A SURVEY OF THE RESOURCES OF UNION COUNTY

by

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A THESIS

submitted to

OREGON STATE COLLEGE

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MASTER OF ARTS

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APPROVED:

Professor of Natural Resources

In Charge of Major

Chairman, Department of Natural Resources

Chairman of School Graduate Committee

Dean of Graduate School

Date thesis is presented

Typed by Verna Anglemier
Acknowledgement

Sincere appreciation is extended to Dr. Richard M. Highsmith, Jr. for encouragement throughout the study and patient guidance in preparing the final form.

Thanks are also extended to Walter M. Ferguson, James M. Trappe, and Paul Anderson for their technical assistance.

Finally, great appreciation is due my wife, Jayne.
"C'est La Grande Ronde"
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UNION COUNTY
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LEGEND

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r - Catherine Creek
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A SURVEY OF THE RESOURCES OF UNION COUNTY

CHAPTER I

INTRODUCTION

The purpose of this thesis is to present a survey of the resources base of Union County, Oregon. Maps and other graphic portrayal devises are intended to be a major aspect of the contribution.

Union County was chosen as the topic for study for several reasons: (1) It is essentially a geographic unit. (2) The diversity of the resources base provided the author with opportunity to apply and gain experience in the various techniques utilized by geographers in area analysis. (3) A study of Union County from the point of view and breadth coverage here presented had not been done previously. (4) Such a study may have usefulness to county leaders.

The research program was organized during the spring of 1956. An orientation field trip throughout the entire county was made during the summer of 1956. At this time emphasis was placed on study of the physical character of Union County. During the following year, the Oregon State College Library was researched for pertinent material, and Extension Service and Experiment Station
personnel were interviewed.

More extensive research was conducted during the summer of 1957. This period was devoted to contacting and interviewing leading farmers, educators, civic leaders, selected urban and rural residents, manufacturers, managers of service industries and public servants of the cities, county, state, and nation. Field representatives of the Soil Conservation Service and U.S. Forest Service accompanied the author during some phases of the actual field work.

An exhaustive study of publications concerning Union County was conducted. These publications were obtained from private individuals, Federal agencies, and from the library of Eastern Oregon College.

Correspondence was relied upon to gain two types of information: (1) details on industries (obtained by mailed questions) and (2) shortages in specific information on several aspects of the resources base.

The thesis presentation results from the correlation of data gained in field observation and mapping with that gained from interviews, questionnaires, and published sources.
CHAPTER II
PHYSICAL BASE

LOCATION

Union County is located in the northeastern quarter of Oregon, lying within the Central Mountains of the Columbia Intermontane Province. The core of the county is an upland basin known as the Grande Ronde Valley. The outline of Union County suggests a roughly hewn triangle (see figure 1). The blunt northern apex projects between Umatilla and Wallowa Counties. The eastern apex wedges between Wallowa and Baker Counties. The western angle lies between Grant and Umatilla Counties.

The narrowest appendage, the eastern apex, is only six miles from north to south; whereas the longest distance, the east-west axis, extends 62 miles. The north-south axis almost equals the east-west, measuring 60 miles.

TOPOGRAPHY

The Grande Ronde Valley occupies a depression 360 square miles in area. This saucer-shaped valley, a one-time lake bed, averages about 2,700 feet in elevation. The valley is drained by the Grande Ronde River and its main tributary, Catherine Creek.
LANDFORM
UNION COUNTY
OREGON

Scale in Miles
0 5 10 15

REFERENCE-
USFS 1/4" Ranger District Base Maps
Figure 1
Figure 1
The northwestern border of Union County is in the Blue Mountains; whereas the northeastern border is in the Wallowa Mountains. The southern border is located along the south-facing slope of the Telocaset Ridge. This ridge unites an Elkhorn Range spur of the Blue Mountains with an Eagle Cap spur of the Wallowa Mountain Ranges.

In the northern third of Union County, the Wallowa and Blue Mountains rise sharply some 3,000 feet above the valley floor. The relief of this northern third of the county is youthful in appearance. Slopes are steep and deeply cut by streams. The ridge tops, in marked contrast, are characterized by roundness.

In the southwest, the Grande Ronde Valley merges into the hills that gradually rise to the Blue Mountains. The rounded, hill-like topography here is comparable to northern Union County. Impressed on this moderate relief, like pillars in the sky, stands the sharp, saw-toothed Elkhorn Range of the Blue Mountains. The one dominant peak of this range is found just across the county line in Baker and Grant Counties; the greatest elevation in Union County in this area is 7,520 feet. The contrast found between this region and the Eagle Cap area stands out markedly on the Land Form map (see figure 1).
GEOLOGY

Union County has not been geologically studied in detail (App., 57).

According to Mr. N. S. Wagner, geologist with the Oregon State Department of Geology and Mineral Industries in Baker, the Grande Ronde Valley shows evidence of being a down-faulted basin. Lacustrine deposits indicate that this basin once contained a lake. The thickness of the sediments is yet undetermined.

The main mountain masses surrounding the Grande Ronde Valley were lifted to their present heights by diastrophic processes in late Tertiary times. Subsequent erosion has carved them into their present form. The normal processes of stream erosion were supplemented by glaciation in the upper elevations of the Elkhorn and Eagle Cap Area. Evidences of glaciation are pronounced in the headwater region of the Grande Ronde River, on the northern slopes of the Elkhorn Mountains.

The rocks of the mountains include lavas of Tertiary age, an assortment of both crystalline and sedimentary types of Mesozoic age, and a highly metamorphosed series of interbedded volcanic and sedimentary rocks of late Paleozoic age (see figure 2). The Elkhorn and Eagle Cap Mountains are granitic islands of the Mesozoic age that remained above a sea of basalt. Tertiary Columbia River
GEOLOGY & MINERALS

IGNEOUS
Cv Somewhat metamorphised flows, breccia and tuff.
Ji Granitoid rocks.
Tu Volcanic flows of diverse kinds with breccia & tuff.

SEDIMENTARY
P Quartzitic beds & dolomitic limestones.
Q Alluvial deposits.
T Clastic deposits, (indurated) sand, silt, gravel with a few limestone beds.

