect those employed in services. These employment/unemployment fluctuations are likely to continue given the seasonality of the current economic base.

Although only 616 people out of the 2,270 unemployed received unemployment benefits in 1977, information from the State Employment Division regarding benefit payments could be used as an indicator of unemployment trends (Tables E-6 and E-7). The impact of seasonal work is seen in the high percentage of benefit payments in the logging and trade industries.

Increases in government unemployment are a unique phenomena where some workers are a) seasonal, b) in a short term program or c) in the CETA programs which has a maximum two year turnover rate.

As could be expected, high unemployment figures in the lumber and construction industries are reflected in high unemployment of this age group being prevalent in the lumber and construction industries.

TABLE E-6

PERCENT OF OREGON BENEFIT PAYMENTS ISSUED TO GRANTS PASS LOCAL OFFICE
(By Selected Industry)

INDUSTRY	1971	1972	1973	1974	1975	1976	1977	1978
Agri., Forestry, Mining	1.4	1.7	1.5	1.6	1.6	2.4	1.8	1.5
Construction	10.7	13.1	13.6	8.7	12.1	13.0	9.9	14.1
Food Processing	0.7	1.2	0.6	0.6	1.1	1.1	0.7	0.3
Other Non-Durables	3.2	7.5	9.4	5.0	8.3	7.2	3.8	2.2
Lumber & Logging	36.9	31.8	33.8	42.3	35.2	26.0	30.6	31.7
Other Durables	12.8	11.7	6.7	8.7	7.6	6.7	6.7	7.1
Transport-Utilities	5.2	4.9	5.2	5.2	5.2	5.9	5.1	4.2
Trade	17.3	16.0	17.4	16.6	14.8	17.9	20.0	17.8
Finance, Ins., Real Estate	1.6	1.2	1.5	1.6	1.2	1.9	1.5	1.7
Services & NEC	9.1	9.2	8.6	8.1	8.6	13.4	11.8	8.1
Government	1.1	1.7	1.7	1.5	3.9	4.4	8.2	11.2
Total Number Receiving Benefits	439	412	477	795	1074	699	719	590

SOURCE: Oregon Employment Division, Grants Pass Local Office, unpublished.

TABLE E-7

AGE CHARACTERISTICS OF OREGON BENEFIT RECIPIENTS
1978-Grants Pass Local Office

AGE	MALE		FEMALE		TOTAL	
	#	%	#	%	#	%
19 and under	4	0.9	2	1.2	6	1.0
20-24	79	17.8	32	18.6	111	18.0
25-34	166	37.4	57	33.1	223	36.2
35-44	74	16.7	31	18.0	105	17.0
45-54	54	12.2	25	14.5	79	12.8
55-64	54	12.2	21	12.2	75	12.2
65 and above	13	2.9	4	2.3	17	2.8
	444		172		616	

SOURCE: Oregon Employment Division, Grants Pass Local Office (unpublished).

MINORITY INTERESTS IN THE LABOR FORCE

Women:

Women and young people have slowly been developing a more active role within the labor market. Nationally, the LFPR for women over the age of 15 has risen from 37.7% in 1960 to 48.4% by 1977, a 21% increase. The LFPR for women in Josephine County has been consistently below the national average, but has also increased at approximately the same rate, 23.6%, over the last seventeen years.

TABLE E-8

WOMEN IN THE LABOR FORCE

YEAR	NATIONAL LFPR	COUNTY LFPR
1960	37.7%	28.1% (age 14 & older)
1970	43.3%	29,8% (age 14 & older)
1977	48.4%	36.8% (estimated)

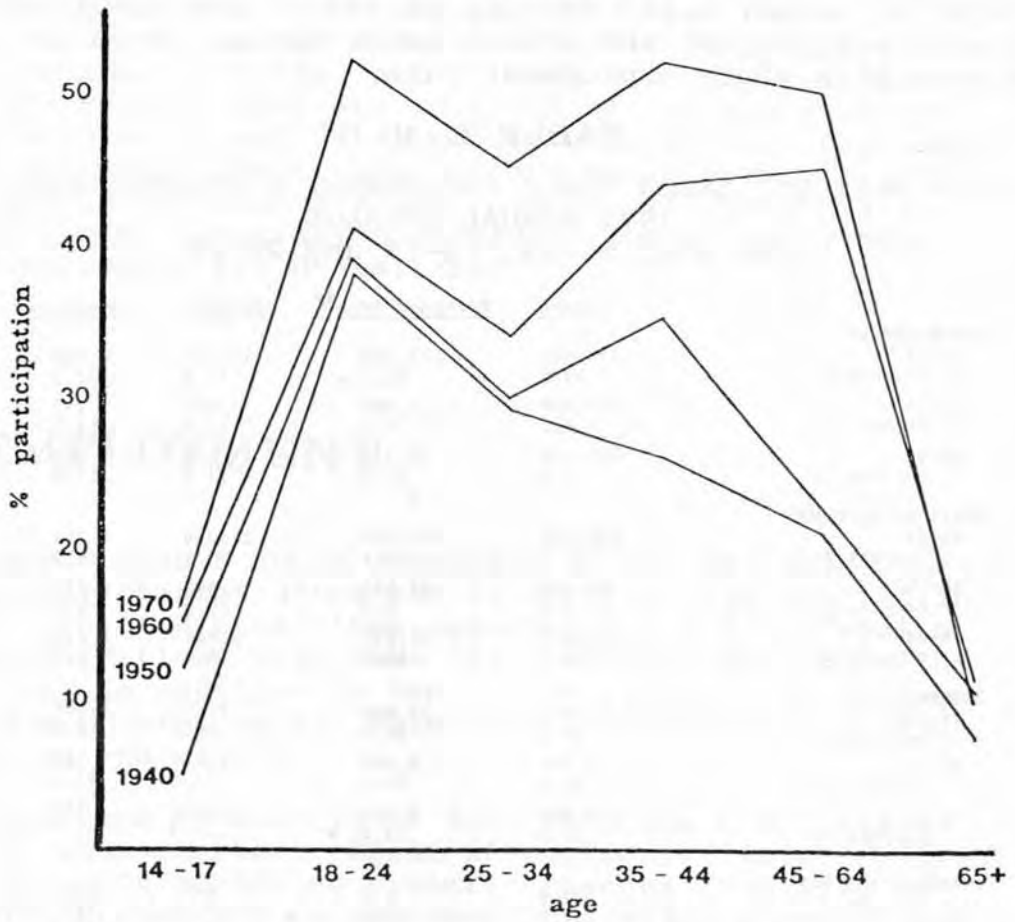
SOURCE: Compiled from The Josephine County Economy and the Research Department of the Oregon Employment Division, 1978.

Employment patterns indicate that women often experience two work cycles - entering the labor force prior to

marriage and childbearing, and then re-entering the labor force when the children are grown.

GRAPH E-9

STATE OF OREGON
FEMALE LABOR FORCE PARTICIPATION RATES BY AGE
1940-1970



SOURCE: U.S. Bureau of the Census

Generally speaking, women are more often vulnerable to lay-offs due to: a) the seasonal nature of their employment, b) their fewer years of experience and seniority, c) work interruption during child-rearing years, or d) financial pressures during economic slowdown. (Oregon Employment Division, 1977)

Youth:

Young people, aged 15 to 24, have also entered the labor market in increasing numbers. Data from the 1970 U.S. Census and the Oregon Employment Division shows an

increase of total youth population (15-25) from 11.8% in 1960 to 16.2% in 1977. It has been estimated that this increase in population would be reflected in increased participation by youth within the labor force.

In 1977, approximately 7000 people (or 13.8% of the County's population) were age 16-24. Yet 22% of the County's actual labor force was within this age group; in other words, 4,460 people, or 63% of the age 16-24 group, was part of the actual labor force. This indicates a very high youth employment rate.

TABLE E-10

YOUTH RESIDENT LABOR FORCE EMPLOYMENT & UNEMPLOYMENT
1977 ANNUAL AVERAGE
FOR AGES 16-24, 16-19 and 20-24

	Oregon	Portland SMSA 4/	Jackson	Josephine
LABOR FORCE*				
16-24	274,740	135,390	13,390	4,460
Percent 1/	24.4	25.1	25.6	22.1
16-19	103,590	50,160	5,810	2,260
Percent 1/	9.2	9.3	11.1	11.2
20-24	171,150	85,230	7,580	2,200
Percent 1/	15.2	15.8	14.5	10.9
TOTAL EMPLOYMENT				
16-24	236,200	118,330	11,320	3,360
Percent 2/	22.6	23.5	23.5	18.7
16-19	85,990	41,900	4,800	1,720
Percent 2/	8.2	8.3	10.0	9.6
20-24	150,230	76,430	6,520	1,640
Percent 2/	14.4	15.2	13.6	9.1
UNEMPLOYMENT				
16-24	38,520	17,060	2,070	1,100
Percent 3/	46.4	46.9	49.3	48.5
16-19	17,600	8,260	1,010	540
Percent 3/	21.2	22.7	24.0	23.8
20-24	20,920	8,800	1,060	560
Percent 3/	25.2	24.2	25.2	24.7
UNEMPLOYMENT RATE				
16 and over	7.4	6.7	8.0	11.2
16-24	14.0	12.6	15.5	24.7
16-19	17.0	16.5	17.4	23.9
20-24	12.2	10.3	14.0	25.5

*Those working or actively seeking employment
1/ Percent of area's total labor force
2/ Percent of area's total employment
3/ Percent of area's total unemployment
4/ Standard Metropolitan Statistical Area
NOTE: Sums may not equal totals due to rounding

SOURCE: State of Oregon Employment Division

Corresponding to this group's high employment rate (relative to the County percentage), a high unemployment rate is also experienced, approximately 25%. This could indicate several factors: a) youth quit work to attend school during the fall, winter and spring and then return for summer jobs, b) when layoffs occur, the non-experienced worker is cut first, c) advancement is limited and people in this age group are leaving the area in search of better jobs, d) young people (who want to work) coming into this area have a difficult time finding jobs.

SENIOR CITIZENS

There is a high percentage of elderly people in Josephine County; approximately 24% of the January 1977 population was age 60 or older. Josephine County is considered "a lovely place to retire"; the air is fresh, the landscape is attractive, the climate is relatively mild, and the fishing is good. But not everyone over the age of 60 is ready to, or can afford to retire completely. Questionaires filled out through a local Area Agency on Aging Program indicate that 81% of those questioned would like to work, and 74% would like to do volunteer work. It becomes evident that seniors could have a significant place in the County's labor force, if opportunities were available. Statistics regarding senior employment/ unemployment are unavailable.

EMPLOYMENT

The economic base of Josephine County has undergone several changes since the first white man settled in the area. Mining, then agriculture, and now visitor accommodations have been major industries within the County in addition to the primary activities of logging and wood processing, which were commercially developed during the 1940's.

Comparison of employment data from the U.S. Census indicates constant change in employment activity (Table E-11). In reviewing historic changes from 1940 to 1970, trends are established indicating a severe decline in agriculture and fisheries employment, fluctuations in manufacturing, including wood processing, and increases in trade and services.

World War II was,in effect, a turning point for the economy of Josephine County. Prior to this time, mining was the prime economic activity in the area with some of the richest claims being worked in the late 1930's. But government regulations placed on mining during the war and increased costs of machinery and labor were primarily responsible for the slow decline of the industry in the early 1940's. However, post-war mechanization saw an emphasis on a new industry in Josephine County - logging. County population swelled as a result of this rapid industrial growth in the lumber and wood products industry. In the late 1950's, this trend began to slow and the County's economic outlook began to change.

As employment in the timber industry began to slowly wane during the 1960's, other economic activities evolved to compensate and new trends began to develop. Some of these trends have become more clearly delineated in the recent past. A detailed view of recent employment (by sector) from 1958 to 1978, is given in Table E-11 through Graph E-13.

Employment characteristics changed during the 1960's and 1970's. Although wood products employment began to rise again during the 1970's (due to increased technology and processing), significantly more men and women were employed in "White collar" positions.

From 1960 to 1978 two obvious trends are noted. First, the amount of people who are self-employed has steadily increased, maintaining a stable percentage of employment while experiencing an increase in total employment. Second, there have been shifts in blue and white collar employment activity. Employment in manufacturing has been steadily decreasing while employment in non-manufacturing has been slowly increasing.

During the 1960's the decline in the manufacturing sector was primarily one of job decreases in the lumber and wood products industry. These positions were, in part, assumed by "other manufacturing' industries and, more significantly, in the non-manufacturing sectors of trade, services, and government. During the 1970's this trend was slightly modified. Employment in lumber and wood products began to rise again, dropping only during the 1974-1975 recession years. Today it is the third largest employer in the County. Employment in "other manufacturing" has, however, continued to increase dramatically as several non-wood oriented firms have located in the area. Continued dramatic increases have also occurred in the trade, government, and service sectors with over 60% of wage and salary employees working in these three sectors.

These changes are clearly demonstrated on Graph E-14.

TABLE E-11

EMPLOYMENT BY ECONOMIC SECTOR, JOSEPHINE COUNTY, 1940 to 1970

INDUSTRY	1940	1950	1960	1970
Agriculture, forestry, & fisheries. . .	1,686	1,700	974	598
Mining.	473	113	44	20
Contract construction	264	592	671	695
Manufacturing	533	2,623	2,708	2,693
Food & kindred products.	86	97	101	93
Textile & apparel products	2	6	4	50
Lumber, wood products, furniture . .	358	2,381	2,323	1,776
Printing and publishing.	49	76	120	135
Chemical and allied products	4	2	0	4
Electrical and other machinery . . .	5	18	61	99
Transportation equipment	4	5	38	317
Other & miscellaneous manufacturing	25	38	61	219
Railroads and rail express.	51	73	52	50
Trucking and warehousing.	50	87	155	130
Other transportation.	19	42	69	102
Communications.	25	55	83	149
Utilities and sanitary service.	52	174	166	118
Wholesale trade	65	233	228	310
Food and dairy product stores	143	260	308	317
Eating and drinking places.	157	318	371	436
Other retail trade.	458	897	955	1,350
Finance, insurance, real estate	89	217	328	433
Hotels and other personal services. . .	263	361	414	433
Private households.	165	200	307	119
Business and repair services.	148	320	264	320
Entertainment, recreation services. . .	39	69	51	118
Medical, other professional services. .	356	673	1,041	1,922
Public administration	148	233	274	536
Total.	5,184	9,240	9,463	10,849
Unemployment .	1/	631	1,096	1,169

1/ Not available.

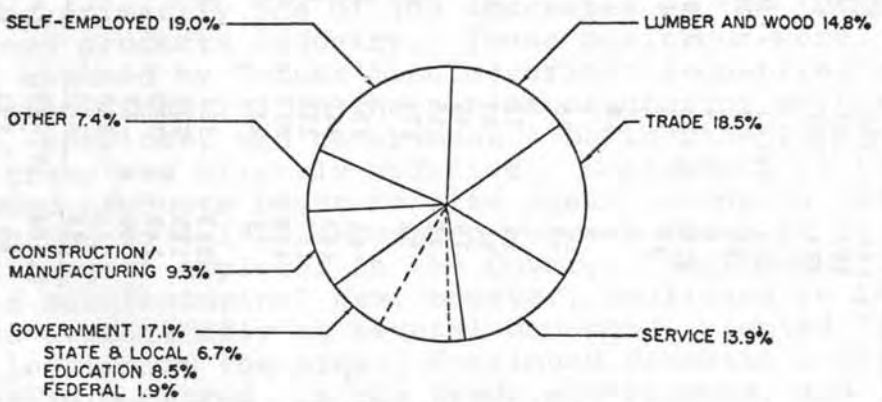
SOURCE: U.S. Department of Commerce, Census of Population.

TABLE E - 12

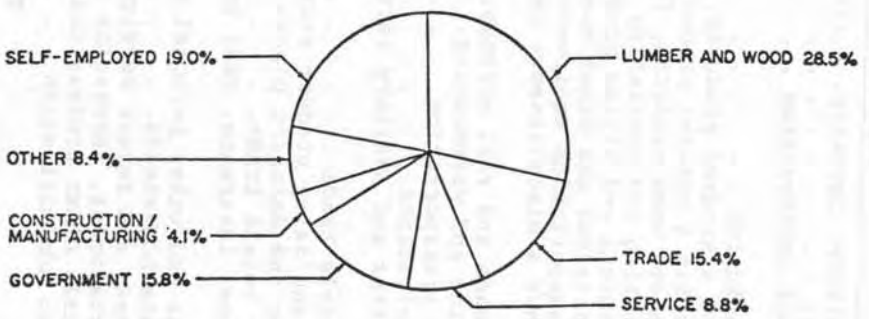
PERCENTAGE OF EMPLOYMENT CHANGE

	1960-1970	1970-1978	1960-1978
Manufacturing	18.0	58.0	75.0
Lumber and Wood	15.2	58.0	34.0
Other Manufacturing	380.0	59.7	666.6
Non-Manufacturing	44.3	80.1	159.8
Contract Construction	-0-	177.8	177.8
Transportation-Utilities	8.1	48.3	60.3
Trade	56.1	66.5	159.8
Finance, Ins., Real Estate	17.4	164.8	210.9
Service and Miscellaneous	61.3	111.6	241.3
Government	45.3	58.9	130.9
TOTAL WAGE AND SALARY	132.1	73.9	33.4
SELF-EMPLOYED	103.9	31.7	54.8
AGRICULTURE	66.4	8.2	63.4
TOTAL EMPLOYED	104.2	65.7	23.3

DATA SOURCE FOR COMPUTATION: Oregon Employment Division. Percentages rounded.



EMPLOYMENT BY SECTOR 1978 DATA

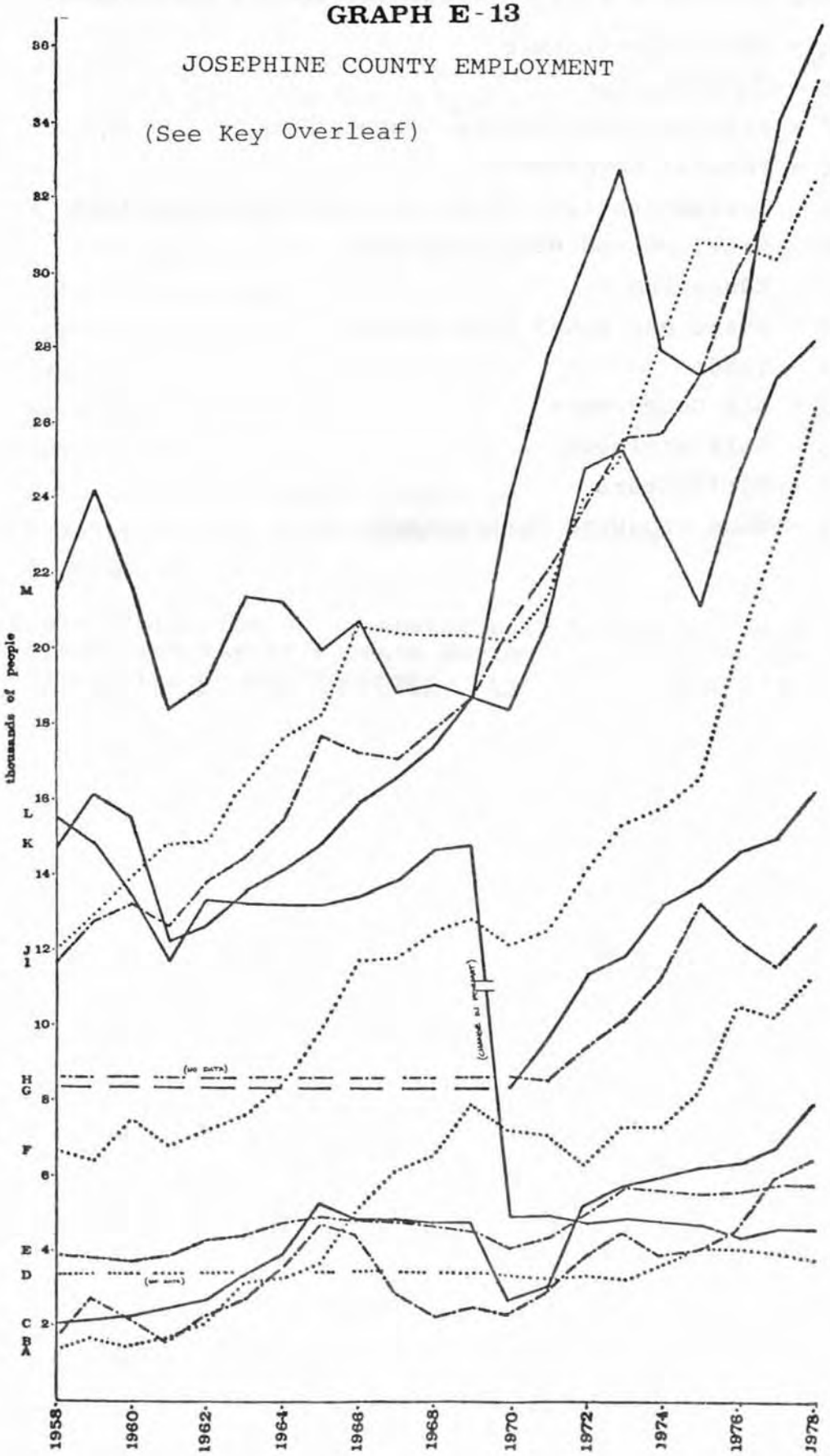


EMPLOYMENT BY SECTOR 1958 DATA

GRAPH E-13

JOSEPHINE COUNTY EMPLOYMENT

(See Key Overleaf)



Key for Graph E-13 -- JOSEPHINE COUNTY EMPLOYMENT

A - Other Manufacture
B - Construction
C - Finance, Real Estate, Insurance
D - Federal Government
E - Transportation, Utilities and Communications
F - Services and Miscellaneous
G - Education
H - State and Local Government
I - Trade
J - All Government
K - Self-employed
L - Agriculture
M - Wood Products Manufacture

ECONOMIC SECTORS

The following pages will address each of the economic sectors identifying its historic status, current status, constraints and opportunities. Topics are:

- Mining
- Agriculture
- Lumbering and Forest Products
- Other Manufacturing
- Construction
- Trade
- Services
- Government
- Real Estate, Finance, Insurance
- Transportation, Communication, Utilities
- Tourism

(Portions of the following sector narratives have been abstracted from the 1978 State Employment Division report, Josephine County Economy: Status and Prospects.)

MINING

Recent mining activity in Josephine County has primarily involved sand and gravel operations. Alluvial deposits of sand, gravel and rock are located along most rivers and stream beds, with most abundant sources of gravel found along the Rogue, Illinois, and Applegate Rivers (see chapter on Earth Resources: Geology). These materials are used for aggregate, road construction, and commercial and residential building construction.

Limited mining takes place for other minerals, including gold, chromium, limestone, talc, copper, and silver. As mentioned earlier, gold and silver were once mined extensively in the County. Over the last twenty years, gold production has averaged approximately 100 ounces a year, and limited amounts of copper are produced from small deposits of high-grade ore. (Anderson, 1978)

The value of mineral production in the County has fluctuated during the 1970's as aggregate production is primarily associated with development and construction within the County. Note the drop during the 1974 recession year. Statistics are not available for 1975-1978.

TABLE E-14

TOTAL VALUE OF MINERAL PRODUCTION IN JOSEPHINE COUNTY

(Sand and Gravel, Stone, Gold, Talc, Copper, and Silver)

YEAR	VALUE
1970	$ 799,000
1971	2,076,000
1972	954,000
1973	1,132,000
1974	274,000
1975	W
1976	S
1977	S

W: Withheld to protect disclosure of specific concerns
S: Statistics not yet available.

SOURCE: Minerals Yearbook, Oregon Department of Geology and Mineral Industries, 1979.

It has been estimated that 200 people were actively involved in mining activities in 1978. This level of activity could be expected to continue if no changes in

this sector were to occur. There are, however, those in the industry who see the potential for increased activity in this field.

As the preceeding chart indicates, fluctuation in employment and payroll are largely accounted for by flucuations in aggregate extraction, which is directly related to construction activity. Oregon Employment Division statistics for covered employment in mining show that in 1975 (a recession year) there were 35 persons employed with payroll of $435,000 in contrast to 63 people and payroll of $835,000 in 1974. It has been estimated that in 1978, 200 people were actively involved in mining activities (Department of Geology). This trend is expected to continue if no changes in this sector would occur. The potential for change is, however, eminent.

MINING POTENTIAL

The potentials for mining activity apply to three areas of concern -- aggregate or rock, precious metals, and rare metals.

It is expected that aggregate mining activity will remain relatively stable. Increases would potentially be correlated to housing and construction activity. Development of new sites along old mine tailings in Sunny Valley, the Placer area and the Illinois Valley is a future possibility if the price of aggregate material or its transportation increases significantly.

As the long term price of precious metals increases, making extraction and processing an economically viable proposition, it is expected that related mining activity would increase correspondingly. The reworking of old mines and tailings and the willingness to pursue minor veins or ores requiring extensive processing could make mining for precious metals a feasible proposition.

These factors also apply to the extraction and processing of rare metals or ores such as cobalt and nickel. Currently the United States imports 90% of its cobalt and nickel. World-wide sources for these products include Africa, the Soviet Union, the South Pacific, and the Carribean. Within the boundaries of the United States there are very few locations of cobalt and nickel. The Southern Oregon area is, however, one of these

sites. According to the State Department of Geology the lateritic soils of the Illinois Valley contain only about one percent nickel and about a tenth as much cobalt requiring a very efficient extraction process for mining to be economical...recent price increases, which seem to have stabilized, have made cobalt mining more attractive" (Oregonian, 1980).

Future mineral production would appear to be related to extraction potential for nickel, cobalt, and chromium in the southwest quarter of the County - noted areas being Eight Dollar Mountain, Woodcock Mountain, and Sourdough Mountain, with greatest potential in the latter two areas. Exploration was conducted in 1942 and during the 1950's. More recently, preliminary exploration has been underway in this area since 1970, employing approximately 15-25 people per year.

Utilization of these areas has become a controversial issue. The future of metal mining in this area will depend upon the ability to extract low grade ore from existing deposits at a profit without causing damage to watersheds, endangered plant and animal species, and general landscape quality.

IMPLICATION

The implications of mining within the County are dependent upon the specific mining activity.

These would appear to be minimal implications regarding the continuation of current operations. Potentially, there would be impacts on adjoining residential lands in the event of increased activity or the establishment of new sites.

Redevelopment of old sites or the opening of new precious metals sites could also have a nuisance or enviornmental impact. However, as the majority of these sites are on public lands and are governed by specific regulations, it is expected that the impact would be minimal.

Development of nickel, cobalt, chromium and other rare minerals could become a reality. Considering the nature of the removal operation the processing facility, personnel required, and the value of the product, such an operation could have a significant social and economic impact on this county, notably the Illinois Valley. Establishment of a production/refining plant in the Cave Junction area could become a reality if:

1) experimental production techniques are refined;

2) State agency requirements and controls can be met;

3) endangered biotic communities can be protected;

4) problems with watershed, landscape and visual quality can be resolved.

The economic effects of such a plant could be significant to the Illinois Valley and potentially the entire county. A very rough estimate by people in the industry is that such a plant would take at least five to ten years to develop and would provide approximately 100 jobs directly involved with mining once the plant began operation.* Such a development would constitute a need for industrial land and water source. Further, a need for additional housing and support services (stores, schools, facilities) could be generated if: a) existing residents were utilized thereby increasing their buying income and/or b) out-of-area employees were induced to relocate to the Illinois Valley area. Obviously a full-scale study would be advisable prior to development.

Other potential development sites would include the aggregate mining of old mine tailings in areas such as Sunny Valley, the Placer area and various locations in the Illinois Valley.

AGRICULTURE

Agriculture was historically important in Josephine County during the late 19th century and the first half of the 20th century. Dramatic decreases in employment have occurred from 1950 to 1970. (Changes in Oregon employment data designations are responsible for the 900 employee drop in 1970.) Trends have remained relatively stable, though, overall there has been a general decline in the number of people employed in agriculture (Table E-11 and Graph E-14).

The decline follows a general trend of decrease in the number of acres being farmed and is related to the greater mechanization of agricultural production.

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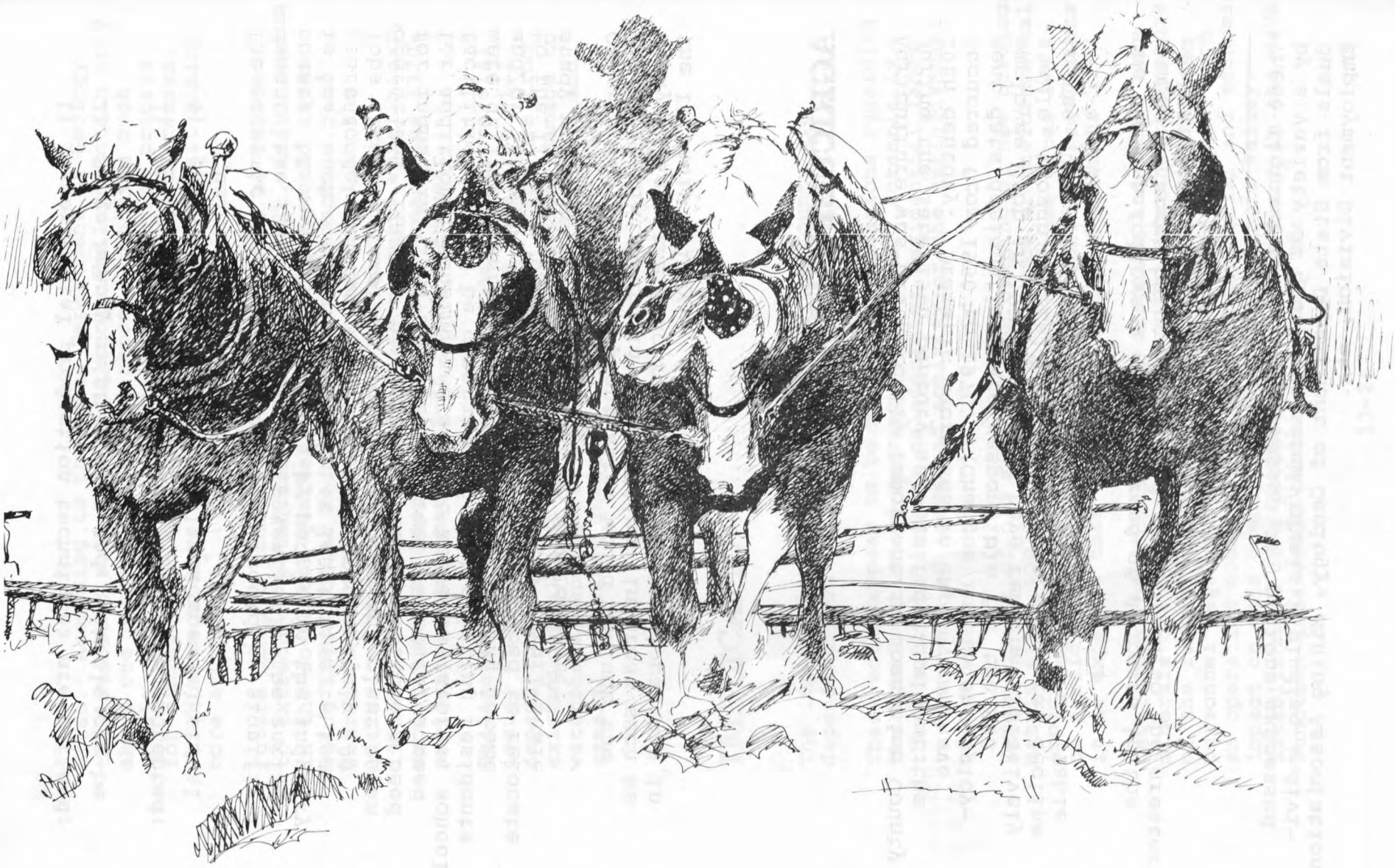
*These figures are a consolidation of opinions expressed by a variety of groups and individuals including individuals from State Department of Geology, Mining Association Employment Division, etc.



HORSE TEAMS WERE UTILIZED FOR FIELD CULTIVATION PRIOR TO MECHANIZATION

According to the 1974 U.S. Census of Agriculture, Josephine County had 40,755 acres of farmland (constituting 3.9% of the total land area) with only .84% of County lands (8844 acres) being harvested cropland. (Table E-15) The County Assessor's office in 1978, estimated 27,061 acres (2.6% of the total land area) being assessed as farm use land (exclusive of the residential portion of the acreage).

In January 1979, approximately 26,847 acres (2.58% of the total county land area) was zoned Exclusive Farm. This is the lowest ratio of agricultural land to total land area of all 36 counties in the State of Oregon (see chapter on Vegetative Resources). The discrepancy in the amount of acres devoted to farm use (U.S. Census versus acres zoned Exclusive Farm) can be reconciled upon recognition that properties devoted to farm use are not necessarily zoned Exclusive Farm. Approximately 10,800 acres receive a special farm assessment.

At one time, Josephine County was divided into large holdings. With the advent of population pressures, many holdings were, over time, divided into smaller parcels and less acreage became devoted to farming practices. As this process continued the average farm size increased as smaller farm holdings were converted to residential use leaving moderate size holdings to predominate. This trend towards conversion now appears to have slowed.

While the amount of acreage devoted to farm use has been reducing, the size of farm operations has also been changing. In 1954, 69.3% of all farms were less than 50 acres in size. By 1974, this figure had changed to 58.1%. This correlates with average farm acreage size being 47.3 acres in 1954 and 103.4 acres in 1974. The following table delineates this conversion: (Table E-16)

TABLE E-15

LAND IN FARMS

JOSEPHINE COUNTY	1959 ACRES	1959 PERCENT	1964 ACRES	1964 PERCENT	1969 ACRES	1969 PERCENT	1974 ACRES	1974 PERCENT
Total Land Area	1,040,000	--	1,040,050	--	1040,064	--		--
Proportion in Farms	---	7.4	---	7.3	---	3.7	---	3.9
Acres in Farms	76,878	100.00	75,948	100.00	38,473	100.00	40,755	100.00
Cropland Harvested	11,575	15.06	12,070	15.89	8,076	20.99	8,844	21.70
Cropland Pasture	12,126	15.77	11,482	15.12	9,210	23.94	7,562	18.55
Other Cropland	2,861	3.72	2,507	3.30	1,949	5.07	993	2.44
Woodland Including Woodland Pasture	39,275	51.09	37,266	49.07	14,286	37.13	18,174	44.59
Other Land	11,041	14.36	12,607	16.60	4,952	12.87	5,182	12.72
Irrigated Land	18,376	23.90	16,871	22.21	11,924	30.99	11,393	27.95

SOURCE: U.S. Bureau of the Census, Census of Agriculture.

TABLE E-16

FARMS IN JOSEPHINE COUNTY

	1954 Acres	1954 %	1959 Acres	1959 %	1964 Acres	1964 %	1969 Acres	1969 %	1974 Acres	1974 %
Number of Farms	1443	--	931	--	823	--	395	--	394	--
Average Size of Farm	47.3	--	82.6	--	92.3	--	97.4	--	103.4	--
Size of Farm:										
Under 10 Acres	431	29.9	176	18.9	122	14.8	51	12.9	73	18.5
10 - 49	569	39.4	412	44.3	379	46.1	166	42.0	156	39.6
50 - 179	306	21.2	232	24.9	232	28.2	122	30.9	109	27.7
180 - 499	111	7.7	94	10.1	70	8.5	43	10.9	43	10.9
500 - 999	22	1.5	11	1.2	14	1.7	8	2.0	8	2.0
1,000 - 1,999	4	0.3	5	0.5	4	0.5	5	1.3	4	1.0
2,000 and Over	0	0.0	1	0.1	2	0.2	0	0.0	1	0.3
Total	1143	100.00	931	100.0	823	100.0	395	100.0	394	100.0

SOURCE: U.S. Bureau of the Census, Census of Agriculture.

A critical element for agricultural operation in Josephine County is the availability of irrigation as the Rogue River and Illinois Valleys represent the hottest, driest valleys in western Oregon. According to the 1974 Agricultural Census, 11,393 farm acres (28% of all farm land) are irrigated. This figure would, however, dramatically drop in a drought year, where irrigation rights are often restricted to 1890 and earlier rights. This would leave a large percentage of the farm lands usable only by dry farming techniques. According to the County Watermaster's office, approximately 57,000 acres have surface water rights. During the 1977 drought year, only approximately 1400 acres were permitted to draw irrigation from surface water sources!

Although farm acreage is decreasing, income to the County from agricultural production has been continuously increasing, doubling in the last 20 years (Table E-17). this has been due primarily to increased production and national inflation.

Many of the smaller farms are (and probably will continue to be) marginal producers, with many of the operators having full-time employment in other occupations. In addition, there has generally been a trend toward production of those agricultural products having high relative dollar value per acre farmed.

According to the Agricultural Census, only 39% of all farms had sales over $2,500 in 1974. These farms averaged 187 acres and accounted for 70% of total cropland, 80% of harvested cropland, and 75% of all irrigated land. Only 51 farms (13% of the total) had sales over $20,000 in 1974 and only 13 had sales of $100,000 or more. For example, mint and hops are grown on approximately 13% of those lands being farmed and account for nearly 40% of the dollar production of all crops. A similar concentration is occurring in livestock products with dairy production (U.S. Bureau of Census, 1974).

In 1978, estimated agricultural production value was $12,833,000 (Table E-17). A reduction in prices caused a decrease in the value of dairy cattle in 1977. Other livestock categories, however, increased over the year. The largest increase in value occurred in specialty crops such as mint and hops, in forestry from small farm woodlands, and in production of fruits, nuts, and berries.

TABLE E-17

OREGON STATE UNIVERSITY EXTENSION SERVICE

JOSEPHINE COUNTY AGRICULTURAL DATA: 1955-1978

	YEAR	DOLLARS TOTAL	DOLLARS LIVESTOCK	DOLLARS CROP	ACRES Estimated Farm Use (A)	ACRES Wood Lot Idle Land & Bldgs. (B)	ACRES Active Farm Land (A-B)
	1955	4,236,000	2,724,000	1,512,000	34,244	2,300	31,944
	1956	4,698,963	3,158,30	1,540,657	35,894	3,600	32,294
	1957	4,500,000	3,037,500	1,462,500	36,747	3,400	33,347
	1958	5,038,400	3,253,900	1,784,500	36,490	3,400	33,090
	1959	5,062,976	3,366,656	1,696,320	37,397	3,500	33,897
CF	1960						
	1961	5,368,063	3,680,558	1,687,505	78,878	31,803	47,075
	1962	5,407,100	3,693,900	1,713,200	77,018	31,750	45,268
	1963	5,481,200	3,840,500	1,640,700	77,090	31,550	45,540
	1964	5,370,000	3,503,000	1,867,000	77,090	31,350	45,740
	1965	5,297,900	3,719,900	1,578,000	77,367	31,417	45,950
	1966	5,609,000	4,085,000	1,524,000	75,948	29,500	46,448
	1967	4,665,000	3,144,000	1,521,000	75,948	29,210	46,738
	1968	5,315,000	3,272,000	2,043,000	75,146	29,210	45,936
	1969	5,571,000	3,447,000	2,124,000	73,479	29,210	44,287
CF	1970	5,553,000	3,748,000	1,805,000	unavailable		
CF	1971	6,090,000	4,108,000	1,982,000	33,300	1,500	31,800
	1972	6,027,000	4,236,000	1,791,000	33,125	1,500	31,625
	1973	6,954,000	4,876,000	2,078,000	33,575	1,500	32,075
	1974	8,480,000	5,444,000	3,036,000*	32,915	1,500	31,415
	1975	9,116,000	6,232,000**	2,884,000	32,915	1,500	31,415
CF	1976	10,373,000	6,948,000	3,425,000***	43,440	-	-
	1977	10,528,000	6,755,000	3,773,000	54,780	-	-
	1978	12,833,000	7,846,000	4,987,000			

Substantial cash increase in:

* Field Crops
** Poultry and Dairy
***Farm and Forestry
CF-Change in Data Collection and Format

Employment in agriculture includes farm operators, unpaid family farm workers, regular hired workers, and seasonal farm workers. It excludes those farm operators who work away from their farm for more than 100 days during the year. Agricultural employment has decreased from an annual average of 1,340 in 1960 to 450 in 1977, a decrease of about 6% per year (Anderson, 1978). This was due to the substantial reduction in the number of farms and full-time farm operators, as well as the increased mechanization of many farming activities, and redefinition of "agricultural" employment. In 1960 agriculture comprised about 14% of total employment in Josephine County. In 1977 its share of total employment had decreased to 2.5% (Table E-11).

AGRICULTURAL POTENTIAL

The future of agriculture, particularly, large-scale commercial production, is limited due to competition from other areas, distance to major market locations, and high initial costs. The production of hops, mint, bulbs, poultry, dairy products, and livestock will probably continue to be major commercial concerns. Competition with producers in other areas is a major problem, possibly making small farm operation in this area economically unfeasible. In addition, the cost of labor, fertilizer, equipment purchase and maintenance, and marketing are generally prohibitive.

This area could, however, be conducive to the development of high yield, intensive farming of specialty crops such as straw flowers, herbs, bedding plants, "exotic" vegetables, grapes, and tree fruits. The development of a growers co-op would be very beneficial to such production (see chapter on Vegetative Resources: Agriculture).

If increased population pressures nationwide become too great a burden to the nations decreasing farm lands, a return to agricultural production may again become economically feasible due to demand for food products. Such a situation could potentially impact southern Oregon with continuing national development, Josephine County will probably not, however, be called on to become a large scale national producer. It could, however, provide for local needs. Based on previously discussed restrictions and development, it is estimated that agricultural employment will continue to remain stable.

A variety of factors must be studied if increased agricultural production is desired for Josephine County. The development of the Farm Task Force has been the first step in a program which would potentially review these factors, including, but not limited to:

a. a complete market analysis - local, national and international;
b. an analysis of what crops can be grown in this area;
c. a review of lease-hold or management assistance programs;
d. an analysis of the costs and benefits of processing; and
e. an analysis of water requirements and available supply.

LUMBER AND WOOD PRODUCTS

As stated earlier, logging and wood products manufacturing provided the economic base of Josephine County during the 1950's and 1960's. A resurgence of activity has occurred during the last seven years, with approximately 18% of wage and salary employment being in lumber and wood products manufacturing (Table E-12). Approximately 90% of Josephine County is forestland, based on Soil Conservation Service soil capability and subject to the State Goal on forest lands, (see chapter on Vegetative Resources: Forest). The average site index for Josephine County is relatively low for western Oregon, but productivity is relatively high in comparison to the United States as a whole.

Although much of the total land area of the County is now zoned for some type of forest use, the supply of marketable timber may be limited. Past timber cutting and forest management practices, combined with physical limitations, leave the area in a questionable position relative to the ability of the forests to provide timber at a rate necessary to sustain current yields, employment, and market demands over the next few decades.

Reductions in the allowable cut on the Siskiyou National Forest as a result of recent Congressional wilderness allocations and the conversion of private timber lands to non-forest use have also resulted in an erosion of the timber base. Harvest levels for 1974 and 1975 involved substantial cutting of both public and private land.

Josephine County's forest land ownership is not typical in relation to ownership patterns of other counties. This County contains fewer acres of industrially owned timber land than any other county in western Oregon, due principally to the revestment of former O & C lands to federal ownerships. With the limited ownership of forest land in Josephine County by timber companies, the majority of private forest lands are held in fragmented, small ownerships. Management of these lands for timber production has historically involved little silvicultural practice other than periodic harvesting. Because of the ownership pattern, the use of these lands for sustained yield harvests is dependent upon small woodlot management. Programs, zoning and tax incentives are in the process of being developed.

Between 1960 and 1977 employment in the lumber and wood products industry increased by 25%, from 2,170 to 2,720. Despite the overall addition of 550 jobs, the area's dependence on the timber industry has decreased slightly, although it is still Josephine County's largest manufacturing sector. Lumber and wood products employment accounted for nearly 94% of all manufacturing jobs in 1960, but had fallen to 73% in 1977; the industry was the area's largest overall employer in 1960, but has dropped to third highest employer during 1978 (Table E-12).

Since 1960 there has been a gradual change in the composition of production in the timber industry. A reduction in the number of persons working in logging and in sawmills has been more than offset primarily by increases in plywood and cabinet maufacturing. Such secondary processing assures greater employment and cash revenue within the County. There has also been a consolidation of wood products production and employment among fewer, larger firms with the majority of private employees working for one of the six largest plywood mills (Anderson, 1978).

Major wood products employers in the Grants Pass area are:

TABLE E-18

COMPANY	EMPLOYMENT		
	1979	1975	% Change
Diamond Industries	450	160	181.3
SWF Plywood Co.	365	200	173.3
Fourply, Inc.	250	250	-0-
Southern Oregon Plywood (SOPLY)	175	180	- 2.8
Timber Products (TIMPLY)	170	175	- 2.9
Spalding & Son	na	145	na

SOURCE: Oregon Department of Economic Development, Directory of Oregon Manufacturers, 1975 and 1979.

NOTE: The above numbers graphically show the impact of the 1974-75 recession on the larger companies.

Because lumber and wood products form a major part of the export base for Josephine County, the direct income generated is only part of the local income from timber harvest and processing. Lumber and wood products accounted for 12.7 to 17 percent of direct income received by Josephine County residents in 1970 to 1975. For the state as a whole, the percentage of direct wage, salary, and proprietorship income from lumber and wood products ranged from a low of 6.9% to a high of 8.6% during the same time period (BLM, 1978). Further, 24% of Josephine County's personal earnings were generated within the lumber and wood products sector (Table E-36). But of course, direct income from the industry is only part of the picture.

A "basic industry" such as lumber and wood products (and other manufacturing) generates significant secondary and tertiary employment and income in the County. This effect, referred to as the multiplier effect, is the result of income derived from the industry respent in the County for goods and services in such "nonbasic industries" as wholesale and retail trade; transportation, communications, and public ultilities; finance, insurance and real estate; and services. The State Department of Economic Development recently estimated the "multipliers" for Josephine County at 2.5-3.0 for employment and 2.0-2.6 for income. Therefore, as an example, the total income impact in the County for 1976

resulting from the industry (using a 2.0 income multiplier) would be almost $75 million; and the employment impact (using an employment multiplier of 2.5) would be over 6000 jobs. This illustrates how fluctuations in the lumber and wood products industry can have widespread impact on the total economy of the County. (DED, 1980.)

As stated, the lumber and wood products industry generates work in related areas such as contract logging and hauling, road building, finished product transport, and forest management. Grants Pass is the headquarters of the Siskiyou National Forest, Oregon State Forestry Department, and Josephine County Forestry Department. These associated jobs and agencies account for an additional 600 to 850 forest-related jobs annually (Anderson, 1978).

Obviously, the supply of harvestable timber is central to employment trends in the lumber and wood products industry. Expected reductions in timber supply, along with increased technological application, will very likely result in a decrease in the number of harvesting and processing firms and in the total number of employees.

LUMBER AND WOOD PRODUCTS POTENTIAL

According to a report published by the Oregon State University School of Forestry in 1976, Timber for Oregon's Tomorrow, a continuation of the present timber management practices in the Medford unit (Jackson-Josephine Counties) would result in a relatively constant harvest until 1995, followed by a decrease of 18% over the next ten years. Employment under these circumstances would remain constant until 1985, fall by 8% from 1985 to 1995, and reach 24% below 1975 levels by 2005.

"If timber management policies resulting in an increase of from 14% to 18% in the timber harvest from 1975 to 1985 were instituted, employment would rise from 6% to 9%. These same policies, if in effect, would result in a timber harvest gain of only 3% to 8% above 1975 levels by 2005 and a reduction in employment of 9% to 13%. Thus, according to the Oregon State University report, depending on timber management practices, by 1985 employment will be about the same to 9% higher, but by 2005 employment will fall from 9% to 24% from 1975 levels." (Anderson, 1978) These figures are verified by projections made by Bonneville Power Administration.

LOG PONDS ARE ALMOST NON-EXISTENT AS NEW TECHNIQUES FOR LOG PROCESSING ARE BEING DEVELOPED.

"In applying these figures to Josephine County, lumber and wood products employment would be 2110 to 2300 persons in 1985 and would drop to between 1600 and 1920 persons by the year 2005. This is an example of the employment change that could result from current or anticipated timber management."

"Alterations in the allowable cut are already occurring in Josephine County. The Bureau of Land Management recently adopted a 36% reduction in the annual harvest it will permit. From 350 to 400 jobs are expected to be lost in the wood products industry as a result of this cutback. Additional job losses could be expected to occur in logging road construction and timber hauling. Income to county governments from federal timber (O & C payments in-lieu of taxes) could be reduced." (Anderson, 1978)

Future employment within the lumber and wood products industry apparently depends on the allowable cut, the amount of diversification and secondary processing, and the application of new technologies for marginal forest lands.

LUMBER AND WOOD PRODUCTS IMPLICATIONS

The projected reduction in allowable cut and subsequently the reduction in employment could have a substantial economic impact on Josephine County. Further, such decreases could have an impact on secondary processing and eventually on the trade and service sector as fewer wage dollars are earned. Development of employment alternatives would appear necessary to retain and enhance economic stability. Further, new jobs should potentially have comparable wages and skill requirements.

Monitoring of new technological advances should be encouraged to determine application within the County. This could potentially offset the reduced allowable cut. Management of private woodlot holdings should be encouraged as an alternative timber source. Further, the County may wish to investigate the possibility of reviewing state and federal policies regarding allowable cut.

OTHER MANUFACTURING

Although wood products employment has risen by 25% since 1960, most growth has taken place in other manufacturing sectors (including manufacture of food, textile and apparel products, printing and publishing, electrical, chemical, equipment, and product manufacture). Employment in other manufacturing averaged 150 people in 1960, a third o which was in food products. The remainder was distributed among other small durable and nondurable goods firms. Between 1960 and 1978 employment in other manufacturing rose by1000 persons, a gain of 666%. Over half of that increase resulted from the opening of electronic equipment manufacturing firms during the 1970's.

This "diversification: in the manufacturing base of the economy has grown steadily over the past 20 years. Currently, the largest employers in "Other Manufacturing" include the firms listed in Table E-19.

Jobs that have been created due to the diversification of manufacturing have generally been at a lower skill level and a lower pay rate than wood products jobs; whereas, the average starting wage in most of the lumber and wood products industry is about $6.00 per hour (some smaller firms starting at $3.00 per hour), much of the production work in other manufacturing begins at $2.75 to $3.00 per hour. Some firms requiring more highly skilled labor may start employees at $5.00 to $6.00 per hour. (Anderson, 1978).

TABLE E-19

"OTHER MANUFACTURING" EMPLOYERS IN JOSEPHINE COUNTY

FIRM	EMPLOYMENT 1980	EMPLOYMENT 1976	EMPLOYMENT % Change	PRODUCTS
Copeland Sand & Gravel (Grants Pass)	55	na	na	Sand and Gravel
Electronics Sub. Assembly (Grants Pass)	60	na	na	Cable and Harness Assemblies
Champion Products (Grants Pass)	78	90	12.2	Imprinted Textiles
Grants Pass Daily Courier (Grants Pass)	80	67	19.4	Daily Newspaper
Caveman Industries (Grants Pass)	85	na	na	Campers, Travel Trailers, Canopies
Environmental Container Systems (Grants Pass)	150	110	36.4	Fiberglass Cases
Oregon Technical Products (Grants Pass)	175	110	59.1	Electronic Assembly
Litton Industries (Grants Pass)	320	247	29.6	Printed Circuit Assembly, Memory Units

SOURCE: Directory of Oregon Manufacturers, 1980-1981: State of Oregon Department of Economic Development, January, 1980.

POTENTIAL

Growth in other manufacturing employment will depend on several factors potentially including restrictions on pollution from industrial sources, the ability of local leaders to attract new non-timber firms or timber re-manufacturing firms to the area, the supply of skilled or trainable labor, and the availability/cost of industrial sites with necessary services ready for immediate utilization, and availability of state industrial revenue bonds.

Diversification of employment by increasing jobs in Other Manufacturing would appear to have several beneficial impacts on this county. First, and most importantly, it should serve to stabilize the County's labor force. Location of Other Manufacturing firms could also potentially increase and stabilize tax revenues to the County. As such firms would be considered a base industry, they would subsequently stimulate secondary and tertiary employment (see Table E-44). Whereas out-migration of county employees due to a lack of employment opportunities could be stemmed, location of such industries here could stimulate in-migration as jobs were made available.

If the County decides to encourage the development of Other Manufacturing industries, especially non-polluting, "footloose" industries, it must consider the locational factors such companies, including available land area, public facilities, and transportation modes. A study of incentives should be considered to include preparation of sites and tax incentives. Organizations such as the Overall Economic Development Committee or Chamber of Commerce may be utilized for public relations of recruiting purposes.

CONSTRUCTION

The construction industry within the County has fluctuated. During the last 20 years employment has gone from a low of 160 employees (1961) to a high of 639 (1978).

Historically construction has been closely related to the lumber/wood products industry, the national economy, and the amount of in-migration to the County. The 1974-1975 recession saw a severe slump in the construction industry both in the number of housing starts and the number of construction employees. Recovery from the slump saw a substantial increase in the number of housing starts during 1976-1977. This trend has begun to stabilize, showing a slight decrease of construction starts and an increase of employment in 1978. (Table E-19)

Whereas recent building construction has declined, valuation has continually increased over time primarily due to inflation.

Construction has been substantial in the commercial and industrial sectors as business has expanded in these areas. Construction of I-5 accounted for employment increases from 1960 to 1966. Other more recent projects have included construction of three high schools, a county justice wing, a state office building, Grants Pass Municipal Building, City Hall-Community Center in Cave Junction, Harbeck/Fruitdale Sewer District, Redwood Sewer District, and Southern Oregon Hospital Emergency Services.

As with other construction aspects, road building (private and county) does correlate with the recession and is associated with O & C timber funds.* State construction in Josephine County has been relatively inconsistent and showed a marked increase during 1978.

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*Receipts from sale of timber on National Forest land (which are not O& C payments) are specifically targeted for County Roads (75%) and schools (25%).

TABLE E-20

PERMITS FOR NEW CONSTRUCTION IN JOSEPHINE COUNTY
(EXCLUDING GRANTS PASS)

	1974*	1975	1976	1977	1978
Single Family Units	70	256	435	634	569
Multi-family units	0	4	6	44	20
Professional/Commercial Structures	8	13	23	37	30
Ag. and Industrial Structures	29	32	9	1	4
Public Buildings**	2	13	2	4	1
Value of Residential Const./ Remodeling	1,977,542	7,614,343	13,227,474	20,176,146	21,872,476
Value of All Const./Remodeling	2,705,382	12,639,061	22,542,811	25,913,049	28,734,357

*Data for July-Dec. 1974 only.
**Schools, Churches, Public Buildings, Institutions.
SOURCE: Josephine County Building Permits.

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PERMITS FOR NEW CONSTRUCTION CITY OF GRANTS PASS

	1972	1973	1974	1975	1976	1977	1978
Single Family Units	122	84	46	64	112	142	93
Multi-family Units	120	76	10	24	142	203	181
Commercial/Industrial	28	22	21	12	21	31	30
Public Buildings	1	0	0	0	0	5	0
Value of Residential Const./ Remodeling	3,818,930	2,744,867	1,478,631	2,530,110	5,761,228	7,696,027	5,709,23_
Value of All Const./ Remodeling	5,909,095	6,219,779	7,722,561	6,277,058	7,885,577	12,645,517	10,728,69_

SOURCE: City of Grants Pass Building Department.

CONSTRUCTION POTENTIAL

Based on future population growth and demand for additional services, it is estimated that construction will continue to increase slowly. Construction of major proposed projects such as a new urban water system, a third (and possibly fourth) bridge and various shopping centers could substantially influence employment in the construction industry.

IMPLICATIONS

Two basic factors determine construction activity and employment. First, fiscal and monetary structure (both local and national) basically determines the demand or availability of construction activity. Specifically Federal Reserve Board monetary policy has had a direct impact on Josephine County's economy. Restrictive monetary policy by the Federal Reserve Board in the 1974-75 period, and more recently in the spring and summer of 1980 resulted in the relative decrease in supply of mortgage funds for housing and other construction financing (in conjunction with the decrease in demand for these funds through the pricing mechanism of higher interest rates). The housing and construction slumps of 1974-1975 and 1980 were a direct and almost immediate result from monetary policy intended to dampen national inflationary pressures by restricting the supply and driving up the price of credit (interest rates).

Second, the allowable cut and availability of building materials determine the supplies that permit construction and also determine the basic costs of construction.

Further, land allocations potentially determine not only the location of residences and associated home construction, but the cost of the property as well. This and the overall economy (e.g. income) have a direct effect on construction activity.

Thus it is evident that construction employment is dependent upon the inter-relationship between population, supplies, land, and public demand. Modifications to any of these factors results in impacts to the industry.

GOVERNMENT

Growth of employment in the government sector has generally kept pace with population increases and the collective demand for public services. To date, government is the second largest employer in Josephine County.

Employment in government can be divided into four basic categories: federal, state and local, and education. When viewed independently, it becomes interesting to note that the majority of public employees are found in the educational system. (Table E-20)

This 50% total increase in government employment corresponds to the 65.7% total employment increase and the 56.7% population increase between 1970 and 1978.

In 1977 government employment in Josephine County constituted 15.3% of the total civilian labor force. Nationally, all government employment is an average 19.2% of the total labor force.

TABLE E-21

GOVERNMENT EMPLOYMENT IN JOSEPHINE COUNTY

	1970	1978	% Change
Federal	330	370	+12.1
State and Local	860	1270	+47.7
Education	830	1620	+95.2
Total	2020	3260	+61.4

Locally, employment by the federal government has remained relatively stable over the last eight years. Growth in state and local governmental employment has occurred due to instigation of programs designed to cope with the effects of recession, unemployment, falling incomes. Other anti-recession public employment programs have increased employment in this sector (i.e. Comprehensive Employment and Training Act of 1973).

Through 1974, growth at Josephine General Hospital and Rogue Community College accounted for 26% of employment in the government sector. Employment in state and local government declined after 1975, partially due to the change in the hospital's status from public to private ownership.

POTENTIAL

As the County experienced high in-migration, government employment rose rapidly to keep pace with this population increase. Employment in the government sector is now expected to maintain a constant percentage in relation to the population and therefore will continue in relation to population growth. Specific sectors of government services and employment could, however, be expanded in the future to accommodate the needs of certain population sectors including seniors, juveniles and tourists.

IMPLICATIONS

Historically, the population has demanded and expected a certain level and type of government service. Monitoring of public desires will determine the future level of services and associated employment.

TRADE AND SERVICES

In Josephine County, the non-manufacturing sectors that have experienced the greatest amount of growth, absolutely and relatively, are trade and services.

As noted in Graph E-13, employment in these sectors has skyrocketed over the last twenty years. Trade employment has increased 99.2% (1,170 to 3,500 employees) and services has increased 294.0% (670 to 2,640 employees). Trade and services, respectively, are the first and fourth largest employers in the County and together provided employment for 40.0% of the County's wage and salary employees in 1978. The following tables have been included to demonstrate the increases in retail sales. They further show the City of Grants Pass had the eighth largest dollar retail sales of all cities in Oregon and that Josephine County as a whole ranked eleventh in the state. (Table E-22) Note the change in total retail sales between 1971 and 1972 data on Table E-24.

TABLE E-22

OREGON RETAIL SALES, FOR SELECTED YEARS, 1963-77

(In Thousands of Dollars)

State/County	1963	1967	1972	1974	1975	1976	1977
Oregon	2,679,337	3,346,901	5,190,581	6,148,114	6,671,271	7,277,016	7,693,075
Baker	20,667	29,788	31,494	32,850	35,509	38,073	40,465
Benton	49,185	64,370	98,817	114,448	125,189	135,812	140,849
Clackamas	122,227	167,131	344,115	422,822	458,546	499,422	537,341
Clatsop	38,185	48,580	60,910	67,774	70,649	79,138	83,246
Columbia	20,833	29,455	48,135	59,377	66,061	67,030	70,388
Coos	74,660	84,837	140,643	173,377	186,577	205,143	220,679
Crook	11,849	11,876	20,619	26,786	29,510	32,329	33,246
Curry	16,911	17,303	27,007	30,400	31,968	34,952	36,155
Deschutes	43,861	53,275	102,088	129,434	139,380	154,862	166,857
Douglas	82,586	92,035	163,440	214,232	227,654	254,985	278,052
Gilliam	5,218	5,324	3,129	3,194	3,507	3,600	3,833
Grant	8,502	10,612	14,136	18,190	20,209	22,474	23,211
Harney	9,692	12,913	15,993	17,359	17,848	19,942	22,892
Hood River	19,377	22,891	29,636	34,884	38,217	42,451	47,396
Jackson	120,642	152,786	249,254	298,031	318,773	346,681	364,347
Jefferson	16,582	16,611	19,563	21,110	21,899	24,319	26,538
Josephine	48,586	55,439	105,519	133,726	141,270	156,399	179,540
Klamath	75,009	83,549	127,444	152,108	163,627	181,591	191,296
Lake	11,299	13,601	15,199	15,711	16,084	16,820	18,691
Lane	267,049	316,281	544,758	628,268	667,125	729,255	780,718
Lincoln	31,833	39,485	67,161	88,118	95,927	105,693	116,044
Linn	78,056	99,389	147,057	171,275	185,229	203,495	211,509
Malheur	36,490	42,556	66,299	72,922	78,437	85,812	87,369
Marion	191,262	254,054	380,702	449,315	485,740	533,738	576,510

TABLE E-22 (CONTINUED)

Morrow	6,966	6,803	5,789	5,574	5,788	6,146	6,955
Multnomah	912,442	1,161,229	1,614, 787	1,834,239	2,012,101	2,169,397	2,198,800
Polk	23,799	29,718	43,686	51,504	54,607	59,089	66,696
Sherman	2,894	2,465	3,414	3,979	4,171	4,660	5,105
Tillamook	19,995	23,209	35,196	46,179	48,282	53,510	56,416
Umatilla	65,952	83,149	101,191	116,540	125,624	135,946	148,557
Union	22,104	29,881	43,983	53,118	56,986	64,106	69,360
Wallowa	6,145	8,554	12,992	16,758	17,155	19,009	21,254
Wasco	37,386	42,927	55,919	65,138	72,241	77,421	85,165
Washington	138,617	187,338	377,041	494,697	557,900	611,194	662,686
Wheeler	1,814	1,584	2,307	2,654	2,619	2,930	3,364
Yamhill	40,659	45,906	71,158	82,023	88,862	99,592	111,545

SOURCE: For years 1963, 1967, and 1972, Bureau of Census, U.S. Department of Commerce. For years 1974 - 77, Sales and Marketing Management Magazine.

TABLE E-23

CITIES RANKED BY VOLUME OF SALES
(In Thousands of Dollars)

CITIES	RANK	VOLUME
Portland.	1	1,730,811
Eugene.	2	502,778
Salem	3	481,848
Medford	4	340,901
Beaverton	5	265,832
Albany.	6	178,711
Roseburg.	7	177,102
Grants Pass . . .	8	176,241
Corvallis	9	171,256
Klamath Falls . .	10	163,533

SOURCE: Advance Report, Geographic Area Statistics, 1977 Census of Retail Trade RC77-A-38(A).

There is some concern, however, regarding the accuracy of these figures as they cannot be correlated. The census information shows $176,241,000 worth of sales in Grants Pass. If correlated to the Sales and Marketing Management Magazine information, the remainder of the County (including the Rogue River Highway strip and Cave Junction) had only $3,299,000 worth of retail sales.

The trade and service sectors in Josephine County primarily serve the local area. Although some business does extend into neighboring counties, regional extension of goods and services is limited, predominantly due to competition with larger market areas. The out-flow of County goods and services are primarily lumber and wood products, electronic equipment, and miscellaneous manufacturing of campers and knitwear.

Although Josephine County supplies the majority of trade and service needs for County residents, considerable cash flow occurs to out-of-county areas, where larger variety and ease of one-stop, major shopping centers are available.

In mid-1979, Consumer Attitude Research did an attitude and awareness survey of Grants Pass and vicinity. A large portion of this survey was involved with marketing information. In regard to trade, the participants indicated they shopped outside the Grants Pass area because the stores: a) had a better selection of goods, b) were larger, c) had lower prices and better values and d) to some degree, had more sales.

TABLE E-24

JOSEPHINE COUNTY RETAIL SALES

(In Thousands of Dollars)

YEAR	TOTAL	FOOD	EATING & DRINK ESTABLISHMENTS	GENERAL MERCHAND.	FURNITURE APPLIANCES	AUTO	DRUG	OTHER
1977	179,540	38,809	15,573	7,728	13,471	46,292	9,675	63,560
1976	156,399	33,793	NA	6,802	12,213	38,802	8,501	56,288
1975	141,270	30,578	12,130	6,101	11,075	33,969	7,597	51,950
1974	133,726	27,695	NA	5,582	10,297	30,888	10,267	48,997
1973	104,837	25,819	NA	6,675	6,112	24,918	1,679	NA
1972	105,519	23,081	NA	4,827	6,048	29,039	5,463	37,061
1971	74,083	20,426	NA	7,630	3,521	16,774	1,564	NA

SOURCE: Data compiled from data in Sales and Marketing Management Magazine.

TABLE E-25

REASONS FOR SHOPPING OUTSIDE GRANTS PASS

IF YOU SHOP OUTSIDE OF THE GRANTS PASS AREA WHAT ARE YOUR REASONS FOR SHOPPING IN THESE OTHER AREAS?	AGE							
	TOTAL	UNDER 25	26 - 30	31 - 40	41 - 50	51 - 59	60 - 65	OVER 65
PERCENTAGE OF RESPONSES		7.6	8.8	18.6	14.9	16.4	12.0	20.8
BETTER SELECTION	63.7	78.6	71.8	78.4	60.7	64.0	63.3	45.2
LOWER PRICES	41.1	60.6	48.7	54.5	49.1	28.1	38.9	24.9
CONVENIENT STORE HOURS	6.8	16.4	15.9	6.6	6.7	6.4	3.2	2.1
LARGER STORES	40.8	52.7	55.1	48.7	45.7	39.2	36.1	24.6
BETTER VALUES	31.4	40.2	36.8	41.0	37.2	26.2	28.8	19.2
BETTER QUALITY MERCHANDISE	9.8	15.8	11.9	14.4	13.9	7.7	4.2	4.7
MORE SALES	14.2	32.7	21.0	23.7	16.0	8.9	8.7	2.4
CLEANER STORES	1.0	2.2	1.9	2.0	.4	.6	-0-	.6
NEAR WORK	1.4	4.3	2.6	1.0	2.7	.3	-0-	.9
NEAR HOME	3.0	2.2	1.9	3.4	2.4	3.0	4.2	3.2
FRIENDLIER CLERKS	3.7	5.2	1.8	3.9	7.3	2.0	3.3	3.0
MORE KNOWLEDGEABLE SALESPEOPLE	4.0	4.5	2.4	4.8	4.5	4.6	4.6	3.0
NEVER SHOP OUTSIDE THE AREA	7.0	2.1	5.0	1.8	4.6	6.8	5.3	17.1
OTHER	.7	.9	1.6	.4	-0-	1.9	.5	.3
NO ANSWER	7.3	7.1	1.2	4.9	7.0	6.9	7.7	11.7

SOURCE: Consumer Attitude Research, 1979.

The items that appear to be in high demand within this County are general merchandise stores, shoe stores, and clothing stores. Secondary demand appears to be for full-service restaurants, gardening centers, hardware stores and supermarkets. (Table E-26)

In accord with public desires, new and proposed commercial development is occurring to provide many of these products and services. The north portion of Grants Pass has boomed over the past year, and has gained a K-Mart shopping center, two smaller (3-4 store) shopping centers and numerous fast food stores. (Table E-27)

Discussion regarding development of major chain stores in Jospehine County have been initiated by private industry. Constraints have, however, apparently been the lack of suitable sites with specific service lands and adequate acreage availability.

Plans are presently being reviewed for a number of major shopping centers in the Redwood area. Assuming development of services, estimated completion of these plans would be 1981-1982. Development of these centers would serve several functions including: a) provision of services to areas south of the river, b) associated reduction in bridge traffic and congestion of Grants Pass proper, c) development of new stores whose products are needed in this area. This development could also, however, have negative impacts on the Downtown shopping area. (See City of Grants Pass Comprehensive Plan and Harbeck Land Use Study.)

The fastest growing non-manufacturing sector in Josephine County is services. Most of the growth in this sector has resulted from increases in population, but expansion is also due to the increasing trend of service-oriented economies both locally and nationally. In Josephine County this situation is enhanced by the large, local senior population, who are frequently retired, yet utilize services.

Increases in services include expansion of medical services and increase in motels, lodging places, and other home and personal services.

At the present time, major trade and service centers are found within the city limits of Grants Pass and Cave Junction and in unincorporated areas such as along Rogue River Highway, east Redwood area, Merlin, Murphy, Kerby, Selma, and Wolf Creek. Other areas include Takilma, Sunny Valley and O'Brien. Future expansion would be expected to occur in these established areas.

TABLE E-26

STORES WHICH NEED TO BE ADDED OR IMPROVED (%)

	TOTAL	- AGE - UNDER 25	26 - 30	31 - 40	41 - 50	51 - 59	60 - 65	OVER 65
PHARMACY OR DRUG STORE	6.1	5.7	5.0	6.0	7.3	4.8	8.4	6.0
SUPERMARKETS	15.2	21.1	15.7	17.1	14.4	13.3	18.4	11.5
GENERAL MERCHANDISE STORE	35.4	36.0	37.4	44.5	37.7	34.0	31.2	28.6
HARDWARE/DO-IT-YOURSELF	17.2	15.0	16.4	21.4	23.3	15.1	19.6	10.4
CLEARNER/LAUNDROMAT	5.7	16.9	5.7	6.1	6.1	2.6	3.5	4.6
FABRIC STORE	12.9	24.7	17.4	17.8	11.5	8.1	9.4	9.4
CLOTHING STORE (MEN/WOMEN)	31.6	52.6	41.0	39.2	38.2	28.3	30.6	11.8
CAMERAS & CAMERA SUPPLIES	5.5	8.8	10.3	9.2	6.5	3.5	2.7	1.4
STEREO EQUIPMENT	4.7	20.8	2.4	6.3	3.1	3.1	4.7	.8
RECORDS & TAPES STORE	7.9	26.6	9.9	11.5	5.5	5.8	6.3	1.1
CLOTHING/CHILDREN	22.4	45.7	46.8	42.4	25.2	10.8	5.6	2.7
SHOE STORE	29.8	36.5	39.5	46.0	29.1	27.9	22.1	15.9

TABLE E-26 (CONTINUED)

BARBER SHOP	4.8	5.0	2.7	4.5	4.8	5.1	7.3	4.2
BEAUTY SHOP	2.2	4.3	-0-	2.1	2.3	1.7	2.8	2.3
HOBBY SHOP	11.4	19.4	18.4	16.2	11.5	6.2	11.8	5.3
FULL SERVICE RESTAURANT	18.2	22.3	16.7	25.8	16.8	18.3	15.5	13.1
QUICK SERVICE (TAKE OUT) RESTAURANT	6.1	12.6	6.6	5.5	8.3	4.1	6.9	3.9
APPLIANCE STORE	4.1	9.4	3.9	6.1	6.5	2.0	4.0	.6
FURNITURE STORE	8.4	14.5	10.3	14.1	11.6	7.7	4.6	1.0
AUTOMOTIVE STORE	7.3	13.7	10.1	7.0	8.0	6.8	9.7	2.6
LIQUOR STORE	11.8	26.9	11.6	12.8	12.2	11.4	13.0	5.0
WALLPAPER & PAINT SUPPLIES	5.8	8.0	9.3	9.0	5.2	5.1	8.3	.5
GARDENING CENTER	16.5	21.2	18.5	21.5	15.9	18.1	12.3	11.4
OTHER	.5	-0-	1.9	1.1	.4	-0-	-0-	.4
NO ANSWER	19.5	6.4	9.7	8.4	14.9	20.2	25.4	36.9

SOURCE: Consumer Attitude Research, 1979.

TRADE AND SERVICES POTENTIAL

Together trade and services in (1979) employed almost 6,500 (40%) people in Josephine Co., compared to just over 2,000 (30%) in 1960. These sectors will continue to grow, both absolutely and relatively--and will probably continue to grow faster than population. That growth, especially in trade, will increase perhaps even faster when population reaches a sufficient level, especially in the Grants Pass area, to attract some major retail outlets as anchors for new shopping "centers". Development of such shopping centers would potentially stem a portion of cash out-flow. The desire for other amenities unavailable in Josephine County would, however, continue to draw residents out of the area (e.g. the theater, "uptown" shops and restaurants, shopping centers, discount centers).

As in the past, future employment in the trade and services sectors will develop in relation to population growth unless basic economic trends are modified within the local or national level.

IMPLICATIONS

Considerable deliberation should be undertaken prior to development of the service and trade sectors as an economic base for Josephine County. Of primary concern would be the fact that employment (and associated economic well-being) would continue to be dependent on such factors as national economic trends, tourist traffic, sufficient senior dollars and the level of services/ trade in the Medford area.

Development of this sector is dependent upon basically two factors--employment in other industries and population size. Further, the advent of the two-worker family could generate enough additional income to stimulate these sectors.

As would be expected, population location and trade/service location are mutually dependent. Whereas commercial centers are often located in or near population concentrations, they could potentially be located in areas where population increasesare desired. The question of location becomes one of great importance, dependent not only upon population but also on land availability, public facilities, and transportation systems. The type of service/trades in the area should also be reviewed. Whereas over

development of certain trades/services could negatively impact on all such business, non-development of certain trades/services could lead to out-of-county cash flow.

TOURISM

Tourist and/or visitor (pass through) traffic is considered to be a major economic concern in Josephine County.

Employment in tourism is found primarily in the trade and service sectors and to some degree in government sectors (Oregon Caves, state and local parks, Fish and Wildlife). Visitor/tourism is a seasonal economic concern with main activities occurring from spring through early fall. Major businesses involved are motels, resorts and campgrounds, restaurants, automobile repair shops and service stations, food stores, general merchandise stores, amusement and recreation enterprises. Employment is also found in governmental park and recreation programs at all levels.

People are attracted to Josephine County for its outdoor recreation such as hunting, fishing, boating, hiking, and camping. The Oregon Caves National Monument, located in the southeastern part of the County near Cave Junction, attracted 160,000 visitors in 1977. The Rogue River is a resource for float-trips and jet boats as well as fishing, hiking, and camping. The recently expanded Kalmiopsis Wilderness includes rugged mountainous areas in Josephine County and in Curry County to the west. The newly created Wild Rogue Wilderness lies just northwest of the County. Further, a major highway runs through Josephine County providing access to the Northern California coast, redwood forests, and the southern Oregon coast.

Concern is expressed in that visitor travel is generally associated with good economic conditions and the availability of inexpensive transportation. Both of these factors are not, however, stable conditions. Whereas jobs stemming from visitor/tourism are not likely to be replaced by automation, they can be phased out by reduced tourist travel.

During the late 1960's, statistics indicated that the average vacationing family in Oregon remains in the state less than four days. This is a daunting figure, but the U.S. Chamber of Commerce (1967) counter-balanced this by stating that two dozen visitors a day benefit a community as much as a factory with an annual payroll of $100,000 (Pacific Power and Light, 1967).

In 1977 the Oregon Department of Transportation estimated there was a total of 44,094,035 visitor (out of state resident) days spent in Oregon. The Grants Pass Chamber of Commerce estimates of those approximately 2,291,000 visitor days were spent in Josephine County. Thus, it is estimated 5.1% of the visitors to Oregon spent some time in Josephine County.

Working from a report done by Battelle (1973) for the Oregon State Highway Division, a number of general observations can be made regarding this visitor population:

1. On the average, 69% of these visitors travel for pleasure. For Jackson and Josephine Counties, 1% of these travelled by air and 99% by private vehicle. The three months of July, August and September account for 54% of all the visitors.
2. For lodging, 49.3% stayed in hotel/motels, 20.1% stayed with friends and 23.1% camped.
3. The total number of visitor days increased by 9.9% over 1976. There was a 10.7% increase in air visitors and a 9.9% in automobile visitors. The average party size was 2.23 persons and the average number of days stayed was 3.37.

In "Out-of-State Tourist Revenue Report-1977", the Oregon Department of Transportation (1978) estimates that out-of-state tourists spent $514,246,000 in Oregon during 1977. This would mean that approximately $26,226,546 was spent in Josephine County. Using the Battelle report (1973), the following expenditure breakout can be developed for 1977:

TABLE E-27

TOURIST EXPENDITURE IN JOSEPHINE COUNTY--1977

Expenditure	%	Dollar Amount
Lodging	20.4	5,350,215
Groceries	21.1	5,533,801
Restaurant	23.2	6,084,558
Other Food	.7	183,585
Recreation	8.2	2,150,576
Gas and Oil	10.5	2,753,787
Other Auto	5.2	1,363,780
Other Travel	.2	52,453
General	2.4	629,537
Apparel	5.9	1,547,366
Other	1.7	445,851

SOURCE: Estimates developed by Planning Staff from ODOT (1978) and Battelle (1973) studies.

The Battelle study (1973) found that for each dollar spent by visitors an additional 42¢ was generaged in the community, resulting in increases in the effects on employment and income. Accommodation of non-resident travel accounts for approximately 6.6% of the employment force of the State of Oregon, consisting of employment in gasoline stations, hotels and motels, eating and drinking establishments, and amusement and recreation businesses.

For the heavy tourist summer months of July, August and September, the average employee increase is as follows:

TABLE E-28

EMPLOYEE INCREASES DURING THE TOURIST SEASON

TYPE	PERCENTAGE
Gas Stations	23%
Eating and Drinking Establishments	24%
Hotels, Rooming Houses, Camps, and Other Lodging	59%
Amusement and Recreational Services	76%

SOURCE: Mathematical Sciences Northwest, Inc. (1974).

A study by Mathematical Sciences Northwest, Inc. (1974) makes several observations regarding non-resident visitor-oriented employment. Most of these jobs have little chance of upward mobility, are generally paid 50% less than the average wage paid in other industries, are highly seasonal, and involve little training.

TOURIST POTENTIAL

As has been stated previously, tourism as a basic industry is dependent upon area attraction, transportation systems and cost, and overall economic well-being of the traveler.

Josephine County is an attractive area with a variety of outdoor attractions. But it is these same attractions that make the County liveable to its residents. Could increased tourism degrade this liveability? The potential for additional tourist development is unquestionable This need has been apparently perceived

as there is currently a proposal for a major convention center immediately north of the river. New riverboat companies are formed each year to cater to tourist and resident alike. Motel 6 has located in Grants Pass placing yet another tourist "attraction" (guaranteed, low-cost lodging) in this area.

It should be noted that during restricted gas sale years, tourism drops. What will the expected rise in gasoline prices and associated transportation costs have on the tourist industry? Will gasoline service remain unrestricted? The health of the overall economy is questionable at this time. People appear to have fewer dollars reserved for tourist activities. What impact will this have on tourism in Josephine County?

The answer to each of these currently unanswerable questions will determine the tourist potential for this County. Until these answers are available, the potential for tourist activity and employment is unknown.

IMPLICATIONS

As has been shown, tourism can have both positive and negative impacts on a community. Before a community decides to further encourage a dependence on a visitor service based economy, consideration must be given to inherent factors. If the decision is made to attract more visitors, the Mathematical Science Northwest Study suggests a number of ways to offset potential problems:

1) The community should encourage full-service resort vacationing. By developing areas where visitors can stay and have their needs met without having to venture out, energy expended for driving is reduced, cost can be determined (by both the operator and visitor) in advance, and the effects on the environment can be reduced and channeled.

2) By developing resorts the local tax base will be expanded. The required employee housing can be developed and the outward movement of funds can be reduced.

3) Resort owners need to be encouraged to develop activities during the noramlly slow parts of the year to standardize their income and to retain workers on a year round basis.

Three active steps the Mathematical Sciences Northwest report identifies are:

1) Increase direct promotional activities. This would include advertising, travel brochures, etc.

2) Develop indirect advertising--special informational phamphlets to travel agents, and advertising in trade magazines.

3) Work on expanding county support and drawing from local suppliers for required goods and services.

REAL ESTATE, FINANCE, AND INSURANCE

Employment, development and economic contribution from these sectors is based primarily on population growth.

Again, referring back to Graph E-13, it is interesting to note that population growth occurring in the early 1960's and during the 1970's corresponds to increases in employment in these sectors as a whole, however, it should be noted that employment in these sectors (as a whole) increased both in percentage employment and in total number of people employed. Also, during the 1974 recession employment did, however, drop severely to 1962 levels.

POTENTIAL

With the continued trend in population growth and construction, employment in this sector could expect to continue increasing slowly. Obviously this sector is also closely tied to financial concerns and could be expected to reflect the economic stability of the area. (See also: Bank Activity discussion in Economic Indicators section, following.)

A close correlation of employment in this sector and density saturation is evident, although this would not portend a termination of real estate or financing activity. The "upper mobility syndrone"* would continue to operate and recycling of homes would continue in relation to in- and out-migration trends.

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*The assumption is that people continually seek to improve their living conditions. They may begin with the apartment as young marrieds, graduate to the "starter house", move to a "nice" neighborhood with good schools and may later move to either an entertainment or retirement type residence. Further, at each phase, the resident may seek a "better" home or location. It should be noted that the average person will move once very five years.

IMPLICATIONS

Developments within the real estate, finance and insurance sector could have significant impact on the community. Local financing programs, such as are currently proposed by local banks, (e.g. low interest construction loans) should be encouraged as they provide low interest money which could stimulate other sectors of the economy. It may, however, be desirable to review other alternatives to low-interest money within the County.

TRANSPORTATION AND UTILITIES

These two sectors are also closely related to population growth. Strong increases or declines are not noted in this area as these services generally continue to be extended without regard to local financial situation. Specific public needs for trucking, buses, electricity, gasoline, and oil determine the scope and amount of employment.

POTENTIAL AND IMPLICATIONS

Employment in these sectors is expected to continue rising very slowly as continued population growth occurs. More efficient procedures and changes in energy production could produce a drop in employment, whereas establishment of new methods and systems could see an increase in this sector. Any development in these sectors will be closely correlated to land allocations and population location. (See chapters on Energy and Public Facilities.)

ECONOMIC INDICATORS

Various indicators are used for measurement of the economic well-being of one area as compared to another, including personal income, per capita income, income by sectors, and retail sales per capita.

PERSONAL INCOME

An important indicator is total personal income, defined as the current income received by residents of an area from all sources measured after deduction of social security, government retirement, and other social insurance programs. (Office of Planning and Research, 1978.)

Total personal income in Josephine County has been increasing dramatically in recent years--both absolutely and relatively. In 1970 total personal income in the County amounted to approximately $11.3 million, but by 1978 was $333 million--an increase of 101%, compared to an increase for the State as a whole of 85% over the same period. The County still, however, ranks only 16th out of 36 Oregon counties.

TABLE E-29

TOTAL PERSONAL INCOME
(Millions of Dollars)

YEAR	OREGON	JOSEPHINE	JOSEPHINE CO. as % of OREGON
1969	$ 7,169.3	$ 98.7	1.4%
1970	7,722.4	111.3	1.4
1971	8,429.9	126.0	1.5
1972	9,467.4	144.5	1.5
1973	10,720.3	168.4	1.6
1974	11,979.7	185.5	1.5
1975	13,008.1	209.1	1.6
1976	14,589.8	243.1	1.7

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, 1977.

TABLE E-30

OREGON PERSONAL INCOME BY COUNTY
1970, 1975, and 1976[1/]
(In Millions of Dollars)

	1970	1975	1976	Percent Change(+) 1970-1976
State Total	$7,722.4	$13,008.1	$14,589.8	88.9%
Baker	50.3	72.9	77.4	53.9%
Benton	156.1	269.7	305.6	95.8%
Clackamas	646.7	1,196.2	1,349.9	108.7%
Clatsop	101.7	159.4	177.8	74.8%
Columbia	92.9	171.8	183.6	97.6%
Coos	189.2	293.1	330.0	74.4%
Crook	33.5	60.1	66.3	97.9%
Curry	39.4	68.2	77.6	97.0%
Deschutes	110.3	216.9	251.9	128.4%
Douglas	230.7	408.8	467.6	102.7%
Gilliam	11.3	16.8	14.6	29.2%
Grant	24.8	36.1	41.4	66.9%
Harney	25.7	39.7	47.9	86.4%
Hood River	46.2	86.6	100.7	118.0%
Jackson	298.7	547.4	618.1	106.9%
Jefferson	23.1	46.7	44.8	93.9%
Josephine	111.3	209.1	243.1	118.4%
Klamath	176.1	265.4	299.6	70.1%

TABLE E-30 (CONTINUED)

Lake	22.1	33.1	35.4	60.2%
Lane	703.7	1,196.8	1,385.7	97.9%
Lincoln	83.3	139.4	158.4	90.2%
Linn	221.4	386.0	447.2	102.0%
Malheur	72.1	122.4	124.6	72.8%
Marion	534.0	922.7	1,042.6	95.4%
Morrow	16.5	61.9	56.3	241.2%
Multnomah	2,433.6	3,738.7	4,116.3	69.1%
Polk	103.6	180.2	202.8	95.8%
Sherman	11.4	24.3	18.0	97.9%
Tillamook	53.7	92.3	105.4	96.3%
Umatilla	159.1	277.7	302.2	89.9%
Union	64.9	101.8	113.7	75.2%
Wallowa	20.7	37.9	41.7	101.5%
Wasco	74.4	122.5	131.3	76.5%
Washington	647.2	1,165.5	1,337.4	106.6%
Wheeler	6.2	8.9	10.4	67.7%
Yamhill	116.4	231.1	262.5	125.5%

1/ By place of residence.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, unpublished data (1978).