MINERAL OCCURRENCE
Ag SILVER
Au GOLD
Cu COPPER
Ir RUTENIUM
Mo MOLYBDENITE
Pb LEAD
Pt PLATINUM
Sb ANTIMONY
( ) claimed

REFERENCE:
LANDFORM
UNION COUNTY
OREGON

Scale in Miles
5 0 5 10 15

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 2
GEOLOGY & MINERALS

IGNEOUS
- Somewhat metamorphosed and breccia (and tuff.
- Granitoid bodies
- Volcanic flows of diverse types with breccia & tuff.
- Quartzite beds & dolomitic limestones.
- Alluvial deposits.
- Clastic deposits (indurated) sand, silt, gravel, with a few limestone beds.

MINERAL OCCURRENCE
- Ag - Silver
- Au - Gold
- Cu - Copper
- Ir - Iridium
- Mo - Molybdenite
- Pb - Lead
- Pt - Platinum
- Sb - Antimony

REFERENCE-
- Oregon Dept. of Geology and Mineral Industries. Oregon metal mines handbook
- USFS 1/4" Ranger District Base Maps

Figure 2
basalt of the Miocene Period engulfed the metamorphosed sediments and intrusives of lesser elevation. Small areas of Paleozoic sediments, metamorphosed by faulting and folding, and by the intrusion of the coarse-grained granitic rocks are found in these island areas (App., 58).

CLIMATE

Union County has a continental climate (Dbs) with a high percentage of sunshine. Summers are warm and relatively dry; winters are not severe, but do have moderate amounts of snowfall. The frost-free period is relatively long for this region of Oregon.

The climate of Union County varies with altitude and relief. In general the higher the altitude, the greater the precipitation and lower the average monthly temperatures. The whole region is dominated by marine air masses that have been reduced in moisture content. Before reaching Union County, the moisture content has been orographically reduced in crossing three mountain ranges - the Coastal, the Cascade, and the Blue.

The longest continual climatic record available in Union County is found at the La Grande Station. This station has an annual average of 49.4°F. During a 60 year period the temperatures have ranged between extremes of 20°F. below zero to 108°F. above zero. Elgin has
recorded extremes of minus 25°F. in January and 106°F. in both June and July. Average monthly temperature as well as extremes for recording stations in Union County are noted on table 1.

Most of the year relative humidity is low and evaporation is high.

July and August are nearly always dry, having a combined mean rainfall of only 1.3 inches. Even in these two months, however, occasional thunderheads may produce substantial amounts of rainfall. With the exception of July and August the precipitation is evenly distributed throughout the year. This distribution is favorable to the growing of winter grain.

The average annual precipitation is 19.3 inches in the Grande Ronde Valley; whereas North Powder has about 13 inches. These amounts are marginal for maximum crop returns. The normal annual precipitation in Union County is illustrated by figure 3, and the climatic regimen is shown on table 1.

The annual snowfall in La Grande is 36.2 inches; but on the mountains surrounding the valley it reaches many feet in excess of this. The heavy snowfall in the mountains provides an ample supply of water, if properly utilized, to irrigate a large acreage. Snow rarely remains on the ground in the valley longer than 10 days at
## CLIMATIC STATIONS IN UNION COUNTY

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<th>Jul</th>
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<td>22.9</td>
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<td>1.15</td>
<td>1.14</td>
<td>13.2</td>
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### Prevaling Wind Direction & Wind Velocity in Miles Per Hour

- **Directions**: S, S, NW, NW
- **Velocities**: 13.9, 12.7, 10.8, 9.6, 8.6
- **Average**: 7.9, 7.2, 7.0, 6.5

### Daily Cloudiness, Tenths of Sky Covered, Sunrise to Sunset

- **Average**: 8.1, 7.9, 8.0, 6.4, 6.2
- **Relative Humidity**: 58, 4.0, 5.8

### Reference

- **State Climatologist**, Weather Bureau Office, Portland.

### TABLE 1
AVERAGE ANNUAL PRECIPITATION
ISOMETES IN INCHES

REFERENCE-
Appendix A, Plate 2.
LANDFORM
UNION COUNTY
OREGON

Scale in Miles
5  10  15

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 3
AVERAGE ANNUAL PRECIPITATION

ISOHYETS IN INCHES

REFERENCE-

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 3
The average date of the last killing frost in the valley is May 6 and the average date of the first killing frost is September 26, giving an average frost-free season of about 143 days. Killing frosts, however, have occurred as late as June 11 and as early as August 30. Although data are not available for the frost-free season in North Powder, the State Climatologist indicated that North Powder and Union were similar in climatic characteristics (App., 91). Frost-free seasons in some mountains valleys are less than 50 days.

In winter the prevailing winds are from the south and during the rest of the year are from the northwest. The climate as a whole is stimulating and healthful, and although high temperatures are common in summer, the heat is not oppressive.

SOIL

Union County has a complex soil series pattern. Recent soil survey data are lacking for the county. The published soil survey of the Grande Ronde Valley (1926) is now out-of-date. A re-survey was initiated in 1957 to be completed in 1967. The North Powder Land Use Division is included in Baker Area Survey of 1941. Surveys of other portions of Union County have not been
published. In 1926, over 28 series of soils were listed for the Grande Ronde Valley. The current resurvey has added eight more to the 28 total (App., 3). Most of the additional series are located in the upland regions. Sixteen soils have been listed on figure 4, but only 14 have been outlined. The two not included on the map are: Springdale loam (c) found dispersed in the Springdale gravelly loam (l) area, and Conley clay loam (h) found within limits of the Hyrum silt loam area (n). Soils not listed were too dispersed to illustrate.

The Cropland areas are characterized by Chernozems, see soils (a) and (b), and associated wet soils, see soil (d), (e), (f), (g), (i), (j), and (m). The parent material of the agricultural soils is predominately alluvial and loess material.

The Range areas are characterized by Chestnut, Chernozem, and Prairie soils. The Chestnut and Chernozem soils are distributed in the low rainfall area of southern Union County, at elevations less than 3,500 feet. At higher elevations the Prairie soils, (see soil (o), figure 4), are interspersed with Brown Forest soils (see soil (k)).

The Forested area has two major soil groups: the

---

1 Key to soil on figure 4.
<table>
<thead>
<tr>
<th>Soil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>o. Catherine Silt Loam</td>
</tr>
<tr>
<td>b. Alice Silt Loam &amp; Sandy Loam</td>
</tr>
<tr>
<td>c. Springsdale Loam</td>
</tr>
<tr>
<td>d. La Grande Gravelly Clay Loam</td>
</tr>
<tr>
<td>e. Gooch Silty Clay Loam</td>
</tr>
<tr>
<td>f. Gooch Silt Loam</td>
</tr>
<tr>
<td>g. La Grande Silt Loam</td>
</tr>
<tr>
<td>h. Conley Clay Loam</td>
</tr>
<tr>
<td>i. Klamath Clay Loam</td>
</tr>
<tr>
<td>j. Klamath Silt Loam</td>
</tr>
<tr>
<td>k. Sarta Silt Loam</td>
</tr>
<tr>
<td>l. Springsdale Gravelly Loam</td>
</tr>
<tr>
<td>m. Gooch Loam</td>
</tr>
<tr>
<td>n. Hyrum Silt Loam</td>
</tr>
<tr>
<td>o. Waha Stony Loam</td>
</tr>
<tr>
<td>p. Toho Loam</td>
</tr>
<tr>
<td>x. Alkali</td>
</tr>
</tbody>
</table>

Overlay

REFERENCE:
Soil Conservation Service
Figure 4
Brown Forest soils and Regosols. The most prevalent in this area are the Brown Forest soils. In Union County, the Regosol group is dominated by the Tolo series, which is most prevalent on the northern slopes (see soil (p), figure 4) (App., 10).

WATER

The water resources of Union County are among its greatest assets. Community existence and growth are dependent upon the presence of water. The utilization of water is a function of availability, dependability, and quantity.

Watersheds. Within Union County there is one major watershed, the Grande Ronde, and portions of five others. The area of the Grande Ronde watershed is six times greater than the total of the other five (see table 2).

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Acres</th>
<th>Percentage Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walla Walla</td>
<td>220</td>
<td>0</td>
</tr>
<tr>
<td>Umatilla</td>
<td>10,000</td>
<td>15</td>
</tr>
<tr>
<td>North Fork of John Day</td>
<td>2,000</td>
<td>0</td>
</tr>
<tr>
<td>Immaha</td>
<td>2,560</td>
<td>0</td>
</tr>
<tr>
<td>Powder</td>
<td>162,200</td>
<td>61</td>
</tr>
<tr>
<td>Grande Ronde</td>
<td>1,123,500</td>
<td>49</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,300,480</td>
<td></td>
</tr>
</tbody>
</table>

Source: Soil Conservation Service
**Hydrographic Characteristics.** The stream flow characteristics of these basins are related strongly to the snow cover in the mountainous portions during the colder months and the rate of melt during spring and early summer.

The Grande Ronde River and its principal tributaries are characterized by a high stream flow in the spring months. The flow diminishes to a minimum in the period between August and September and continues to be low through January (35, p. 223).

The total mean annual run-off of the Grande Ronde River at La Grande is about .28 million acre feet per year. The maximum recorded flow at this point was 8,880 second-feet. The minimum summer flow on record is three second-feet (34, p. 18). The yearly flow cycle is illustrated on figure 5.

Catherine Creek, near Union, has a mean average run-off of 96,150 acre feet with an average annual discharge of about 119 cubic feet per second. The highest recorded discharge, 1,740 cubic feet per second, was on May 27, 1948 (see figure 6), and the lowest was four cubic feet per second in November of 1931.

At Elgin, the Grande Ronde River has a mean average run-off of 549,000 acre feet and an average discharge of
MAJOR STREAMS

Average Yearly Runoff in Acre-feet.

Grande Ronde at La Grande
Period of record 1908-1956.
383 c.f.s. average annual discharge.
679 square miles drainage area.
27,730 acre-feet per year.

Catherine Creek near Union
Period of record 1927-1956.
119 c.f.s. average annual discharge.
105 square miles drainage area.
86,150 acre-feet per year.

LEGEND:

Δ — Gaging Station
⊙ — Existing Irrigated Lands.
○ — Area inundated in flood of 1917 (frequency 25 to 50 years)

REFERENCE: U.S. GEOLOGICAL SURVEY,
BUREAU OF RECLAMATION,
U.S. ARMY CORPS OF ENGINEERS.
Figure 5
WATERSHEDS, FLOOD PRONE AREA & IRRIGATED LANDS OF UNION COUNTY

MAJOR STREAMS
Average Yearly Runoff in Acre-feet
Grande Ronde at La Grande
Period of record 1906-1956.
365 c.f.s. average annual discharge.
679 square miles drainage area.
277,300 acre-feet per year.
Catherine Creek near Union
Period of record 1927-1956.
119 c.f.s. average annual discharge.
105 square miles drainage area.
86,150 acre-feet per year.

LEGEND:
- Gaging Station
- Existing Irrigated Lands.
- Area inundated in flood of 1917 (frequency 25 to 50 years)
- Projected Multiple-use Dam Sites:
  1 - Grande Ronde Reservoir, 150,000 acre-feet capacity
  2 - Catherine Creek Reservoir, 32,000 acre-feet capacity.

REFERENCE: U.S. GEOLOGICAL SURVEY, BUREAU OF RECLAMATION,
U.S. ARMY CORPS OF ENGINEERS.
Figure 6. Spring flood of May 22, 1948, in the Grande Ronde Valley. The maturity of this valley is illustrated by the meandering stream pattern and ox-bow scars.

Photo (d)    Source: Corps of Engineers, Walla Walla District, U.S. Army.
760 cubic feet per second. The highest and lowest discharges at the Elgin station were 9,220 cubic feet per second and 15 cubic feet per second (38, p. 18).

The Union County portion of the Powder watershed, as a hydrographic unit, has not been studied. The Powder River run-off is characterized by low flows from July through February and by high flows from March through June. The four months of March through June account for about 84 percent of the total annual flow. At a station near North Powder, an intermittent record of which only four years are continuous, indicates a mean flow of 236 cubic feet per second and an average annual run-off of 170,600 acre-feet. In 1921 the maximum flow observed was 3,010 cubic feet per second. The stream was dry in 1910 (35, p. 144).