An indicator of personal income source is found in the table on the next page. Of interest is the large percentage of County income derived from transfer payments, the receipt of payments from government and business for which no service is currently rendered. This figure correlates with the high percentage of the population receiving financial aid. For the year 1975, local welfare assistance payments were approximately 7.5 million dollars, (see Social Characteristics Chapter regarding government assistance). Considering the high percentage of senior citizens, the bulk of transfer payments would potentially constitute retirement and social security benefits. It is interesting, however, to note that the percentage increase of transfer payments has significantly decreased during the 1976-1978 time period.

TABLE E-31

TOTAL PERSONAL INCOME BY PLACE OF RESIDENCE
(Thousands of Dollars)
Josephine County

	1976			1978		
	DOLLARS	PERCENT	PERCENT CHANGE 1972-1976	DOLLARS	PERCENT	PERCENT CHANGE 1976-1978
TOTAL	$243,072	100.0	+ 68.2	$333,300	100.0	+37.1
Labor and Proprietors' Income	144,354	59.4	+ 60.4	211,100	63.0	+46.2
Dividends, Interest & Rent	39,828	16.4	+ 58.1	62,700	19.00	+57.4
Transfer Payments	58,890	24.2	+100.6	72,700	22.00	+23.5

SOURCE: Anderson, Economy of Josephine County; State Employment Division, 1978 (1978 figures are rounded estimates).

There is a large difference between total personal income, and total laborers and proprietors income. In 1978, for example, total personal income in the County (by place of residence) was $333.3 million compared to total laborers and proprietors income (by place of work) of $211.1 million. The difference is made up of: (1) dividends, interest and rent, plus (2) transfer payments--two categories that apply largely to that part of the population who are not employed or who are retired.

The importance of these two categories to the economy of Josephine County is obvious from the magnitude of the figures. In 1973 they made up about 38% of the total personal income in the County and by 1978 the figure was 41%! Further, they are largely unaffected by economic fluctuation in the County (except for unemployment compensation, which is part of transfer payments) and act as economic stabilizers to the County economy. Also, they are generally not dependent on a "basic" sector for their dollar total. In fact, this income supports business by the purchase of goods and services in trade and services and other "nonbasic" sectors. In this way, this income itself could be considered a "basic sector", as well as an economic stabilizer.

Transfer payments, which is the larger of the two sectors, is made up of retirement and disability payments, unemployment insurance benefits, medical assistance, public assistance, and "other transfers". In 1970 transfer payments per capita in Josephine County amounted to $609. In 1975, they amounted to $1,161 per capita, compared to $908 per capita for the State as a whole.

The following table shows the make up of transfer payments in Josephine County in 1975.

TABLE E-32

JOSEPHINE COUNTY TRANSFER PAYMENTS

	Dollar	Percent of Total
Total Transfer Payments	52,940	100.00
Retirement and Disability Benefits	33,844	63.9
Social Security	22,452	42.4
Railroad Retirement	939	1.8
Federal Civil Pensions	3,262	6.2
Other Civilian Programs	820	1.6
Military, Veterans & Dependents Programs	6,371	12.0
Unemployment Insurance Benefits	4,822	9.1
Medical Assistance (Medicare)	3,766	7.1
Educational Assistance	1,263	2.3
Public Assistance	6,916	13.1
Direct Relief	4,572	8.6
Food Stamps	2,229	4.2
Other Public Assistance	115	.2
Other Transfers	2,329	4.4

SOURCE: DED, unpublished review, 1980.

Note that retirement and disability benefits (civilian and military) total $33,844,000 out of total transfer payments of $52,940,000--or 64%. This implies that retirement income is a major and important part of the economy of Josephine County--more, indeed than in most counties in the State. Josephine County, apparently, is an attractive place for retirees--general, federal, civilian and military. This, as mentioned, has a potentially stabilizing effect on the economy and offsets somewhat the destabilizing effects of fluctuations due to the dominance of the major industry of lumber and wood products.

The future stability of this sector is, however, dependent upon (1) retention of a high retired population, and (2) continuation of the federal programs for retirement and disability payments. To some degree this is dependent upon retention of a good living environment, as many (working and retired) have moved here to breathe clean air and live a less hectic lifestyle (see Social Chapter, Tables 23 and 24). Impacts on this funding source should be investigate during the economic planning process.

PER CAPITA PERSONAL INCOME

Per capita personal income (total personal income for an area divided by that areas total population) has risen 88% from $2,763 in 1969 to $5,201 in 1976.

Increases such as these seem impressive. They do not alter the fact, however, that Josephine County is a low-income area. This fact becomes apparent when the County's per capita income is compared to state and national averages. The following two tables show Josephine County as averaged under 79% of the national and 82% of the state's average per capita income from 1967 to 1976, and has consistently ranked low in comparison with other Oregon counties.

TABLE E - 33

PER CAPITA PERSONAL INCOME: 1969-1976

YEAR	DOLLARS			JOSEPHINE AS A % OF		RANK OUT OF 36 COUNTIES
	U.S.	OREGON	JOSEPHINE	U.S.	OREGON	
1969	$3,667	$3,477	$2,763	75.3	79.5%	35th
1970	3,893	3,677	3,067	78.3	83.4	30th
1971	4,132	3,944	3,267	79.1	82.8	30th
1972	4,493	4,338	3,719	82.8	85.7	31st
1973	4,990	4,829	3,955	79.4	81.9	35th
1974	5,428	5,312	4,113	75.8	77.4	35th
1975	5,851	5,695	4,616	78.9	81.1	33rd
1976	6,396	6,265	5,201	81.3	83.0	29th

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

TABLE E-34

OREGON RESIDENT PER CAPITA INCOME BY COUNTY,
FOR SELECTED YEARS, 1970-1976
(In Dollars)

	1970	1975	1976	Percent Change 1970-1976
State Total	$3,677	$5,695	$6,265	70.4%
Baker	3,341	4,670	4,881	46.1%
Benton	2,893	4,254	4,684	61.9%
Clackamas	3,870	5,934	6,596	70.4%
Clatsop	3,567	5,466	6,062	69.9%
Columbia	3,222	5,439	5,699	76.9%
Coos	3,324	4,942	5,512	65.8%
Crook	3,322	5,126	5,575	67.8%
Curry	3,010	4,870	5,455	81.2%
Deschutes	3,570	5,416	6,061	69.8%
Douglas	3,198	5,118	5,762	80.2%
Gilliam	5,008	7,987	6,693	33.6%
Grant	3,500	4,920	5,601	60.0%
Harney	3,579	5,437	6,427	79.6%
Hood River	3,498	6,093	7,009	100.4%
Jackson	3,131	4,977	5,501	75.8%
Jefferson	2,682	4,848	4,553	69.8%
Josephine	3,067	4,616	5,201	69.6%
Klamath	3,499	4,910	5,428	55.1%

TABLE E-34 (CONTINUED)

Lake	3,466	5,079	5,372	55.0%
Lane	3,251	4,982	5,664	74.2%
Lincoln	3,205	5,075	5,670	77.1%
Linn	3,050	4,796	5,392	76.8%
Malheur	3,091	5,090	5,092	64.7%
Marion	3,511	5,564	6,050	72.3%
Morrow	3,695	12,012	10,592	186.7%
Multnomah	4,393	6,868	7,485	70.4%
Polk	2,914	4,466	4,927	69.1%
Sherman	5,336	11,189	8,285	55.3%
Tillamook	2,966	5,021	5,697	92.1%
Umatilla	3,535	5,799	6,077	71.9%
Union	3,317	4,634	5,150	55.3%
Wallowa	3,306	5,624	6,095	84.4%
Wasco	3,689	6,093	6,503	76.3%
Washington	4,066	6,145	6,861	68.7%
Wheeler	3,347	4,437	5,142	53.6%
Yamhill	3,131	5,179	5,776	84.5%

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, unpublished data (1978).

MEDIAN FAMILY INCOME

With the increased numbers of "two-worker"families, major consideration of realistic economic status could be based on median family income. It is this figure which is the basis of a family's standard of living and buying index. Again, the figures indicate that Josephine County is a low-income area with this county ranking 34th out of Oregon,s 36 counties; in January 1978, the median family income was $13,015. It is interesting to note that neighboring Jackson County had a median family income of $14,404 and the state's median family income was $16,768. (Table E-35)

TABLE E - 35

MEDIAN FAMILY INCOME

COUNTIES	1969	JAN. 1, 1978	1978 RANK IN STATE
Baker	$ 7,557	$12,893	35
Benton	9,640	17,663	4
Clackamas	10,680	19,052	2
Clatsop	9,430	17,516	5
Columbia	9,258	17,119	6
Coos	9,243	16,557	8
Crook	8,288	15,012	21
Curry	8,544	14,794	24
Deschutes	8,940	15,779	15
Douglas	8,670	15,312	18
Gilliam	8,220	13,317	32
Grant	7,876	14,192	28
Harney	9,003	15,910	12
Hood River	8,412	14,662	25
Jackson	8,574	14,404	26
Jefferson	8,549	14,263	27
Josephine	7,449	13,015	34
Klamath	8,645	16,122	9
Lake	8,801	15,395	17
Lane	9,332	16,618	7
Lincoln	7,909	14,118	29
Linn	8,724	16,068	10
Malheur	7,568	13,411	30
Marion	9,014	15,977	11
Morrow	8,425	14,910	22
Multnomah	10,138	17,914	3
Polk	8,891	15,675	16
Sherman	8,526	15,066	20
Tillamook	8,014	13,363	31
Umatilla	8,639	14,903	23
Union	8,730	15,821	14
Wallowa	7,748	13,203	33
Wasco	9,025	15,864	13
Washington	11,476	20,448	1
Wheeler	7,293	12,735	36
Yamhill	8,633	15,256	19
State Median	$ 9,489	$16,768	

SOURCE: State of Oregon Housing Division for (1978) data and Oregon State University, Income Distribution in Oregon, 1974 for 1969 data.

EFFECTIVE BUYING INCOME

Income figures are an important indicator of a county's economic situation, but the capacity of providing a living from this income is obviously a major consideration.

A household's Effective Buying Income (EBI) is an indicator of this capacity as it addresses personal household income (after deductions for federal, state and local taxes) which may be used for discretionary consummer spending. It is this amount of money that goes towards providing housing, food, clothing, medical care, other goods, and the amenities of life.

Compared to state figures (Table E-36), Josephine County has a higher percentage of households with lower incomes than the state average and correspondingly a lower percentage of households with higher incomes.

These figures provide an explanation for the fact that Josephine County's median household EBI of $9,098 is the lowest in the State of Oregon (Table E-36). Even when computed in a variety of ways, Josephine County, still maintains its low status.

TABLE E-36

1977 EFFECTIVE BUYING INCOME

	JO. CO. % HOUSEHOLDS	OREGON % HOUSEHOLDS
$ 0 - 7,999	44.5	29.7
$ 8 - 9,999	10.1	7.8
$10 - 14,999	23.5	22.5
$15 - 24,999	16.5	29.3
$25,000 & over	5.3	10.7
Median Household EFI	$ 9098	$12,834

SOURCE: Kohl, Don, Socio-Economic Indicators, 1978.

TABLE E - 37

VARIATIONS OF EFFECTIVE BUYING INCOME

	Total Households (Thousands)	Median Household EBI	Average Household EBI	Per Capita EBI
Oregon	856.9	12,834	14,437	5,256
Eugene-Springfields SMSA	88.1	12,873	14,301	5,068
Lane	88.1	12,873	14,301	5,068
Portland SMSA	410.3	14,191	15,730	5,848
Clackamas	71.7	15,620	17,090	5,900
Multnomah	214.9	13,130	14,961	5,922
Washington	67.7	15,786	17,203	5,930
Clark, WN	56.0	14,149	15,157	5,420
Salem SMSA	76.4	12,201	13,758	4,839
Marion	61.6	12,302	13,816	4,863
Polk	14.8	11,794	13,517	4,741
Baker	5.9	9,916	11,112	4,150
Benton	21.3	12,824	16,073	5,080
Clatsop	11.9	11,993	13,538	5,352
Columbia	11.6	12,356	13,037	4,611
Coos	21.5	12,537	13,692	4,850
Crook	4.6	11,196	12,321	4,684
Curry	5.7	12,362	13,922	5,326
Deschutes	15.4	12,446	13,910	5,052
Douglas	28.6	11,988	13,131	4,563

TABLE E-37 (CONTINUED)

Gilliam	.7	12,158	13,024	4,798
Grant	2.8	10,920	11,808	4,468
Harney	2.6	13,246	14,042	5,142
Hood River	5.6	12,246	14,159	5,394
Jackson	44.3	11,245	12,654	4,691
Jefferson	3.3	12,371	13,670	4,423
Josephine	18.9	9,098	10,606	4,074
Klamath	19.7	12,381	13,907	5,018
Lake	2.4	11,634	12,065	4,387
Lincoln	11.1	10,886	12,658	5,018
Linn	29.0	12,684	13,374	4,662
Malheur	8.3	10,019	11,952	3,942
Morrow	1.9	11,342	13,785	4,942
Sherman	.9	9,255	9,964	4,076
Tillamook	7.1	10,186	11,742	4,458
Umatilla	17,8	12,052	13,407	4,821
Union	8.5	11,548	12,969	4,711
Wallow	2.6	10,476	11,615	4,253
Wasco	7.4	12,483	13,361	4,800
Wheeler	.5	9,292	9,988	2,938
Yamhill	16.2	11,669	13,491	4,690

TABLE E-38

LABOR AND PROPRIETORS' INCOME BY INDUSTRIAL SECTOR

(Thousands of Dollars)

Josephine County

INDUSTRY	1976	% of TOTAL	PERCENT CHANGE 1972-1976
Total	$154,109	100.0	+ 63.0
Farm	3,333	2.2	+709.0
Non-Farm	150,776	97.8	+ 60.2
Private	118,884	77.1	+ 55.8
Manufacturing	48,914	31.7	+ 59.4
Lumber & Wood*	38,349	24.9	+ 56.5
Other Manufacturing	10,565	6.9	+ 70.7
Non-Manufacturing			
Concstruction	8,734	5.7	+ 51.1
Trans., Comm., & Util.	8,602	5.6	+ 53.1
Trade	28,570	18.5	+ 52.1
Finance, Ins., Real Est.	4,743	3.1	+ 52.8
Services & Other**	19,321	12.5	+ 57.1
Government	31,892	20.7	+ 78.9
Federal	5,755	3.7	+ 50.1
State & Local	26,137	17.0	+ 86.7

SOURCE: Bureau of Economic Analysis.

* Employment Division Estimate.
** Includes Mining

NOTE: Figures for Farm and non-manufacturing are not consistent with OREGON Department of Economic Development figures.

INCOME AND WAGES

According to the Oregon Employment Division, two major sources of income in the County are 1) those industries producing goods and services that generate income flows into the area, and 2) those sectors producing goods and services primarily for local consumption. The former includes the lumber and wood products industry, electronic equipment manufacturing, forestry, tourism, and agriculture. The second category contains construction, most of trade and services, food processing, public education, finance, insurance, and real estate, transportation and utilities. The following table shows total laborers' and proprietors' income by industrial sector for 1976 for Josephine County and changes since 1972.

By 1978, total income had increased to $211 million with farm income decreasing to 1.6%, government decreasing to 15.4%, services increasing to 14.7%, and manufacturing remained stable. It is evident that the major sources of labor income to the County are lumber and wood manufacture, trade, government and services. (Table E-38)

BANK ACTIVITY

Another type of data which can be used to determine comparative levels of economic activity is the ratio of bank debits to deposits.

The low income situation is indicative of the high unemployment situation within the County. In each graph, the year 1974 shows a significantly unique figure which mirrors the extreme unemployment experienced in this area. The large percentage of senior citizens residing in this area may have an effect in reducing the per capita income by age. Information on per capita income by age is unavailable.

TABLE E - 39

OREGON BANK DEPOSITS BY COUNTY FOR SELECTED YEARS 1960-1977 (Millions of Dollars)

	1960	1970	1976	1977	Percent Change 1970-1977
State Total	$2,151.0	$4,328.0	$7,331.1	$8,395.4	94.0%
Baker	14.9	28.8	48.5	53.4	85.4%
Benton	36.1	83.8	119.1	134.5	60.5%
Clackamas	76.1	187.9	399.1	471.8	151.1%
Clatsop	36.9	65.4	102.5	108.2	65.4%
Columbia	19.1	45.4	74.6	79.7	75.6%
Coos	55.3	105.4	188.4	200.6	90.3%
Crook	9.5	20.6	39.9	46.0	123.3%
Curry	11.8	28.5	49.7	59.8	109.8%
Deschutes	24.4	64.9	131.7	185.9	186.4%
Douglas	67.8	130.9	251.3	290.5	121.9%
Gilliam	6.1	7.4	11.9	13.0	75.7%
Grant	7.1	13.6	25.2	28.5	109.6%
Harney	8.2	16.7	31.1	34.6	107.2%
Hood River	15.0	29.7	43.3	53.1	78.8%
Jackson	69.2	163.1	306.0	349.1	114.0%
Jefferson	7.4	15.2	31.0	35.3	132.2%
Josephine	28.4	65.5	124.0	147.8	125.7%
Klamath	39.2	78.0	137.8	140.8	80.5%

TABLE E-39 (CONTINUED)

Lake	9.2	18.2	27.5	34.2	87.9%
Lane	135.2	305.7	568.2	678.3	121.9%
Lincoln	20.7	51.0	95.0	118.2	131.8%
Linn	54.4	120.3	206.0	236.1	96.3%
Malheur	24.6	50.0	85.6	94.6	89.2%
Marion	130.8	314.7	547.4	633.5	101.3%
Morrow	7.2	13.2	25.2	26.5	100.8%
Multnomah	998.6	1,788.2	2,681.7	3,017.2	68.7%
Polk	11.0	22.2	45.9	53.6	141.4%
Sherman	3.4	4.2	7.0	7.3	73.8%
Tillamook	19.0	35.5	63.1	70.8	99.4%
Umatilla	46.2	80.6	157.7	171.1	112.3%
Union	18.5	37.5	73.1	81.4	117.1%
Wallowa	7.3	15.1	30.1	30.1	99.3%
Wasco	29.4	45.7	73.7	86.5	89.3%
Washington	64.1	199.2	395.6	478.9	140.4%
Wheeler	2.1	3.4	5.9	7.4	117.6%
Yamhill	35.1	72.6	127.5	137.4	89.3%

SOURCE: Oregon Department of Commerce, Banking Division.

TABLE E - 40

JOSEPHINE COUNTY BANKING ACTIVITY
(Thousands of Dollars)

YEAR	DEPOSITS		LOANS & DISCOUNTS		NUMBER of BANKS
	AMOUNT	% CHANGE	AMOUNT	% CHANGE	
1970	$ 65,473.1		$29,003.8		4
1971	73,917.1	12.9	31,845.3	9.8	4
1972	89,897.1	21.6	37,411.3	17.5	4
1973	98,928.1	10.1	41,855.3	11.9	4
1974	97,211.7	1.7	40,845.8	2.4	4
1975	108,983.9	12.1	42,868.8	5.0	4
1976	124,016.0	13.8	48,610.1	13.4	5
1977	147,769.0	19.2	61,629.0	26.8	7
1978	167,032.0	13.0	80,441.0	30.5	8

SOURCE: Superintendent of Banks, Annual Reports.

Based on the preceding tables, it would appear economic activity within Josephine County has been increasing over the years and has been especially stimulated during the last two years. Deposits in Josephine County have increased 155.1% since 1970, whereas loans have increased 177.5% (Table E-40).

EMPLOYMENT PROJECTIONS

Employment projections for Josephine County have been developed through utilization of various methods: a) straightline projections based on population trends from 1970-1977, b) projections based on employment data from 1958-1977, c) projections keyed to specific population data (both mid- and high-range) as provided by Portland State University, and d) projections estimated by the Bonneville Power Administration in early 1976.

These projections (see Table E-41) are utilized only for employment sectors which have historically been related to population. This would mean exclusion of resource based employment (such as lumber and wood products manufacture, agriculture, mining and to some degree manufacturing of products other than wood related goods) as employment in these sectors is dependent upon a resource rather than population growth or pressures.

It should also be noted that service and trade employment has a greater rate of increase than that of employment. Since this is an unpredictable rate, future employment

TABLE E-41

JOSEPHINE COUNTY EMPLOYMENT PROJECTIONS
Non-Manufacturing Sectors

INDUSTRY	YEAR	ESTIMATES CORRELATED TO POP GROWTH			EMPLOYMENT TRENDS 1958-1977	BONNEVILLE POWER ADMIN. (1976)
		PSU MID	PSU HIGH	STRAIGHT LINE 1970-1977		
CONSTRUCTION	1980	620	630	640	640	500
	1990	820	890	1000	620	500
	2000	970	1150	1360	740	
UTILITIES, TRANSPORT	1980	610	620	620	580	700
	1990	740	780	850	670	875
	2000	830	940	1080	760	
FINANCE, REAL ESTATE, INSURANCE	1890	600	610	620	700	650
	1990	860	940	1080	920	850
	2000	1040	1260	1530	1130	
SERVICES	1980	2660	2710	2740	2130	2275
	1990	3560	3850	4320	2880	2900
	2000	4210	4970	5900	3620	
TRADE	1980	3600	3640	3660	2130	2275
	1990	4620	4950	5490	2880	2900
	2000	5360	6240	7300	3620	
GOVERNMENT	1980	3530	3570	3610	3280	3350
	1990	4550	4880	5420	4250	3850
	2000	5290	6170	7230	5220	

for this sector has been prepared using a constant percentage increase equal to that of population growth. Thus it should be realized that a greater number of jobs may actually be available.

It should also be remembered these employment projections are merely estimates--estimates which become less accurate the farther into the future these projections are made. Also, as these estimates are based on population projections, an additional potential for error is acknowledged.

As discussed earlier, the County's estimate of 56,000 as the 1978 population is a mid-ground estimate with PSU estimating 3,900 less people in the County and Pacific Power and Light estimating approximately 3,000 more people in the County.

The initial population projection (97,000 people by the year 2000) which was chosen by the Board of County Commissioners is a modification of the PSU high-range population estimate and is comparable to the Migration Model projection. Consequently, the latter projection has been used to project employment figures.

Based on all previous information within this chapter, rough estimates for total County employment with a 97,000 population have been compiled (Table E-42) utilizing employment office estimates, Department of Economic Development estimates, and trend evaluation. The premises utilized in this projection are:

1. population composition will remain relatively stable,
2. employment in population related sectors will follow historic trends,
3. employment in manufacturing industries other than wood products will continue to increase as industries are actively encouraged to locate in this area,
4. employment in wood products will decline under projected harvest levels and low amount of secondary processing of wood will continue,
5. self-employment will follow historic trends,
6. employment in agriculture will remain static, employment in trade and services will continue to increase,
7. the mining industry will undergo expansion,
8. the ratio of government employees to population will decrease, and
9. remaining sectors will retain a constant percentage of employment.

TABLE E-42

EMPLOYMENT PROJECTIONS*
YEAR 2000 POPULATION OF 97,000

SECTOR	1978		1990		2000	
	NUMBER	%	NUMBER	%	NUMBER	%
Agriculture	450	2	450	2	450	1
Mining	100	1	250	1	250	1
Self-Employed	3,510	18	4,880	18	6,000	16
Total Wage and Salary	15,340	79	21,770	80	30,800	82
Manufacturing		21		14		13
Lumber and Wood	2,810	15	1,950	7	1,600	4
Other	1,130	6	1,950	7	3,400	9
Non-Manufacturing		59		66		69
Construction	640	3	1,080	4	1,500	4
Transport-Utilities	570	3	810	3	1,100	3
Trade	3,500	18	5,150	19	7,500	20
Finance, Ins., Real Est.	790	4	1,080	4	1,500	4
Service and Misc.	2,640	14	5,150	19	9,000	24
Government	3,260	17	4,600	17	5,200	14
TOTAL	19,400 = 34.6% of 56,000 pop.		27,350 = 36.3% of 75,300 pop.		37,500 = 38.7% of 97,000 pop.	

*Figures are based on employment trends discussed earlier in the chapter and Department of Economic Development estimates. Percentages have been rounded.

As the preceding table has indicated, the economy of Josephine County will probably become more service-oriented. As earlier stated, manufacturing is a base industry. Employment in many other income-producing activities is dependent (directly or indirectly) on logging, wood products, manufacturing, other manufacture and mining. As Table E-42 has indicated, a percentage decrease is expected in base industries as a whole. This does not, however, mean that there will be a decrease in the number of jobs. Whereas, employment in logging is expected to decrease employment in other manufacturing and secondary wood processing is expected to increase as such industries are actively encouraged to locate in Josephine County. If significant development of other industries does not occur, concern would then center around the major question of who will provide the dollars to support stable economic development of the County, and the implied question of what type of development and community living do the County's leaders want to see for Josephine County.

Obviously the lack of jobs will have an effect on the number of people that will choose to live in Josephine County. The above projection is merely an estimate based on available information, current and projected trends, and an estimated population of 97,000 in the year 2000. The population and employment projections form a symbiotic relationship; one cannot exist without the other.

The total employment figures of the previous chart would appear to indicate that projected employment figures would provide sufficient employment for the County's population. But this is not necessarily true. The percentage of employed people in the County has shown a slow, oscillating increase. This trend is expected to continue as citizens continue to desire more and more amenities in life and/or strive to keep pace with inflated costs.

A rough estimate would indicate that approximately 37,400 people will be within the civilian labor force by the year 2000 (Table E-43). Table E-42 shows that many of these people could probably be accommodated with jobs. Considering the number of two (2) worker families and the general trend towards part-time jobs, it becomes obvious that more jobs would be required.

TABLE E-43

LABOR FORCE PROJECTIONS

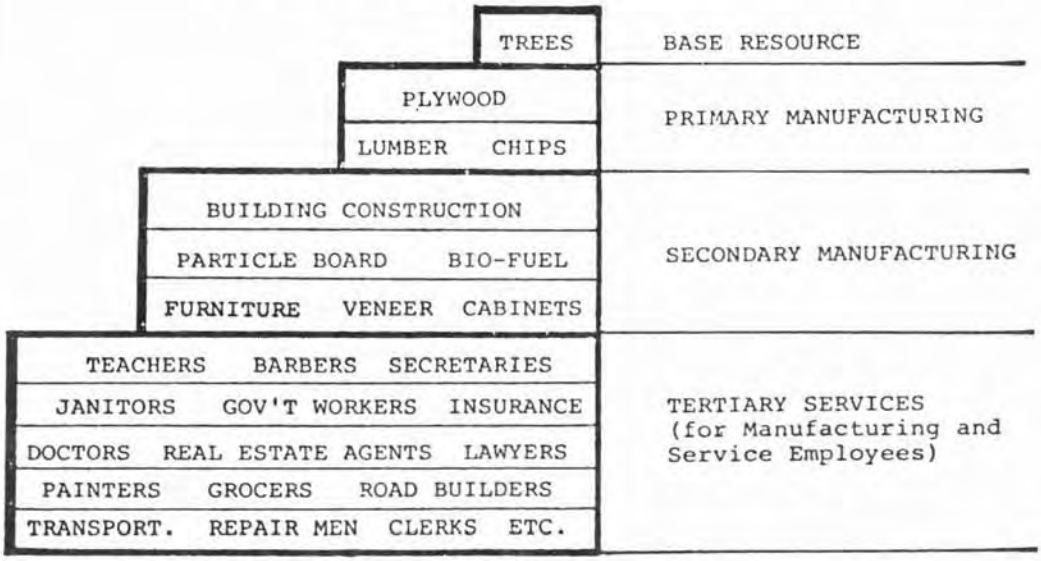
YEAR	STRAIGHT-LINE PROJECTION		MIGRATION MODEL*		LF as PERCENT OF POP.
	POPULATION	LABOR FORCE	POPULATION	LABOR FORCE	
1978	56,000	21,280	56,000	21,280	38.0
1980	62,649	24,245	56,800	21,672	38.7
1985	82,932	32,095	64,812	25,082	38.7
1990	109,784	42,486	75,283	29,135	38.7
1995	145,328	56,242	85,970	33,270	38.7
2000	192,381	74,451	96,643	37,401	38.7

SOURCE: ODED, field representative, 1979.
*See Social Characteristics Chapter.

Let us regress for a minute. It is the premise of economic-base theory that employment in basic industries is necessary to support service employment and that this is done on a specific job ratio. Base industries are those industries which generate or bring income to the County. These include resource extraction and processing (e.g. forestry, agriculture, and mining), tourism, and transfer payments.

EXAMPLE E-44

PRINCIPLE OF ECONOMIC-BASE THEORY



Using the simplified diagram (Diagram E-44) we have designed a hypothetical example of how base economic theory operates. Here the logging of trees by about 10 people could produce jobs for possibly 20 people in primary processing which could produce jobs for possibly 20 people in secondary processing which could possibly involve jobs for an additional 40 people in sales, marketing, repair and transport. (These figures are only conceptual examples--not absolutes.) And further all of these people would require services such as those provided by doctors, lawyers, teachers, barbers, painters, government workers, grocers, secretaries, clerks, real estate agents, insurance people and on and on.

In Josephine County this system is somewhat complex due to the source of money to the community. We have basically two sources of goods and dollar resources: 1) local natural resources for extraction and processing, and 2) out of area dollars and goods for processing. Diagram E-45 illustrates this County's flow of cash and related employment.

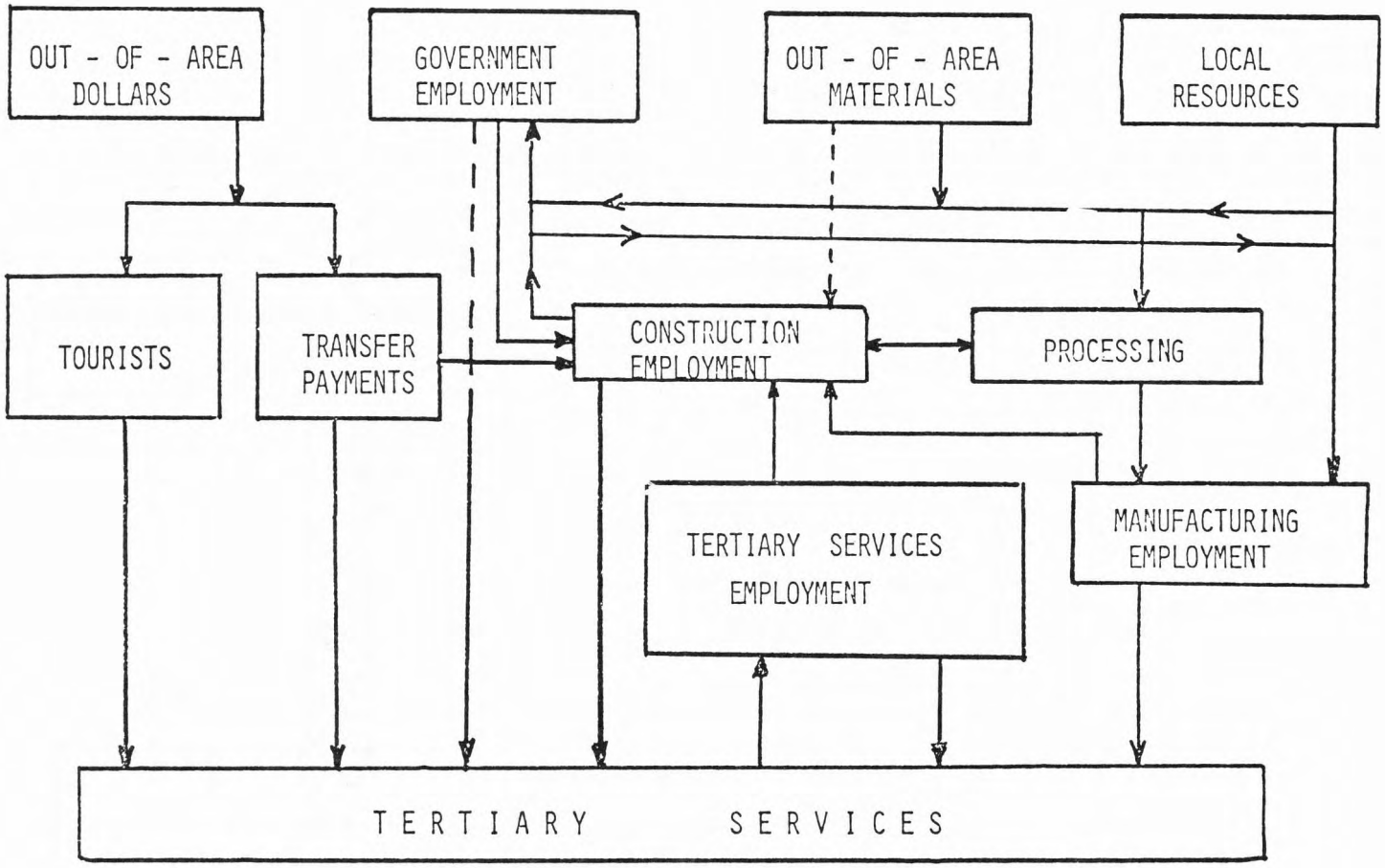
The first category would include: resource extraction and processing of agricultural, mining and lumber (base) products. It is these categories which would appear to remain stable, constant employment sectors with no major increases projected for agriculture and lumber. This would, however, produce reductions in their employment in proportion to total employment (Diagram E-45).

The second category has three sub-parts. The employment category of "Other Manufacturing" processes primarily out-of-area goods. It, therefore, does not depend on local products and does not require a resource-tied location. Diversification through such "foot-loose" industries is a well-known economic ploy and therefore these industries are highly desired by most communities. They are often clean-producers (non-polluters), employ a variety of individuals, do not further reduce the local resource base, and provide additional employment stability in the case of local or national economic slump. "Over-expansion" of these industries could, however, create further expansion of population growth.

Secondly, out-of-area tourist dollars provide, at present, substantial income primarily to the tertiary service employment sectors. This could also be considered to be a relatively clean industry which doesn't substantially reduce the local resource base. Employment in this sector is, however, uncertain. As discussed earlier, tourist/visitor traffic is greatly affected by national economy, availability and cost of transportation, and human desires.

DIAGRAM E-45

CASH FLOW AND RELATED EMPLOYMENT IN JOSEPHINE COUNTY



Finally, out of area dollars are also acquired through transfer payments. This includes military and other government pensions, interest from investments, retirement funds, social security, and other government dollars. This is a very stable source of revenue to the County's economy. Further, a portion of the population has come to Josephine County with enough money to purchase a home (or rent an apartment) and still maintain a healthy savings account. Although some of these individuals are younger (e.g. retired military), the majority are senior citizens.

Approximately 24% of the County's population is age 60 or over. The majority of these people do not work, but receive transfer payments. This demonstrates that our senior population could to some degree, support a large portion of County employment, but not all of it. If sufficient jobs in basic industries are not promoted, this service-oriented economy could become recycling and stagnant.

As jobs in basic industries dwindle in proportion to population, the young and middle-age people who work in these sectors will be forced into fierce competition and/or will have to leave the area in search of better economic opportunities.

In short, employment in Josephine County could become a self-fulfilling prophecy and thereby be a major influence in population growth; Josephine County will reach its projected population size only if a sufficient amount of jobs are available.

OPPORTUNITIES AND RESTRICTIONS FOR ECONOMIC DEVELOPMENT

Economic development in Josephine County is dependent upon a variety of factors including public desires, facility development, and out-of-area influences.

In 1975, the Oregon Department of Economic Development developed a list of excellent, good, fair, and poor economic characteristics for Josephine and Jackson counties. Since it addresses both counties as a unit, the information may not be accurate for Josephine County as a separate unit. Therefore, although this information is available, it has not been placed in this document.

ACREAGE REQUIREMENTS

Statistics have indicated a direct ratio between number of employees in a specific field and acreage size. The following table constitutes a rough guide for the amount of suitable land required for each employee in various industries.

TABLE E-46

INDUSTRIAL ACREAGE REQUIREMENTS**

*SIC**	*Industry Category*	*Acres per Employee*
24	*Lumber and Wood*	*.2173*
25	*Furniture*	*.0226*
32	*Stone, Clay, Glass*	*.3333*
26	*Paper*	*.0603*
29	*Petroleum*	*.1298*
39	*Miscellaneous*	*.0253.*
28	*Chemicals*	*.0152*
33	*Primary Metals*	*.1333*
35	*Machinery (not electrical)*	*.0377*
34	*Fabricated Metals*	*.0454*
37	*Transportation Equipment*	*.0397*
36	*Electrical Machinery*	*.0363*
20	*Food*	*.0433*
23	*Apparel*	*.0095*
27	*Printing and Publishing*	*.0100*

*SIC: Standard Industry Code
** Survey for Portland SMSA

SOURCE: Department of Economic Development, "How to do Economic Planning", 1976.

These figures do, however, vary with the specific company involved, the geographic location and services provided. A more realistic method would be to compare the amount of land presently utilized to other population figures or the amount of employees in industry and commercial activity.

Commercial: Approximately 875 acres within Josephine County are used for commercial purposes of which about 430 acres are located within the Grants Pass Urban Growth Boundary. Based on existing use and estimated population increases, this translates to a need for 1630 acres (includes a 10% vacancy rate) of commercial

land by the year 2000.* Currently, only about 1242 acres of land are zoned commercially, indicating the need to designate at least 388 additional acres. Considering population concentrations within Grants Pass and its environs, the majority of this should be located in or near urbanizing areas.

The location of existing commercial development and the approximate number of acres available for future development are delineated in Table E-47.

Industrial: Approximately 1171 acres within Josephine County are used for industrial purposes with the majority of industrial lands located near the County airport or within the Grants Pass Urban Growth Boundary. Based on existing uses and population projections, this translates to a need for a minimun of 2154 acres (includes a 10% vacancy rate) of industrial land in Josephine County by the year 2000*. Two thousand and forty acres are currently zoned industrial, indicating a need for about 115 additional acres county-wide. Current level of use may not, however, be sufficient for economic health, necessitating designation of additional industrial lands. Areas with the largest amount of vacant industrial land include the Merlin airport site, Murphy, and the Grants Pass Urban Growth Boundary.

Since the County's population is scattered, County government has considered the development of rural commercial service centers which would (1) provide services such as supply of food, clothing and sundries, repair services and auto services, (2) be used as employment centers, and (3) provide housing alternatives. Such areas would include Wolf Creek, Merlin, Murphy, Kerby, Selma and O'Brien.

On a smaller scale, neighborhood service centers (with fewer services provided) to accommodate rural populations may be desirable.

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*Projected land needs were estimated by determining the amount of commercial or industrial acreage used per person today and then recalculating by multiplying by projected population figures.

TABLE E - 47

EXISTING COMMERCIAL DEVELOPMENT -- SPRING 1979

AREA	COMMERCIALLY USED BUT NOT ZONED	COMMERCIALLY ZONED LANDS		
		USED	VACANT	RESIDENTIALLY OR UNDER-DEVELOPED
1. Grants Pass City*	--	206.00	53.00	78.00
Grants Pass UGB (Unincorporated)	60.33	146.26	63.24	76.95
2. Cave Junction City*	--	35.52	--	--
Cave Junction UGB (Unincorporated)	.45	14.69	.40	8.76
3. Rural Service Centers:				
Wolf Creek	--	10.95	5.49	3.85
Merlin Townsite	--	6.15	4.68	2.36
Merlin Interchange	--	18.53	40.79	8.75
Murphy	6.76	4.64	2.62	2.35
Selma	--	18.40	5.07	10.70
O'Brien	--	8.90	--	.10
4. Other Centers				
Sunny Valley	7.79	12.98	24.17	.70
Highland North	.32	11.50	--	--
Kerby	--	48.25	36.39	11.71
Cave Junction Strip	--	45.22	8.36	7.52
5. Miscellaneous	76.78	119.78	33.02	44.86
TOTAL COUNTY	166.88	707.77	277.23	256.61

SOURCE: Josephine County Planning and Grants Pass Planning Offices, 1979.

*NOTE: Numbers for these two incorporated areas are not yet to be verified.

TABLE E-48

EXISTING INDUSTRIAL DEVELOPMENT -- SPRING 1979

AREA	INDUSTRIALLY USED BUT NOT ZONED	INDUSTRIALLY ZONED LANDS		
		USED	VACANT	RESIDENTIALLY OR UNDER-DEVELOPED
1. Grants Pass City*	--	173.00	28.00	125.46
Grants Pass UGB (Unincorporated)	--	188.56	95.84	35.37
2. Cave Junction City*	--	.87	--	--
Cave Junction UGB (Unincorporated)	--	3.40	.82	--
3. Rural Service Centers:				
Wolf Creek	--	4.64	12.22	1.01
Merlin Townsite	--	159.84	64.56	10.66
Merlin Interchange	--	--	--	--
Murphy	--	47.98	105.30	--
Selma	15.27	6.94	41.43	--
O'Brien	--	--	--	4.03
4. Other Centers				
Rough and Ready	--	85.84	79.60	11.21
Airport (and Vicinity)	63.83	321.34	221.19	48.34
5. Miscellaneous (all other areas)	--	99.43	--	64.30
TOTAL COUNTY	79.10	1091.84	648.96	300.38

SOURCE: Josephine County Planning and Grants Pass Planning Offices, 1979.

*NOTE: Numbers for these two incorporated areas are estimates.

SITE DEVELOPMENT

As discussed earlier, there is much competition for desirable "foot-loose industries". Therefore, a need for developed sites which provide: a) sufficient acreage, b) sufficient support facilities (i.e. water, sewer transportation network), c) sufficient work force, d) location buffered from residential lands, and e) room for expansion is recognized.

The qualify of existing or planned development sites have been ranked as follows by the D.E.D. based on data from Bessire (1976):

High	The site is fully developed with a minimum of landscaping requirements. Road and other transportation connections are in place. All utility connections are in place. If an industrial park, the park is set aside for industrial use with covenants that limit setbacks, type of construction, etc. The site is properly zoned and all permits will be processed without delay.
Moderate	The site is properly developed with minimum landscaping requirements. Roads are in place, utilities extend to the property. The land is properly zoned.
Low	The site is clear of debris, properly zoned, has utility connections nearby, and is available at a specific cost per acre.
Very Low	The site is available at a specific cost per acre.
Non-Existent	The site lies within a line drawn on a map. It is probably available at perhaps a certain cost per acre.

Obviously, site development is an important consideration for economic stimulation according to the D.E.D. In considering alternatives for industrial zoning or development, the following rules of thumb should be followed:

> "First, a small tract of land that is developed is better than a larger tract that is merely zoned.
>
> Second, locating a site (or industrial park) on a main highway allows good access, keeps trucks from clogging secondary roads, and offers the prospect some free advertising.
>
> Third, transportation access is very important. The best approach is to identify the type of activity wanted, survey the transportation needs of companies within that type, and plan the location with these

needs in mind. (For many companies access to air freight services is important. For national firms access to air passenger service is important. Give special attention to potential sites near an airport.)

Fourth, consider the costs of providing public services to alternate locations. The site will need complete utilities and public safety services (especially police and fire protection).

Fifth, consider terrain and special building problems (soil stability, flooding, etc.). A level piece of ground has its advantages, but hills should not necessarily be ruled out. In some cases, they can save construction costs by providing natural loading docks or other special features."

Based on all previously discussed data, the Department of Economic Development has selected companies and organizations which they feel may be good prospects for branch or headquarters plants, warehouses or offices in Josephine County. These are as follows:*

Book Publishing

Manifold Business Form Manufacturing

Pharmaceutical Manufacturers and Distributors

Health Product Manufacturers

Bio-medical Equipment Manufacturers.

Electronics Manufacturers

Computer Manufacturers

Photo and Optical Manufacturers

Hospital Supply Manufacturers

Apparel Manufacturers

Beverage Manufacturers

Air Conditioning Manufacturing

Office Equipment Manufacturers

Personal Care Product Manufacturers

Boat Manufacturers

Garden Equipment Manufacturers

Furniture Manufactures

Leisure Time Industry Manufacturers

Commercial and Home Canning Metal Closure Manufacturers

Small Household Electric Appliance Manufacturers

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*(Individual company names and address, and the names of the chief executives can be obtained from the State of Oregon Department of Economic Development.)

OVERALL ECONOMIC SUMMARY

Approximately 90% of Josehine County is forest land. Just as the Josephine County landscape is dominated by forest, the County economy is dominated by the forest products industry, although less now in relative terms than in the past. In 1960, lumber and wood products accounted for 90% of all manufacturing employment in the County. By 1979 this percentage had dropped to 68.5%. So while total forest products employment in the industry has increased significantly over the past two decades, it is now less significant, in relative terms, than it was two decades ago. However, it is still the major component of the economic base of Josephine County.

As stated earlier, this industry is highly sensitive to outside forces such as the Federal Reserve Board's monetary policy for 1974. During this time, mortgage dollars were limited, causing a housing slump and corresponding decline in demand for forest products. Further, a basic industry such as lumber and wood products generates significant secondary and tertiary employment.

The most significant point to be made regarding this industry is, however, that significant declines can be expected between the years 1985 and 2005.

"Other Manufacturing" has shown very significant gains in Josephine County in the past two decades and has been a major factor in reducing cyclical impacts of lumber and wood products activity on the overall economy.

Economic diversification via increase in "Other Manufacturing", should continue to improve the stability of the County economy. With the base that already exists in this sector there should prove to be further opportunities for (1) location of satellite firms related to electronics manufacturing and assembly, and (2) expansion of existing "Other Manufacturing" operations. Local efforts to provide suitable, attractive, serviced industrial sites and a generally receptive attitude should continue to be beneficial to expansion of what has become an important part of the economic base of the County.

Whereas agriculture was, at one time, a significant county industry, it now plays a minor role. This has been consistent with the national trend and is accounted for by

several factors including steadily increasing mechanization and consolidation of land into larger farms, supporting fewer and fewer workers.

Mining activities within the County may be reviving. As gold and silver prices increase, interest in lower grade ore has been intensified. Also the search for nickel and cobalt deposits has concentrated interest in the southwest portion of the County as a probable area for mining activity. Economic, social and environmental impacts could be significant if such mining proved to be economically feasible.

Tourism has also played an active role in the County's economy, creating the need for jobs in a variety of sectors. However, tourist activity is similar to the wood products industry in that it follows a cyclical employment pattern and is dependent on outside economic factors, e.g. national economy and the price of gasoline.

The service and trade sectors have experienced the greatest percentage growth -- over 200% -- in the last twenty (20) years. In comparison total manufacturing has increased 80% and the population has increased 83%. While manufacturing employment has kept pace with population growth, employment in trade and services has out paced population growth.

The percentage of total employment in Josephine County has been consistently low in comparison with overall state figures. Unemployment has been high, especially during those years when national activities have created a decline in basic industry employment.

Total personal income in Josephine County has been increasing dramatically in recent years, however, the median family income for Josephine County is still one of the lowest in the state. In reviewing the sources of income to the County, it becomes apparent that approximately 40% of all income is derived from transfer payments or dividends, interest and rent. The importance of these sources is obvious from (1) their sheer magnitude and (2) the fact that these dollars are largely unaffected by economic fluctuations. Since these in-coming dollars support services, trade, and other non-basic sectors, they could, themselves, be considered a kind of basic industry, as well as an economic stabilizer. However, fluctuations in population composition, (i.e. through declines in the retirement population due to livability changes in the area, government policy changes or eventually death) can modify the amount and significance of these dollars.

Josephine County is an economically depressed area with a low per capita income and a high unemployment rate. Major base industries are lumber and wood products (and their associated manufacturing) and tourism, each of which has a cyclical or seasonal pattern of unemployment. This pattern is due, to a large degree, to weather and local and national economic health. Combined with other employment factors, this results in an unhealthy local economy. Further, there would appear to be too few jobs for the current population, potentially, forcing the working population to leave the area. For those that remain, two-worker family status is not unusual. Whereas the County's labor force has been consistently lower than that of the state, the future trend will potentially show a consistently higher labor force per working age population.

Diversification of the employment base and expansion of existing "Other Manufacturing" would appear to be one solution to these economic problems. This would hopefully provide enough jobs to minimize the cyclic effect of the other base industries while providing greater employment opportunities. Diversification would appear to best occur in light manufacturing which is not heavily dependent on public sewer and water and is non-polluting. Since such "foot-loose" industries are highly desired by many areas, the County should look towards ways of enticing such development.

HOUSING

Prime considerations in the development of a comprehensive plan are the placement and sheltering of people. Where and how people live determine the placement of roads, schools, commercial activities, parks, and all of the other things that would be necessary for future projection. Thus, it is important to understand who, what, and where the citizens of Jospehine County are. To a large degree these questions have already been answered in the preceding population chapter. The specifics of housing are, however, yet to be addressed.

In 1972, the League of Oregon Cities developed an overview of the population and housing of Josephine County in 1970. A portion of this information is presented in Table H-1.

In looking at housing, several factors need to be considered: how many families there are in the County; how many persons are in the family; how much money they can spend; what housing is available; and does what is available meet the needs of those looking for housing.

1978 HOUSING INVENTORY

Today, the majority of housing in Josephine County is provided by single family, wood-frame, residences, constituting approximately 68.1% of all dwelling units. Mobile homes, providing about 20.6% of the residences, also play a considerable role in fulfilling local housing needs. Multiple family units are steadily being developed, primarily within the Grants Pass city limits, but as yet provide only about 11.3% of the local housing needs.

Table H-2 delineates the use of these housing types. These figures do not however, include units which are: a) not assessed, b) group quarters, or c) non-frame structures.

The three major housing types are discussed in detail on the page 3 through 10. Prior to such a discussion, it is, however, necessary to define the terms urban,

TABLE H-1

1970 CENSUS DATA - HOUSING

	CAVE JUNCTION		GRANTS PASS		JOSEPHINE COUNTY	
	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL
Housing Units	168		4,789		13,120	
By Structure Type: 1 -Unit Structure	130	77.4	4,134	86.3	11,523	87.8
2+ Unit Structure	17	10.1	589	12.3	888	6.8
Mobile Home	21	12.5	66	1.4	709	5.4
Housing Units Lacking One or More Plumbing Facilities	5	3.0	114	2.4	632	4.8
Occupied Housing Units	163	97.0	4,552	95.0	12,327	94.0
By Tenure: Owner-Occupied	97	59.5	2,936	64.5	9,010	73.1
Median Value	$10,100		$13,300		$13,400	
Renter-Occupied	66	40.5	1,616	35.5	3,317	26.9
Median Rent	$ 66		$ 70		$ 70	
Crowded Occupied Units	8	4.9	202	4.4	939	7.6
Households	163		4,552		12,327	
Average Household Size	2.6		2.7		2.9	

SOURCE: League of Oregon Cities, Human Resources Data, 1970, 1971; from the 1970 Census.

rural and suburban as they are used frequently throughout this chapter:

Urban: Those lands basically within incorporated cities, (i.e. Grants Pass and Cave Junction).

Urbanizing Areas: Those lands within the UGB which are identified and a) determined to be necessary and suitable for future urban areas, b), can be served by urban services and facilities and c) are needed for the expansion of an urban area.

Suburban Areas: Those lands which are located near the urban area, developed to a moderate density standard, and will potentially be located within or near the UGB. These would include, primarily, the Redwood area and the Fruitdale/ Harbeck area.

Rural Areas: Those lands which are outside the UGB and are a) non-urban agricultural, forest, or open space lands or b) other lands suitable for sparce settlement, small farms or acreage homesites with no (or hardly any) public services, and which are not suitable, necessary or intended for urban use.

TABLE H-2

HOUSING UNITS IN JOSEPHINE COUNTY - 1980

	NUMBER	% TOTAL
Single-Family	15,867	68.1
Multi-family*	2,609	11.3
Mobile Homes	4,800	20.6
TOTAL	23,276	100.0

SOURCE: Josephine County Assessor's Office--Computer Run of January, 1979.

*Multi-family units estimated. See Text for discussion.

SINGLE FAMILY RESIDENCE

According to the Josephine County Assessor's office there are 15,867 single family residences in the County. Of these, approximately 31.8% are in the urban area, 14.4% in the suburban area, and 53.8% are in the rural area.

TABLE H-3

SINGLE FAMILY RESIDENCES BY PARCEL SIZE

	Single Family on Less Than 5 acres	Single Family on More Than 5 acres	% of TOTAL
Urban	5,048	7	31.8
Surburban	2,168	116	14.4
Rural	6,341	2,104	53.8
TOTAL	13,550	2,317	

SOURCE: Josephine County Planning Department from County Assessors Office data, 1980.

Further it is interesting to note that although the majority of single family dwellings are rural residences, 85.4% of all single family residences are still located on parcels less than 5 acres in size.

The first questions that need to be raised regarding these structures are: How old are they and what is their condition? The age of a structure is an important question because of the increased potential for removal or the need for repair and/or renovation. The 1970 Census of Housing showed that the majority of single family housing stock was built prior to 1960.

TABLE H-4

AGE OF SINGLE FAMILY RESIDENCES (1970)

% of Total	Year Built
25.7%	-- - 1939
21.7%	1940 - 1949
24.0%	1950 - 1959
14.1%	1960 - 1964
13.4%	1965 - 1968
2.7%	1969 - 1970

SOURCE: Data from the 1970 U.S. Census.

The majority of these units are still within the housing stock today. Although complete data for 1970-1978 is

unavailable, 239 permits for demolition were issued for that time period. This represented 1.8% of the total 1970 housing stock. (Table H-5)

According to available data (1971 to present for the city of Grants Pass and mid-1974 to present for remainder of the County), at least 3,981 permits for single-family residences were issued (Table H-7). Considering the early 1970's data gap, and a percentage of non-completion, this figure does correlate to the 15,867 single-family residences on the tax rolls in 1980.

Regarding the condition of housing structures, the Oregon Department of Revenue has developed a publication entitled, "Cost Factors for Residential Buildings - 1978 Edition", to aid in mass appraisal projects. This publication presents a method of residential evaluation that is "...based on the principle that a typical purchaser would pay no more for a building than the cost of constructing an equally desirable substitute..." (page 1). The factors considered are: cost of labor, materials, plans and specifications, construction permits, sales commissions, contractors profit and overhead, temporary facilities insurance coverage and interim facility. These factors have been evaluated and a class rating system developed as follows:

CLASS 1: These are minimum shelters. The majority have no foundations, and no provision for plumbing or electricity.

CLASS 2: These buildings do not meet minimum building standards for frame foundations and no provision for plumbing or electrictiy.

CLASS 3: These are low cost dwellings that fall just below current building codes. They have a masonry foundation, low capacity sheathed cable wiring and sewer and water connections.

CLASS 4: These structures adequately meet current building codes. They have concrete foundations, wood frame construction, multi-circuit panels, and sewer and water connections with fair quality piping.

CLASS 5: These are average quality homes with the most popular combinations of styling and design. They are above minimum code requirements.

Using the 1978 cost factor coding system on single family dwellings in the county, the following table has been developed to building class, as determined by the County Assessor's Office.

TABLE H-5

HOUSING DEMOLITIONS+

AREA	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
Grants Pass	8	13	17	17	17	14	12	18	116
County	*	*	&	13**	20	13	10	22	88
TOTAL	8	13	17	17	37	27	22	40	204

*Not available.

**Data for first 6 months only.

+This represents only demolitions for which permits have been issued.

SOURCE: Grants Pass City and Josephine County Permits.

TABLE H-6

SINGLE FAMILY BUILDING PERMITS ISSUED (1971-1978)

AREA	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
County	*	*	*	70**	256	435	634	569	2,364
City	59	122	84	46	74	112	142	93	732
TOTAL	59	122	84	116	330	547	776	662	3,096

*Data not available.
**Data for last 6 month only.
SOURCE: Grants Pass City and JOsephine County Building Permits.

TABLE H-7

1980 BUILDING CLASS FOR SINGLE FAMILY RESIDENCES

CLASS	NUMBER	%
1	460	2.9
2	1,476	9.3
3	4,315	27.2
4	6,966	43.9
5+	2,650	16.7
TOTAL	15,867	100.0

*NOTE: The difference between this total and the apparently correct total of 15,867 single-family residences is due to coding errors in the Assessor's roll, January 1979.

This table indicates that approximately 12.2% of all single-family housing in the County is potentially unsound.

In May of 1977, 4,478 were single-family residences, in Grants Pass. Table H-8 shows existing city housing to be of approximately equal quality to County housing with about 12% of single-family housing listed as potentially unsound.

Assuming the Assessor's Class 1 correlates with the survey's "dilapidated" (Table H-8), Class 2 with "deteriorating", and Classes 3 and 4 as "sound", Table H-9 can be developed for comparison.

TABLE H-8

GRANTS PASS HOUSING CONDITION SURVEY*

MAY 1977

Condition	Ward 1 (NW)		Ward 2 (N#)		Ward 3 (SE)		Ward 4 (SW)		City	
	#	%	#	%	#	%	#	%	#	%
A (Sound)	1004	89.2	1223	92.6	616	89.0	1103	82.4	3946	88.1
B (Deter.)	120	10.7	90	6.8	71	10.3	217	16.2	498	11.1
C (Dilap.)	2	.2	8	.6	5	.7	19	1.4	34	.8
Total	1126		1321		692		1339		4478	

Estimates in Housing Assistance Plan

Suitable for Rehab. (B) - 467

Not Suitable (C) - 25

Conducted by the Josephine County Housing and Community Development Council

*Does not include multiple-family dwellings.

TABLE H-9

JOSEPHINE COUNTY HOUSING CONDITIONS

CONDITION	CITY	% OF TOTAL	COUNTY*	% OF TOTAL	TOTAL
Sound	3,946	29.3	9,985	71.7	13,931
Deteriorating	498	33.7	928	62.3	1,426
Dilapidated	34	.8	426	-0-	460
TOTALS	4,478		11,339		15,867

*Includes Cave Junction.

Table H-9 shows that of all single-family structures outside Grants Pass City Limits, 8% are dilapidated and some should be replaced. Additionally, 11.2% will need some degree of up-grading. In these two categories only 3.8% of all unsound single residences are located within the city. The remainder are located in the County.

MULTI-FAMILY UNITS

It is estimated that, in 1980, 2,609 multi-family units existed in Josephine County. Multi-family units are identified as any structure containing more than one dwelling unit such as multiple family units, apartment buildings, courts, and motels. Due to the summary data filing system within the Assessor's Office and Building Department, accurate figures for all multi-family units are unavailable.

The majority of these multi-family units are in or near Grants Pass. Most of these units are one or two bedroom units with a few three bedroom or studio units.

TABLE H-10

MULTIPLE FAMILY UNITS IN JOSEPHINE COUNTY - 1980

TYPE	UNITS	STRUCTURES
Multi-family (8 or less units)	1,289	391
Apartments (9 or more units)	584	31
Motels and Courts	716	119
Hotels	20	4
TOTAL	2,609	545

SOURCE: Josephine County Planning estimate based on data from County Assessor's Office and Housing Authority.

The Housing Authority estimates there are 1,306 multi-family units in the City of Grants Pass. Consequently this indicates there are 1,303 units within the City of Cave Junction and the unincorporated county areas.

County Assessor's office computer data indicates there are 391 multi-family structures with two to eight units each.

TABLE H-11

MULTIPLE-FAMILY STRUCTURES (2-8 UNITS)

CLASS	UNITS	STRUCTURES	% OF STRUCTURES
2	13	4	3
3	148	44	11.3
4	1,019	318	82
5+	109	25	6.4
TOTALS	1,289	391	100

SOURCE: Josephine County Assessor's Office -- Computer run for January 1980.

Of these structures, 13 units are presently considered "deteriorating".

Consistent with the data files, structures with 9 units or more can be placed in a variety of categories including "multi-family" or "apartments". Further, under this system, it is impossible to tell how many units are in each structure. There are 31 such structures located within the County. Sixteen of these structures, containing 344 units, have been built within the city of Grants Pass since 1970. The remaining 15 structures are located outside the city limits. Since the number of units are unknown, it has been arbitrarily estimated that these 15 structures contain 16 units each or 240 units. Thus the total estimated for these 31 multi-family structures is 584 units.

Finally, there are 119 motels and courts appraised in the County. Forty of these are listed by the Environmental Health Department as motels having units available for rent for periods less than one month. This indicates that the remaining 78 structures are potentially usable for housing purposes.

Again, for purposes of calculation, two assumptions will be made:

1. Of the licensed motels, it is estimated that 5.3% or 56 rooms are available on a monthly basis. Many motels will do this to help insure some income, especially during the winter months.
2. Of the 78 remaining structures, 15% have been

removed from the market due to demolitions, deterioration, and/or the high cost of operation. There is a strong possibility that this number is low due to the 6-year appraisal cycle and the delay between an appraisal and its inclusion on the computer print-out.

For the remaining 66 units, it is estimated that the average number of units is 10. Most of the structures that would be included in the cou t category are older and built during a period of less demand and smaller investment. The units in "courts" are estimated at 660.

MOBILE HOMES

One of the viable alternatives to living in a wood-frame dwelling is the mobile home. In 1970, there were 945 mobile homes in the County. State Housing Division records show that in July, 1978, 4,107 mobile homes existed in Josephine County. This means there was a 408% increase in mobile homes during the eight year period. Further, in 1978, the County Building Department issued 476 mobile home siting permits and on January 1, 1981, 4,800 mobile homes were assessed in the County.

Of the total 4,800 units, 2,840 are classed as real property, while the remaining 1,960 units are assessed as personal property. These latter units are on rented land or in some form of mobile home or trailer park.

Of the total mobile home units, 48 are in the city of Grants Pass, with six assessed as real property and 42 as personal property. Current city policy is that mobile homes are only allowed in mobile home parks, with no additional parks being allowed.

VACANCY RATE

According to the State Housing Division, "The housing market in Josephine County has been characterized by a low vacancy rate. Total vacant units declined by about 248 units between 1970 and 1978. The sales vacancy rate increased from 1.5 percent in 1970 to an estimated 1.9

percent in 1978, while the rental rate dropped from 6.2 percent in 1970 to an estimated 2.1 percent in July 1978.

TABLE H-12

JOSEPHINE COUNTY VACANCY TRENDS

1960 - July 1978

	April 1, 1960	April 1, 1970	Current
Total Vacant	1,243	814	566
Available Vacant	347	354	366
For Sale	106	133	263
Sales Vacancy Rate	1.4	1.5	1.9
For Rent	241	221	102
Rental Vacancy Rate	8.9	6.2	2.1
Other Vacant Units*	896	460	N/A

SOURCE: 1960 and 1970 Census of Housing and estimates Made by the Housing Division, State of Oregon, 1978.
*i.e. vacation homes, group quarters.

These figures are not, however, consistent with data from the multiple listing service. For the period of April, 1978, through December, 1979, 1,156 single family homes were listed through the multiple listing service, or stated otherwise, approximately 10.8% of all single family units were for sale during a one year time period. Of these, approximately 1,076 units, or 7.5% of all single family units were sold. (This does not include private sales or exclusive listings.) This sales rate is higher than the State Housing Division estimate, and is much higher than the "traditionally accepted standard" 1% vacancy rate.

In July of 1978, the State Housing Division estimated an overall rental vacancy rate of 2.1%. Currently it is estimated that there is a 5.9% vacancy rate as determined from newspaper advertising and Assessor's records. However, the Josephine County Housing and Community Development Council estimates this rate to be much lower.

SIZE OF RESIDENCE

Regardless of type and location of residence, size and cost are important factors in housing review.

As stated in the Social Chapter, the average family size is 2.65 people. As could be expected, the majority

TABLE H-13

NUMBER OF BEDROOMS BY AGE OF RESIDENT (%)

NUMBER OF BEDROOMS	TOTAL	AGE OF RESIDENT							
		UNDER 25	26 - 30	31 - 40	41 - 50	51 - 59	60 - 65	OVER 65	"C"
One	6.1	13.3	10.3	2.9	1.8	1.8	6.4	11.3	
Two	38.6	58.6	43.8	25.2	23.8	29.2	50.7	53.3	
Three	42.8	25.8	41.4	54.1	52.9	53.3	35.4	28.6	
Four	9.4	2.3	4.5	16.0	15.8	12.3	5.9	3.6	
Five or More	1.8	-0-	-0-	1.2	5.2	3.5	1.2	.3	
Studio-Apt.	.1	-0-	-0-	-0-	-0-	-0-	-0-	.5	
Other	.1	-0-	-0-	-0-	-0-	-0-	-0-	.3	
No Answer	1.0	-0-	-0-	.6	.5	-0-	.5	2.1	

SOURCE: Consumer Attitutde Research, 1979.

(59%) of housing in Josephine County has three or more bedrooms. This statistic is taken from a recent survey of Grants Pass and vicinity which shows that two and three bedroom homes (constituting 81.4%) predominate the housing stock. (Table H-13)

HOUSING COSTS

In reviewing the 1970 census information, the Rogue Valley Council of Governments (1977) stated "the average cost of housing in the district (Josephine and Jackson counties) is significantly lower than for the state as a whole." At that time, the majority of available houses were valued at $5,000 - $15,000.

In July, 1978, the State Housing Division stated the average price for a newly-constructed home was $40,000. Based on County planning staff discussions with builders and realtors, this price has now increased to over $57,000 for the same average three-bedroom home. And the price increases with time and improvements. The picture is not totally bleak, however, as older and/or smaller homes may still be affordable.

Renting is also a viable alternative. The State Housing Division estimates that historically about 25 - 26% of the County's housing inventory has been renter occupied (Table H-14).

TABLE H-14

OWNER/RENTER OCCUPIED UNITS IN JOSEPHINE COUNTY

	APRIL 1, 1960	APRIL 1, 1970	1978
Total Housing Inventory	11,059	13,141	18,977
Total Occupied Units	9,816	12,237	18,410
Owner Occupied Units	7,342	9,010	13,614
Percent of Total	74.8	73.6	73.9
Renter Occupied Units	2,474	3,317	4,796
Percent of Total	25.2	26.4	26.1

SOURCE: State Housing Division, "Housing Market Analysis Situation Report:, 1978 from 1960 Census of Housing and Estimates made by the Housing Division, State of Oregon.

This is, however, a higher figure than indicated by the recent Consumer Attitude Research Survey. Their figures show that (of those who answered) 19.4% of County residents live in a rented residence.

Sales through multiple listing give an indication of housing costs for 1978. In Table H-13, it is indicated that the majority of homes, approximately 72%, sold for $30,000 to $69,999. However, a significant percentage (15%) sold for $70,000 to $89,999.

TABLE H-15

JOSEPHINE COUNTY
SINGLE FAMILY RESIDENCE SALE-MULTIPLE LISTING
(APRIL TO DECEMBER 1978)

Selling Price	Number of Bedrooms 1 & 2	3	4+	Total	%
Up to 14,999	1	-	-	1	.1
15,000 to 19,999	5	-	1	6	.7
20,000 to 29,999	29	6	15	50	6.0
30,000 to 49,999	94	97	107	298	37.0
50,000 to 69,999	46	135	98	279	34.5
70,000 to 89,999	19	53	50	122	15.0
90,000 to 109,999	4	13	9	26	3.2
110,000 and over	2	11	12	25	3.0
Total	200	315	292	807	100.0
Percentage	24.7	39.0	36.2		

SOURCE: Multiple Listing Service, 1979.

To quote the State Housing Division (1978), "This upward trend in the moderately priced housing market is making acquisition of such homes more difficult for middle income families."

One of the general guidelines for personal finances is that no more than 25% of gross monthly income or about 35% of disposable income should be spent on housing. By using the general rule that monthly rent or house payments should be 1% of the total cost, the following table has been developed showing income required for home purchase.

TABLE H-16

MONTHLY INCOME TO HOUSING COST (DOLLARS)

Cost of House	20,000	30,000	40,000	50,000	60,000	70,000
Monthly Cost/Rent	200	300	400	500	600	700
Monthly Income Required						
Gross	800	1,200	1,600	2,000	2,400	2,800
Disposable	570	860	1,150	1,450	1,700	2,000
Yearly Disposable	6,800	10,300	13,800	17,400	20,400	24,000

SOURCE: Kohl, 1978.

These figures may not, however, be totally realistic since the large majority of home owners do make initial down-payments. This may not, however, ease the problem of home purchase. This is graphically demonstrated through the following assumption: if the average home costs $50,000 and the down payment is $10,000, the home-owner must still make $400 per month payments and earn a gross salary of $1,200 a month or $14,400 a year.

In the Economic Chapter, it was stated the median family income in Josephine County was $13,015 in 1978. Further, 45% of residents paying income tax have an income less than $14,999. The median effective buying income was $9,098 a year. The following effective buying income table was developed by Kohl (1978) for households in Josephine County.

TABLE H-17

EFFECTIVE BUYING INCOME

	PERCENT OF HOUSEHOLDS IN EBI GROUPS	
	1976	1978
0 - 7,999	44.5	37.9
8,000 - 9,999	10.1	8.2
10,000 - 14,999	23.5	21.5
15,000 - 24,999	16.6	23.4
25,000 and over	4.3	9.0
Median Household EBI	$9,098	10,923

SOURCE: Kohl, 1978, 1980.

Considering all these facts, it is deduced that only about 45% of the County's households can afford the average $30,000 home and about 21.9% can afford the average $45,000 home (each without down-payments).

Obviously, many families find they must search for housing alternatives. Rental units vary greatly in price. In January 1979, rents for a one-bedroom unit ranged from $75 to $286 per month; for a two-bedroom unit, from $175 to $266 per month; and $150 to $375 per month for a three-bedroom unit.

As was noted earlier, there has been a substantial increase in mobile home ownership since 1970. According to the State Housing Division (1978), "Mobile homes have become the major alternative to traditional home ownership for low and moderate income families. The comparatively low cost of mobile homes tends to place the purchase of a single family lot within the financial capabilities of many families who would not be able to afford both a lot and a traditional house. Double wide mobile homes are most often placed on lots. Single-wide tend to be placed in parks. However, development of new mobile home parks and subdivisions in both Grants Pass and the County are [presently] restricted by zoning requirements."

Currently, the price of a single-wide mobile home ranges from $9,000 to $19,000 with the average cost being $14,000, (exclusive of land or set-up cost). For a double-wide, the price is from $10,000 to $45,000, with the average cost being $25,000. During April through December of 1978, 268 lots were sold with the potential for mobile home sitings. As stated earlier, 476 mobile home site permits were issued in 1978.

SPECIAL HOUSING NEEDS

LOW INCOME HOUSEHOLDS

According to the 1970 census, 16.6% of the County's population was at or below the National poverty level (Kohl, 1978). In 1976 the Home Owners and Renters Tax Relief Returns data indicate that 14.2% of reported household incomes are still less than $5,000.

Using 3 as the average family size, roughly 15% of the County's population, (or 8,400 households), have a special need for housing which meets minimum standards and is in a price/rent range that they can afford. Using the rule of thumb that no more

than 25% of a family's monthly income should be spent on housing, these families require housing of $104 or less per month. Also, location of their housing in relation to work and services must be considered.

TABLE H-18

C.S.A. Poverty Guidelines for All States Except Alaska and Hawaii

Family Size	Nonfarm Family		Farm Family	
	1970	1980	1970	1980
1	$1,840	$3,790	$1,569	$3,250
2	2,383	5,010	2,012	4,280
3	2,924	6,230	2,480	5,310
4	3,743	7,450	3,195	6,340
5	4,415	8,670	3,769	7,370
6	4,958	9,890	4,244	8,400
7	6,101*	11,110	5,182*	9,430

SOURCE: Kohl, 1980.

ELDERLY

Josephine County has a high "senior" population. Estimates indicate that 20.2% to 22.9% of the County's population (or 11,312 to 12,824 people) is age 60 or older. Estimates from the Area Agency on Aging also indicate 55% of all seniors are below the poverty level. (The Rogue Valley Council of Governments (1977) quoted a 55% figure.) This 55% means there are more than 5,650 senior individuals who can barely afford to pay $104 a month for housing rent or payments.

This data is somewhat substantiated by the Consumer Attitude Research survey which shows that for seniors over age 65, the majority have household incomes under $10,000 a year with approximately 19% having household incomes of $5,000 or less. For those aged 60-65, 8.4% have household incomes less than $5,000 a year and another 24.5% have incomes $5,000 to $10,000.

The Seniors Program in Josephine County has developed a client intake form which has provided much valuable information regarding senior housing. Realizing that questions can be raised about the representativeness of this survey, a review still provides an interesting comparative report. Of the 1,400 responses from people age 60 and over:

	65.8% own their own home
	85.8% say the home's structure condition is adequate
(65.0%)	61.4% live in single family units
(7.4%)	9.0% live in apartments
(23.2%)	18.6% live in mobile homes
*(64.6%)	55.0% are married
	30.6% are widowed
	62.5% report good personal mobility
	23.1% report partial personal mobility

(Note: Numbers in parenthesis are from 1979 Consumer Attitude Research Survey for people over the age of 65. *Defined as a two person household.)

In consolidating all the available information, it becomes readily obvious that the level of difficulty in finding adequate, physically sound, affordable, and physically suitable housing for the elderly is increasing.

MINORITIES

According to the 1970 census, less than 2.8% of the County population is non-caucasian. There has, as yet, been no special identified needs for racial minorities. Another group that is sometimes classed as a minority is women. In 1970, the census reported 356 families in the Grants Pass area with a female as head of household. This may indicate a need to address the availability of day care services. More importantly, this may indicate a need to address low cost housing for a single-income family (i.e. following pages).

DEVELOPMENTALLY AND EMOTIONALLY DISABLED

It is estimated by Kohl (1978) that 2.1% of the population is at risk of being developmentally disabled and that 2.9% are at risk of being emotionally disabled.

Two forms of housing consideration would be beneficial for both of these groups. The first would be zoning that would allow the formation of group homes and the second would be the allocation of a certain percentage

of subsidized housing to these individuals. A need for rest or convalescent homes has also been stated by hospitals and agencies within the County.

TRANSITORY POPULATION

A number of persons who have come to the County seeking employment prefer (or can only afford) staying in County Parks. The Director of Josephine Information and Referral Center has received roughly 210 requests for low or no-cost camping facilities. Since there are only two such camps in the County...Alameda and Lake Selmac...consideration may be given to the development of additional minimum facility, no-cost, long term campgrounds.

PHYSICALLY HANDICAPPED

Of the County population 10.8% is designated as "at risk of being physically handicapped" (Kohl, 1978). Thus, 6,048 individuals could require some form of special consideration in their living arrangements. Also, consideration must be given to location of their living units in relation to commerce, recreation, and services.

HOUSING PROGRAMS

There are a number of government programs which help to provide people with suitable housing. Housing assistance programs are generally based on the applicant's income and current housing situation.

LOCAL HOUSING AUTHORITY

The Josephine Housing and Community Development Council is funded by the Department of Housing and Urban Development to provide assistance to low-income families in Josephine County in paying their rent under the Section 8 Existing Housing Rental Assistance Program. Eligible applicants pay 25% of their adjusted income towards their housing cost and the balance, under certain limitations, is subsidized by the Council:

1. Section B, Rental Assistance: Under this program, tenants pay 25% of their income to their landlord and the government subsidized the remainder of the fair-market rent for the particular unit. In mid 1980, 293 units were being utilized with 297 units yet required. This indicates a serious need for low-income housing.

2. Housing Improvement for the Elderly (HIEP): This program utilizes labor and materials from other existing programs to perform home repair for low-income elderly homeowners. Projects have included such things as repair of broken steps and replacement of unsound roofs.

It is estimated that local needs for low-cost housing are greater than exhibited by the Councils figures since "people generally turn to [this agency]for assistance only out of desperation when all else has failed. Many people in need of housing assistance will not contact the Housing Council either because they are not aware of it or are "too proud to take a handout" (RVCOG, 1979).

OWNER-BUILT HOUSING

During the Spring 1979 session of the Oregon Legislature, Senate Bill 921 was passed, exempting owner-built rural dwellings and outbuildings from certain provisions of the structural code. Exemptions may not, however, include those items regarding: a) fire egress or fire retardent smoke detectors, 6) maximum bending strength allowed by the structural code for structural members, or c) insulation and energy conservation. Much has been written on the merits of owner-built homes especially as related to reduced costs; claims have been that housing cost can be reduced from $1000 to 22 - 53 percent. Permits for such housing would be issued to any individual only once every five years.

OREGON REVISED STATUTE AUTHORITY

Chapter 456 of the Oregon Revised Statutes also provides the authority for cities and counties to aid with the provision of low-cost housing projects. ORS 456.365 delineates the specific areas or terms which such jurisdictions are authorized to act upon. These could include provision of public facilities, exceptions from building regulations or ordinances, zoning designations, and the dedication, sale, or lease of public properties within its jurisdiction.

FARMERS HOME ADMINISTRATION

The Farmers Home Administration serves two functions in Josephine County. As a lending agency it serves the credit needs of low to moderate income people who live in communities of less than 20,000 people. The home loans are not restricted just to home building but may also be used to buy, improve, repair or rehabilitate rural homes. However, the emphasis is on new construction.

The applicant is required to meet certain requirements. The applicant must "be without decent, safe and sanitary housing; be unable to obtain a loan from private lenders on terms and conditions that they can reasonably be expected to meet; have sufficient income to pay house payments, insurance premiums and taxes and maintenance, other debts and necessary living expenses (persons with inadequate repayment ability may obtain co-signers for the loan); and possess the character, ability, and experience to meet loan obligations."

The agency also provides financial aid through apartment rental projects. These are all newly constructed units and the FHA will pay up to 25% of the rent of a unit depending upon the income of the occupant. In 1979 there were four such projects in Josephine County:

Grants Pass	16 units
Cave Junction	20 units
Cave Junction Phase I and II	32 units

STATE HOUSING

The state also provides subsidizing for new units through the same type of program provided by FHA. In 1979 there were three such apartment projects in Grants Pass, all of which are for people over age 60 who have low incomes:

Grants Pass	38 units
Grants Pass	10 units
Grants Pass	14 units

Two other housing programs are available in Josephine County. These are described as follows by the Rogue Valley Council of Governments:

Federal Land Bank: The Federal Land Bank is another lending institution which provides credit to people living in rural areas. Loans can be obtained for purchase of land, construction of homes or barns and for many other farm-related purposes. To receive these long term, low interest loans, the borrower must give first mortgages on his farm real estate as security. He must also be a member of a national farm-loan association, own stock in the association at least equal to 5% of his loan and live in a community no larger than 2,500 people. The size of the loan is based upon the appraisal value of the property mortgaged. The funds for making loans are obtained from the public sale of bonds (this program is not highly utilized in Josephine County).

Veterans Administration Loans: The Oregon Veteran's loan program gives direct loans with interest rates of 5.9%. A veteran can borrow up to $58,000 but not more than 95% of the Department's appraised value of the home. A down payment depends on the veteran's credit standing, employment record and security offered. The maximum term for repayment is 30 years on city or suburban properties and 40 years on farms. Generally, the term is less depending upon: 1) the amount of the loan, 2) quality, location, and age of the property, and 3) the veteran's ability to repay. Approximately 90% of eligible applicants receive their loans. Funding for this program is obtained through bond sales. These bonds are voted by the people of Oregon and are repaid by the veterans participation in the program. Oregon Veteran's is the largest single-family residential lender in the United State and is quite active in Josephine County. In 1978-79, the program gave out a total of 352 home loans here, totaling $12,344,226.

HOUSING PROJECTION AND NEEDS

Ninety-two percent of the net population increase in this area since 1970 has been due to migration. This concentrated influx has caused considerable stress on a variety of resources, including housing, and may have resulted in over-building for present needs. It is, however, anticipated that a high in-migration to this area will continue for several more years.

As shown in the Social Characteristics Chapter, the population of Josephine County is estimated to reach at least 96,643 by the year 2000. Applying the factor of decreased average household size (2.47), it is estimated there will be at least 38,800 families living in Josephine County by 2000 A.D. Obviously, fulfilling the housing needs for these families will be a major undertaking.

TABLE H-19

PROJECTED DWELLING UNITS

YEAR	POPULATION	EST. AVG. FAMILY SIZE	DWELLING UNITS	ADD. UNITS NEEDED
1980	58,000	2.65	21,887	1,389
1985	64,812	2.63	24,644	1,368
1990	75,283	2.60	28,955	4,311
1995	85,970	2.55	33,714	4,759
2000	96,643	2.47	39,127	5,413

An initial method of housing need projections is to assume that current percentages of housing types will remain the same.

TABLE H-20

PROJECTION OF CURRENT PERCENTAGE

HOUSING TYPE	1980		2000	
	%	NUMBER	NUMBER	HOUSING NEED
Single-Family	68.1	15,867	26,645	10,778
Multi-Family	11.3	2,609	4,421	1,812
Mobile Home	20.6	4,800	8,061	3,261
TOTAL	100.0	23,276	39,127	15,851

Reality, however, teaches us that people's lifestyles and desires change, and in so doing, the character and needs of housing will also change. The following table delineates the changes that have occurred in housing types over the past eight years.

TABLE H-21

HOUSING CHANGES 1970-1978

HOUSING TYPE	1970		1980		% INC.
	NUMBER	%	NUMBER	%	
Single-Family	11,523	86.3	15,867	68.1	37.7
Multi-Family	888	6.6	2,609	11.3	193.8
Mobile Home	945	7.1	4,800	20.6	407.9

SOURCE: County Planning Department from 1970 Census data and 1978 County Assessor's Office data.

Based on estimated population figures, 39,127 dwelling units will be needed by the year 2000. This translates to a need for 15,851 additional dwelling units, most of which will be single family residences.

Multiple family residences are expected to increase in number over the next several years. They are, however, expected to increase slightly or to retain substantially the same percentage of housing as presently exist.

Approximately 75% of all multiple-family units are within the city of Grants Pass. If current percentages were continued,1,359 additional units would have to be continued, 1,359 additional units would have to be constucted within the city. This, however, is not a realistic number since most of the existing 751 units in motel and courts are in older motels that have been converted to monthly rentals. This type of structure is not new construction and has a variable life-span. Also a hotel with 20 rooms has closed down and there is no expectation for its replacement. Consequently, additional multiple-family units would be required. Further, it is to be noted that current vacancy rate figures indicate a deficit of existing multi-family units.

Multiple-family housing requires public sewer and water services. As such, these units will be a result of a) construction on an existing lot (often forcing removal of an existing residence) or b) expanded development into the Urban Growth Boundary areas with accomodation of associated services.

Obviously, the mobile home has become a major alternative. The question that this creates is whether: a) the mobile home will supply a larger and larger percentage of housing needs in future years, or b) the housing market has neared a mobile home saturation level and will provide substantially the same percentage of housing needs as presently exists.

At present 20.6 of the housing units are mobile homes. If current percentage were retained this would mean that by the year 2000 we would have 8,060 mobile homes. This is a total addition of 3,260 units or 163 units each year. Of these additional units, 1,366 would be placed on some form of rental property outside of the city of Grants Pass.

Based on historic trends and existing data, it is assumed this situation will continue for the next few years and will then begin to level off. As such, the previously discussed figures would need to be increased. Also, the existing economic situation appears to have accelerated mobile home purchase over that of a conventional residence. The effects of inflation may result in a larger population of mobile homes/multi-family dwellings.

The single-family, conventional-construction residence is still expected to remain the pre-dominant type of housing within Josephine County. For the present, there appears to be an abundance of single-family dwellings. These may not, however, be the type (size, cost, location) of residence required by residents and potential residents.

In summary review, it would appear that whereas the single-family residence will pre-dominate the County's housing inventory, there will be an increased percentage of mobile homes and multi-family units, (Table H-22).

TABLE H-22

PROJECTED HOUSING INVENTORY

	Conventional Single-Fam.	Multi-Family	Mobile Home
1978	69.7	9.0	21.3
1980	68.1	11.3	20.6
1990	60.0	13.0	27.0
2000	55.0	15.0	30.0

DISTRIBUTION

Although previous statistics show approximately 78% of the population is within eight miles of central Grants Pass, only about 39% of the population was located within the Grants Pass Urban Growth Boundary. To carry this further, in 1978, approximately 58% of all housing was located outside designated Urban Growth Boundaries for Grants Pass and Cave Junction.

TABLE H-23

HOUSING DISTRIBUTION

Year	1970		1980		2000	
	# Dwell. Units	%	# Dwell. Units	%	# Dwell. Units	%
CAVE JUNCTION	143	1.2	414	1.8	2,230	5.7
GRANTS PASS	4,231	34.3	6,233	26.8	14,751	37.7
REMAINING COUNTY	7,952	64.5	16,619	71.4	22,146	56.6
TOTAL	12,326	100.0	23,276	100.0	39,127	100.0

The designated Urban Growth Boundaries have adequate sewer and water supplies to maintain approximately 14,151 families in a safe and healthy environment. In Grants Pass, the projected sewage treatment plant could accommodate additional people; however, adequate water supplies are lacking for full urban level development. The Cave Junction Urban Growth Boundary is also limited. (See Public Facilities Chapters)

Initial review would thereby indicate that these restrictions will cause the County to remain a rural residential jurisdiction. In fact, an even larger amount of rural housing may be required if the 96,000 population projection proves to be a low estimate. As stated earlier, 96,000 is a conservative year 2000 estimate based on a conservative 1980 estimate of a 56,000 population.

Housing needs in this area could also be greatly affected by various internal and external changes. Presently, the U.S. is experiencing a trend of relocation from urban to rural areas. This phenomenon has definitely been experienced in Josephine County throughout the seventies.

As with other resource-based counties, Josephine County has more vigorously reflected national economic trends. (See Economic Chapter.) Effects of recession and inflation are definite concerns for the community. An obvious reflection is the difficulty experienced in acquiring a house mortgage or loan. Locally, the economic situation could potentially be stimulated through development of clean, new industries. Further, such conditions as mandatory energy conservation, gas shortages, national recession/depression, and reduction of construction supplies can have major impacts on housing development.