Flood Control. Lowlands of the Grande Ronde Valley are subjected to flooding almost yearly in varying proportions. The primary water problem in the Grande Ronde Valley is flood control. The high spring discharges of the Grande Ronde River and Catherine Creek combined with their flat gradient and meandering courses in the valley cause considerable overflow annually. Flooded areas range from 2,000 acres minimum to a 1894-1895 record of 51,000 acres. The 1917 flood area covered the 30,000
acres shown in figure 5 (36, p. 21).

Two types of damage occur during floods in the Grande Ronde Valley. The force of the high peak period damages roads, bridges, property, and levees. The overflows cover the low-lying farm areas and water-log the land. Crops are destroyed and normal land use is disrupted. The areas most frequently subjected to damage are the Grande Ronde and Catherine Creek Land Use Divisions. Flood control investigations by the U.S. Army, Corps of Engineers have indicated that the combination of channel improvements and multiple-use dams would be feasible (App., 89). To finance the dam construction and channel improvements, however, a total county effort must be exerted (App., 84).

Drainage problems occur in agricultural lands that are subjected to periodic uncontrolled floods. Due to the presence of a high water table, the removal of this excess water is retarded. The high water table results from a combination of flooding and irrigation. By lowering the water table in certain subirrigated lands of the valley floor, productivity would be reduced (App., 12).

Flood control and drainage are not major problems in the areas of the Powder Watershed (App., 3).
Irrigation. Interest in irrigation has been evident in Union County since 1872. Numerous investigations have been made by both private and public interests (App., 90). The immediate need for irrigation became apparent in the 1930's. Due to a succession of years with sub-normal precipitation, the demand for late season water could not be supplied by unregulated stream flows (App., 84).

The great expense of financing flood control and irrigation facilities in the Grande Ronde Valley has discouraged the farmers from implementing a water management program. The profitable production of crops that do not require irrigation offers a more acceptable solution. The success in production of grass and legume seed has focused the attention away from irrigation developments in Union County (App., 86).

Most of the irrigated land of the Grande Ronde Valley lies along Catherine Creek and the Grande Ronde River. Subirrigation from sloughs and smaller channels of the valley supplies water to large areas. The stream run-off and water spreading methods of flood irrigation used since the early settlement are still employed.

Low summer stream flow seriously limits irrigation possibilities of the Grande Ronde Valley. A total of 26,400 acres is presently classed as irrigated land; but
Figure 7. Spense Reservoir. This private-owned reservoir supplies irrigation water and fishing.
Photo (j)
Source: Soil Conservation Service
less than 3,300 acres have an adequate water supply (41, p. II-4). The total stream flow is not adequate to irrigate more than 4,000 acres during an average year. In drought years, only about 1,500 acres can be properly irrigated (41, p. IV-8).

Ground water sources provide very little irrigation water. Numerous attempts have been made to pump water for irrigation from shallow wells; none have yielded adequate water (App., 85).

Several deep wells have been drilled. One well, near Imbler, was drilled to 1,150 feet and reportedly produced an artesian flow of 3,500 gallons per minute. Another well near Island City, drilled to about 2,000 feet, did not produce a significant flow. Surface waters, therefore, are considered the primary source of irrigation water.

The limited total annual precipitation of the North Powder area necessitates irrigation practices for crop production. The inadequacy of water in this area has been reflected by some litigation concerning water rights (App., 87).

The North Powder Area is traversed by the North Powder River and its northern tributaries, Wolf Creek and Clover Creek. Preliminary studies have been conducted in an attempt to initiate small water storage projects, to
store spring run-offs for later utilization. Appropriations for further studies have not been granted because of the lack of public support (App., 84). As is the case in the Grande Ronde Valley, well water is used for watering stock and for domestic purposes, whereas surface water provides the major means of irrigating crops.

**LAND USE DIVISIONS**

For field work and long range planning, the Soil Conservation Service has divided Union County into twelve divisions. These divisions are based on similarity in topography, soil characteristics, land capability (see table 11), and historical usage and limitations. Throughout this study these areas have been called Land Use Divisions. Table 3 summarizes the characteristics of each and their locations are shown on figure 8.
LAND USE DIVISIONS

1  COVE AREA
2  RANGE AREA
3  STARKEY AREA
4  PALMER JUNCTION
5  ELGIN CRICKET FLAT
6  PUMPKIN RIDGE-PLEASANT GROVE
7  SAND RIDGE AREA
8  GRANDE RONDE
9  LADD CANYON
10  FOREST AREA
11  CATHERINE CREEK
12  NORTH POWDER
Figure 8
LAND USE DIVISIONS

1  COVE AREA
2  RANGE AREA
3  STARKEY AREA
4  PALMER JUNCTION
5  ELGIN CRICKET FLAT
6  PUMP HILL-PLEASANT GROVE
7  SAND RIDGE AREA
8  GRANDE RONDE
9  R E G I O N
10  LAGO CANYON
11  FOREST AREA
12  CATHRINE CREEK
13  NORTH POWDER

SCALE in MILES

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 8
<table>
<thead>
<tr>
<th>Division (Acreage)</th>
<th>Type of Land</th>
<th>Land Capability Classes</th>
<th>Major Soil Types</th>
<th>Limiting Factors</th>
<th>Area Adapted For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Area (292,150)</td>
<td>Drivers and maintainous</td>
<td>VI-VII 1-9</td>
<td>Waha stony loam, silt loam.</td>
<td>Shallow soil, slope, water erosion.</td>
<td>Grazing</td>
</tr>
<tr>
<td>Starkey (33,200)</td>
<td>Alluvial fan</td>
<td>IV-VI-VI 1-2-3</td>
<td>Aliso silt loam, sandy loam.</td>
<td>Slope, water erosion.</td>
<td>Grazing</td>
</tr>
<tr>
<td>Sangre de Cristo Flat (29,700)</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 1-2</td>
<td>Aliso silt loam, sandy loam.</td>
<td>Slope, water erosion.</td>
<td>Grazing</td>
</tr>
<tr>
<td>Grande Ronde (36,350)</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 2-3-1-1</td>
<td>Aliso silt loam, silt loam.</td>
<td>Wind erosion, water erosion.</td>
<td>General farming</td>
</tr>
<tr>
<td>Forest Area (81,620)</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 2-1</td>
<td>Tolo silt loam.</td>
<td>Slope, infertility, wind erosion.</td>
<td>Grazing</td>
</tr>
<tr>
<td>Catherine Creek (18,500)</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 2-3-1</td>
<td>Catherine silt loam.</td>
<td>Soil texture</td>
<td>Beef, barley, hay, alfalfa, livestock</td>
</tr>
<tr>
<td>North Powder (18,200)</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 2-3-1</td>
<td>Catherine silt loam.</td>
<td>Slope, water erosion, wind erosion.</td>
<td>Hay, grazing, livestock</td>
</tr>
<tr>
<td>Ledge Creek</td>
<td>Alluvial fan</td>
<td>II-III-IV-VI 2-1-6-1</td>
<td>Good loam.</td>
<td>Water erosion, wind erosion.</td>
<td>Beef, barley, hay, alfalfa.</td>
</tr>
</tbody>
</table>

**Note:**
- Land Capability Classes were computed to the nearest 10 percent of each land use division.
- Example: Forest Area VI-VII Class VI, 80 percent; Class VII, 70 percent.
- Livestock includes beef, sheep, and swine.

Source: Soil Conservation Service
<table>
<thead>
<tr>
<th>Land Capability Class</th>
<th>Acreage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class II</td>
<td>56,140</td>
<td>4.3%</td>
</tr>
<tr>
<td>Class III</td>
<td>59,690</td>
<td>4.6%</td>
</tr>
<tr>
<td>Class IV</td>
<td>47,060</td>
<td>3.6%</td>
</tr>
<tr>
<td>Class V</td>
<td>637,040</td>
<td>49.3%</td>
</tr>
<tr>
<td>Class VI</td>
<td>480,140</td>
<td>36.9%</td>
</tr>
<tr>
<td>Unclassified (towns, roads)</td>
<td>20,410</td>
<td>1.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,300,480</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Figure 9
ACREAGE AND PERCENTAGE OF TOTAL UNION COUNTY AREA IN LAND CAPABILITY CLASSES.

<table>
<thead>
<tr>
<th>Class</th>
<th>Acreage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>56,140</td>
<td>4.3%</td>
</tr>
<tr>
<td>II</td>
<td>59,690</td>
<td>4.6%</td>
</tr>
<tr>
<td>III</td>
<td>67,060</td>
<td>5.6%</td>
</tr>
<tr>
<td>IV</td>
<td>53,040</td>
<td>4.3%</td>
</tr>
<tr>
<td>V</td>
<td>45,740</td>
<td>3.6%</td>
</tr>
<tr>
<td>VI</td>
<td>20,410</td>
<td>1.6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,300,480 acres</td>
<td>100%</td>
</tr>
</tbody>
</table>

LAND CAPABILITY CLASSES
UNION COUNTY
OREGON

REFERENCE-
Soil Conservation Service

LANDFORM
UNION COUNTY
OREGON

Scale in Miles

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 9
CHAPTER III
FOREST RESOURCES BASE

The forest resource base is the major contributor to the industrial economy of Union County. The county depends heavily on the forests for raw materials. Timber represents the most important raw material supplied, but summer forage for livestock, habitat for wild game, and water storage capacity of the watershed are important utilization facets of the forest resource base.

FOREST TYPES

The Forested Region, located in the mountainous sections of Union County, covers 67 percent of the county. Approximately three-fourths of the Forested Region is in the Blue Mountains and the remaining one-quarter is in the Wallowa Mountains.

The differences in temperature and precipitation have resulted in many different combinations of tree species in various parts of the Blue and Wallowa Mountains. The location and extent of the species are shown on figure 10. U.S. Forest Service field work in 1957 suggested that the 1937 data on areas of species occurrence is still valid (App., 46).

Softwoods. Ponderosa pine (Pinus ponderosa),
occurring on the drier sites, accounts for over 45 percent of the total forested area. Stands of this species have been classified into two general types: ponderosa pine types and pine mixture (see figure 10).

This species begin at the "dry timberline" bordering the Non-forested Region at about 2,700 feet elevation, and extend up to about 5,500 feet. The purer stands (greater than 80 percent) are found on the dry south or west slopes. Stands of from 50 to 80 percent occur on the moist east or northeast slopes. The pine mixture grows on the moist, cooler north or northeast slopes (29, p. 5).

Above the ponderosa pine types, Douglas fir (Pseudotsuga menziesii or Pseudotsuga taxifolia), lowland white fir (Abies grandis), lodgepole pine (Pinus contorta) and upper-slope mixtures dominate. Upper-slope mixtures are composed of various combinations of Douglas fir, western larch (Larix occidentalis), white fir, lodgepole pine, alpine fir (Abies lasiocarpa), mountain hemlock (Tsuga mertensiana), western white pine (Pinus monticola), and Engelmann spruce (Picea engelmannii) (App., 46).

Hardwoods. The hardwood trees found in the county are thinly distributed in the lowlands. A few isolated stands have been planted by farmers to serve as
Non-forest Land

Ponderosa Pine, greater than 50% by volume of Ponderosa Pine.

Pine mixture, Ponderosa Pine 20–50% by volume with Western Larch, White Fir, Douglas Fir, & White Pine.

Lodgepole Pine, greater than 50% by volume.


Subalpine—Forests at upper limits of tree growth, usually unmerchantable.

Reference—US Forest Service, Forest type map, state of Oregon, NE quarter, 1937.
Figure 10
Figure 11. Lodgepole pine stand. A bore core showed the tree, in back of Mr. Walter M. Fergerson of the Soil Conservation Service, to be about 75 years old. The short evergreen growth to his front is white fir, about 25 years old.

Photo (n) Source: Author
Figure 12. Bow hunting area, north of Mount Emily in Upper Slope Mixture Area. This area is still suffering from the overgrazing practices of the early 1900's. Soil is extremely shallow and cheat grass is thick. Photo (o) Source: Author
Figure 13. Starkey Area. The topography is typical of this part of Union County. The heavy timbered areas are on the north slopes and creek bottoms. Most of the large openings are on scab ridges with very shallow soil. The contour-like lines are stringers of Ponderosa pine growing where deeper soils have accumulated. The straight stringers of timber are faults in the bed rock where soil has collected in the depressions. Dense growths near center are Lodgepole pine, open stands are Ponderosa pine mixture.