HOUSING NEEDS AND DESIRES

As shown in the 1977 Steven's study (Social Characteristics Chapter), the majority of new residents to this area a) move to Josephine County for the quality of life here and b) locate their homes in a rural area. To restate that, the majority of new resident previously lived in a larger, more urban area and have come to Josephine County to live a rural lifestyle. As such, they may often want "a place in the country", not realizing what type of actual lifestyle changes this requires. After a few years of rural living, they may realize they can have the same benefits on a smaller lot, closer to town. In part, this pendulum effect of human desires explains the large volume of home sales in this area.

TABLE H-24

BUILDING SITE PREFERENCE

SITE	TOTAL	UNDER 25 YRS	26-30 YEARS	31-40 YEARS	41-50 YEARS	51-59 YEARS	60-65 YEARS	OVER 65
Small City Lot (6,000 sq.ft.)	9.4	2.2	1.2	3.2	6.6	8.2	11.7	22.7
Large City Lot (7,000-20,000 sq.ft.)	13.1	1.9	9.7	14.7	12.8	15.7	12.7	15.9
1/2 Acre	11.3	6.1	4.3	8.2	8.1	14.5	20.1	13.7
1 Acre	15.0	15.7	14.3	9.5	18.0	17.9	18.5	13.7
1 - 2 1/2 Acres	9.3	11.2	6.4	12.3	10.8	9.3	11.3	5.0
2 1/2 - 5 Acres	19.9	33.5	28.9	25.6	20.4	20.4	14.9	8.0
More Than 5 Acres	16.0	25.8	31.2	25.0	21.7	12.0	3.7	4.6
Apartment or Condominium	2.5	3.7	1.2	-0-	-0-	1.3	4.6	6.4
No Answer	3.6	-0-	2.7	1.5	1.6	.6	2.5	10.0

SOURCE: Consumer Attitude Research, 1979.

A later study by Consumer Attitude Research (1979) discusses consumer preference regarding building sites. It is interesting to note that over 70% of the survey group (over 27,400 people) had lived in Josephine County for five or more years. (Table H-24)

Obviously people prefer the larger lot sizes with 2.5 to 5 acre lots being most desired, lots over 5 acres being second in desire, one acre lots coming in third and large city lots coming in fourth. Approximately half of these responses came from people who live in Grants Pass. As a sub-population, city residents were overwhelmingly (22%) in favor of larger (7,000-20,000 square feet) city lots.

A major concern is the amount of income required to acquire housing that meets a family's needs. It is projected that the cost of housing will continue to increase faster than income, thus forcing families to seek alternatives or to settle for less than desired housing. If this becomes the actual trend, then those with fixed or lower incomes will be the most affected, both in terms of restricted flexibility and also from the view of contending with increased assessments and ability to retain what they currently have.

Obviously, the most significant housing need revolves around low cost housing, apartments and mobile homes which are located close to job opportunities, stores, and service centers.

ALTERNATIVES

A number of alternatives could be available for Josephine County and, as such, could determine a more centralized energy-efficient development pattern. However, it appears that a primary requisite for several of these alternatives is the supply of services and associated high initial cost.

Housing alternatives deal basically with two situations: large, spatial distributions and project specific development.

Other jurisdictions within the state are pioneering the way for experimental or alternative housing. As these are often a change from the "status quo", the public may show reticence in readily adopting these new ideas. But whereas many of these ideas may be new to rural America they have been in existence for an extended

time in European countries and urban areas. Some of these ideas could be adopted to Josephine County thus providing for a variety of housing types, desires and housing costs.

A desirable situation might be the development of cluster communities around rural service centers. If provided with either a public water system and/or a public sewer, concentrated development on 1/2 to 1 acre lots could potentially occur. This may be the most viable method of maintaining rural or semi-rural lifestyles while still retaining economic access to commercial and services. By giving careful consideration to service provision, open space, and spatial relationships, desirable living situations could be created.

On a larger scale, the County may want to consider specific areas as potential urban growth boundary study sites. With theexisting commercial development, proposed industrial park land, airport, freeway access, and existing lot development, the Merlin area could be considered as a potential area for low-key urbanization.

Planned unit developments are also potentially a good alternative to conventional lot partitioning. Use of this technique would allow the developer to create a variety of housing patterns. Development of concentrated housing with common grazing or forest lands could allow reduced development rates, use of a community water or sewer system and efficient, energy-saving development of the land. (See Diagrams H-25 and 26.) This type of development may be well suited to a recreational, resort-like subdivision. The PUD is also well suited to mobile home park design (e.g. Rogue Lea Estates). The need for mobile home parks within the Grants Pass Urban Growth Boundary has been loudly voiced.

On a smaller scale, apartment projects can provide an efficient, yet attractive housing alternative. (See Diagram H-27.) Such units could be:

Townhouses: a group of four houses that share a common area. These can be modest homes.

Semi-detached: Utilization of air spaces between units.

Condominiums: Purchase of an apartment unit with shared expenses in general up-keep of the lot. This method of living unit construction has become popular, especially on the west coast. More consideration could be given to this form of development.

Mixed Housing: A development where a variety of housing types are provided.

Twins: A housing unit with two living areas and one central kitchen. This concept is reminiscent of college dorms and is utilized in Eugene as low-cost housing for the elderly and for single-parent families. In Eugene as many as 5 units have been designed to focus around one kitchen.

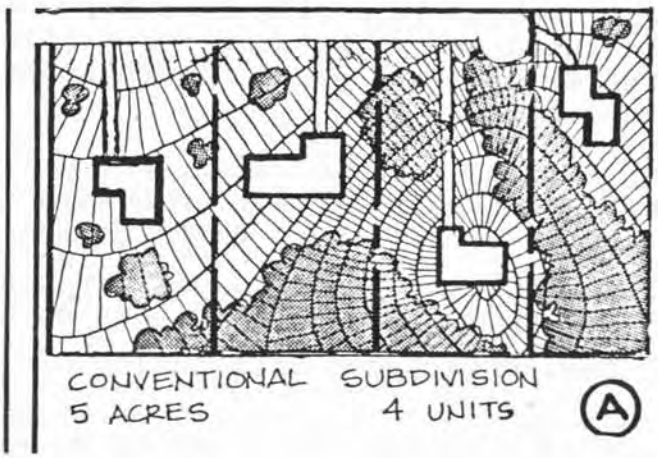
Obviously, each or any of these alternative housing types could be combined with a P.U.D. Density or other bonuses could be used as an incentive towards development of alternative forms of housing.

DIAGRAM H-25

HOUSING ALTERNATIVES

This set of diagrams illustrates the variety of methods which could be used in developing this 5-acre parcel of sloped land.

DIAGRAM A: is a conventional subdivision design. The parcels are equally divided and are held in independent ownerships. There is a degree of privacy and a feeling of space. Development of this parcel could, however, be costly. (Construction costs could possibly have been reduced by building the road along the contour.) Each person does have his own open and forest areas.



As compared to A, both diagrams B and C could result in a perception of urban living. This could be modified by the placement of landscaping and use of the forested area for recreation or open space.

DIAGRAM H-25 (CONTINUED)

DIAGRAM B: offers a development alternative, allowing independent ownerships with joint usage at the north common area. These parcels could be supplied with public facilities, and overall construction costs would be lower. A loss of privacy is potentially experienced, however, the commons area could be managed as a woodlot while providing recreation benefits.

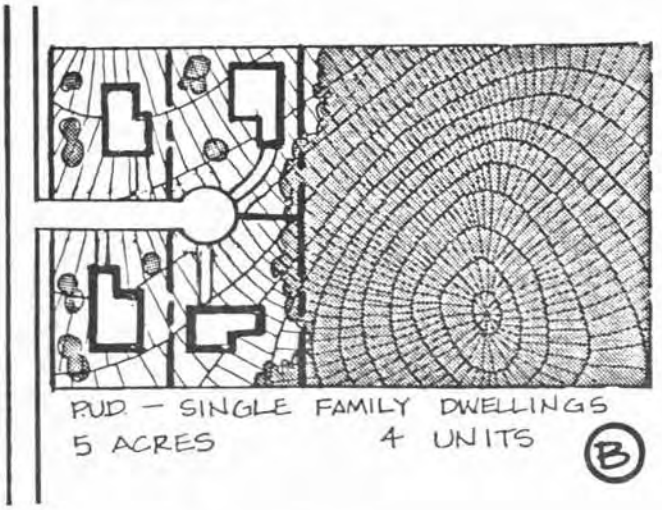
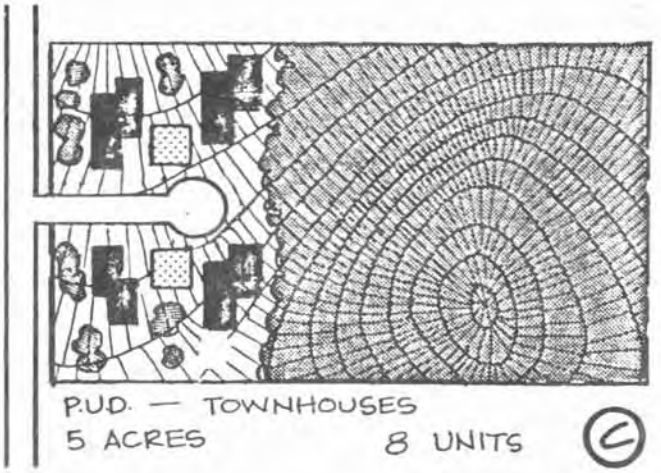


DIAGRAM C: by having a higher density, this plan provides an efficient use of the land. This alternative, potentially supplied with public facilities, is the least costly per unit. Compared to Diagram A, there is a loss of privacy, however, this is a low density alternative to providing multi-family units. It would provide the benefits of both rural and urban living. Further, this alternative would provide the opportunity to develop economic, on-site recreation facilities.



PLANNED UNIT DEVELOPMENT

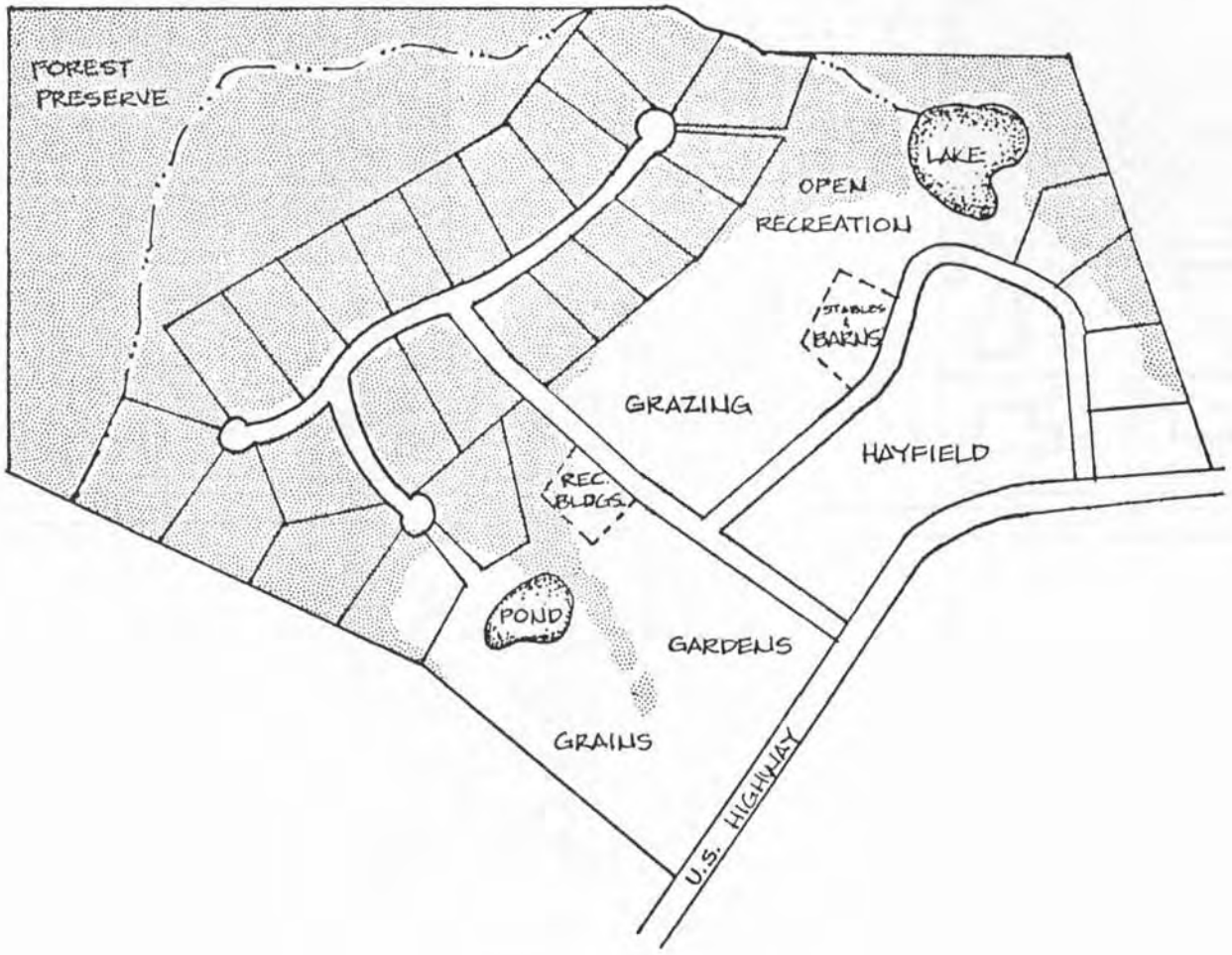


DIAGRAM H-26

FARM COLONY

This is a simplified diagram of a rural "Farm Colony" in Virginia -- a large scale planned development with commons areas. Individual parcels have been created on the lower and gentler slopes of the property in the wooded area. As a whole, however, the Farm Colony is operated as a working farm with a farm manager whose salary is paid from the property owners association dues. The forested area is also managed as a resource and recreation area. Such a situation allows owners to have a home in the country while having low-cost farm products, and enjoying common benefits such as on-site recreation and crafts buildings, stables, swimming pool, lakes, streams, and forested areas with trails. Surplus farm products are sold and the profits put back into the farm. This same principle could be used for recreational subdivisions.

Diagram H-27 shows mixed residential development. The large parcel outlined with a dark line was developed to maximize housing opportunities with seven single-family residences, six condominimums/townhouses, and twenty-one apartment units. Duplexes are located on corner lots and exit to separate streets. On a smaller scale mixed housing could be realized by building a single-family subdivision and locating duplexes or triplexes on a portion of the lots. In a new subdivision, a buyer would be aware of the housing mix prior to purchase.

ALTERNATIVES TO MULTI-FAMILY HOUSING

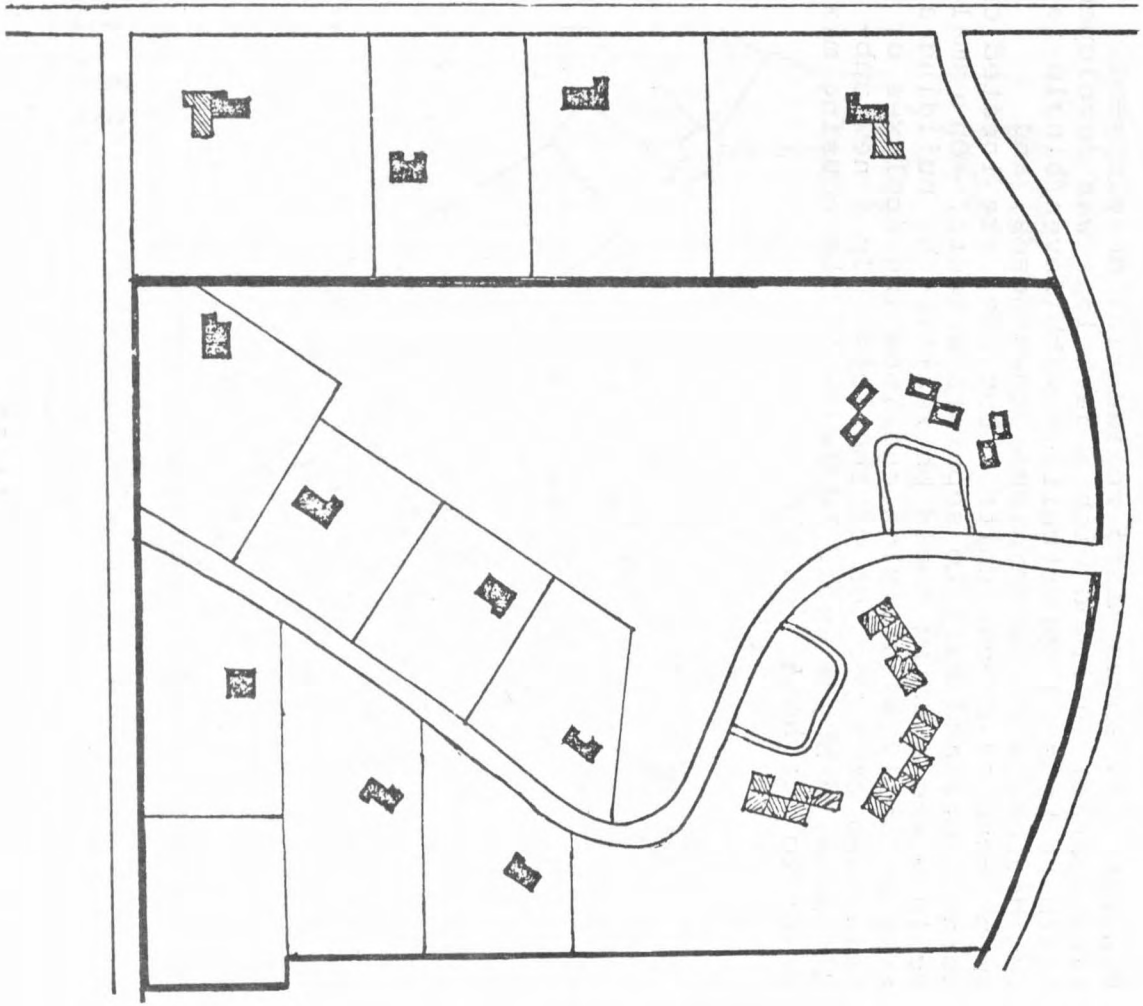


DIAGRAM H-27

KEY:

- Single Family
- Duplex/Semi-Detached
- Condominium
- Multi-Family

WATER SYSTEMS

Water needs are closely correlated to type of use and location of use. It has been noted that rural areas generally use less water per capita than urbanizing areas (Stevens, Thompson & Runyan, 1972). This would reflect the high water use of industrial and commercial users within urban areas. Further fluctuation in needs occurs with seasonal variations; summer use being greater than winter use.

WATER USE REQUIREMENTS

The following table was developed by CH_2M (1979) to predict future water needs in the Grants Pass municipal and urbanizing areas.

TABLE PF-1

WATER USE - AVERAGE DAILY UNIT CONSUMPTION VALUES

Residential Users	148 gallons per capita per day
Commercial Users	3000 gallons per acre per day
Low Water Use Industrial Land	670 gallons per acre per day
High Water Use Industrial Land	Actual water use, 1973-1978
Institutions and Public Lands	1000 gallons per acre per day

SOURCE: CH_2M, 1979.

Average daily consumption values for urban residential development are more finely delineated in Table PF-2 which is used to compute the daily water needs for source determination, as well as treatment and storage calculations.

Water use throughout the County could, however, be assessed in light of Table PF-3 in which water use has been estimated for a variety of uses including dwellings, schools, livestock, commercial, and recreational facilities.

TABLE PF-2

PUBLIC WATER - QUANTITIES NEEDED

Density	Total Daily Water Requirements Per 100 Acres of Residential Development				Total Yearly Requirements Per 100 Acres of Res. Dev.		Total Yearly Req. Per 100 Pop.
	Avg. Day		Max. Day				
	1000 Gal.	Acre Feet	1000 Gal.	Acre Feet	1,000,000 Gal.	Acre Feet	Acre Feet
1. Less than 1 d.u./acre	43	.14	130	.41	16	49	255
2. 1 - 2.9 d.u./acre	130	.40	390	1.21	47	144	192
3. 3 - 4.9 d.u./acre	192	.59	577	1.78	70	214	161
4. 5 - 15 d.u./acre	346	1.06	1037	3.19	126	389	128
5. Over 15 d.u./acre	722	2.22	2166	6.66	263	809	106

[1]Assumes 2.9 persons per dwelling unit.

[2]One acre-foot equals 325,830 gallons.

[3]Maximum daily consumption equals 3 times average daily consumption.

SOURCE: George Ney, Standards for New Urban Development -- The Sewer Background (adjusted for a density of 2.9 persons per dwelling unit).

TABLE PF-3

WATER USE GUIDE

Types of Establishments	Gallons Per Day
Airports (per passenger)	3-5
Apartments, multiple family (per resident)	60
Bathhouses (per bather)	10
Camps:	
Construction, semipermanent (per worker)	50
Day with no meals served (per camper)	15
Luxury (per camper)	100-150
Resorts, day and night, with limited plumbing (per camper)	50
Tourist with central bath and toilet facilities (per person)	35
Cottages with seasonal occupancy (per resident)	50
Courts, tourist with individual bath units (per person)	50
Clubs:	
Country (per resident member)	100
Country (per nonresident member present)	25
Motels with bath, toilet, and kitchen facilities (per bed space)	50
with bed and toilet (per bed space)	40
Parks:	
Overnight with flush toilets (per camper)	25
Trailers with individual baths units (per camper)	50
Picnic:	
With bath houses, showers, and flush toilets (per picnicker)	20
With toilet facilities only (gallons per picnicker)	10
Poultry:	
Chickens (per 100)	5-10
Turkeys (per 100)	10-18
Restaurants with toilet facilities (per patron)	7-10
Without toilet facilities (per patron)	2½-3
With bars and cocktail lounge (additional quantity per patron)	2

TABLE PF-3 (CONTINUED)

Dwellings:	
Boardinghouses (per boarder)	50
Additional kitchen requirement for nonresident boarders	10
Luxury (per person)	100-150
Multiple family apartments (per resident)	40
Rooming houses (per resident)	60
Single family (per resident)	50-75
Estates (per resident)	100-150
Hotels with private baths (2 persons per room)	60
Hotels without private baths (per person)	50
Institutions other than hospitals (per person)	75-125
Hospitals (per bed)	250-400
Laundries, self-serviced (gallons per washing, i.e., per customer)	50
Livestock (per animal):	
Cattle (drinking)	12
Dairy (drinking and servicing)	35
Goat (drinking)	2
Hog (drinking)	4
Horse (drinking)	12
Mule (drinking)	12
Sheep (drinking)	2
Steer (drinking)	12
Schools:	
Boarding (per pupil)	75-100
Day with cafeteria, gymnasiums or showers (per pupil)	25
Day with cafeteria but no gymnasiums or showers (per pupil)	20
Day without cafeteria, gymnasiums, or showers (per pupil)	15
Service stations (per vehicle)	10
Stores (per toilet room)	400
Swimming pools (per swimmer)	10
Theaters:	
Drive-in (per car space)	5
Movie (per auditorium seat)	5
Workers:	
Construction (per person per shift)	50
Day (school or offices per person per shift)	15

SOURCE: Environmental Health Practice in Recreational Areas: Public Health Service, U.S. Department of Health, Education, and Welfare.

DOMESTIC WATER SUPPLY SYSTEMS

Domestic water supply systems are monitored by Josephine County Environmental Health Services Division as authorized by the Oregon State Health Division. The administrative guidelines are found in Oregon Administrative Rules (OAR) 333-42-200 through 42-245. These rules address water quality, construction standards, plan standards, sanitary survey, operation, maintenance and penalties.

Table PF-4 lists the community, public utility, and municipal water systems in Josephine County. The majority of these systems are located near Grants Pass.

COMMUNITY SYSTEMS

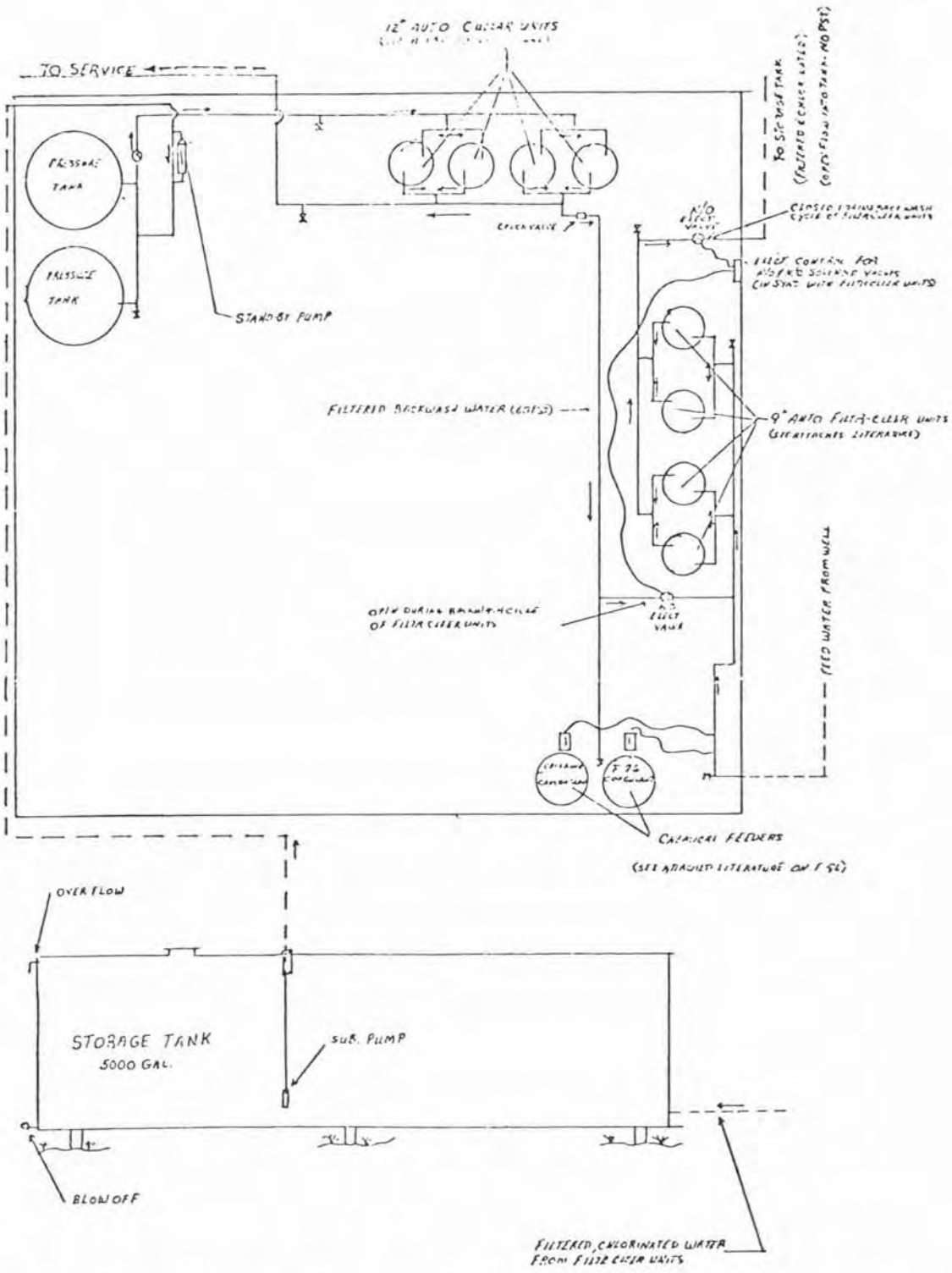
A Community Water Supply System is defined in the OAR's as a "domestic water supply source or distribution system which serves more than three single residences or other users for the purposes of supplying water for household uses, but is neither a municipal water supply system nor a public utility water supply system". This definition applies to a system serving from three to 500 residences or other users. These systems can be privately or jointly owned and/or maintained.

Several areas in the County, where groundwater is limited, could utilize the yield from one or more wells or springs in a storage and distribution system. This could be more economically feasible than the drilling of individual wells for each residence. Such a system could, however, be quite costly in regard to the additional chlorination unit required.

There are, however, several concerns regarding the development of community water systems. Undersized piping, improper casing/seals, proximity to sewers/septic systems, and lack of storage could all work towards deterioration or unacceptability of a community system. The chances of contamination of the water supply (and groundwater resources) also increase under the above circumstances.

Conversely, community systems which are carefully constructed and monitored offer an attractive, eco-

nomical and desirable choice for domestic water supply. The majority of the existing systems are not, however, adequate for inclusion into or development of larger systems.



SCHEMATIC DRAWING OF A PUBLIC OR COMMUNITY WATER SYSTEM.

TABLE PF-4

TYPE	SYSTEM	LOCATION	WATER SOURCE	APPROX. POPULATION SERVED	CAPACITY (MGD)	OR. HEALTH APPROVAL
PU	City of Cave Junction	Cave Junction	Illinois River			Yes
Municipal	City of Grants Pass	Grants Pass	Rogue River			Yes
C	Fruitdale Heights	Crestview	Well	130		No
C	Fruitdale Water Utility	Fruitdale Area	Well	900		No
PU	Fruitdale Water Utility	S.E. of Grants Pass S. of River	Well	840	.31	No
C	Galice Water Supply	Galice	Creek			No
C	Medart	N. of Grants Pass	Well	28	.01	No
C	Medgal	Hw. 99 and Carnahan	Well	15		No
C	Merlin Lumber Corp. (So. Pacific RR)	Merlin	Well	10		Yes
C	Pardee Lane	Redwood Area	Well	35		No
C	Parkdale-Hill	Parkdale	Well	44		Yes
PUC	Pine Creek Water Utility	Skycrest-Harper Loop	Well	120		Yes
C	Robertson	Hamilton & Cloverlawn	Well	25		No
C	Roguelea	West of Grants Pass (UGB)	Well	70	.02	No

P = Public Water System

PU = Public Utility Water System

C = Community Water System

M = Municipal Water System

SOURCE: Josephine County Environmental Health Department, 1979.

PUBLIC UTILITY WATER SYSTEMS (PU)

A more intensive water system is the Public Utility Water Supply System. This is defined by OAR as "domestic water supply sources and distribution systems supplying water for household uses, owned and operated by a person subject to regulation by the Public Utility Commission of Oregon and supplying water to a total of 500 or more households".

There is one such system presently located in Josephine County, serving the city of Cave Junction. This system is presently providing water to 565 users.

Cave Junction has two water rights on the East Fork of the Illinois River: a 1949 right for one cfs is perfected (formally granted) and another right for two cfs applied for in 1971 is not yet perfected. A third 1964 water right applies to the wells south of the city and is for one cfs. Total water rights for Cave Junction are four cubic feet per second equalling approximately 2.5 million gallons per day. If utilized, this amount of water could supply a residential population of approximately 5,000 assuming water use patterns similar to those of Grants Pass with a smaller peak daily demand due to Cave Junction's smaller size (i.e. 500 gallons per capita day).

The City now utilizes a water treatment plant recently built on the Illinois River which will serve an estimated population of 2,000. Population projections for Cave Junction vary somewhat. As shown in the Population Element, the city's growth rate in the 1970-75 span nearly equalled that of the previous ten years. If, as a maximum estimate, Cave Junction continued to increase fifty percent every five years, the current water treatment capacity would suffice until approximately 1990 when the population would be about 2200 people. Existing water storage facilities for Cave Junction are two reservoirs with capacities of 63,000 and 300,000 gallons.

The existing reservoirs, if full, could provide only 3000 gallons per minute for 2 hours. If the wells were also utilized this figure could be boosted to 3741 gallons per minute. CH2M Hill has recommended reserve storage for a population of 840 to be 1.51 million gallons. CH2M has further estimated a storage capacity peak demand of 2.3 million gallons to accomodate the 2200 population estimated for the year 1990. These estimates do not consider additional developments which would either be large water users or require extensive water storage for fire flow.

PUBLIC WATER SYSTEMS

Similar to, but not the same as, the public utility water system, is the Public Water Supply System.

Such a system is defined by the OAR as a "domestic water supply source and distribution system other than a municipal water supply system where water is provided for or is available through the single user to public consumption, including, but not limited to a school, a farm labor camp, an industrial establishment, and recreational facility, a restaurant, a motel, or a group care home."

Public water supply systems in Josephine County are primarily limited to motels, restaurants, county parks, and mobile home parks (Tables PF-5 and -6). Water supplies to mobile home parks are not, however, governed by OAR Domestic Water Supply regulations, but rather come under the auspices of the Department of Commerce, which has for all practical purposes adopted OAR 333-42-245.

TABLE PF - 5

PUBLIC WATER SUPPLY SYSTEMS

NAME	LOCATION	TYPE OF WATER SYSTEM	APPROVAL STATUS
FULL SERVICE RESTAURANTS			
A & W Drive IN	Grants Pass	PWS	not approved
Alley Way Walk-Up	Wolf Creek	PWS	not approved
Applegate Tavern & Cafe	Grants Pass	PWS	not approved
Black Bar Lodge	Galice	PWS	not approved
The Black Forest	Selma	PWS	not approved
Thee Browner's Water Hole	Murphy	PWS	not approved
Burger Inn	Grants Pass	PWS	not approved
Hamberger Joynt	Grants Pass	PWS	not approved
Buzz's Wheel-In Cafe	Merlin	PWS	not approved
Chat-N-Chew	Selma	PWS	not approved
Circus Donuts	Grants Pass	PWS	not approved
Clansman Dinner House	Cave Junction	PWS	not approved
Cody's	Grants Pass	PWS	not approved
Casa Del Rio	Grants Pass	PWS	not approved
Coventry Inn	Grants Pass	PWS	not approved
Doubletree Place	Merlin	PWS	not approved
Forest Lodge Motel & Restaurant	Cave Junction	PWS	not approved
The Foxhole Restaurant	Kerby	PWS	not approved
Galice Resort	Galice	PWS	not approved
Paliani's	Grants Pass	PWS	not approved
Grants Pass Drive In Theatre	Grants Pass	PWS	not approved
Hamilton House	Grants Pass	PWS	not approved

TABLE PF-5 (CONTINUED)

The Hideaway	Grants Pass	PWS	not approved
Hungry Wolf Truck Stop	Wolf Creek	PWS	not approved
Illinois Valley Golf Club	Cave Junction	PWS	approved
The Lantern	Grants Pass	PWS	not approved
Larry's La Casita Restaurant	Grants Pass	PWS	not approved
The Last Resort	Selma	PWS	not approved
M & F Theatres	Cave Junction	PWS	not approved
Morrison's Lodge	Galice	PWS	not approved
Mt. Sexton Trading Post	Sunny Valley	PWS	not approved
Murray's 19th Hole	Grants Pass	PWS	not approved
The New Chit and Chat	Cave Junction	PWS	not approved
O'Brien Cafe	O'Brien	PWS	not approved
O. K. Corral	Grants Pass	PWS	not approved
199 Tavern	Grants Pass	PWS	not approved
Oregon Caves Chateau	Cave Junction	PWS	not approved
Pete & Gene's	Merlin	PWS	not approved
Piper Inn	Grants Pass	PWS	not approved
Pizza Wagon	Merlin	PWS	not approved
Redwood Tavern	Wilderville	PWS	not approved
R Haus	Grants Pass	PWS	not approved
Rogue College Drive In	Grants Pass	PWS	not approved
Rogue Glen Lodge	Galice	PWS	not approved
Rollerdrome	Grants Pass	PWS	not approved
Selma Tavern	Selma	PWS	not approved
Shepp's Tavern	Grants Pass	PWS	not approved
S. Millie's Sandwich Shop	Grants Pass	PWS	not approved
The Sportsman's Inn	Grants Pass	PWS	not approved
Stop-'N-Go Pizza	Grants Pass	PWS	approved
Ten Pin Cafe	Grants Pass	PWS	not approved
The 10th Hole	Grants Pass	PWS	not approved
Town & Country Tavern	Grants Pass	PWS	not approved
Twin Pines Cafe	O'Brien	PWS	not approved
The Village Chalet	Cave Junction	PWS	not approved
Weasku Inn Cafe	Grants Pass	PWS	approved
Western Corral	Merlin	PWS	not approved
Wilderness Lodge	Hays Hill	PWS	approved
Williams Valley Inn	Williams	PWS	not approved
The Woodshed	Grants Pass	PWS	not approved
Wolf Creek Tavern	Wolf Creek	PWS	approved

MOTELS:

Black Bar Lodge	Galice	PWS	not approved
Forest Lodge Motel	Cave Junction	PWS	not approved
Galice Resort	Galice	PWS	not approved
Garden Plaza	Grants Pass	PWS	not approved
Holiday Motel	Kerby	PWS	not approved
Hungry Wolf Truck Stop, Inc.	Wolf Creek	PWS	not approved
Madrona Motel & Gift Shop	O'Brien	PWS	not approved
Morrison's Lodge	Galice	PWS	not approved
Motel Del Rogue	Grants Pass	PWS	not approved
Oregon Cave Co (Chateau)	Cave Junction	PWS	not approved
Rivershore Motel	Grants Pass	PWS	not approved
Rogue Glen Lodge	Galice	PWS	not approved
Stage Coach Motel	Wolf Creek	PWS	not approved

TABLE PF - 5 (CONTINUED)

Twin Pine Motel	O'Brien	PWS	not approved
Weasku Inn	Grants Pass	PWS	approved
Wilderness Lodge Motel	Hays Hill	PWS	approved
Woodland Echoes Motor Lodge	Cave Junction	PWS	not approved
Wolf Creek Tavern	Wolf Creek	PWS	approved

LIMITED RESTAURANTS:

E & I Market	Grants Pass	PWS	not approved
Colonial Valley Golf Course	Colonial Valley	PWS	not approved
Pine Cone Tavern	Grants Pass	PWS	not approved
Quiki-Mart #3	Grants Pass	PWS	not approved
Quiki-Mart #2	Grants Pass	PWS	not approved
Watson's Market	Grants Pass	PWS	not approved
Why Not Market	Grants Pass	PWS	not approved
Wolf Creek Country Store	Wolf Creek	PWS	not approved

RECREATION PARKS:

Cave Hwy Trailer Park (24)	Cave Junction	PWS	approved
Caves Trail Camp (25)	Cave Jucntion	PWS	not approved
Grants Pass Over-nighter (31)	Grants Pass	PWS	not approved
Holiday Mobile Manor (4) (Mobile Home Park)	Grants Pass	CWS	approved
Kerby Trailer Park (12) (Mobile Home Park)	Kerby	CWS	not approved
Last Resort, The (41)	Selma	PWS	not approved
Les Claire Campground (47)	Grants Pass	PWS	approved
Mountain View Mobile (Mobile Home Park)	Grants Pass	CWS	not approved
Pine Villa Trailer Park (7) (Mobile Home Park)	Grants Pass	CWS	not approved
Pink Petunia Campground (25)	Grants Pass	PWS	not approved
Rainbows End Koa (50)	Hays Hill	PWS	not approved
Royal Trailer Park (25) (Mobile Home Park)	Grants Pass	CWS	not approved
Shady Acres Trailer Park (20) (Mobile Home Park)	Cave Junction	CWS	not approved
Sunny Valley KOA Campground (55)	Sunny Valley	PWS	approved
Town and Country Travel Park (31)	Cave Junction	PWS	not approved
Trails End Mobile Park (16)	Cave Junction	PWS	not approved
Twin Pines Rec. Park (7)	O'Brien	PWS	not approved
Weasku Inn (4)	Grants Pass	PWS	approved
Woodland Echoes Campground (20)	Cave Junction	PWS	not approved

ORGANIZATIONAL CAMPS:

Sundance Expeditions	Galice	PWS	not approved
Tall Timbers Girl Scout Camp	Grants Pass	PWS	not approved

SOURCE: Josephine County Environmental Health Department, 1979.

TABLE PF-6

PUBLIC WATER SUPPLY SYSTEMS

MOBILE HOME PARKS

System	Units Served
Grants Pass	
*Caveman Mobile Home Park	28
Circle Tree Trailer Park	38
College Mobile Home Park	16
Country Estates Mobile Park	100
Country View Trailer Park	33
Country Village Mobile Estates	58
*Del Mar Mobile Home Park	8
Dun Rovin Trailer Court	75
*Fruitdale Trailer Park	45
Highland Mobile Home Park	26
*Holiday Mobile Manor	33
Inland Mobile Home Park	10
Mt. Baldy Mobile Home Park	8
Murphy Trailer Court	5
New Hope Christian School Trailer Court	10
Pine Villa Trailer Park	21
Redwood Mobile Estates	8
Riverhaven Mobile Estates	60
Riviera Mobile Park	50
Six Pines Trailer Court	4
Cave Junction-Kerby	
Caves Highway Trailer Park	4
Jay Vees Trailer Park	6
Kerby Trailer Park	23
Merlin	
Blue Moon Trailer Park	15
Cormont Trailer Park	14
Keith's Trailer Park	23
Sanitarium Mobile Home Park	8
TOTAL	739

TABLE PF-6 (CONTINUED)

MOTELS

System	Units Served
Grants Pass	
Motel Del Rogue	15
Rivershore Resort	6
Weasku Inn	8
Wilderness Lodge Motel	3
Cave Junction-Kerby	
Forest Lodge Motel	11
Holiday Motel	11
Madrona Motel	9
Oregon Cave Resort	40
Trails End Motel	5
Wish-U-Well Motel	6
Woodland Echoes Motor Lodge	15
Merlin	
Black Bar Lodge	11
Galice Resort	5
Jumpoff Joe Ranch	9
Morrison's Lodge	11
Rogue Glen Lodge	5
O'Brien	
Twin Pines Motel	8
Wolf Creek	
Hungry Wolf Motel	10
Stage Coach Motel	8
Wolf Creek Tavern	8
TOTAL	204

SOURCE: Josephine County Health Department - 1979.

* Oregon Health Services Approval

MUNICIPAL WATER SYSTEMS

Municipal water systems are defined as "water supply systems utilized by municipal or city areas which serve more than 1000 households or users." There is one municipal system in Josephine County, serving the city of Grants Pass.

As would be expected, the Grants Pass Water Department now serves the largest populated area in the County, providing all domestic water supply services.

The City currently has two water rights allowing up to 37.5 cubic feet of water per second (cfs) to be diverted from the Rogue River for municipal supply. The first right (dating from 1888) permitting 12.5 cfs is a perfected right (a right put to an authorized beneficial use for a specified minimum amount of time certified by the State Water Resources Board) permitting the city to draw approximately 8.08 million gallons of water per day from the Rogue River. The second water right applied for in 1960 is for twice the prior amount of water though it is not yet a perfected right. The 1960 (25 cfs) right has never been cut off during the low flow years and could reasonably be considered reliable. (When flows become critically low in a stream or river the County Watermaster may allow only the holders of the older water rights to draw from the watercourse).

The total 37.5 cfs is equivalent to an uninterrupted flow of 24.2 mgd. In addition, the City has an agreement with the Corps of Engineers for the allocation of up to 6,700 acre-ft/year of water stored in the Lost Creek-Elk Creek Projects. This water is available from June through September. From these two sources, the City of Grants Pass has adequate water supply to 27 mgd (CH2M Hill, 1979).

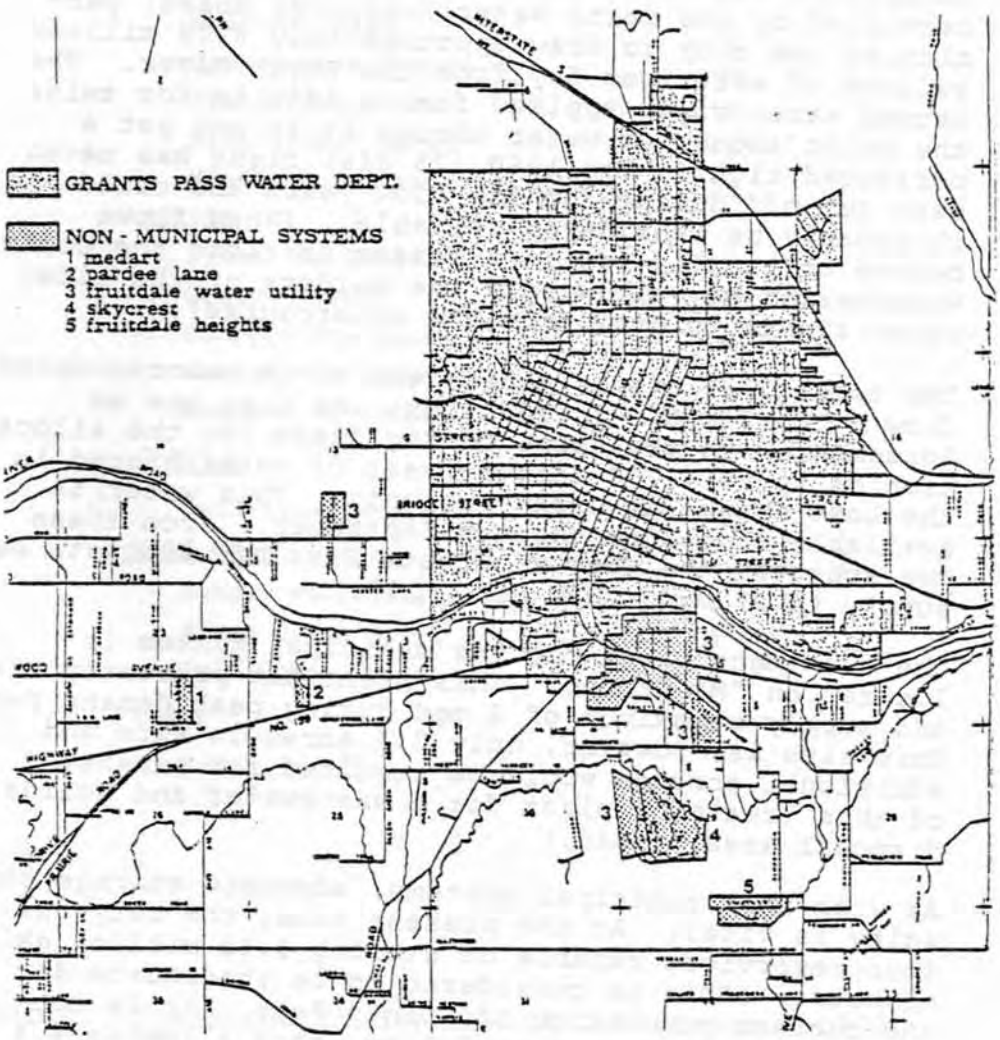
The treatment plant for the municipal system is located on "M" Street. This plant can presently treat and supply a maximum of 9 mgd during peak demand periods. This site is, however, only 3.5 acres in size and additional acreage would be required for expansion of this treatment plant for a wastewater and solids disposal area. (Ibid.)

As with most municipal systems, adequate storage capacity is vital. At the present time, the city has four reserviors capable of storing 5.45 million gallons of water. This is considered to be inadequate for the current population of Grants Pass. It is recommended that storage be 8.1 mg, thus allowing 4.4 mg for emergency reserve, 2.2 for equalizing pressure,

and 1.5 mg for fire fighting. (Ibid.)

Under present conditions, the existing 5.45 mg would supply the population's maximum day demands for about 2½ hours. (Ibid.) However, the Grants Pass city manager has indicated that under the average annual day circumstances, existing storage would provide water for approximately 1½ days as people would be requested to conserve water. This latter figure does not take into consideration unusual or emergency situations such as fire or major leaks within the system.

MAP PF-7



NEEDS OF THE URBAN AREA

As indicated in the previous paragraphs, there is already concern over the adequacy of the Grants Pass Municipal water supply system. Establishment of the Urban Growth Boundary further increases this concern. Areas which now have sewers or for which sewers are proposed will also probably require public water supplies.

CH2M (1979) has developed the next three tables to demonstrate the water needs of the entire urbanizing area. Table PF-8, projecting water demands, was calculated from data in Table PF-1 in conjunction with design population projections.

TABLE PF-8

PROJECTED WATER DEMANDS
Year 2000, Urban Growth Boundary Service Area
(in million gallons per day)

DESCRIPTION	COLUMN NO. *			
	(1)	(2)	(3)	(4)
Average annual demand	9.26	9.87	11.64	11.63
Average day demand during maximum month	17.87	19.05	22.47	22.45
Maximum day demand	25.00	26.65	31.43	31.40
Peak hour demand	37.04	39.48	46.56	46.52

* 1. Urban Growth Boundary low-range target population year 2000, 36,600 with per capita consumption values.

2. Urban Growth Boundary mid-range target population year 2000, 39,000 with per capita consumption values.

3. Full site development (present land-use ratios), population 46,000, with per capita consumption values.

4. Full site development (present land-use ratios), population 46,000, with unit consumption values.

Tables PF-9 and PF-10 show the incremental average day demand through the year 2000 for the city of Grants Pass and the entire Urban Growth Boundary. The projections assume a uniform increase in population.

POTENTIAL WATER SUPPLIES

The table on the following page shows all the currently feasible sources of surface water which might be used as water supply. The majority of these involve diversions from the Rogue River, the methods varying as to legalities involved in obtaining the water. The only other confirmed water source at this time is Lost Creek Dam.

The proposed allocation schedule for municipal water releases from both Lost Creek and Elk Creek Dams projected Grants Pass receiving 29.45 percent of the total allocation. At the present time, the U.S. Army Corps of Engineers projects an allotment of 10,000 acre feet of water per year to be released from Lost Creek between June 1 and October 15 each year for municipal supplies. Grants Pass would then be receiving 2,945 acre feet of water for its use (approximately 7.004 million gallons per day). Contracts for an actual amount of water for each municipality are yet to be signed. Problems of allotment have occurred as reservoir capacity is less than projected.

The future of Elk Creek Dam, proposed to be built in the vicinity of Lost Creek Dam, is yet to be decided. Land has been purchased for the project; however, environmental concern has delayed construction. This dam would provide municipal water in the same ratio as Lost Creek with an estimated 2,945 acre feet of water for Grants Pass from June 1 through October 15. The exact water supply available from Elk Creek is potentially more variable than that of Lost Creek due to the stream drainage area. Supply will be redetermined each spring in light of winter rainfall and snowpack.

A third proposed reservoir project may eventually have some value as a water resource for municipal use. The Sexton Dam project on Jumpoff Joe Creek northeast of Merlin was proposed to supply 2,000 acre feet of water annually, originally for irrigation, and later for municipal and industrial use in Josephine County. Due to its location and projected need, the Merlin-Colonial Valley area would probably receive the water.

TABLE PF-9

PROJECTED WATER DEMANDS
Five-Year Increments
Present Grants Pass City Limits Service Area
(in million gallons per day)

	1980	1985	1990	1995	2000
Average annual demand	3.89	4.25	4.61	4.97	5.33
Average day demand during maximum month	7.51	8.20	8.90	9.59	10.29
Maximum day demand	10.50	11.48	12.45	13.42	14.39
Peak hour demand	15.56	17.00	18.44	19.88	21.32
MID-RANGE TARGET POPULATION	15,358	16,786	18,215	19,643	21,071

SOURCE: CH_2M, Water Distribution System, Grants Pass, Oregon, 1979.

TABLE PF - 10

PROJECTED WATER DEMANDS
Five-Year Increments
Urban Growth Boundary Service Area
(in million gallons per day)

	1980	1985	1990	1995	2000
Average annual demand	7.29	8.10	8.73	9.34	9.87
Average day demand during maximum month	14.07	15.63	16.85	18.02	19.05
Maximum day demand	19.68	21.87	23.58	25.22	26.65
Peak hour demand	29.15	32.39	34.92	37.35	39.48
MID-RANGE TARGET POPULATION	28,000	32,000	34,500	36,900	39,000

SOURCE: CH_2M, Water Distribution System, Grants Pass, Oregon, 1979.

TABLE PF-11

PRESENT AND POTENTIAL WATER SUPPLIES

Water Source & Quantity	Equivalent Gallons/Day	Period of Allotment	Avg. Population Supportable	Notes
Present Supplies				
Rogue River:				
1888 Water Right (12.5 cfs)	8,078,400	year round	11,968[a]	perfected right*
1960 Water Right (25.0 cfs)	16,156,800	year round	23,936[a]	unperfected right*
U.S. Army Corps of Engineers:				
Lost Creek Dam 2945 Ac. Ft.	7,004,130	June 1-Oct 15	18,677[b]	actual quantity of water not yet contracted
	31,239,330		54,581	some shortages in month of May forseen when population reaches 35,000
Potential Supplies				
U.S. Army Corps of Engineers:				
Elk Creek Dam 2945 Ac. Ft.	7,004,130	June 1-Oct 15	18,677[b]	actual water allotments will be redetermined each spring

TABLE PF-11 (CONTINUED)

Bureau of Reclamation: Sexton Dam 2000 Ac. Ft.	1,785,363	year round	4,760[b]	
Rogue River: Additional Water Rights		Oct-May		gaining water right at other times during the year appears unlikely
Grants Pass Irrigation District: indefinite		April-Oct	quantity available may be limited after survey and certification process is completed	

[a] Supportable population is based on average per capita consumption of 250 gallons per day with a peak daily demand of 2.7 times the average. The number of gal/day supplied would then support x number of people at 675 gallons per day usage. (See text.)

[b] In the ase of stored water which may be released as needed an average figure is used reflecting consumption characteristics over time. For the June-Oct. period the consumption for the Grants Pass Water Department users averaged approximately 150% of normal (375 gallons per capita day). See Brown and Caldwell, 1974. 375 gallons per capita day is also used to project serviceable population from the Sexton project.

*See Water Rights in Water Resources chapter.

The dam would also provide recreation, fish enhancement, and some flood control and irrigation. Construction is dependent upon development of a favorable definite plan report by the Bureau of Reclamation. At this time, there seems to be little chance of such a development. Investigation is, however, continuing on a reduced scale.

Other storage projects have also been proposed. At the request of the County Commissioners, the Army Corps of Engineers and Bureau of Reclamation identified potential dam and reservoir sites in Josephine County. A map of these is shown on the following page.

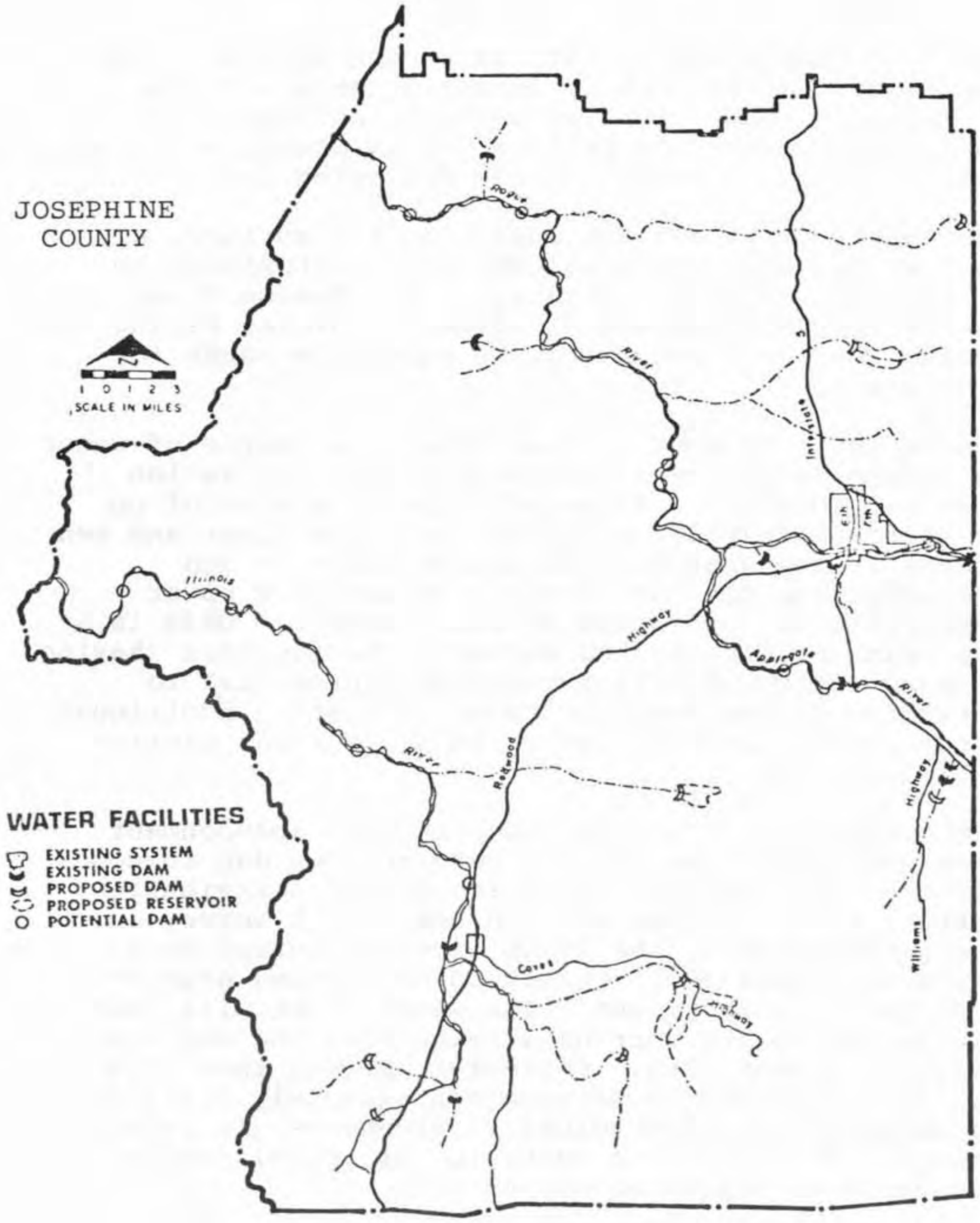
The Sucker Creek project would, on the surface, appear to have the most potential due to its proximity to 1) the city of Cave Junction, 2) the Oregon Caves tourist attraction, and 3) potential nickel mining production which could require extensive water for processing.

The largest and most readily available source of water in Josephine County is the Grants Pass Irrigation District (GPID). GPID permits the diversion of up to approximately 200 cfs from the Rogue River and ten creeks in the area for irrigation purposes and secondly, for the use of up to 845 cfs for power generation and operation of fish ladders. GPID is now being studied by the Bureau of Reclamation (having primary responsibility for Savage Rapids Dam) to determine 1) the feasibility of irrigating additional lands, and 2) needs relative to the current distribution system.

Recommendations from the study suggest abandonment of a portion of the present service area due to conditions of finance, deterioration of the distribution system, and reduction of land served. A survey is being conducted by the State Water Resources Board which will ultimately result in GPID being granted a perfected water right. The water right will probably correspond to the current service area and not the original permit area. Estimates project that GPID will be certified as serving approximately 7,500 acres as compared to the original 18,000 acres (in 1916); this would result in a reduction of the allowable diversion to approximately 65 cfs.

Oregon laws (545.110 to 545.144) with certain stipulations (540.510 to 540.530) allow an irrigation district to sell water to suppliers of domestic water (including a municipality) as a means of producing revenue for the district. The District does not, however, have the right to sell that water until it obtains a perfected water right. The possibility of

MAP PF - 12


JOSEPHINE
COUNTY
N
1 0 1 2 3
SCALE IN MILES
WATER FACILITIES
EXISTING SYSTEM
EXISTING DAM
PROPOSED DAM
PROPOSED RESERVOIR
POTENTIAL DAM
Rogue
River
Illinois
Highway
Applegate
River
Redwood
River
Interstate
Highway
Williams
Caves
Highway

supplying water to Grants Pass has been entertained in the past but did not meet with the approval of the GPID Board of Directors. The potential variability of the amount of water to be granted under the 1916 right leaves several questions unanswerable at this time.

ALTERNATIVES FOR WATER PROVISIONS

Utilization of water can be accomplished to accommodate a variety of uses which would 1) be economically feasible/desirable, 2) promote energy conservation, and 3) promote efficient land use practices. Thus, properties which are located away from urban centers could potentially enjoy many of the benefits of urbanization without sacrificing their rural environment.

GROUND AND RAIN WATER

As previously discussed, community water systems (utilizing well water) are in operation throughout the County, the majority being located within the Grants Pass urban growth boundary. These systems are not, however, restricted to urbanizing areas.

Community water systems in moderate to good water areas could be potentially beneficial in situations where homes or commercial enterprises are clustered. Depending on the number of users, a total of 250 to 500 gallons per "community unit" is desirable according to the County Watermaster. This would be accomplished by drilling a number of wells to insure the required flow. If the amount of ground water available is limited, the use of surface storage tanks may be utilized. Again, the size of the storage unit would depend on the number of users.

There are, however, several considerations regarding community water systems including potential requirements for a chlorination system, and dual back-up generators for any type of commercial (water-sale) supply system.

For the individual home or a small cluster of homes or businesses, cisterns may prove to be a viable source of water, or at least a method of augmenting the existing supply.

By properly placing/developing catchment systems a considerable amount of rain water can be retained for household use. If questionable groundwater is available, two separate plumbing systems could be developed, one for sanitation and one for consumption.

At present the only regulation on such a system would be the plumbing codes.

DAMS AND RESERVOIRS

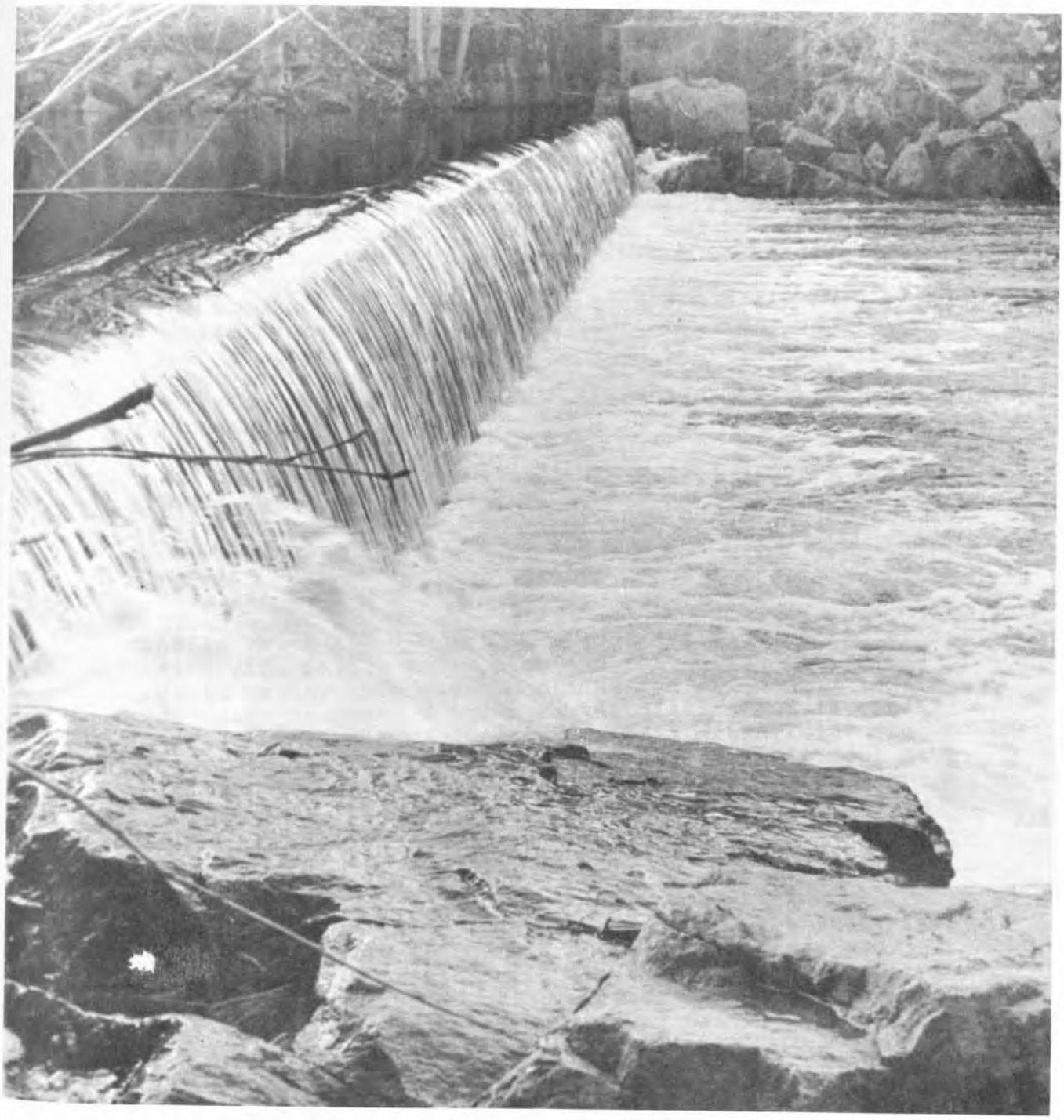
As shown in the water section, there are a number of creeks in the Rogue River basin which would have a flow adequate to fill a catchment area. This means that a community could build a low earthen dam.

The construction of an earthen dam in the County is authorized by the County Watermaster. If the dam is more than ten feet high, holds more than 3,000,000 gallons or will contain more than 9.2 acre feet, then a licensed engineer must design it. But anything less than these amounts can be designed in conjunction with the Watermaster's Office. For the construction of an earthen dam the preferable slope is 3:1 upstream and 2:1 downstream. A variety of materials are acceptable for the foundation, especially with the lower dams.

Prior to the development of a dam, a number of concerns should be considered including liability constraints. Who would pay for construction and how would such costs be amortized? How would dispersement be made and monitored? Who would maintain the dam or pay for repairs if a rupture occurred? And more seriously, who would be liable for damages caused if a rupture occurred or water supplies dwindled?

Another important consideration is that of environmental impact. One off-setting approach is that of maintaining the original stream course and diverting what is needed for storage while maintaining enough flow for wildlife.

A third consideration is that of water rights below the proposed site. Here again, the Watermaster is the local authority. If all factors can be accommodated, obviously a small dam site could provide a source of domestic water for a community that existed in a poor ground water area. Based on Table PF-3, a non-recharged 3,000,000 gallon water supply system could serve a community of approximately 100 individuals.



SMALL DAM LOCATED ON WILLIAMS CREEK

WASTE DISPOSAL

SUBSURFACE SEWAGE DISPOSAL

At the present time, sewage disposal in Josephine County is achieved basically through two methods: sub-surface sewage disposal (septic) systems and public sewage collection and treatment systems. With the approval in 1979, by the Department of Environmental Quality (DEQ), of the use of sand filter systems, septic capabilities in Josephine County have been greatly enhanced.

The majority of non-urban county areas are served by septic systems. All areas cannot, however, be served due to limitations imposed by high watertable, insufficient soils above the bedrock, slopes greater than 25%, lot size and soil type/composition and its associated permeability.

The best soils for domestic septic tank systems are those which are well drained, have moderate permeability, and gentle slope. Also, soils should not be subject to flooding, highwater table, and ponding nor should they overlie open, gravelly material which would allow contamination of ground water.

Soils which are dry and have good drainage characteristics will permit absorption and filtration of the organic matter suspended in discharged effluent. This drainage process is known as percolation and is essential to the proper functioning of a drainfield. In order to insure effective treatment, the soil must have a moderate drainage rate--too slow and the effluent may rise to the surface and too fast the unfiltered effluent may enter underground water sources or seep into streams and rivers. In either case, the potential for contamination is severe.

In general, soils in Josephine County have characteristics which allow drainfield operations. There are, however, soil limitations in vast areas of the county. Therefore, each proposed subsurface sewage disposal site must be considered on an individual basis.

First of all, there are geological and topographical considerations. A vast majority of the area in Josepine

County is composed of very steep and rugged terrain which is highly unsuitable for septic tank operations. Not only is the slope too great, but the depth of the soil is too shallow along with the underlying bedrock to even permit construction, let alone operation of a system. As a result, any area containing 25% or greater slope has been assigned a septic tank limitation of very severe. Alternative systems are in the process of being approved in Josephine County, thus enabling many of these acres to be developed with a sewage disposal system. However, these systems are very expensive.

The lower valley areas have less severe limitations. Here the soil characteristics themselves--texture, structure, shrink-swell potential, permeability, etc.--are generally more conducive to proper drainage rates that insure effective treatment. There are, however, problems in some areas with high watertables and winter surface water.

A critical consideration in septic tank operation is development density. With the exception of steep terrain, high watertable, bedrock and floodplain areas, a septic tank system, if properly designed and constructed, can be made to function adequately in most soils. Problems result when development densities become too great for the soil to accommodate the resulting effluent discharges. For example, a few homes scattered about a new subdivision on one acre lots may operate very effectively with individual drain fields. However, when the subdivision becomes fully developed with homes on every adjacent lot, the soil may become saturated with unfiltered effluent which could eventually surface and/or contaminate wells and other groundwater sources. The result is a potentially dangerous health situation. (Concepts discussed in the first two pages have been adapted from Stevens, Thompson, and Runyan, 1971 as modified by Environmental Health Services, 1979).

The subsurface sewage disposal program is monitored by the County's Environmental Health Division as sanctioned by the State Department of Quality (per statutory regulations, effective 1974). This program, in effect, placed more stringent controls on installation of subsurface sewage disposal systems and lowered the potential for malfunctioning systems. Statistics for the inspection of septic sites, since 1974, indicate a 75-80 percent approval rate for installation of systems.

In areas where conventional systems may not be feasible, alternative and/or experimental systems may be utilized.

The experimental systems program began on a non-funded basis in late 1975 with funding supplied by the legislature in 1977. Presently, there are 148 permits for

11 experimental systems in Oregon. Three (3) experimental systems are presently approved for operation in Josephine County.

Experimental systems are principally of the following types: seepage trenches, gray water trenches used in conjunction with non-site discharge toilets, evapotranspiration systems, sand and rock filters, mounds, and low pressure distribution systems. Studies on these systems are anticipated to be concluded during 1979-82 (if climatic conditions do not place constraints or stress on the study time allotted). In 1979 the DEQ approved the sand filter system for use.

Some of these systems are potentially available for Josephine County; all are alternatives. Other alternative systems presently utilized in the County are holding tanks, polishing pond (lagoons) and irrigation. (Pete Pescador, County Soil Scientist, 1979).

AREAS OF LIMITED SEPTIC AVAILABILITY

There are several areas within the County that are experiencing higher than average denial rates for septic installation. These areas could require sewage collection facilities in the future if: 1) growth rates continue, 2) development exceeds limits of individual disposal systems, and 3) public desires for increased development.

Merlin and Colonial Valley: One major area approaching its growth limit relative to the land's capacity to handle wastes from individual septic tanks is the Colonial Valley area where a higher than average denial rate is found. It is estimated by Environmental Health Service that if this area was constructed to peak capacity (as zoned-1978) approximately one third of the septic systems would be failing.

A preliminary study has been done for this area by Marquess and Marquess (1976) outlining possible disposal systems and the problems which exist. It is thereby assumed that future development of any magnitude will require a treatment plant. Growth projections for the Merlin-Colonial Valley area by Stevens, Thompson and Runyan (1972) forecast a population of near 4,000 by the year 1990, a 60 percent increase over the 1974 estimate of 2,500.

Residents in Colonial Valley have recently indicated their reluctance towards installation of public sewer until such time as it is necessary for health and safety (Merlin Urban Growth Boundary meeting, 1979).

Wolf Creek: At its current level of development, Wolf Creek does not appear to have many disposal problems. Commercial development pressures could, however, occur in the Wolf Creek area leading to a saturation of septic tank capabilities.

Until plans for expanded commercial development are considered, estimates of potential waste quantities and land holding capacity would be premature. Obviously, future needs would, in part, be determined by demands of commercial facilities.

Rogue River Highway: Much of the area east of the Harbeck-Fruitdale District along Rogue River Highway is zoned for one-acre minimum lot sizes. There are also some areas of commercial, industrial and urban density zoning. Development is scattered throughout the area and some septic problems have recently occurred. Good soils are found in much of the area but drainage problems have been encountered, compounded by the use of flood irrigation. As development continues, there will be a much higher risk of polluting the groundwater with septic effluent. (Environmental Health Service, 1979.)

Highline Irrigation Canal: Several areas south of the Highline Irrigation Canal are experiencing septic problems due to the granitic nature of the soils and water seepage from the canal. This would include Crestview and Harper Loops, Skyway and Skycrest roads. This problem is further complicated by existing small lot development. According to Environmental Health Services, this area is definitely a potential sewer area.

High Water Table: There are several other areas in the County where, due to alluvial soils and their relatively high watertable and permeability, development could potentially be restricted to larger lots. These include areas in the Upper/Lower River Road loop area, the alluvial valley areas of the Williams Creek, Applegate River (about three miles southeast of Murphy), Deer Creek, Sucker Creek, and portions of the following: East Fork of the Illinois River near Takilma, Althouse Creek and West Fork of the Illinois River near O'Brien, Kerby and various areas between these two towns.

Small Lot Size: During the 1900's, several townsites and/or subdivisions were platted. Lots in these areas were legally partitioned and can be constructed upon. Problems, however, occur when there is physically not

TABLE WD-2

EXISTING SEWAGE COLLECTION SYSTEMS

	Base Population	(Date)	Design Population	Acres Served	Maximum* Population
Grants Pass	9,300	(1972)	27,000***	5,010	51,200**
Harbeck/Fruitdale Service District	3,700	(1972)	9,900	2,700	15,400
Redwood Sanitary Sewer Service District	1,650	(1975)	15-16,000	1,560	15-16,000
Cave Junction	330	(1964)	700	340	no estimate
Fleming Jr. High School-	330	(1972)E.R.	500		
Riviera Mobile Home Pk					
Illinois Valley H.S.					
North Valley H.S.					
Hidden Valley H.S.					

E.R. (Equivalent Residential) - a residential population serveable by the treatment facility.

*Estimate of the holding capacity of an area if fully developed at current zoning.

**Includes the Harbeck/Fruitdale District which is served by the Grants Pass treatment facility.

and Cave Junction. The remaining three systems serve unincorporated suburb areas adjacent to Grants Pass--these are the Fruitdale/Harbeck area to the southeast, the Redwood area to the southwest and Riveria Mobile Home Park to the southwest (Map WD-3). Lines have been extended to the majority of the service area but no further extensions are planned until public need and demand are established.

GRANTS PASS AND FRUITDALE/HARBECK SEWER

The treatment facility serving the City of Grants Pass and the Harbeck and Fruitdale area is designed to serve a residential equivalent of 27,000. The population of Grants Pass-Fruitdale-Harbeck service area was identified as being approximately 34% of the County population in 1972 (Stevens, Thompson and Runyan, 1972). Using these two figures, it is calculated that the plant will be at capacity when the County population reaches 79,000. Assuming a population of 82,000 in the year 2000, a 79,000 population will occur approximately by the year 1995. This does not, however, take into consideration the possibility of greater development occurring in the Grants Pass-Fruitdale-Harbeck area in proportion to county-wide development. The possibility of a waste-producing industry (such as a food processing plant) locating in the service area could also significantly impact the time allotted for the plant to reach capacity. In other words, the plant could optimally reach capacity in 1995 or it could reach capacity much sooner--possibly within the next 5 to 10 years.

REDWOOD SEWER

As shown on the service area map, the Redwood district is divided into two sections. Construction of service lines and a sewage treatment plant to handle the eastern area has been completed.

The Redwood Sewer was initially proposed for construction in 1966 due to the higher than average septic failure in this area and its associated health hazard. Construction was begun in the spring of 1977 and completed in the summer of 1978 with a total project cost of approximately

$4 million. County residents in the area were charged for only about 17.5% of the total cost of this project. The majority of the funding came from state (12.5% or $550,000) and Federal (52.5% or $2.1 million) sources.

Federal funds were provided through an Environmental Protection Agency grant. Approval by EPA was based on three factors. The proposed sewer system was:

1. designed to handle an existing health problem,
2. designed to handle densities as defined by the existing 1972 Comprehensive Plan,
3. NOT designed to promote development.

Development in the Redwood Area is, therefore, limited. The existing sewage collector lines pose a hydraulic limit of approximately nine people per acre which would translate to a maximum population of 15-16,000 in the originally proposed service area. The population density can be increased beyond the nine people per acre figure in areas already serviced if additional service extensions are not made. (Note: Hydraulic capacity of line is fixed and cannot be increased.) The present service area can be urbanized, only if service extensions into the substantial portions of Phase II are foregone.

The capacity of the treatment plant is designed to accommodate a peak flow rate of 1.44 million gallons of effluent a day. (A peak day flow rate is generally 2.5-3 times average treatment flow for a day.) At present, the plant treats approximately .20 million gallons, on the average, per day. This would appear to provide sufficient capacity for development of this area.

TABLE WD-3

REDWOOD TREATMENT PLAN CAPACITY

	Present	Maximum
Average Daily Flow	.20 MGD	.48 MGD
Daily Flow	.60 MGD	1.44 MGD
Population	1,600	4,000

When viewing the figures above, it becomes obvious that the present population in the area can multiply by a factor of approximately 2.5 (from 1,600 to 4,800) prior to enlargement of the existing treatment facility.

Construction of the sewer and establishment of a tentative Urban Growth Boundary, has promoted a desire for immediate development of the area. Based on growth projections and population percentage in the area, this could potentially necessitate:

1. enlargement of the plant in the near future,
2. limitation of development per year to a specific percentage growth rate
3. a moratorium until addition to the facilities can be funded and constructed.

Being forced into these choices cannot be delegated to any specific source other than engineering requirements of a sewage treatment facility--a treatment plant can operate efficiently only within certain parameters. (A certain amount of effluent flow is required for a particular plant size.)

To summarize, complete construction of the Redwood Sewer District would require additional funds in future years to facilitate development to increased population levels.

CAVE JUNCTION

Currently, facilities serving the city of Cave Junction are near capacity. Construction of additional sewage treatment facilities is underway with completion of Phase I expected late 1979. Based on updates of the population projections (Stevens, Thompson and Runyan, 1972). Phase I is estimated to accommodate the city until 1980-1987. This date could be further expanded to past the year 2000 if the golf course can be used for spraying of treated effluent.

DISPOSAL LIMITATION

Within the county, the Rogue River is the only watercourse which can receive treated effluent on a year-round basis. The State-Wide Water Quality Management Plan of the Department of Environmental Quality contains guidelines for all streams and tributaries of the Rogue River. The parameters established in this plan

require effluent discharges to be sufficiently treated to meet high quality standards. During low flow periods most streams and tributaries do not have sufficient flow to dilute effluents to the extent of meeting water quality standards. In most cases it is less costly to hold effluent in ponds during low flow periods or use the effluent for land irrigation as a means of disposal than to provide extra treatment required to meet quality standards.

The impact of striving to achieve acceptable water quality can be shown in several areas of the County by examining measures taken to limit effluent discharge into streams with insufficent flows. Three County Unit schools are affected by discharge limitations. As noted, the two new high schools discharge no effluents to any stream. Fleming Jr. High School does not discharege effluent between June 1 and October 31 under the conditions of its permit for operation of sewage lagoons. The city of Cave Junction does not discharge effluent into the Illinois River between June 1 and October 31. Recent contact with the Department of Environmental Quality indicates that all tributary streams in the County, including the Illinois and Applegate Rivers and Jump Off Joe Creek, would have disposal limitations as described above.

It is possible that the Applegate Dam (under construction) will provide enough water through conservation releases during low flow periods to increase the capacity of the stream to carry treated effluent. Whether this will actually make a difference for the Applegate-Murphy area will depend on the impact made by the reservoir once completed. Increases in the amount of effluent discharged into the Rogue River from new systems or expansion of existing plants will be dependent on improvements in the treatment of the effluent. In other words, it appears that a level has been reached such that sewage treatment facilties will need to become more efficient than they are now. Also, means other than discharge into watercourses will have to be pursued for eliminating wastes in many parts of the county (e.g. effluent disposal through land irrigation).

SOLID WASTE DISPOSAL

By definition, solid wastes are any materials in a solid or semi-solid form which are thrown away or discharged into the environment. This would include all wastes from households, construction, farm use and public sewage treatment. The following chart describes the various types of solid waste that must be contended with.

TABLE WD - 4

CLASSIFICATION OF SOLID WASTE

Kind	Composition	Sources
Garbage	Wastes from preparation, cooking and serving of food; market wastes; wastes from handling, storage and sale of produce	Households, Restaurants markets, food processing
Rubbish	Combustible: paper, catrons, boxes, barrels, wood, excelsior, tree and yard trimmings, wood furniture, bedding dunnage; noncombustible: metals, tin cans, metal furniture, dirt, glass, crockery, minerals	Households, restaurants, institutions, stores, markets
Street Refuse	Sweepings, dirt, leaves, catch basin dirt, contents of litter receptacles	Streets, sidewalks
Dead Animals	Cats, dogs, horses, cows, etc.	Streets, sidewalks
Abandoned Vechiles	Unwanted cars and trucks left on public property	Alleys, vacant lots
Industrial Wastes	Food processing wastes, boiler house cinders, lumber scraps, shavings	Factories, power plants
Demolition Wastes	Lumber, pipes, bricks, masonry and other construction materials from razed buildings and other structures	Demolition sites to be used for new buildings, renewal projects, expressways
Construction Wastes	Scrap lumber, pipe, other construction materials	New construction
Special Wastes	Hazardous solids and liquids; explosives, pathological wastes, radioactive wastes, feed lots	Households, hotels, hospitals, institutions, stores, industry dairy farms
Animal and Agricultural Wastes	Crops, animals	Farms, feed lots
Sewage Treatment Residue	Solids from coarse screenings and from grit chambers; septic tank sludge	Sewage treatment plants, septic tanks

SOURCE: Refuse Collection Practice, Third Edition, America Public Work Association, 1966, p 15.

In 1974, the firm of Stevens, Thompson and Runyan identified waste factors in five specific sections of the county. The study shows that the county had to contend with an average of approximately three ponds of household and commercial (mixed) waste per capita per day, totalling approximately 168,000 pounds of waste per day in 1973. When demolition and industrial wastes were also included, the average amount of waste per capita per day increased to 4.5 pounds, totalling approximately 252,000 pounds per day for the county as a whole.

MAP WD-5

SERVICE AND ANALYSIS DISTRICTS, JOSEPHINE COUNTY

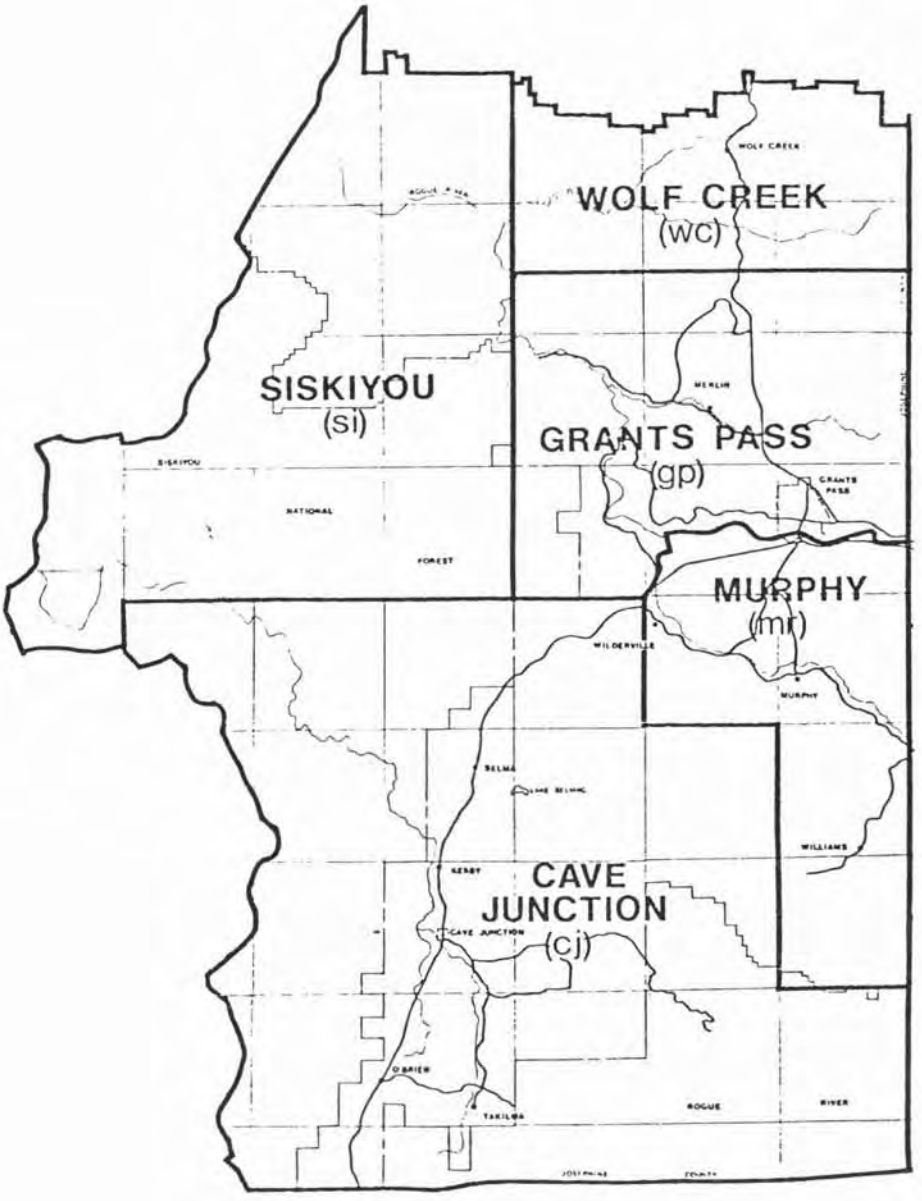


TABLE WD-6

SOLID WASTE LOCATIONS IN JOSEPHINE COUNTY

Service District	Est. 1973 Population	Mixed LBS/CAP/DAY	%	Demolition LBS/CAP/DAY	%	Industrial LBS/CAP/DAY	%	Total LBS/CAP/DAY
Cave Junction	4,500	3.0	71	0.7	17	0.5	12	4.2
Grants Pass	20,400	3.5	59	0.5	8	2.0	33	6.0
Murphy	14,800	2.1	81	0.3	12	0.2	7	2.6
Siskiyou	-0-	0	0	0	0	0	0	0
Wolf Creek	800	3.0	100	0	0	0	0	3.0

SOURCE: Stevens, Thompson, and Runyan, Solid Waste Management Plan - Josephine County, 1975.

Table WD-6 indicates two basic situations within the County. The first is that the rural sections of the County produce mostly household and commercial wastes. Conversely, urban areas (with their supportive services) are often sites of industrial development and therefore produce more wood, industrial, and demolition wastes. The second trend is that rural residents introduce smaller quantities of wastes per day into public disposal systems as rural areas provide greater opportunities for backyard burning, and composting, (and to a lesser degree backyard burial of wastes, which is not a permitted practice).

At present, the majority of waste collection in Josephine County is performed by two commercial sanitary service companies. Both the city and county have contracted with either one or both of these companies. Grants Pass Sanitation Service serves the city of Grants Pass and much of the immediately surrounding area. Pat's Sanitary Service serves large portions of rural Josephine County and portions of Jackson County as well.

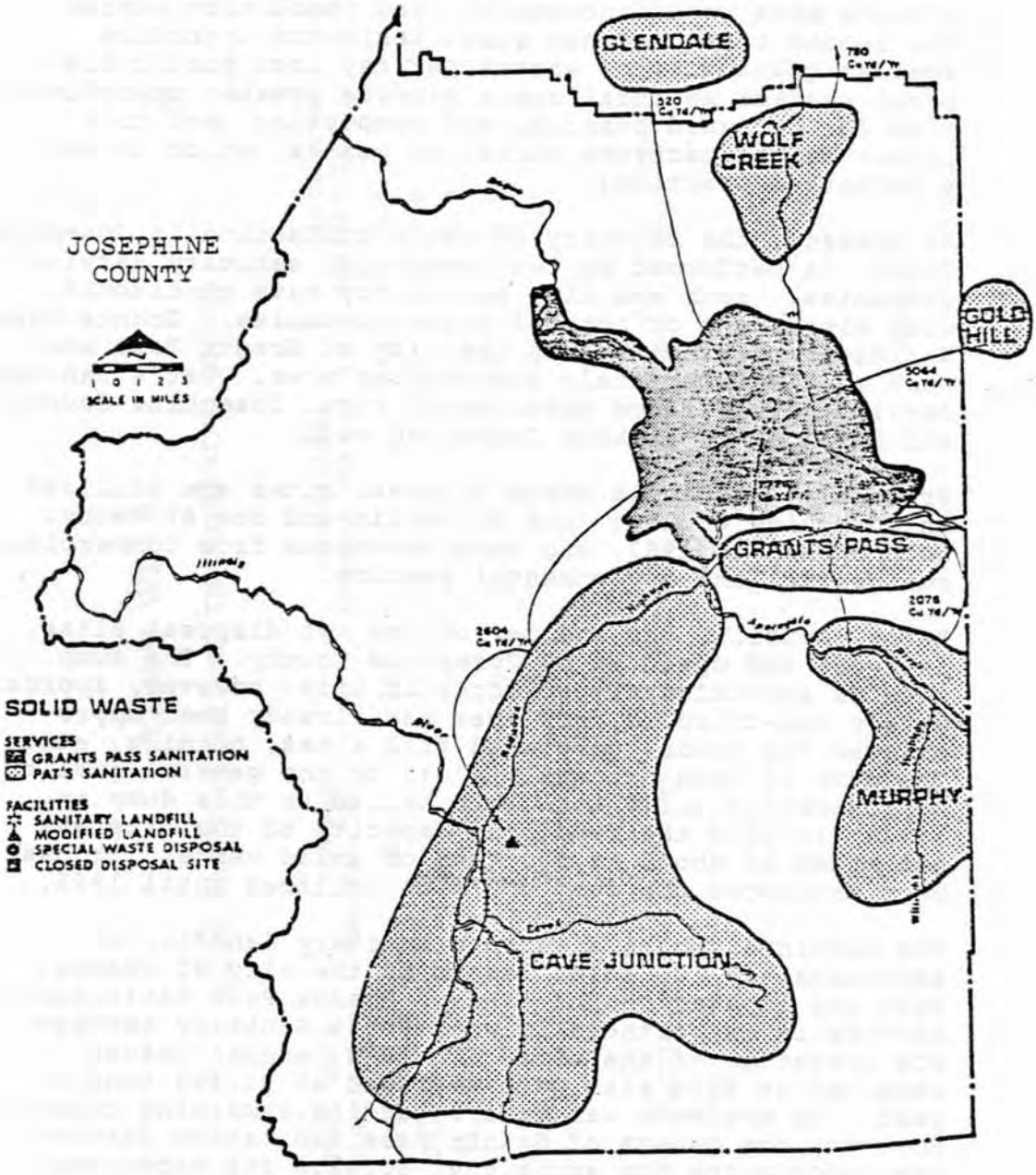
Presently, two solid waste disposal sites are utilized in Josephine County: one at Merlin and one at Kerby. Both opened in 1967, and receive wastes from commercial, residential and governmental sectors.

Kerby landfill, the smaller of the two disposal sites, is owned and operated by Josephine County. The dump site is approximately 80 acres in size; however, approximately one-third of this area has already been appropriated for roads, completed fill sites, burning, etc. The dump is used primarily (70%) by the general public. Approximately 3,190 tons were hauled to this dump in 1973. In 1974 the remaining capacity of the site was estimated at about 18,000 tons of solid waste. It has been estimated the dump could be utilized until 1995.

The Merlin disposal site is a sanitary landfill of approximately 100 acres leased by the city of Grants Pass and located on BLM lands. Grants Pass Sanitation Service is in partnership with Pat's Sanitary Service for operation of the site. In 1973, annual wastes received at this site were averaged at 31,400 tons a year. No estimate was made regarding remaining capacity. However, the owners of Grants Pass Sanitation Service are negotiating for additional acreage for expansion towards the south and west.

Two closed disposal sites are located in the County. These are the Marlsan site (east of the existing Marlsan sludge lagoons, north of Grants Pass) and the Foothill Boulevard site (about two miles east of Grants Pass). These were closed in 1966 and 1962 respectively.

MAP WD-7



T/YR = Tons per Year
CY/YR = Cubic Yard Per Year

SOURCE: Stevens, Thompson, and Runyan; Solid Waste Management Plan - Josephine County, 1975.

TABLE WD-8

JOSEPHINE COUNTY SOLID WASTE SITES

Site	Type	Limitations
Kerby Landfill	Modified Land Fill	Receives no production-process wood residues, oil, sewage-sludge, industrial or hazardous wastes. Receives limited amounts of bulk wastes.
Merlin Sanitary Landfill	Sanitary Landfill	No auto bodies or sludge
Marlsan Sludge Lagoons	Septic Sludge Disposal	Receives only sludge
Airport Industrial Sludge Lagoons	Glue Waste Disposal	Receives only glue waste
Rogue Valley Recycling, Inc.	Resource Recovery	Financial resources for expansion of services

Two sludge lagoons are located in Josehine County, both in the North Valley area. The Marlsan Lagoons are used for disposal of septic tank sludge and consist of four ponds--two for reception of raw sludge and two for liquid discharge and evaporation. Apparently, odor and seepage of liquids have not posed any problems to date. The digested sludge is then land spread with the Department of Environmental Quality approval.

The Airport Glue Ponds consist of two acres adjacent (on the northwest side) to the Merlin Airport runway. These ponds receive industrial glue residues. This site is proposed to be phased out by 1980-81 as producers of this waste will be recycling it on an in-plant basis.

A few private sites for industrial waste disposal are located in Josephine County. These are, however, small in size (storage tank to a quarter of an acre) and are considered to have a negligible impact.

Bulky wastes are primarily processed by private commercial companies in the form of junk, auto wrecking and recycling yards which are scattered throughout the County. Recycling of metals, cardboard, etc. from the Merlin Disposal Site is franchised to Rogue Valley Recycling Incorporated by the city of Grants Pass. The facility is located on five acres immediately adjacent to the Merlin site. Recycling of goods from the Kerby dump site is also contracted.

RECYCLING

The 1975, Solid Waste Management Plan addresses the issue of recycling by proposing development of a Regional Resource Recovery Center (RRRC). The center is proposed to be used and managed jointly by Jackson and Josephine counties. If the RRRC becomes a reality, the existing disposal sites at Kerby and Merlin will become transfer sites. Additional sites would be located at south Grants Pass and potentially at Murphy. Development of an RRRC is dependent upon: 1) a sufficent base population and disposal amount, 2) economic consideration, 3) community need, desire for recycling and (potentially) 4) coordination with Jackson County.

The potential for reuse of materials generated from this process has been estimated by STR (1972) based on their population projections. It should, however, be noted that new projections have been generated which

could potentially generate more materials than are estimated in Table WD-9.

TABLE WD-9

RESOURCE GENERATION INVENTORY
JOSEPHINE COUNTY TOTAL, LBS/DAY

Item	1973	1978	1983	1993
Paper	59,192	82,858	122,873	220,570
Newsprint	11,838	16,572	24,574	44,114
Cardboard	11,838	16,572	24,574	44,114
Other Paper	35,515	49,715	73,724	132,342
Glass	8,287	11,600	17,202	30,880
Metals	10,655	14,914	22,117	39,703
Ferrous Metal	8,287	11,600	17,202	30,880
Nonferrous Metal	2,368	3,314	4,915	8,823
Tires	1,065	1,491	2,212	3,970
Autos	7,799	9.911	12,749	16,379
White Goods	1,366	1,700	2,186	2,808
Organics	37,883	53,029	21,195	27,232

SOURCE: STR, Solid Waste Management Plan, 1972.

Presently, low level recyclable resource collection is occurring at two main locations in Josephine County. These are: 1) the Grants Pass Boy's Club which collects glass containers, newspapers, paper bags and used motor oil, and 2) the Adult Retarded Activity Center Which collects newspapers, cardboard and aluminum.

Collection sites for used motor oil are also located in various sites throughout the county. Recycling of the oil would produce a project that could be reused as either new oil or road surfacing oil mat.

Incentives for recycling are a main concern regarding public acceptance of compliance with resource recovery. Various alternatives could be considered such as remuneration in the form of money or products, reduction of existing collection costs, deposit--return system, and financial benefits to the community at large through an RRRC.

Recycling of wood products residue could result in power/heat generation for the Rogue Valley (see chapter on Energy: Biomass). Various opportunities for economically viable recycling do exist. A study of realistic developments could be beneficial to the county in terms

of financial gain and concern for the livability of the County.

A twenty-year Solid Waste Management Plan for Josephine County was completed in 1975 by Stevens, Thompson and Runyan. This reviewed the current solid waste situation in the County with an analysis of future capacities relative to projected needs. Several recommendations were made regarding present and future management of solid waste in Josephine County. A number of these were incorporated into the County Commissioners' 1975 Resolution of Preliminary Adoption of the Josephine County Solid Waste Management Plan.

STORM DRAINAGE

Currently, there are no storm drainage systems outside the Grants Pass city limits. A storm drain study is being conducted by the Josephine County Public Works Department.

TRANSPORTATION

In a rural area such as Josephine County the main modes of transit for goods and people are auto, truck or rail. This demonstrates a need for adequate road and rail systems to efficiently and safely move people and goods.

ROAD SYSTEMS

Roads in Josephine County are under the jurisdiction of city, county, state and federal governmental agencies. The Federal and State Departments of Transportation, working in cooperation, maintain Interstate 5 Freeway. The State Department of Transportation maintains Highways 99, 199, 238, 46 Riverbanks Road, Lower River Road, Sixth and Seventh Streets"E" and "F" Streets east Sixth Street, and "G" Street. The County and City road departments work in cooperation in and near the Grants Pass City Limits, with the County agency administering the remaining roads in Josephine County.

SOUTHBOUND CAVEMAN BRIDGE

TABLE T-1

JOSEPHINE COUNTY ROADS IN GRANTS PASS CITY LIMITS

Name	Miles	From	To
Beverly Drive	0.21	Beacon Drive	Terrace Drive
Hillcrest Drive	0.15	Sunset Lane	Terrace Drive
Roseana Drive	0.12	Beacon Drive	Hillcrest Drive
Sunset Lane	0.08	Terrace Drive	City Limits
Terrace Drive	0.34	Beacon Drive	Sunset Lane
Burns Avenue	0.09	Valley View Drive	North line Subdivision
Butler Avenue	0.09	Valley View Drive	North line Subdivision
Candler Avenue	0.09	Valley View Drive	North line Subdivision
Eunice Avenue	0.09	Valley View Drive	North line Subdivision
Valley View Drive	0.25	Highland Avenue	West line Subdivision
Oakdale Drive	0.16	East Scenic Drive	East line Subdivision
Scenic Drive, E & W	0.43	200' West of Scoville Road at City Limits	(Around Loop) East Scenic Drive
East "D" Street	0.28	McLearn Drive	City Limits
Fairview Avenue	0.28	McLearn Drive	City Limits
Foothill Boulevard	0.14	Royal Drive	City Limits
Terry Lane	0.22	N.E. "D" Street	E & F Couplet Section
Hawthorne Avenue	0.78	Midland Avenue	Interstate Freeway 5
Lawnridge Avenue	0.12	Midland Avenue	Loughridge Avenue
Loughridge Avenue	0.10	Hawthorne Avenue	Washington Boulevard
Washington Boulevard	0.49	Midland Avenue	Morgan Lane
West Park Street	0.30	South Sixth Street	City Limits
Short Street	0.18	West Park Street	North end Short Street
Lewis Avenue	0.17	South Sixth Street	West end Lewis Avenue
Cherry Lane	0.17	Rogue Drive	East end at City Limits
Tussey Lane	0.17	West Park Street	Redwood Highway
Marion Lane	0.23	Tussey Lane	Redwood Highway
Piedmont Avenue	0.19	N.E. "A" Street	City Limits
Oregon Avenue	0.11	N.E. "A" Street	Sleepy Hollow Avenue
Sleepy Hollow Avenue	0.05	West line Subdivision	East line Subdivision
North Park Street	0.08	Acacia Lane	West end North Park Street
Acacia Lane	0.03	East Park Street	North Park Street
Highland Avenue	0.50	Midland Avenue	North City Limits
Hillcrest Drive	0.50	Hawthorne Avenue	N.E. Ninth Street
Morgan Lane	0.44	Highland Avenue	Vine Street
East Morgan Lane	0.11	North Seventh Street	City Limits
Ninth Street	0.08	Hillcrest Drive	South 430 Feet
Pleasant View Drive	0.25	Highland Avenue	West End Pleasant View Drive
Scoville Road	0.35	Interstate Freeway 5	North City Limits
Union Avenue	0.13	Williams Highway	West to City Limits
East "A" Street	0.20	Beacon Drive	Royal Drive
Beacon Drive	0.75	Madrone Street	Roseanna Drive
"N" Street	0.02	McLearn Drive	East to City Limits
"M" Street	0.02	Section Line (20 & 21)	East to City Limits
Rogue Drive (E & S)	0.24	Portola Drive	East end Rogue Drive
East Park Street	0.28	Vista Drive	East to City Limits
Portola Drive	0.50	Rogue Drive	East to City Limits
Park Street ("A" St. Extension)	0.10	Royal Drive	Laurel Drive
Greenfield Road	0.28	Scoville Road	East to City Limits
Ridge Road	0.12	Beacon Drive	S.E. to City Limits
"A" Street	0.70	Eighth Street	Beacon Drive
Foundry Street	0.30	Fry Street	"G" Street
"G" Street (1884)	0.59	Foundry Street	Skunk Creek
"G" Street (1889)	0.25	West City Limits	1320 Feet East
"M" Street	0.45	Skunk Creek	Milbank Street
"N" Street	0.25	Section Line (20 & 21)	West 1320 Feet
TOTAL MILES	13.60		

TABLE T-2

COUNTY ROADS MAINTAINED BY JOSEPHINE COUNTY

Name	Mileage	Name	Mileage
	DISTRICT 1		
Beecher Road	0.35	Lower Grave Creek Road	11.90
Bloom Road	0.25	Lower Wolf Creek Road	6.00
Bridge Lane (Mackin Gulch)	2.60	Main Street, Wolf Creek	0.50
Brimstone Road	0.98	Mobil Way	0.09
Carrie Street	0.10	Old Stage Road	0.70
Coyote Creek Road	5.40	Placer Road	4.40
Dog Creek Road	0.30	Railroad Avenue	1.00
Edgewood Road	0.50	Speaker Road (Upper Wolf Creek)	6.80
Frontage Road	0.56	Sunny Valley Loop	3.40
Leland Road	3.67	Warner Road	1.00
	DISTRICT 2		
Abegg Road	2.50	Leonard Street	0.15
Acorn Street	0.31	Lincoln Road	0.25
Agness Avenue	0.40	Lloyd Drive	0.53
Ament Road	1.40	"M" Street, S.E.	0.13
April Drive	0.67	Marlsan Road	0.25
Artlin Road	0.25	McLearn Road	0.25
Aurora Avenue	0.15	Meadow Lark Drive	0.24
Averill Drive	1.30	Merlin Avenue	0.21
Azalea Drive	6.25	Merlin Landfill Road	0.30
Barbara Drive	0.58	Merlin Sanitarium Road	0.50
Barker Drive	0.75	Merlin-Galice Road	18.64
Beacon Drive	0.13	Mina Lane	0.26
Becklin Drive	0.24	Monterico Road	0.58
Bowhill Road	0.07	Monument Drive	6.00
Boyer Road	0.55	Nelson Way	0.51
Brett Way	0.38	Ninth Street, N.E.	0.12
Bridge Street, West	0.25	Northwood Drive	0.25
Brookside Boulevard	1.03	Oakmont Drive	0.38
California Avenue	0.40	October Lane	0.24
Camp Joy Road	1.80	Opal Lane	0.50
Carter Drive	0.37	Orchard Street	0.06
Carton Way	0.62	Ort Lane	0.80
Cathedral Way	0.20	Oxyoke Road	1.70
Chaparral Drive	0.18	Palomino Drive	0.75
Cienaga Lane	1 30	Pavillain Drive	0.28
Cindy Lane	0.06	Pearce Park Road	1.08
Colonial Drive	0.50	Peco Road	0.45
Connie Lane	0.40	Pesterfield Place	0.10
Crossbow Lane	0.10	Pickett Creek Road	1.71
Crow Road	0.90	Pickett Creek Road, West	0.80
"D" Street, N.E.	0.13	Pine Crest Drive	2.65
Debrick Way	0.25	Pleasant Valley Road	2.80
Dellwood Drive	0.17	Plumtree Lane	1.27
Denver Avenue	0.34	Polaris Circle	0.16
Donaldson Road	1.90	Portola Drive	0.35
Doncen Lane	0.50	Quail Lane	0.20
Donet Lane	0.39	Rainbow Drive	0.51
Dustin Way	0.13	Rancho Vista Drive	0.57
Echo Way	0.22	Ray Drive	0.56
Enterprise Avenue	0.30	Red Fox Lane	0.11
Eric Loop	0.36	Red Mountain Drive	0.30
Ewe Creek Road	1.90	Robertson Bridge Road	3.00
Fairview Avenue	0.21	Rogue Rim Drive	0.06
Favill Lane	0.15	Roguelea Lane	0.50
Favill Road	0.15	Rolling Hills Drive	0.23
Ferry Road	1.55	Russell Road	2.30
Flaming Road	0.70	Rustic Canyon Drive	0.09
Foothill Boulevard	4.61	San Francisco Street	0.66
Gary Lane	0.18	Saratoga Way	1.73
Gladiola Avenue	0.10	Scenic Drive	0.53
Glen Drive	0.50	Scoville Road	0.10
Grange Road	0.10	Shannon Lane	0.25
Granite Hill Road	4.60	Shetland Drive	0.34
Greenfield Road	0.25	Soldier Creek Road	1.60
Grouse Creek Road	0.80	Spring Street	0.25
Gun Club Road	1.09	Stardust Circle	0.14
Gunnell Road	2.00	Stewart Road	0.20
Guth Road	0.10	Stratton Street	0.16
Hampden Road	0.18	Sunbeam Circle	0.10
Hansen Drive	0.23	Surrey Drive	0.32
Harley Lane	0.09	Susan Lane	0.10
Harris Road	0.05	Sycamore Drive	0.21

TABLE T-2, CONTINUED

Hassis Drive	0.41	Tavis Drive	0.10
Hieglen Loop Road	0.24	Taylor Creek Road	1.44
Highland Avenue	1.13	Templin Avenue	0.40
Hillcrest Drive	0.52	Tenth Street, N.E.	0.25
Hitching Post Road	0.66	Terry Lane	0.08
Horseshoe Drive	0.90	Thornbrook Drive	0.67
Hugo Road	7.35	Thornridge Lane	0.23
Hunt Lane	0.70	Three Pines Road	1.75
Jones Creek Loop, East	0.10	Timber Lane	0.83
Jones Creek Road, East	1.65	Tunnel Loop Road	2.70
Jones Creek Road, West	2.50	Upper River Road	4.80
Josephine Street	0.13	Vertical Drive	0.27
Jump-Off-Joe Creek Road	5.40	Ward Road	0.25
Karen Drive	0.08	Webster Road	0.50
Keeta Way	0.19	Wildflower Drive	0.81
Kilborn Drive	0.40	Wilma Lane	0.10
Kimberly Way	0.28	Wilson Street	0.28
Lathrop Lane	0.36	Winona Road	3.83
Lathrop Road	0.52	Woodbrook Drive	0.25
Laubach Lane	0.10		

DISTRICT 3

Adeline Drive	0.15	Lonnon Road	0.80
Alexander Lane	0.09	Macnew Lane	0.10
Allen Creek Road	1.00	Maple Lane	0.15
Allenwood Drive	0.12	Marcy Loop	2.35
Almar Road	0.25	Mayfair Lane	0.19
Ann Roy Drive	0.26	Mayfield Drive	0.17
Annabelle Lane	0.30	Medart Lane	0.20
Applegate Avenue	1.63	Mesman Drive	0.25
Arnold Avenue	0.25	Midway Avenue	2.93
Bailey Drive	0.30	Minnow Lane	0.53
Ben Aire Circle	0.23	Missouri Flat Road	1.10
Bluebell Lane	0.17	Monroe Way	0.17
Board Shanty Road	1.35	Montgomery Lane	0.09
Bolt View Lane	0.20	Moonbeam Lane	0.19
Boundary Lane	0.15	Morris Lane	0.45
Boundary Road	0.60	Moss Lane	0.12
Brandy Lane	0.09	Mountain View Place	0.20
Bristow Road	0.25	Mount Baldy Road	0.20
Brooke Lane	0.27	Murphy Creek Road	4.10
Buena Vista Lane	0.12	Murphy Lane	0.35
Bull Creek Road	1.39	Nebraska Avenue	0.10
Bushnell Way	0.28	Neila Lane	0.12
Campus View Drive	0.65	Neill Road	0.40
Canaan Street	0.16	New Hope Road	6.40
Candlelight Lane	0.06	North Applegate Road	6.60
Canyon Drive	0.15	Nottingham Way	0.05
Carnahan Drive	0.20	Ojai Avenue	0.25
Carrollwood Drive	0.46	Omaha Drive	0.08
Century Circle	0.03	Pardee Lane	0.17
Cheney Creek	3.32	Park Street, East	0.99
Cheslock Road	0.50	Park Street, West	0.53
Chinook Park Lane	0.20	Parkdale Circle	0.03
Clara Avenue	0.15	Parkdale Drive	0.53
Cloverlawn Drive	5.30	Patrick Road	0.36
Coed Place	0.11	Pauldine Way	0.16
College Drive	0.45	Pearl Drive	0.28
Conestoga Drive	0.09	Penny Lane	0.50
Coutant Lane	0.50	Playford Lane	0.20
Crestview Loop	0.60	Plummer Avenue	0.20
Crystal Drive	0.62	Ponderosa Lane	0.50
Cullison Road	0.25	Poplar Drive	0.07
Daisy Lane	0.20	Prairie Lane	0.28
Darneille Lane	0.50	Pyle Drive	0.87
Dawn Allen Drive	0.27	Raydean Drive	0.20
Dawn Drive	0.04	Red Spur Drive	0.17
DeWoody Lane	0.15	Redlands Drive	0.70
Demaray Drive	3.67	Redwood Avenue	5.57
Detrick Drive	0.91	Redwood Circle	0.25
Devon Drive	0.07	Regina Way	0.35
Dexter Way	0.29	Ringuette Street	0.20
Dolores Drive	0.07	River Heights Way	0.10
Douglas Drive	0.33	River Lane	0.05
Dowell Road	1.00	Robert Avenue	0.10
Drury Lane	0.40	Robinson Road	0.86
Dutcher Creek Road	1.10	Rogue Mannor	0.06

TABLE T-2, CONTINUED

Edgewater Drive	0.20	Rosewood Street	0.30
Elaine Drvie	0.07	Rossier Lane	0.31
Elk Lane	1.50	Round Prairie Creek Road	0.43
Elliott Creek Road	0.11	Rounds Avenue	0.75
Elrod Lane	0.05	Ruby Drive	0.28
Espey Road	0.30	Sand Creek Road	0.90
Evergreen Avenue	0.05	Saradan Lane	0.09
Fairgrounds Road	0.20	Schroeder Lane	0.45
Firview Lane	0.42	Schutzwohl Lane	0.25
Fish Hatchery Park Road	0.05	Shady Lane	0.20
Fish Hatchery Road	6.55	Sherwood Lane	0.05
Florence Lane	0.25	Sky Crest Drive	0.75
Frankham Road	0.64	Sky Way	0.90
Fruitdale Drive	2.40	Slate Creek Road	2.00
Gaffney Way	0.30	Sleepy Hollow Loop	2.20
Garden Terrace Road	0.10	Sloan Mountain Lane	0.25
Glenwood Street	0.40	Smokey Lane	0.22
Gordon Way	0.40	South Park Drive	0.10
Gordon Way South	0.30	South River Road	0.98
Grandview Avenue	1.00	South Side Road	4.45
Grays Creek Road	1.35	South Union Road	0.35
Greens Creek Road	1.13	Southgate Way	0.60
Griffin Road	0.70	Stanford Way	0.20
Hamilton Lane	2.75	Stringer Gap Road	2.60
Harbeck Road	1.01	Summit Loop	1.75
Harbeck Road, West	0.96	Sun Gio Drive	0.10
Harper Loop	0.51	Sunny Circle	0.03
Hartley Lane	0.25	Sunset Way	0.25
Havilland Drive	0.34	Swarthout Circle	0.16
Hayes Hill	2.10	Swarthout Drive	0.03
Helgeson Lane	0.38	Teel Lane	0.25
Helm Road	0.80	Thomas Terrace	0.17
Hessar Street	0.25	Tipton Road	0.10
Hidden Valley Road	0.55	Towne Street	0.30
Hill Top Drive	0.10	Triller Lane	0.30
Hillview Drive	0.38	Troll View Drive	0.50
Homewood Road	0.30	Turtle Lane	0.16
Honeylynn Lane	0.20	Twilight Lane	0.06
Hubbard Lane	1.10	Union Avenue	0.67
Humberd Lane	0.35	Verna Lane	0.25
Ingalls Lane	1.18	Village Lane	0.22
Intervale Road, East	0.70	Virginia Lane	0.04
Jason Way	0.05	Walker Road	1.20
Jaynes Drive	1.43	Walnut Avenue	0.40
Jenkins Avenue	0.65	Waters Creek Road	1.80
Jerome Prairie Road	3.68	Watson Drive	0.10
Johnson Drive	0.35	Westwood Drive	0.28
Karral Drive	0.10	Wetherbee Drive	0.50
Keldan Lane	0.09	Whispering Pines Road	0.17
Kubli Road	1.15	Whiteridge Road	0.15
Lappland Drive	0.32	Willow Lane	0.50
Larkin Road	0.14	Wineteer Lane	0.28
Laurel Avenue	0.90	Wolf Lane	0.50
Leonard Road	3.70	Woodland Park Road	1.27
Limpy Creek Road	1.75	Woodrow Way	0.13
Linda Lee Lane	0.23	Woodside Street	0.22
Linda Vista Road	0.34	Worden Way	0.09
Little Lane	0.10	Wylie Lane	0.05

DISTRICT 4

Browns Road	0.70	Panther Gulch Road	1.10
Cave Camp Road	2.25	Pine Tree Drive	0.50
Cedar Flat Road	4.25	Powell Creek Road	1.80
Davidson Road	0.50	Tetherow Road	1.00
East Fork Road	5.10	Thompson Creek Road	4.70
Fields Road	0.20	Water Gap Road	5.10
Kincaid Road	2.50	Williams Highway	6.29
Messinger Road	1.00		

DISTRICT 5

Airport Drive	2.40	Kirkham Road	0.81
Althouse Creek Road	2.30	Krauss Lane	0.70
Blascerdena Drive	0.33	Lake Shore Drive	6.25
Bonanza Drive	0.09	Laurel Road	2.23
Bridgeview-Takilma Road	8.30	Lone Mountain Road	2.20

TABLE T-2, CONTINUED

Burch Drive (Old Highway 99)	0.25	Martin Road	0.58
Crooks Creek Road	2.90	Maureen Drive	0.27
Deer Creek Road	5.61	McMullin Creek Road	0.89
Dick George Road	5.40	Messinger Road	2.30
Draper Valley Road	2.90	Norman Road	0.45
Dryden Road	0.50	O'Brien Road	0.90
Eight Dollar Mountain Road	1.30	Old Highway 199	0.35
Finch Road	0.82	Old Stage Road, South	1.90
Garner Road	0.91	Parker Lane	0.70
Gene BrownRoad	1.30	Patton Bar Road	0.25
Glendon Road	0.09	Pinewood Way	0.55
Happy Camp Road	12.50	Pugetville Road	0.22
Harlow Way	0.14	Reeves Creek Road	4.91
Hayes Cut-Off Road	1.00	River Street	0.50
Hogue Drive	1.00	Robinson Road	1.40
Holland Loop Road	7.80	Rockydale Road	6.50
Holton Creek Road	0.50	Smith-Sawyer Road	0.65
Idlewild Drive	0.99	South Shore Road	0.37
Illinois River Road	2.55	Thompson Creek Road	3.00
Jackadel Lane	0.50	Turner Road	0.24
Kendall Road	1.71	Waldo Road	4.77
Kerby Mainline	1.10	Warren Road	0.50
Kerby Street	0.13	West Side or Seats Road	6.25
		White School House Road	2.45

District 1	50.50
District 2	152.29
District 3	155.31
District 4	36.99
District 5	118.98
TOTAL	514.06

SOURCE: Josephine County Road Department, 1978.

Management by several agencies with differing standards requires close consideration in regard to development of both a road system and adjoining lands.

In August, 1977, the County adopted "Standards and Specifications for Design and Construction of County Roads". In addition to providing standards, this document has incorporated a road classification system similar to the one developed by the Federal Highway Administration.

TABLE T-3

RURAL ROAD STANDARDS

	LIMITED RESIDENTIAL	RESIDENTIAL	LOCAL	MINOR COLLECTORS	MAJOR COLLECTORS
Design Speed Minimum	20 mph	20 mph	30 mph	45 mph	50 mph
Recommended	25 mph	25 mph	40 mph	50 mph	55 mph
Lane Width Minimum	11 feet	11 feet	11 feet	12 feet	12 feet
Recommended	- -	- -	12 feet	12 feet	12 feet
Surface Type	oil mat	oil mat	oil mat - AC	oil mat - AC	AC
Degree of Curve Maximum	57°	57°	20°	10°	8°
Recommended	40°	40°	12°	8°	6°
Stop Sight Distance Minimum	175 feet	175 feet	200 feet	315 feet	350 feet
Recommended	200 feet	200 feet	250 feet	350 feet	415 feet
Grade Maximum	15%	15%	12%	10%	8%
Shoulder Width	- -	2 feet	4 feet	6 feet	8 feet
Shoulder Surface	gravel	gravel	oil mat - AC	oil mat - AC	AC
Structure Width	28 feet	30 feet	32 feet	36 feet	40 feet
Vertical Clearance	16½ feet	16½ feet	16½ feet	16½ feet	16½ feet
Load Design (Structure)	HS 20 - 44	HS 20 - 44	HS 20 - 44	HS 20 - 44	HS 20 - 44
Applicable Specifications	O.S.H.D.	O.S.H.D.	O.S.H.D.	O.S.H.D.	O.S.H.D.
R/W Width Minimum	50 feet	50 feet	60 feet	60 feet	60 feet

SOURCE: Josephine County "Standards and Specifications for Design and Construction of County Roads, 1977".

TABLE T-4

URBAN STREET STANDARD

	LOCAL	COLLECTORS
Design Speed Minimum	25 mph	40 mph
Recommended	30 mph	50 mph
Lane Width Minimum	12 feet	12 feet
Paving Width Curb-Curb	36 feet	44 feet
Surface Type	curb, gutter & paving	curb, gutter & paving
Degree of Curve Maximum	57°	12°
Recommended	40°	8°
Stopping Sight Distance Minimum	200 feet	300 feet
Grade Maximum	15%	10%
Shoulder Width	6 feet	10 feet
Shoulder Surface	paved & concrete	paved & concrete
Structure Width	30 feet surface	36 feet surface
Vertical Clearance Minimum	16½ feet	16½ feet
Land Design (Structure)	HS 20-44	HS 20-44
Applicable Specifications	O.S.H.D.	O.S.H.D.
R/W Width Minimum	50 feet	60 feet

SOURCE: Ibid.

In rural areas this includes major and minor collector roads, local roads, residential and limited residential roads. For urban areas this would involve collector and local streets. The basic definitive difference between the two road types is that urban roads serve areas with sanitary sewer where lots are one acre in size or less and rural roads serve those areas not served by sanitary sewer and lots are one acre or larger. Specific definitions and requirements are delineated in the County's road standards document.

FUNDING AND PROJECTS

The decision-making process behind most public road projects is based on a variety of factors in addition to funding through return of tax funds. (County road funds are based on National Forest timber receipts. 25% of the receipts are delegated to local governments, with 75% of this amount to be used for roads and 25% for schools.

Because funds are limited, the primary thrust of the State is preservation of existing facilities. On state projects, the Resident Engineer must first consider available funding and prioritize need, based on a number of considerations such as traffic volume, current condition, probable growth of surrounding area, accident rate, availability of labor, and the season. The County Road Department is faced with the same funding limitations and consideration of need when maintaining county systems. Often a given road project is passed by because of greater funding flexibility for another project in the County.

At the present time, the one major project proposed in Josephine County is a series of collectors (Map T-5) to serve the Fruitdale-Harbeck-Jerome Prairie area, connecting Rogue River Highway (at Cloverlawn Drive) and Jaynes Drive. Right-of-way purchases for the project are nearly complete. Objections from adjoining property owners have been expressed to the Board of County Commissioners. The purpose of the system would be to collect residential traffic from the numerous residential streets in the area and to carry the traffic safely to the arterial roads. The system should be designed to service adjoining residential lands. Large portions of the upgrading and construction of this project have either been completed or proposed for completion by the end of 1980.

MAP T-5

This map will depict the location of a proposed series of collector roads within the Grants Pass Urban Growth Boundary. This system of road is being developed by TPM, Inc. Traffic Engineers, in cooperation with city and county staff. A final version is not yet available (3/1/81).

Two new road locations are now in the long-range plans of the County Road Department. One of those, the Lake Selmac Bypass, will relocate the road north of Lake Selmac. The second project will extend Espey and Walker Roads to join each other, making another connection between the Murphy-Williams Highway and Cloverlawn Drive.

Several road improvements are planned for roads in various parts of the County. These improvements will be to upgrade the quality of existing roads. These are delineated in the following table:

TABLE T-6

JOSEPHINE COUNTY ROAD DEPARTMENT

PROPOSED ROAD CONSTRUCTION PROJECTS
(Subject Yearly to Change)

1979-1980 Budget Year (proposed)

Contract Services Roads

Grandview Avenue from Sky Way to Cloverlawn Drive to urban standard, 3600 feet.

Demaray Drive from Woodland Park Road to Helm Road to major collector standard, 4000 feet.

Deer Creek Road from Dryden Road to Lake Shore Drive to local road standard, 1.42 miles.

"N" Street, Gladiola, Portola, Shannon. Review for railroad crossing to provide an alternate crossing to Shannon Lane.

1981-1982 Budget Year (Proposed)

Pleasant Valley Road

Amend Road from Foothill Boulevard to "N" Street.

Overland Drive from Rogue River Highway to Cloverlawn Drive.

Alternates: Cloverlawn Drive - Extend urban standard south to Highline Canal.

1982-1983 Budget Year (Proposed)

Cloverlawn Drive from Hamilton Lane to Jaynes Drive.

Penny Lane from Jaynes Drive to New Hope Road.

Happy Camp Road from Four-Corners to U.S.F.S.

1983-1984 Budget Year (Proposed)

Redwood Avenue from Allen Creek Road to Dowell Road.

Holland Loop Road from Caves Highway to Sucker Creek Bridge.

Ferry Road from Lower River Road to Boar Landing.

Hillcrest Drive from Ninth Street to Beacon Drive.

1984-1985 Budget Year (Proposed)

Redwood Avenue from Dowell Road to Darneille Lane.

Hugo Road from Three Pines Road south for one mile.

Cloverlawn Drive from Highline Canal to Overland Drive.

1985-1988 Budget Years (Proposed)

Fourth Bridge approaches.

New Hope Road from Lonnon Road to Intervale Road.

Pleasant Valley Road from Harris Creek Bridge to Monument Drive.

Hubbard Lane from Redwood Avenue to Leonard Road.

SOURCE: Josephine County Road Department, 1977.

BRIDGES

One of the most serious transportation problems in the County is the lack of crossings over the Rogue River, which essentially divides Josephine County in half. Whereas the City of Grants Pass is immediately north of the River, much development has recently occurred south of the River. Further, the proposed urban growth boundary envelops considerable (potentially urbanizable) acreage on either side of the River.

The third bridge proposal has received widespread attention for at least the last ten years. In June of 1978, the State Department of Transportation held public hearings from which emerged a selection of one of two alternatives (1 and 1-A, Map T-7) for eventual construction of a third bridge.

In its Draft Environmental Impact Statement for the Grants Pass Third Bridge, the Oregon Department of Transportation's primary impacts were identified as follows:

"In the short run, a new bridge in Grants Pass would contribute only minimally to population growth in the urban area.

This highway project would increase regional and local accessibility, an increase in the number of linkages between these areas. This project would effectively serve as a bypass for through traffic eliminating it from the central business district. Reduced congestion downtown would allow safer and more convenient access for routine trips to and from the downtown area.

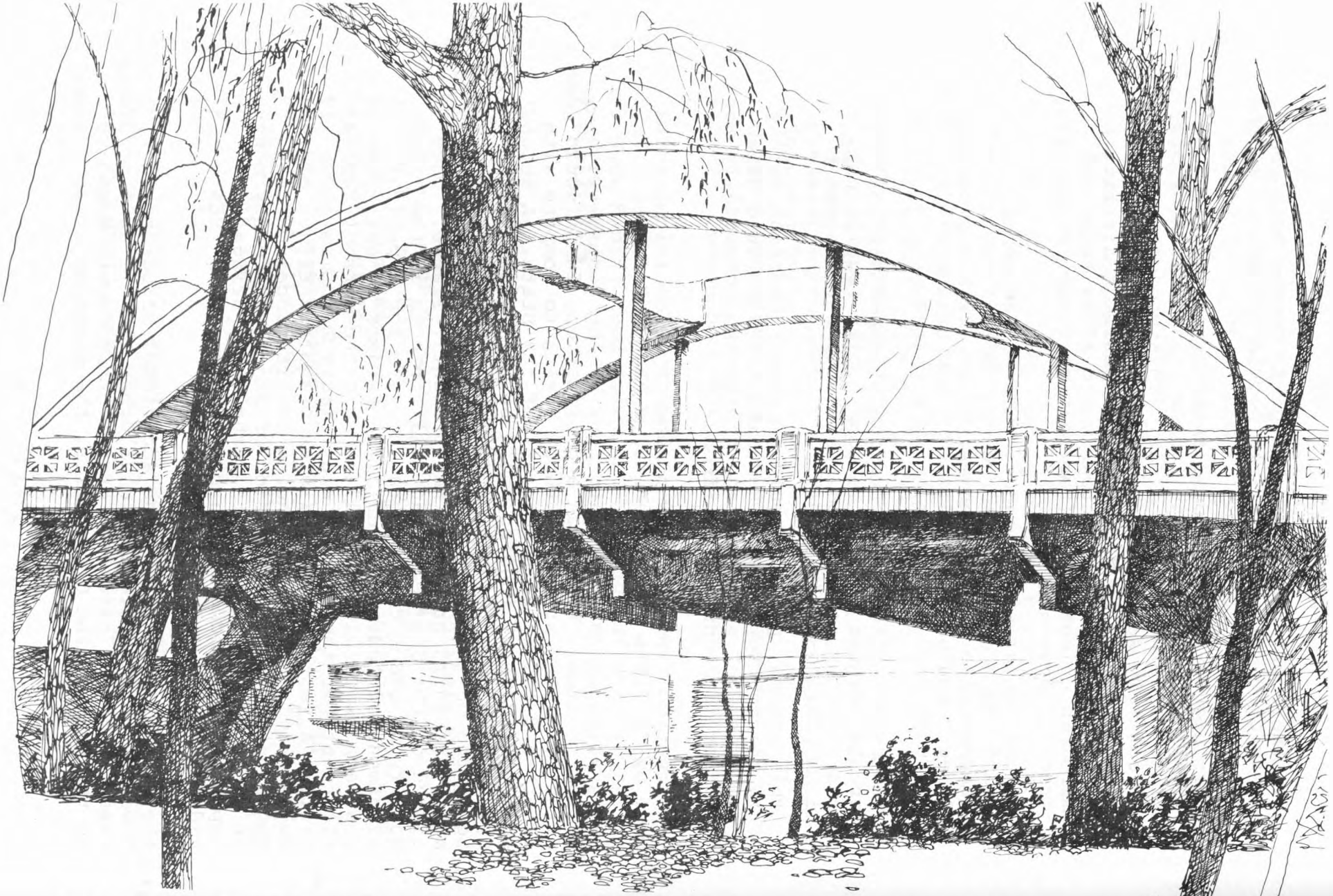
Of particular significance would be the beneficial change in access for emergency vehicles, which now compete with traffic congestion on Sixth and Seventh Streets and on the bridges. A new bridge would provide an additional route for these services.

The construction and operation of a new highway would create adverse impacts on some public facilities, institutions, parks, and residences not exposed to a busy highway...

This highway project would improve pedestrian safety in the downtown area. Reducing traffic would allow safer use of sidewalks and crosswalks, especially for senior citizens and children..."

Construction funds are now dependent on decisions to be made by Congress or the Federal Highway Administration or the State. The project has twice been turned down for designation as an Interstate Spur by the Federal Highway Administration. With such a designation, funds would come directly to the project without having to compete with other road programs in the rest of the State. A second source of Federal funding would be the Federal Aid Primary System. To obtain funds through this program, a project must be listed on the Six-Year Plan of the State Highway Department--the Third Bridge is not presently listed. Once listed on the Six-Year Plan, all projects in the State qualifying under this program compete for a periodic allotment of Federal funds. The project is estimated to cost approximately $6 million, and the current Federal allotment for the Federal Aid Primary System is about $10 million a year for the State as a whole. Either of these two sources of Federal funding require local matching funds, normally a combination of State and County money. In other words, at this stage the Third Bridge is dependent upon some action being taken at the State and Federal levels.

The construction of the one additional bridge may not, however, be adequate for local urban traffic east of Grants Pass. With the extension of the Urban Growth Boundary to the west of the City Limits, the question of access to



SOUTHBOUND BRIDGE BUILT IN 1931; CANNOT HANDLE CURRENT TRAFFIC VOLUMES.

the Redwood area and west Grants Pass should be considered. The County Road Department in conjunction with input from various other departments, has developed several alternatives for the fourth bridge. Map T-7 shows the proposed alternatives for bridge locations and associated road approaches. The preferred route would be a crossing at Allen Creek, providing direct access to the Redwood Highway and improved access to the County Fairgrounds.

MAP T-7

FOURTH BRIDGE SITES

* proposed 3rd bridge site

* proposed 4th bridge alternative sites

TRANSPORTATION MODES

In rural Oregon the private vehicle has been, and will continue to be the primary source of private transportation. The individual vehicle allows a flexibility of living location, trip timing, and goods transport that cannot be met by any other method.

But with the potential for increased fuel cost and restricted availability, consideration must be given to methods of augmenting the privately-owned vehicle.

Three areas for consideration in the development of transportation systems are the general population, transportation disadvantages, and goods.

For the general population, a taxi service is the most common answer. Currently there is one such service that serves the Grants Pass area. It is licensed by the City, provides service to the airport, and delivers goods.

If, eventually, the demand on this service became too great, consideration may be given to some form of fixed route van or bus system. There is considerable cost in developing such a system though external money to do so is currently available. The real problem comes with maintenance through usage or subsidy. A number of systems in Oregon have failed due to low utilization.

Either the taxi or fixed vehicle system require a certain level and density of population to continue operation. In the County, including Cave Junction, there is not currently a great enough demand to make either system economically feasible. At some point in the future, external factors may force people to look toward one of these methods, or to look toward government subsidy to expand existing systems.

In the publication "Josephine County-Grants Pass: Public Transportation Development Study" (1978), the term "transportation disadvantaged" is defined as:

1. Those who do not own an automobile due to income, or cannot afford to get one repaired.
2. Those who are too old or young to own a vehicle.
3. People with mental of physical handicaps.
4. A family with only one car, and it is taken to one member's work place, leaving the others without a vehicle.
5. People with legal prohibitions on their driving.

For most of these individuals a fixed route bus system would meet their needs. But here, again, the distance between residences becomes a factor. If there is too great a distance between pick-up points and too few riders, the system ceases to be cost-effective and will require supplementary support.

The other issue represented by the "transportation-disadvantaged" is those who are handicapped by physical, mental, or location restrictions. These people will need an "on-call" system that will respond to specific requests. Also, there is the possible need for a lift for wheel chairs. This question has been addressed by the Area Agency on Aging and the City Council, and up to this point, it is not felt that a great enough need exists to justify the expenditure.

A final source of transportation is that of volunteers. However, other than the car-pooling aspect, this is not viable from a total community point of view.

For the 60+ population, the Senior Program does have the Senior Citizen Area Transportation (SCAT), but due to funding and insurance, it does have a restricted ridership.

INTER - CITY TRANSPORTATION

In addition to the need to get from residence to a location, is the need for getting from community to community.

On main roads the bus system provides some service. Locally the two primary systems are Greyhound and Continental Trailways.

Other than these two systems, the means of travel between cities is greatly restricted.

For the transportation of freight there are a number of truck lines. It appears to be easier to have a package delivered than an individual.

Historically, another option for passenger transport was the railroad. Until 1956 the California and Oregon Coast Railroad extended from Grants Pass south to Waters Creek. Originally incorporated as a common carrier, the railroad operated exclusively as a freight line during its declining years. The Siskiyou line of the Southern Pacific Railroad Company was originally the main line between Portland and San Francisco. The line was reduced to a branch service in the 1920's with the construction

of the new main line through Klamath Falls. Passenger service on the Southern Pacific has been discontinued for many years. The line currently operates on a freight only basis providing north and south connections for commodity shipments. Officials of the Southern Pacific Railroad have reported that reinstatement of their passenger service would not be competitive with bus service already available to the community. The present roadbed condition and alignment would not permit high-speed passenger service and equipment and operating costs would be prohibitive.

RAILROAD

Currently Southern Pacific Railroad has through trains that operate seven days a week, labeled the Eastman, once a day to Eugene; Westman, once a day from Eugene; and the Glendale turning, once a day. For each of these runs the load could be increased to three trips a day if the freight volume required it.

In 1978, 11,071 cars originated from Josephine County. The majority of these were loaded with wood products. The majority of inbound goods are dairy products, groceries, furniture, carpets, gas, etc.

One of the general requirements for incoming industrial locations is access to rail shipping facilities. Currently, Rough and Ready, Webco, Murphy, etc. truck to Foundry Street in Grants Pass for shipping. At some point in time, though, this could become prohibitive. Additionally, the amount of available industrial land adjacent to the railroad is extremely limited. An alternative would be to expand the spur lines, but the current estimated cost for this would be $40 to $50 a linear foot, plus $150,000 to $200,000 for a switch.

AIR

Currently two airports serve the County. The primary one, especially in terms of passenger traffic, is in Medford; and the second one is north of Grants Pass. There is also one airstrip located outside of Cave Junction, but it is basically used by the forest service for fire suppression.

The County airport has one 4,000 foot lighted asphaltic concrete runway. There are five storage hangars and a maintenance hangar. Fuel is available for private planes. A connecting air frieght service between Grants Pass and 13 other western Oregon cities provides for shipments of a maximum package size of 2 feet by 2 feet. One flight daily is scheduled and in mid-July, 1979 the firm plans to schedule two flights. The concept is for "door-to-door" service between the 13 participating cities. Charter air service, private business planes, and sport flying are provided for.

At present the State Aeronautics Division estimates that for 1976 there were 65 aircraft based at the County airport. They project that by 1995 this will increase to 133. Additionally, they estimated that there was a 42,900 operation flow at that airport with a projected increase to 97,100 by 1995.

Recently the County has entered into a jointly-funded planning grant for an Airport Master Plan Study with the State and the Federal Aviation Administration. This study, to be conducted by CH_2M-Hill, would:

a. provide a graphic presentation of the development of the airport and of adjacent land use;

b. determine a schedule of priorities and phasing airport development;

c. to gather appropriate information;

d. identify alternatives for future development;

e. to fully lay out impact of the alternatives.

BICYCLE AND FOOTPATHS

In 1971 the Oregon State Legislature provided a source of funding for bikeway and footpaths. This legislative action allows for the State Highway Department, County Road Departments, and the City of Grants Pass (Cave Junction is too small) to expend 1% of their share of the gasoline tax revenue on bikepaths. Since that time, 1972-1978, Josephine County has been allotted $44,293 and the City $12,145.

Generally, there are two types of bikepaths: utility (shopping communities, etc.) and recreation. Though they are not exclusive, the evaluation of the need will be different.

One of the primary emphasis for the expenditure of these funds is the serving of schools. This, to the present, has been the policy of the County with one trail constructed to serve the South Middle School. Also, there is one on River Street, which is located on a County road in Cave Junction.

Additionally, the state has placed at least two paths in connection with new construction. These are parallel to the Redwood Highway, to Rogue Community College, and on the new section of Williams Highway.

The law generally requires that trails be constructed "whenever a highway, road or street is being constructed, reconstructed or relocated." But the qualifiers to this are:

a. where it is contrary to public safety;

b. where cost would be disproportionate to need or probable use; or

c. where sparcity of population or other factors indicate an absence of need.

For both the utility and recreation bike paths the above points must be given careful review and consideration. According to State Highway Division, the cost of putting in a path can range from $1,500 a mile to over $70,000 so available funds do not go far.

The planning of trails should be a community decision, taking in the need for destination, access, convenience and recreational value. Any action taken should be in accordance with an overall bike and footpath plan so that the paths can be eventually developed into a system.

FIRE PROTECTION

It takes approximately one hour for the average house to totally be destroyed by flames*. It takes about twenty minutes for flames to totally destroy a mobile home.* Obviously, these time figures vary with climatic conditions, housing materials, and fire source; but they do give an indication of the importance of time response required in the case of fire occurrance.

Approximately twenty fire stations and/or substations (for structure protection) are located in Josephine County (Map ES-5). These belong to five independent fire districts and/or two privately owned fire companies.

ISO RATING

Fire protection agencies are periodically appraised on the basis of standards established by the Insurance Service Office (ISO), a national agency. The grading schedule is a means of classifying an area with reference to its fire defenses and physical conditions through the use of a point system. A maximum of 5,000 points is available. Points are deleted for inadequacies; therefore, the fewer points, the higher the class rating (i.e.: 5,000 points = Class 1 (best), 0 points = Class 10 (worst)).

The grading schedule now encompases four basic elements which contribute to a community's ability to prevent or reduce loss of life or property from fire. These elements and their relative weight in the overall evaluation are water supply, fire departments, fire service communications, and fire safety control:

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*Consolidated estimates from State Fire Marshal, Grants Pass Fire Department, State Forestry, etc.

TABLE ES-1

ISO RATINGS

RELATIVE VALUES AND MAXIMUM DEFICIENCY POINTS

Feature	Percent	Points
Water Supply	39	1,950
Fire Department	39	1,950
Fire Service Communications	9	450
Fire Safety Control	13	650
	100	5,000

This grading system DOES NOT measure the efficiency, economy, or quality of fire protection services on a daily basis. The grading system DOES evaluate the sufficiency of manpower, facilities, and equipment of a department against standards established by ISO. Consequently, the system should not be used in comparing fire departments except in their ability to prevent an extensive fire (Rogue Valley Council of Governments, 1974). The system was developed primarily to establish uniform insurance rates.

The ISO ratings for Josephine County vary from Class 5 (City of Grants Pass) to Class 10 (unprotected county areas). Specific districts and companies addressed by ISO are further delineated in Table ES-2 and in the following text.

TABLE ES-2

INSURANCE SERVICES OFFICE OF OREGON CLASSIFICATION+

Distrib. Area	Prot. Class	Location	Dwg. Class	Effective Date
OR18	10	Josephine County . . . . (except areas otherwise classified)	10	10-15-74
OR18	5/7	Grants Pass (Inc.), Josephine County	5/7	2-1-64
OR18	9+/9+	Grants Pass Rural Fire Dept., Inc.	9+/9+	4-4-77
		+"Proprietary Fire Department Clause - In consideration of the premium at which this policy is written, it is a condition of this policy that the Named Insured shall maintain a subscription contract with a proprietary fire department providing fire protection service for the insured premises during the term of this policy."		
		FS1 Jenkins & Redwood Highway FS2 Merlin Road & Pleasant Valley Road FS3 South Park Avenue & Redwood Hwy. FS4 Murphy & Williams Highway FS5 Hugo & Tunnel Loop Road		
OR18	7/9	Illinois Valley R.F.P.D., Josephine County		5-3-77
		Cave Junction FS (Hwy. 46, 1 mi. S.E. of City)	7/8*	
		O'Brien FS (Hwy. 199 at O'Brien)	7/8*	
		Selma FS (Hwy. 199 at Selma)	7/8*	
		Holland Lp FS (Holland Lp Rd. & Dick George Rd.)	7/9	
		Dryden FS (Upper Deer Crk Rd. at Dryden)	7/9	
		*response distance 8 miles		
OR18	8/9	Valley Fire Services	8/9	
OR18	9/9	Williams R.F.P.D., Jo. Co.	8/8	8-15-74
	10	Wolf Creek, Josephine Co.**		
	10	Sunny Valley, Josephine Co.**		

Source: Insurance Offices of Oregon, Classification, 1978.

* within eight (8) miles

** as these areas have not recently applied for ISO rating or re-evaluations, they are still considered class 10

\+ definition of categories is in Table ES-5, immediately following

SOURCE: Insurance Services Office of Oregon, Classification 1978.

TABLE ES-2 (CONTINUED)

INSURANCE SERVICES OFFICE OF OREGON CLASSIFICATION+

Definitions:

Protection Class:

The Protection Class column shows the General Protection Classes which apply to all class rated properties other than dwellings in the city or district.

Dwelling Class:

The Dwelling Class column gives the Protection Classes which apply to properties rated under the Dwelling Policy and Homeowners programs.

Distribution Areas:

Information on specifically rated property in the listed community is available in the Distribution Area's published rates or by contacting Insurance Services Office of Oregon.

Special Notes:

1. Except when specifically noted otherwise, where two Protection Classes are indicated (Example: 6/9) apply the following:
   a. The first class shown applies to properties within 500+ feet of a fire hydrant on a 4-inch or larger main++ and within 5 road miles of a responding fire department station+++.
   b. The second class applies to properties located over 500+ feet from a fire hydrant but not over 5 miles from a responding fire department station+++.
   c. Where properties are over 5 but not over 10 miles from a responding fire station, Class 9 applies.
   d. In all other cases Class 10 applies.

   \+ A distance of 1,000 feet is applicable for dwellings.

   ++ When specific water systems are noted, only hydrants supplied by those systems are creditable.

   +++ When Fire Stations are specified, base credit only on response from noted locations. The symbol * indicates the footnoted response distance should be substituted for "5 miles" in statements 1.b. and 1.c.

2. When rule 1.a., 1.b., or 1.c. is applicable, compliance with the fire hydrant and fire department running distances must be indicated on the policy.
3. When response distance from more than one Fire Station would produce differing Protection Classes for a property, use the better class.

The following descriptions have been provided from summary data regarding fire protection Class 8 through Class 10.

CLASS 8:

1. The Fire Department qualifies as a recognized fire department.

2. Areas are within five mile response (road) distance of the closest engine (pumper) company, and within an eight mile distance of the balance of any apparatus units required under A-8(b).

3. For more than one unit of apparatus, all assigned apparatus is radio equipped.

4. For more than one unit of apparatus, there are not less than five men responding on the first alarm.

5. There is additional manpower, as necessary, to meet conditions.

6. At least one unit of apparatus is a pumper constructed and equipped in accordance with the intent of the standards of NFPA No. 19.

7. The department demonstrates a capability to effectively develop and continuously apply water for not less than twenty minutes at a rate of not less than 200 gpm, commencing with the initial evolutions of the first due company.

CLASS 9:

1. Fire department is one that:

   a. receives 4001 to 4500 points of deficiency out of 5000 possible, or receives less than 4001 points but has no water supply.

CLASS 10:

1. Department is one that receives more than 4500 deficiency points; or has no water supply; or has a water supply but no fire department; or has no fire protection.

WATER SUPPLIES

An adequate and reliable water supply is an essential part of fire-fighting services.

In order to be recognized for grading purposes by ISO, a water supply shall be capable of delivering at least 250 gpm for a period of two hours, or 500 gpm for one hour, for fire protection, in addition to consumption at the maximum daily rate. Any water supply which cannot meet this minimum requirement shall not be graded, and a deficiency of 1,950 points shall be assigned.

TABLE ES-3

RECOMMENDED URBAN LEVEL FIRE FLOWS

Area classification	Fire flow, gpm	Duration of flow, hours	Volume of water req'd mg
Residential			
Suburban[a)]	1000	2	0.12
Urban, low density	1000	2	0.12
Urban, medium density[b)]	2500	2	0.30
Urban, high density[c)]	3500	3	0.63
Commercial			
Central business district	4500	4	1.08
Tourist	3000	3	0.54
Limited commercial	3000	3	0.54
Strip commercial	2500	2	0.30
Industrial[d)]	5000	5	1.50
Institutional			
Schools	3500	3	0.63
Hospitals	4500	4	1.08

a) Minimum design flow for study.

b) For a two-story, four-unit, wood frame building.

c) For a three-story, twelve-unit, wood frame building in close proximity to a similar building.

d) For typical mill found in the industrial area.

SOURCE: CH_2M, Grants Pass Water Study, 1979.

A water supply is considered to be adequate if it can deliver the required fire flow for the number of hours specified in the following table (with consumption at the maximum daily rate). If this delivery is possible under certain emergency or unusual conditions, the water supply is also considered to be reliable.

TABLE ES-4

REQUIRED DURATION FOR FIRE FLOW

Required Fire Flow gpm	Required Duration Hours
10,000 and greater	10
9,500	9
9,000	9
8,500	8
8,000	8
7,500	7
7,000	7
6,500	6
6,000	6
5,500	5
5,000	5
4,500	4
4,000	4
3,500	3
3,000	3
2,500 and less	2

Source: Insurance Service Office

Water supply for rural areas is generally limited to water delivered by tankers, natural surface waters such as creeks and ponds, and swimming pools. Specific storage areas, created as additional sources for multi-water uses, could potentially be utilized for fire services. This includes small dams, ponds, and water tanks.

MANPOWER

The majority of (structural) fire fighting service for Josephine County is performed by volunteers. Minimal remuneration is made only to volunteers for Grants Pass Fire Department and Illinois Valley Fire District. Training, inspections, maintenance and public contact programs do not appear to be performed on a scheduled basis by departments other than the aforementioned Grants Pass Fire Department and the Illinois Valley Fire Department. Response time, defined as the time from incoming call to departure of men and equipment, varies for each district or company.

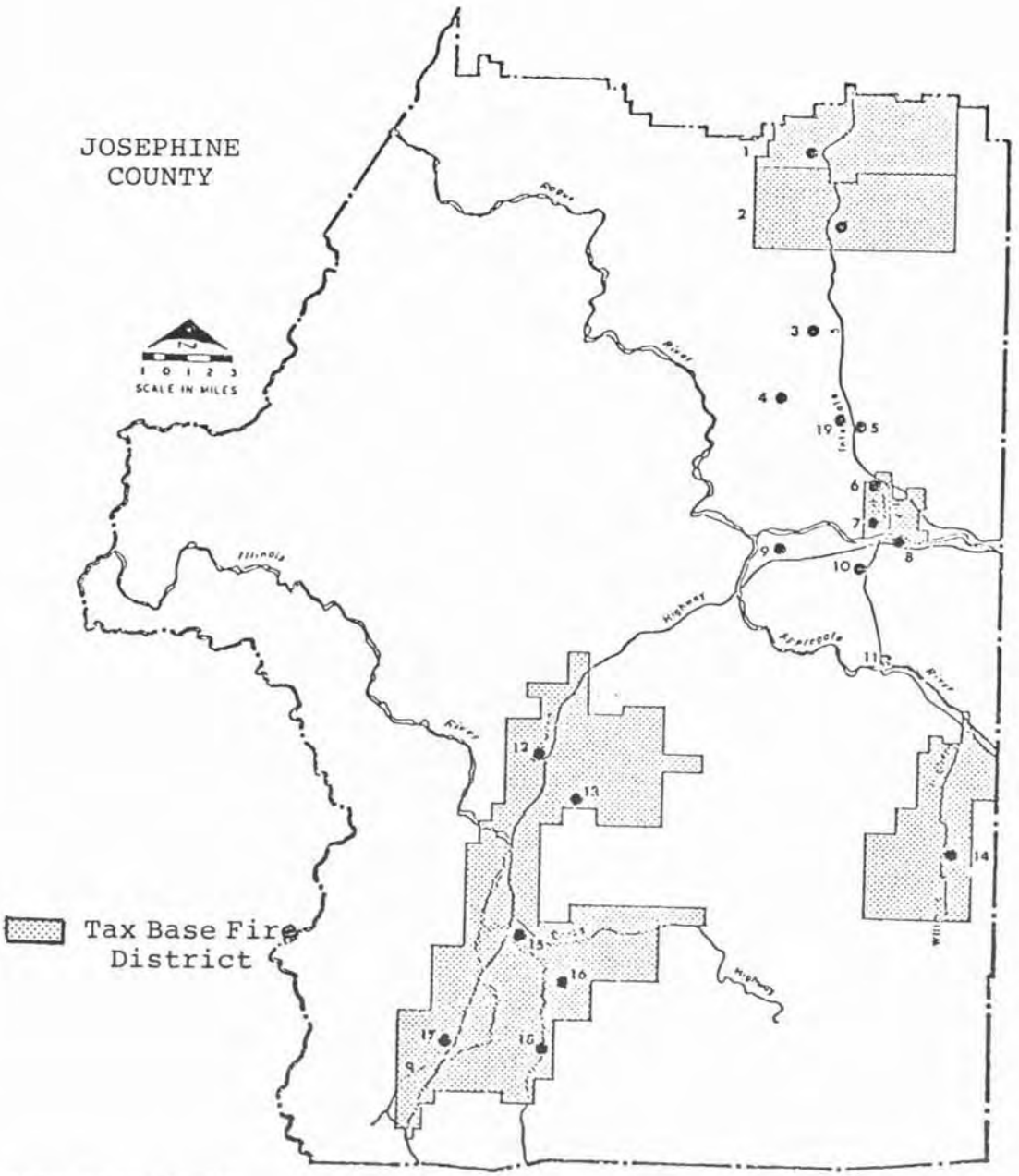
FIRE PROTECTION SERVICE

The City of Grants Pass Fire Department (created in 1965) operates within the city limits of Grants Pass, and also provides service to a few small areas (primarily schools) south of the city limits, that have contractual agreements for fire protection.

This department responds to an average of over 300 fires a year. It's average response time is approximately 1½ minutes. The department presently has two full-time (24 hour) stations in Grants Pass and is staffed by 25 paid workers and 20-35 active volunteers. Approximately 2 hours per day is spent on training and 25% of total time is involved with fire prevention. Services are paid from tax dollars on a basis of $1.78 per $1000 assessed valuation of property within the district boundaries (1978). The ISO code for the city of Grants Pass is Class 5 (Class 6 water system, Class 4 fire department outfitting).

The Illinois Valley Fire District (operational since 1965) covers approximately 131 square miles, extending from north of Selma to south of O'Brien;and includes the City of Cave Junction,and the Dryden, Holland, and Takilma areas. The district is served by one main station in Cave Junction and six substations scattered throughout the district. All seven stations are heated. The main station is staffed by seven paid employees while 35-50 active volunteers man the six substations. Response time for the main station (whose trucks roll on every fire in the district) is 1 to 10 minutes. The

MAP ES-5



FIRE PROTECTION

Wolf Creek Fire District 1
Sunny Valley Fire District 2
Williams Valley Fire District 14
Grants Pass City Fire District
  Hillcrest Station 6
  Main Station 7
Illinois Valley Fire District
  Selma 12
  Dryden 13
  Cave Junction 15
  Holland 16
  O'Brien 17
  Takilma 18
Grants Pass Rural Fire District
  Hugo 3
  Merlin 4
  Colonial Valley 5
  E. Park 8
  Redwood Ave. 9
  Murphy 11
Valley Fire Service 10,19

district is funded through taxes on a basis of $2.09 per $1000 assessed valuation of property within the district (1978).

The ISO rating for the City of Cave Junction is: dwelling, Class 7 within 500 feet of a hydrant; Class 8 if more than 500 feet, but less than 5 miles from a hydrant. This also applies to the majority of the unincorporated areas of the fire district. In addition, these unincorporated areas have a dwelling Class 9 within eight to ten miles of a station. Properties within 10 miles of the Holland or Dryden substaticns are ISO dwelling Class 9.

The Williams Fire District (formed in 1968) covers approximately 37 square miles near the town site of Williams. The fire station is located in Williams. This heated building houses three pumpers and three tankers. One pumper and one tanker remain outdoors. The district is staffed with approximately 45 active volunteers. Average response time is three minutes. Funding is through taxation at a rate of $1.91 per $1000 valuation of property within the district (1978). The ISO code for the district is a dwelling Class 8 with a protection Class 9.

The Wolf Creek Fire District (formed, 1977) encompasses approximately 28 square miles. The station is a heated, concrete building located in Wolf Creek, and is manned by twenty active volunteers. Response time varies according to time of day and number of volunteers available. Funding of the fire district is derived from taxation at a rate of $2.70 per $1000 assessed valuation of property within the district. This money is used primarily for fixed costs such as utilities and insurance. The district has not yet undergone re-evaluation ISO rating.

The Sunny Valley Fire District (formed in 1978) encompasses approximately 34 square miles. It is manned by 10 - 15 active volunteers. No fire station is presently in existence; the pumper is located in the commercial district of Sunny Valley near the interstate exchange. Response time varies. Funding is by taxation at a rate of $1.50 per $1000 assessed valuation. The ISO rating for the district is dwelling Class 10 as no request for ISO evaluation has yet been made by the fire district.

Two private (independently owned) fire companies offer protection to remaining portions of the county on a subscription basis. These are the Grants Pass Rural Fire Department (operational since 1968) and Valley Fire Service (operational since mid 1979).

The Grants Pass Rural Fire Department (GPRFD) has one main station manned by paid workers and active volunteers. This station, located on Redwood Avenue near Redwood Highway, is also used for repair of all GPRFD equipment. The four substations located in Hugo, Merlin, Murphy, and on South Park Street are manned by an unspecified number of active volunteers. Training sessions are not given on a regular schedule. None of the GPRFD stations are heated buildings. The GPRFD does not have a specific district boundary as they respond to reported structure fires in otherwise unprotected, non-district areas. Subscription members are not charged for this service, whereas non-subscription members are billed for protection services rendered. Subscription to the GPRFD is a flat rate of $30.00 per property. The department's subscription properties are rated protection Class 9 for areas within ten road miles of a station.

The Valley Rural Fire Department presently has one main station near the intersection of Murphy and New Hope, which can house 6 personnel. The Department maintains a minimum of three paid personnel and twenty-seven volunteers (reserve). Training is performed on a regular updating schedule with all personnel required to take fire fighting courses. The present station is heated and houses two pumpers and two tankers (3000 gallons each). All equipment is less than a year old. A second station is planned to be located in Merlin in late 1979. Funding is through subscription, the rate being based on $2.50 per $1000 assessed valuation of the specific property.

FIRE QUANTITY AND LOSS

The following table delineates the number of fires experienced by each district or company and the total value loss.

TABLE ES-6

*INCIDENTS AND FIRES BY FIRE DISTRICT

TOTAL TABULATION
FOR THE STATE

(As Reported by Fire Departments and Insurance Adjusters)

Dist. No.	Class No.	District Name	Total Incidents Reported in District	Total Fire Related Incidents	Total Fires Reported	Per Cent of Fires of Dist. Incidents	Per Cent of Total State Fires
1972							
129	5	Grants Pass	284	119	150	52.81	.74
502	9	Grants Pass Rural	238	86	122	51.26	.60
154	8-9	Illinois Valley Rural	111	27	76	68.46	.37
403	9	Williams	10		10	100.00	.04
1973							
129	5	Grants Pass	243	119	115	47.32	.57
502	9	Grants Pass Rural	342	97	185	54.09	.91
154	8-9	Illinois Valley Rural	207	98	107	51.69	.53
403	9	Williams	22	7	14	73.68	.06
1974							
129	5	Grants Pass	288	132	142	49.30	.68
502	9	Grants Pass Rural	204	92	105	51.47	.50
154	8-9	Illinois Valley Rural	259	140	110	42.47	.52
403	9	Williams	29	6	13	44.82	.06

TABLE ES-6 (CONTINUED)

1975							
129	5	Grants Pass	264	115	134	50.75	.70
502	9	Grants Pass Rural	228	83	132	57.89	.69
154	8-9	Illinois Valley Rural	233	87	110	47.21	.58
403	8-9	Williams	20	5	12	60.00	.06
1976							
129	5	Grants Pass	291	114	164	56.35	.89
502	9	Grants Pass Rural	241	73	123	51.03	.66
154	7-8-9	Illinois Valley	251	72	135	53.78	.73
403	8-9	Williams	25	3	13	52.00	.07
1977 - 1978							
Not Available							

*An "incident" is: extinguishment, rescue only, investigation only, remove hazard, stand-by, salvage, ambulance service, mutual aid.

SOURCE: Annual Statistical Report, Office of State Fire Marshall.

FOREST FIRES

Two governmental agencies, the Oregon Department of Forestry and the United States Forest Service, provide forest and range fire protection in Josephine County. Their standards of attack time and pumping capabilities are much different than those of city fire departments. Typically, these agencies have response times of one-half hour or more and other fires in their protection area can lengthen this response time. Their trucks arrive with tanks containing 500 gallons of water or less that can be pumped out at about 60-70 gallons per minute. By contrast, structural firefighting requires response times of less than ten minutes and high volumes of water produced at high pressures. (Northwest Inter-agency Fire Protection Group, 1978).

State Department of Forestry headquarters are located near the Merlin freeway interchange. This agency protects the private, county, state, and Bureau of Land Management forest lands* within Josephine County and parts of Jackson, Curry, and Douglas counties. Fire protection for private "forest lands" is guaranteed by the State fire patrol assessment collected yearly by the County Assessor's office (1978 rate being $.46 per acre). This protection is also provided to non-forested areas by request to the Oregon Department of Forestry and is funded through the annual assessments.

Structural fire protection is only incidental as wild-land fire protection agencies (Department of Forestry, USFS, and BLM) are not charged with the responsibility for, nor do they possess equipment to deal with, structure fires. Their job is to prevent and extinguish forest and other wildland fires. Response to structural fires occurs only where forested lands are thereby endangered. (Ibid)

About 400-500 forest fire runs are made per year out of the Grants Pass unit, although the district experiences an average of 200 fires a year. About half of all runs are to the north of Grants Pass and the other half to the south, requiring a bridge crossing. A police escort is required to move equipment through Grants Pass due to traffic congestion and crossing of the Rogue River (6th Street) Bridge since both lanes are required (EIR, Third Bridge, 1978).

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*For state fire protection services, forest lands are defined by ORS 477.001 as "any forested land, woodland, brush timber land, cutover land or clearing, which, during any time of the year contains enough flamable forest growth, forest refuse, slashing or forest debris to constitute a fire hazard".

The Galice Ranger District of the Siskiyou National Forest has a district warehouse and storage yard on "L" and Judsen Streets, a few blocks west of the downtown area. The district responds to an average of 25 fires per year. The Galice District uses the Rogue River Bridge about 80-90 percent of the time to get to the Siskiyou National Forest (EIR, Third Bridge, 1978).

Mutual aid contracts are signed between Grants Pass Fire District, Wolf Creek Fire District, Sunny Valley Fire District, Oregon State Forestry, and Illinois Valley Rural Fire District.

TABLE ES-8

ANALYSIS OF INSURED LOSSES OF CITIES, TOWNS AND RURAL FIRE PROTECTION DISTRICTS

District Name	Number of Claims	Sound Value	Actual Loss	Per Cent of Loss to Value	Amount of Insurance	Insurance Paid
1972						
Grants Pass	36	2,311,685	20,029	.87	2,271,385	19,272
Grants Pass Rural	10	843,440	9,014	1.07	826,900	6,853
Illinois Valley	7	48,275	19,380	40.15	48,175	19,180
Williams	2	14,500	804	5.54	14,500	704
Unprotected	29	1,113,644	335,453	30.12	1,006,750	312,052
1973						
Grants Pass	32	1,054,204	114,451	10.86	1,037,500	96,880
Grants Pass Rural	24	507,100	66,871	13.19	469,300	65,346
Illinois Valley	9	115,789	95,499	82.48	99,447	78,857
Williams	4	94,413	22,878	24.23	93,500	21,765
Unprotected	34	400,435	44,435	11.10	382,564	41,635
1974						
Grants Pass	30	922,968	81,165	8.79	886,000	79,547
Grants Pass Rural	48	2,152,019	1,382,504	64.24	2,064,004	349,986
Illinois Valley	7	219,480	121,724	55.46	191,000	100,439
Williams	1	6,000	4,414	73.57	6,000	4,314
Unprotected	4	35,595	5,972	16.78	35,595	5,772

TABLE ES-8 (CONTINUED)

1975						
Grants Pass	22	1,386,409	62,714	4.52	1,335,132	61,652
Grants Pass Rural	32	594,510	222,008	37.34	550,323	191,005
Illinois Valley	8	197,659	130,572	66.06	141,930	109,120
Williams	2	50,945	9,071	17.81	49,945	8,775
Unprotected	71	2,239,048	425,996	19.03	2,086,855	372,183
1976						
Grants Pass	28	1,121,590	85,910	7.66	1,083,000	82,782
Grants Pass Rural	34	1,246,284	137,076	11.00	1,200,692	119,756
Illinois Valley	3	58,936	31,337	53.17	54,936	31,087
Williams	1	30,000	20,800	69.33	20,800	20,800
Unprotected	12	415,610	6,652	1.60	352,610	5,934
1977						
Grants Pass	28	1,216,032	278,300	22.89	1,198,848	241,140
Grants Pass Rural	46	1,436,056	159,947	11.14	1,318,937	138,410
Illinois Valley	9	140,674	57,094	40.59	128,404	46,204
Williams	8	1,311,121	846,220	64.54	1,311,121	831,522
Unprotected	4	50,729	49,351	97.28	45,549	44,021
1978						
Grants Pass	19	851,137	134,906	15.85	803,747	121,743
Grants Pass Rural	29	1,110,068	187,307	16.87	1,010,488	136,759
Illinois Valley	4	3,240,550	31,201	.96	3,234,500	30,901
Williams	2	100,470	31,370	31.22	89,500	26,066
Wolf Creek	2	24,196	15,889	65.67	18,000	11,515
Unprotected	5	112,473	5,148	4.58	104,973	4,748

It has been found that there is a direct correlation between insurance costs and the degree of fire protection. This correlation is demonstrated in the following table and graph which were compiled from information received from six insurance companies located in Josephine County.

TABLE ES-7

AVERAGE COST FOR FIRE INSURANCE ($)

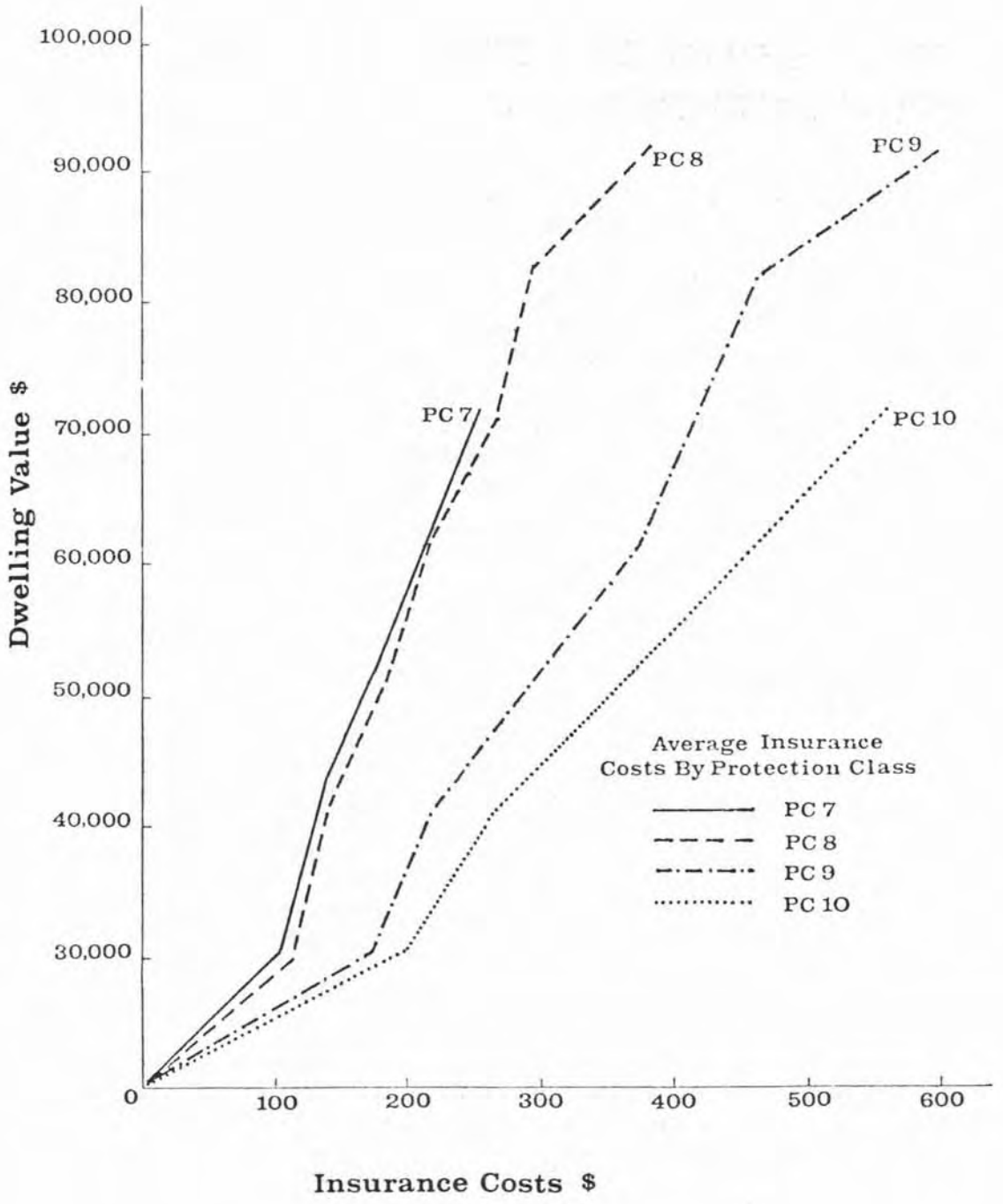
DWELLING VALUE	PROTECTION CLASS				DIFFERENCE	AVERAGE FIRE
	7	8	9	10**	PC 10 & 8	Protection Costs ($1.95/$1000.)
$ 30,000	106	111	171	196	85	59
$ 40,000	128	137	218	260	123	78
$ 50,000	172	182	298	361	179	98
$ 60,000	213	214	373	453	239	117
$ 70,000	256	270	451	551	281	137
$ 80,000	269*	296	459	500*	204*	156
$100,000	353*	387	593	632*	245*	195

*based on single response

**some insurance companies contacted stated they would not provide fire insurance to homes with a PC 10 rating.

SOURCE: Josephine County Planning Department, 1980.

GRAPH ES-9


100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
0
Dwelling Value $
100
200
300
400
500
600
Insurance Costs $
PC 7
PC 8
PC 9
PC 10
Average Insurance
Costs By Protection Class
PC 7
PC 8
PC 9
PC 10

An interesting result of Graph ES-9 is the realization that, in every case, the amount of money saved due to improved fire protection is greater than the cost of protection. Savings may be further enhanced for areas with a PC 10 rating as some insurance companies do not provide coverage to homes with a PC 10 rating.

DISCUSSION OF EXISTING FIRE PROTECTION SERVICES

Three studies have been conducted regarding Josephine County fire protection services:

1) "A Report on Fire Protection Services - Jackson and Josephine Counties" by Charles Anderson for the Rogue Valley Council of Governments in 1974,

2) "Josephine County Fire Protection Study" by Josephine County Ad Hoc Fire Protection Study Committee as requested by Board of County Commissioners, 1976, and by

3) Ad Hoc County-wide Fire Protection Committee, 1979 (no publication - meetings and cost estimates only).

The first two written studies appear to have identified several similar factors. They have both noted the following:

1) "Rural areas and rapidly developing suburbs can be plagued with many problems: insufficient water supplies, lack of building codes, or too few inspectors to enforce them, insufficient funds to pay fire fighters or replace antiquated equipment. Even where a strong volunteer fire department exists, delays in notice by public, inadequate alarm facilities, and great distances to fires often result in response times of 15 to 30 minutes or more." (1974).

2) "The areas and population covered by the City of Grants Pass, Williams, and Illinois Valley Fire Departments are receiving fire protection commensurate with, and adequate for, the levels of population density in these districts." (1976).

TABLE E-10

JOSEPHINE COUNTY FIRE PROTECTION SERVICES

Number of Fire Stations	Ambulance Service Rendered	Training Facilities	Volunteer Fireman Pay	District
1	No	No	Yes	Grants Pass
6	No	Yes	Yes	Illinois Valley
1	No	No	No	Williams
1	No	No	No	Wolf Creek
7				Sunny Valley GPRFD Valley Rural Fire Station

SOURCE: Rogue Valley Council of Governments, "Report on Fire Protection Services", 1974.

Figures from the State Fire Marshall's Annual Report of 1978.

This Table coincides with information on pages 18-8 through 18-11.

3) "The remainder of the county's population (approximately 56%) are given a Class 10 fire protection rating by the Insurance Services Office, unless they are subscribers to Grants Pass Rural, in which case they receive a 9 rating." (1976).

4) "A Class 10 rating is equivalent to having no fire protection; a Class 9 rating indicates a rudimentary level of protection; Class 8 indicates an adequate and relatively thorough level of rural fire protection." (1976).

5) "Small multi-district fire protection is often too costly, inefficient, and undermanned. These shortcomings are built-in and not necessarily the fault of the individual district. Each district must have its own commissioners, chiefs, budget, equipment, etc. as a separate entity. The ISO evaluates each district separately on its own merit. Duplication is inevitable. Fire station locations are often questionable due to boundary restrictions ... exception to this is most valid in very small or scantily populated areas. Because a small district generally has a narrow, small tax base, the district cannot afford adequate salaries for its chiefs, or has inadequate manpower and/or equipment. The public, nevertheless, is very fortunate in many cases in that fire fighting attracts many conscientious, dedicated men." (1974).

The 1976 study further stated that "a report compiled for their committee previously reflected that Josephine County averages 30% loss compared to approximately 4% for the state."

The 1976 Fire Study Committee recommended the following actions be taken based on their findings:

1) Establish total structural fire protection (every structure protected) at a minimum of a Class 8 rating in the underprotected high density areas of the County within two years. High density areas to be determined by the County Planning Staff in conjunction with the State Fire Marshall's office.

2) Establish a basic total structural fire protection system to those less dense areas in the County where practical. Practicality to be determined by the County Planning Staff in conjunction with the State Fire Marshal's office.

3) Provide continued and/or added support to the City of Grants Pass Fire Department, Williams Rural Fire Protection District, and the Illinois Valley Rural Fire Protection District. Support should be of such a type that these Departments are able to keep up with the growth in their areas to provide a continued adequate level of protection. The actual type of support should be decided by the County Commissioners.

Implementation Alternatives:

1) Form taxing districts to provide the adequate level of structural protection as recommended above:

   a. Contract some areas to Existing Departments and/or

   b. Establish new Departments for some areas and/or

   c. Contract with private enterprise

2) Contract all underprotected areas with private enterprise establishing a specific set of protection standards to be spelled out in the contract.

3) Develop several separate individual tax supported Fire Districts to provide an adequate level of protection in the underprotected areas of the County.

4) Form a County-wide fire district.