Photo (v) Source: U.S. Forest Service
windbreaks.

Hardwoods, such as black cottonwood (*Populus trichocarpa*) and quaking aspen (*Populus tremuloides*) grow along the valley streams. Limited quantities of paper birch (*Betula fontinalis*) are found near Elgin. In Union County these species are of little commercial importance as they never occur over large areas, and the total volume is negligible (5, p. 4).

**FOREST CONDITION**

Recent data on the condition of Union County forest resources is not yet available. The U.S. Forest Service started a reinventory in 1957 which will be ready for release near the end of 1959 (App., 42). The only available forest data considered to be complete was released in 1937. Growth and cutting changes during the 20 year period following the 1937 reinventory makes the value of this data questionable.

In 1945, bookkeeping revisions of the 1937 reinventory statistics on forest land area and timber volume were made. These revisions were rough estimates made by the U.S. Forest Service on the basis of average growth increments and the known timber harvest rate (App., 42).

**EXTENT OF THE FOREST RESOURCE**

Of the 867,000 acres in the Forested Region, in 1945,
72,000 acres were classed as noncommercial. These non-commercial lands included those areas unable to produce crops of usable wood because of their high elevation and rugged topography or insufficient moisture. Noncommercial lands also included a wilderness area which was permanently set aside for recreation and study.

The remaining 795,000 acres in the Forested Region were classed as commercial forest area, and contained 3,212 million board feet of sawtimber (see table 4).

In 1937, the volume of ponderosa pine was 1,033 million board feet (29, p. 11); whereas by 1945 the volume had decreased to an estimated 705 million board feet (App., 42) (see table 5).

### TABLE 4

<table>
<thead>
<tr>
<th>Stand Size Classes of Union County Forest Land*</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw timber trees</td>
<td>424,000</td>
</tr>
<tr>
<td>Pole timber</td>
<td>151,000</td>
</tr>
<tr>
<td>Seedlings and Saplings</td>
<td>216,000</td>
</tr>
<tr>
<td>Non-stocked</td>
<td>4,000</td>
</tr>
<tr>
<td>Commercial Forest Total</td>
<td>795,000</td>
</tr>
</tbody>
</table>

* Based on 1945 revision of the 1937 reinventory
Source: U.S. Forest Service, Portland, Oregon
TABLE 5

Volume of Sawtimber by Species* (Millions of board feet, scribner scale)

<table>
<thead>
<tr>
<th>Species</th>
<th>1937</th>
<th>1945*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas fir</td>
<td>657</td>
<td>803</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>1,033</td>
<td>705</td>
</tr>
<tr>
<td>True firs</td>
<td>477</td>
<td>608</td>
</tr>
<tr>
<td>Other softwoods</td>
<td>905</td>
<td>1,094</td>
</tr>
<tr>
<td>Hardwoods</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,073</td>
<td>3,212</td>
</tr>
</tbody>
</table>

* Based on 1945 revision of the 1937 reinventory
Source: U.S. Forest Service, Portland, Oregon

Apparently by 1945 the continued harvest of ponderosa pine had depleted markedly the saw timber inventory of this species. According to Chief F. L. Moravars, U.S. Forest Service Economist, this depletion has encouraged the harvest of other species (App., 42).

The upper slope mixtures have been harvested at an annually increasing rate. Scattered stands of lodgepole pine found throughout the Forested Region remained unused (see figure 11), (App., 42). Random samplings made by the U.S. Forest Service in 1957, indicated that about 354,838 million cubic feet of lodgepole pine were available. This volume represents a large reservoir of timber for eventual industrial use. Eighty-two percent of this species is potential pulpwood, one percent is potential sawtimber, and the remainder is submerchantable (App.,
During the period from 1954 to 1956, lodgepole pine was chipped near Kamela by the Oregon Fibre Products Company of Pendleton (App., 39). These chips supplied the raw material in the manufacture of hardboard panels, but because of the expense of such an operation, it was discontinued.

FOREST OWNERSHIP

The ownership of commercial forest land is divided between private and public interests (see figure 14).

Public Forests. In 1945, public ownerships accounted for 57 percent of the total forested land. Over 98 percent of the public land was in National Forests (see table 6).

<table>
<thead>
<tr>
<th>Ownership Class</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>343,000</td>
</tr>
<tr>
<td>National Forest</td>
<td>438,000</td>
</tr>
<tr>
<td>Bureau of Land Management</td>
<td>5,000</td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>1,500</td>
</tr>
<tr>
<td>State, County, and Municipal</td>
<td>8,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>795,000</td>
</tr>
</tbody>
</table>

*Based on 1945 revision of the 1937 reinventory

Source: U.S. Forest Service, Portland, Oregon
LANDFORM
UNION COUNTY
OREGON

Scale in Miles

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 14
Figure 14
The Federal government still is the largest single owner of commercial forest land (App., 46). The National Forests between 1937 and 1945 built up their sawtimber reserves by selective cutting of mature and overmature stands, except in areas where clear-cutting was necessary. The large size of the Federal lands lend themselves readily to applied forest management. The sustained yield management system of the U.S. Forest Service provides a steady supply of forest raw materials for present utilization and insures an adequate supply for the future of Union County.

In Union County, the U.S. Forest Service regenerates Douglas fir by the patch method. Scattered areas are clear cut to allow the reseeding of the deforested area. The ponderosa pine, on the other hand, lends itself to selective logging. Other species in the county require different management practices.

Private Forests. The ownership pattern of private land in 1957 is complex. The largest part of private timber lands in the county was controlled by a few owners, with 5.4 percent of the total private owners holding more than 40 percent of the private forest land. Data were not available to indicate whether these same owners controlled a proportionate amount of the
sawtimber. The Mt. Emily Lumber Company alone owned about 64,000 acres (App., 43), which represented the largest single private ownership (App., 64). Complexity in the ownership pattern results from the large proportion of small forest land owners to large owners. Nine hundred and ninety-three owners have deeds to lands each of which was less than 2,561 acres. Eighty percent of these landlords own acreages which are less than 160 acres (see table 7). Many are farmers who have woodlands on their property (App., 64).