PROPOSED COUNTY-WIDE FIRE DISTRICT

The 1979 Ad Hoc Fire Study Committee was created to review the feasibility of a county-wide fire protection district. The committee disbanded after three meetings stating costs for such a district would be prohibitive.

The following tables (11-13) present information utilized to determine costs. These are "high" figures in that no consideration was made for consolidated (group) purchases. The program would deliver Class I or better fire protection services to the majority of privately owned land in Josephine County. Under the above assumption (regarding no group purchases) average rate per $1000 of assessed evaluation was estimated to be $2.51 to $2.71 for the first year and $1.39 to $1.56 the second year. The existing 1978 year rate in Grants Pass was $1.78 and was $2.09 in the Illinois Valley.

Development of county-wide fire district requires consideration of several factors other than cost. Concern has been expressed over:

1) The potential redistribution of emergency equipment;
2) Retention/development of equal service and quality of service throughout the county;
3) Existence of private fire companies and their role in a county-wide district;
4) Funding of each station and its relationship to the population served.

Independent proposals include:

1) Retention of existing fire districts with scheduled county-wide training and/or special equipment being provided by the county; and
2) Contractual purchase of privately-owned fire protection services by Josephine County, potentially dissolving some existing fire protection districts.

FUNDING

Funding for fire protection services is apparently available from several sources. These have been delineated in the 1974 study:

> "In its provision for revitalizing the economy of rural America, the Rural Development Act of 1972 recognizes that fire protection in rural areas must grow apace. One section provides loans for water supply systems for industrialized areas being constructed in rural communities.

Title IV of the law, called 'Rural Community Fire Protection' provides for assistance in organizing, training, and equipping local fire protection forces. The assistance is both technical and financial with the Federal Government assuming up to 50 percent of the costs. Full and continuing funding of the fire protection provisions of the Rural Development Act is essentially in the National Commission on Fire Prevention and Controls' judgement (Fire Journal, July 1973, Volume 67, No.4)."

On May 9, 1973, legislation was introduced to Congress called the Fire Prevention and Control Act of 1973...

> The Act calls for the establishment of a United States Fire Administration within the Department of Housing and Urban Development, to assist state and local governments in reducing death, personal injury, and property damage from fire and to increase the effectiveness and coordination of fire prevention and control agencies at all levels of government.
>
> Therefore, there is at the present time funding available through the Rural Development Act of 1972, and with the passage of Fire Prevention and Control Act of 1973, there appears to be more funding available for needs such as ours in Josephine County."

Additional monies could be available from O & C funds at the discretion of the Board of County Commissioners. Voter desires for taxation and/or special districts are also a possible source of funds.

TABLE ES-11

ESTIMATED FIRST YEAR CAPITAL OUTLAY (EQUIPMENT) FOR COUNTY-WIDE FIRE DISTRICT*

		APPARATUS	FACILITIES	TOTAL
Wolf Creek (Volunteer)				
1 Station	$25,000			
1 Pumper	$50,000			
1 Tanker	$50,000			
FP. Maint. Ops. Disp. Tn		$100,000	$25,000	$125,000
Sunny Valley (Volunteer)				
1 Station	$25,000			
1 Pumper	$50,000			
1 Tanker	$50,000			
FP. Maint. Ops. Disp. Tng.		$100,000	$25,000	$125,000
Merlin (Volunteer)				
1 Station	$80,000			
1 Pumper	$60,000			
1 Tanker	$50,000			
FP. Maint. Ops. Disp. Tng.		$110,000	$80,000	$190,000
Murphy (Volunteer)				
1 Station	$25,000			
1 Tanker	$50,000			
1 Pumper	$50,000			
FP. Maint. Ops. Disp. Tng.		$100,000	$25,000	$125,000
Wilderville (non-existent)				
1 Station	$25,000			
1 Tanker	$50,000			
1 Pumper	$50,000			
FP. Maint. Ops. Disp. Tng.		$100,000	$25,000	$125,000
South (non-existent)				
1 Station	$125,000			
1 Tanker	$ 50,000			
1 Pumper	$ 70,000			
FP Maint. Ops. Tng. Disp. (9)		$120,000	$125,000	$245,000

* THESE ARE HIGH ESTIMATES AND DO NOT CONSIDER CONSOLIDATED PURCHASES. THIS SYSTEM WOULD BRING ENTIRE COUNTY TO ISO CODE.

ADDITIONAL EQUIPMENT FOR EXISTING STATIONS (CODE 8 AND BETTER)

		APPARATUS	FACILITIES	TOTAL
City (Paid and Volunteer)				
1 Tanker	$50,000	$50,000		$50,000
FP., Maint. Ops, Disp. Tng (21)				
Williams (Volunteer)				
1 Tanker	$50,000	$50,000		$50,000
FP. Maint. Ops. Disp. Tng.				
Illinois Valley (Volunteer and Paid)				
1 Tanker	$50,000	$50,000		$50,000
FP Maint. Ops. Disp. (11)				
TOTALS OF BOTH TABLES		$780,000	$305,000	$1,085,000

( ) - Status of Stations at Present

* THESE ARE HIGH ESTIMATES AND DO NOT CONSIDER CONSOLIDATED PURCHASES

TABLE ES-12

ESTIMATED MATERIALS AND SERVICES COST (YEARLY)
FOR COUNTY-WIDE FIRE DISTRICT

ITEM	AMOUNT
Office Supplies	1800
Maintenance Supplies	2500
Safety Supplies	8500
Printing	1000
Memberships & Subscriptions	900
Uniforms & Clothing	4000
Utilities (Heat & Light)	18000
Utilities (Hydrant)	20000
Special Department Materials	8000
Investigation Expense	1000
Meetings, Training & Travel	6000
Telephone (One central number for dispatch anywhere)	10000
Office Equipment Maintenance	500
Vehicle Maintenance & Operations	16000
Other Equipment Maintenance	8000
Buildings & Grounds Maintenance	3500
Laundry	2000
Volunteer Meetings	2000
Insurance	20000
Lease Payments	60000
Hose Replacement	8000
TOTAL	201700
CAPITAL OUTLAY	305000
Facilities	305000
Apparatus	780000
Equipment	100000
TOTAL	1185000
Contingency	200000
Transfer to Equipment Reserve (Safety Fund) (Vehicle Replacement Fund)	150000

TABLE ES-13

ESTIMATED TOTAL COST
FOR COUNTY-WIDE FIRE DISTRICT

	1st Year	2nd Year
Personal Services (69 paid- of which 7 are non-fire)	1,098,252	1,208,077
Materials and Services	201,700	231,955
Capital Outlay	1,085,000	100,000
Transfers to Equipment Res.	150,000	150,000
Contingency	200,000	200,000
SUBTOTAL: Anticipated Expenditures	2,734,952	1,890,032
Estimated Taxes Not Collected	382,893	264,604
TOTAL: Funds Required to Balance	3,117,904	2,154,636

TAX RATE COST vs. VALUE IN DOLLARS/1000.00 (TCV)	
Total Cost	
1st Year	2.51 - 2.71
2nd Year	1.39 - 1.56
Operating Cost	
1st Year	1.51 - 1.63
2nd Year	1.39 - 1.56
Assessed Value	
1st Year	1,239,000,000 (40% inc.) - 1,150,500,000 (30% inc.)
2nd Year	1,548,750,000 (25% inc.) - 1,380,060,000 (20% inc.)
Average Rates	
Present District	1.78 / $1,000 TCV
New District	1.59 - 2.13 / $1,000 TCV

WILDFIRE

The development of rural residential homesites in areas with vegetation highly conducive to the spread of wildfire has resulted in conditions which pose potential hazards of catastrophic fire spread. Wildfire hazards in southern Oregon are as severe as in southern California. Much of the vegetation occurring naturally in Josephine County is a result of past fire-spread and is conducive to the development of uncontrolled conflagrations.

Curran (1978) has studied the interrelationship of wildfire hazards in the rural areas of southern Oregon. The existing relative hazard may be expected to increase as additional structures are constructed in areas with characteristics favorable to wildfire spread. The possibilities of disastrous wildfire are increased by a number of factors: the placement of residential homesites, the location and construction of roads, the type and dryness of vegetation, the humidity, the presence of heat, and drying summer winds. The worst conditions in Josephine County can result in fires where flames spread rapidly, engulfing both brush, trees and any homes unfortunately located in the path of the fires. Such fires can spread literally with the speed of the wind.

The Oregon State Department of Forestry provides range and forest land, but not structural, fire protection. Between 1973 and 1978, Department crews participated in suppressing 1,036 fires in Josephine County. The major cause of fires was lightning strikes during the dry summer months. Over 467 fires occurred during the months of July, 189 fires in the months of August and 138 fires during the months of September. Of these fires 742 were on private land. The potential for repeated fire occurrence, in combination with adverse fuel and climatic conditions, is severe.

Although lightning was the single largest source of fires during the period of study, 146 fires were caused by improper debris burning; 139 fires were caused by smokers or carelessly tossed cigarettes; and 132 fires were caused by children. Criminal activity must also be considered, and records indicate that 76 fires were due to arson.

A major factor influencing the susceptibility of natural vegetation to wildfire is the ratio of dead and decayed matter to live vegetation. Curran (1978) has observed that young, vigorous growing vegetation has less fuel volume per acre than older decadent stands. The quantity of dead fuel may increase the spread of fire and may increase the intensity, causing ignition of live vegetation. Chaparral brush fields and stands heavily dominated by Pacific madrone are highly flammable and are fire-dependent for continuation. Curran suggests that fire-dependent plant communities have an accelerated burn rate, as compared to non-fire-dependent communities.

Fuel management in the development of rural land uses is essential to prevent the build-up of fuel and catastrophic wildfire spread. Fuel management can be accomplished through the reduction of fuel loadings and through the planting of fire-resistant vegetation. Curran (1978) suggests that the following species display a definite resistance to destruction by fire: snowberry (Symphoricarpos aldus), spirea (Spirea betulifolia), bunchberry (Cornus canadensis), lupine (Lupinus spp.), timber milkvetch (Astragalus miser) and buffalo berry (Shepherida canadensis). Moderately resistant plants include Oregon grape (Mahonia nervosa), fireweed (Epilobium angustifolium), creamy peavine (Lathrys ochrolducus) and showy aster (Aster conspicuous).

Trees that display distinctive slow-burning characteristics include aspen (Populus tremuloides) and paper birch (Betula papyrifera). Mutch (1970) has suggested that certain oak woodlands possess characteristics of reduced susceptibility to burning. Oak woodlands dominated by canyon live oak (Quercus chrysolepis) may be less susceptible to fire damage than other kinds of oak forest. This susceptibility, however, may be in part due to the bulk of the trees upon maturity and not to any chemical characteristics that cause them to be less flammable. Slow-burning shrubbery includes creeping sage (Saldia sononensis), rock rose (Cistus spp.), iceplant (Lampranthus spp.), salt brush (Atiritlex spp.), snow carpet (Ceanothus prostratus), and sun rose (Helianthemum numnalurium).

The importance of fuel modification in rural residential developments can be emphasized by the relationship of fire spread to response times by suppression agencies. If a wildfire occurs in a rural residential area, suppression crews would have to be secured either from a special fire protection district, a private fire company, or the State Department of Forestry. Depending upon the location of the residential area in Josephine County, response times can vary dramatically and the rate of fire spread can be critical. Fuel modification that would reduce the rapidity of fire spread may be a

major determinant of the potential of saving a residential structure located in a high fire risk area by allowing additional time for response by fire suppression agencies. Orange County, California, for example, has experienced severe fire management problems in the dry chaparral communities that cover extensive areas of that County. The County supervisors have authorized extensive studies of fire management techniques and have identified rates of fire spread under extreme weather conditions (Board of Supervisors, 1976). Fast fire spread in grass is rated at 12 feet per second, or about 8 miles per hour. Fires in older stands of chaparral brush have been measured at 24 miles per hour, or 35 feet per second. The most extreme example of fire spread occurring under conditions of high-velocity winds was 88 feet per second, or 60 miles per hour in chaparral vegetation on the Angeles National Forest.

Environmental conditions which affect and modify wildfire spread include topography. The steeper a slope, the more rapidly a fire can spread up that slope. Topography also affects air-flow, with steeper topography creating conditions favoring higher-velocity winds. Steep topography may also limit the accessibility of the fire to suppression crews and equipment.

Climatic conditions also modify fire intensity and behavior. The higher the wind velocity, the greater the rate of fire spread. Humidity affects the dryness of vegetation and the potential of that vegetation to ignite. Precipitation may influence the growth of vegetation, which increases the extent of fuel build-up. Altitude influences the amount of precipitation which occurs in the vegetative community, and may also influence the intensity of temperatures during the summer drought.

The development of rural residential homesites in areas of high fuel risks presents other conflicts, besides the increased dangers of personal and property damage. Many of the vegetative communities that are dependent upon repeated fire occurrence for maintenance are critical wildlife habitat areas. The modification of such areas by the placement of structures, roads and fuel breaks may substantially reduce the amount of browse and cover that is available to shelter and support wildlife species. Construction of fuel breaks and vegetative modification may also result in increased erosion and detrimental sedimentation of surface water. The construction of rural residences, roads, fuel breaks, and vegetative modification may also cause visual and aesthetic changes in the landscape character, resulting in a deviation from the natural aesthetic conditions that form an important part of the rural character of Josephine County

LAW ENFORCEMENT AND PROTECTION

Four governmental agencies share the principal duties of law enforcement and protection within Josephine County. These are the Oregon State Police, the County Sheriff's Office, the City of Grants Pass Police Department and the City of Cave Junction Police Department. (Other agencies are, however, also involved with some form of law enforcement/monitoring. These include Bureau of Land Management, U.S. Forest Service, Oregon State Forestry, Fish and Wildlife, and various offices in city and county government which have specific regulatory authority.)

STATE POLICE

This office, located in north Grants Pass, was originally established in Josephine County basically as an "assist" unit in the early 1930's. This main area of concern soon included patrolling and enforcement on State highways, particularly, Interstate 5 and Highway 99 (Redwood Highway), patrolling of the Rogue River, and enforcement of Fish and Wildlife regulations.

The office is unique in that it is not really an entity to itself but is a part of a state-wide organization and is thereby dictated by state-wide planning directives.

At present, a total of 27 active uniformed officers and one plainclothes officer are employed in Josephine County. (This is an increase of four officers since 1970). All officers receive ten weeks of intensive recruit training at the academy, continuous local training, in-service yearly training, and special certification for the Crash-Injury Maintenance (CIM) program and breatholator machine training.

The office maintains ten patrol vehicles, two pick-up trucks (primarily for Fish and Wildlife regulation enforcement), and a sled boat with motor. Usually

three to four traffic vehicles patrol during the day and on swing shifts. One to two traffic vehicles patrol during the graveyard shift.

Traffic violations and accidents occur among all age and resident groups although area residents are estimated to be the largest group involved. The area with the highest accident potential is I-5 as it passes over Sexton Mountain.

TABLE L-1

STATE POLICE STATISTICS

	1977	1978
Miles Driven	634,000	599,418
Total Violations	13,354	11,933
Hazardous Violations	8,084 (60.5%)	7,784 (65.2%)
Drinking Driver	550 (4.1%)	433 (3.6%)

Although statistics indicate that only about 4% of violations are for drunk driving, the local office estimates that 76% of all fatalities are due to alcohol consumption in association with operation of a motor vehicle. The local office has stated that there does not appear to be a major problem regarding arrests/violations due to drug use in Josephine County as compared to the state figure. Although in 1978 there were 46 undercover investigations regarding drug traffic.

The State Police, as part of a state-wide agency, have use of a regional crime lab, arson division, aircraft, etc.

COUNTY SHERIFF

The County Sheriff's Office is responsible for law enforcement and protection of all areas of the County. Their services are, however, primarily outside the city limits of Grants Pass and Cave Junction. The Sheriff's Office is also responsible for the jail and Work Out Center. In addition, the Civil Department is responsible to the courts for civil actions (e.g. court papers,

bankruptcies, evictions). The headquarters is located in the Courthouse Annex in central Grants Pass. A rural substation is located in the County Building in Cave Junction. The Wolf Creek and Williams areas are each assigned a resident deputy.

Presently, the office employs 86 full-time personnel of which 36 are active uniformed deputies, 6 are dectivies 16 are jail personnel, 7 work as minimum security at the Work Out Center, 11 are dispatch and records personnel, 5 are civil deputies, 5 are administrators. This is a 33% increase since 1975, and is reflected primarily in increases of jail personnel and patrol deputies.

Some deputies perform double functions as specialized personnel. These include 5 certified skindivers, 2 marine deputies, a theft and vandalism prevention deputy, a deputy contracted with the U.S. Forest Service and 1 deputy assigned part-time in the area of crime prevention.

All uniformed deputies have received, or will receive, intensive training at the Police Academy in addition to a 9 month, 90 credit field training course. Several officers have received additional training in the form of college instruction and inservice training. In addition to basic certification, several officers have received intermediate certification, and nine have received advance certification.

The ratio of active enforcement/protection deputies (36) to total County population is 1:1,556. The ratio of all personnel is 1:651. The national median average is one officer to 1000 population (1:1000). The Oregon average number of sworn officers to population is 1:877 for counties with populations of 25,000 to 99,000. (Law Enforcement Data System, 1979.)

Approximately 5 to 7 uniformed deputies work the day shift; 4 to 5 deputies work the graveyard shift. A number of special duty officers work a varied shift, including the resident deputies in the Williams and Wolf Creek areas, two marine deputies and 2 special services (U.S. Forest Service and logging show) deputies. In addition the six man patrol at the Illinois Valley sub-station also maintains at least one patrol car (1-2 uniformed deputies) per shift. Average response time (receipt of call to arrival of deputies) is five to ten minutes.

The Sheriff's Office also maintains a reserve unit of volunteers at an authorized level of 25 individuals (20 assigned to the central office and 5 assigned to the Cave Junction sub-station). Their task is to assist in all law enforcement functions. Reserve personnel are required to attend a 46 hour basic criminal justice

course at Rogue Community College, firearms training classes, self-defense class, and other law enforcement related training. They are assigned to a Designated Field Training Officer for a six month period for 200 hours of field training. During 1978, reserve personnel worked 3,327 volunteer hours and received 601 hours of training. Currently, there are 23 reserve officers. The office maintains eighteen marked vehicles (of which seven are 4X4 all-terrain vehicles), twelve unmarked vehicles, two boats, and two trail motorcycles.

Special facilities provided by the Sheriff's Office include a 74 bunk jail with holding area, a 24 bunk work-out area, a detoxification area, and a photography lab. County jail services are utilized by all enforcement agencies within the County. These other agencies provide partial reimbursement funds for use of the jail, however, the bulk of jail expenditures are met by the Sheriff's Office. Presently, 14 sworn corrections officers and 2 cooks are assigned to the jail. This constitutes a 60% increase in jail personnel since 1975.

A review of increases in crime and staff reveals that increases in crime are far higher than increase in staff.

TABLE L-2

INCREASES WITHIN THE SHERIFF'S OFFICE

CATEGORY	% INCREASE 1975-1978
Sworn Uniformed Officers	33%
Jail Personnel	60%
Total Employees	39%
Part I and II Crimes	32%
Part III Offenses	48%
Total I, II and III	40%
Drunk Driving Arrests	86%
Reported Motor Accidents	66%
Total Traffic Enforcement	764%
Complaint Calls	42%
Warrant Service	181%

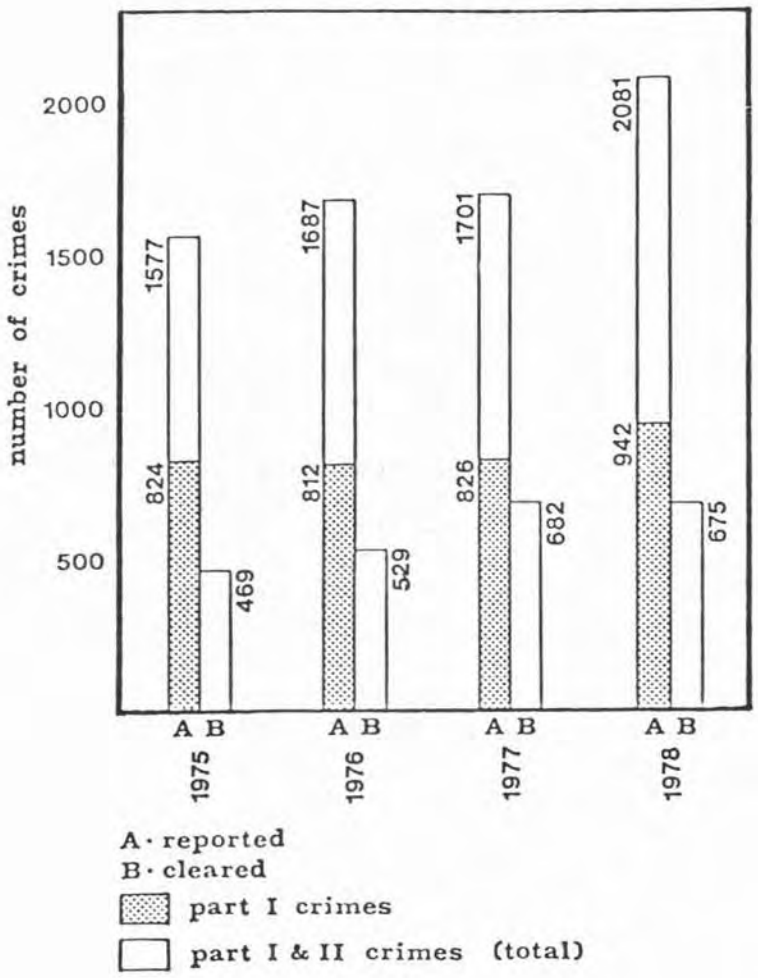
SOURCE: Compiled from data submitted by the County Sheriff's Office, 1979.

Trends would indicate a percentage decrease of Part I - (Major) crimes although increases have occurred in theft and burglary (Graph L-3). Part II (Lesser) crimes have shown a drastic increase, specifically in the fields of fraud, vandalism, marijuana, other assaults, offenses against family, and drunk driving.

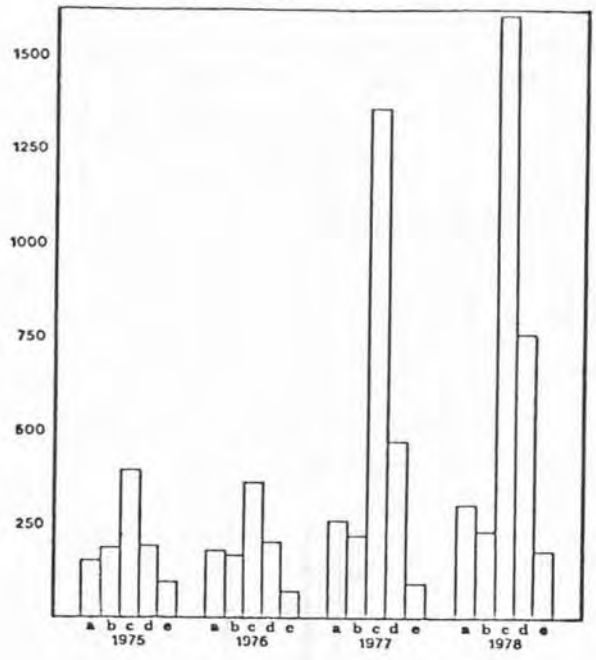
GRAPH L-3

JOSEPHINE COUNTY

PART I AND II CRIMES



In regard to highway/motor vehicle monitoring, the Sheriff's Office patrols all roads outside city limits including all state highways except Interstate 5. From 1975 to 1978, citations have increased 312% and accidents have increased 66% (Graph L-4).



GRAPH L-4

JOSEPHINE COUNTY
TRAFFIC ACCIDENTS
AND ARRESTS

a- non-injury accidents
b- injury accidents
c- hazard citations
d- non-hazard citations
e- drunk driver arrests

As with all other crime statistics, jail bunkings have increased 48% from 1975 through 1978, (1,601 to 2,362) to where the jail averages 93% occupancy (Table L-5).

Sheriff's office officials state they have no specific information on the amount of drug use and drug traffic within the County, especially since the Josephine Interagency Narcotics Team (JOINT) was disbanded in the mid-1970's. They do, however, estimate that drug problems in Josephine County are no more prevalent than in other Oregon counties.

In general, the County's Sheriff's office experiences more violations during the summer months. The majority of all crimes/violations are committed by area residents as opposed to tourist/visitor traffic. According to local officials, it is estimated that the majority of crimes are committed by young adults age 18 to 35 (Table L-6).

In relation to other Oregon counties (Table L-7), Josephine County has one of the larger Sheriff's Department expenditures (9th in the state). This may, however, be directly related to the high tourist (pass-through) attraction, Work Release and Work Alternative Center, and central facilities used by all enforcement agencies including jail, photo lab, detox and holding facilities, in addition to basic law enforcement functions. Employee salaries compare with other counties.

TABLE L-5

JOSEPHINE COUNTY SHERIFF'S OFFICE
(Jail Bookings 1975-1978)

	1975	1976	1977	1978	1975-78
Adult Bookings (Percentage Increase)	1601	1728(+8)	22.5(+28)	2302(+7)	(+48)
Juvenile Bookings	167	236	336	204	--
Estimated Daily Population	50	53	55	65	--

SOURCE: Ibid.

TABLE L-6

JOSEPHINE COUNTY SHERIFF'S DEPARTMENT STATISTICS

CLIENTS	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	% Inc. 1979-78
Number of Clients arrested		271	431	382	414	370	431	490	587		116.6
Percent Male		80	79	87	88	89	82	85	78		
Percent under age 20		47	53	38	36	50	54	53	47		
Percent age 20 - 40		40	42	59	54	41	39	36	43		
Percent age 40 - 60		12.3	4	2	9	8	6.4	7	8		
Percent over age 60		.7	1	1	1	1	.6	4	1		
Number of Employees	44	47	44	52	53	61	66	73	76	86	95.5
Annual Dollars	347,414	436,037	531,432	528,751	636,879	803,353	897,264	1,059,884	1,397,980	1,954,749	348.3

TABLE L-7

1978 AGENCY COMPARISONS
(by County)

COUNTY SHERIFFS' OFFICES	POPULATION[a]	BUDGET	AUTHORIZED PERSONNEL				Total	
			Tax	Corr.	Civil	Crim.	Sworn	Civ.
Baker	16,050	$ 191,855	0	3	0	10	11	2
Benton	67,400	1,365,394	0	12	4	37	37	16
Clackamas	211,000	4,441,456	19	22	19	132	134	58
Clatsop	29,800	536,275	5	8	2	11	16	10
Columbia	33,300	497,747	0	8	3	13	21	3
Coos	61,100	1,583,731	0	29	4	38	59	12
Crook	12,100	180,296	0	0	1	7	6	2
Curry	14,500	663,176	3	8	1	20	32	0
Deschutes	46,800	869,426	0	7	7	39	43	10
Douglas	83,700	2,912,125	0	39	7	101	109	38
Gilliam	2,100	21,500	0	0	0	1	1	0
Grant	7,500	149,201	1	0	1	4	6	0
Harney	7,700	150,504	0	4	1	3	8	0
Hood River	14,600	284,740	0	4	2	14	17	3
Jackson	118,500	3,427,370	0	32	7	95	90	44
Jefferson	10,100	367,167	3	5	0	10	14	5
Josephine	50,900	1,848,181	0	16	5	55	59	17
Klamath	56,500	693,988	0	17	7	32	40	16
Lake	6,680	140,515	3	4	0	5	9	2
Lane	252,500	6,569,442	0	77	10	183	168	102
Lincoln	28,700	570,412	0	11	2	23	27	9
Linn	85,000	1,803,563	0	9	5	57	61	10
Malheur	11,735	405,648	3	8	1	9	15	6
Marion	177,700	2,701,375	0	29	12	80	88	33
Morrow	5,500	171,527	0	0	1	12	6	7
Multnomah	556,400	8,939,000	0	0	0	281	225	56
MCCD[d]		5,176,566	0	211	0	0	138	73
Polk	42,000	769,947	0	8	2	26	24	12
Sherman	2,200	51,200	1	0	0	2	2	1
Tillamook	18,800	447,912	0	5	2	19	21	5
Umatilla	52,100	673,008	0	10	4	19	32	1
Union	22,600	276,898	0	5	2	7	12	2
Wallowa	6,900	57,016	0	1	0	7	3	5
Wasco	20,400	443,853	3	7	1	19	19	11
Washington	200,800	3,325,884	0	40	10	142	142	50
Wheeler	1,920	41,097	0	0	0	1	1	0
Yamhill	47,200	667,475	0	7	2	24	25	8

[a]1977 population figures from the Center for Population Research, Portland State University.

SOURCE: Law Enforcement Data Systems, 1979.

SEARCH AND RESCUE

This organization operates under the jurisdiction of the Sheriff's Office. Funding and equipment, however, are financed through private donations and state funds rather than county subsidy. The approximately 40 personnel are all volunteers. Training is provided through the State Emergency Services Office (619 hours general training and 240 hours first aid in 1978). Their equipment includes street cars, off-road vehicles and emergency medical equipment. In 1978, the organization participated in 40 searches involving 3,042 man hours and traveling 16,122 miles.

CITY OF GRANTS PASS POLICE DEPARTMENT

This department, located in the County Courthouse Annex, is responsible for law enforcement and protection within the city limits of Grants Pass. Of the 36 employees, 19 are active uniformed officers, with support groups that include administration (2), detectives (4), meter enforcement (3), and clerical (8). There has been a 34% overall increase from 1970 to 1978, predominantly involving support personnel.

The ratio of active uniformed officers (19) to the City's population (15,000) is approximately one (1) uniformed officer to 789 people. The national average is one (1) officer to 800 people (1:800). The Oregon median average ratio is 1:480 for cities with populations between 10,000 and 25,000. Average response time is 2.5 minutes.

All officers are required to attend a seven (7) week basic training course at the Oregon Police Academy. In addition to this, officers receive in-service training on a continuing basis. Through training and education, to date, ten (10) officers have received Advanced Certificates from the Oregon State Board on Police Standards and Training.

The Police Department also maintains a reserve (volunteer) program consisting of sixteen reserve officers and four senior volunteers in the Crime Prevention Unit. In addition the department maintains a very active crime prevention program with full time personnel, school visitations, neighborhood talks, etc.

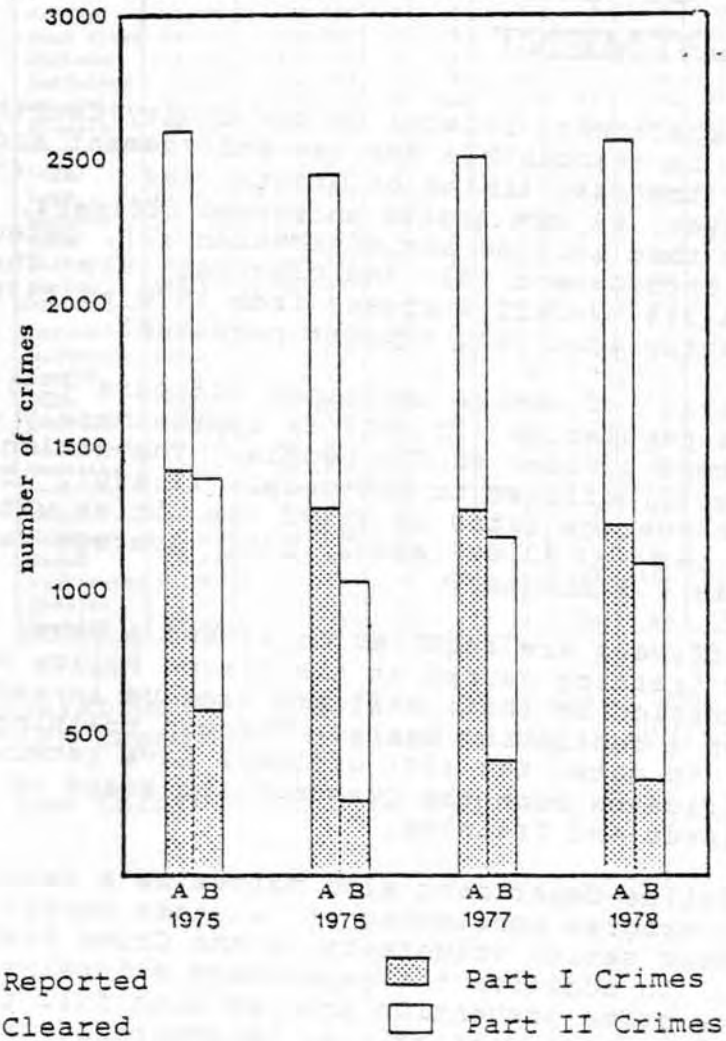
The department maintains seven marked vehicles, four unmarked vehicles, three motorcycles, and one crime prevention car. Use of county facilities such as the detoxification area, jail, and photo lab is available by contract.

Crime rates within the city have fluctuated only slightly over the years. There has, however, been an overall 15% decrease of Part I major crimes from 1975 through 1978 (Graph L-8). The majority of Part I crimes are larceny, burglary and auto theft. Part II crimes are primarily fraud, vandalism, disorderly conduct, runaways, narcotics and liquor law violations.

GRAPH L-8

CITY OF GRANTS PASS

PART I AND II CRIMES REPORTED AND CLEARED



Traffic violations are primarily speeding, illegal parking and hazardous driving. The department generated about $59,000 in parking meter fines and approximately $64,000 in other traffic fines. (This constitutes about 70% of posted fines as a percentage do not pay their tickets.)

Violations are apparently committed by all age groups within the city, but juveniles make up 30 to 40 percent of all arrests. Local officials estimate 80% of all violations are attributed to area residents. The number of incidents does increase during the summer months.

TABLE L-9

INCREASES WITHIN THE GRANTS PASS POLICE DEPARTMENT

CATEGORY	1975 - 1978 % INCREASE
Uniform Officers	5.5* (1970-1978)
Total Employees	42.3* (1970-1978)
Part I and II Crimes	- 3.4
Arrests	18.5
Prisoners Lodged	85.3

SOURCE: Compiled from data submitted by Grants Pass Police Department.

CITY OF CAVE JUNCTION POLICE DEPARTMENT

NOTE: The Cave Junction Police Department was disbanded in May 1981 when funds to run the department were depleted. Until funds are obtained to reactivate the department, the County Sheriff's Department will provide protection to the City at roughly the same level provided to rural residents. The following section is for informational purposes only.

This department is primarily responsible for law enforcement and protection within the city limits of Cave Junction. The Department is located in the new city hall in central Cave Junction.

The department employs six personnel of which five are uniformed officers. This is a 200% increase since 1970 when only 2 persons inhabited the station. The ratio of

sworn officers to population (1,200) is 1:240. The Oregon average for cities with a 1,000 to 4,999 population is 1:457. All uniformed officers are certified and receive additional regular training. All personnel are taking classes in law enforcement.

In addition to police personnel, the department maintains a reserve program of six to eight individuals, two of whom work as clerk/dispatchers. This system allows for 24 hour service with usually only one patrol on duty at any one time. Average response time for the department is 3 1/2 minutes.

Accurate crime statistics are apparently not available prior to 1977. Statistics for the last two years indicate a low percentage of Part I crimes with the greatest violation being larceny. Major incidences of Part II crimes are vandalism and drunken driver offenses.

TABLE L-10

CAVE JUNCTION CRIMES

	1977	1977
PART I	82	87
Larceny	57	57
Burglary	11	15
Other	19	15
PART II	211	160
Vandalism	56	40
Drunk Driving	13	27
Disorderly	31	13
Fraud	17	10
Drug Abuse	11	11
Other	83	59

SOURCE: Law Enforcement Data System, 1979.

Local officials have stated that there appears to be a decrease of victim-related crimes. Apparently the greatest problem is alcohol abuse. Hourly bar checks have contributed to a decrease in assault and disorderly conduct offenses. Most offenders in these two categories are between the ages of 20 and 40.

Animal control has done much to eliminate the problem of wild dog packs running through the city.

The police department has acquired a three cell jail where suspects are held until they can be transported to the county jail in Grants Pass. A radio base has

been purchased and should be of benefit to central communications. Burglar alarm monitoring is provided by Illinois Valley Fire Department.

As with other sections of the County, the incidence of violations increases during the summer months. Most violations (approximately 90%) are committed by area residents.

In review of the types of crimes experienced in Josephine County as a whole (Table L-11) it would appear the majority are victimless crimes such as larceny, vandalism, and motor vehicle violations. Many of these violations are, however, related to use of alcohol or drugs. This aspect of the situation is echoed by juvenile authorities, mental health department, drug abuse and alcohol control programs (see Social Services Chapter).

FUTURE

All law enforcement departments have stated that, at present, additional personnel would be desirable though not absolutely necessary. In other words, department functions currently can be carried out adequately.

Each department has voiced concern about the Illinois Valley with its approximately 5,000 residents. local State Police Office has indicated a desire for a rural sub-station near Cave Junction. But as planning is done by the main office in Salem, the local office has no idea when such a sub-station would be constructed (possibly 1990). With the establishment of an urban growth boundary, Cave Junction Police project that they can provide adequate protection until approximately a 3,000 city population is reached. Concern has been expressed, however, regarding the surrounding county area being patrolled by only one sheriff's vehicle at any one time. Desire has also been expressed for some level of judicial services in the Illinois Valley (i.e. once a month visit).

The County Sheriff's Office has not indicated concern in regard to enforcement within the Grants Pass Urban Growth Boundary as greater service is already provided in this general area. Concern is, however, noted if service level of 1:800 is required as additional personnel would be needed (see Urban Service Policies).

County Sheriff's Office personnel have indicated a desire for a more intensive crime prevention program

(particularly through the schools); administration has stated the present program is adequate. The city police apparently visit a large percentage of all schools.

All law enforcement agencies within the County work in cooperation with one another. Comments have, however, been made regarding the need for county-wide, inter-agency, central communications. Comments also indicated a need for acquiring or maintaining adequate fire protection and emergency medical services within the County.

TABLE L-11

CRIMINAL ACTIVITIES FOR JACKSON AND JOSEPHINE COUNTY

DISTRICT 8 — PART I OFFENSES — PART II OFFENSES

MONTHS OF REPORTING	AGENCY	OFFICER ASSAULT	YEAR	MURDER 011	MANSLAUGHTER 012	FORCIBLE RAPE 02	ROBBERY 03	AGGRAVATED ASSAULT 04	BURGLARY 05	LARCENY 06	MOTOR VEHICLE THEFT 07	OTHER ASSAULT 042	ARSON 09	FORGERY & COUNTERFEIT 10	FRAUD 11
12	JACKSON CO. NO	8	78	2	1	9	16	150	548	999	110	133	15	13	242
12		1	77	4	7	17	13	84	511	947	104	137	21	12	212
12	Ashland	1	78			3	3	25	186	457	28	25	8	3	291
12			77			2	5	22	171	600	32	9	1	12	141
1	Butte Falls		78							5	1				5
0			77												
12	Central Point PD		78			2	2	30	63	251	18	7		2	74
12		1	77			1	3	32	72	294	11	6	5	1	37
12	Eagle Point PD		78				2	9	43	97	15	6	5	4	26
12			77				1	11	22	120	5	6		4	44
12	Jacksonville PD		78					3	9	39		1		1	11
12		1	77			1		3	8	28		1		1	5
12	Medford PD	32	78			21	63	111	822	2373	236	224	30	47	561
12		31	77	1		14	48	59	687	2226	195	242	30	50	415
12	Pheonix PD		78				1	4	28	51	4		2	4	3
12		1	77			1	1	2	13	45	1				2
12	Rogue River PD		78				1	8	14	52	4	1		1	64
5		1	77			1	1		8	24	3	1			13
12	Shady Cove PD		78					4	13	28	5	2		4	6
12			77				1	2	18	26	2	1		2	10
12	Talent PD		78				2	5	15	35	4		1	2	
12			77					3	26	42	2	4	1		
12	State Police	3	78		1	3	2	11	59	106	28	20	54	8	147
12		2	77			3	3	16	48	102	25	19	43	3	75
	COUNTY TOTAL	44	78	2	2	38	92	361	1800	4503	453	419	115	89	1430
		38	77	5	7	40	76	234	1584	4454	380	426	101	85	954
12	JOSEPHINE CO. SO	4	78	6		7	8	25	317	498	43	77	3	6	304
12		2	77	1	10	8	12	65	261	396	50	49	3	13	205
12	Cave Junction PD	1	78				1	8	15	57	6	2			10
12		1	77					9	11	37	5	7	1		17
12	Grants Pass PD	1	78	1		5	22	16	226	808	87	68	2	35	285
12			77	2		3	9	13	181	910	88	59	5	49	278
12	State Police		78				3	5	22	44	21	9	10	3	9
12		1	77					7	20	46	17	7	10		2
	COUNTY TOTAL	6	78	7		12	34	54	590	1407	157	156	15	44	608
		4	77	3	10	11	21	94	473	1409	160	122	19	62	502
	DISTRICT 8 TOTAL	50	78	9	2	50	126	415	2390	5910	610	575	130	133	2098
		42	77	8	17	51	97	328	2057	5863	540	548	120	147	1456

TABLE L-11(CONTINUED)

PART II OFFENSES — DRUG ABUSE ARRESTS

EMBEZZLEMENT	STOLEN PROPERTY	VANDALISM	WEAPONS	PROSTITUTION	OTHER SEX OFFENSES	DRUG ABUSE TOTAL (ARRESTS)	NARCOTIC (ARRESTS)	MARIJUANA (ARRESTS)	SYN. NARCOTIC (ARRESTS)	DANG. DRUGS (ARRESTS)	GAMBLING	FAMILY OFFENSES	DUI (ARRESTS)	LIQUOR LAWS (ARRESTS)	DISORDERLY CONDUCT (ARRESTS)	ALL OTHER (EXCEPT TRAFFIC)	CURFEW & LOITERING (ARRESTS)	RUNAWAY JUVENILE
12	13	14	15	16	17	18	181	182	183	184	19	20	21	22	24	26	28	29
	6	720	26		62	137	8	119	1	9	1	15	308	40	45	885		201
1	5	706	23	1	31	135	6	119		10	2	7	227	48	30	676		409
	4	229	2		10	100	1	96	2	1		6	103	133	19	272	22	52
	2	257	4		19	268	4	256	3	5		1	128	257	37	237	45	35
		3														3		1
		186	19	1	3	27		24		3		2	42	18	18	176	32	17
	3	184	7		9	41	1	39	1				28	37	18	160	17	41
		63			4	14		12		2		1	1	8	18	43	1	16
	2	44	3			18		16		2		4	2	21	17	33		19
		25	2			2	1	1					15	2	10	1		
		116	4		2	8		4	1	3			20	3	10	2	3	1
28	11	846	45	3	107	251	8	218	3	22	1	46	367	345	226	1420	18	176
26	16	931	78	1	90	166	6	142	1	15	6	24	263	251	247	2349	79	199
		21			1	7	5	2					14	2	2	5		1
		15				5		5				1	14	5		8		6
		24	1		1	14		13		1		2	4	5	1	48		6
		7				1		1				1	4			11		1
		16	1		1								5			6		4
		19				1		1					2		2	6		
		16			3	2		2						2	9	5	3	
		23				5		5						3	10	21	4	4
		27	13		3	174		167		7	1		773	95	12	18		17
		36	10			218	3	204		11			1353	67	13	25	1	10
28	21	2176	109	4	195	728	23	654	6	45	3	72	1652	650	360	2882	76	489
27	28	2238	129	2	151	866	22	792	6	46	8	38	2041	702	384	3520	149	629
	1	162	5		16	78	2	70		6		22	166	57	17	117		109
		124	2		10	54		59	1	4			86	18	26	101		167
	1	40	1		4	11		6	4	1		1	27	6	13	24	1	8
	1	56	1	1		11		11				3	13	11	31	30	3	14
1		275	10		26	87	2	80	1	4		5	177	110	84	206	4	110
		273	8		24	114		106	1	7		5	170	80	95	175	3	123
	3	22	5		2	101	4	94		3			420	27	10	21		3
		9	5		1	151	3	127		21			524	45	8	6		12
1	5	499	22		48	277	8	250	5	14		28	790	200	119	368	5	230
	1	462	16	1	35	340	3	303	2	32		8	793	154	160	312	6	316
29	26	2675	131	4	243	1005	31	904	11	59	3	100	2442	850	479	3250	81	719
27	29	2700	145	3	186	1206	25	1095	8	78	8	46	2834	856	544	3840	155	945

MEDICAL SERVICES

EMERGENCY MEDICAL

At present, emergency medical services are available through 1) various fire district programs, 2) law enforcement personnel training in first aid, 3) ambulance personnel, and 4) emergency room services at the two hospitals, and 5) search and rescue service.

Fire Districts: The Wolf Creek Rural Fire Department has a state-supported emergency services program. Three men have received emergency medical technician (EMT) training and some 20 men have received Crash-Injury-Maintenance (CIM) training in addition to general first-aid. The Wolf Creek Fire Department does have a rescue vehicle (donated) which houses numerous tools, first-aid equipment, and a portable oxygen unit.

The Illinois Valley Fire Department has eleven men with EMT training and approximately eight with CIM training. They also have a rescue vehicle which contains a generator, an assortment of power tools, first aid equipment and a portable oxygen unit.

The City of Grants Pass Fire Department also has a rescue vehicle. Three men have EMT training and all firemen have received first-aid training. The department has six first-aid instructors (of varying degree). The two lead pumpers contain rescue equipment in the form of oxygen, first-aid kits, backboards, generators, minor hand tools, blankets, etc.

AMBULANCE / EMERGENCY TRANSPORT SERVICE

Two ambulance services operate in Josephine County: Action Ambulance (headquarters in Grants Pass with sub-station in Cave Junction) and Grants Pass Rural Fire Department Ambulance (headquarters in Grants Pass with a sub-station at Jenkins-Redwood Avenue. Each of the employees of these services has received or is in the process of acquiring EMT training.

Inland Helicopter Service is also available for transport from difficult access locations. The Search and Rescue operation (previously discussed) also provides transport from difficult access locations.

HOSPITALS / CLINICS

Two accredited hospitals are located in Josephine County. Josephine Memorial Hospital, with 81 beds, and Southern Oregon General Hospital, with 46 beds, are located within the Grants Pass City Limits. Both hospitals have plans for expansion.

Medical services are also provided by the County Health Department, the Illinois Valley Medical Clinic, the Deer Creek Clinic in Selma, and the Takilma People's Clinic.

JOSEPHINE GENERAL HOSPITAL

In 1977, Josephine General Hospital elected to segregate itself from county ownership and became an independent organization. The hospital supports 81 beds, (predominantly semi-private) 80 medical/dental personnel and 260 other employees.

The hospital occupancy rate has averaged 75% full over the last four years with approximately 50% of the patients receiving Medicare and 10% receiving Medicaid. Usage increases slightly during the spring.

Primary use of the hospital has been for (in order of use) heart disease/attacks, vascular problems, orthopedic problems, malignant tumors. In addition, there has been great demand for respiratory therapy.

In addition to the general services offered, the hospital also provides obstetric services, obstetric educational programs, 24-hour emergency room facilities, a rehabilitation team (i.e. physical & speech), and out patient services. Presently, there are 1100-1400 emergency visits per month.

A study is planned to be conducted on mill workers for stress, sawdust inhalation, smoking, etc.

The hospital has noted a need for 1) additional allocation of space to ancillary services within the hospital probably during the next 5 to 10 years and 2) additional nursing home accommodations.

SOUTHERN OREGON GENERAL HOSPITAL

This hospital supports 46 beds, 80 nurses and 85 other technical and service personnel. The hospital occupancy rate has averaged 80% with approximately 50% of the patients receiving Medicare. Usage is constant year-round with slightly heavier usage during the winter.

Primary use of the hospital is for respiratory ailments and cardio-vascular problems.

In addition to general services, the hospital also offers 24-hour emergency room facilities, stress test-

ing for pulmonary functions and has requested approval for acquisition of a holter (24-hour heart monitoring) system. The hospital has noted a larger than average number of occurrences of colon cancer. A study has been proposed.

DEVELOPMENT CONCERNS

All large purchases or expenditures for hospitals are required to be reviewed for consistency with the Oregon State Health Plan to avoid duplication of services in a local area, thereby, supposedly, providing more satisfactory levels of service for the total amount of money expended. This situation could, however, create a problem as 1) allocations are given to areas of higher densities/need and 2) large areas are considered to be within a use unit with such criteria.

Josephine County residents may require services which are only available in the larger urban area of Medford. The County does not have a CAT scanner (brain scanner in Medford, body scanner in Eugene), radiation therapy for cancer patients or the terminally ill, or a dialysis machine.

As is to be expected, the total number of hospital users has increased since 1970 (about 4% per year), but the length of stay has decreased. This has been due to 1) changes in physician attitude regarding the necessity of stay or prolonged stay in the hospital, 2) more outpatient treatment, 3) hospital costs, 4) greater health awareness nationally and 5) State utilization review and certification of stay. Josephine County's average hospital stay is of the longest duration in the State of Oregon. This does, however, demonstrate the need for additional nursing home facilites for posthospital care.

A potential problem that does exist with existing hospital facilities is their location in that 1) they are located a considerable distance from community nodes scattered throughout the County and 2) they are both located north of the river requiring a bridge crossing. As yet, neither hospital has experienced any problems with this situation. A large portion of the solution to this problem is good, in-transit, paramedic care.

Another potential solution could be the development of small-scale primary care clinics (i.e. care for cuts,

burns, other out-patient care) south of the river, and in the north and south portions of the County. Development of these, however, requires full documentation of need and demonstration of cost-effectiveness. Because of costs, such clinics would probably need to be connected to an existing hospital, to better accommodate the medical needs.

PHYSICIANS AND CLINICS

There are approximately 44 physicians and 34 dentists in Josephine County, the vast majority being located within the Grants Pass Urban Growth Boundary. Two physicians and two dentists are located in Cave Junction.

Several "clinics" are located throughout the county; clinic being defined as "an institution associated with a hospital and dealing chiefly with out-patients and/or a center that offers counsel or institution" (American Heritage Dictionary, 1973).

The County Health Department maintains a community-service clinic whose services include public health care for communicable diseases, planned parenthood, counseling, immunization program, venereal disease checks, well-baby care, Medicare health checks, and home-care. The main clinic is located in central Grants Pass and a small sub-clinic is located in central Cave Junction. The County's Drug Council also provides counseling and aid for drug and alcohol abuse.

Many doctors in the Grants Pass area and the two physicians in Cave Junction have joined to form clinics. These are primarily co-operative doctor's offices.

The Takilma Clinic is a non-profit organization which provides many of the services offered by the County Health Department in addition to primary health care and some lab work-up costs are defrayed through contributions.

Several areas (notably Murphy, Williams and Wolf Creek), in the past, have considered invitation of physicians (primarily recent graduates) to establish offices/clinics in rural areas. A rotational clinic would appear to also provide some relief for these rural areas. This could decrease the need for additional trips into Grants Pass.

To summarize, the majority of health care facilities are located in Grants Pass as correlated to the majority of the population. Facilities to outer areas are, however, meager. This and the river crossing situation could prove to be a problem in the future. There would appear to be a need for coordination of health care services (state and local) and county adoption of a health service policy to support community services in the appropriation of medical services and equipment.

LIBRARIES

The Josephine County Library, erected in 1959, is situated across from the County Courthouse between "B" and "C" Streets. It is responsible for providing educational recreational materials and services for all ages and serves as a research and information center for Josephine County. As such, the library houses adult, processing, circulation, and juvenile departments, offices, and a meeting room used for film programs, school classes, and story hours, and public meetings.

For the convenience of county residents, branch libraries have been located in Cave Junction, Wolf Creek and Williams.

The library book collection consists of a total of 121,591 volumes: 93,654 adult volumes and 27,937 children's volumes. The library subscribes to 248 periodicals and 22 newspapers. It has 3,732 sound recordings and 33 periodicals on microfilm. Further, micro-film reader-printers and a photo-copier are available for use by the public. The library offers other special services including film programs for adults and children, story hours, a children's summer reading program, and a weekly program for Senior Citizens.

The County library system participates in the Southern Oregon Library Federation which consists of 12-year and higher education libraries and other public libraries in the area. The purpose is to share library resources and services. For example, patrons holding Josephine County Library cards may use them free of charge in any of the Jackson County libraries. Through state membership in the Pacific Northwest Bibliographic Association, Josephine County is eligible to use the library resources of all the large libraries in the Pacific Northwest.

The Josephine County Library System provides services to area nursing homes and retirement residences and maintains a Jail Library program.

In addition to this library system, "specific topic libraries" are maintained by various government and private offices, including the County's law library, the local State Geology office's library and the Bureau of Land Management's multi-topic library.

SCHOOLS

The public schools in a community directly reflect trends in population and development. Siting of schools can benefit a rapidly-growing community, or can adversely impact traffic flows, development patterns, sewer and water facilities. Correspondingly the cost inherent in educating the public school-age residents of a community often impacts the effectiveness and viability of the educational process itself.

ENROLLMENT TRENDS

Josephine County School District's enrollments clearly reflects the County's high growth rate. As the following table shows, all grades in the County school district have experienced considerable increase in enrollment.

TABLE S-1

SCHOOL ENROLLMENT & PERCENTAGE OF CHANGES
GRANTS PASS & JOSEPHINE COUNTY
(1960-1975)

	1960	1965	% Change 60 - 65	1970	1978	% Change 70 - 78
Grants Pass						
Grades						
1 - 8	2,638	2,956	12.1%	2,739	2,569	- 6.2%
9 - 12*	889	N/A	--	1,294	1,383	6.4%
Josephine County						
Grades						
1 - 8	2,291	2,818	23.0%	3,003	4,398	31.8%
9 - 12**	911	N/A	--	1,406	2,040	31.1%

*Does not include county tuition students.
**Includes tuition students actually attending Grants Pass schools.

SOURCE: Correspondence, Josephine County Schools and Grants Pass Public District #7, 1979.

In spite of population increases, city schools have experienced decreasing enrollments in grades one through eight. This apparently reflects the nationally declining birth rate as well as the local residential pattern of high senior occupancy in urban areas and restricted city development potential. This has not affected county schools where in-migration has continued to swell enrollments at all grade levels.

As the city expands its boundaries, school enrollments may again show substantial increases. The county school district is expected to continue experiencing increases at most (or all) grade levels as in-migration trends continue to generate population growth.

ENROLLMENT BY LOCATION

School enrollments (by location) reflect the general trend of growth occurring in the Grants Pass and county areas. The following table and map address each of the schools.

TABLE S-2

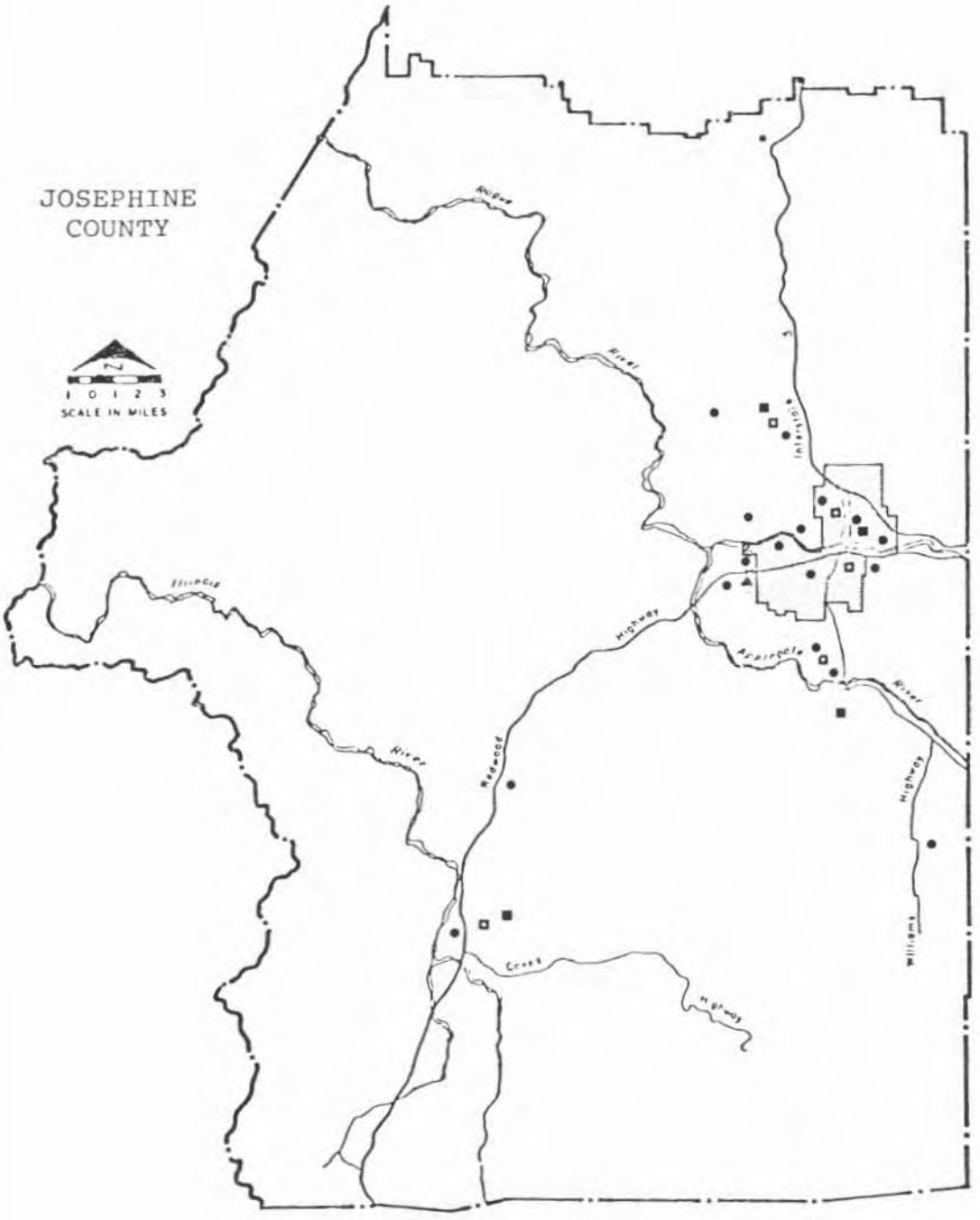
DISTRICT 7 SCHOOL ENROLLMENTS

	1960*	1965*	1970*	1975*	1978
Allendale	--	--	312	316	296
Grants Pass High School	1213	1748	1847	2074	1383
Highland	383	443	274	318	333
Lincoln	480	492	396	376	420
North Middle School	438	607	530	611	548
Redwood	617	738	366	329	249
Riverside	250	292	397	325	318
Roosevelt	138	140	135	146	-
South Middle School	517	587	589	526	405
Washington	188	207	185	157	-

* Includes County Unit tuition students.

As can be noted in the above table, a significant decrease in enrollment at Grants Pass High School occurred in 1978. This decrease was the result of the completion of construction of three new County Unit high schools which accommodated those students who previously attended the District 7 high school in Grants Pass.

MAP S - 3



SCHOOLS

- ● ELEMENTARY
- ▫ MIDDLE
- ■ HIGH
- ▲ COLLEGE
- G.P. SCHOOL DIST. # 7
- JO. CO. SCHOOL DIST.

The following table reflects the addition of the three high schools to the County Unit District, and details the distribution of the studens throughout the County.

TABLE S - 4

COUNTY STUDENT POPULATION

	1960*	1965*	1970*	1975*	1978
Illinois Valley High School	215	258	281	424	428
Fleming Middle School	--	364	380	593	645
Lincoln Savage Middle Sch.	--	489	558	643	674
Evergreen	109	83	550	735	456
Fort Vannoy	187	185	233	303	311
Fruitdale	316	355	261	301	274
Hugo	89	95	--	--	--
Jerome Prairie	343	302	310	260	273
Kerby	363	402	--	--	--
Madrona	--	--	179	289	239
Manzanita	--	--	456	440	427
Merlin	188	171	--	115	134
Murphy	285	293	216	236	198
Selma	76	99	80	137	150
Wilderville	61	74	--	--	--
Williams	112	75	73	114	158
Wolf Creek	114	78	78	102	119
Hidden Valley High School	--	--	--	--	832
North Valley High School	--	--	--	--	788
Lorna Byrne Middle School	--	--	--	--	340

*Does not include tuition students attending Grants Pass, District 7, schools.

PROJECTIONS

In 1978, the County School District contracted for a school facilities study. In addition to demographic data and district value assessments, the study also provided historic and projected enrollment figures.

TABLE S-5

PROJECTED COUNTY SCHOOL DISRICT
POPULATION AND ENROLLMENTS

Year	District Population[1]	% of County	District Enrollment *
1968	17,973	49.24	4,096
1969	18,261	50.74	4,225
1970	18,298	51.19	4,450
1971	19,768	54.07	4,946
1972	21,537	55.94	5,297
1973	24,390	57.66	5,455
1974	26,487	58.73	5,525
1975	26,927	59.05	5,714
1976	28,685	60.67	5,979
1977	32,006	62.88	6,329
1978	34,300	64.34	6,624
1979	36,736	65.80	6,903
1980	39,327	67.26	7,142
1981	42,084	68.72	7,347
1982	45,006	70.18	7,637
1983	48,120	71.64	7,900
1984	51,418	73.10	8,236
1985	54,928	74.56	8,524

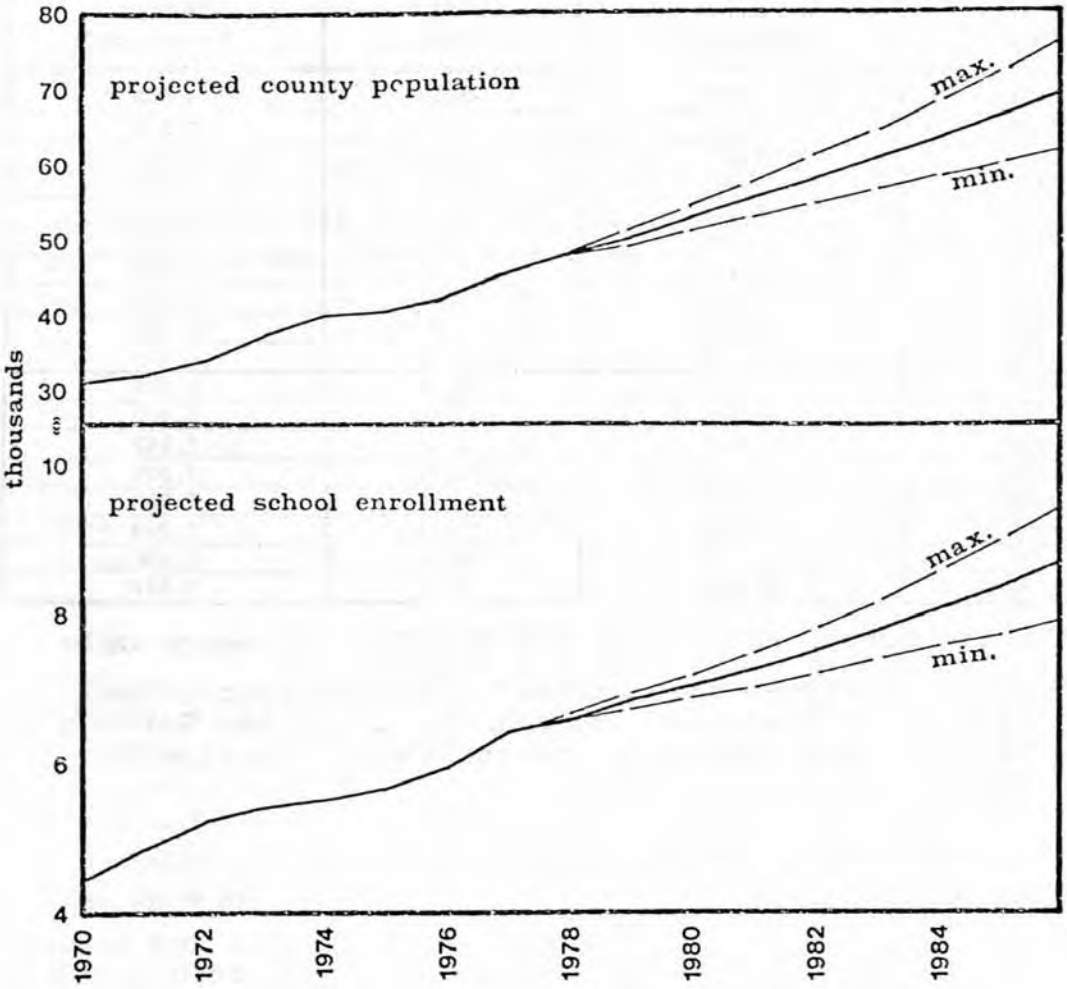
*Public School Enrollment for Resident Students Only

SOURCE: Patterson and Stewart, "Demographic-School Facilities Study for Jackson Co. Education Service District and Josephine County School District", 1978.

GRAPH S-6

POPULATION AND COUNTY SCHOOL ENROLLMENT PROJECTIONS

TOTAL JOSEPHINE COUNTY POPULATION PROJECTION



PROJECTED SCHOOL ENROLLMENT (September)

JOSEPHINE COUNTY SCHOOL DISTRICT

SOURCE: Ibid

NOTE: See Social Characteristics Chapter for discussion on population projections.

A review of individual schools and their projected enrollments gives us an indication of the need for new schools. Many County District schools are already using relocatable (relo) classrooms. In reviewing the following table, it should be kept in mind the Board of Education has set recommended maximum capacities for schools: elementary schools - 500; middle schools - 700 to 750; and high schools 2000 to 2400.

TABLE S-7

JOSEPHINE COUNTY SCHOOL DISTRICT

CAPACITY AND PROJECTED ENROLLMENTS PER SCHOOL

B = Beyond Capacity
N = Near Capacity (within 30 students)
A = Can accommodate over 30 more students

	1978	1979	1980	1981	1982	1983	1984	1985	School Capacity		9/79
Fort Vannoy (1-5) Elementary (1-6) thru 76/77 Year	344	351	374	381	367	374	372	390	A	270+ 1 relo = 370	336
	8 Year estimated growth = 43 = 12.76%										
Fruitdale (1-5) Elementary (1-6) thru 76/77 Year	304	332	360	366	380	392	396	412	N	270	242
	8 Year estimated growth = 108 = 33.33%										
Jerome Prairie (1-5) Elementary (1-6) thru 76/77 Year	251	263	271	276	321	368	404	456	A	270	237
	8 Year estimated growth = 207 = 83.13%										
Madrona (1-5) Elementary (1-6) thru 76/77 Year	241	251	264	264	272	271	276	283	N	270	246
	8 Year estimated growth = 58 = 25.78%										
Manzanita (1-5) Elementary (1-6) thru 76/77 Year	396	401	402	420	477	521	554	604	A	405	452
	8 Year estimated growth = 217 = 56.07%										
Merlin Elem. (1-3) (1-4) 74/75 Year (1-5) 75/76 and 76/77 Yrs.	138	136	141	142	154	176	202	216	N	135	120
	8 Year estimated growth = 114 = 111.76%										
Murphy (1-5) Elementary (1-6) thru 76/77 Year	183	193	196	192	185	177	178	173	A	270	202
	8 Year estimated loss = -19 = 9.80%										
Selma (1-5) Elementary	149	153	172	171	165	164	164	166	A	180	138
	8 Year estimated growth = 24 = 16.90%										
Wilderville (1-5) Elementary											
Williams Elem. (1-5) (1-6) 68/69 Year (1-4) 70/71 thru 73/74	153	150	144	137	114	107	115	117	N	158+ 1 relo = 183	157
	8 Year estimated loss = -29 = -19.86%										
Wolf Creek (1-5) Elementary (1-6) 71/72 thru 76/77	116	127	134	142	153	154	159	162	N	135	123
	8 Year estimated growth = 63 = 63.64%										

TABLE S-7 (CONTINUED)

	1978	1979	1980	1981	1982	1983	1984	1985	School Capacity		9/79
Hidden Valley High School (9-12)	923	993	974	1001	1025	1067	1150	1224	B	900	967
	8 Year estimated growth = 393 = 47.29%										
Illinois Valley High School (9-12)	437	467	468	481	498	523	567	581	B	450	472
	8 Year estimated growth = 196 = 50.91%										
North Valley High School (9-12)	828	874	898	921	967	960	994	999	B	720	833
	8 Year estimated growth = 207 = 26.14%										
Fleming Jr. High (6-8) (7-9) 68/69 thru 76/77	644	638	672	684	705	735	755	782	N	495+ 6 Relo = 645	628
	8 Year estimated growth = 131 = 20.12%										
Lincoln Savage Jr. High (6-8) (7-9) 68/69 thru 76/77	661	691	754	824	872	902	926	927	N	585+ 1 relo = 610	628
	8 Year estimated growth = 264 = 39.82%										
Lorna Byrne Junior High (6-8)	349	358	384	406	424	441	452	460	B	338	380
	8 Year estimated growth = 113 = 32.56%										
Evergreen Elementary (1-5) (1-8) thru 75/76 Year	453	469	476	479	495	503	505	515	A	540	490
	8 Year estimated growth = 84 = 19.49%										

SUMMARY:	1978	1979	1980	1981	1982	1983	1984	1985
Secondary (6-12)	3842	4021	4150	4317	4491	4628	4811	4973
Elementary (1-5)	2723	2826	2934	2970	3053	3207	3325	3384
Special (Not Classified)	57	56	58	60	63	65	67	67
Total District*	6621	6903	7142	7347	7607	7900	8236	8524
	8 Year estimated growth = 2195 = 34.68%							
Non-Residents Students In County District Schools*	No reliable statistical method exists on which to estimate future non - resident enrollment.							

*Non-district students are not included in this count.

SOURCE: Ibid.

A review of the preceding table indicates that County District schools are just coping with current growth and many are extending facilities beyond capacity. Obviously, a margin of extension is built into this figure; in other words, more than 900 students can be handled by a school with a 900 student design capacity. However, in September, 1979, all of the high schools were beyond capacity; all of the middle schools are near or beyond capacity, and five of the eleven elementary schools are near capacity. Four of the schools are already using relocatable classrooms. According to county school officials, at least one and perhaps three new schools may need to be constructed. Additional classroom space may be needed at several schools.

FUTURE

To accommodate accelerated growth rates and associated swelling of school enrollments, both the Grants Pass and County Unit school district are anticipating shifts of specific district boundaries as a major short term solution. This should allow more efficient use of physical plants and transportation resources. Subdivision and building activity have already generated enrollment increases at Fruitdale Elementary, Highland Elementary and North Middle schools. Off-setting this is a decrease in Riverside School, which is surrounded by an older residential area. Obviously, a future growth and impact area for either district will be the urbanizing area south and southwest of Grants Pass. Reactions of the public to increased costs, in part a result of major population increase, are one of the primary determinants of a continued capability to respond to growth demands.

Location of future schools should occur in relation to growth patterns illustrated in the Land Use and Social Characteristics chapters. The selection of specific school sites should be determined by (1) the adequacy of the site for physical plant development; (2) location in relation to planned population concentrations to reduce transportation costs; and (3) adequacy and availability of needed services to support the use of that facility.

Another consideration of the school districts, relative to classroom capacity, is kindergartens. While not currently a state or local requirement,the need for kindergartens has been identified. With kindergarten standard requirements for classroom capacity being equal

to those of a regular grade level, the increased pupil burden could have impacts on a district which is physically at capacity or crowded.

A need has also been identified for licensed day care centers where children are provided not only with "baby-sitting" services but basic educational services as well.

HIGHER EDUCATION

Higher education needs are presently met by either Rogue Community College (RCC) locally or by Southern Oregon State College (SOSC) in Ashland, Jackson County. RCC does provide curriculum for both an Associate of Arts degree and occupational programs. Other occupational and apprentice programs are also offered by independent trade groups.

SOCIAL SERVICES

One of the basic premises of land use planning is that planning is done by and for people. The capability of the land, combined with the desires of community residents, determines future lifestyles and development patterns by designating general neighborhood and community housing patterns, resource production areas, transportation forms, and other factors. Their patterns and directions (expressed in the form of a Comprehensive Plan) will determine the future quality of life in Josephine County.

Land use decisions may affect social composition of a community by determining:

1. types and amounts of employment,
2. types and amounts of recreational opportunities,
3. transportation modes and availability,
4. density and location of housing, and
5. location and efficiency of sewer water, police, fire and school services.

These determinants affect the age, profession, and in general, the lifestyle of community residents. The characteristics of the people who are in the community, the way they live, and the demands they put on the resources of the community, often produce social/psychological needs and problems that are more than families can deal with. From these needs arise special programs, i.e. church, schools, or general social services.

SOCIAL CHARACTERISTICS

A community is made up of people of different ages, backgrounds, skills, interests, etc. The percentage of individuals in any sector directly affects the interaction within a community and the demands placed upon it. Following is a listing of some of these factors and how they influence the total community.

Population: There is a direct relationship between the number of people in an area and the special programs that may be needed. As the population increases there seems to be a percentage increase in problems to which an individual cannot provide answers. When the volume of similar problems (be they juvenile delinquency, alcoholism, etc.) becomes great enough, a special program will have to be created to supplement the individual family, or other social groups.

Age: The age distribution of an area will impact the services and resources of a community. The young need schools, the old require supportive services while in between groups have their own needs.

Education: Education level influences the types of values a community has, the lifestyles it designs, the income that is brought in, the amenities it requires, and the form of public expenditure that it will accept.

Employment: There is a clear relationship between employment and social problems. In times of high unemployment there is an increase in juvenile delinquency, marital problems, suicide and crime. In an area that is susceptible to fluctuating economic cycles, the demands placed upon the community to meet these problems can be considerable.

Transience: People who move into an area without jobs or a commitment to that community may place demands on resources without contributing. Also, in many cases extended family ties and resultant support are lacking which places additional demands on the community.

In an attempt to mitigate or offset some of the social problems that have arisen from the existing community forum, a number of agencies, organizations and programs have been created. In the 1978 edition of the "Josephine County Community Resource Directory" published by the Josephine County Council on Drug Abuse, 245 programs have been identified. Because of the relationship between the community and the land, any alteration of the uses of land and resources will have some impact on the problems that these groups are trying to alleviate.

In some cases the impact may not be direct, but by re-adjusting people's relationship to the land there could be an effect on community problems and the services that have developed to mitigate them. Examples of this are:

1. By placing people closer together so a more effective use is made of the land and public facilities (water, sewer, etc.) an increase in emotional/social problems may result from closer physical contact.

2. If the decision is made to reduce "polluting industry" and no active steps are taken to encourage other industry, younger workers may leave and the number of retired people may increase. Thus, there would be a shift in required services and the type of public programs and services needed.

3. The increasing of density could demand expanded public facilities and the creation of new ones, e.g. mass transit, to the point that tax support may be necessary.

COMPREHENSIVE PLAN DECISIONS

There is a wide range of comprehensive plan decisions that can be made that will influence the above factors. As well as impacting the specific factors, the decision will affect how one factor interacts with others.

Decisions can be made as to the number of people that will live in the County, how they will be employed, where they will be employed, where they live, age, etc. As shown above each one of these places a demand on the total community and its resources. The problem then becomes "what response does the community want to make and to what degree does it want to mitigate the impact?"

Thus, conscious decisions can be made about community composition and community direction. Inherent in these decisions are social/psychological problems that may be beyond the ability of existing community structure to contend with. Specific social programs can be created:

1. as an attempt to prevent problems from arising,
2. to alleviate problems before they reach crisis proportions, or
3. as an emergency response to crisis situations.

Before making decisions as to when social programs should be implemented, the basic cause-and-effect relationships discussed earlier must be understood.

EXISTING PROGRAMS

Examples of health- and medical-related community support groups currently functioning are:

1. Adult and Family Services Division (Oregon State Public Welfare): provides financial aid and medical assistance to qualifying adults.
2. Josephine County Health Department: Medicheck program, well-child clinic, WIC (Women-Infants-Children) program, immunization, pregnancy testing and counseling, family planning, venereal disease clinic, home health agency and homemaker service.
3. Josephine County Council on Drug Abuse: education/resource center and treatment.

Examples of activity-oriented groups are:

1. Senior Citizens Club of Grants Pass
2. Sweet Adelines (choral group)
3. Illinois Valley Fine Arts, Inc.
4. Barnstormers Little Theater Group

Many, many other groups exist that address nearly any kind of education, social, or medical need that can be found in our community.

RECREATION

Recreation types are as varied as human personalities. Wild rivers, libraries, rustic lodges, museums, and taverns (to mention just a few) are all utilized as recreation sites in Josephine County. This element will address many types of recreation, but will concentrate on outdoor-oriented activities that utilize special facilities (whether developed or primitive).

Josephine County is unique, in that it has a higher population of senior citizens compared to the state average. This may indicate special needs for non-strenuous, easily accessible recreation activities and facilities. The Josephine County Parks Department, partially in recognition of this need, is developing a series of park sites along the Rogue River (with a few scattered in other areas of the County). Increased travel costs for the public in general may force local residents to concentrate more recreational activity in these close-to-home sites as well.

Federal designation of the Rogue as a National Wild and Scenic River had drawn national attention to the area. The fish resources, proximity to urban areas, and character of the Rogue River (and other rivers in the County) make these waters popular with local residents as well.

The Oregon Caves National Monument is another significant attraction and delightful recreational experience.

According to the U.S. Forest Service, in their "Rogue-Illinois Planning Unit Draft Environmental Statement" (November, 1978):

> "An analysis of southwest Oregon recreation use shows a demand trend which increases 200% by the year 2000 for dispersed types of recreation. A 175% increase in use is projected for developed recreation sites."
>
> "Research indicates a shift on the part of the recreating public toward a demand for more primitive recreation opportunities."

Apparently, then, the need for <u>both</u> developed and undeveloped (or primitive) types of recreation are

justified in the County, and new sites should be made available as demand increases.

(NOTE: Throughout this section, facilities listed as "Josephine County" may actually be within the Urban Growth Boundaries of Grants Pass and Cave Junction. They are presently outside the city limits, however, and are listed on that basis.)

PARKS

Park sites may offer softball fields, picnic tables, boat ramps, or other facilities, and often in combination. In 1976, the Parks and Recreation Branch of the Oregon State Department of Transportation inventoried parks by administering agency and park type in Josephine County.

Table RC-2 is an inventory of all outdoor recreational facilities available in Josephine County in 1976.

TABLE RC-1

JOSEPHINE COUNTY PARK TYPE BY ADMINISTERING AGENCY (IN ACRES)

Park Type	City	County	State	Federal	Private Non-Prof.	Private Prof.	Park Type Total
1. Neigh. PK.	15	1	0	0	0	0	16
2. Comm. PK.	78	0	0	0	0	0	78
3. Dist. PK.	0	1,200	178	0	0	0	1,378
4. Reg. PK.	0	300	0	0	0	0	300
5. Nat. Res. PK.	0	178	0	480	0	0	658
6. Hist. Res. PK.	2	0	3	0	0	0	5
7. Mult. Res. A.	0	0	7,326	717,026	0	0	724,352
8. Mult. Res. A. (Rec.)	0	0	0	91	0	0	91
9. Wayside	2	129	918	0	0	0	1,049
10. Spec. Purp. A.	0	0	0	0	80	732	812
AGENCY TOTAL	97	1,807	8,425	717,597	80	732	

1. Neighborhood Park
2. Community Park
3. District Park
4. Regional Park
5. Natural Resource Park
6. Historical Resource Park
7. Multiple Resource Area
8. Multiple Resource Area (recreation)
9. Wayside
10. Special Purpose Area

SOURCE: Oregon Outdoor Recreation Supply Bulletin, 1976.

TABLE RC-2

JOSEPHINE COUNTY RECREATION FACILITIES BY ADMINISTERING AGENCY

Rec. Fac.	City	County	State	Federal	Private Non-Prof.	Private Prof.	Rec. Fac. Total
Campsite	0	264	0	117	100	606	1,087
Pic. Ta.	118	511	25	19	0	0	673
Hik. Tra. Mi.	0	17.0	0	28.0	0	5	50
Bik. Tra. Mi.	0	0	0	0	0	0	0
Brid. Tra. Mi.	0	0	0	0	0	0	0
ORV Tra. Mi.	0	0	0	0	0	0	0
Golf Holes	0	0	0	0	0	27	27
Tennis Cts.	4	0	0	0	0	0	4
All Purp. Cts.	3	0	0	0	0	0	3
Ballfields	4	4	0	0	0	0	8
Tot Lots	4	0	0	0	0	0	4
Beach Ft.	0	0	0	0	0	0	0
Shoremile	.60	4.91	.25	42	0	0	47.76
Paved Lans.	3	18	0	1	0	0	22
Unpaved Lans.	3	5	0	0	0	0	8

SOURCE: Ibid.

NATIONAL PARK SERVICE

The National Park Service administers the Oregon Caves National Monument, an outstanding geological attraction in the southern section of the County. A private organization operates concession and lodging facilities at this site.

TABLE RC-3

OREGON CAVES NATIONAL MONUMENT

Annual Attendance: 1970 - 1975

(Fiscal Year November 1 - October 31)

1970	107,455
1971	114,226
1972	122,817
1973	107,896
*1974	93,079
1975	100,777

*Low figure perhaps due to gasoline shortage of 1973.

STATE OF OREGON

The Parks and Recreation Branch of the Oregon Department of Transportation administers two parks in Josephine County. One of these, Illinois River State Park, is managed by the State Forestry Division. The other is an unimproved area near the Jackson County line, in the vicinity of the freeway. For administrative purposes, the property is included with Valley of the Rogue State Park which is located within Jackson County.

The Parks and Recreation Branch also manages the Wolf Creek Tavern which has been restored to provide eight guest rooms, a restaurant and conference rooms. Four other waysides are State-owned: Gateway, Mackin Gulch Forest, Rough and Ready, and Stagecoach Forest.

The State of Oregon has classified 84 miles of the Rogue River (from the Applegate confluence downstream to Lobster Creek) and 46 miles of the Illinois River (from Deer Creek to the confluence with the Rogue) as Scenic Waterways. This designation requires the State to regulate all proposed land use changes within the delineated boundaries.

JOSEPHINE COUNTY

Table RC-4 denotes parks administered by Josephine County. The majority of the sites are on county-owned lands; however, some of the sites are leased from the Bureau of Land Management. Map RC-5 shows the locations of the 25 county parks and Table RC-6 compares 1978 to 1977 usage of parks administered by Josephine County. Whereas usage increased 12% during that time, camp receipts increased only 5.8%.

The origin of park users is shown in Table RC-7. Use by Californians was significantly high in 1971. Since then, California use has decreased 12%, whereas, Oregon residents use has significantly increased by 14%.