**TABLE 7**

<table>
<thead>
<tr>
<th>Acre Size</th>
<th>Owners</th>
<th>Percent of Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-20</td>
<td>139</td>
<td>13.1</td>
</tr>
<tr>
<td>21-80</td>
<td>333</td>
<td>31.6</td>
</tr>
<tr>
<td>81-160</td>
<td>223</td>
<td>21.1</td>
</tr>
<tr>
<td>161-320</td>
<td>132</td>
<td>13.1</td>
</tr>
<tr>
<td>321-640</td>
<td>103</td>
<td>9.7</td>
</tr>
<tr>
<td>641-1280</td>
<td>48</td>
<td>4.6</td>
</tr>
<tr>
<td>1281-2560</td>
<td>15</td>
<td>1.4</td>
</tr>
<tr>
<td>Greater than 2561</td>
<td>57</td>
<td>5.4</td>
</tr>
<tr>
<td>Total Owners</td>
<td>1050</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Union County Assessor, La Grande, Oregon

**FOREST MANAGEMENT**

In order to plan for the future of Union County forest resources, the U.S. Forest Service revised the data in the 1937 reinventory and determined the annual
allowable cut for a sustained yield. On the bases of this revision, the recommended cut was calculated to be 17,076 million board feet annually (see table 8).

**TABLE 8**

Estimated Annual Growth by Ownership\(^*\)
(Thousands of board feet, scribner scale)

<table>
<thead>
<tr>
<th>Type</th>
<th>Private Owned</th>
<th>National Forests</th>
<th>Other Public Owned</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas fir</td>
<td>1,232</td>
<td>1,310</td>
<td>45</td>
<td>2,587</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>7,198</td>
<td>1,478</td>
<td>148</td>
<td>8,824</td>
</tr>
<tr>
<td>True firs</td>
<td>1,105</td>
<td>1,464</td>
<td>45</td>
<td>2,614</td>
</tr>
<tr>
<td>Other softwoods</td>
<td>1,203</td>
<td>1,803</td>
<td>45</td>
<td>3,051</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,738</strong></td>
<td><strong>6,055</strong></td>
<td><strong>283</strong></td>
<td><strong>17,076</strong></td>
</tr>
</tbody>
</table>

\(^*\) 1945 revision of 1937 reinventory

Source: Division of Forest Economics Research, Pacific Northwest Forest and Range Experiment Station, Forest Service, U.S.D.A.

**Timber Harvest.** The annual timber harvest in the county, in relation to the recommended allowable cut, suggests depletion of the private forests at a rapid rate. The amount of timber harvested since 1949 has been greater than the estimated annual growth. The harvest in 1949 was about 1.2 times the allowable cut; whereas in 1956 it had gone up to 3.6 times the allowable cut (see table 9).

In 1956, private ownership had contributed 90 percent of the timber harvest at five and one-half times its allowable cut. The continued depletion of private forest
TABLE 9
Timber Harvest in Union County
(Thousands of board feet, scribner scale)

<table>
<thead>
<tr>
<th>Year</th>
<th>Private Live</th>
<th>National Forests</th>
<th>Indian Lands</th>
<th>Total Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956</td>
<td>59,092</td>
<td>100*</td>
<td>--</td>
<td>62,192</td>
</tr>
<tr>
<td>1955</td>
<td>53,094</td>
<td>4,802</td>
<td>211</td>
<td>58,107</td>
</tr>
<tr>
<td>1954</td>
<td>51,092</td>
<td>3,000</td>
<td>100</td>
<td>54,925</td>
</tr>
<tr>
<td>1953</td>
<td>47,076</td>
<td>900*</td>
<td>297</td>
<td>48,273</td>
</tr>
<tr>
<td>1952</td>
<td>43,607</td>
<td>4,235</td>
<td>265</td>
<td>48,548</td>
</tr>
<tr>
<td>1951</td>
<td>33,505</td>
<td>4,500*</td>
<td>--</td>
<td>38,005</td>
</tr>
<tr>
<td>1950</td>
<td>26,765</td>
<td>12,600*</td>
<td>--</td>
<td>39,365</td>
</tr>
<tr>
<td>1949</td>
<td>22,638</td>
<td>281*</td>
<td>--</td>
<td>22,919</td>
</tr>
</tbody>
</table>

* No differentiation made

Source: Division of Forest Economics Research, Pacific Northwest Forest and Range Experiment Station, Forest Service, U.S.D.A.

Land has reduced the volume of timber considerably. The increased harvesting rate of privately owned forest is especially noticeable after 1951 (see table 9).

The percentage increase of sawtimber volume in the National Forests represented a real gain of 277 million board feet in a period of eight years. The privately owned sawtimber had decreased by 154 million board feet during this same period of time. The overall gain in the county was 137 million board feet. Therefore, the percentage of increase of sawtimber volume in the National Forests was able to offset the depletion rate for this period (see table 10). The National Forest can not be expected, however, to continue to make up the deficiencies
Table 10

Net Volume of Live Sawtimber*  
(Millions of board feet, scribner scale)

<table>
<thead>
<tr>
<th>Ownership Class</th>
<th>1937</th>
<th>1945*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>1,010</td>
<td>856</td>
</tr>
<tr>
<td>National Forest</td>
<td>1,993</td>
<td>2,270</td>
</tr>
<tr>
<td>Bureau of Land Management</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>State, County, City, and Bureau of Indian Affairs</td>
<td>48</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>3,075</td>
<td>3,212</td>
</tr>
</tbody>
</table>

* 1945 revision of 1937 reinventory

Source: U.S. Forest Service, Portland, Oregon

brought on by over cutting in the private lands.

The excessive harvesting of private forests indicates the need for a sustained yield program. The effective application of such a program is hindered by the commercial forest ownership pattern. A large number of small owners have found it difficult to accept trees as a long range crop. This has resulted in excessive harvesting (App., 39). The vital need of a sustained yield program has been recognized by community leaders, educators, and the public.