TABLE RC-4

PARKS ADMINISTERED BY JOSEPHINE COUNTY

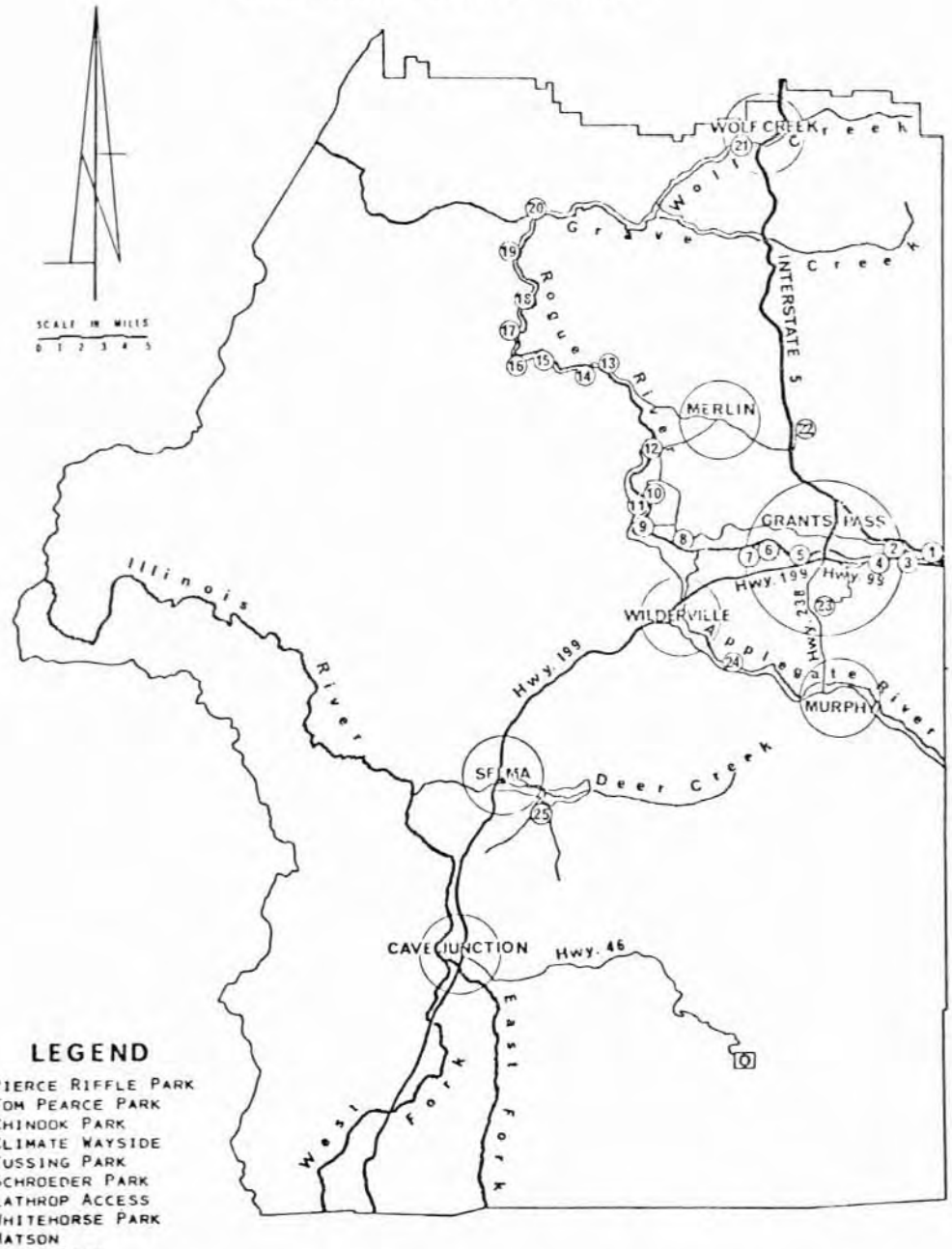
	Total Acreage	Developed Acreage	Tent Sites	Elect. & Water	Elect.	Elect., Water & Sewer	Shelter	Elect.	Picnic Sites /Tables	Grills	Garbage Cans	Flush	Chemical	Pit	Vault	Fountains /Faucets	Well	Turf Irrigation	Parking Spaces	Boat Ramp
Almeda Bar	27.9	4.0	10	0	0	0	0	0	8/7	2	8	0	0	0	4	0/0	1	no	30	yes
*Argo Rec. Area	82.7	20.0	0	0	0	0	0	0	0/0	0	1	0	0	1	0	0/0	0	no	0	no
*Carpenter Island	4.0	1.0	0	0	0	0	0	0	1/0	0	0	0	0	0	0	0/0	0	no	0	no
Cathedral Hills	400.0	400.0	0	0	0	0	0	0	1/1	0	1	0	0	0	1	0/0	0	no	10	no
Chinook Park	2.43	.5	0	0	0	0	0	0	5/8	4	2	0	0	0	2	0/0	1	yes	10	yes
Climate Wayside	.4	.4	0	0	0	0	0	0	3/2	0	1	0	0	1	0	0/0	0	no	3	no
Ennis Riffle	50.1	1.0	0	0	0	0	0	0	2/0	0	1	0	1	2	0	0/0	0	no	10	yes
Fish Hatchery Park	177.79	20.0	0	0	0	0	0	0	20/8	5	0	0	0	2	4	0/0	3	no	100	no
Foothill Access	4.0	.0	0	0	0	0	0	0	0/0	0	0	0	0	0	0	0/0	0	no	30	[illegible]
Galice			0	0	0	0	0	0	0/0	0	5	0	0	0	0	0/0	0	no	0	yes
*Grave Creek	22.85	10.0	0	0	0	0	0	0	0/0	0	1	0	2	0	0	0/0	0	no	30	yes
Griffin Park	16.09	10.0	16W	0	0	0	1	2	20/27	22	17	0	0	0	6	1/8	2	yes	20	yes
* Holligate	27.0	5.0	0	0	0	0	0	0	5/0	0	1	0	0	0	0	0/0	0	no	0	no
Hog Creek	1.53	.1	0	0	0	0	0	0	0/0	0	0	0	0	0	0	0/0	0	no	10	yes
Illinois Valley	40.0	4.0	6	0	0	0	0	0	6/0	0	0	0	0	0	0	0/0	1	no	0	no
Indian Mary	61.0	41.0	35W	13	4	41	1	6	158/150	102	114	20	0	2	2	7/8	2	yes	30	yes
Irrigation Park	5.0	5.0	0	0	0	0	0	0	0/0	0	0	0	0	0	0	0/0	0	no	0	no
Lake Selmac	300.0	50.0	65W	0	0	1	1	2	118/161	100	70	6	0	12	18	3/74	0	yes	40	yes
Lathrop Access	2.0	.1	0	0	0	0	0	0	2/1	0	0	0	0	0	0	0/0	0	no	8	yes
Matson Park	7.31	3.0	0	0	0	0	0	0	8/4	0	2	0	0	2	0	0/0	1	no	10	yes
Tom Pearce Park	108.0	9.0	0	0	0	1	3	6	/79	7	26	8	0	0	3	2/6	1	yes	142	no
Pierce Riffle	23.0	23.0	0	0	0	0	0	0	2/2	3	2	0	0	0	2	0/0	1	no	50	yes
* Rand Rec. Area	26.0	5.0	0	0	0	0	0	0	2/3	0	3	0	0	2	0	0/0	0	no	20	yes
Robertson Bridge	.74	.1	0	0	0	0	0	0	1/0	0	2	0	0	0	2	0/0	0	no	30	yes
Schroeder Park	24.0	6.0	34W	0	0	29	1	0	54/47	30	39	8	0	0	2	2/29	1	yes	10	yes
Silver Creek	21.95	.0	0	0	0	0	0	0	0/0	0	0	0	0	0	0	0/0	0	no	0	no
Sixth St. Triangle	.50	.5	0	0	0	0	0	0	2/2	0	3	0	0	0	0	0/0	0	yes	0	no
Sportsman Park	220.0	105.0	0	0	0	0	0	0	32/59	0	20	8	1	5	0	1/14	1	yes	200	no
Sucker Creek	40.0	.0	0	0	0	0	0	0	0/0	0	0	0	0	0	0	0/0	0	no	0	no
Sunny Valley	.1	.1	0	0	0	0	0	0	0/0	0	1	0	0	0	0	0/0	0	no	2	no
Tussing Park	1.2	.1	0	0	0	0	0	0	2/1	1	1	0	0	1	0	0/0	0	no	6	no
Upper Ferry	4.3	1.0	0	0	0	0	0	0	2/1	0	1	0	0	1	0	0/0	0	no	15	yes
Whitehorse Park	24.5	10.0	30W	0	0	8	1	2	63/45	54	25	6	0	0	2	0/16	2	yes	50	no
Wolf Creek Park	80.0	10.0	30W	0	0	2	1	0	15/27	24	20	0	0	0	4	0/9	1	no	30	no

*Leased Sites

SOURCE: Josephine County Parks Department.

MAP RC-5

JOSEPHINE COUNTY PARKS



LEGEND

1 PIERCE RIFFLE PARK
2 TOM PEARCE PARK
3 CHINOOK PARK
4 CLIMATE WAYSIDE
5 TUSSING PARK
6 SCHROEDER PARK
7 LATHROP ACCESS
8 WHITEHORSE PARK
9 MATSON
10 FERRY PARK
11 GRIFFIN PARK
12 ROBERTSON BRIDGE ACC.
13 HOG CREEK ACCESS
14 INDIAN MARY PARK
15 ENNIS RIFFLE
16 CARPENTER'S ISLAND
17 RAND (BLM)
18 ALMEDA PARK
19 ARGO
20 GRAVE CREEK ACCESS
21 WOLF CREEK PARK
22 SPORTSMAN PARK
23 CATHEDRAL HILLS PARK
24 FISH HATCHERY PARK
25 LAKE SELMAC PARK

0 OREGON CAVES NATIONAL MONUMENT

SOURCE: Josephine County Parks Department.

TABLE RC-6

ATTENDANCE AND CAMP RECEIPTS COMPARISON SHEET

(1978 as sompared with 1977)

		1977	1978	1977	1978
*Chinook				27,023	23,089
Climate				600	1,000
Tussing				1,500	2,000
Schroeder	Non-Campers	49,250	49,850		
	Campers	13,585	15,029	62,835	64,879
Lathrop				1,500	1,800
*Whitehorse	Non-Campers	22,500	27,250		
	Campers	5,297	4,329	27,797	31,579
Watson				8,000	8,000
Upper Ferry				10,000	10,000
*Griffin	Non-Campers	31,583	37,899		
	Campers	1,413	1,180	32,996	39,079
Robertson Bridge				9,500	9,500
Hellgate				4,500	4,700
Indian Mary	Non-Campers	73,040	74,100		
	Campers	29,188	31,032	102,228	105,132
Almeda	Non-Campers	23,084	26,700		
	Campers (est./free)	10,000	12,200	33,084	38,900
Illinois Valley Park				500	500
*Lake Selmac	Non-Campers	84,399	87,500		
	Campers - Paid	7,222	6,423		
	Campers Free (est.)	7,530	8,000		
	Campers - Resort	10,010	11,000	109,161	112,923
Silver Creek				400	300
Fish Hatchery				32,000	34,000
Sucker Creek				100	100
Irrigation Park				100	-0-
Argo				4,500	4,800
Cathedral Hills				3,000	4,000
*Grave Creek Access				19,593	22,150
Pierce Riffle				16,050	17,000
*Wolf Creek	Non-Campers	37,358	40,093		
	Campers - Paid	652	1,910		
	Campers - Free (est.)	600	-0-	38,610	42,003
Ennis Riffle				7,750	8,000
Carpenter's Island				1,000	1,200
Rand Recreation Area				6,400	6,500
Hog Creek Landing				11,440	12,000
*Sportsman Park				26,920	24,728
Tom Pearce Park				12,000	54,926
				611,087	684,788

SUMMARY

	1977	1978	Percent Increase/Decrease
Non-Campers	525,590	593,685	13.0% Increase
Paid Campers	57,357	59,903	4.4% Increase
Free Campers (est.)	18,130	20,200	11.4% Increase
Last Resort Campers	10,010	11,000	9.9% Increase
Total Use	611,087	684,788	12.1% Increase

CAMPER DOLLARS RECEIVED

	1977	1978
Facilities	$ 2,933.12	$ 3,162.85
Registration	57,519.00	60,784.50
Total Camp Receipts	$60,452.12	$63,947.35

SOURCE: Josephine County Parks Department.

TABLE RC-7

BREAKDOWN OF JOSEPHINE COUNTY PARK USAGE BY STATE

	1971	1972	1973	1974	1975
California	60%	59%	55%	52%	48%
Oregon	26%	28%	33%	38%	40%
Washington	5%	5%	5%	4%	5%
Other	9%	8%	7%	6%	7%

SOURCE: Josephine County Parks Department.

CITY OF GRANTS PASS

The City has 19 parks and an extensive recreation program, all of which are utilized by county residents as well as city dwellers. City Parks and Recreation facilities are listed in Table RC-8.

TABLE RC-8

GRANTS PASS CITY PARKS

	PARK	LOCATION	SIZE	FACILITIES
1.	Baker	E. Park Street	2.26 acres	Boat ramp and fishing(undeveloped)
2.	Bridge & 4th	Bridge & 4th Streets	.20 acres	Beautification area, benches
3.	Croxton	Memorial Drive	1.92 acres	Historical Cemetery
4.	Debo	G & 3rd Streets	.13 acres	Beautification area, benches
5.	Greenwood	Greenwood Drive	1.58 acres	Undeveloped
6.	Highland	Oakridge Street	41.84 acres	Open space (undeveloped)
7.	Hillside	B & Grant Streets	1.50 acres	Undeveloped
8.	Kesterson	6th & Evelyn Streets	.57 acres	Rose gardens, benches
9.	Lawnridge	Manzanita Avenue	1.42 acres	Tennis court, basketball, rest rooms, BBQ pit, playground, picnic tables
10.	North Gilbert Creek	Hawthorne Avenue	8.72 acres	Tennis courts, soccer, softball, restrooms, par course, picnic tables
11.	Nursery	M Street	1.00 acre	Greenhouse, plants for parks
12.	Ogle	Midland Avenue	.25 acres	Gazebo, picnic benches

TABLE RC-8 (CONTINUED)

	PARK	LOCATION	SIZE	FACILITIES
13.	Portola	Portola Drive	6.93 acres	Soccer, tennis courts, picnic tables, open grass area
14.	Riverside	E. Park Street	25.77 acres	Soccer, softball)lit), rest rooms, boat ramp, shelter, gardens, Izzak Walton Building, playground, art center
15.	Standsfield	G & Jordan	.01 acres	Beautification
16.	Washington	Washington Boulevard	1.90 acres	Cherry trees, meadian strips
17.	Westholm	Greenwood Avenue	2.75 acres	Tennis court, rest rooms, softball, playground, picnic tables, BBQ pit
18.	Caveman Pool			
19.	Grants Pass Highschool			Tennis Courts (4)

SOURCE: Grants Pass Parks and Recreation Department.

CAMPING

According to State Parks and Recreation Branch, there were 264 county, 117 federal, and 706 privately managed individual campsites in Josephine County for a total of 1087 campsites in 1976. This number has increased, but current figures have not been located.

Camping is a popular activity in Josephine County, partially due to the large amount of federally managed land (about 72%).

Currently, definitions are as follows:

1. Campsites may be divided into two categories - primitive and improved.
2. Primitive campsites usually contain only one camping unit. Commonly, they consist solely of a table and a fire pit, although some may have shelters or hunters cabins. Most lack toilet facilities, but users can generally be assured of water, solitude, and pleasant scenery.

   Primitive campsites may be located along secondary, gravel, dirt, or jeep roads. They may also be located along trails, especially near a creek or spring.
3. Improved campgrounds in Josephine County are few in number and generally contain multiple campsites. They also may have a fee, paved access, and be frequented largely by tourists.

Following is a partial list of Josephine County campsites. Some of these sites noted may not be located on any maps, but have simply been "discovered". It can be assumed that other unmapped sites exist in this same category.

Also included is an "Unverified" list of campsites indicated on older maps which may no longer exist.

PUBLIC CAMPGROUNDS IN JOSEPHINE COUNTY

(Wilderness area campsites and private campgrounds are not included.)

I. Improved Campgrounds

Siskiyou National Forest

- Grayback
- Big Pine
- Store Gulch
- Bolen Lake
- Tannen Lake
- Briggs Creek
- Cave Creek

Rogue River National Forest

- Thompson Creek

Bureau of Land Management

- Deer Creek
- Shady Branch

Josephine County Parks and Campgrounds

- Indian Mary
- Whitehorse
- Griffin
- Lake Selmac
- Wolf Creek
- Schroeder

II. Established Primitive Camps (partial list)

Verified

- Bain Station (Oregon Mt.)
- Babyfoot Trail
- Bear Camp
- Bigelow Lakes
- Brush Creek Camp (Sucker Creek)
- Brushy Bar (Briggs Creek)
- Buck Camp (Bear Camp Road)
- China Garden (Sucker Creek)
- Chrome Camp
- Conners Place (Illinois River)
- Fish Lake
- Flattop-York Butte Trail
- Grayback Shelter - Kruase Cabin
- Horse Springs Camp and Shelter (Craggy Mt.)
- Little Bald Mountain Prairie
- Miller Lake
- Mud Spring (Buckskin Peak)
- Onion Camp (Fiddler Mt.)
- Pepper Camp (Buck Peak)

Unverified, Continued

Howard Camp (Bear Camp)
Maurer Cabin (Swan Mtn.)
Meadow Camp (Bunker Crk. - Rogue R.)
Packer Creek (E. Fork Ill. R.)
Pea Soup Camp (Onion Mtn. Rd.)
Sebastopole Creek (Canyon Crk.)
Sourgrass Camp (Bear Camp)

PRIVATELY – OWNED CAMPGROUNDS

In their "Private Outdoor Recreation Inventory, 1974", the National Association of Conservation Districts identified the following privately owned and managed campgrounds in Josephine County.

	Name and Address	Facilities
1.	Woodland Echo, 7901 Caves Hwy, Cave Junction, OR	35 vehicle sites
2.	Last Resort, Lakeshore Dr. Selma, OR	12 tent, 25 trailer 38 boats
3.	Shady Acres, 27566 Redwood Hwy, Cave Junction, OR	4 tent, 16 trailer
4.	Pink Petunia Campgrounds, 7501 Lower River Rd, Grants Pass, OR	30 trailer sites
5.	Rainbow's End - KOA, 13770 Redwood Hwy, Wilderville, OR	15 trailer sites
6.	Trails End, 336 Burch Dr, Cave Junction, OR	15 tent, 20 trailer sites
7.	Cave Highway Trailer Park, 977 Cave Highway, Cave Junction, OR	26 trailer sites
8.	Town and Country, Redwood Hwy Cave Junction, OR	25 trailer sites
9.	Kerby Trailer Park, 24542 Redwood Hwy, Cave Junction, OR	52 trailer sites
10.	Sunny Valley KOA, 140 Old Stage Road, Grants Pass, OR 503-479-0209	41 trailer sites 24 tent sites

Privately-Owned Campgrounds Continued

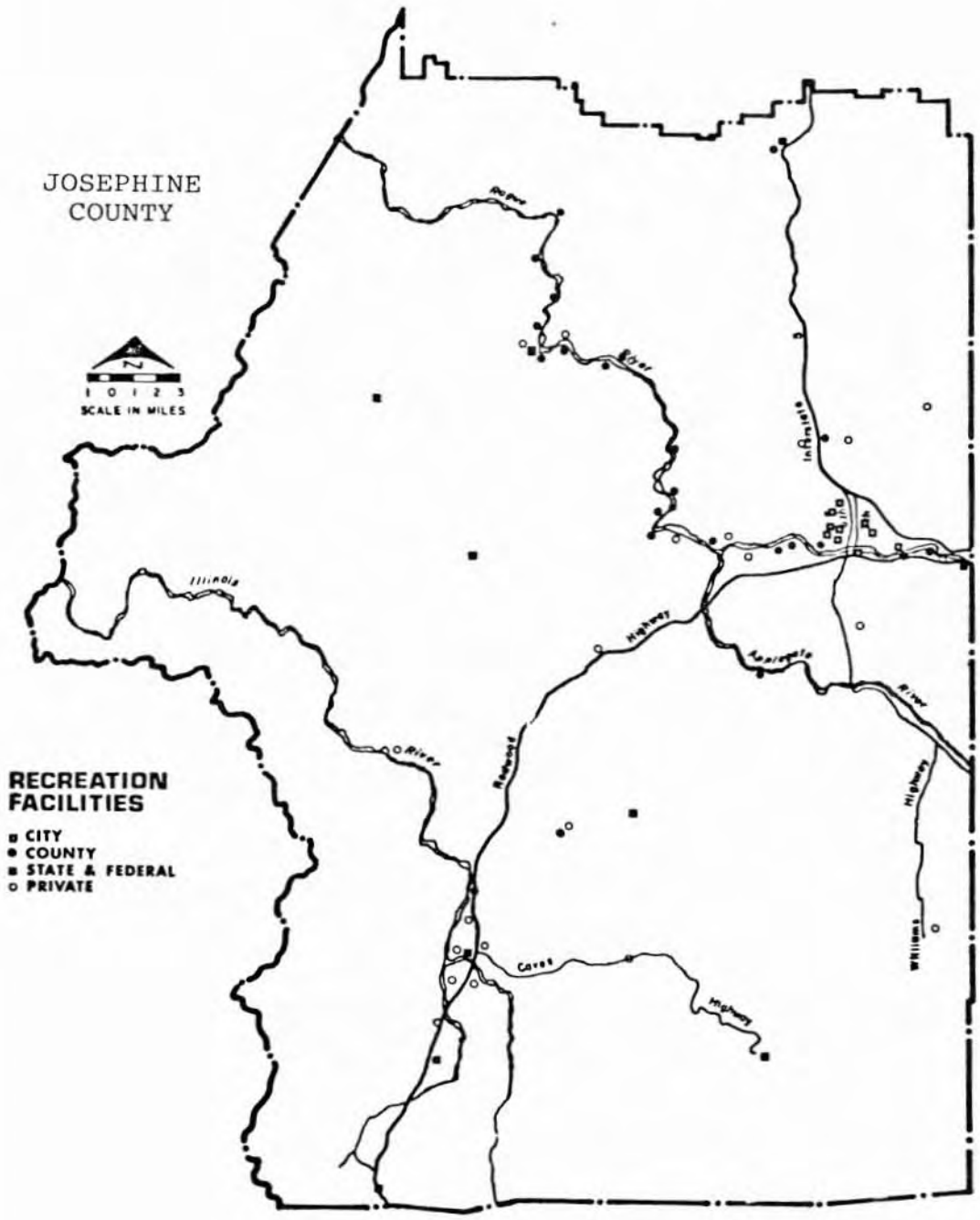
	Name and Address	Facilities
11.	Riverbanks Mobile Home Park 5541 Riverbanks Rd., Grants Pass, OR, 503-479-2062	25 vehicle sites
12.	Royal Trailer Park, 200 Lewis Ave., Grants Pass, OR, 503-476-2159	106 vehicle sites

In addition, the Grants Pass telephone directory lists the following campgrounds:

1.	Circle W. Campground, 8110 Rogue River Hwy, Grants Pass, OR	35 campsites
2.	Grants Pass Over-Nighters 5941 Highland Ave., Grants Pass, OR	39 campsites
3.	Knotty Pine Trailer Park 8890 Rogue River Hwy, Grants Pass, OR	11 campsites
4.	Lesclare Campground, 2956 Rogue River Hwy, Grants Pass, OR	47 campsites
5.	Riverfront Trailer Park and Campground, 7060 Rogue River Highway, Grants Pass, OR	21 campsites

Map RC-10 shows the locations of the recreation facilities in Josephine County.

MAP RC-10


JOSEPHINE
COUNTY
1 0 1 2 3
SCALE IN MILES
RECREATION
FACILITIES
CITY
COUNTY
STATE & FEDERAL
PRIVATE

BOATING

In 1968 Congress recognized the Rogue River as one of eight rivers having "remarkable qualities" and included it in the National Wild and Scenic River System. The two agencies with responsibility for administering this program on the Rogue are the Bureau of Land Management (for the 47 miles starting at the mouth of the Applegate River) and the United States Forest Service--Siskiyou National Forest (the remaining 37 miles). The river is divided into wild, scenic and recreational zones.

Based on development and accessibility, BLM has designated the 27 mile section from the Applegate to Graves Creek as recreational. This area has been further divided into five zones: Natural, Recreational Development, Agricultural, Commercial Development, and Open Space.

For this Recreational Area, BLM has developed the Rogue National Wild and Scenic River Activity Plan. This plan inventories existing uses and resources and outlines future development.

From the mouth of Graves Creek (downriver) to Curry County the Rogue River has been designated as a Wild River. For this section, a permit for River use is required during the summer months. In 1978, 12,309 people were scheduled to float this section, but only 8,303 actually undertook the journey. (Tables RC-12 and RC-13)

Float trips are also popular on the Illinois and Applegate Rivers. Figures for the number of users are not, however, readily available for these two rivers.

Lake Selmac (located three miles southeast of Selma) is a 160 acre lake created in 1961 principally for recreation. Boat launch facilities and boat rentals are available at the lake.

TABLE RC-11

ROGUE RIVER DRIFT PERMITS: MONTHLY BREAKDOWN - 1978

	NONCOMMERCIAL		COMMERCIAL		OPEN POOL		NC/C
	Scheduled	Actual	Scheduled	Actual	Scheduled	Actual	Breakdown
May	369	154	120	45	66	81	81/0
Jun	1841	1041	1386	876	156	161	106/55
Jul	1899	975	2040	1585	0	189	108/81
Aug	1904	1113	2120	1539	0	206	97/109
Sep	248	179	160	108	0	51	35/16
TOTAL	6261	3462	5826	4153	222	688	427/261

SOURCE: Josephine County Sheriff's Office, Marine Division.

TABLE RC-12

NUMBER OF RIVER PERMITS ISSUED IN JOSEPHINE COUNTY

SUMMARY

I. Scheduled Totals

Noncommercial =	6,261 people
Commercial =	5,826 people
Open Pool =	222 people
Grand Total	12,309 people

II. Actual Totals

A. Noncommercial:

Regular	3,462 people
Open Pool =	426 people
Total	3,889 actuals

B. Commercial:

Regular =	4,153 people
Open Pool =	261 people
Total	4,414 actuals

Total Actually Going Down River: 8,303
*"Open Pool" Permits are issued to fill cancellations.

SOURCE: Josephine County Sheriff's Office, Marine Division.

Overall, boating is popular in Josephine County, and participation is available by inflatable rafts, driftboats, canoes, sailboats, motor boats, and charter craft.

TABLE RC-13

CHARTER BOAT OPERATIONS: JOSEPHINE COUNTY

1.	Adventure Tours, Inc., 8965 Lower River Rd., Grants Pass, Oregon 503-476-2057	Charter Boat	3 boats
2.	Robert Bell, 1176 Fruitdale Drive, Grants Pass, Oregon 97526	Charter Boat Fishing Enterprise	1 boat
3.	Jerry Briggs, 2750 Cloverlawn Dr., Grants Pass, Oregon	Charter Boat Fishing Enterprise	1 boat
4.	Clarence Davidson, 1270 Rogue River Hwy., Grants Pass, OR 503-476-5664	Charter Boat	1 boat
5.	Tom Keith, 1176 Fruitdale Dr., Grants Pass, Oregon	Charter Boat Fishing Enterprise	1 boat
6.	Don Lund, 1410 Applegate Ave., Grants Pass, Oregon	Charter Boat Fishing Enterprise	1 boat
7.	Mel Norrick, 1990 Southgate Way, Grants Pass, Oregon 503-476-6493	Charter Boat	4 boats
8.	Orange Torpedo Trips, 310 Nelson Way, Grants Pass, Oregon 503-479-5061	Charter Boat	24 boats
9.	Carl R. Pierce, 4152 Leonard Rd., Grants Pass, Oregon 503-476-7576	Charter Boat	1 boat
10.	Bill Pruitt, 909 S. W. Rogue River Ave., Grants Pass, Oregon 503-479-2481	Charter Boat	2 boats
11.	Sid Pyle and Son, 2686 Demaray Dr., Grants Pass, Oregon 503-476-4739	Charter Boat	2 boats
12.	Rogue River Boat Shop, 1815 S. W. Bridge, Grants Pass, Oregon 503-479-1504	Charter Boat	6 boats
13.	Bob Pritchett, 4522 Upper River Rd., Grants Pass, Oregon 503-476-3838	Charter Boat	6 boats
14.	Bob Smith, 1108 S. E. Rogue Dr., Grants Pass, Oregon 503-476-3109	Charter Boat	2 boats
15.	Hellgate Excursions, 5201 Riverbanks Rd., Grants Pass, Oregon 503-479-7204	Charter Boat	1 boat
16.	Steve VanGordon, 455 Timber Lane, Grants Pass, Oregon 503-479-4358	Charter Boat	2 boats
17.	Troon, Inc., 1475 Kubli Rd., Grants Pass, Oregon 503-846-6562	Charter Boat	1 boat
18.	Osprey River Trips, Inc., 6109 Fish Hatchery Rd., Grants Pass, Oregon 503-479-4215	Charter Boat	8 boats
19.	Galice Raft Trips, P. O. Box 638, Merlin, Oregon 503-476-8051	Charter Boat	8 boats
20.	We-ask-u Inn River Resort, 5560 Rogue River Hwy., Grants Pass, Oregon 503-479-2455	Charter Boat	5 boats

FISHING

Fishing is a pursuit of traditional appeal to a large segment of the population. It is less strenuous than hunting and people of all ages and both sexes can and do participate.

According to Oregon Department of Fish and Wildlife statistics, anadromous fish, (those that live in salt water, but move into fresh water to reproduce) produced in Josephine County have an annual harvest value of $5,713,000 while resident fish have an annual harvest value of $384,045. Recreational fishing is expected to increase 2.3 times over the next twenty years in Josephine County.

HUNTING

Hunting opportunities are extensive and varied. Deer are numerous, some black bear are taken, and good elk hunting is available in Curry County immediately adjacent to Josephine County's western border. Bird hunters find waterfowl, upland game, dove and pigeon hunting opportunities plentiful.

Use of wild life for recreation purposes within Josephine County is delineated in the following tables. During 1976, it is estimated that over 1.34 million dollars were expended in the hunting of game.

TABLE RC-14

DOLLAR EXPENDITURES BY HUNTERS
IN JOSEPHINE COUNTY, 1976

SPECIES	HUNTER EXPENDITURE PER DAY	NUMBER OF HUNTER DAYS	TOTAL HUNTER EXPENDITURE[1]
Black-tailed Deer	$33.62	28,897	$ 971,500
Black Bear	55.23	3,935	217,300
Roosevelt Elk	44.52	50	2,200
Ring-necked Pheasant	11.95	922	11,000
Quail[2]	11.95	2,121	25,300
Mourning Dove	11.95	784	9,400
Grouse[3]	11.95	2,150	25,700
Gray Squirrel	11.95	1,920	22,900
Band-tailed Pigeon	11.95	2,340	28,000
Ducks and Geese	$15.27	1,948	$ 29,700
TOTAL			$1,343,000

1. Rounded to nearest $100
2. Valley and Mountain quail
3. Blue and Ruffed grouse

TABLE RC-15

NUMBERS OF HUNTERS AND GAME HARVEST
IN JOSEPHINE COUNTY, 1976

SPECIES	NUMBER OF HUNTERS	NUMBER ANIMALS HARVESTED
Black-tailed Deer	4,911	1,109
Roosevelt Elk	25	5
Black Bear	394	40
Ring-necked Pheasant	359	539
Mourning Dove	212	302
Quail[1]	592	2,059
Grouse[2]	491	882
Band-tailed Pigeon	486	1,849
Gray Squirrel	404	2,163
Ducks	342	2,922

1. Includes Valley and Mountain Quail
2. Includes Blue and Ruffed Grouse

SOURCE: Hostick, Gary, Economic Value, Harvest, and Status of Wildlife Resources in Josephine County, Oregon Department of Fish and Wildlife, 1978.

The ratio of hunters to animals harvested to fiscal expenditure would indicate that hunting in the County is primarily a recreational pursuit; $971,500 was expended by 4,911 hunters to harvest 1,109 deer at an average cost of $876 per deer or $8 a "dressed" pound.

Trapping would appear to be a more economically-oriented pursuit with the average cost of a pelt being $13. (Table RC-14) This reflects the fact that muskrat and beaver comprised the majority of the furbearer harvest. According to ODF and W the total furbearer harvest, amounting to over $14,000 was accomplished by thirty-three trappers.

TABLE RC-16

NUMBER OF FURBEARERS HARVESTED
AND DOLLARS RECEIVED IN JOSEPHINE COUNTY
1976-1977 TRAPPING SEASON

SPECIES	NUMBER OF ANIMALS HARVESTED	AVERAGE PRICE PER PELT[1]	TOTAL PRICE RECEIVED[2]
River Otter	17	$ 56.90	$ 967
Mink	4	10.20	41
Muskrat	719	4.38	3,149
Beaver	117	18.04	2,111
Raccoon	82	20.69	1,697
Striped Skunk	53	3.26	173
Spotted Skunk	8	4.80	38
Gray Fox	31	28.09	871
Bobcat	29	103.21	2,993
Coyote	64	$ 41.22	$ 2,638
TOTAL	1,124		$14,678

[1]Statewide Average
[2]Rounded to nearest dollar.

SOURCE: Ibid.

HIKING AND EQUESTRIAN TRAILS

In 1971 the legislature passed the State Trail Systems Act. One of the primary results of this legislation is that the State provides funding for a coordinator to aid in the development of a statewide trail system. This individual can serve as a resource if the County should decide to attempt consolidation of existing trails into a county-wide system.

The primary trail of State concern in Josephine County is the Rogue River Trail. Currently there are 119 miles completed of the proposed 170. The intent for this trail is to connect from Gold Beach to the Pacific Crest Trail via Lost Creek Dam.

Maps of Josephine County show a vast network of trails connecting many mountain tops, rivers, lakes, ridges, lookouts, and roads. Since most trails began as horse or footpaths in days prior to motor travel, or were built as fire access routes before the present network of logging roads was developed, many trails still shown on the map are completely overgrown or obliterated by roads and logging. Only a few are maintained, signed, and hikable.

Fewer still are maintained and routed to accommodate horse travel. Most significant are the Illinois River Trail and Siskiyou Boundary Trail (below Elk Creek).

Josephine County also provides access to a number of popular hiking trails located wholly outside the County. These include the Tincup and Upper Chetco Trails in the Kalmiopsis Wilderness Area and the Upper Illinois-Youngs Valley Trail in California. The Kangaroo-Red Buttes Crest Trail in California, accessible from the Siskiyou Boundary Trail and Steve Ford Road, may be developed and improved if the proposed Kangaroo Wilderness Area is established.

No trails are presently maintained or signed for cross-country skiing or snowmobiling. The Siskiyou Boundary Trail could be used for such purposes if winter road access were improved. Presently, the numerous county residents who pursue these sports are forced outside the County. The nearest snowmobile trails are at Mount Ashland, Union Creek area, and the Howard Prairie area in Jackson County.

Following is a list of frequently used or otherwise "important" trails in Josephine County. Only verified trails have been included to avoid inclusion of abandoned, obscured, or impassible trails.

JOSEPHINE COUNTY TRAILS*

Trails Which Are Frequently Used, "Important", and Verified

Siskiyou National Forest

Baby Foot Lake Trail--(1124A--Quickest route into Kalmiopsis Wilderness Area, from Fiddler Mountain Road.) Short hike, excellent panoramas near trailhead.

Swede Creek (Number 1135-1.0 miles)

Tannen Lake Trail--(1 1/2 miles from Tannen Lake Road to lake.) Connects to Siskiyou Boundary Trail.

Taylor Camp (Number 1138--1.7 miles)

York Butte (Number 1140--0.7 miles)

Briggs Valley Trail--(1132--Big Pine area to Illinois River.) Populatr with anglers.

China Creek (Number 1130--4.9 miles)

Collier Bar Trail--(1182--Spur off Bald Ridge to Illinois River)

Dutchy Creek Trail--(1146--Upper Silver Creek To Chrome Ridge to Big Pine)

Flattop-Bald Ridge--(Partially developed, partially old cut line.) Important potential because it picks up Illinois River Trail at top of Bald Ridge and bypasses a steep climb. (Spur to York Butte summit).

Florence Way (Number 1219A--3.5 miles)

Illinois River-Bald Mountain Trail--(1161-1162) Second most popular trail in the county after Rogue River Trail.

Kalmiopsis Rim Trail--(1124) May be the county's most scenic. Access at several points in the County. Runs from Hayward Peak on Chetco-Illinois divide, along county line to Piersoll Peak. Continues past Babyfoot lake and re-enters county briefly near Rough and Ready Lake. Beyond Rough and Ready Lake, follows Chetco-Smith River divide past Chetco Peak, ending at Vulcan Peak.

Lazy Creek (Number 1137--6.7 miles)

Minnow Creek (Number 1142--2.4 miles)

Mt. Elijah Trail--(1206 --From Oregon Caves to Siskiyou Boundary Trail with supr to Bigelow Lakes).

Mud Springs (Number 1144--3.0 miles)

Pine Flat Trail--(1219--Spur from Bald Ridge to Illinois River).

Pupps Camp (number 1174.1--2.7 miles)

Red Dog (Number 1143--2.5 miles)

Silver Creek Trail--(1134--From Flattop-Siver Creek road to Silver Falls.) Well marked and maintained but not shown on Forest map. (3.5 ,miles)

*Partial List -- Total +180.7 Miles

Shan Creek Trail--(1145--Shan Creek to Onion Mountain).

Snailback Trail--(Near Serpentine Lookout) Short, steep hike across serpentine formation; superb views of Illinois canyon and Grants Pass area.

South Bend (Number 1189--1.5 miles)

Rogue River National Forest

Miller Lake Trail (One mile from access spur off of Sturgis Creek. Fascinating and scenic botanical area.)

Siskiyou Boundary Trail (1207--Twenty miles along Siskiyou crest from Tannen Lake to Grayback Peak and Grayback Glades in Williams area. Could be improved, especially above Elk Creek. Much potential, especially with respect to winter sports. Many access points, most notably Thompson Ridge Road, Sucker Gap Trail, Sturgis Creek, Bigelow Lakes, Elk Creek, and O'Brien Creek. Spectacular panoramas of most of Josephine County and the Siskiyou Region, plus Mt. Shasta, Mt McLoughlin, and the Crater Lake rim).

Steve Peak Trail (908--From Thompson Creek Road.)

Sucker Gap Trail (1236, 906--Sucker Creek Road to Boundary Trail. Connects to Steve Fork Raod and Azalea Lake--Red Buttes area.)

Bureau of Land Management

Kerby Peak Trail (Improved from White Creek out of Selma, over summit, to gap between Kerby Peak and Little Grayback Peak. Other segments and spurs are obscured by road construction and logging. There is a ribbon line connecting Rabbit Lake Road and the Kerby-Little Grayback gap.)

Rogue River Trail (Grave Creek to Marial. Nationally known scenic trail along Wild and Scenic waterway.)

National Park Service: Oregon Cave National Monument

No Name Canyon Trail (1 mile)

Mt. Elijah Trail (7 miles)

Big Tree Trail (3 miles)

Cave Trail (over top) (.5 miles)

Josephine County

Cathedral Hills (Hiking and horseback trails, 6.5 miles)

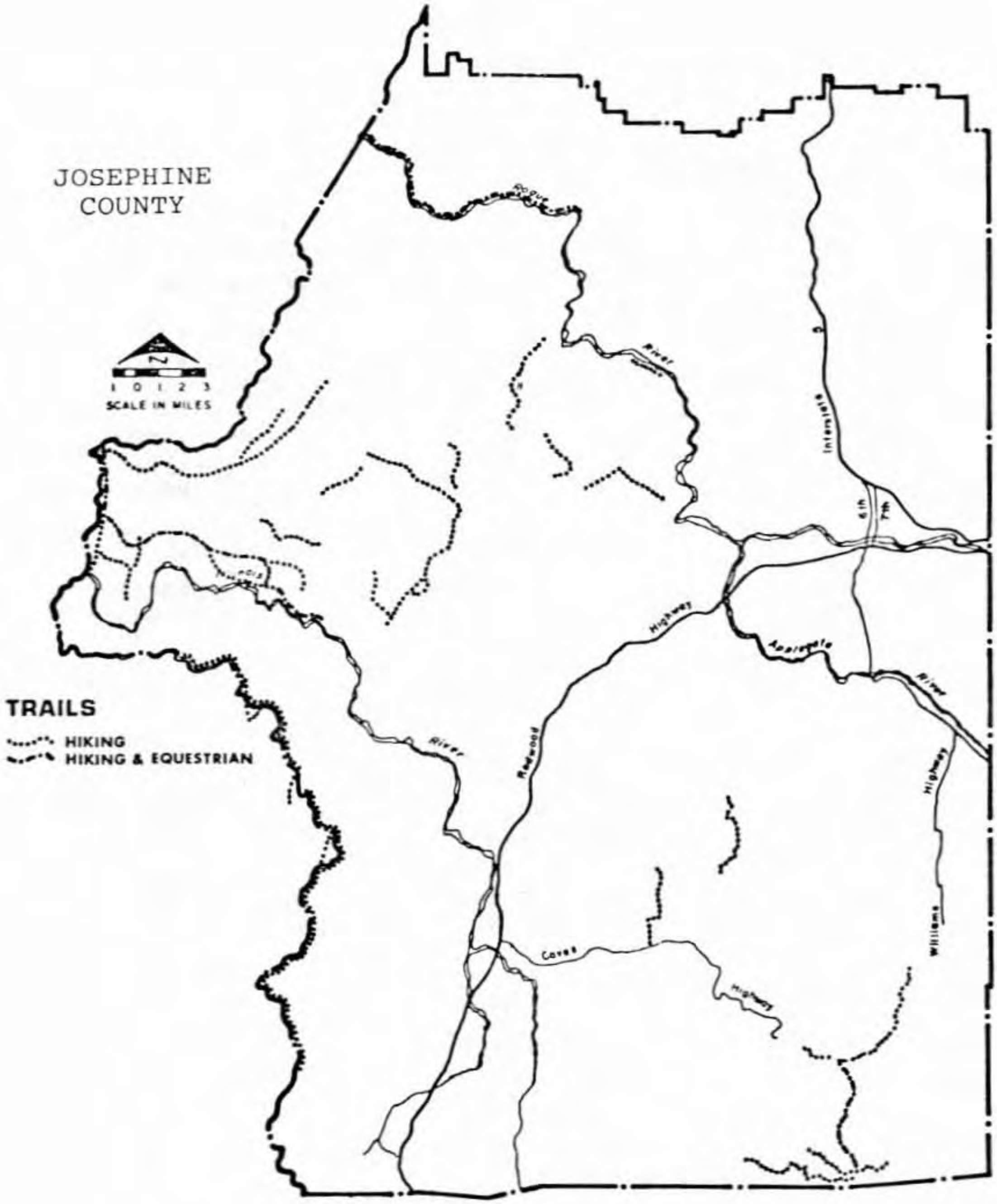
Indian Mary (Umpqua Joe Trail, 2.3 miles)

Lake Selmac (Lake trail and viewpoint trail, 2 miles)

Wolf Creek (Park to viewpoint, 1 mile)

Pierce Riffle Park (Nature trail, .5 miles)

MAP RC-17



JOSEPHINE
COUNTY
SCALE IN MILES
TRAILS
HIKING
HIKING & EQUESTRIAN
River
Highway
Applegate
River
River
Redwood
Interstate
Highway
Williams
Caves
Highway

PLEASURE DRIVING

"Soaring gasoline prices will inevitably affect pleasure driving, though it currently appears to be one of the principal forms of outdoor recreation nationwide." (Oregon Outdoor Recreation Demand Bulletin, Department of Transportation, 1975) Josephine County contains numerous highly scenic routes which offer rewarding driving. Those which are paved are generally narrow, winding, and with some notable exceptions, suited to local rather than tourist use.

The network of unpaved roads is impressive. Not only do these provide access to most of the County's areas of interest, but they also provide views of the heart of most roadless and wilderness areas. The County's highest peak, Grayback, can be seen only from unpaved roads.

Since many area residents own four-wheel drive vehicles ("4x4"), major 4x4 routes are also listed here. Unfortunately, 4x4 driving on poor roads, or no roads, often results in severe soil erosion. Upgrading would likely force 4x4 owners to establish new routes and paths, as well as encourage destructive off-road driving.

At various times, the County has supported recreational road construction. Proposed roads (Proposed Alternative for the North Siskiyou Planning Unit - 1977) would open up a contained tourist corridor through the County's most scenic high country.

One high priority proposal would require about three miles of new construction between Mt. Elijah and Sturgis Creek, cresting at a 5500 foot saddle. For maximum tourist impact, the entire route could be widened and paved to accommodate normal traffic. (Proposed Fish Lake Campground is on this route.)

Much lower priority was given to a link between this proposed road and the Tannen Lake Road, with a spur into the Lake Peak and Low Gap campground area.

The County has also recommended* improving the loop from U.S. 199 to the summit of the Takilma-Happy Camp Road, thence to Bolen Lake and back down to the Oregon Caves Highway; and construction of a road through Briggs Valley, connecting Taylor Creek Road to the Illinois River.

The following is a partial list of scenic routes.

*1967, "Park and Recreation Plan", Josephine County.

SCENIC ROUTES

Paved.

Applegate River Route (Murphy-Provolt Road, Fish Hatchery Road, and Riverbanks Road to Robertson Brodge)

Bear Camp Road (Galice Creek, connecting the estern end of the Rogue River Canyon with the terminus of the Rogue Trail at Agness and the coastal town of Gold Beach)

Cedar Flat Road (This is the county's highest paved thoroughfare, cresting at about 4500 feet. It offers spectacular closeup views of upper Deer Creek canyon, Kerby Peak, and the Williams Valley, connecting Selma and Williams. The road provides access to Kerby Peak, Rabbit Lake, Mungers Butte, Holcomb Peak, and Little Grayback Road. Stands of Brewer Spruce near the summit lie within the BLM's Brewer Spruce Natural Area)

Onion Mountain Road (Taylor Creek to Hayes Hill. Offers vistas of the Grants Pass valley and the Illinois Valley. The Big Pine Campground boasts the world's second largest ponderosa pine, while Serpentine Lookout and Onion Mountain Lookout offer interesting side trips)

Oregon Caves Highway (State Route 46, perhaps the major tourist thoroughfare aside from Interstate-5 and US-199)

Rogue River Road (Hellgate to Grave Creek. The county's other principal paved tourist route, through the Rogue Canyon, past Galice, to the trailhead and boat launch at Grave Creek. Hellgate is an important scenic vista point)

Takilma-Happy Camp Road (Paved to state line. This is the county's highest paved road, but not thoroughfare. Provides views of the Illinois Valley and access to the Bolen-Tannen Road and Klamath River country of California. Brewer spruce near summit)

Unpaved (partial list).

Big Pine-Chrome Ridge (Spectacular views high above Briggs Valley and Silver Creek. Goes through old growth Douglas-fir and stunted serpentine forests. Brewer spruce in Flattop area. Flattop also provides access to Bald Ridge portion of the Illinois Trail, eliminating a grueling climb, and to the trail to the summit of York Butte. Silver Creek is spectacular and remote)

Bolen-Tannen Road (From Happy Camp-Takilma Road. Bolen and Tannen Lakes are supurb examples of alpine glacial lakes and contain developed campgrounds. Sub-alpine vegetation may be seen, as well as rocky peaks. The road also provides access to Thompson Ridge and the trailhead of the Siskiyou Boundary Trail)

Caves Camp-Grayback Creek and Caves Camp-Bigelow Lake (Caves Camp Road begins in Williams and runs over Low Divide to the Illinois River drainage. The route skirts the base of Grayback Peak, highest in the county. The Grayback Creek road follows this scenic creek to the Oregon Caves Highway. The Bigelow Lake road ends at Bigelow Lakes, with its alpine meadows and scenic cliffs. The trail from Bigelow Lake connects with the Siskiyou Boundary Trail and the Mt. Elijah Trail to Oregon Caves)

Chetco Pass Road (From Illinois River. Jeep road and trail heads to Piersoll Peak and Kalmiposis Wilderness)

Fiddler Mountain Road (From Eight Dollar Road in Selma. Leads through serpentine areas above canyon and Josephine Creeks, into heavy timber and trailhead to Babyfoot Lake in Kalmiopsis Wilderness)

Illinois River Road (From Selma. Spectacular scenic attraction through canyon. Ends at Briggs Valley trail and Illinois River Trail to Agness. Access to Kalmiopsis Wilderness Area)

King Mountain-Grave Creek (Highest point in northeast portion of county. Covered bridge at Sunny Valley, gold dredge near Ditch Creek Road, road to King Mountain summit and connections to Evans Valley and Douglas County)

Onion Mountain Lookout (Spur from Onion Mountain Road. View of lower Rogue Valley connecting to Shan Creek)

Serpentine-Squaw Mountain Road (Spur from Onion Mountain Road. View of lower Rogue Valley from Serpentine Lookout. Supurb view of Illinois canyon and Selma area from Squaw Mountain and Snailback)

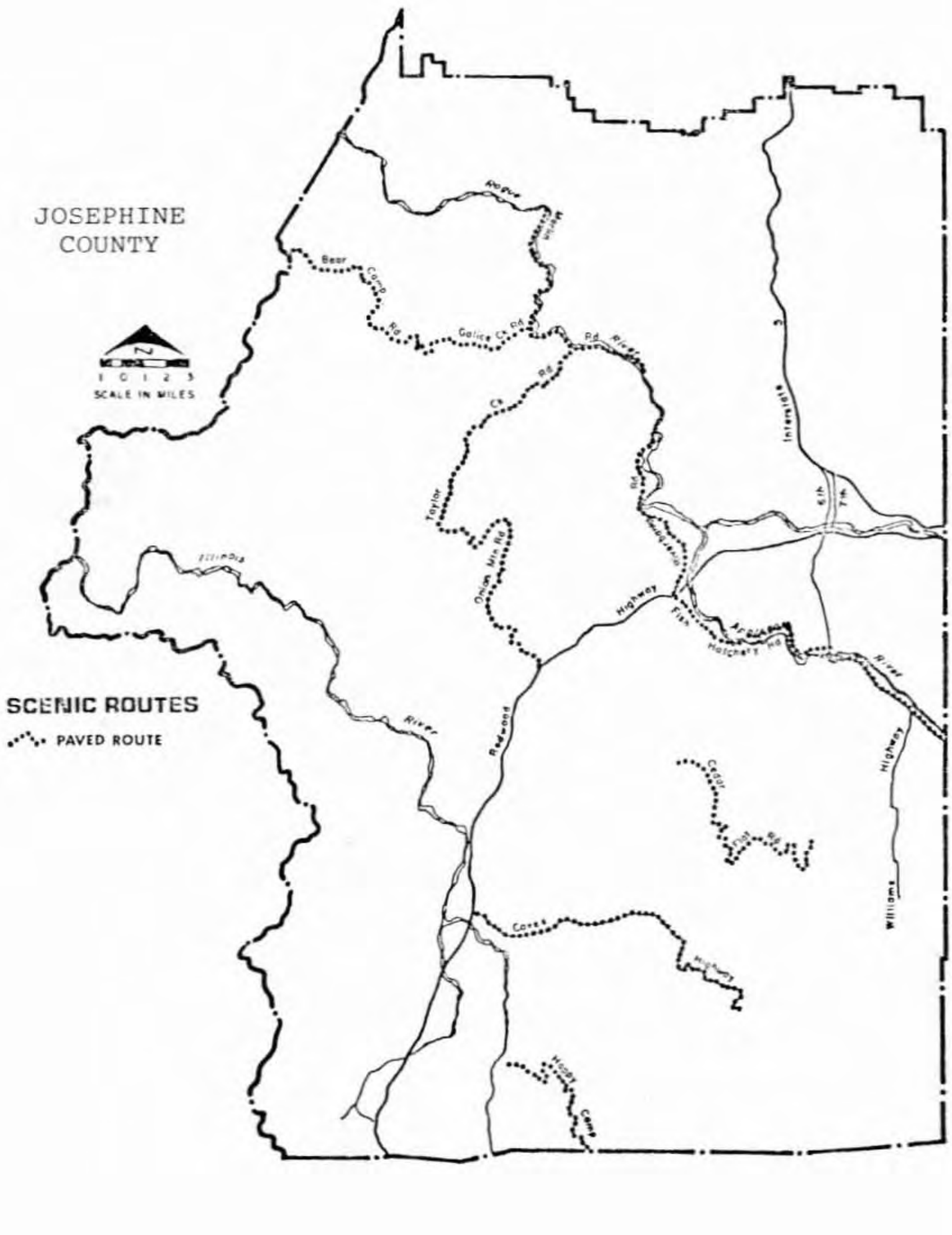
Steve Fork Road (Spur from Thompson Creek on east side of Siskiyous. Trail heads to Sucker Gap and Azalea Lakes)

Strugis Creek (Spur from Thompson Creek. Affords the best view of Grayback Peak, highest in the County. Also, access to Miller Lake Botanical Area's Baker Cypress, Brewer Spruce, and Sadler Oak, and access to Fish Lake)
Swede Basin Road (Spur off Onion Mountain Road)
Waldo Lookout Road (From Waldo Road at Obrien. Best road into high peaks of the western Siskiyou roadless area in California. Sanger Lake and Sanger Peak Lookout in California are of special interest)
Whiskey Peak Road (Spur from Thompson Creek. The best view of the upper Applegate Canyon, Red Buttes area, and Siskiyous. Mt. Shasta and McLoughlin also visible. Jeep road to Low Gap and Hinkle Lake)
Wimer-Oregon Mountain Road (From Obrien. Exceedingly rugged serpentine country. Road ends at Sourdough Camp on the Smith River. Trails into southern Kalmiopsis Wilderness. Side road to Buckskin Peak and Rough and Ready Lakes)

4x4 (partial list).

Flattop-Silver Creek Road (From Chrome Ridge Road. Granite outcroppings and old growth timber leading to old mine on Silver Creek. Sheer cliffs above creek and old gold barrel sluice)
Mungers Butte Road (From Cedar Flat Road. Snakes around the highest peak visible from Grants Pass)
Rabbit Lake Road (From Cedar Flat Road. Trails to Little Grayback Peak and Kerby Peak. Jeep Road to Little Grayback Road. Sheer granite cliffs and large Brewer Spruce. BLM Brewer Spruce Natural Area. Rabbit Lake is on peak above and difficult to find)
Rough and Ready Lake Road (From Wimer Road. Perhaps the single most spectacular 4x4 road in the county. Winds along a precarious serpentine ridge between Smith River and Rough and Ready Creek. Granite island contains rare stand of Western Hemlock. Road ends after six miles at southern end of Kalmiopsis Wilderness Area, with trailheads to Chetco Peak and headwaters of Chetco River. Improvement of road would be inappropriate in view of ecological fragility of area)
Silver Falls Road (From Bear Camp Road. Very steep road along Silver Creek, through immense old growth Douglas-fir. One mile trail to Silver Falls is one of the county's highlights)
Tennessee Lookout-Canyon Creek (Short road out of Selma. Supurb view of Josephine-Canyon Creek serpentine area, Eight Dollar Mountain, Kalmiopsis Wilderness Area, Illinois Valley, and Siskiyous. Very rugged and steep)
Thompson Ridge Road (From Bolen-Tannen Road to Happy Camp, California. Best trailhead of Siskiyou Boundary Trail. Awesome view of Red Buttes area, particularly Pyramid Peak, as well as western Siskiyous)
Whiskey Peak-Low Gap (From Whiskey Peak Road. Network of roads through alpine country. Access to Hinkle Lake, Azalea Lake trails, upper Applegate area)

MAP RC-18



WINTER ACTIVITIES

Josephine County boasts a considerable amount of sub-alpine country, particularly in its southeast corner (Table RC-15). In a normal winter, the snowline is generally between 3000 and 4000 feet. At 4500 feet, however, persistent snow at least until May, is virtually assured. The County's highest point, Grayback Peak (7055 feet) is located in the southeast section of the County.

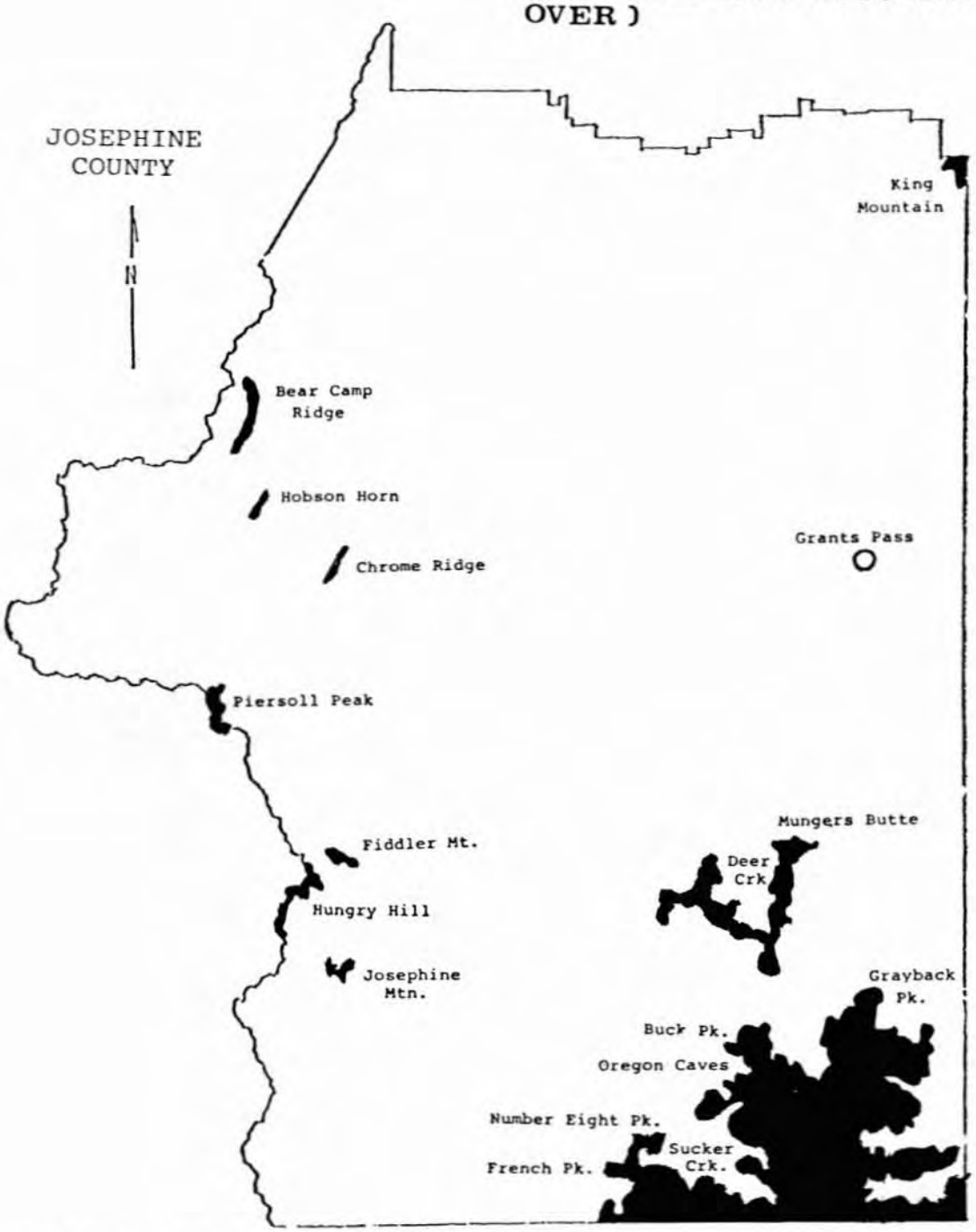
Four paved roads presently penetrate the County's snow country: Cedar Flat Road, Onion Mountain Road, Happy Camp Road (paved to the summit), and Bear Camp Road (also paved to the summit). None are maintained in the winter. Suitable localities for winter activities as cross-country skiing, snow-shoeing and snow-mobiling are difficult to find due to limited access. No County areas are presently designated specifically for these uses, although they are rapidly gaining in popularity. Participants in these sports are forced outside the County to areas where plowed highways provide access to trailheads. Popular winter sports areas outside the County include Crater Lake, Diamond Lake, Lake of the Woods, Howard Prairie, and Mt. Ashland.

Implementation of a plan to establish an all weather route from Oregon Caves National Monument to the new Applegate Reservoir (involving about three miles of new construction, plus paving and widening), could help alleviate this problem. The road would crest at 5600 feet, providing access to the Siskiyou Boundary Trail, Bigelow Lake, Fish Lake, and Miller Lake. It would allow more residents to recreate within the County, conserving gas and localizing expenditures.

Table RC-20 lists roads and trails in or near Josephine County considered worthwhile for the adventurous winter sportsman (cross-country skiing or snow-shoeing), under present conditions. Snow and road conditions, of course, may vary greatly and trails may be difficult or impossible to follow in winter.

MAP RC-19

HIGH ELEVATION AREAS
(APROXIMATELY 4500 AND OVER)



One Inch Equals About 6 Miles

SOURCE: Art Bernstein, Josephine County Forestry Department.

TABLE RC-20

WINTER ACTIVITY AREAS

JOSEPHINE COUNTY AND IMMEDIATE VICINITY

Area	Access	Destination	Trailhead Elev.	Activity	Distence
1. Cook and Green Pass	4x4	Red Buttes	4500 ft.	Snowshoe	2 miles
2. Cook and Green Pass	4x4	Azalea Lakes	4500 ft.	Snowshoe, ski	15 miles
3. Sturgis Creek	4x4	Miller Lake	4900 ft.	Snowshoe, ski	1 mile
4. O'Brien Creek	4x4	Grayback Peak	4500 ft.	Snowshoe	3 miles
5. Bigelow Lakes	4x4	Boundary trail	5400 ft.	Snowshoe, ski	2 miles plus
6. Sucker Creek	4x4 or 2x4	Boundary Trail	4500 ft.	Ski	2 miles plus
7. Bolen Lake	4x4	Boundary Trail	5100 ft.	Snowshoe, ski	1 mile plus
8. Tannen Lake area	4x4	Boundary Trail	5600 ft.	Ski	1 mile plus
9. Sanger Lake	2x4	Youngs Valley, Upper Illinois R.	5200 ft.	Ski	3 miles
10. Sanger Lake	2x4	Sanger Peak	5200 ft.	Ski	1 mile
11. Oregon Mtn.	2x4	Rough and Ready Lake, Chetco Peak	3500 ft.	Snowshoe (rocky)	6 miles plus
12. Big Pine-Flattop	4x4 or 2x4	Bald Ridge Trail, Agness	4000 ft.	Ski	2 to 20 miles
13. Eight Dollar Road	4x4 or 2x4	Babyfoot Lake	4200 ft.	Snowshoe, ski	3 miles
14. Chetco Pass	4x4	Piersoll Peak	3800 ft.	Ski	3 miles
15. Bear Camp, Hobson Horn	4x4	Silver Peak, Agness	4000 ft.	Ski	10 to 20 miles
16. Bear Camp Road	4x4 or 2x4	Chrome Ridge	3600 ft.	Ski	1 to 6 miles
17. Cedar Flat	4x4 or 2x4	Hungers Butte	4400 ft.	Ski	1 to 5 miles
18. Deer Creek-Rabbit Lake	4x4	Kerby Peak	4500 ft.	Snowshoe	2 miles

MISCELLANEOUS RECREATION AND ENTERTAINMENT

Many interesting facilities and attractions throughout the County provide recreational experiences. Many of these are privately owned and managed. Below is a partial list of these facilities.

Arts and Crafts

The Grants Pass Art League and Josephine County Artist Association provide a variety of instructional classes and sponsor art shows and contests.

The City Park and Recreation Department sponsor many craft and art classes such as: rug hooking, quilting, upholstery, candlemaking, cake decorating, interior decoration, creative writing, and ceramics. They utilize Highland, North Middle, Lincoln, South Middle, and Riverside schools, as well as Grants Pass High School. Each has a full range of classrooms.

Baseball and Softball Diamonds

Grants Pass High School has one regulation baseball diamond and three practice fields, non-regulation size.

The Parks and Recreation Department has two regulation size softball fields utilized also for Pee Wee League Baseball.

Babe Ruth Baseball, Inc., has one new ballpark utilized for Babe Ruth and American Legion baseball only.

Basketball Courts

Bicycling (See Text)

Boating and Rafting (See Text)

Bowling

Caveman Bowl
Grants Pass Bowl

Camping (See Text)

Community Center

The Community Center operated by the City of Grants Pass has: Pool tables, table tennis, shuffle-board, television, juke box, dance hall, dining and kitchen facilities. The Parks and Recreation Department also has a group meeting space available on a rental basis.

County Fairgrounds

Provides hundreds of attractions each year in addition to the County Fair, including horse-racing, motorcycle racing, art and craft shows, 4-H shows, and special interest displays and functions.

County Schools

Have gymnasiums, non-regulation football and softball fields.

Dancing

Square dancing clubs.

Dance classes are sponsored by various public and private organizations.

Popular dancing is accommodated by a variety of restaurants and lounges.

Fishing (See Text)

Grants Pass Art Museum

Art shows with local and visiting displays. Some classes are sponsored by the GPAM.

Gold Panning/Rock Hounding

This has become a popular hobby with activities sponsored by a number of clubs.

Golf:

Colonial Valley (9 hole course)

Grants Pass Golf Club (18 hole course)

Illinois Valley Golf Club

Hiking (See Text)

Hunting (See Text)

Illinois Valley Artist Association

Josephine County Library

(See Public Services: Libraries)

Kerbyville Historical Museum

Exhibits and displays of historical artifacts

Movie Theaters

One drive-in theater is in the Redwood area southwest of Grants Pass; another is located south of Cave Junction

Musical Activities

The Josephine County Community Concert Association presents a variety of concerts throughout the year. In addition, the Rogue Valley Symphony Association presents performances throughout the year. A number of vocal clubs are also active in this area.

School bands, orchestras, and choirs perform several times annually.

Photography

The areas natural beauty has brought many photographers and artists to this area.

Pinball/Billards

Several privately operated specialty businesses and lounges provide such recreational opportunities.

Raquetball Courts

Rogue Community College

Offers several recreational classes including indoor and outdoor sports, dancing, music and art. The college also sponsors various cultural and sports programs and events

Roller Skating

Roller Drome

Siskiyou Smoke Jumper Base

Visitor tours

Swimming Pools

Three publicly operated pools, one of which is located in the Illinois Valley. An extensive aquatic instruction program has been developed for these pools.

Tennis Courts

Grants Pass High School has four courts.

City Parks Department maintains four courts.

Private courts are available.

Theater

Three indoor movie theaters and two drive-in theaters.

The Barnstormers Theater: a community playhouse.

Winter Sports (See Text)

Woodland Deer Park

Several varieties of deer

Numerous recreation-oriented clubs and organizations also operate in the County, including the Photography Club, Geology Club, Chess Club, Sierra Club, Audubon Society, Ski Club, scouting, garden clubs, choirs and choruses. Restaurants and taverns can also be considered entertainment facilities.

Listed below are enrollment figures for the City of Grants Pass Parks and Recreation Programs from 1975 through 1978, and a comparison of city resident users with non-city resident users.

TABLE RC-21

CITY OF GRANTS PASS: PARKS AND RECREATION PROGRAMS
1978 TOTALS JAN.-DEC.

	1975	1976	1977	1978	City %	Non-City %
Winter Programs	10,479	13,729	16,963	18,460	9,118 (49%)	9,342 (51%)
Spring Programs	3,240	6,779	8,003	27,492	14,608 (53%)	12,884 (47%)
Summer Programs	30,021	32,245	29,406	39,849	20,073 (51%)	19,776 (49%)
Fall Programs	15,422	18,209	12,550	19,001	10,046 (53%)	8,955 (47%)
Community Center	43,401	52,082	42,432	46,045	23,155 (50.2%)	22,890 (49.8%)
Izaak Walton Bldg.	20,788	14,133	11,881	11,698	5,093 (43%)	6,605 (57%)
Art Center	3,400	2,939	1,986	NO RENTALS (ONLY RECREATIONAL CLASSES)		
Swim Pool	59,454	65,456	57,263	55,068	34,842 (63%)	20,226 (37%)
TOTALS	186,205	205,572	180,484	217,613	116,935 (53%)	100,678 (47%)

SOURCE: Grants Pass Recreation Department.

TABLE RC-22

PRIVATE RESORT FACILITIES

1.	Galice Resort, Galice, Oregon 503-476-3818	Resort	20 guests
2.	Morrisons Lodge, 8500 Galice Road Grants Pass, Oregon 503-476-3825	Resort Boating	20 guests
3.	Greyback Mountain Ranch, 107 Panther Gulch Road, Williams, Oregon 503-846-6561	Vacation Ranch	25 guests
4.	Paradise Guest Ranch, 7000 Monument Drive, Grants Pass, Oregon 503-479-4333	Vacation Ranch	20 guests 5 mile trails
5.	Rogue Glen Lodge, Galice Rd., Grants Pass, Oregon 503-476-5902	Resort	20 guests
6.	Tall Timber Ranch, C.S. Moore, P.O. Box 398,, Selma, Oregon	Vacation Ranch Fishing Horse Riding Hiking	10 guests 8 horses
7.	Oregon Cave, Cave Junction, OR, Oregon Cave Chateau and Cabins) 140 N.E. F Street, Grants Pass, OR		40 rooms

SOURCE: Josephine County Planning Office, 1979.

FUTURE NEEDS

Future recreational needs for Josephine County have been assessed by several governmental entities. In 1978 the Oregon State Parks and Recreation Branch of the Department of Transportation published the Oregon Comprehensive Outdoor Recreation Plan, based on input by individual counties. Josephine County expressed the following recreational needs:

Indoor pools	Boat launch lanes
Bike trails (see Transportation)	Multiple use trails
Tennis courts	Ballfields
Picnic tables	Swimming beach
Hiking trails	All-purpose courts
ORV trails	Golf course
Neighborhood parks	Community parks
Regional parks	Swimming pools
Bridle trails	

A translation of these expressed needs into numbers (totals for Jackson and Josephine Counties) were taken from the Pacific Northwest River Basin's Commission as projected in Oregon Comprehensive Outdoor Recreation Plan, 1978. The projected demand for various recreation activities through the year 2000 is listed in Table RC-23

The resulting demand for facilities in Josephine County between 1975 and 1990 is shown in Table RC-25.

TABLE RC-23

DISTRICT VIII
OUTDOOR RECREATION DEMAND*
Recreation Data Subcommittee

Activity	1975	1980	1990	2000
Camping	672,300	754,500	917,800	1,051,800
Picnicking	2,153,500	2,474,000	3,034,600	3,487,100
Swimming Pool	2,582,560	2,979,680	3,519,120	3,853,280
Non-pool	645,640	744,920	879,780	963,320
Sightseeing	2,060,900	2,356,100	2,848,800	3.195,500
Fishing	1,033,600	1,182,700	1,372,000	1,481,900
Boating	638,400	734,300	875,600	969,800
Water Skiing	251,500	289,200	345,100	383,000
Walking & Hiking	5,286,900	6,061,100	7,107,600	7,753,500
Hunting	278,400	318,500	372,400	403,500
Outdoor Games	3,563,800	4,113,100	4,874,400	5,356,400
Bicycling	4,361,900	5,025,100	5,893,100	6,404,300
Golfing	220,900	255,800	300,900	327,600
Horseback	891,500	1,024,900	1,205,200	1,316,900
Cultural Events	493,700	562,400	654,900	708,300
Snow	507,100	585,000	706,300	799,200
Other	2,051,700	2,351,100	3,044,900	3,704,100

SOURCE: Pacifc Northwest River Basin Commission.

TABLE RC-24

COMMON STANDARDS AND FACTORS*

Facility	Activity	Peak Day Factor	Wish to Use Factor	Turnover Rate	Standard
Campsites	Camping	1.2%	75%	1	1 site/4 AO
Picnic Tables	Picnicking	1.2%	75%	2	1 site/4 AO
Swimming	Pool 80%	1.0%	80%	3	1 pool/300 AO
Swimming	Non Pool 20%	1.6%	60%	2	2 feet/AO
Boating	Boating	2.2%	70%	1	1 lane/175 boat days
Boating	Waterskiing	2.2%	80%	2	1 boat/20 acres
Rivers/Streams	Fishing	2.2%	75%	1	1 mile/12 users
Trails	Walking/Hiking	1.2%	50%	5	1 mile/15 users
Trails	Biking	0.7%	80%	6	1 mile/25 AO
Trails	Horseback	1.2%	70%	5	1 mile/10 AO
Hunting Acres	Hunting	6.0%	85%	1	75 acres/hunter
Outdoor Games	Ball Fields				1 field/1,200 pop.
Outdoor Games	All Purpose Courts				1 court/2,500 pop.
Golf Holes	Golfing				18 holes/25,000 pop.

*The standards were applied to the determination of needs for each facility, activity, opportunity, or park type.

SOURCE: Ibid.

TABLE RC-25

JOSEPHINE COUNTY NEEDS
1975 - 1990

Facility	Unit	Supply	Gross Need	Net Need 1975	Net Need 1980	Net Need 1990
Campsites	Site	1,087	721	(366)	(279)	(108)
Picnic Tables	Table	673	1,066	393	557	833
Swimming Pools	Pool	1	11	10	11	14
Boat Launch Lanes	Lane	30	14	(16)	(13)	(10)
Swim Beach	Feet	0	2,843	2,843	3,329	3,962
Walking & Hiking Trails	Mile	65	209	144	176	218
Biking Trails	Mile	4	66	62	74	88
Bridle Trails	Mile	0	68	68	79	93
Ball Fields	Field	38	18	(20)	(15)	(12)
Tennis Courts	Court	7	18	11	15	20
All Purpose Courts	Court	13	18	5	9	14
ORV Trails	Mile	0	19	19	23	28
Golf	Holes	27	36	9	9	27
Neighborhood Parks	Acres	16.0	227.5	211.5	262.5	315.5
Community Parks	Acres	28.0	455.0	427.0	479.0	585.0
District Parks	Acres	1,378.0	682.5	(695.5)	(542.5)	(383.5)
Regional Parks	Acres	300.0	1,138.0	838.0	1,093.0	1,358.0

SOURCE: Ibid.

Finally, the City and County Parks Departments developed their own facility needs assessments for the next ten years in the Grants Pass area.

TABLE RC-26

PARK AREA IN CITY

City owned - 50 acres developed; 60 acres undeveloped.

County owned - 1½ acres developed.

ESTABLISHING COST

Gilbert Creek's 9 acres have been developed at cost of $28,000 to $30,000 per acre; cost of land per acre probably $10,000.

AREA	EXISTING	NEEDED
Redwood	Redwood School Fairgrounds Tussing Schroeder School property 10 acres	Neighborhood Parks 2 sites - 5 acres each
Allendale	South Allendale Cathedral Hills (400 acres - 7 mi. trails) 10 acres	Neighborhood Parks 2 sites - 5 acres each
Fruitdale	Fruitdale Climate Wayside Riverside Baker 15 acres	Neighborhood Parks 3 sites - 5 acres each
North of I-5	Reservoir	Neighborhood Parks 2 sites - 10 acres each 20 acres
County River Frontage		As much as possible
Northeast	Croxton High School Lincoln Kesterson Cemeteries Reservoirs 10 acres	Neighborhood Parks 2 sites - 5 acres each

TABLE RC-26 CONTINUED

Northwest	Gilbert Lawnridge Highland 40 acres Hillside 3 acres 6th Street Triangle Ogle Reservoirs Laurelridge exaction------	None 10 acres
Southeast	Tom Pierce Eckstein Cemeteries Industrial Sites beautified	Neighborhood Parks 1 site 2 acres 2 acres
Southwest	Greenwood Plant Westholm School Park	Neighborhood Parks 2 sites 5 acres 10 acres
City River Frontage		As much as possible
Totals		77 acres Neighborhood Parks 10 acres Laurelridge Exaction Industrial Sites Beautified As much River Frontage as possible (purchase or easement)

Cost Projection - 1978-79 Estimates

77 acres purchase	$770,000
Development	$2,250,000
Per year maintenance	$308,000
Per year program	$350,000

Development Costs - Existing Property Undeveloped

BLM	40 acres @ $5,000	$200,000	
Fairgrounds	5 acres @ 30,000	150,000	
Schroeder	9 acres @ 30,000	270,000	
Tussing	3 acres @ 30,000	90,000	
Redwood School	10 acres @ 30,000	300,000	
Allendale	5 acres @ 30,000	150,000	
Baker	2 acres @ 30,000	60,000	(boat ramp,
4 Water Reservoirs	20 acres @ 30,000	600,000	restrooms)
Hillside	3 acres @ 30,000	90,000	
Greenwood	10 acres @ 30,000	300,000	
School - SW	10 acres @ 30,000	300,000	

River Frontage 30 acres desired
12 acres in flood plain priced $1,500,000 1979

In a plan submitted to the USFS, the County proposed campgrounds at Fish Lake and Hinkle Lake, as well as Low Gap contingent on the implementation of a recreational road system proposed in the same plan.

Development of campgrounds at the entrance to Oregon Caves National Monument, Sucker Creek Gap, the proposed Sexton Reservoir, and Highway 199 at the California border have also been supported by the County at various times.

TABLE RC-27

BLM: PROPOSED RECREATION SITES IN JOSEPHINE COUNTY

Fishing sites	Dump Station	Family Picnic (# of sites)	Group Picnic (# of people)	Group Picnic (# of people)	Family Camping (# of sites)	Boat Ramp	Interpretive/ Env. Ed. Trail	Seasonal Vehicular Riverbank access (Memorial Day to Labor Day)	Salmon Board (BLM installed)	Trailhead	Parking (# of cars)
Applegate Landing						x	x	x			10
Finley Bend Fishing Access											10
Steelhead Fishing Access		2									6
Jumpoff Joe Fishing Access		2									6
Rainbow Fishing Access		3									6
Carpenters Island Fishing Access											6
Chair Riffle Fishing Access		2									4
Griffen Park Group Picnic Area			-500-					x			Unspecified
Hellgate Visitor Info. Center											5
Rand Visitor Info/Admin. Center							x				10
Grave Creek Visitor Ck. Station						x				2	15
Rocky Riffle Recreation Area		15	---	---	15			x			10
Rand Recreation Area	x	15	-75- $25 each		30	x		x	x		40

ENERGY

This chapter examines local energy consumption, potential production and conservation. Terms and notation used within this chapter are defined as follows:

	W	= watt (a unit of power)
1000	watts	= 1 kW (kilowatt)
1,000,000	watts	= 1 MW (megawatt)
	kWh	= kilowatt hour (total energy developed by a power of one KW acting for one hour)
	BTU	= British Thermal Unit (the amount of energy required to raise the temperature of 1 pd. of water by 1°F)
1	therm	= 100,000 BTU
one	W	= 56.9 BTU/min.
one	kWh	= 3415 BTU

Note: Watts are generally used to define power whereas BTU are generally used to define power utilization. As such, conversion from one to another requires the element of time.

Josephine County has no commercial power generation facilities and thus it is essentially dependent on external sources for electricity, natural gas and oil. Energy self-sufficiency is economically and politically desirable, and is generally more reliable. Increasing alternative small-scale energy production and decreasing reliance on external fossil fuel supplies will result in a) prolonged use of fossil "fuels" for other uses (e.g. medical and manufacturing and b) associated local social/ economic stability.

The following table outlines energy consumption by specific sectors for Oregon and the United States.

TABLE EG-1

OREGON AND U.S. DIRECT ENERGY USE COMPARISON BY SECTOR - 1973

	Oregon Million BTU Per Capita	Percent Total Energy	U.S. Million BTU Per Capita	Percent Total Energy
Household	50.9	20.5	50.8	14.7
Commercial	38.8	15.6	38.3	11.1
Industrial	61.1	24.5	114.9	33.3
Transportation	89.3	35.6	85.5	24.8
Electric Utilities	8.8	3.5	55.1	16.0
Total	248.9	99.7	344.6	99.9

SOURCE: Office of Energy Research and Planning, page 90.

As is to be expected, the rural character of Oregon is exhibited even in its use of energy; greater emphasis is placed on energy use for home heating and transportation. In an expanded form, the following table shows that the predominant difference in Oregon and overall U.S. consumption is the private automobile. This would reflect the highly scattered housing that exists in this rural state. Construction and wood processing are also designated as having a high energy consumption level in Oregon.

TABLE EG-2

OREGON AND U.S. DIRECT ENERGY END USES ACCOUNTING FOR MORE THAN 1 PERCENT OF ENERGY CONSUMPTION

OREGON 1973		U.S. (1970)	
CATEGORY	%	CATEGORY	%
Private Automobile	23.4	Private Automobile	13.8
Home Heating	13.4	Home Heating	10.4
Paper Products Industry	6.7	Paper Products Industry	1.7
Primary Metals (52% Alum.)	4.6	Primary Metals	6.8
Trucks	4.0	Trucks	5.3
Agriculture	2.5	Agriculture (direct use)	2.0
Residential Hot Water	2.3	Residential Hot Water	2.7
Food Processing Industry	2.2	Food Processing Industry	1.7
Air Passenger Traffic	1.7	Air Passenger Traffic	1.7
Government	1.6	Government (non-defense)	1.7
Natural Gas Loss	1.5	Natural Gas Loss	1.9
Sone, Clay, Glass	1.1	Stone, Clay, Glass	1.6
Chemical Industry	1.0	Chemical Industry	6.3
Lumber and Wood	7.0	Petroleum Refining	3.9
Construction	5.1	Defense	2.6
Trade	4.2	Home Refrigeration	1.1
Services	2.0	Home Cooking	1.0

SOURCE: D.O.E., Transition, 1975.

LARGE SCALE USE AND PRODUCTION

NATURAL GAS

Currently Josephine County does not have its own source of natural gas. The California Pacific Natural Gas Company supplies natural gas (piped from Canada) to Josephine County and parts of Jackson County (See Map EG-3).

In 1978, California Pacific Natural Gas Company provides the following quantities of natural gas to this district.

MAP EG-3

OREGON NATURAL GAS
UTILITY DISTRICTS AND PIPELINES
1973

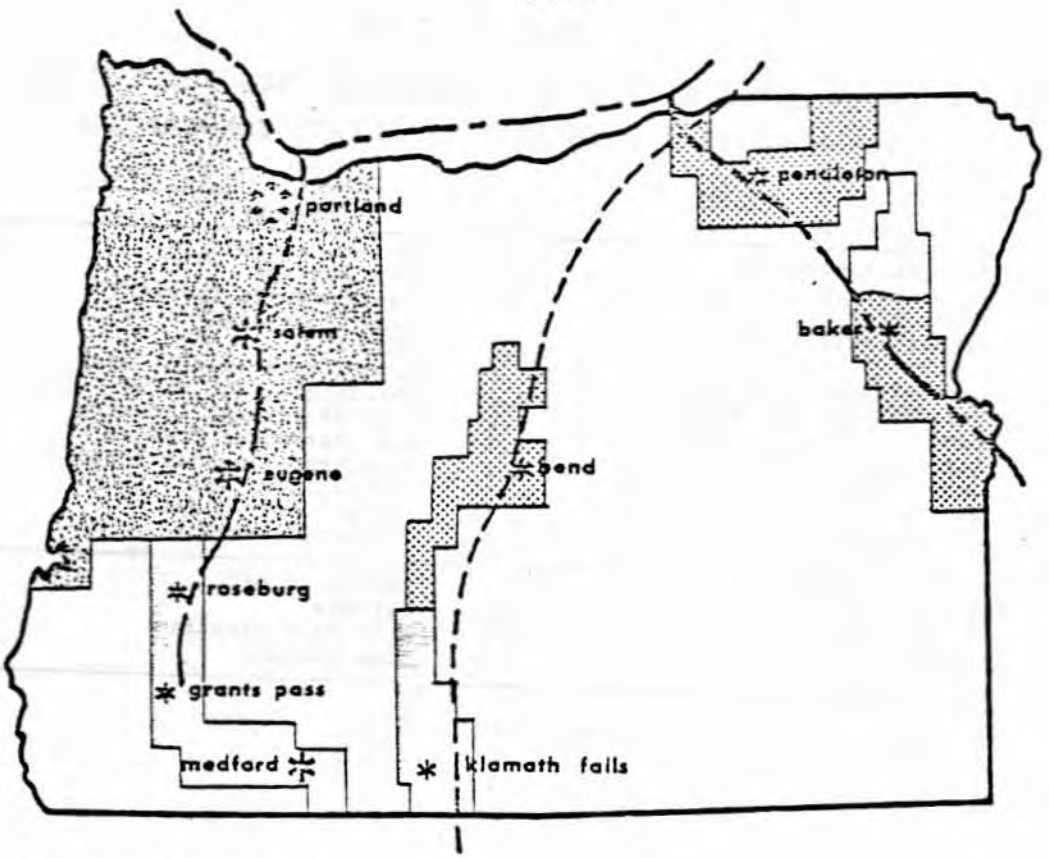


TABLE EG-4

1978 NATURAL GAS SUPPLY TO THE SW DISTRICT

Residential	2,520,581 Therms	= 73,809,107 kWh
Commercial	3,084,726 Therms	= 90,382,472 kWh
Industrial	2,473,987 Therms	= 72,487,819 kWh
	8,079,294 Therms	

SOURCE: California Pacific Natural Gas, 1979.

Their 1988 projection, based on a 5% a year use increase, is as follows:

TABLE EG-5

Residential	3,780,872 Therms
Commercial	4,627,089 Therms
Industrial	3,710,981 Therms
	12,118,942 Therms

SOURCE: California Pacific Natural Gas, 1979.

At present the district is receiving its natural gas from the Northwest Pipeline Cooperative in Canada. It was their feeling their company would have no supply problems for the next ten years. This is emphasized in light of recent gas discoveries in northwest Oregon which may result in increased ease of supply and lower cost. This becomes important when we realize that residential supplies are estimated to increase 50%, whereas residential costs are expected to increase by approximately 400% by the year 1988 (Table EG-6).

TABLE EG-6

AVERAGE NATURAL GAS PRICES
(¢/therm)

Year	Residential	Commercial	Industrial
1971	15.2	12.7	4.9
1976	26.9	23.9	15.7
1981	46.4	41.3	27.1
1986	80.0	71.2	46.7
1991	112.6	100.2	65.7
1996	158.5	141.1	92.6

Source: D.O.E., 1978.

GASOLINE

It was not possible to determine the total amount of gasoline that was consumed in Josephine County during 1978. But by contacting the Highway Tax Office it was found that 1,432,113,484 gallons of gasoline were taxed in the state during 1978. This does not include diesel fuel or those gallons used by tax exempt organizations.

As of January 1, 1978, Josephine County has 2.44% of the State's registered vehicles. This is detailed as 2.4% of registered passenger vehicles, .09% of the buses, 2.4% of the trucks, 3.4% of the motor homes, 2.4% of the motorcycles, 1.2% of the snowmobiles, and 1.5% of the farm equipment/vehicles.

If the total amount of gasoline used in the State is divided by the percentage of registered vehicles in the County, the total gallons used in Josephine County would be 34,371,723.5. This would mean that there was an average of 740.6 gallons used per vehicle (excluding motorcycles, snowmobiles, boats, lawn mowers and chain saws).

Two observations must be made about both the estimated total gallons and the gallons per vehicle numbers. The first is that Josephine County is a rural county and it is quite possible it accounted for more than a straight percentage of the state's total gasoline

consumption. The second point is, the County experiences a considerable amount of pass-through traffic. This includes both the use of Interstate 5 and Redwood Highway for direct passage use and tourist use for those who visit the County for its resources. It is difficult to say how each of these has affected total gas usage.

At the present time it is impossible to predict future gasoline consumption in the County. Historically, this county has been a rural area with an obvious resident preference towards the large-lot, rural lifestyle. This preference defines a need to travel (consume gasoline) to obtain services and employment. It is not expected that this lifestyle preference will change even if petroleum becomes more difficult to obtain. (Increased gas costs are to be expected anyway and, as yet, have not appreciably deterred rural living.) Thus, consideration must be given to location of service centers, schools, planned unit developments, etc. Also support must be given to transportation that uses other forms of energy.

TABLE EG-7

REPRESENTATIVE PETROLEUM PRICES
(cents per gallon)

YEAR	GASOLINE	HOME HEATING FUEL
1971	36.7	19.2
1976	59.2	41.3
1981	85.5	59.5
1986	123.3	85.9
1991	173.6	120.8
1996	244.1	170.0

SOURCE: D.O.E., 1978.
NOTE: Obviously gasoline prices for 1979 have already exceeded the 1981 projection. The projection should be increased accordingly.

ELECTRICITY

At present only the Pacific Power and Light Company provides electrical power to Josephine County. Pacific Power and Light's sources of electrical energy are: 13.8% hydro-generated; 69.5% thermal-generated; 16.7% purchased power and metropolitan interchange. There

are a number of future power generation projects being considered by Pacific Power and Light which are generally coal or nuclear powered.

The number of customers served by Pacific Power and Light has increased by 64.8% since 1970.

TABLE EG-8

ELECTRIC COMPANY CUSTOMER SUMMARY

YEAR END	TOTAL CUSTOMERS		RESIDENTIAL CUSTOMERS*		JO. CO. ESTIMATED POPULATION
	NUMBER	% INCR	NUMBER	INCREASE	
1970	18,116		15,840	--	35,746
1971	19,163	5.78	16,767	5.85	37,837
1972	20,616	7.58	18,105	7.98	40,856
1973	21,755	5.55	19,165	5.86	43,250
1974	22,716	4.42	19,981	4.26	45,093
1975	23,732	4.47	20,865	4.42	47,086
1976	25,013	5.40	22,036	5.61	49,728
1977	26,764	7.00	23,552	6.88	53,149
1978	28,232	5.49	24,877	4.63	56,141
1979	29,826	5.65	26,109	4.90	58,892

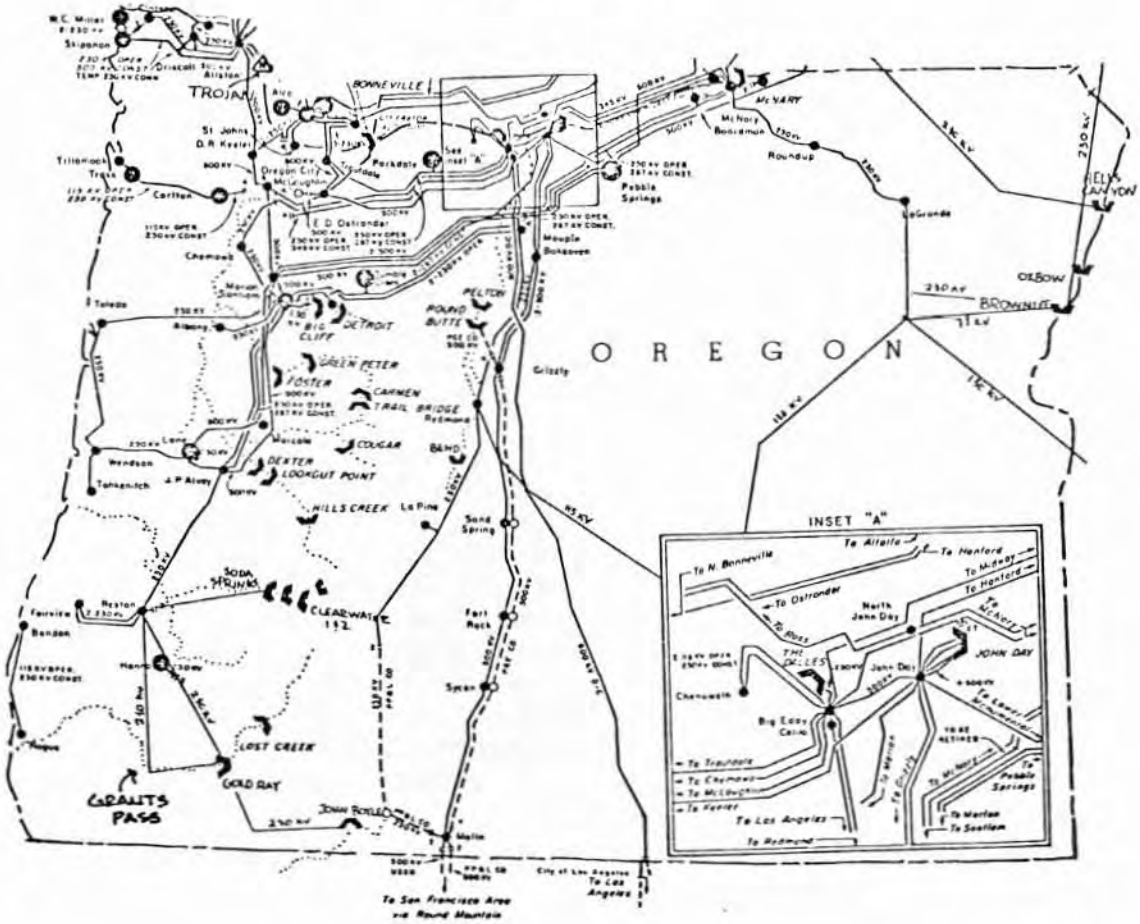
*Includes customers in Glendale and Rogue River.
SOURCE: Electric Customer Summary, Pacific Power and Light, unpublished.

County-wide use of electrical energy has increased faster than the company's average use. Whereas use increased 5.49% from 1977 to 1978, the company is estimating an annual 6.2% increase for the next ten years.

MAP EG-9

ELECTRIC POWER PLANTS MAIN TRANSMISSION GRID

-OREGON 1973-



Dam and Power Plant
— Transmission Lines

SOURCE: Bonneville Power Administration, Revised; March 14, 1975.

ALTERNATIVES

LOW-HEAD HYDROELECTRIC POWER

Peter Klingeman of the Water Resources Research Institute at Oregon State University has been conducting a study on river energy and low-head hydroelectric power potential in Oregon.

The general criteria for "low-head hydroelectric power" production are: 1) median streamflows of 36+ cubic feet per second; 2) gross hydraulic heads between the limits of three and twenty meters; and 3) potential for storage. Generally, the stream reaches analyzed were less than ten miles in length, and typically started and ended at the mouths of tributary streams. The minimum generating capacity accepted was 200 kilowatts.

Of the 110,000 miles of streams in Oregon, only 7% or 6,626 miles were considered. In the Rogue Basin, 135 reaches (a total of 577 miles) were identified and addressed in the study. It was estimated that the Rogue Basin reaches 2,875.26 megawatts of energy ten percent of the time, and 165.05 megawatts could be produced ninety-five percent of the time. This was the third greatest production potential in the study area. A number of constraints were identified in the 135 Rogue River Basin reaches with the greatest limitation being the distance of the station to a viable market (see Map EG-9).

TABLE EG-10

CONSTRAINTS TO LOW-HEAD HYDRO GENERATION SITES IN THE ROGUE BASIN

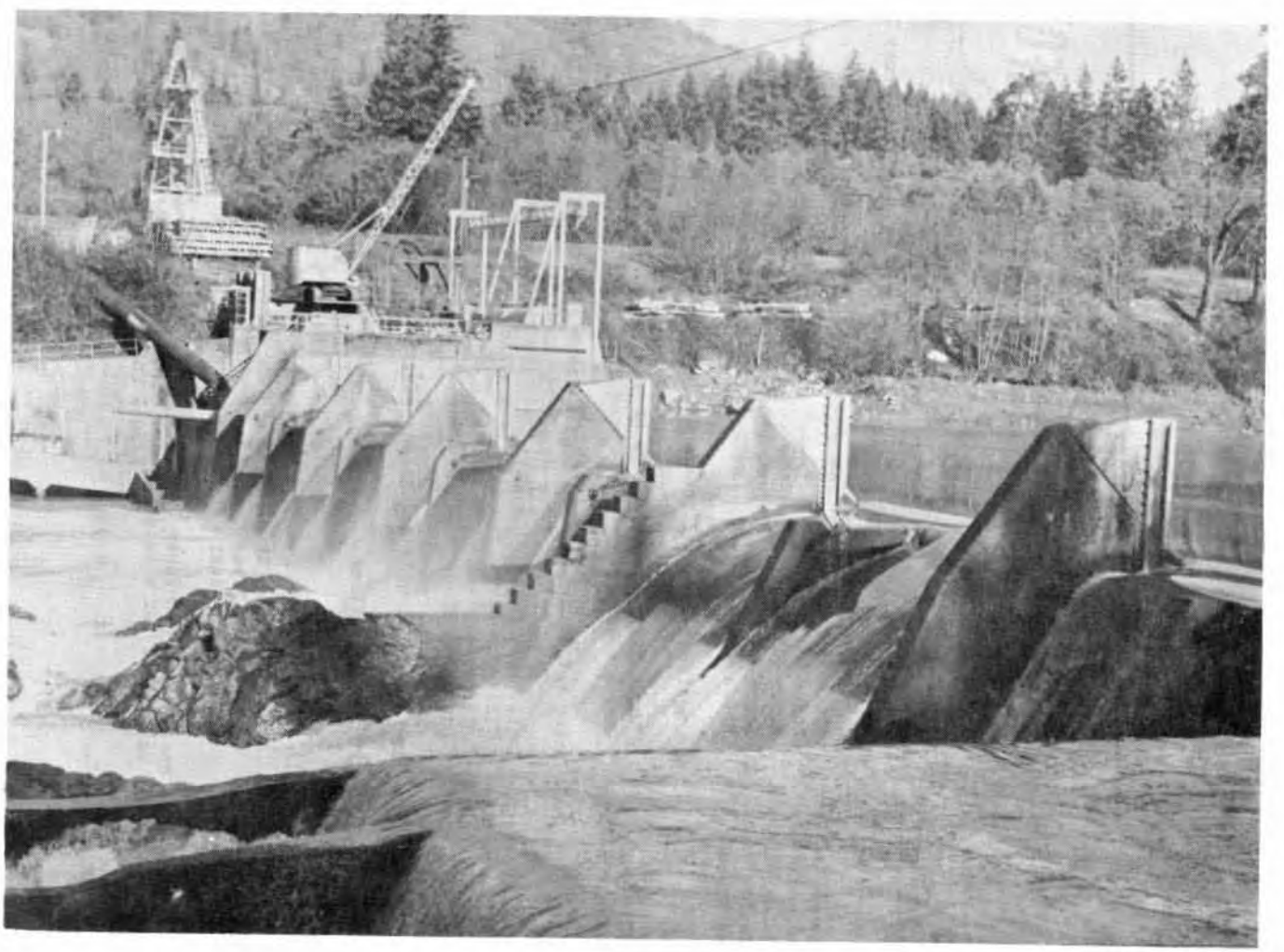
Land Use Restrictions	27
Utility Displacement	50
Building Displacement	50
Special Fish Problems	77
Distance to nearest power line greater than ten miles	31
Distance from reach to viable local market too great	130

SOURCE: Water Resources Research Institute.

Impondment of water would increase the potential for these sites but would create substantial environmental impacts.

POTENTIAL HYDROPOWER SITES

Following is a 1976 site list of potential dam sites which could be used to generate electricity. These have been listed in Table EG-11 and mapped on the following page (Map EG-12). Since that time a number of these sites have come under federal protection or ownership. The Wild and Scenic River Regulations restrict development of sites in designated wild and scenic areas.



SAVAGE RAPIDS DAM IS UNDER CONSIDERATION FOR CONVERSION TO HYDROPOWER.

Josephine COUNTY, OREGON
POTENTIAL HYDROPOWER SITES
U. S. ARMY, CORPS OF ENGINEERS
PORTLAND DISTRICT
January 1976

INFORMATION ONLY

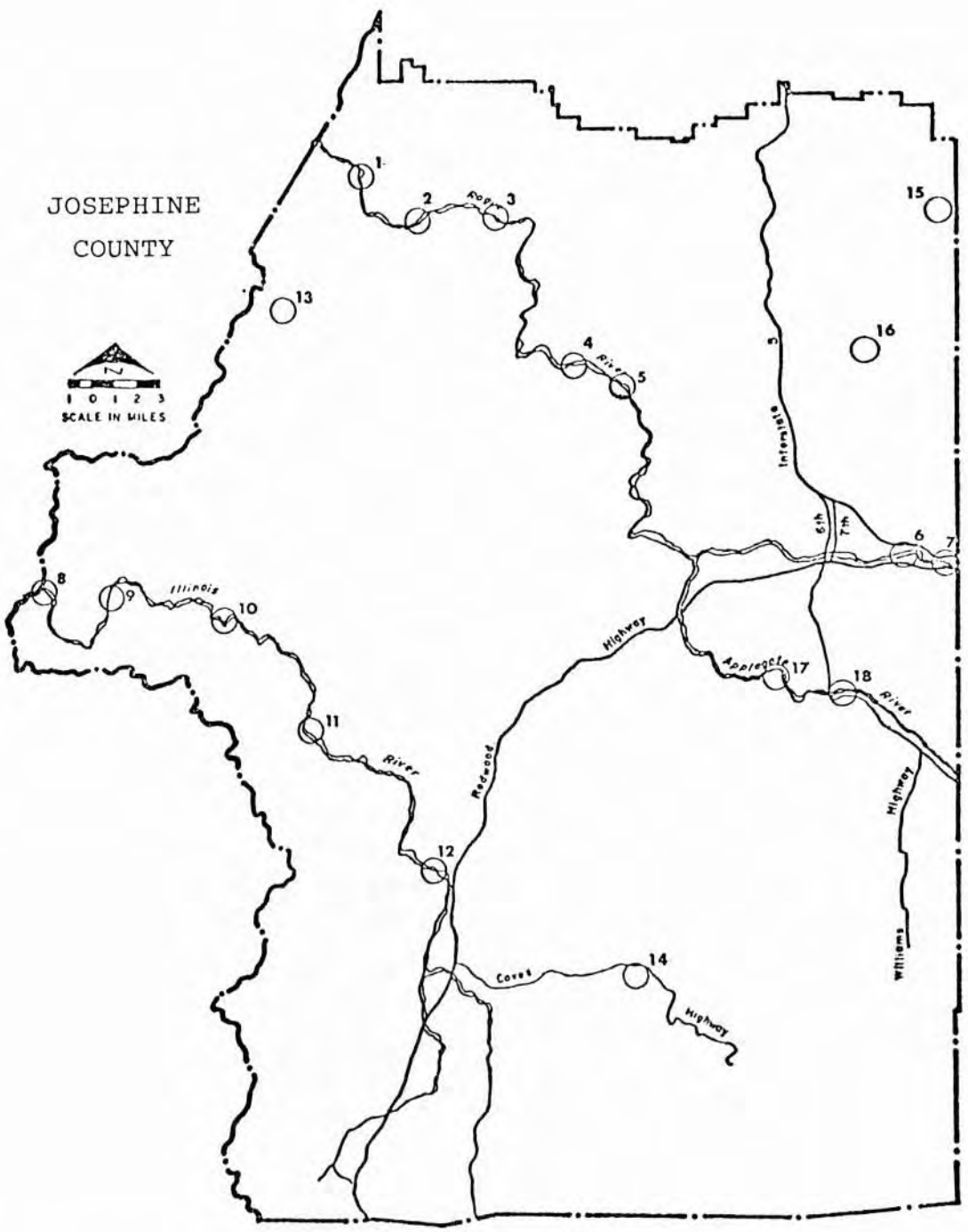
TABLE EG-11

NO.	SITE NAME	STREAM	RIVER MILE	AVERAGE FLOW (CFS)	HEAD (FT)	CAPACITY (MW)	ENERGY (AVE. MW)	STORAGE (1000 AF)	SOURCE
		Begin National Wild and Scenic River and Oregon Scenic Waterway Limits River Mile 11							
1	Horseshoe Bend	Rogue River	58	No Data Available					O
2	Rainey Falls	Rogue River	63	6000	330	173	104		O
3	Swing Bridge	Rogue River	66	No Data Available					O
4	Taylor Creek	Rogue River	80	No Data Available					O
5	Hellgate	Rogue River	82	No Data Available					O
		End National Wild and Scenic River and Oregon Scenic Waterway Limits River Mile 95							
6	Ament	Rogue River	104	4000	30	11	7		O
7	*Savage Rapids	Rogue River	106	3430	100	29	23		G
		Begin Potential Wild and Scenic River and Oregon Scenic Waterway Limits River Mile 0							
8	Collier Bar	Illinois River	12	No Data Available					O
9	Bald Mountain	Illinois River	21	2500	480	102	82		G
10	Clear Creek	Illinois River	29	2000	500	99	60		O
11	Falls Creek	Illinois River	40	1935	360	59	47		G
		End Potential Wild and Scenic River and Oregon Scenic Waterway Limits River Mile 47							
12	Kerby	Illinois River	50	1312	180	9	6	465	F
13	Frantz Ranch	Indigo Cr.		460	280	11	9		G
14	Sucker Creek	Sucker Cr.	8	210	204	4	3	33	G
15	Pease Bridge	Grave Cr.	25	60	145	1		28	2
16	Sexton	Jump-off Joe Cr.	11	50	180	1	1	30	2
17	Applegate	Applegate River	9		206	9	5	7	F
18	Murphy	Applegate River	12	725	150	9	7	195	G

*Existing Bureau of Reclamation Non Power Project Capacity and Energy values are for a future powerhouse

Source Code
O - State of Oregon
G - United States Geologic Survey
F - Federal Power Commission
2 - Corps of Engineers

MAP EG-12



○ POTENTIAL HYDRO-ELECTRIC SITE
IDENTIFIED BY THE U.S. ARMY CORPS OF ENGINEERS

BIOMASS

Electric power generated from the burning of organic material is termed biomass conversion. Such materials can be grown specifically for use as a fuel. The following table lists potential biomass fuels.

Eucalyptus seems to have significant potential as a biomass plantation crop due to its tolerance of marginal soils and climatic conditions. Unfortunately, BTU/Lb information could not be found, but "the trees can be converted to electricity, gas, and liquid fuel, or used directly as a solid fuel" (BPA, 1977).

Wastes from lumber and pulp mills and logging operations can also be utilized in biomass conversion (see following discussion of co-generation). The Oregon Department of Energy (1978) estimates that approximately 15% of Oregon's total energy supply could come from wood waste.

Unused wood residue in Oregon and Washington total 21.5 million dry tons annually (BPA, 1977). At present this residue is being used for a variety of purposes including chipboard, sawdust and garden bark. However, it could also be used for power generation. A 25MW (megawatt) wood-waste burning plant would utilize 134,000 tons of fuel (BPA, 1979). Such a plant is currently being studied for siting in the Estacada area in the northern Oregon Cascades. Construction cost of the 25MW plant (estimated in 1982 dollars) would be $28.3 million; cost of a 5MW plant would be about $13 million (BPA, 1979).

Garbage (solid waste containing inorganic as well as organic components) also has potential as a fuel for a similar combustion plant. The Eugene Water and Electric Board, using their Waterville steam plant, has determined that energy generated from garbage burning is competitive with other environmentally acceptable solid waste disposal methods (BPA, pg.-138). Plans for larger scale application are being implemented. The following chart illustrates the energy content of various components of garbage.

TABLE EG-13

ENERGY CONTENT (BTU/POUND) OF PLANT BIOMASS

BTU/Lb	Plant	Plant Part	Percent H^2O
9,750	Chamise (Adenostoma fasiculatum)	Leaves	0
9,450	Chamise (Adenostoma fasiculatum)	Stems	0
9,030	Pine (Pinus sp.)	Bark	0
9,000	Oilseed crop	Seed	---
8,810	Fir (Abies sp.)	Bark	0
8,740	Spruce (Picea sp.)	Bark	0
8,370	Oak (Quercus sp.)	Bark	0
8,350	Redwood (Sequoia sempervirens)	Bark	0
8,139	Oak (Quercus sp.)	Bark	7
7,956	Pine (Pinus sp.)	Wood	12
7,594	Buckwheat (Fagopyrum esculentum)	Hulls	10
7,578	Birch (Betula sp.)	Wood	12
7,560	Coconut (Cocos nucifera)	Shells	13
7,506	Beech (Fagus sp.)	Wood	13
7,398	Bamboo (Phyllostachys sp.)	Cane	10.5
7,281	Sugarcane (Saccharum officinarum)	Bagasse	12
7,182	Oak (Quercus sp.)	Wood	13
4,000	Sugarcane (Saccharum officinarum)	Bagasse	52

SOURCE: Stanford Research Institute, 1974, p. 95.

TABLE EG-14

COMPARISON OF NORMAL AND "TRASH" FUELS

	10^6 BTU/Ton
Coal (average)	23.0
Newspaper	16.96
Brown paper	15.39
Corrugated board	14.85
Food cartons	15.46
Pulp trays	16.52
Waxed milk cartons	23.47
Plastic film	27.68
Polystyrene	31.57
Polyethylene	29.90

SOURCE: Berry, R.S. and Makino, H., 1974, p. 42.

COGENERATION

If boilers of industrial steam generators are reinforced, pressures increased, and half again the amount of fuel is added, efficiency can be increased 30% (to 60-70% total), and electric energy can be created in addition to the steam provided for the industry(ies). This process is termed cogeneration.

The following is excerpted from "Oregon's Energy Future" (D.O.E., 1978):

> "While cogeneration has received much publicity in recent months, industry has long been aware of this option. Utilization of cogeneration has been low because the economics have not been favorable. This is especially true in the Pacific Northwest where electricity prices have been low. Additionally, numerous institutional constraints still block cogeneration planning and development. However, as the price of central-station-generated electricity rises, cogeneration will become a more economically viable alternative.
>
> In Oregon the majority of the potential for cogeneration lies in the pulp and paper and the wood products industries.
>
> Although some food processors use large amounts of steam that would justify cogeneration, the season-

ality of their operation renders the practice unattractive. The form of cogeneration where utilities would provide steam from their existing and currently planned central stations to industry is extremely limited in Oregon. This is primarily because the designs of planned plants, which have already been finalized, preclude cogeneration and cannot be retrofitted. Additionally, the remoteness of thermal power plants from industrial activity causes problems because steam cannot be transported over long distances.

While it is easy to generalize about the potential of cogeneration at industrial settings in Oregon, the economics of each individual project will be the ultimate determinant of how much cogeneration will be realized. At present, the usage of wood wastes and coal appears to be the most economically feasible means to implement cogeneration. Industrial customers can currently purchase electricity for less than they can produce it via additional steam from oil and natural gas boilers.

Future implementation of cogeneration projects will depend on many factors. As in the case of coal utilization, a national energy plan could play a large role. The provisions of such a plan for dealing with institutional problems that hamper the development of cogeneration and the financial incentives that might be provided will be pivotal in the future of cogeneration. Other factors that will influence industry's consideration of cogeneration include electricity price, fuel availability and price, utilities attitudes, and availability of capital."

Research is currently being conducted by Bonneville Power Administration (in conjunction with Rocket Research Company) evaluating the feasibility of cogeneration facilities for the Northwest.

The Eugene Water and Electric Board and Weyerhauser Corporation have contracted to design and implement a cogeneration plant in Springfield, Oregon, that has a fuel conversion efficiency of 81% (Hunt, A.A., 1978). The plant is fueled by a pulp and paper mill by-product.

GEOTHERMAL

The report entitled "Assessment of Geothermal Resources of the United States--1975" (U.S. Department of the Interior) reveals generally poor potential for geothermal production in this area. Some eastern Oregon sites (e.g. Klamath Falls) do possess geothermal

resources, but research and well data (few hot water wells) in southwest Oregon do not indicate any obvious possibilities.

SOLAR

Solar technology is attaining a very feasible status for residential application. Simple methods of utilizing solar energy as heat stored in large water vessels, stone walls, or other large masses (often combines with other simple systems such as foam-insulation of windows at night) are very economical and easy to design into new dwellings. Retrofitting existing dwellings is equally as feasible with slightly altered methods. Systems such as this are called passive, whereas systems which utilize pumps and/or fans are called active systems. Passive systems are generally used for space heating (the largest residential use--see Chart EG-15); active systems can supply hot water, space heating, and more expensively, air conditioning and electricity. Many periodicals contain information about solar systems, and some local architectural firms now have experience in design and implementation of solar systems.

The first solar-designed house in Josephine County is currently being constructed near Cave Junction (designed by a Medford firm). Also, a solar-powered radio translator (with a 15 day storage capacity) is being used in the County by KSOR Radio.

Site orientation and use of landscaping materials can also be a major factor in basic utilization and moderation of solar energy.

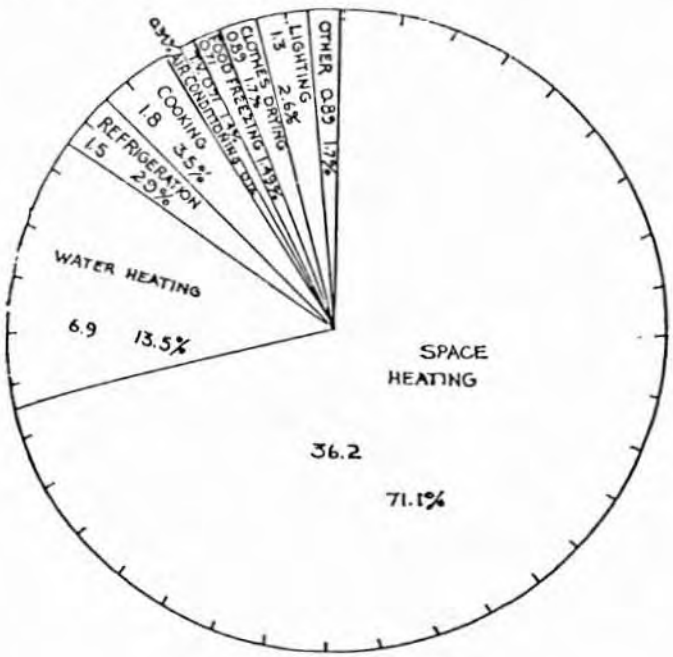
The annual average daily solar radiation (in BTU's/ft^2 on horizontal surface at ground level) measured in Medford (in neighboring Jackson County) is 386. This is approximately 10% higher than Pendleton, Oregon (Office of Energy Research and Planning, 1975).

CHART EG-15

OREGON AND UNITED STATES RESIDENTIAL

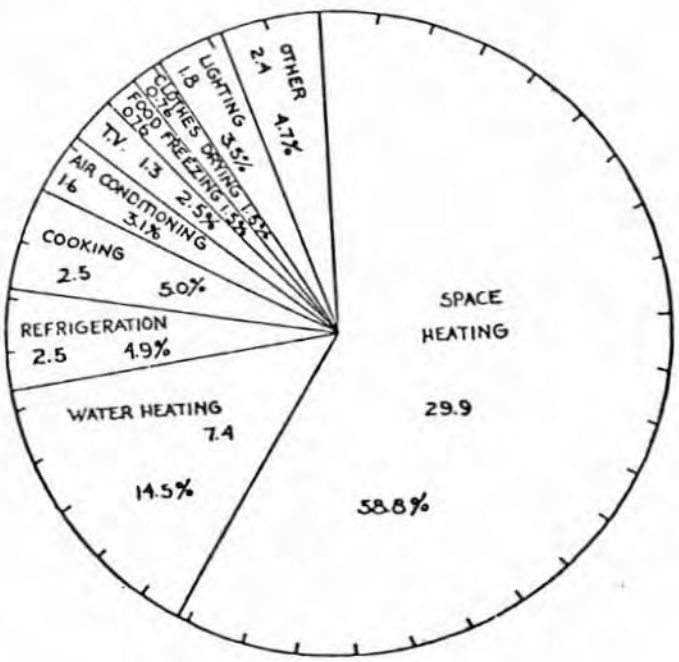
DIRECT ENERGY COMPARISON - 1973

Numbers expressed in million BTUs per capita and percent of sector total.



OREGON

Total-51 Million BTU's Per Capita



UNITED STATES

Total-51 Million BTU's Per Capita

SOURCE: Office of Energy Research and Planning, p. 94.

WIND

Wind power generation is not feasible as a supplemental energy system unless storage batteries are utilized or winds are fairly constant. Various horizontal and vertical axis systems are available. Equipment and installation is somewhat expensive at present, but long-term use should result in a net savings. The amount of power generated and used, as correlated to commercial rates, determines the pay-back time.

Constant winds are not a feature of any large areas of the County, but specific sites may be especially suitable if local breezes are fairly continuous.

The Oregon Department of Energy has been conducting research in wind power generation. Information on 1) monthly mean wind speed, 2) frequency distribution of wind speed (the percent of time the wind blows at a given strength), and 3) daily variation of wind speed is highly valuable in determining the wind resources of a particular area.

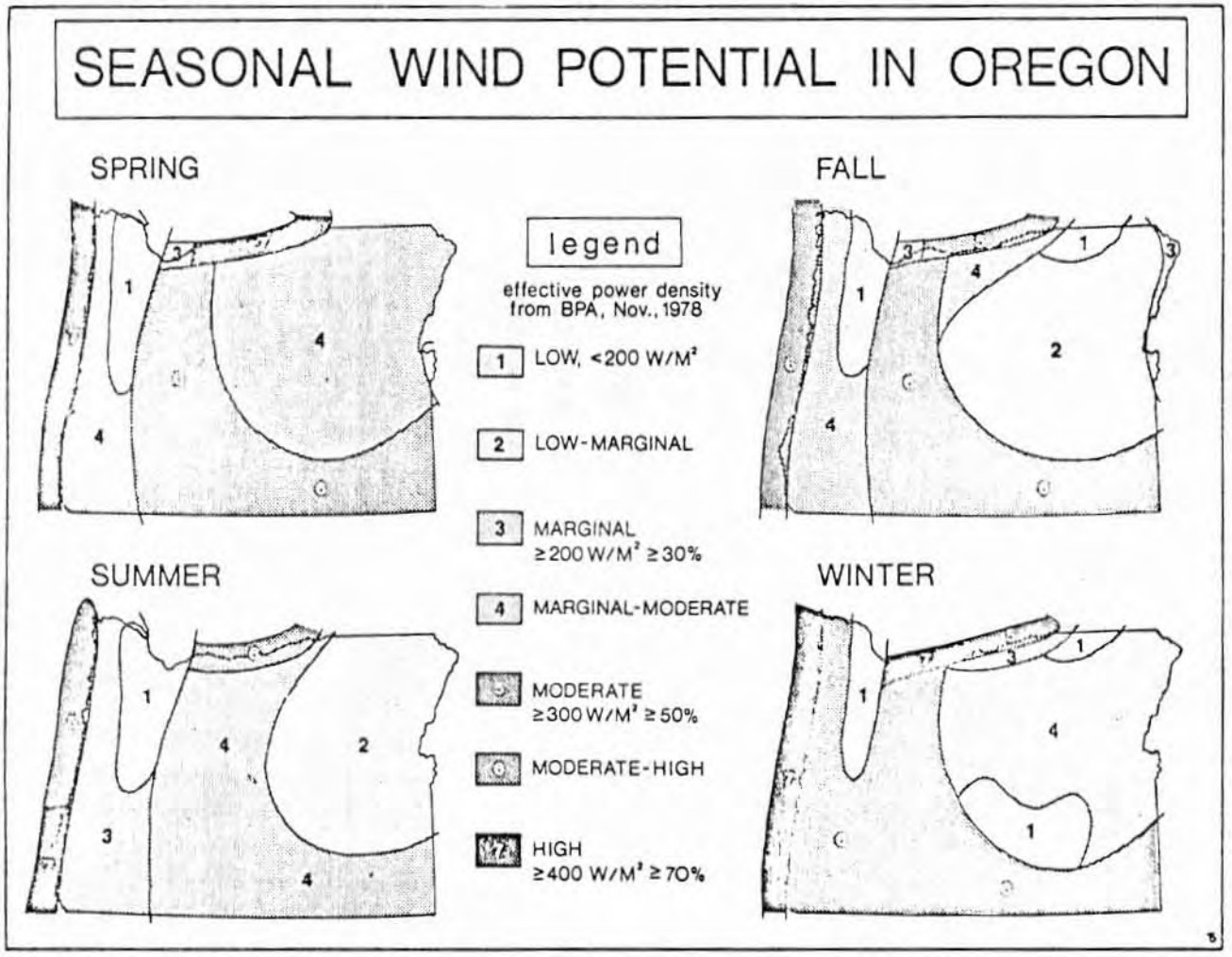
This information is not, however, readily available for this area, particularly on a site-specific basis. Individual readings must, therefore, be taken. According to the Oregon Wind Book, "Wind censor equipment can be rented through the Oregon Department of Energy's wind anemometer loan program. Equipment includes an anemometer, auxiliary equipment, tower and materials. The data obtained will be analyzed for you by the Department of Atmospheric Sciences at Oregon State University and returned with an estimate of the average wind power for that wind site. (For details contact the Renewable Resources Section, Oregon Department of Energy, Labor and Industries Building, Salem, Oregon 97310.)" Data should be collected for at least one year.

According to the Department of Energy wind resources in Oregon are substantial. The following map has been included to show the potential for wind sites. This is, however, a very general map; poor exposure could alter this designation drastically. Therefore, individual site investigation must occur. The maps do indicate that "winter, the season of peak power consumption, provides frequent strong winds in most of the state...

An average wind speed of ten miles per hour is generally considered the minimum required for cost-effective wind energy conversion." Cost efficiency, however, depends upon the cost of utility power in the area.

At present large scale wind generated energy projects are being constructed in California and Washington.

MAP EG-16



SOURCE: Department of Energy, Oregon Wind Book, 1978.

WOOD

Josephine County has vast timber resources, often marginal for commercial production, but widely distributed and generally accessible to individuals. Slash clean-up and thinning are two useful techniques for forest management that could be expanded if and when firewood demand increases. Hardwoods are especially valuable fuels, as they have a higher heat output than softwoods.

For efficiency in wood burning, well designed wood stoves are superior to fireplaces. The stoves can also be more easily installed into existing dwellings.

Air pollution is a potential problem with wood burning. This is somewhat alleviated by the dispersed nature of the population in Josephine County and the minimal amount of burning in the summer months.

CONSERVATION

TRANSPORTATION

The following table compares various types of transportation for energy efficiency:

TABLE EG-17

COMPARISON OF ENERGY EFFICIENCY
OF TRANSPORTATION MODES

Urban	Energy (BTU/Passenger-mile)	Inter-City	Energy (BTU/Passenger-mile)
Bicycle	200	Bus	1,600
Walking	300	Railroad	2,900
Mass Transit	3,800	Automobile	3,400
Automobile	8,100	Airplane	8,400

SOURCE: Citizens Advisory Committee on Environmental Quality, 1974.

In reviewing the chart, it can be seen that railroads are the most fuel-efficient means man has yet devised for overland transportation of freight, using only one-quarter as much energy as a truck does to carry cargo. (Citizens Advisory Committee on Environmental Quality, 1974). Their operation for this purpose ought to be encouraged.

Development of rail for human transit may be a desirable step to connect Grants Pass to Medford or Eugene. Probably the greatest fuel savings, however, could result from the development of a mass transit system. Public transportation generally requires high-density population, but many alternatives are being researched and implemented. The existing developed corridors (Highway 199, Interstate 5, and the Murphy-Williams Highway) have potential for mass transit systems (see Transportation Chapter).

GENERAL

Energy conservation and conversion to small-scale production in Josephine County will reduce use of fossil fuels and make the County less dependent on remote power sources. Local power companies, the Oregon Department of Energy, and the U.S. Department of Energy are just a few of the many sources providing information on energy conservation to consumers. Compilation of such sources for public dissemination may be a desirable project.

RECYCLING

Recycling used materials is one of the more obvious and efficient ways of saving energy and resources. Logistics of a recycling system are discussed in Public Facilities. Energy saved by recycling is shown in the following table.

TABLE EG-18

PRODUCTION ENERGY SAVED BY RECYCLING

Material	Point of Impact	Energy Cost (10^6 BTU/ton) Virgin Material	Recycled Material	Percent Saved
Steel	Molten Steel	46.7	22.6	52
Aluminum	Molten Aluminum	224.5	8.2	96
Plastics	Molten polymer	45.2	2.0	96
Paperboard	Pulp	6.6	3.3	50
Glass	Transportation	7.8	7.8	0

SOURCE: Berry, R.S. and Makino, H., 1974, p. 41.

INCENTIVES

A number of bills have been passed by the Federal and State legislatures during the last few years:

1. Federal Tax Credit: provides a tax credit of 30% of the first $2000 (and 20% of the next $8000) for money spent on solar, wind, or geothermal energy sources for the home.

2. State Tax Credits: Oregon Revised Statute 316.116 provides a tax credit to any Oregon homeowner who installs a certified solar, wind or geothermal energy device in their principal or secondary residence. Twenty-five percent of the investment cost, up to $1,000, may be claimed provided the alternative energy device will meet or exceed 10 percent of the total energy requirements of the home and has been certified by the D.O.E.

3. Property Tax Exemption: Under Oregon Revised Statute 307.175, increases in personal property value due to these additions are exempt from property tax from January 1980 to January 1998.

4. Veterans Loans: Oregon Revised Statute 407.048 applies to all veterans who install solar, wind or geothermal energy devices in their homes. A DVA loan of up to $3,000 may be obtained, provided the alternate energy device meets criteria established by the Department of Veterans' Affairs.

5. Low Cost Loans: Oregon Revised Statute 317.100 provides that loans up to $10,000 will be available for the installation, construction and operation of certified alternative energy devices.

Conservation through weatherization is the primary focus of recent legislation.

1. Oregon Revised Statute 469.150 and 317.100 provide programs for consumers to obtain a range of information and weatherization services directly from space heat energy suppliers. These services include home heat loss inspections, cost estimates of energy saving measures and information about low-interest loans. Lending institutions will provide 6.5% loans for people who take advantage of these programs.

2. For veterans, Oregon Revised Statute 407.058 requires that in order to acquire a veteran's loan for a home built prior to July 1, 1974, (when state insulation standards went into effect for new home construction), the home must meet new "retrofit" weatherization standards set by the Department of Commerce. Eligible veterans may also finance weatherization home improvements through this measure.

3. Numerous federal programs provide weatherization assistance to low-income and/or elderly persons. At the state level, Oregon Revised Statute 310.681 appropriates $4 million to the Department of Revenue for home weatherization expenses for low-income and elderly residents. This is a reimbursement plan for the cost of weatherization materials and/or services up to $300 per household for those who qualify. This program is managed through the Josephine County Housing Authority.

4. Oregon provides a tax credit of 25% (up to $125) for the cost of weatherization materials. Oregon Revised Statute 316.088 allows a personal income

tax credit for individual taxpayers to improve the energy efficiency of their principal residence or the principal residence of their renters, including mobile homes. Installation must meet applicable minimum standards of the Uniform Building Code.

5. A federal tax credit program provides a credit of 15% up to $300 on federal taxes for money spent on weatherization as specified in IRS Publication 903.

County regulations should also be tailored to promote energy conservation and utilization of alternative energy sources. Incentives could be developed at the County level, including building allowances, planning allowances, and tax reductions.

APPENDIX A

BEFORE THE BOARD OF COUNTY COMMISSIONERS OF THE STATE OF OREGON FOR THE COUNTY OF JOSEPHINE

In the Matter of the Adoption of a Program to Provide the Opportunity for Citizens to be Involved in Matters Relating to Land Use Planning

RESOLUTION 76-12

WHEREAS Chapter 197.160 of the Oregon Revised Statutes require that Josephine County provide an opportunity for persons within Josephine County to become involved in preparing, adopting and revising the Comprehensive Plan of Josephine County, and

WHEREAS a program has been prepared by the Josephine County Citizen Involvement Committee and recommended to the Board for adoption,

NOW THEREFORE BE IT RESOLVED that the Citizen Involvement Program attached hereto as Exhibit A be and hereby is adopted as the means of obtaining compliance with ORS Chapter 197.160, as well as providing the citizenry of Josephine County a program whereby they may have the opportunity to be involved in matters relating to land use planning.

DONE AND DATED this 29th day of April, 1976.

BOARD OF COUNTY COMMISSIONERS

Approved as to form:

Duane Wm. Schuitz, Legal Counsel

CITIZEN INVOLVEMENT PROGRAM

JOSEPHINE COUNTY

Citizen Involvement Committee

I. Method of Selection.

A. Elections: Citizen Involvement Committee (CIC) members will be elected by individual Citizen Advisory Committee (CAC) areas throughout the county, with two CIC members and alternates per CAC area, for appointment by the Board of County Commissioners. Any incorporated city within the county will be asked to provide a non-voting member for the county CIC to establish cooperation between the county and city CIC's. Total membership of the CIC is then dependent upon the number of functioning county CAC areas and city CIC's. CIC elections shall comply with CAC criteria.

B. Term: CIC membership shall be based on calendar year, with each new membership assuming CIC responsibilities on ... (date to be determined by existing area groups and set at May 17, 1976 CIC meeting). Members can serve for up to four consecutive terms if their CAC areas so choose.

C. Duties: CIC duties remain as outlined in original order, dated January 15, 1976.

Citizen Advisory Committees

I. Method of Selection.

A. Elections: Selection of CAC members shall be by a public election process of verified residents of the CAC area. The time and frequency of subsequent elections shall be clearly outlined in each CAC charter.

B. Voting Privileges: Voting privileges shall be widely dispersed. The voting qualifications, as well as balloting procedures, shall be clearly outlined in each CAC charter.

C. Broad Representation: All elections shall be extensively publicized using one or all of the mass media (radio, television, newspaper and the public mail), with the primary purpose being to encourage broad participation and representation. Each area shall compile a mailing list of residents by a means appropriate to the area, with the aid of the Planning Office Citizen Coordinator.

II. Organization

A. Each CAC shall furnish a group of officers which will be responsible for the operation of the CAC and for coordinating with the Planning Office Citizen Coordinator, with a minimum of a chairperson and a secretary-treasurer.

B. Each CAC shall determine specific length of term of officers and number of consecutive terms, including a stipulation for staggering terms and for an uneven number of members.

C. Minimum size of committee shall be five (5) members.

D. Each CAC shall have a recall procedure.

E. Meeting dates shall coincide with the planning process.

F. Charging dues for membership shall not be required. Voluntary contributions may be used as a source of income.

III. Function

A. A land use application/request made to the Planning Department is referred to the relevant CAC within three working days. (The land use application will inform the applicant of the CAC's interest and indicate that the applicant may be requested to attend a CAC meeting, but is under no obligation to do so.)

1. The CAC will be notified by telephone and mail by the Planning Office Citizen Coordinator. A copy of the application and all departmental research relating to the request (permits, environmental-economic impact studies, etc.) shall be furnished to the CAC officers.

2. Each CAC will establish a standard meeting date, time and location, and these will be recorded by the Coordinator.

3. Each CAC will notify the Coordinator for notice publication of the public CAC meeting for the request in the CIC column of the (Friday) Grants Pass Daily Courier and/or the Illinois Valley News.

4. The Planning Department shall furnish technical/material assistance for the CAC as necessary for their deliberations.

B. By the last day of the second week after an application has been received by the signed receipt of one CAC officer, the CAC shall submit a written recommendation to the Planning Commission. Failure of the CAC to provide its recommendation with the time allowed will forfeit the CAC's right to comment, unless a verbatim oral report of said written recommendation is received prior to expiration of two-week period.

1. The Planning Department will make necessary copies for inclusion of this CAC report in the Planning Commission's agendas for their hearing.

C. The CAC may call a public meeting to deliberate a request.

1. Minutes of this meeting will be kept.

2. Every CAC recommendation to the Planning Commission will include a majority and minority report, enumeration of decision reasons, and include all relevant data collected by the CAC in their deliberations.

   a. The Planning Office Citizen Coordinator shall assist the CAC whenever requested during their deliberations.

   b. The Planning Department will provide copies of the recommendation when requested by the CAC.

3. The CAC recommendation may request either a table of the application, with reasons stated, or a special hearing to be held in the area of the request. The special hearing would be used in instances of major community concern, such as Comprehensive Plan amendments, sewer extensions, arterial road construction, etc.

D. The CAC recommendation shall be read at the Planning Commission hearing and shall become part of the official transcript.

1. The CAC's are encouraged to have a spokesperson present at the Planning Commission hearing.

2. The Planning Commission shall make findings as required by law, after giving due consideration to the CAC's recommendation.

   a. Copies of these findings and minutes of the hearing will be given upon request to the CAC.

3. Appeals of the Planning Commission's decision will be made to the Board of County Commissioners as permitted by land use hearing rules.

4. CAC's may recommend Planning Commission candidates to the Board of County Commissioners in order to assist the Board in ensuring reasonable geographic representation on the Planning Commission.

E. The CAC shall hold as many public hearings as necessary to review and recommend changes in the Comprehensive Plan for its area.

1. Majority and minority reports of the CAC recommendations shall be submitted in writing to the Planning Department. (see Section III, B)

2. The Planning Department shall provide technical assistance for CAC deliberations and investigation of Comprehensive Plan related matters.

Budget

Items to be paid for by Josephine County
as approved in the annual Budget.

I. Citizen Involvement Committee:

A. Notice of meetings: cost of paper, printing and postage.

B. Round-trip mileage for one car from each area to Grants Pass CIC meetings, @ 15¢ per mile, to be submitted by each CAC treasurer.

C. Preparation and mailing of meeting minutes.

II. Citizen Advisory Committees:

A. Notice of special meetings: flyers or newspaper ads for special issues (elections)

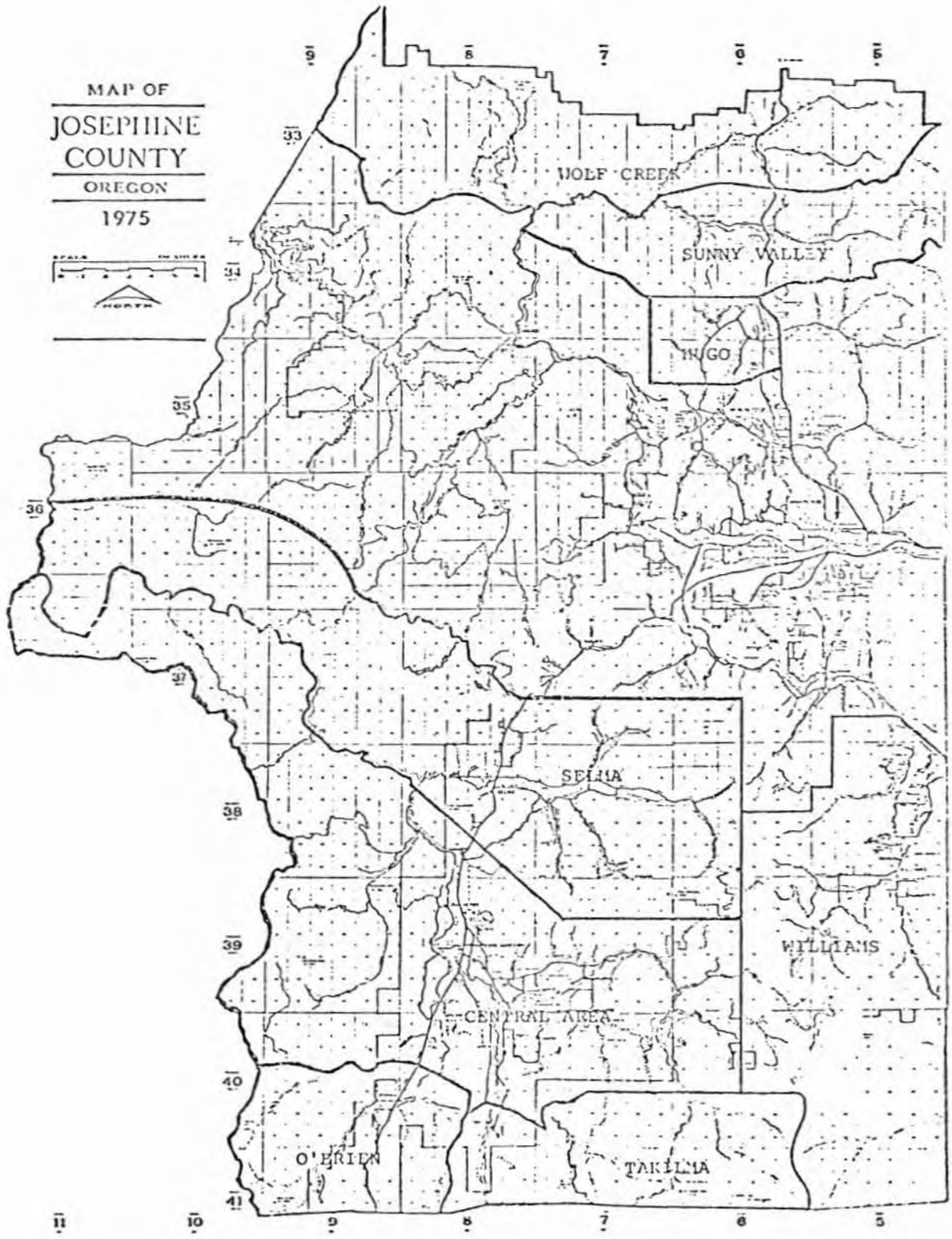
B. Informational surveys, germane to major land use planning issues, when such costs are prohibitive on the CAC level.

C. Reference materials in each area.

D. Expenditures for educational programs may be reviewed by a CIC subcommittee to determine if there are costs which may be prohibitive on the CAC level. If so, such costs may be paid by the County.

Citizen Advisory Committee Area Boundaries

Areas not currently represented on the attached map and who wish to form area advisory committees must recognize the established boundaries of existing CAC groups. Once new boundaries are established and CAC groups formed, the Planning Office Citizen Coordinator and the CIC will be so informed. If any area within an existing CAC boundary wishes to establish a new area, they must present their reasons for division to the CIC for consideration and subsequent recommendation of the Planning Commission to the Board of County Commissioners.


MAP OF
JOSEPHINE
COUNTY
OREGON
1975
WOLF CREEK
SUNNY VALLEY
IRIGO
SELMA
WILLIAMS
CENTRAL AREA
O'BRIEN
TAKILMA

The Long Range Goals of the Citizen Involvement Program Shall Be:

A. First, it shall be determined what information is necessary for land use planning in each category.

1. Citizen Involvement
2. Agricultural Lands
3. Forest Lands
4. Open Spaces, Scenic and Historic Areas, and Natural Resources.
5. Air, Water and Land Resources Quality
6. Areas Subject to Natural Disasters and Hazards
7. Recreational Needs
8. Economy of the State
9. Housing
10. Public Facilities and Services
11. Transportation
12. Energy Conservation
13. Urbanization

B. Every land owner and resident shall receive a copy of the "Statewide Planning Goals and Guidelines".

1. This shall be accompanied by a letter from their CAC representatives.
2. Questionnaires shall be utilized to determine as much land use planning information as possible. Questionnaires will be color coded or number coded or use confidential check lists so that privacy of respondents will be preserved.
3. The letter shall announce a meeting date for the local CAC with an agenda attached. (The questionnaire should be returned before the meeting date to enable compilation of information.)
4. A public educational program on land use planning shall be held for each phase with no politics involved.

C. Before each and every meeting, the CAC shall obtain all the necessary facts they can for the items on the agenda being discussed.

All meetings shall stay as close as possible to the subject on the agenda, and have a goal for each meeting. If the public is not satisfied that they are accomplishing anything, then they will become frustrated and not return; thus, no "public awareness".

D. The CAC shall identify the problem and provide alternate solutions.

Educational Programs

Educational programs on land use planning in Josephine County shall be made available through the Citizen Coordinator of the Planning Office. The following are types of programs which may be utilized at the discretion of the Citizen Advisory Committees.

I. Workshops for advisory groups and all county residents ...
   --to acquaint citizens with basics of land use planning
   --to define functions of the planning commission, planning staff, and citizens' groups.
   --to explain comprehensive plan and implementing ordinances

II. Special programs for groups and organizations ...
   --as requested and keyed to the interests and needs of sponsoring groups

III. Information and reference shelves ...
   --set up and maintain reference shelves at numerous locations throughout the county, including Josephine County Comprehensive Plan, Zoning Regulations, Land Development Regulations, appropriate zoning maps, LCDC materials and other material as available and requested.

IV. (Optional) Compilation of citizens handbook on land use planning specific to Josephine County.

Procedure for Program Evaluation

The Josephine County CIC will have regular meetings once a month for program evaluation. Evaluation shall consider and include items covered in the LCDC-CIAC aid dated December 1975. Evaluation materials shall be distributed to local area CACs for consideration and distribution.

The first CIC meeting in 1977 will include on its agenda the evaluation results and examine any possible resulting revisions of the citizen involvement program.

E. It is suggested that the CAC keep accurate records of the questionnaires received, the number of people attending each public meeting, results reached at meetings, letters received, and other forms of citizen input. Each CAC will will serve as a channel for local citizen opinion to move upward and reach elected officials and other public agencies. In this process the privacy of individual citizens will be scrupulously respected.

Josephine County
Division of
Advance Planning

LOCATION: Grants Pass City Hall
Sixth & A Streets
PHONE: (503) 476-8801 ext 257
MAILING ADDRESS: Josephine County Courthouse
Grants Pass, Oregon 97526

DEVELOPMENT FORM AND GROWTH

ALTERNATIVES ANALYSIS: Growth and population trends from the Development Form and Growth and Population Elements were examined, with discussion of alternate futures and growth scenarios. Rate and quantity of growth was evaluated relative to demand for public facilities, impact on natural resources, and esthetic condition of the living environment. The inter-relatedness of all systems dealt with in the Plan became especially clear while evaluating economic impacts of growth patterns (sprawl vs. urban-centered, urban vs. rural), and the impacts of development on resources such as surface and ground water supplies.

FINDING: Josephine County is one of the most rapidly growing areas in Oregon. Development is occurring mostly outside of incorporated areas, both in the Grants Pass urban area and in sparsely settled large-lot rural areas. The rate of population increase is such that careful consideration needs to be given to County policies that affect the economy, resource base, and rate and density of development; failure to do so will result in a steady decrease in living quality and economic viability. There is a wide diversity of opinion and desires in the County about growth, and an effort should be made to accomodate these needs to the extent possible, while realizing that hard choices must be made in a world of finite resources. Despite varied opinions about rate and amount of growth, it is generally agreed that the rural character of Josephine County must be preserved.

GOAL #1: DEVELOPMENT OF URBAN DENSITIES, SERVICES, AND ASSOCIATED COMMERCIAL AND INDUSTRIAL USES SHALL OCCUR WITHIN WELL-DEFINED COMPACT URBAN AREAS TO REDUCE SERVICE COSTS, TAX BURDENS, AND IMPACT ON RURAL AREAS AND ENVIRONMENTAL QUALITY.

Policy #1: Urbanizable land shall be separated from rural lands by an urban growth boundary. The criteria for determination of the boundary, and any subsequent changes, shall be as set forth in State Planning Goal 14 (Urbanization). Record of the process of boundary determination shall be included as a separate addenda to this Plan. Provision of services in designated areas shall be as given in Public Facilities goals and policies, and shall be consistent with Goal 1 above.

Policy #2: Allow only those urban uses outside urban or urbanizing areas that are required to serve the needs of residents of an immediate area, or those which, by the nature of the use, cannot be located elsewhere.
Policy #3: The rate and amount of urban growth must be consistent with: the limitations of resource quality and quantity (air, water, etc.); the ability to provide the full range of urban services without negating any of the goals and policies of this Plan; and the overall quality of Josephine County as a living environment.

GOAL #2: THE RURAL CHARACTER OF JOSEPHINE COUNTY IS ONE OF ITS STRONGEST ASSETS, AND MUST BE PROTECTED. WHILE STRONG GROWTH CONTROL MEASURES ARE NOT ACCEPTABLE TO MANY OF THE COUNTY'S RESIDENTS, THERE IS A COMPELLING NEED FELT TO PREVENT OVER-POPULATION AND DENSITIES THAT WOULD DESTROY THE QUALITIES THAT ARE MOST VALUED AND IMPORTANT HERE.
Policy #1: To the extent possible, keep present density designations in the Comprehensive Plan and Zoning Ordinance intact, recognizing that each incremental change to greater density is part of a general trend toward loss of the rural nature of the County. The present zoning would allow more than triple the existing population, a strong argument against the need for further increases in allowed densities at this time.
Policy #2: Through use of urban growth boundaries, public facilities planning, and identification of resource carrying capacity, allow only those levels of development density that are consistent with Plan goals and policies and the planned intent to provide services. This policy is intended to avoid the problem of belatedly attempting to bring services up to the density level of development which has grown beyond the capacity of existing facilities (septic tanks, wells, rural roads, etc.) to serve it.

ECONOMY

FINDING: The economy of Josephine County is unique, being largely dependent on tourism, government employment, and the forest industries. The economic base is not growing at nearly the same rate as population, unemployment is high, many young people must leave the area to seek employment, thus increasing the trend toward a predominance of retired persons within the population, and much of the dollar flow within the County stems from outside sources, such as Social Security, Welfare, retirement, and other similar payments.

The economy is not necessarily weak as a result of this pattern, rather,

it is different than that found in many other areas. There is much concern within the County about the lack of jobs for young people, and an equal amount of concern regarding the growth stimulant effects of providing or encouraging new industry.

GOAL #1: PROVIDE ADEQUATE LAND AND SERVICES FOR INDUSTRIAL USES BENEFICIAL TO THE PEOPLE AND ECONOMY OF THE COUNTY.
Policy #1: Industrial locations shall be consistent with Plan goals and policies relating to urbanization, services, and land use.
Policy #2: Industries that cause considerable air, noise, visual, water, or other pollution shall be discouraged.

GOAL #2: THE EMPHASIS IN BOTH COMMERCIAL AND INDUSTRIAL GROWTH SHALL BE DIRECT BENEFIT TO THE PEOPLE OF JOSEPHINE COUNTY.
Policy #1: Small locally based industries and businesses that are energy efficient shall be encouraged as a source of jobs for local people.
Policy #2: Recognition is made that industrial expansion causes a ripple effect in the economy, spurring growth and development in general. It is the policy and intent of this Plan to further opportunities for the people of Josephine County, while encouraging no actions which would cause a considerable increase in the general rate of growth, and be inconsistent with other Plan goals and policies related to growth.

Josephine County
Division of
Advance Planning

LOCATION: Grants Pass City Hall
South & 'A' Streets
PHONE: (503) 476-8881 ext. 237
MAILING ADDRESS: Josephine County Courthouse
Grants Pass, Oregon 97526

- Draft -

HOUSING AND RESIDENTIAL LAND USE

FINDING: The rate and amount of development in Josephine County has several implications for housing and each individual's use of the land. Costs are being pushed up to an extent that is making it increasingly difficult for all but higher-income people to find, and keep, the housing they need. This is especially true for the elderly living on fixed incomes. The growth rate is also a potentially serious problem for the resource base and livability of the County, while controls used to alleviate these problems may impose unacceptable limitations on landowners.

GOAL: MAINTAIN THE QUALITY OF HOUSING AND RESIDENTIAL ENVIRONMENTS IN JOSEPHINE COUNTY, AND TAKE ACTIONS THAT WILL LESSEN THE IMPACT OF HOUSING COSTS ON THE HOMEOWNER.

POLICY #1: Provide areas suitable for a wide variety of housing types, densities, and cost levels to enable all segments of the population to find a decent place to live.

POLICY #2: The character of rural residential areas shall be preserved as set forth in Goal 2 and Goal 2, Policy #1 of Development Form and Growth.

POLICY #3: Encourage cluster development as provided in the Zoning Ordinance, especially where it helps to preserve scenic, agricultural, forest, or other lands with intrinsic value as open space. Explore the possibility of a density incentive to encourage such development.

POLICY #4: Residential densities shall be compatible with other goals and policies of this Plan, and shall directly reflect the carrying capacity of the land and resource base, and the criteria for such development in State Planning Goals 14 (Urbanization), and 11 (Public Facilities).

POLICY #5: All public facilities shall be provided in relation to planned levels of development as set forth in Plan goals for public facilities, growth and development, and Plan mapping and urban growth boundary designations.

POLICY #6: Multiple-family residential uses shall be located in areas designated for urban density development. (Exception: Multiple-family development shall be allowed outside Urban Growth Boundaries where it is part of a Planned Development concept and does not exceed the density requirements of the surrounding zone.) Their size and location shall be such that the character and livability of surrounding residential areas shall not be compromised, and shall in addition meet the following standards:

1. Development shall be located on streets of design and capacity such that resulting traffic loads shall not either overburden the immediate street system nor create noise or hazard, or other nuisance conditions for the surrounding area.
2. Development shall be within walking distance or short driving time of convenience shopping facilities, public schools, and urban open spaces.
3. Development shall be served by urban level services in accordance with Plan policies stated in the Public Facilities and Urban Growth Boundary goals and policies.
4. Development shall conform to Zoning Ordinance amenity standards regarding landscaping, lot coverage, screening, etc. that assist in making the development compatible with surrounding land uses.

Multiple-family development cannot always be located in advance on Plan maps, as appropriate locations are often the result of unique circumstances of change and development in a given area. For this reason, they may be located as a Plan map amendment and zone change when they meet the criteria set forth in this policy.

POLICY #7: Duplexes are recognized as a desirable means of providing economical housing, and appropriate provision should be made for their location within the Zoning Ordinance. Standards should also be provided within the Zoning Ordinance which will mitigate potential negative impacts on surrounding single-family development. Such standards shall prevent clustering of duplexes such that they change the character of an area (areas designed or designated for exclusively duplex development would not be included in this standard), and shall provide large enough lots to insure sufficient open space given the household size and age characteristics of likely occupants.

New Policy

POLICY #8: Mobile home parks shall be located inside Urban Growth Boundaries, except where part of a rural commercial service center. Mobile homes outside boundaries or rural commercial service areas shall conform to the density requirements of the surrounding zone. Parks within rural commercial service areas shall be of limited size so as not to degrade the rural quality of the surrounding residential area. Zoning Ordinance and/or Planning Commission standards shall be designed to decrease and mitigate visual and esthetic impacts on adjacent areas. Such standards may include (but are not limited to) landscaping, number of units per acre, open space areas within the park, screening, etc. The Planning Commission shall insure that such parks within a rural commercial service center shall not have a cumulative negative impact on groundwater resources or sewage disposal capabilities of surrounding lands.

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Grants Pass, Oregon 97526

COMMERCIAL AND INDUSTRIAL LAND USE

FINDING: Commercial and industrial development in Josephine County will be increasing rapidly along with population growth. The location, type, and site design of commercial and industrial facilities affects traffic patterns, economic viability of businesses, appearance of the community, etc. People living adjacent to such areas are especially concerned by the impacts they have on the living environment.

As with residential uses, it is strongly felt by residents of the County that any activities that will not adversely affect neighboring properties or the long-range development pattern or welfare of the County should be allowable.

GOAL #1: PLAN FOR COMMERCIAL AND INDUSTRIAL DEVELOPMENT THAT WILL SERVE NEEDS WHILE MAINTAINING THE QUALITY OF THE LIVING ENVIRONMENT OF THE COUNTY.

POLICY #1: No actions shall be taken which would permit establishment or expansion of strip commercial areas. Such areas are a visual blight, destructive to the safe and efficient use of streets on which they are located, and ultimately detrimental to the business within them (Strip commercial shall be defined in relation to this policy as unrelated commercial uses located on a traffic corridor, having numerous curb cuts and unrestricted access). Alternatives shall be explored in developing commercial areas, which may include: limited access streets with traffic control at intersections; frontage roads; planned unit developments; and any other option which fulfills the intent of this policy.

POLICY#2: All proposed commercial and industrial Plan designations and changes shall be evaluated in relation to their impact on both the livability of nearby residential uses, and the cost of providing additional facilities to serve them. Sites shall be favored which provide good access and facilities, and meet the goals and policies of other parts of this Plan.

POLICY #3: Recognition shall be made in the planning process that commercial and industrial growth serves as a growth inducement in the neighborhood where it is located, and that establishment of such uses creates a precedent for more in the same area.

POLICY #4: Sufficient lands shall be allocated for tourist-related uses such as overnight camping and parking areas, retail and service business, etc., in recognition of the role of tourism in the County economy.

POLICY #5: Public facilities shall be provided for commercial and industrial growth in accordance with plan goals and policies in Development Form and Growth and Public Facilities.

POLICY #6: Home occupations are recognized as a positive means of providing for small local business in accord with Goal 2, Policy 1 under Economy, and provision should be made in the Zoning Ordinance for residents of large rural lots to conduct activities which would not logically be permitted within an urban setting. Zoning standards to accomodate these uses should be straightforward and performance-oriented, keeping visual, noise, and traffic impacts to the lowest level possible.

POLICY # 7: In order to reduce the need for trips to commercial centers, thereby saving fuel and travel time, provision shall be made in the Zoning Ordinance for small neighborhood commercial centers. These shall be extremely limited in size, number and type of uses, and shall have a generally specified service area. They shall serve only the daily convenience needs (groceries, laundry, gas stations, etc. as opposed to uses of wider attraction, such as shoe stores, hardware stores, etc.) of the immediate vicinity, and shall not be allowed to function as a precedent for further commercial expansion in an area. Neighborhood convenience centers cannot generally be located in advance on the Plan map or Zoning Map, but shall be evaluated on an individual case basis according to Plan and Zoning Ordinance standards, and located on the maps if the standards are met.

POLICY #8: Zoning Ordinance designations for commercial and industrial uses shall provide flexibility to plan for growth that will be compatible with other land uses. Current zoning designations are general and inclusive of such a wide variety of uses that it is difficult to locate zones appropriately in relation to surrounding land uses. This is especially true with uses of "lighter" density or impact which may have very little effect on adjacent properties, while the zoning classification would allow incompatible uses. New zoning categories should also contain performance standards relating to noise, traffic impact, landscaping, and other impact and amenity issues to insure compatibility.

POLICY #9: Commercial uses outside Urban Growth Boundaries shall be located to provide for the market needs of a specific rural area. Such uses, other than neighborhood commercial, shall be located within commercial centers identified for the particular rural area. New centers shall not require urban-level water or sewer services, nor shall such services be expanded in existing centers. Centers shall not be developed in strip-commercial fashion.

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PUBLIC FACILITIES

General

Finding: The most important problem in Public Facilities planning in Josephine County is adequate identification of urban and rural areas. The present development pattern includes many areas, especially around Grants Pass, that are rapidly developing to densities that cannot be supported by rural systems and facilities. The future growth pattern and densities of these and other outlying areas must be planned for well in advance to avoid financially and environmentally costly problems later.

GOAL #1: PROVIDE PUBLIC FACILITIES APPROPRIATE TO THE URBAN OR RURAL CHARACTER OF EACH AREA.
Policy #1: Delineation and definition of urban and rural areas shall be in accordance with the urban growth boundary portion of this Plan.

GOAL#2: FACILITIES SHALL BE PROVIDED IN AN ORDERLY, TIMELY, EFFICIENT MANNER.
Policy #1: Areas shall not be permitted to develop to densities that would require a greater level of service without prior recognition and designation of the desired growth level consistent with Plan goals and policies.
Policy #2: Facilities needed for an area shall be developed together in a coordinated manner. Isolated urban density developments with only partial urban-level services shall be allowed only when included in a long-range Plan designation which is appropriate for that density.
Policy #3: All facilities shall be sized to serve the population densities indicated in this Plan, recognizing that oversizing is an inducement, and often a determinant, of density levels.
Policy #4: Any extension of urban services outside an urban growth boundary shall be to solve the existing problem, and facilities will therefore be sized to serve only the population currently in the service area. Service beyond this level must be accompanied by inclusion within an urban growth boundary, such boundary change meeting all criteria set forth in this Plan and State Planning Goal #14.

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TRANSPORTATION

FINDING: Transportation in Josephine County does not present the wide range of problems found in larger urban areas, but there are several key problem areas. One is the need for additional traffic capacity across the Rogue River in the Grants Pass Urban Area. Rapid growth south of Grants Pass, in addition to summer tourist traffic, make it difficult to cross the river during peak traffic hours without considerable delay. The South Grants Pass urban fringe is the fastest growing area of the County, and this problem will rapidly become more serious. Another problem is the need to corilate road construction to population growth to avoid over or under-building, both of which may be financially and environmentally costly.

The rural nature of the County makes it difficult for older persons and the physically handicapped to travel to doctors and other professional services, shopping areas, entertainment, etc. Some relief is provided by the federally-funded bus system operated by the Senior Aid Center; future need may require additional services.

Another alternate form of transportation important to Josephine County is bicycle paths. Such paths will become more and more essential with the increased population in the urban areas.

GOAL: To provide an adequate, economic, and efficient transporation system within Josephine County.

POLICY #1: Provide additional traffic capacity across the Rogue River in South Grants Pass to cope with population expansion and tourist traffic.

POLICY #2: Project road construction needs based on population growth and traffic generation in each area of the County. Provide a level of transportation network that will efficiently move traffic without encouraging premature growth or adversely impacting the character of surrounding rural areas. Land should be acquired for right-of-way as early as possible to minimize cost.

POLICY #3: Roads other than rural local roads shall not be constructed through areas zoned for agricultural use unless no feasible alternative exists.

POLICY #4: Facilities and systems should be provided for the transportation disadvantaged where the number of such persons justifies the expenditure, and funding is available.

POLICY #5: As an alternate and energy-saving mode of transportation, bicycle paths shall be provided whenever possible in urban and urbanizing areas on major arterial and collector streets. They should also be considered between smaller community centers.

POLICY #6: The County shall create a comprehensive road construction plan by 1980 which shall be carefully coordinated with goals, policies and map designations of this plan and all applicable State planning goals.

POLICY #7: In order to ensure long-term compatibility of the County Airport with surrounding land uses, a clear zone shall be established which will prohibit residential construction and commercial and industrial uses which would involve substantial concentrations of people.

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FOREST RESOURCES

FINDING: The economy and esthetic environment of Josephine County are dependant largely on its forest lands. Forests occupy 89.9% of the land of the County; 67.9% of this is Federal, .9% State, 2.9% County, and 18.2% private. These 935,148 acres of land must be managed in a manner that will lead to continued production of forest products, provision of recreation and tourist-oriented activities, and fish and wildlife protection.

GOAL: Protect and conserve forest lands within the County.

POLICY #1: Require all agencies involved in forest management in Josephine County to coordinate their activities with the Comprehensive Plan and citizen planning process so that specific plans and practices may be in conformance with Plan policies.

POLICY #2: In order to protect the economic viability of productive forest lands, and so that harvesting has minimal impact on residential areas, residential development of greater than rural density shall not be permitted immediately adjacent to major forest land areas.

POLICY #3: To the maximum extent possible, forests within the County shall be managed such that the following values are maximized. This policy shall apply directly to County forest lands, and to the review and coordination process with State and Federal agencies (and shall be encouraged on private lands):

1. Sustained yield such that present harvesting does not decrease the potential for replenishment and future yield.
2. Multiple use such that forest-related activities such as timber harvesting, recreation, fish and wildlife protection, etc. are mutually enhanced.
3. Environmental protection, with special attention to using management methods that: will not damage watersheds through over-cutting or clear-cutting in sensitive areas; preserve stream habitat in accordance with Oregon Fish and Wildlife standards; avoid road-building in areas of especially steep and easily-eroded hillside; avoid using environmentally damaging or dangerous chemicals or other methods to an extent greater than that level absolutely essential to forest management; and any other concerns found during the review and coordination process to be of particular importance.

POLICY #4: The development of timber supplies on small woodlots shall be encouraged. In cases where commercial forest land proposed for subdivision has been substantially clear cut (as differentiated from selectively cut) within the last five years, the Planning Commission shall require assurance of adequate reforestation prior to plat approval. Such reforestation shall be accomplished according to State Forest Practice Rule Standards for site and species on similar forest land.

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NATURAL RESOURCES

FINDING: Josephine County's wealth of natural resources provides abundant esthetic appeal along with viable economic worth, both in terms of tourist and recreation income and in terms of dollar values of resources harvested. Recognition is made that conservation and sound management of such resources is essential to the continued economic stability of the County. Further, the desire on the part of most County residents to protect the rural integrity of the area goes hand in hand with protection of the County's scenic and natural values.

GOAL: NATURAL RESOURCES, INCLUDING MINERALS, AGGREGATES, FISH, WILDLIFE, GROUNDWATER AND OTHER WATER AREAS, AND SOILS, SHALL BE MAINTAINED AND MANAGED SO AS TO RETAIN THE QUALITY OF THE COUNTY'S LIVING ENVIRONMENT, ECONOMIC VIABILITY AND ESTHETIC APPEAL.

Policy #1: Mineral and aggregate deposits, an ample and valuable resource in the County, shall be protected for current and future utilization by open land uses, such as forest, agriculture and floodplain. Extraction and production shall be conditional upon meeting all applicable State and Federal requirements for air and water quality, noise levels, etc.

Policy #2: Soils and slope shall be taken into consideration in hillside residential developments, especially in relation to road cuts and road building, with erosion protection a requirement in areas of decomposed granite or other easily eroded soils.

Policy #3: Protection of fishery resources, along with preservation of habitat, streamside vegetation, water quality, and recreational and esthetic values, shall be accomplished through implementation of shoreline buffer areas; retention of vegetation; restrictions on channelization, diking and filling; and adherence to the Forest Practices Act and other State and Federal management policies.

Policy #4: Groundwater quality and quantity shall be protected and maintained at a level adequate to insure its continued use for domestic water supplies, keeping development consistent with known groundwater availability.

Policy #5: Floodplain areas in the County shall be protected from further development through retention of low density or open space uses, such as large lot rural residential, forest, agriculture, or recreation.

Policy #6: Wildlife habitat and production shall be recognized as a supplementary benefit of open space or low density uses, with small lot subdivisions or other intensive land uses discouraged in areas of deer and elk winter range, pond and streamside vegetation, drainageways, wet and dry meadows, bogs and swamps, heron rookeries, and other sensitive wildlife habitat.

Policy #7: Significant and ecologically important natural areas in the County shall be protected from conflicting, intensive land uses, to the extent that natural values outweigh economic, social, or energy considerations.

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PARKS, RECREATION, AND OPEN SPACE

FINDING: Provision of parks and other public open spaces in Josephine County must be viewed in relation to the fact that approximately 70% of the County is in public forest ownership. Present acreage of parks is adequate for County population, but rapid growth in the Grants Pass Urban Area will make park lands more and more essential in the near future. Many of the environmental assets of Josephine County are of national or state-wide significance, such as wild and scenic rivers and historic areas. Parks and open space are also an essential part of the County's economy because of the impact of the tourist trade.

GOAL: Provide adequate parks, open space, and recreation opportunities within Josephine County in relation to population increase.

POLICY #1: Where acquisition of key park sites is deemed necessary, they shall be acquired as soon as possible to reduce cost.

POLICY #2: Coordinate with the City of Grants Pass to identify needed parks and recreation developments in the Grants Pass Urban Area and take whatever action is necessary to insure an adequate supply of needed lands for the future.

POLICY #3: Maximum use should be made of the school-park concept to provide low cost recreation lands.

POLICY #4: Encourage further development of hiking trails by all agencies as a means of providing for multiple recreation uses at low expense.

POLICY #5: Planning for future recreation needs shall include provision for bicycle paths. They are a valuable form of recreation, and serve as an energy-saving and non-polluting alternate to automobile transportation.

POLICY #6: The County shall encourage retention of lands within wild and scenic rivers areas in private ownership whenever possible. Such lands shall be designated in large-lot rural density classifications in order to meet the intent of wild and scenic rivers legislation.

POLICY #7: Sites of historic significance shall be preserved unless there is strong need for alternate use of the historic site.

ADOPTED BY-LAWS

JOSEPHINE COUNTY CITIZEN INVOLVEMENT COMMITTEE

SEPTEMBER 1978

ARTICLE I: NAME AND PURPOSE

1. NAME: The name of this committee shall be Josephine County Citizen Involvement Committee.

2. PURPOSE: This committee shall provide a forum for the residents of Josephine County on matters pertaining to land use, land use planning, zoning, comprehensive planning, and community development. Furthermore, this organization shall have the responsibility of making decisions regarding Citizen Advisory Committees' procedural issues (either on an individual level upon request or on a countywide level as deemed appropriate by the executive committee or majority vote).

3. FUNCTIONS:

   a. Community Forum: The CIC will identify areas of county-wide concern and after appropriate hearings and discussion, will make recommendations to pertinent agencies, commissions, and/or organizations. In hearings, appropriate notice will be provided to news media seven (7) to fourteen (14) days prior to the hearings.

   b. CAC Procedures: The CIC will have the responsibility for hearing and making decisions on internal or joint CAC level procedural disputes or questions. The CIC will not intervene or arbitrate in CAC internal affairs except by a majority vote of the board or the presentation of ten (10) signatures on a petition. Additionally, the CIC shall address procedural questions that have countywide implications.

ARTICLE II: MEMBERSHIP

1. MEMBERS: Shall be comprised of two elected representatives from each of the Citizen Advisory Committee areas.

   a. Any incorporated city within the county will be asked to provide a non-voting member for the county CIC to establish cooperation between the county and city citizen programs. Total membership of the CIC is then dependent upon the number of functioning county CAC areas, as defined by the executive committee of the CIC.

   b. Term: CIC membership shall be based on the calendar year, with each new membership assuming CIC responsibilities directly after CAC election.

ARTICLE III: EXECUTIVE COMMITTEE

1. OFFICERS: The executive committee of the CIC shall be elected by the CIC members and there shall be a minimum of chairperson, vice-chairperson, and secretary.

2. NOMINATIONS AND ELECTIONS: Election of the executive committee shall be held at the first meeting of every calendar year.

   a. Nominations will be open at a regular CIC meeting prior to the election date. Nominations from the floor may be accepted at the night of the elections.

   b. Individuals nominated must be elected CIC representatives and must consent to the nomination.

ARTICLE IV: SELECTION OF CIC MEMBERS FROM CAC AREAS - CAC ELECTIONS

1. ELECTION: CAC Board members shall be elected by their CAC areas throughout the county. Each CAC will then elect or appoint from the Board representatives and designate alternate members for each CAC area. The following are the procedures to be followed:

   a. The elections shall be open to qualified voters of each CAC area.

   b. Voters must be verified residents or property owners of the CAC area. There shall be an identification check at the time of polling using such verification as drivers license, landlord's statement, and/or property tax statement.

   c. Absentee ballots shall be accepted for both CAC and CIC elections. There will be only one ballot per qualified voter, with the marked ballot folded and inserted into an envelope. The voter will then sign his/her name, current address, and where appropriate, identification of owned property in the CAC area, across the edge of the sealed envelope. This envelope may then either be mailed, or given to a second party to be delivered to the election place so that it arrives no later than the time of the election. Once it has been verified that the ballot was from a qualified voter, the envelope shall be opened and the folded ballot included with the rest of the uncounted ballots.

   d. Elections shall be well publicized through newspaper publication and/or mail notification (Grants Pass Daily Courier, Illinois Valley News).

   e. Elections shall be held annually in a local community building, or wherever regular elections are held for that area.

   f. Nominations will open at a regular meeting prior to the election date (nominations may be submitted by sealed letter, but the nominee must know of and accept the nomination. If nominees are not able to attend, nominees shall endeavor to have a statement of policy presented at the meeting. Nominees must be informed of the re-

quirement of the office). Nominations from the floor may be accepted at the night of the elections.

g. The election will be run by a non-partisan volunteer group with a minimum of two persons. A CAC member not in contest must be present to verify board election results.

h. Election results will be made public information within seven (7) to fourteen (14) days. A copy of the results must be submitted to the Planning Office for record.

ARTICLE V. RECALL AND/OR REMOVAL OF CIC AND CAC MEMBERS

1. CIC RECALL: Recall of any CIC member maybe effected by a majority vote of the CAC board members.

   a. A petition for recall must be submitted to the CAC and to the Josephine County Planning Office.

      1. The petition must clearly state the reason(s) for recall, and the statement must be based on fact.

      2. The petition must be signed by a minimum of twenty five (25) verified residents or property owners of the CAC area.

   b. The person(s) being recalled must have the opportunity to present his/her/their case against recall to the electorate of the area.

   c. CAC board members will vote at a special meeting publically advertised seven (7) to fourteen (14) days in advance.

   d. Replacement of CIC members may be accomplished in one of two ways:

      1. A vote of the total CAC membership at a meeting where the replacement vote was a listed agenda item.

      2. The CAC board members will appoint a new representative by a majority vote at a public meeting for the completion of the unexpired term.

2. REMOVAL: Any member who is absent without excuse for three consecutive meetings may be removed by a majority vote of the CAC board members. Replacement would then follow the above procedures.

3. CAC RECALL: Recall of any board members may be effected by a majority vote in a special election held according to the standard election procedure listed in Article IV:

   a. A petition for recall must be submitted to the CAC and to the Josephine County Planning Office.

      1. The petition must clearly state the reason(s) for recall, and the statement must be based on fact.

      2. The petition must be signed by a minimum of twenty five (25) verified residents or property owners of the CAC area.

   b. The person(s) being recalled must have the opportunity to present his/her/their case against recall to the

electorate of the area.

c. The CAC board members will appoint a new representative(s) by a majority vote at a public meeting for the completion of the unexpired term.

ARTICLE VI: MEETINGS

1. REGULAR MEETINGS: The CIC shall hold a public meeting on the third Monday of each month, which shall be publicized one (1) week before the meeting.

2. QUORUM: A quorum will consist of one-half of all functioning CAC's. Any CAC that does not have a member at a CIC meeting on three consecutive regularly scheduled meetings will be no longer considered functioning for the purpose of CIC business. Notice will be presented to a CAC after the second missed meeting.

3. MINUTES: Minutes of the meeting will be taken by a member of the Planning Office staff and will become public information.

ARTICLE VII: AMENDMENT OF THE CIC BY-LAWS:

The by-laws may be amended by a 2/3 vote of the quorum present at a meeting when the proposed amendment was on the previously printed agenda.

ARTICLE VIII: BOUNDARY ALTERATION:

Boundaries may only be altered by a 2/3 majority vote of active members of the CIC. This vote may only be held by:

1) A request signed by all of the elected board members of every CAC involved; or,

2) Upon the presentation of a petition with twenty five (25) signatures of area residents that clearly state the reasons for the change and specifically identifies the proposed boundaries.

3) a) The CIC may use this as the basis for taking a vote; or,

b) May establish a number of public hearings in the area to determine appropriateness; or,

c) Request the Planning Office mail out a questionaire developed by the CIC to residents of the affected area; or,

d) Take any other action, or combination of actions, that would establish a basis for taking such a vote.

BEFORE THE BOARD OF COUNTY COMMISSIONERS FOR THE COUNTY OF JOSEPHINE
STATE OF OREGON

In the Matter of Approving By-Laws and Boundary Maps for the Josephine County Citizen Involvement Program.	RESOLUTION No. 78-35

WHEREAS, Chapter 197 of the Oregon Revised Statutes requires that Josephine County adopt a program providing an opportunity for citizens to be involved in all phases of the land use planning process; and

WHEREAS, such a program was duly adopted by the Josephine County Board of Commissioners by unanimous vote on the 29th day of April, 1976; and

WHEREAS, the most efficient and proper implementation of such a Citizen Involvement Program requires that by-laws be approved and adopted and that boundaries for the respective Citizen Advisory Committees be established in order to provide guidance in the functioning of the Citizen Involvement Committee and Program; and

WHEREAS, the Josephine County Citizens Involvement Committee has recommended and adopted by-laws and citizen advisory committee boundaries to serve the aforementioned purposes; and

WHEREAS, it is now both reasonable and proper that the Josephine County Board of Commissioners affirm said by-laws and boundary maps as an indication of its approval and support for the Citizen Advisory Program in Josephine County;

NOW, THEREFORE, IT IS HEREBY RESOLVED approving the adopted by-laws and boundary maps of the Josephine County Citizen Involvement Committee and Program. (See Exhibits "A" and "B" attached hereto and expressly made a part hereof)

DONE and DATED this 14th day of September, 1978.

BOARD OF COUNTY COMMISSIONERS

Commissioner Ben Kilpatrick Opposed

APPROVED AS TO FORM:

Alvin L. Calvert

M. C. Roughtelidge

_____CITIZEN ADVISORY COMMITTEE

APPLICATION REVIEW

The reason for this form is to let local people explain to the Planning/Zoning Commission how the enclosed request will affect your neighborhood. Include whatever you think is necessary.

NAME OF APPLICANT: _____

TYPE OF APPLICATION: _____

COMMITTEE MEETING DATE: _____

DATE PROPERTY VIEWED BY CAC REVIEW COMMITTEE: _____

NUMBER OF CAC REVIEW COMMITTEE MEMBERS VIEWING PROPERTY: _____

HOW MANY ADJOINING NEIGHBORS WERE CONSULTED: _____

NEIGHBORS COMMENTS: _____

_____

_____

DID THE APPLICANT OR A REPRESENTATIVE EXPLAIN THE REQUEST?

_____YES _____NO

CAC AREA MEMBERS POLLED: _____APPROVED

_____DISAPPROVED

(Do not include vote of applicant or representative)

CAC BOARD MEMBERS VOTE: _____APPROVED _____DISAPPROVED

_____ABSTAINED _____ABSENT

1) Is there anything special about the property that the Commission should know about? What? (Shape, slope, adjoining land use, etc.):

_____

_____

_____

_____

_____

2) How will this request affect the neighborhood?

a. Benefits: _____

_____

_____

b. Disadvantages: _____

_____

_____

3) Would granting this request benefit or hurt adjoining property owners? How?

_____

_____

_____

4) If approved, would this request put a strain on local services? (Schools, roads, water resources, etc.): How?

_____

_____

_____

5) In some cases, to change a use in a zone, you have to ask the Zoning Commission. Before you can do this, you have to meet certain conditions for that zone as listed in the Josephine County Zoning Regulations. To the best of your knowledge, has the applicant met those conditions? If not, what needs to be done?

_____

_____

_____

6) Additional Comments: _____

_____

_____

_____

Name of person filling in this form: _____
Date: _____

Revised 6/78 BB

PROCESS TO DEVELOP JOSEPHINE COUNTY"S COMPREHENSIVE PLAN LAND ALLOCATIONS

July, August of 1977	1. Staff developed the land use inventory, agricultural and forest soil maps, water shed maps and updated present zoning maps.
September into November	2. The process of developing and publishing notices, organizing meetings, and scheduling staff for local work sessions was started. This continued into November.
September, October, November of 1977	3. Two staff members were sent to 22 work sessions in ten different areas over a period of two months. The intent of these sessions was to present information and to initially identify what areas of land citizens would deem appropriate.
December thru March	4. Staff developed county-wide maps representing the results from these meetings.
April 1978	5. Seventy-five copies of maps of work sessions results, initial agricultural (and forestry lands were applicable) goal exception verbage, and previously developed draft of goals and policies were sent out for review. Copies were sent to CAC's, agencies and Planning Commission members as to its accuracy and reflection of area recommendations.
April and May 1978	6. Schedule and notice 5 area meetings to review and discuss alterations in published document.
April and May 1978	7. Five formal presentations were made throughout the County with at least one staff and two Planning Commission member in attendance. There were at least 5 additional CAC or group presentations made upon request. Forms requesting comments and alterations were handed out for those in attendance or for later discussion.
June 1978	8. Comments from meetings, returned forms, and written correspondence were compiled and used to re-evaluate proposed agricultural and exception areas.
June, July 1978	9. An initial evaluation was made as to which properties with Class IV or better agricultural soils (as per the Goal), not currently in Exclusive Farm, could possibly stand a court review if rezoning were challenged. Additionally and evaluation was made of these lands that local citizens felt should be excepted from the goal from the perspective of justification by LCDC's Goal #2.

10. Areas that had Class IV or better soil but were suggested by staff via area workshops for exceptions were discussed by the Planning Commission. Full public notice of these meetings were made as required by law.

July August 1978

11. Property owners land was to be presented to the Planning Commission for consideration of rezoning were notified. Additionally, all adjoining property owners were notified. For each meeting one legal notice was provided, one news release made, and radio stations were notified.

12. Full findings of fact were developed, as required, for properties recommended for rezoning into Exclusive Farm by the Planning Commission. This was accomplished within two to four weeks of the hearings.

August September 1978

13. Again, each property owner was notified of the date and time of the rezoning hearing in front of the Board of County Commissioners. For each hearing one legal notice, one news article was released and each radio station was notified.

14. There were six initial hearings by the Board of County Commissioners plus several additional ones for individuals who held large parcels of land. For each hearing full finds of fact were developed and are on file in the Commissioners office. The final order for rezoning was adopted in December 1978.

November

15. As a result of Planning Commission meetings, a document and map on the lands where exceptions (via Goal 2) to the Agricultural (and forest where applicable) Goal were proposed was developed.

November

16. Presentation on the Exception Document to the Planning Commission and the Board of County Commissioners. It was then sent to LCDC for review and comment.

December

17. Presentation of the Exception Document to the CAC's was made. Copies were sent to CAC's not in attendance. A request was made for CAC's to identify land that were not rezoned to Exclusive Farm that they felt should have been rezoned.

18. The Exceptions Document was presented to the CIC on Monday, January 15, 1979.

Summer 1979

19. Release of DAta Base, Goals and Policies, and Map for first public review. This included:

a. citizen meetings to introduce the document

b. presentation of overlays on physical determinants

Spring 1980	20. Release of Implementation Chapter and Exceptions Document, Supplement II.
Spring & Summer 1980	21. Release of Draft Zoning Ordinance, public hearing and zoning/Planning Commission workshops.
August 1980	22. Property owners in proposed Serpentine, Forest Conservation, Farm Residential and Woodlot categories notified by mail of potential zone changes. (Also rural residential designations that constituted a "downzoning" from a higher density or commercial.)
September 1980	23. Public hearings by Board of County Commissioners on the Draft Comprehensive Plan.
October through December 1980	24. Board of County Commissioners workshops on the Planning Commission recommendation of the Draft Comprehensive Plan and the input received from the Public Hearings held in September.

APPENDIX B

ARCHAEOLOGICAL AND HISTORICAL SITES LEGISLATION

There are a number of state and federal laws affecting archaeological and hisotrical sites. Below is a reasonably complete listing of these laws.

HISTORIC PRESERVATION FACT SHEET

Oregon State Historic Preservation Office (SHPO):

Mr. David G. Talbot, State Parks Superintendent
State Historic Preservation Officer
Department of Transportation
Parks and Recreation Branch
525 Trade Street SE
Salem, OR 97310
(503) 378-5019
for operating questions, call Historic Preservation Coordinator (503/378-5002)

National Register of Historic Places:

The National Register of Historic Places is the official list of the nation's cultural resources worthy of preservation. It is maintained by the National Park Service under authority of the National Historic Preservation Act of 1966. The list contains districts, sites, archaeological sites, buildings, structures, and objects of national, state or local significance. National Historic Landmarks are automatically included. A cumulative listing of all National Register properties is published annually in the February issue of the Federal Register, the regular Congressional publication. Under certain circumstances, National Register properties are eligible for federal preservation assistance.

Dr. William J. Murtagh
Keeper of the National Register
National Park Service
Department of the Interior
Washington, DC 20240

The Advisory Council on Historic Preservation:

In the National Historic Preservation Act of 1966, Congress established the Advisory Council on Historic

Preservation to advise Congress and the President and to assist federal departments and agencies in discharging their historic preservation responsibilities under Section 106 of the Act.

Advisory Council on Historic Preservation
Suite 430, 1522 K Street NW
Washington, DC 20006

The National Trust for Historic Preservation:

The National Trust for Historic Preservation is a national non-profit organization chartered by Congress to encourage public participation in the preservation of sites, buildings and objects significant in American history and culture.

Chairman, Board of Trustees: Mr. Carlisle Humelsine
President, Colonial Williamsburg
Williamsburg, VA 23185

President: Mr. James Biddle
740-748 Jackson Place NW
Washington, DC 20006
202/638-5200

Director, Western Regional Office: Mr. John L. Frisbee III
681 Market St., Suite 859
San Francisco, CA 94105
415/543-0325

Other Organizations:

American Association for State and Local History
1400 8th Avenue S.
Nashville, TN 37203
William Alerson, Director

Society of Architectural Historians
1700 Walnut Street
Philadelphia, PA 19103
Rosann Berry, Executive Secretary

Oregon Historical Society
1230 SW Park Ave.
Portland, OR 97205

Northern Pacific Coast Chapter
Society of Architectural Historians
Earl D. Layman, Preservation Officer
City of Seattle Office of Urban
Conservation, Arctic Building
Seattle, WA 98104

Josephine Co. Hist. Soc.
714 NW "A" Street
Grants Pass, OR 97526

American Institute of Architects
Alfred M. Staehli, Preservation Officer
317 SE 62nd Ave
Portland, OR 97215

The Victorian Society in America
The Athenaem
East Washington Square
Philadelphia, PA 19106
Joan Thill, Executive Director

Friends of Cast Iron Architecture
44 W. 9th Street
New York, NY 1001
Margot Gayle, Director

Portland Friends of Cast Iron Architecture
1030 SW Second Ave
Portland, OR 97204

Association for Preservation Technology
Box CP 2487 -- Station D
Ottawa, Ontario
CANADA KIP 5W6

FEDERAL LAWS PERTAINING TO THE PROTECTION OF CULTURAL RESOURCES:

1906 -- Antiquities Act (P.L. 59-209) Established protection over any "historic or prehistoric ruin or monument, or any object of antiquity situated on government lands..."; required permits for their removal. Secretary of the Interior charged with responsibility.

1935 -- Historic Sites Act (P.L. 74-292) Congress declared that "it is a national policy to preserve for public use historic sites buildings and object of significance..." Act empowers the Secretary of the Interior through the National Park Service to conduct surveys, publish studies and otherwise encourage the preservation of historic properties not federally funded.

1960 -- Reservoir Act)P.L. 86-523) Gave the Department of the Interior through the National Park Service major responsibility for preservation of archaeological data that might be lost specifically through dam construction.

1966 -- National Historic Preservation Act (P.L. 89-665) Established Advisory Council, expanded the National Register of Historic Places, pledged federal assistance to preservation efforts of state and local groups. Advisory Council given responsibility to comment on effect of federal undertakings on properties entered in the National Register.

1969 -- National Environmental Policy Act (P.L. 91-190) Title I, Section 101 (b), "...it is the continuing responsibility of the federal government to use all practicable means...to preserve important historic, cultural and natural aspects of our national heritage..." Under Title I, Section 102(2)(c), federal agencies were to prepare environmental impact statements for each major federal action having an effect on the environment.

1971 -- Executive Order 11593 "Protection and Enhancement of the Cultural Environment." Charged federal agencies with responsibility to survey all lands and nominate properties to the Register. Requires Secretary of the Interior to advise other federal agencies in matters pertaining to the identification and evaluation of historic properties located on lands in their jurisdictions.

1974 -- Archaeologicaland Historic Preservation Act (P.L. 93-291) Amended the Reservoir Salvage Act of 1960. Secretary of the Interior to be responsible for coordinating and administering a nationwide program for recovery, protection and preservation of scientific, prehistoric and historic data.

1976 -- Tax Reform Act (P.L. 94-455) Section 2124 provided for changes in federal tax treatment of demolition costs, rehabilitation expenses, depreciation and charitable contributions of partial property interests when certified historic properties are involved.

OREGON LAWS PERTAINING TO THE PRESERVATION OF CULTURAL RESOURCES:

Archaeology -- ORS § 273.705-.742 (1942) governs removal of archaeological, historical and other valuable materials from state land. Permits required from Division of State Lands and president of University of Oregon. Provision made for finder's fee for discovery of valuable materials.

Oregon H.B. 2625, 1977 Regular Session The bill, which provides greater protection for antiquities in Oregon, classifies removal of archaeological historical, prehistorical or anthropological materials from state lands as a Class B misdemeanor. It was signed into law following the last Legislative session.

Oregon H.B. 2626, 1977 Regular Session. The bill prohibiting tampering with Native Indian cairns and graves also was signed into law in 1977. It requires reinterment of discovered Indian remains, while permitting scientific archaeological study of such sites and remains.

Archives and Historical Commissions -- ORS § 358.110-.770 (1973) governs city and county museums and county memorials, monuments and historical funds.

Historic Preservation -- ORS § 271.710-.750 (1974) authorizes state or any county, city or park and recreation district to acquire conservation or scenic easements to preserve or maintain all or part of natural or existing state of historical or other appropriate places of public significance. Use of power of eminent domain prohibited.

Oregon H.B. 2686, 1977 Regular Session. The Public Buildings Cooperative Use Act insures that the state government will investigate the feasibility of adapting historic properties whenever additional space and facilities are required. The state law, signed by the Governor on July 21, 1977, was a first of its kind at the state level in the county.

Protocol Agreement to Implement the Federal Public Buildings Cooperative Use Act of 1976. In 1977, also, the Governor signed a protocol agreement with the federal General Services Administration. It was the first agreement between the GSA and a state government to implement the Federal Public Buildings Cooperative Use Act of 1976. The agreement provides that the GSA will notify the State Department of General Services and the State Historic Preservation Office when there is any major relocation of federal facilities in Oregon. The agreement provides that priority consideration will be given to the adaptation of recognized historic properties.

Environmental Quality -- ORS § 390.310-.368 (1973) establishes Willamette River Greenway to protect, preserve and restore natural qualities and historic sites structures, facilities and objects on lands along Willamette River; specifies procedures for acquisition of land and scenic easements.

ORS § 390.410-.450 (1973) establishes Columbia River Gorge Commission with power to preserve and protect scenic and historic areas of Columbia River Gorge.

ORS § 390.805-.990 (1973) establishes scenic waterway system to preserve certain free-flowing rivers and adjacent lands possessing outstanding historical and archaeological values.

ORS § 273.562-.597 (1974) authorizes establishment of natural area preserves system, including land and water (although altered in character) important for study of historic and paleontological features or appreciation of natural features.

Historic Trails -- ORS § 376.220 (1971) authorizes citizens of road district or county to establish trails under control of court of county where located.

ORS § 276.605 (1971) authorizes Department of Transportation to construct public pedestrian trails and bridle paths connecting legally established streets, roads and public parks with Pacific Ocean shore.

ORS § 390.950-.989 (1973) authorizes Department of Transportation to establish Oregon Recreation Trails System. Before establishing trail, department to consider at a public meeting areas adjacent to such trails to be utilized for scenic and historical purposed. Rights-of-way to be of sufficient width and so located as to protect natural conditions, scenic and historic features and any primitive character of trail area.

Parks and Historic Sites -- Oregon Constitution, art. IX, § 3 authorizes use of proceeds from tax on motor vehicle fuel for acquiring, maintaining and publicizing parks and historic places.

ORS § 226.110-.400 (1971) authorizes cities to establish public parks and memorials.

ORS § 390.010-.290 (1973) establishes State Parks and Recreation Division with power to acquire and develop scenic or historic places. Establishes state policy to preserve and restore for public enjoyment and education structures, objects, facilities and resources as examples of state history, archaeology and natural science.

ORS § 377.505-.545 (1974) establishes Scenic Area Board with power to designate scenic areas, defined as areas adjacent to or along segment of public highway within federal or state park, sites of historical significance or sites affording view of unusual natural beauty.

ORS § 276.001-.108 (1974) establishes Capitol Planning Commission with power to preserve and maintain capitol area in Salem. Executive residence also to be maintained.

Enabling legislation authorizes State Parks Branch, Department of Transportation, to accept conservation or scenic easements on historic property in perpetuity. None have been accepted.

Taxation -- ORS § 308.740-.790 (1974) authorizes assessment of land as "open space" to reduce economic pressure and prevent forced conversion of open space land to more intensive uses. Open space land" defined as any land area preservation of which in its present use would preserve historic sites.

Oregon H.B. 2476, 1975 Regular Session declares state policy to maintain and preserve properties of state historical significance. Owner of property listed in National Register of Historic Places to apply to county assessor for property tax classification, with review of application by State Historic Preservation Officer. Requires county assessor to assess property classified as historic at its true cash value at time of applications for next 15 consecutive assessment years.

Oregon H.B. 2342, 1975 Regular Session declares state policy to encourage rehabilitation of existing rental units in substandard condition. Enables cities and counties to establish exemption from ad valorem taxation for five years at 100% of assessed value of qualified rehabilitation improvements to non-owner-occupied rental housing at least 25 years old. Establishes formula to determine when provisions apply and procedure for granting exemptions, including filing agreement with city or county to negotiate rental rates to be charged. Requires that improvements be made before January 1, 1980 to quality for exemption.

Oregon H.B. 2333, 1975 Regular Session provides that land located in commercial, industrial or high-density residential zone which is used, and has been used for preceeding five years, exclusively for single-family residence, be assessed at its true cash value for single-family residence and not at value if applied to other use.

Oregon H.B. 2344, 1975 Regular Session establishes exemption from assessed valuation of owner-occupied, single-family residential property for amount of increased valuation directly attributable to deferred maintenance performed and completed during period of July 1, 1975 to December 31, 1982. Deferred maintenance defined as repair or replacement to existing dwelling which does not increase square feet of living space.

Tort Liability -- ORS § 105.655-.680 (1974) establishes standard of care owed by landowners to those they allow to use property free of charge to view historic and archaeological sites.

APPENDIX C

Water Quality Standards not to be Exceeded: D.E.Q.

A. Water Quality Standards Not to be Exceeded (To be adopted pursuant to ORS 468.735 and enforceable pursuant to ORS 468.720, 468.990 and 468.992.)

1. Notwithstanding the water quality standards contained below, the highest and best practicable treatment and/or control of wastes, activities and flows shall in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor and other deleterious factors at the lowest possible levels.

2. No wastes shall be discharged and no activities shall be conducted which either alone or in combination with other wastes or activities will cause violation of the following standards in the waters of the Rogue River Basin:

a. Dissolved Oxygen (DO):

1) Fresh Waters: DO concentrations shall not be less than 90 percent of saturation at the seasonal low, or less than 95 percent of saturation in spawning areas during spawning, incubation, hatching, and fry stages of salmonid fishes.

2) Marine and Estuarine Waters (Outside of zones of upwelled marine waters naturally deficient in DO): DO concentrations shall not be less than 6 mg/l for estuarine waters, or less than saturation concentrations for marine waters.

b. Temperature:

1) Fresh Waters: No measurable increases shall be allowed when stream temperatures are 58° F. or greater; or more than 0.5° F. increase due to a single-source discharge when receiving water temperatures are 57.5° F. or less or more than 2° F. increase due to all sources combined when stream

temperatures are 56° F. or less, except for specifically limited duration activities which may be specifically authorized by DEQ under such conditions as it may prescribe and which are necessary to accommodate legitimate uses or activities where temperatures in excess of this standard are unavoidable.

2) Marine and Estuarine Waters: No significant increase above natural-background temperatures shall be allowed, and water temperatures shall not be altered to a degree which creates or can reasonably be expected to create an adverse effect on fish or other aquatic life.

c. Turbidity (Jackson Turbidity Units, JTU):

No measurable increases in natural stream turbidities shall be allowed when natural turbidities are less than 30 JTU, and no more than a 10 percent cumulative increase in natural stream turbidities shall be allowed when stream turbidities are more than 30 JTU, except for certain specifically limited duration activities which may be specifically authorized by DEQ under such conditions as it may prescribe and which are necessary to accommodate essential dredging, construction, or other legitimate uses or activities where turbidities in excess of this standard are unavoidable.

d. ph (Hydrogen Ion Concentration): ph values shall not fall outside the range of 6.5 to 8.5.

e. Organisms of the Coliform Group where Associated with Fecal Sources (MPN or equivalent MF using a representative number of samples):

1) Marine and Estuarine Waters: Average concentrations of coliform bacteria shall not exceed 240 per 100 ml.

2) Mainstem Rogue River from the point of salt water intrusion, approximately R.M. 4, upstream to Dodge Park, R.M. 138.4, and Bear Creek: Average concentrations of coliform organisms shall not exceed 1000 per 100 milliliters, except during periods of high natural surface runoff.

3) Rogue River above Dodge Park and all unspecified tributaries: Average concentrations of coliform organisms shall not exceed 240 per 100 milliliters, except during periods of high natural surface runoff.

f. Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health shall not be allowed.

g. The liberation of dissolved gases, such as carbon-dioxide, hydrogen sulfide or other gases, in insufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such waters shall not be allowed.

h. The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or which are injurious to health, recreation or industry shall not be allowed.

i. The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish shall not be allowed.

j. The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation or industry shall not be allowed.

k. Objectionable discoloration, scum, oily sleek or floating solids, or coating of aquatic life with oil films shall not be allowed.

l. Aesthetic conditions offensive to the human senses of sight, taste, smell or touch shall not be allowed.

m. Radioisotope concentrations shall not exceed Maximum Permissible Concentrations (MPC's) in drinking water, edible fishes or shellfishes, wildlife, irrigation crops, livestock and dairy products or pose an external radiation hazard.

n. The concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed one hundred and five percent (105%) of saturation, except when stream flows exceed the 10-year, 7-day average flood.

o. Dissolved Chemical Substances: Guide concentrations listed below shall not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may deem necessary to carry out the general intent of this plan and to protect the beneficial uses set forth in Section B.

	mg/l
Arsenic (As)	0.01
Barium (Ba)	1.0
Boron (Bo)	0.5
Cadmium (Cd)	0.003
Chromium (Cr)	0.02
Copper (Cu)	0.005
Cyanide (Cn)	0.005
Fluoride (F)	1.0
Iron (Fe)	0.1
Lead (Pb)	0.05
Manganese (Mn)	0.05
Phenols (totals)	0.001
Total dissolved solids	500.0
Zinc (Zn)	0.01

3. Where the natural quality parameters of waters of the Rogue Basin are outside the numerical limits of the above assigned water quality standards, the natural water quality shall be the standard.

4. Mixing Zones:

   a. The Department may suspend the applicability of all or part of the water quality standards set forth in this section, except those standards relating to aesthetic conditions, within a defined immediate mixing zone of specified and appropriately limited size adjacent to or surrounding the point of waste water discharge.

   b. The sole method of establishing such mixing zone shall be by the Department defining same in a waste discharge permit.

   c. In establishing a mixing zone in a waste discharge permit the Department:

      1) May define the limits of the mixing zone in terms of distance from the point of the waste water discharge or the area or volume of the receiving water or any combination thereof,

      2) May set other less restrictive water quality standards to be applicable in the mixing zone in lieu of the suspended standards, and

      3) Shall limit the mixing zone to that which in all probability, will

         a) Not interfere with any biological community or population of any important species to a degree which is damaging to the ecosystem, and

         b) Not adversely affect any other beneficial use disproportionately.

5. Testing Methods: The analytical testing methods for determing compliance with the water quality standards contained in this section shall be in accordance with the most recent edition of Standard Methods for the Examination of Water and Waste Water published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation, unless the Department has published an applicable superseding method, in which case testing shall be in accordance with the superseding method; provided, however, that testing in accordance with an alternative method shall comply with this section if the Department has published the method or has approved the method in writing.

41-080 Special Water Quality and Waste Treatment Standards for the Rogue River Basin.

1. Special Water Quality Standards. The provisions of this sub-section shall be in addition to and not in lieu of the General Water Quality Standards contained in Section 41-025, except where this sub-section imposes a conflicting requirement with the provisions of Section 41-025, this sub-section shall govern. No wastes shall be discharged and no activities shall be conducted which either alone or in conjunction with other wastes or activities will cause in the waters of the Rogue River Basin:

   a. Organisms of the Coliform Group where Associated with Fecal Sources (MPN or equivalent MF using a representative number of samples).

      1) Mainstem Rogue River from the point of salt water intrusion, approximately R.M. 4, upstream to Dodge Park, river mile 138.4, and Bear Creek; average concentrations to exceed 1000 per 100 milliliters, except during periods of high surface runoff.

      2) Rogue River above Dodge Park and all unspecified tributaries, average concentrations to exceed 240 per 100 milliliters, except during periods of high surface runoff.

   b. Dissolved Oxygen (DO). Dissolved oxygen concentrations to be less than 90 percent of saturation at the seasonal low, or less than 95 percent of saturation in spawning areas during spawning, incubation, hatching, and fry stages of salmonid fishes.

   c. ph (Hydrogen Ion Concentration). pH values to fall outside the range of 7.0 to 8.5

   d. Turbidity (Jackson Turbidity Units, JTU). Any measurable increases in natural stream turbidities when natural turbidities are less than 30 JTU, or more than a 10 percent cumulative increase in natural stream turbidities when stream turbidities are more

than 30 JTU, except for certain short-term activities which may be specifically authorized by the Department of Environmental Quality under such conditions as it may prescribe and which are necessary to accommodate essential dredging, construction, or other legitimate uses or activities where turbidities in excess of this standard are unavoidable.

e. Temperature. Any measurable increases when stream temperatures are 58° F. or greater; or more than 0.5° F. increase due to a single source discharge when receiving water temperatures are 57.5° F. or less or more than 2° F. increase due to all sources combined when stream temperatures are 56° F. or less, except for short-term activities which may be specifically authorized by the Department of Environmental Quality upon such conditions as it may prescribe and which are necessary to accommodate legitimate uses or activities where temperatures in excess of this standard are unavoidable.

f. Dissolved Chemical Substances. Guide concentrations listed below to be exceeded except as may be specifically authorized by the Department of Environmental Quality upon such conditions as it may deem necessary to carry out the general intent of Section 41-010 and to protect the beneficial uses set forth in Table 11.

	mg/l
Arsenic (As)	0.01
Barium (Ba)	1.0
Boron (Bo)	0.5
Cadmium (Cd)	0.003
Chloride (Cl)	25.0
Chromium (Cr)	0.02
Copper (Cu)	0.005
Cyanide (Cn)	0.005
Fluoride (F)	1.0
Iron (Fe)	0.1
Lead (Pb)	0.05
Manganese (Mn)	0.05
Phenols (totals)	0.001
Total dissolved solids	100.0
Zinc (Zn)	0.01

2. Minimum Standards for Treatment and Control of Wastes. All wastes shall be treated, prior to discharge, in accordance with the following:

a. Sewage Wastes.

1) During the period of low stream flows (approximately June 1 - October 31 of each year), secondary treatment resulting in monthly average effluent concentrations not to exceed 20 mg/l of 5-day 20° C. Biochemical Oxygen Demand (BOD) and 20 mg/l of suspended solids or equivalent control.

2) During the period of high stream flows (approximately November 1 - May 31 of each year), a minimum of secondary treatment or equivalent shall be provided and all waste treatment and control facilities shall be operated at maximum efficiency so as to minimize waste discharge to public waters.

3) All sewage wastes shall be disinfected, after treatment, equivalent to thorough mixing with sufficient chloride to provide a residual of at least 1 part per million after 60 minutes of contact time.

4) More stringent waste treatment requirements may be imposed, especially in headwater and tributary streams, where waste loads may be large relative to stream flows.

b. Industrial Wastes.

1) Industrial waste treatment requirements shall be determined on an individual basis in accordance with the provisions of Sections 41-010, 41-015, 41-020, 41-025, and 41-030.

2) Where industrial effluents contain significant quantities of potentially toxic elements, treatment requirements shall be determined utilizing appropriate bio-assays.

Source: Department of Environmental Quality

AIR QUALITY STANDARDS FOR OREGON

Pollutant	Averaging Time	Federal Standards		Oregon Standards
		Primary (Health)	Secondary (Welfare)	
Total Suspended Particulate	Annual Geometric Mean	75 ug/m^3	60 ug/m^3	60 ug/m^3
	24 hours[1]	260 ug/m^3	150 ug/m^3	150 ug/m^3
	Monthly[2]	-	-	100 ug/m^3
Ozone[4]	1 hour	235 ug/m^3[3]	235 ug/m^3[3]	160 ug/m^3[3]
Carbon Monoxide	8 hours[1]	10 mg/m^3	10 mg/m^3	10 mg/m^3
	1 hour[1]	40 mg/m^3	40 mg/m^3	40 mg/m^3
Sulfur Dioxide	Annual Arithmetic Average	80 ug/m^3	-	60 ug/m^3
	24 hours[1]	365 ug/m^3	-	260 ug/m^3
	3 hours[1]	-	1300 ug/m^3	1300 ug/m^3
Nitrogen Dioxide	Annual Arithmetic Average	100 ug/m^3	100 ug/m^3	100 ug/m^3
Hydrocarbons (Nonmethane)	3 hours[1] (6-9 a.m.)	160 ug/m^3	160 ug/m^3	160 ug/m^3
Lead	Monthly	-	-	3 ug/m^3
	Calendar Quarter	1.5 ug/m^3	1.5 ug/m^3	-

NOTES:

(1) not to be exceeded on more than one day per year.
(2) 24-hour average not to be exceeded more than 15 percent of the time
(3) a statistical standard, but basically not to be exceeded more than an average one day per year based on the most recent three years of data.
(4) The federal standards were revised in February, 1979, and the state standard changed from photochemical oxidant to ozone in June, 1979.

APPENDIX D

LAND CLASSIFICATION SYSTEMS

Land Conservation Development Commission goals and guidelines require all Oregon counties to evaluate their lands and determine whether these lands are:

1. agricultural lands
2. forest lands, or
3. lands needed or used for non-agricultural/ forestry uses.

To meet part of this requirement, Josephine County applied and reviewed the U.S. Department of Agriculture classification and systems for agriculture (developed by Soil Conservation Service) and forestry (developed by U.S. Forest Service) as required by LCDC goals.

Both of these systems have limited use in that they do not specifically consider management limitations. To incorporate the full range of factors that apply to agricultural and forestry development, Josephine County, in co-operation with State and Federal agencies, has developed two new classification/rating systems. The following pages address the methodology, concepts and results of these new systems.

AGRICULTURAL LAND CLASSIFICATION FOR LAND USE PLANNING

What is agricultural land in Josephine County? According to LCDC Goal #3, agricultural lands are:

1. Those lands which are designated class I through IV by the Soil Conservation Services "Soil Capability Classification System",
2. "Other lands which are suitable for farm use taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land use patterns, technological and energy inputs required, or accepted farming practices," and
3. "Lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands."

Initially, the Soil Conservation Service agricultural classification system was developed to acquire soil resource data, with a major purpose being the prevention of erosion and the control of sediment production. Basically, the system indicates the type and degree of soil and landscape limitations that exist, and then separates these limitations into groups by required conservation practices.

Because of major misconceptions and misuse of the capability system, a number of soil scientists in Oregon have felt that modifications and additional interpretations were needed to complement the system. Goal #3 also recognizes that "more detailed soil data (to define agricultural land) may be utilized by local governments". To this end Jackson County took the lead in developing a productivity-management rating system. According to the Soil Conservation Service, this concept was tentatively approved by LCDC for use in Jackson County, and was, therefore, developed for Josephine County in the Spring of 1980.

JOSEPHINE AGRICULTURAL CAPABILITY RATING SYSTEM (JACRS)

Primarily three agencies provided technical support/ data for development of the JACRS. These were the Soil Conservation Service, the Oregon State University Extension Service, and Josephine County. Participating expertise included two soil scientists, a range manager, two small-farm managers, a horticulturist, a geographer, and a soil conservationist.

At initial meetings, the general concepts of the Jackson County rating system were reviewed and accepted. A locally applicable rating system was then devised based on:

1. limitations for cultivation,
2. desirability (lack of soil limitations),
3. crop production, and
4. relative management costs.

These factors were chosen as they appeared to provide a clearer definition and prioritization of agricultural land in Josephine County, and adequately accounted for soil limitations and conservation problems.

1. Soil Depth
2. Surface Texture
3. Permeability
4. Slope Gradient
5. Erosion Hazard
6. Water Holding Capacity
7. Drainage Class
8. Flooding Hazard
9. Growing Season
10. Climate
11. pH (Acidity/Alkalinitz)
12. Predicted Yield Chart (SCS)

Although no specific priority or multiplier figures were used to establish the degree of impact of each factor (see JFCRS), review of each specific soil unit entailed a detailed discussion of each of the twelve criteria. The concepts regarding each criterion are discussed in the following paragraphs:

Soil Depth is an indication of the depth to which roots will have unrestricted growth. Water tables, claypans, bedrock, cemented gravels, or radical textural changes can effectively decrease the rooting depth of any soil, causing stunted growth or potential mortality.

The texture of the surface layers (topsoil) gives an indication of workability. It basically reflects the percentages of sand, silt, and clay within the soil. (A soil which provides a balance of the properties of sand - approximately 40%, clay - approximately 20%, and silt - approximately 40% is considered a loam.) Texture of the soil also depends on the amount and type of coarse fragments, such as gravels or cobbles. Texture is generally an indicator of permeability, compaction potential, and water holding capacity.

Permeability is that quality of a soil which allows the internal movement of water or air through the soil. This reflects the amount of pore space and the structural fabric of the soil profile. In general, clay soils have slow permeability while sandy soils have moderately rapid permeability. This influences the type of plants that can be grown and the methods of cultivation.

Slope gradients are expressed as percentages and indicate the overall rise or drop of elevation per 100 feet. Obviously the intensity of conservation practices increases, and the type of management changes, as slope gradients increase. For example, contour plowing is generally restricted to a 25% grade or less, at which point gravity takes over. An evaluation is also made of the natural drainage pattern since the frequency of seasonal runoff channels may affect the degree of gullying and associated management techniques.

The erosion hazard is a qualitative rating of the combined effects of slope gradient, surface texture, soil structure, climate, permeability and clay minerology

on soil movement by surface runoff. Soils with a high erosion potential require cautious selection of farming practices to reduce erosion and runoff, and may not be suitable for plowing.

The water holding or available water capacity (AWC) is a measurement of the total water held by the soil particles for use by most plants. The measurement is related to the soil depth and profile textures. The ramifications of soils with poor available water capacity are obvious - stunted growth, a disease/insect susceptible crop and potentially high crop mortality.

Drainage class is determined by evaluating shallow water table depths and duration of water at a specific depth. The observed water levels, soil profile colors, landscape position and natural vegetation are used to establish the drainage class. As an example, poorly drained soils are generally black or very dark brown with decomposing organic matter and have water loving vegetation with some free standing water. Such poor drainage obviously causes problems for adequate aeration of the soil and general desirability due to the high degree of organic material in the soil.

Soils with a flood hazard are determined by landscape position and profile development. The potential for flooding can pose a severe problem for farm operations such as irrigation and land leveling. There is also the potential for land loss or, conversely, the accumulation of somewhat sterile soil from upstream materials. This becomes especially important as soils (such as Serpentine) with a high arsenic, asbestos, or other mineral content are eroded from upstream areas. It should, however, be realized that much of the prime agricultural land is located in areas with alluvial deposits.

Growing season and climate are closely related. The length of the growing season is the average number of frost-free days. This figure is approximately 163 days in the lower elevations of Josephine County. In comparison, the growing season for Salem is approximately 213 days, for Brookings- 213 days, and for Klamath Falls - 134 days.

The climate in Josephine County consists of cool, wet winters and hot, dry summers. Precipitation generally occurs only in the cooler fall, winter, and spring. No significant rainfall occurs during the hot summer months. The lack of rainfall and high evapo-transpiration at the critical midsummer growing period makes climate a very severe limitation to cultivated, non-irrigated crops. Combined with the unavailability of irrigation in much of Josephine County, climate becomes a major factor for

broad-scale agricultural development in Josephine County. There are adapted plants (primarily perennial grasses) which can survive with limited water availability. Also, whereas orchards and vinyards can also survive limited water availability as adult plants, irrigation is generally necessary for seedling and plant establishment.

pH is an indicator of acidity versus alkalinity. It is a reading with a range from 1 through 14 with pH-7 being neutral. This factor is important for cultivated crops since most plant nutrients are available to plants within the narrow pH range of 6.5 to 7.5. An acid or alkali soil needs extra management, including the use of additives such as lime. Obviously, crops which are compatible with the soil's pH can be selected for planting.

The predicted yield charts from the soil survey of Josephine County were used to determine yield and crop variety levels for each soil mapping unit. These yields are a summation of data gathered during field mapping. The data were then correlated with sampling and experimental data from the Oregon State University Experiment Station and Extension Service. Only crops normally grown on each soil type are listed on interpretation sheets.

These twelve criteria were applied to develop a series of charts, with irrigated and non-irrigated lands being separately addressed. Matrix factors for these charts were selected to most adequately address the overall agricultural situation in Josephine County. These factors were cultivation versus desirability and productivity versus management requirements. A discussion of these factors for both irrigated and non-irrigated land follows.

Irrigated Agricultural Lands

Cultivation Rating

This rating relates to the physical limitations imposed on equipment used in a normal farming operation. Soil texture, depth, slope gradients, erosion hazard and drainage class were the primary factors considered here.

A High rating indicates deep and moderately deep, well-drained soils with loam to sandy loam surface layers on slopes of 0 to 7 percent. The erosion hazard is slight to moderate. These are generally the nearly level terrace and floodplain soils having the lowest power requirement for cultivation and wear and tear on equipment.

A Medium rating indicates limitations imposed by gravelly textures, steeper slopes and moderate to high erosion hazard imposed by loose sandy or silty surface layers. Also included are deep soils with fluctuating permanent water tables. Parent material is a strong consideration when rating the erosion hazard. For example, granitic and silty metamorphic materials produce soils easily eroded by surface runoff.

A Low rating includes those soils with strongly sloping landscapes, wet bottomlands, shallow to moderately deep claypans, clay surfaces, and very gravelly floodplains. These low rated soils are generally suitable for only limited cultivation to establish usable, permanent vegetative cover.

Desirability for Agriculture

The desirability of a soil for agricultural uses is an evaluation of the degree of limitations imposed by any single or all twelve criteria. A High rating indicates few limitations with minimum compounding effects on agricultural uses. Soils with a Medium rating have few limitations with a moderate compounding effect. A Low rating indicates several limitations with severe compounding effects.

A highly desirable soil for irrigated agriculture would include deep, well-drained soils on smooth,nearly level to gently sloping landscapes with a relatively high predicted yield.

The following matrix table was developed to show the relationship of agricultural soils to these two categories. Soil Conservation Service capability class information has been included to show a correlation between the two systems.

TABLE 1

IRRIGATED LANDS

DESIRABILITY FOR AGRICULTURE

CULTIVATION RATING	LOW	MEDIUM	HIGH
HIGH		30B Barron--Coarse, sandy loam--IIe	1A Newberg--fine sandy loam--IIw 5A Evans loam--IIw 22A Kerby loam--I 7A Central Pt. sandy loam--IIs 14A Foehlin gravelly loam--I 56B Pollard loam--IIe 94B Manita loam--IIe
MEDIUM		19B,C Abegg grav. loam--IIIs, IVs 29B Clawson sandy loam--IIIw 30C Barron coarse sandy loam--IIIe 42C Ruch grav. silt loam00 IVe 56D Pollard--IVe 70C Debenger--IVe 96D Manita--IVe	15C Foehlin grav. loam--IIIe 25B Holland sandy loam--IIe 41B Ruch grav. silt loam--IIe 56C Pollard loam-IVe 95C Manita loam--IVe
LOW	12A Camas grav. sandy loam--IVw 23A,B Copsey Clay IIIw 27D Holland sandy loam--IVe 36B,C Brockman clay loam00 IIe, IVe 71D Debenger--IVe 75A Camas--Newberg--IVs	2A Wapato silt loam--IIIw 10B Selmac loam--IIIe 11D Selmac loam--IVe 19D Abegg grav. loam--IVs 26C Holland sandy loam--IVe 32A Jerome sandy loam--IIIw 39A Cove--IIIw 43A Banning loam-IIw	

NOTE: Roman numerals are the Soil Conservation Service Capability Classes. The small "e" denotes problem with erosion; the small "w" indicates a water problem such as a high water table or flooding; the small "s" indicates a problem with rocks, stoniness, or mineralogy.

A second matrix table was developed correlating productivity and relative management cost/limitations for irrigated soils. These factors are defined as follows.

Crop Production

The productivity rating was developed from predicted yield charts used by the USDA - Soil Conservation Service. A Low rating was applied to irrigated soils able to support only low production. A soil capable of raising a wide variety of crops with high production was rated high.

Medium ratings were applied to soils which could produce either (1) a single crop with a high yield, (2) a variety of crops with moderate to low yields, or (3) a moderate variety of crops with moderate yields. Only those crops normally grown in Josephine County were considered in these ratings.

Management Limitations/Costs

Only costs directly attributed to coping with inherent soil and landscape limitations were considered for this category. Cost factors related to the type of operation, distance from market, fluctuating prices, etc. were not entered into the rating matrix system.

Where sophisticated management systems were needed to correct or lessen the effect of soil limitations, the soil was given a High rating. Management systems which dealt with only a single soil limiting factor were given a Low rating. It is important to note that this is a relative cost rating without consideration of actual dollar amounts.

As an example, management could include such processes as tile drainage, cultivation techniques, soil texture modification, crop rotation requirements, harvesting limitations, etc.

TABLE 2

IRRIGATED LAND

CROP PRODUCTION

MANAGEMENT COSTS	LOW	MEDIUM	HIGH
LOW			7A Central Point IIs 14A Foehlin I 22A Kerby I 41B Ruch IIe 56B Pollard IIe 94B Manita
MEDIUM	10B Selmac IIe 19B Abegg IIIs 19C Abegg IVs 29B Clawson IIIw 70C Debenger IVe 32A Jerome IIIw	25B Holland IIe 56C Pollard IVe 95C Manita IVe	1A Newberg IIw 5A Evans IIsw 15C Foehlin IIIe 30B Barron IIe 42C Ruch IVe
HIGH	8A Takilma IVs 11D Selmac IVe 12A Camas IVw 19D Abegg IVs 23A Copsey IIIw 23D Copsey IIIw 34B Brockman Cobbly-- 36B Brockman Clay IIIe 37C Brockman Clay IVe 71D Debenger IVe 75A Camas-Newberg IVw	2A Wapato IIIw 26C Holland IVe 27D Holland IVe 39A Cove IIIw 43A Banning IIw 56D Pollard IVe 96D Manita IVe	30C Barron IIIe

NOTE: Roman numerals are Soil Conservation Service site class. The small "e" denotes problems with erosion; the small "w" indicates a water problem such as a high water table or flooding; the small "s" indicates a problem with rocks, stoniness, or minerology.

A final rating system for irrigated lands was developed by correlating the information on the two preceding tables.

TABLE 3

PRIORITY FOR AGRICULTURE
(Classes I-IV)

IRRIGATED

High:

1A Newberg
5A Evans
7A Central Point
22A Kerby
14A Foehlin
56B Pollard
30C Barron
94B Manita
15C Foehlin
25B Holland
41B Ruch

Medium:

56C Pollard
95C Manita
10B Selmac
19B Abegg
19C Abegg
26C Holland
29B Clawson
30C Barron
42C Ruch
43A Banning
56D Pollard
70C Debenger
96D Manita
2A Wapato
32A Jerome
39A Cove

Low:

12A Camas
27D Holland
19D Abegg
23A Copsey
8A Takilma
34B Brockman
36B Brockman
11D Selmac
23B Copsey
36C Brockman
71D Debenger
75A Camas-Newberg

Very Low:

38A Brockman
35D Brockman

Non-Irrigated Agricultural Lands

A second set of matrices was developed for non-irrigated lands. The rating factors for these lands were productivity and management limitations/costs.

Although a chart of cultivation-desirability ratings was not developed, all of their associated factors were incorporated into the review of productivity and management limitations/costs. Greater emphasis was, however, placed on climate, growing season, water-holding capacity, and drainage class since these factors have a greater influence on non-irrigated agriculture. As is to be expected, soil moisture availability during the active growing season is the primary limitation of these soils.

Productivity ratings were developed from Soil Conservation Service predicted yield charts. A High rating included those soils where:

1. production was limited to one or two crops yet had high yields, and
2. a wide variety of crops (to include grasses, fruit, vegetables) could be produced

although only moderate yields were produced.

A Moderate rating included those soils where production was limited to a moderate variety of crops with a moderate yield. A Low rating included those soils which had low yields, regardless of the variety of crops that could be produced. In general, it was found that most of these soils were limited to grass crops.

Obviously, crop production, variety, and yield are definitely restricted on non-irrigated lands. Crops generally suited to dryland production are grasses, grass seed, alfalfa (hay or pasture) and small grains. Specialty crops are generally unsuited for dryland agriculture.

It should be noted, however, that irrigation of these lands could change the applied rating. However, since the criteria for classification differs for irrigated and non-irrigated lands, there is no direct correlation between the two classifications. Interestingly though, the majority of those soils rated "High" for non-irrigated lands also rated "High" for irrigated lands.

For example:

Kerby is "H" for irrigated and "H" for non-irrigated

Barron is "H" for irrigated and "M" for non-irrigated

Cove is "L" for irrigated and "M" for non-irrigated

TABLE 4

NON-IRRIGATED LANDS

CROP PRODUCTION

	LOW	MEDIUM	HIGH
MANAGEMENT COSTS			
HIGH	12A Camas IVw 27D Holland IVe 19D Abegg IVs 8A Takilma VIs 11D Selmac IVe	2A Wapato IIIw 32A Jerome IIIw 23A Copsey IVw 23B Copsey IVw 75A Camas-Newberg IVw 39A Cove IIIw	
MEDIUM	10B Selmac IVe 19B Abegg IVe 19C Abegg IVs	30B Barron IVe 25B Holland IVe 43A Banning IIw 29B Clawson IIIw 26C Holland IVe 30C Barron IVe 56D Pollard IVe 96D Manita IVe	15C Foehlin IVe 42C Ruch IVe 56C Pollard IVe 95C Manita IVe
LOW		1A Newberg IIIw 94B Manita IVe	5A Evans IIIw 7A Central Point IIIw 22A Kerby IVe 41B Ruch IVe 14A Foehlin IVe 56B Pollard IVe

NOTE: Roman numerals are Soil Conservation Service site class. The small "e" denotes problems with erosion; the small "w" indicates a water problem such as a high water table or flooding; the small "s" indicates a problem with rocks, stoniness, or minerology.

A final rating system for non-irrigated lands was developed by correlating the information in the previous chart, to include inherent soil characteristics.

TABLE 5

PRIORITY FOR AGRICULTURE
(NON-IRRIGATED)

High:

1A Newberg	22A Kerby	42C Ruch
94B Manita	41B Ruch	15C Foehlin
5A Evans	14A Foehlin	56C Pollard
7A Central Point	56B Pollard	95C Manita

Medium:

10B Selmac	29B Clawson	32A Jerome
19B Abegg	26C Holland	23A Copsey
19C Abegg	30C Barron	23B Copsey
30B Barron	56D Pollard	75A Camas-Newberg
25B Holland	96D Manita	39A Cove
43A Banning	2A Wapato	

Low:

12A Camas
27D Holland
19D Abegg
8A Takilma
11D Selmac

FOREST LAND CLASSIFICATION FOR LAND USE PLANNING

INTRODUCTION

"Forest Land" is a term that means different things to different people. Generally, most people consider undeveloped land with trees and underbrush or grass a forest; and, according to the Society of American Foresters' definition that a forest is a "community of plants and animals", they may be right.

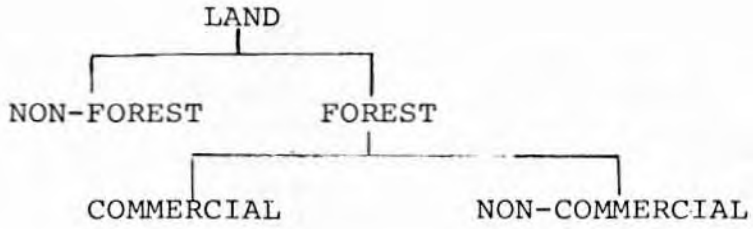
"Commercial Forest Land" is, however, more difficult to identify, as there are a number of criteria that could be considered. Forests provide watershed, esthetic and wildlife values, act as visual buffers and filter the air, provide recreation, and can be used for grazing. Consequently, in a broad sense, they have economic value to both individuals and the community even if they do not produce timber.

However, for the purpose of establishing forest management plans, a system of evaluating forest lands based on relative timber-production has been established. This system is embodied in the U.S. Forest Service program which is required by Congress to inventory and classify the nation's forest lands (both public and private) on a continuous (10 year reporting) basis.

The U.S. Forest Service's system was adopted by the Land Conservation and Development Commission to determine, in part, what lands are considered commercial forest lands through the use of the United States Forest Service Manual "Field Instructions for Integrated Forest Survey and Timber Management Inventories - Oregon, Washington, and California, 1974".

U.S. FOREST SERVICE LAND CLASSIFICATION

This Land Classification system initially determines whether the land is forest or non-forest, and then further divides forest lands into "commercial forest" lands and "non-commercial forest" lands.



These units are defined by the Field Manual as follows:

"Nonforest land. Land that has never supported forests (range land, rock barrens, meadows, etc.) and lands formerly forested where use for timber utilization is precluded by development for other uses (crop lands, improved roads, railroad rights-of-way, powerlines, etc.).

(NOTE: An improved road, by definition, is one which is graded and maintained for continuous use. Roads not meeting these standards will be considered unimproved and will be classified according to surrounding area.)

Forest land. Land at least 10 percent occupied; stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for non-forest use.

Forest land is further classified as commercial (productive) and non-commercial(unproductive)":

"Non-commercial (unproductive) Forest Land is forest land incapable of yielding 20 cubic feet per acre per year because of adverse site conditions, or land considered permanently inoperable because of steepness and rockiness. This includes sterile or poorly drained forest land which produces stunted and deformed trees; [infertile soils with pronounced nutrient imbalances or heavy metal toxicities]; subalpine forests at the upper limits of tree growth; steep rocky areas with cliffs, ledges, and talus slopes and forest land capable of producing only non-commercial tree species.

Commercial Forest Land is forest land which is producing or capable or producing crops of industrial wood and has not been reserved or

deferred. This includes areas suitable for management to grow crops of industrial wood generally of a site quality capable or producing in excess of 20 cubic feet per acre of annual growth. This includes both accessible and inaccessible areas. Permanently inoperable or nonstockable areas are excluded because they are not suitable for silvicultural management. Conversely, nonstocked areas which are stockable and otherwise meet this definition are included." (NOTE: The aforementioned index of "20 cubic feet per acre per year" is comparable to a cubic foot site class of 7.)

In simple terms, forest lands can be evaluated on the basis of site index--the height that trees attain in a certain number of years (100 years being the base index in the Pacific Northwest Region). This allows comparison of the relative timber producing value of forest lands by measuring the height of trees at 100 years of age on different sites. Graphs and charts have been developed so that trees older or younger than 100 years can be measured and their equivalent height at 100 years determined.

For relatively high-site lands this fairly simple measurement will suffice to determine whether a tract of land is of commercial timber-producing value or not. However, site index alone will not provide such a determination on low-site lands. The reason is this: low-site land may frequently produce a few trees of relatively high-site index, but may be incapable of growing enough trees with sufficient diameter growth to justify investments in silvicultural practices or management. In other words, it may be feasible to harvest trees that are there now (which requires little or no investment or management effort) but it may not be economically feasible to manage the land as a continuing forestry enterprise.

Consequently, on low-site lands an additional procedure is required by the Forest Service System to determine what is and what is not commercial forest land. The procedure can be done in one of three ways, each designed to determine if a forest tract is capable of <u>producing in excess of 20 cubic feet of commercial products per acre per year</u>.

In general, the process requires measuring non-suppressed trees to see how high they will grow in 100 years and also whether the site will grow enough of those trees, with sufficient diameter growth, to produce in excess of 20 cubic feet of commercial products per acre per year. All of the processes require a cruise over a large enough portion of the area to acquire a representative sample of the number of trees that:

1. once grew on the area (stumps),
2. now grow on the area (present stocking), or
3. would probably result from replanting a cleared or burned over area.

As a second step in this process, a judgement must be made as to whether or not economically-sound silvicultural management could reasonably be expected to secure such stocking since, according to the Field Manual, "permanently inoperable or non-stockable areas are excluded because they are not suitable for silvicultural management". This second step is generally necessary in areas such as the interior valleys of Jackson and Josephine counties. Here the stocking and reforestation issues frequently need to be addressed in order to properly identify commercial forest land.

OTHER LAND CLASSIFICATION SYSTEMS

As discussed previously, site index information must be augmented by stocking and reforestation information and analysis of suitability for silvicultural management. It is this latter area which has become a nucleus of discussion regarding forest lands classification. In Josephine County, this resulted in the involvement of professional foresters, soil scientists and County planners committed to resolving the issue.

The outcome is a mapping system based on a variety of criteria including site productivity. Subsequent steps still follow the required Forest Service evaluation system (outlined above in Step 2) concerning stocking and silvicultural opportunities; however, in lieu of subjective judgement about the latter, the County has developed specific, applied criteria to evaluate forest capabilities. The criteria encompass normal and induced stocking, reforestation opportunity and difficulty, harvesting methods, soil characteristics,

and topography. The process recognizes that site index alone does not clearly indicate whether a specific site can, physically and/or economically, be managed to produce stands of marketable timber. As such, the County's proposed system was designed to be definitive rather than subjective.

The system that the County has created is new, but it is not necessarily unique. It is but one of several pioneering efforts. Similar systems are presently being developed by the U.S. Forest Service on the Siskiyou National Forest in Josephine County and by the Bureau of Land Management. For the Forest Service, this work is being coordinated by their Soil Scientist, Mike Amaranthus, who is a member of the County's "Forest Classification Advisory Committee". The U.S. Forest Service system is proposed for interim use in the "Siskiyou National Forests Management Plan" since their Plant Community System will not be completed in the near future. The BLM system is in an early development phase.

The State of Washington is also utilizing a similar system for taxation of timber lands. Whereas the Washington system is based on determining forest potential, it also addresses those factors which affect the cost of harvesting timber.

JOSEPHINE FOREST CAPABILITY RATING SYSTEM (JFCRS)

Early in development of the JFCRS, an invitation to discuss forest land classification was extended to both public and private agencies involved with forest management within Josephine County. The public sector responded by sending professionals who represented various specialized aspects of forest management, including foresters, forest managers, silviculturists, and soil scientists. Consequently, this system was devised with the cooperation of representatives from Siskiyou National Forest, Bureau of Land Management, State Forestry, Oregon State University Extension Service and Soil Conservation Service, and has been endorsed in principle by the advisory committee.

At the initial work session, discussion centered around wood production problems, site measurement techniques, and related soil qualities. A presentation of the County's agricultural rating system was given and the possibility of developing a similar rating system for forest lands was discussed. At that time, representatives from Siskiyou National Forest discussed their own ongoing work with a similar, computer-model classification system. Based on a variety of

factors including initial, yet significant results from the United States Forest Service model, it was decided that a capability classification of forest lands--using soil surveys as a mapping base--was a feasible, objective, and substantive alternative to the subjective reviews currently utilized.

Work tasks for the classification system were initially divided into two separate functions. The first activity listed and prioritized soil productivity factors. The second activity reviewed and weighted forest management practices.

Soil Productivity

The criteria used in the soil productivity rating are those which influence the quality and quantity of tree growth. As such, productivity becomes a relative index of the influence of soil morphology and soil-forming factors. The criteria used are aspect, soil depth, rock fragments, soil texture, mineralogy and climate. Each of these was prioritized to reflect its relative impact on site productivity. Each criterion was then further divided into significant difference levels, with each level receiving an appropriate numerical multiplier.

FOREST PRODUCTIVITY CRITERIA

PRIORITY RATING	CRITERIA	MULTIPLIER
4	ASPECT:*	
	North	10
	South	2
	Other	5
5	SOIL DEPTH:	
	>60"	10
	40-60"	9
	20-40"	5
	<20"	1
3	ROCK FRAGMENTS:	
	0-35%	10
	35-60%	5
	>60%	2
1	TEXTURE:	
	Sandy to Sandy Loam	5
	Clay Loam to Sandy Loam	10
	Clay	5
4	MINERALOGY:	
	Serpentine	1
	Serpentine Influence	4
	Mixed	10
3	CLIMATE**	
	Elevation and Evapotranspiration	
	1000'-4000' <35"	4
	1000'-4000' >35"	8
	4000'-5500'	4
	5500'+	1

*If serpentine soil, use a 5 multiplier.
**If serpentine soil, use a 2 multiplier.

As an example, if a soil is found on a north aspect it would be given ten (10) points for its location multiplied by its priority rating of four (4) for a total point value of 40. The point values for each criterion are then added together to form a single point value for each soil. (The higher the number, the better the soil.) See Table 6.

The criteria and associate multipliers/priorities were derived only after considerable discussion. The general concepts inherent in these criteria are presented in the following paragraphs.

Aspect indicates the relative north or south exposure as mapped, thus reflecting the differences in water availability and plant evapotranspirational stress as influenced by daily movement of the sun. Forest soils with a north aspect predominantly display deeper rooting zones, increased moisture availability and less plant evapotranspirational stress. East or west

facing slopes and slopes of less than 35 percent were rated as "other" since the aspect influence is insignificant except in small localized areas. Since aspect differences have a minimal effect on the productivity of serpentine soils they were given a rating of 5.

Soil depth has the most significant influence on tree growth. It reflects both (1) the available water holding capacity of the soil and (2) the available rooting depth. The effective rooting depth takes on great significance as shallow rooting effectively decreases the length of the growing season, especially in relation to the hot, dry summers of Southern Oregon. Bedrock, claypan or a seasonally high water tablecan restrict vertical root growth, thereby reducing the soil volume available for water and nutrients. Further, Rock fragments (coarse material) in the soil profile decrease water storage capacity. This increasing droughtiness , associated with increasing rock percentage, dramatically changes growth patterns and vegetative cover.

Soil texture has basically the same effect as rock percentage on water storage capacity. However, the degree of influence is less severe. Due to their chemical bonding characteristics, clay texture soils have high water storage capabilities; however, a high percentage of clay generally reduces infiltration rates. Consequently, heavy clay soils hold more water but have less water available for plant growth. Further, rooting depths are reduced in all but light, structured clays. Trees on sandy soils generally have better root systems but the reduced water storage capacity and high percolation rates generally result in slower overall growth.

Mineralogy of the soil parent material is important from the aspect of natural fertility or infertility. The major mineralogic problems are associated with the ultramafic intrusions of serpentine and periodotite. These are often highly mineralized rocks which produce 1) a calcium to magnesium chemical imbalance, and 2) high concentrations of heavy metals. Although not as dramatic, soils derived from gabbro and olivene gabbro also exhibit a degree of natural infertility.

Climate factors change the actual growing season by causing variations in rainfall, elevation, temperature and associated evapotranspiration. Locally, the climatic pattern of winter precipitation and summer drought has a greater influence on lands at 0-4000 feet elevation and receiving less than 35 inches of precipitation. Above 4000 feet, there is a decrease in wood volumes caused by changes in the temperature regime and the dominant species. Above 5500 feet elevation, alpine vegetation indicates low temperatures and short growing seasons.

Obviously, these soil productivity factors do not act independently but have an additive or a buffering effect on each other. Each is interrelated and as such, the factors combine to form a total picture of soil productivity.

Table 6 shows the numeric rating for each soil and its consequential rating as high, medium or low, cubic foot site class and site index are also found on this chart to show the relationship of the County system to the U.S. Forest Service system.

TABLE 7

FOREST SOILS PRODUCTIVITY RATINGS + SITE INDEX

HIGH				MODERATE				LOW			
SOIL	CFC*	PR*	DFSI*	SOIL	CFC*	PR*	DFSI*	SOIL	CFC*	PR*	DFS
Pollard (north)	3	194	120±7	Josephine (south)	4	157	121±7	Vannoy (south)	5	131	105
Josephine (north)	3	189	130±8	Vannoy (north)	4	155	110	Althouse (south)	5	130	95
Jump-Off (north)	4	184	120	Barron (B,C)	4	155		Goodwin (south)	3	130	
Tethrick (north)	4	184	104	Holland (B,C)	4	155	109	McMullin (F)	NF	129	
Pollard (B,C,D,E)	3	174	126±7	Holland (D,E)	5	155	94	Cornutt (D,E)	4	128	97
Manita (north)	4	170	110	Manita (D,E)	5	155	94	Vermisa (north)	5	125	70
Josephine (E)	4	169	120±7	Rogue (north)		155		Siskiyou (E)	4	124	101
Colestine (north)	3	169	124	Beekman (north)	5	154	115±5	Vannoy (south)	5	123	105
Jump-Off (D,E)	5	164	90	Rogue (south)		152		Beekman (south)	4	122	105
Pollard (south)	3	162	116	Tethrick (south)	5	152	95	Fantz (north)	NF	121	75
Goodwin (north)	4	162	113	Jump-Off (south)	5	152	90	Bigelow (E,F)		119	
Ruch (B,C)	5	160	92±6	Manita (B,C)	5	150	94	Siskiyou (south)	5	118	90
				Siskiyou (north)	5	150	101±8	Voorhies (south)	4	116	90
				Abegg (B,C,D)	4	144	114	Cornutt (south)	5	116	90
				Goodwin (E)	2	142		Jayar (E)	4	113	118
				Jayar (north)	4	142	118	Jayar (south)	5	101	95
				Manita (south)	4	138	109	Knapke (north)	5	101	75
				Speaker (south)	4	137	113±3	Crannler (F)	4	99	
				Cornutt (north)	4	137	97	Brockman Variant	5	97	95
				Colestine (south)	4	137	110	Woodseye (north)	5	93	80
				Vannoy (E)	4	135	110	Fantz (south)	NF	89	50
								Vermisa (south)	5	83	70
								Woodseye (south)	5	81	80
								Dubakella (D,E,F)	NF	75	60
								Knapke (south)	5	69	75

*CFC -- Cubic Foot Site Class
PR -- Production Rating
DFSI - Douglas Fir Site Index

FOREST MANAGEMENT

The purpose of evaluating this portion of the system is to identify those factors which determine the type of forest management to be used and its associated costs. A major goal of forest management is a sustained yield of marketable timber. Depending on particular site limitations and tree species, the sustained yield cycle varies from 50 to 80 years in three general stages: harvest (logging), regeneration and stand maintenance or enhancement.

These stages form the basis of the forest management evaluation. The criteria within each of these stages were then prioritized to reflect the importance of each on long-term management. (This rating also has implied cost-return factors.) Each criterion was then further divided into significant difference levels, with each level receiving an appropriate numerical multiplier.

TABLE 8

FOREST MANAGEMENT CRITERIA

PRIORITY RATING	CRITERIA	MULTIPLIER
2	HARVEST FACTORS	
	Slope	
	less than 35%	9
	more than 35%	4
	Silviculture System	
	clearcut	9
	shelter	5
	all age/selective cut	2
	Soil Limitations (High to Low)	
	stability	1-3
	surface erosion hazard	1-3
	compactability	1-3
6	REGENERATION	
	High Mortality Poor Mineralogy	2
	Medium Mortality/Mineralogy	7
	Low Mortality/Good Mineralogy	10
	Serpentine Soils	10
3	STAND MAINTENANCE	
	Plant Competition	
	Severe	2
	Moderate	6
	Low	10

The criteria are individually discussed in the following paragraphs.

Three basic silvicultural systems are used in Southern Oregon:

1. clearcut
2. shelterwood cut, and
3. selective cut.

Clearcut involves the complete removal of the timber stand in a single cut. This system requires the use of intensive management practices (including erosion control) in site preparation and regeneration of a new forest. Clearcutting is one of the most economic methods from the standpoint of harvest and marketing since it permits intensive use of both labor and equipment over a short time period. Disease and insect infested old growth stands can be replanted to genetically improved trees with clearcutting. Health, disease/insect resistant trees may be retained as seed trees for natural regeneration or manual regeneration through planting may be used.

The shelterwood system requires stand removal in a series of two or more cuts. This system is especially well adapted to species and sites where (1) protective cover is needed, usually for reproduction purposes, or (2) where shelterwoods give the regeneration of desirable species and advantage over undesirable competing vegetation. Final stand removal is accomplished after seedling establishment. This process results in an even-aged stand and a release of the younger trees.

Selective cutting involves the removal of mature trees either singly or in groups at specific intervals of time. This results in an uneven-aged stand with different ages intermingled. New trees are established continuously, usually by natural reseeding. This system is the least efficient in terms of equipment use, damage to immature trees, and regeneration.

Slope gradients are important from a practical standpoint. The 35% slope split for mapping unit design is also the limit for tractor-skidder operations. Landscape stability decreases on the steeper slopes while erodibility increases. Overall safety and ease of all operations also decrease with increasing slope gradients.

Soil limitations, such as instability, erosion hazard and compactability, indicate the potential impact of cutting operations, road building, and site preparation for regeneration. Slope stability is a problem inherent in the soils and geology of any site. Disturbance of the natural stability by road building, logging and

excessive slash can cause debris flows, slides, and avalanches. Unstable soils have left damaging scars on the landscape in the form of creep, slumps, earth flows and landslides.

The erosion hazard, or erodibility of mineral soils, is a qualitative evaluation of slope stability, gradient, surface texture, climate, mineralogy and drainage. These are factors which have an influence on the erosion potential of exposed mineral soil. The erosion potential is an important consideration in logging system selection, road design, and skid trail locations. In addition to consideration of soil loss, erosion hazards translate to excessive sediment accumulation in streams, causing adverse effects on water quality.

Compactability refers to the ability of soils to increase in density or unit weight. Compaction in forest management is usually caused artificially by tractors and skidders. Logs cause compaction when they are felled and dragged across the ground surface. Primary factors which influence density are the moisture content, organic matter content, particle gradation and natural structure of the soil and the type and amount of compactive effort.

Site productivity is lost with increased compaction. The resulting reduced plant growth is similar to that caused by shallow to bedrock or claypan soils. Studies have indicated that compaction (caused during harvest) can and have reduced the Soil Conservation Service's site class for an area by a value of II.

Regeneration, or re-establishment of wood species, is the most important criteria of forest management in Southern Oregon. This is accomplished by the basic methods--by natural or direct seeding, or by planting of seedlings. Natural regeneration is the least costly of the alternatives; however, it can be time consuming and risky because of climatic factors, seed-crop failures, plant competition or regeneration of undesired tree species. Many of these risks can be overcome or modified by direct artificial seeding or by planting of improved nursery-grown seedlings.

The seedling mortality-mineralogy rating indicates the degree of seedling survival attributed to soil factors such as depth, aspect, climate, and mineralogy (including wind throw). The ratings assume proper planting and good seedling stock during periods, of sufficient rainfall.

Factors not related to the soil such as planting technique, seedling-climate incompatibility and destruction by animals may also contribute to some observed mortality rates in the field. However, such factors are not predictable and were not included in the rating system.

Stand maintenance assumes the use of procedures to stimulate growth, improve species composition, increase timber quality and production, and make better use of growing space. The one major observable factor in stand maintenance in the interior valleys of southwest Oregon is plant competition. Young stands are frequently overtopped by more rigorous brush and hardwood vegetation, which inhibit growth and prevent development of productive forests. It is quite obvious that the competition for space, moisture, and nutrients enhances the effect of soils and climate on growth. On a competitive basis, those soils with a severe plant competition rating need intensive site preparation, weeding and some form of brush control management during the early life of a stand.

Once a productive stand is established, thinning of overstocked areas will reduce the number of stems. Thinning can also upgrade species composition and remove undesirable trees. This process becomes especially important on low producing sites where a high number of stems are initially common. Consequently, vegetative management of competing plant species tends to have dramatic results as individual trees are released and become free to grow.

Table 8 shows the numeric rating for each soil and its consequential rating as high, medium or low. United States Forest Service site class has been included on this chart.

TABLE 9

FOREST MANAGEMENT RATINGS
(Top Score 144)

HIGH			MODERATE			LOW		
SOIL	MGR*	SC*	SOIL	MGR*	SC*	SOIL	MGR*	SC*
Pollard (B,C,D,E)	130	3	Althouse (south)	92	5	Vermisa (F)	64	5
Pollard (north)	124	3	Jump-Off (north	92	4	Bigelow (south)	62	3
Althouse (north)	114	4	Beekman (north-south)	90	4	Holland (B,C)	62	4
Josephine (E)	112	4	Siskiyou (north	90	4	Goodwin (south)	62	3
Manita (B,C)	112	5	Colestine (south)	90	4	Woodseye (E,north)	60	5
Manita (D,E)	110	5	Vannoy (north)	88	4	Tethrick (south)	60	5
Abegg (B,C,D)	110	4	Cornutt (north)	88	4	Rogue (south)	60	
Brockman Variant	110	5	Cornutt (south	88	5	Speaker (south)	60	4
Jump-Off (E)	106	5	Manita (south)	88	4	Siskiyou (south)	60	5
Jayar (E)	106	4	Barron (B,C)	84	4	Jayar (south)	60	5
Vannoy (E)	104	4	Holland (D,E)	82	5	Dubakella (D,E,F)	58	NF
Josephine (north)	98	3	Goodwin (E)	78	2	Woodseye (south)	56	5
Tethrick (north)	98	4	Siskiyou (E)	74	4	Voorhies (south)	52	4
Pollard (south)	98	3	Bigelow (north)	72		Knapka (north)	52	5
Manita (north)	96	4	McMullin (F)	72	NF	Fantz (north)	48	NF
Jayar (north)	96	4	Ruch (B)	70	5	Crannler (F)	48	4
Colestine (north)	94	4	Rogue (north)	68		Vannoy (south)	46	5
			Ruch (C)	68	5	Witzel (F)	46	NF
			Goodwin (north)	68	2	Jump-Off (south)	42	5
			Josephine (south)	68	4	Knapka (south)	42	5
						Fantz (south)	42	NF

*MGR -- Management Rating
SC -- Site Class

After completion of the ratings for productivity management--a matrix was developed to show the combined impacts of the two categories. This then resulted in an overall rating of each soil as High, Medium or Low, with Medium soils being those with moderate management limitations and high/medium productivity.

In a comparison with cubic foot site class, it would appear that although class 3 soils generally appear in the High rating and class 5 soils generally appear in the Low rating, there is a considerable sprinkling of soil classes 2 though 5 in each of the rating categories.

TABLE 10

FOREST - SOILS PRIORITY MATRIX

PRODUCTIVITY RATING

MANAGEMENT RATINGS COST RETURN	LOW	MODERATE	HIGH)
HIGH	Jayar (E) - 4 Brockman Variant-5	Manita (B,C,D,E) - 5 Abegg (B,C,D) - 4 Jayar (north) - 4 Vannoy (E) - 4	Pollard (B,C,D,E) - 3 Pollard (north) - 3 Josephine (north) - 3 Josephine (E) - 4 Manita (north) - 4 Tethrick (north) - 4 Colestine (north) - 4 Jump-off (D,E) - 5 Pollard (south) - 3 Althouse (north) - 4 HIGH
MODERATE	Cornutt (south) - 4 Althouse (south) - 5 McMullin (F) - NF Cornutt (D,E) - 4 Siskiyou (E) - 4 Beekman (south) - 4 Bigelow (north) - 5 Jump-Off (south)	Manita (south) - 4 Josephine (south) - 4 Vannoy (north) - 4 Cornutt (north) - 4 Baron (B,C) - 4 Colestine (south) - 4 Holland (D,E) - 5 Rogue (north) - Beekman (north) - 4 Siskiyou (north) - 4 Goodwin (E) - 2	Ruch (B,C) - 5 Goodwin (north) - 2 Jump-Off (north) - 4 MEDIUM
LOW	Crannler (F) - 4 Vannoy (south) - 5 Goodwin (south) - 3 Woodseye (north-south) - 5 Vermisa (F) - 5 Dubakella (D,E,F) - NF Fantz (north-south) - NF Bigelow (E, south) - Siskiyou (south) - 5 Voorhies (south) - Jayar (south) - 5 Knapke (north-south) - 5	Holland (B,C) - 4 Beekman (south) - 4 Rogue (south) Tethrick (south) - 5 Speaker (south) - 4	LOW

NOTE: numbers are U.S. Forest Service cubic foot site class.

APPLICABILITY OF JOSEPHINE AGRICULTURAL AND FOREST CAPABILITY SYSTEMS

For both agricultural and forest rating systems, High rated soils of an adequate size and location are considered prime resource land. Medium rated soils could also be considered resource lands if adequate size and location were available. In small acreages or adjacent to residential uses, these Medium rated soils could be considered desirable for small-scale or intensive resource management such as prescribed for the Woodlot and Farm Residential zoning districts. Low rated soils may not generally be desirable for resource development. Intensive management of some Low soils with higher yields may possibly be suitable for Woodlot and Farm Residential designation.

ADDITIONAL COMMENTS

Any system that attempts to classify over a million acres on a comprehensive basis is bound to have inequities when examined on a specific lot basis. Further on-ground mapping would be desirable for acres that have a highly complex soil make-up. Consequently, analysis of these areas could require the use of additional factors in determining priority/classification. Therefore, a process wherein professional expertise can be considered, evaluated, and responded to should be established.

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING*		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
1A	Newberg fine sandy loam	H	H	IIw	IIIw
2A	Wapato silt loam	M	M	IIIw	IIIw
5A	Evans loam	H	H	IIw	IIIw
7A	Central point sandy loam	H	H	IIs	IVc
8A	Takilma cobbly loam	L	L	IVs	VIs
9A	Takilma variant extremely cobbly loam				VIs
10B	Selmac loam, 2 to 7% slopes	M	M	IIIe	IVe
11D	Selmac loam, 7 to 20% slopes	L	L	IVe	IVe
12A	Camas gravelly sandy loam	L	L	IVw	IVw
14A	Foehlin gravelly loam 0 to 3% slopes	H	H	IIs	IVc
15C	Foehlin gravelly loam, 3 to 12% slopes	H	H	IIIe	IVe
19B	Abegg gravelly loam, 2 to 7% slopes	M	M	IIIs	IVs
19C	Abegg gravelly loam, 7 to 12% slopes	M	M	IVs	IVs
19D	Abegg gravelly loam, 12 to 20% slopes	L	L	IVs	IVs
22A	Kerby loam	H	H	I	IVc
23A	Copsey clay, 0 to 3% slopes	L	M	IIIw	IVw
23B	Copsey clay, 3 to 7% slopes	L	M	IIIw	IVw
25B	Holland sandy loam; cool, 2 to 7% slope	H	M	IIe	IVe
26C	Holland sandy loam, cool, 7 to 12% slope	M	M	IVe	IVe

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
1A	NF				3,575	.3
2A	NF				1,233	.1
5A	NF				2,575	.2
7A	NF				1,904	.2
8A	NF				8,011	.8
9A	NF				1,647	.2
10B	NF				3,132	.3
11D	NF				1,324	.1
12A	NF				2,782	.3
14A	NF				3,682	.4
15C	NF				1,226	.1
19B	F	M	4	DF(114-3),PP(-)	8,168	.8
19C	F	M	4	DF(114-3),PP(-)	3,693	.4
19D	F	M	4	DF(114-3),PP(-)	4,978	.5
22A	NF				4,645	.4
23A	NF				700	.1
23B	NF				666	.1
25B	F	L	4	PP(110-3),DF(94-1)	1,677	.2
26C	F	L	4	PP(110-3),DF(94-1)	5,154	.5

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING*		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
27D	Holland sandy loam, cool, 12 to 20% slopes	L	L	IVe	IVe
28E	Holland sandy loam, cool, 20 to 35% slopes				VIe
29B	Clawson sandy loam, 2 to 7% slopes	M	M	IIIw	IIIw
30B	Barron coarse sandy loam, 2 to 7% slopes		M	IIe	IVe
30C	Barron coarse sandy loam, 7 to 12% slopes	M	M	IIIe	IVe
32A	Jerome sandy loam	M	M	IIIw	IIIw
34B	Brockman cobbly clay loam, 2 to 7% slopes	L		IIIs	VIe
35D	Brockman cobbly clay loam, 7 to 20% slope	VL		IVe	VIe
36B	Brockman clay loam, 2 to 7% slopes	L		IIIe	VIe
37C	Brockman clay loam, 7 to 12% slopes			IVe	VIe
38A	Brockman variant very gravelly loam	VL			IVc
39A	Cove silty clay loam	M	M	IIIw	IIIw
41B	Ruch gravelly silt loam, 2 to 7% slopes	H	H	IIe	IVe
42C	Ruch gravelly silt loam, 7 to 12% slopes	M	H	IVe	IVe
43A	Banning loam	M	M	IIw	IIw
50E	Siskiyou gravelly sandy loam, 20 to 35% slope				VIe
50F	Siskiyou gravelly sandy loam, 35 to 60% south slope				VIe
51F	Siskiyou gravelly sandy loam, 35 to 70% north slope				VIe
52F	Dubakella-Pearsoll complex, 35 to 70% south slope				VIIs

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
27D	F	M	5	PP(100-1),DF(94-1)	9,832	.9
28E	F	M	5	PP(100-1),DF(94-1)	4,050	.4
29B	NF				4,276	.4
30B	F	M	4	PP(110-1),DF(-)	3,736	.4
30C	F	M	4	PP(110-1),DF(-)	163	.0
32A	NF				1,586	.2
34B	NF				2,459	.2
35D	NF				3,694	.4
36B	NF				2,018	.2
37C	NF				1,914	.4
38A	F	L	5	DF(95-1)[JF,IC(-)]	1,728	.2
39A	NF				650	.1
41B	F	M	5	PP(120-3)DF(92-6)	2,306	.2
42C	F	M	5	PP(120-3)DF(92-6)	2,120	.2
43A	NF				2,173	.2
50E	F	L	4	DF(101-8)PP(-)	3,032	.3
50F	F	L	5	DF(90-1)PP(-)	12,840	1.2
51F	F	M	4	DF(101-8)PP(-)	7,736	.7
52F	NF-S				20,541	2.0

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING *		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
53F	Dubakella-Pearsoll complex, 35 5o 75% north slope				VIIs
54F	Pearsoll-Rock outcrop complex 20 to 60% slope				VIIs
55F	Pearsoll-Rock outcrop complex 60 to 90% slope				VIIs
56B	Pollard loam, 2 to 7% slopes	H	H	IIe	IVe
56C	Pollard loam, 7 to 12% slopes	M	H	IVe	IVe
56D	Pollard loam, 12 to 20% slope	M	M	IVe	IVe
56E	Pollard loam, 20 to 35% slope			IVe	VIe
57F	Pollard gravelly loam, 35 to 50% slopes				VIe
58F	Pollard-Beekman complex, 12 to 70% slopes				VIIs
61F	Speaker Josephine gravelly loams 35 5o 55% south slopes				VIe
62E	Josephine gravelly loam, 20 to 35% slope				VIe
63F	Josephine gravelly loam, 35 to 55% north slope				VIe
70C	Debenger loam, 7 to 12% slopes	M		IVe	VIe
71D	Debenger loam, 12 to 20% slopes	L		IVe	VIe
75A	Camas-Newberg complex	I	M	IVw	IVw
76A	Dumps				VIIIs
80E	Vannoy silt loam, 20 to 35% slopes				VIe
81F	Vannoy silt loam, 35 to 55% north slopes				VIe
82F	Vannoy-Voorhies complex, 35 to 55% south slopes				VIs

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
53F	NF-S				16,876	1.6
54F	NF-S				31,562	3.0
55F	NF-S				33,993	3.3
56B	F	H	3	DF(126-7)PP(108)	6,865	.7
56C	F	H	3	DF(126-7)PP(108)	6,624	.6
56D	F	H	3	DF(126-7)PP(108)	8,074	.8
56E	F	H	3	DF(126-7)PP(108)	7,735	.7
57F	F	H	4	DF(116-1)PP(95)	1,867	.2
58F	F	H	3	DF(126-7)PP(108)	5,413	.5
61F	F	L	4	DF(113-3)PP(-)	87,238	8.5
62E	F	H	4	DF(120-7)	16,489	1.6
63F	F	H	3	DF(130-8)	70,771	6.8
70C	NF				165	.0
71D	NF				209	.0
75A	NF				3,533	.3
76A	NF				1,368	.1
80E	F	M	4	DF(110)PP(-)	2,207	.2
81F	F	M	4	DF(110)PP(-)	12,332	1.2
82F	F	L	4	DF(105-3)PP(-)	20,920	2.0

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING*		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
86D	Cornutt-Debakella complex, 7 to 20% slope				VIe
88E	Cornutt-Dubakella complex, 20 to 35% slopes				VIe
89F	Cornutt-Dubakella complex, 35 5o 55% south slope				VIIs
90F	Cornutt-Dubakella complex, 35 to 55% north slope				VIIs
92F	Witzel-Rock outcrop complex, 30 to 75% slopes				VIIs
93F	Woodseye-Rock outcrop complex 20 to 60% slopes				VIIs
94B	Manita loam, 2 to 7% slopes	H		IIe	IVe
95C	Manita loam, 7 to 12% slopes	M	H	IVe	IVe
96D	Manita loam, 12 to 20% slopes	M	M	IVe	IVe
97E	Manita loam, 20 to 35% slopes.				VIe
98F	Manita loam, 35 5o 50% north slopes				VIe
99F	Manita loam, 35 to 50% south slopes				VIe
102D	Eightlar extremely stony clay, 5 to 20% slope				VIIs
103E	Eightlar extremely stony clay, 20 to 35% slopes				VIIs
104F	Eightlar-Dubakella complex, 35 to 65% south slope				VIIs
105F	Eightlar-Dubakella complex, 35 to 65% north slope				VIIs
111F	Beekman-Vermisa complex, 60 to 100% north slope				VIIs
112F	Beekman-Vermisa complex, 60 to 100% south slope				VIIs
115F	Beekman-Colestine complex, 50 to 75% south slope				VIIs

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
86D	F-S	L	4	DF(97-2)[JP,PP,IC(-)]	1,122	.1
88E	F-S	L	4	DF(97-2)[JP,PP,PC(-)]	4,024	.4
89F	F-S	L	5	DF(90)[PP,JP,IC(-)]	28,153	2.7
90F	F-S	M	4	DF(97-2)[JP,PP,IC(-)]	12,569	1.2
92F	NF				2,852	.3
93F	NF				5,144	.4
94B	F	M	5	DF(94-2)PP(-)	2,970	.3
95C	F	M	5	DF(94-2)PP(-)	4,849	.5
96D	F	M	5	DF(94-2)PP(-)	3,713	.4
97E	F	M	5	DF(94-2)PP(-)	4,670	.4
98F	F	H	4	DF(110-1)PP(-)	1,153	.1
99F	F	M	4	DF(109-1)PP(-)	1,626	.2
102D	NF-S				2,747	.3
103E	NF-S				5,276	.5
104F	NF-S				6,147	.6
105F	NF-S				6,688	.6
111F	F	M	4	DF(115-5)PP(-)	34,486	3.3
112F	F	L	4	DF(105)PP(-)	29,541	2.8
115F	F	L	4	DF(105)PP(-)	58,047	5.6

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING*		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
117F	Beekman-Colestine complex, 50 to 80% north slope				VIIs
121D	Jumpoff clay loam, 7 to 20% slopes			IIIe	IVe
122E	Jumpoff clay loam, 20 to 35% slopes				VIe
123F	Jumpoff clay loam, 35 to 50% south slopes				VIe
124F	Jumpoff clay loam, 35 to 50% north slopes				VIe
125F	McMullin gravelly loam, 30 to 60% slopes				VIe
130F	Jayar very gravelly loam, 35 to 70% south slope				VIIs
131F	Jayar very gravelly loam, 35 to 70% north slope				VIIs
132E	Jayar very gravelly loam, 20 to 35% slope				VIs
135F	Vermisa-Beekman complex, 60 to 100% north slope				VIIs
136F	Vermisa-Beekman complex, 60 to 100% south slope				VIIs
137F	Vermisa-Rock outcrop complex, 60 to 100% south slope				VIII
140F	Perdin cobbly loam, 30 to 50% south slope				VIIe
141F	Perdin cobbly loam, 30 to 50% north slope				VIIe
161F	Tethrick gravelly fine sandy loam, 45 to 70% north slopes				VIe
162F	Tethrick gravelly fine sandy loam, 45 to 65% south slopes				VIe
171F	Woodseye very gravelly loam, 50 to 90% south slopes				VIIs
172F	Woodseye Jayar complex, 50 to 90% north slopes				VIIs
181F	Fantz-Knapke complex, 35 to 85% north slopes				VIs

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
117F	F	M	4	DF(115-4)PP(-)	76,719	7.4
121D	F	H	5	DF(90-3)[PP,IC(-)]	879	.1
122E	F	H	5	DF(90-3)[PP,IC(-)]	1,047	.1
123F	F	L	5	DF(90-3)[PP,IC(-)]	3,096	.3
124F	F	M	4	DF(120-2)[PP,IC(-)]	3,009	.3
125F	NF				381	.0
130F	F	L	5	DF(95)SRF(40)	10,839	1.0
131F	F	M	4	DF(118)SRF(50)	19,137	1.9
132E	F	L	4	DF(118)SRF(50)	2,107	.2
135F	F	L	5	DF(70)PP(-)	43,025	4.1
136F	F	L	5	DF(70)PP(-)	56,564	5.5
137F	NF				36,741	3.5
140F	NF-S				2,221	.2
141F	NF-S				3,382	.3
161F	F	H	4	DF(105-2)PP(-)	4,393	.4
162F	F	L	5	DF(95)PP(-)	3,214	.3
171F	F	L	5	DF(80)SRF(-)	3,795	.4
172F	F	L	5	DF(80)SRF(-	5,128	.5
181F	F	L	5	DF(75)[PP JF,IC(-)]	4,896	.5

FIELD MAP SYMBOLS	NAME OF MAPPING UNIT	PRIORITY RATING *		AG. CAPABILITY	
		Irrig.	Non-Irrig.	Irrig.	Non-Irrig.
190F	Fantz-Knapke complex, 35 to 85% south slope				VIs
191F	Fantz-Rock outcrop complex, 60 to 100% slope				VIII
200F	Althouse very gravelly silt loam, 35 to 75% north slopes				VIs
202F	Althouse very gravelly silt loam, 35 to 75% south slopes				VIs
208E	Bigelow very gravelly sandy loam, 5 to 35% slopes				VIs
209F	Bigelow very gravelly sandy loam, 35 to 60% slopes				VIs
210E	Cryaquepts, 0 to 30% slopes				VIIw
215F	Crannler very stony sandy loam, 50 to 90% slopes				VIIs
216F	Crannler-Rock outcrop complex, 50 to 100% slopes				VIIIs
217F	Cryumbrepts, very steep				VIIs
219F	Goodwin very stony sandy loam, 35 to 65% north slopes				VIs
220E	Goodwin very stony sandy loam, .5 to 35% slope				VIs
221F	Goodwin very stony sandy loam, 35 to 65% south slopes				VIs
909F	Rogue-Goodwin complex, 35 to 70% north slopes				VIe
910F	Rogue-Goodwin complex, 35 to 70% south slopes				VIe
RW	Riverwash				VIIIw

FIELD MAP SYMBOL	NF-Non-Forest F-Forest S-Serpentine	PRIORITY** RATING	DOUGLAS FIR+ SITE CLASS	SPECIES TO PLANT	ACRES	% COUNTY SOIL
190F	F	L	5	PP(50)[DF,JP(-)]	5,337	.5
191F	NF				1,085	.1
200F	F	H	4	SRF(50)DF(113)	7,787	.7
202F	F	L	5	SRF(40)DF(95)	4,675	.4
208E	F	L	3	SRF(40)WF(-)	1,258	.1
209F	F	L	3	SRF(40)WF(-)	3,000	.3
210E	NF				1,452	.1
215F	F	L	4	SRF(30)	5,866	.6
216F	F	L	4	SRF(30)	5,246	.5
217F	NF				6,757	.6
219F	F	M	2	SRF(50)WF(80)	2,627	.3
220E	F	M	2	SRF(50)WF(80)	297	.0
221F	F	L	3	SRF(40)WF(70)	3,250	.3
909F	F	M	2	SRF(80)SF(50)	4,470	.4
910F	F	L	3	SRF(40)WF(70)	3,484	.3
RW	NF				3,278	.4

EXPLANATION OF ABBREVIATIONS USED UNDER SPECIES TO PLANT:

DF -- Douglas Fir
PP -- Ponderosa
SRF -- Shasta Red Fir
WF -- White Fir
IC -- Incense-cedar
JP -- Jeffery Pine

* Ag Priority Rating -- See Appendix D for explanation.

** Forest Priority Rating -- See Appendix D for explanation.

\+ This is only a relative index; not all soils may be suitable for Douglas Fir. Check the next column for desirable species to plant.

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