Tree Farms. The acceptance of the Tree Farm concept has been encouraged by public opinion and the education of the forest landowner (App., 59). In 1957, Union County led the counties of Oregon with 15 certified Western Pine
Tree Farms (see figure 14). Tree farms include about one-third of the privately owned forested land. The smallest tree farm occupies 30 acres and the largest 64,000 acres. Most of the 15 Tree Farms are engaged in timber and livestock production (App., 41). Nine other forest landowners are in the process of qualifying for Tree Farm Certificates (App., 3). This latter indicates that the Tree Farm movement is gaining influence in the current management of timber resource, and points toward a brighter picture in sustaining continued forest harvests.

FOREST UTILIZATION

Historically, timber resources have been second to agriculture in the economy of the county. The present utilization pattern of Union County forested resources is a resultant of ownership, technology, markets, and the history of the activity.

Forest-Based Industries. In 1956, the forest-based industries of the county employed over 79 percent of all persons engaged in manufacturing and paid over 92 percent industrial payroll (App., 68).

In 1956, outside markets supported Union County lumber industries. Less than one percent of the lumber
produced was for local consumption. The county shipped 99 percent of its lumber; 45 percent went to markets in Portland, and the remaining 54 percent to markets in the midwestern states (App., 76).

Union County primarily supplies its own lumber-based industries, but the county also supplies timber to lumber industries located in Baker, Wallowa, and Umatilla Counties (App., 73). Keen competition for timber exists among Union County lumbermen and between lumbermen in the neighboring counties. The question most often asked by sawmill owners and managers is: "How long can all the mills in Union County continue to operate on the timber available?" (App., 32). Competition for a decreasing timber resource has already forced sawmills which do not control sufficient supplies to cease operations (App., 56).

The threat of an inadequate sawtimber supply forced the more solvent mill operators to initiate a private timber supply program. This program was designed to insure the future raw material base of the individual mills. Many of the larger mills have purchased tracts of land and are restoring them to a productive status. This program suggests a healthy situation for the area's future, in that the larger companies have the necessary
capital for reforestation and are in a better position to carry out this work. When land purchases have not been economically feasible, the mill operators have attempted to purchase timber harvesting rights (App., 43). Sharp competition among forest land buyers has made both types of purchases increasingly more difficult (App., 52).

In 1956, there were 18 stationary mills with about 1,096 employees and a payroll of 4.7 million dollars. Of these nine were located in Elgin and La Grande (App., 50) (see figure 27).

La Grande, the center of the lumber industry, has five sawmills. The total capacity is approximately 850 thousand board feet per day. La Grande alone has 38 percent of this total capacity and Elgin has 30 percent. The remaining milling capacity is distributed throughout the county.

**Wood Products.** Today an important factor in profitable wood products manufacturing is an integrated mill operation. Under competitive conditions, the sawdust piles and slab waste represent a potential profit for mills. The utilization of these by-products is directly related to the continued profitable operation of the sawmills. Mills not able to utilize their logs completely will be forced to close down in the future (App.,
The lumber industry in Union County presently emphasizes the early stages of manufacture. The manufacture of wood products from rough or planed timber is very limited. In 1956, only two companies were engaged in the production of prefabricated wood specialties such as furniture parts, moulding, door jambs, luggage shook, and Venetian blind slats (App., 43).

The lumber products industry is characterized by non-integrated mills. A recent development within the industrial pattern was the introduction of a new type of milling operation, the stud mill.
FORESTED REGION

The range resources within the Forested Region supplement the agricultural resource base. The two range types found are: (a) The untimbered grassland range, which contains bunchgrass and dry meadow range, covers about 25 percent of the Forested Region; and (b) The open forest range covers about 50 percent of the Forested Region. The overstory varies from ponderosa pine to mixtures of ponderosa pine and western larch (see figure 15). The remaining 25 percent of the Forested Region is dense lodgepole pine and Douglas fir areas which have little value as cattle range, but do provide considerable browse for big game (App., 45) (see figure 13).

The grassland ranges occur as scattered openings in timber areas (see figure 10). The size of the openings varies from a few acres to more than 100 (see figure 16). More than 25 grass species are found on this range; the major species are Sandberg bluegrass (Poa secunda), bluebunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis), prairie junegrass (Koeleria cristata), and one spike danthonia (Danthonia unispicata).

Forbs are more dominant than grass species in the
Figure 15. Open forest range. Cattle grazing in the ponderosa pine type area.  
Photo (p)  Source: U.S. Forest Service
Figure 16. Grassland within the Forested Region. The area is located west of Starkey.
Photo (q)  Source: U.S. Forest Service
grassland range; most plentiful are rush pussytoes
(*Antennaria luzuloides*), western yarrow (*Achillea lanulosa*), Wyeth eriogonum (*Eriogonum heracleoides*), and low
gunweed (*Grindelia nana*) (App., 44).

In the open forest range, the bunchgrasses, such as
bluebunch wheatgrass, Idaho fescue, and prairie junegrass
are common. Under denser forest, pinegrass (*Calamagros-
tis rubescens*) and elk sedge (*Carex geversii*) are the
dominant grass and grass-like plants. Lupines (*Lupinus
spp.*), heartleaf arnica (*Arnica cordifolia*), wild straw-
berries (*Fragaria spp.*), prairie-smoke sieversia
(*Sieversia ciliata*), hawkweeds (*Hieracium spp.*), and
western yarrow represent the common forbs. Elk sedge
provides more forage than any other species; whereas
pinegrass is the highest herbage producer, but is not as
palatable for cattle as elk sedge (App., 44).

Weather and condition of forage species regulate the
utilization of the open forest range. The carrying
capacities of government-owned forage areas are shown
on figure 21. Efforts to improve private range land are
being implemented through better management practices,
such as rotation, deferred grazing, brush control, and
improved fencing with water development (App., 42).
NON-FORESTED REGION

The Non-Forested Region covers about one-third of the total county area (see figure 10). Treeless ridge tops scattered throughout the Forested Region account for about 10 percent of this region. The remaining 90 percent lies in the central north-south band through the county which accounts for about 95 percent of the agricultural production (App., 12).

The Non-Forested Region has two types of ranges. The sagebrush-grass range, located in the Telocaset portion of the Range Area Land Use Division, is the largest area. The bunchgrass type range, the most productive, is found between the central agricultural crop area and the periphery of the Non-Forested Region (App., 14).

The sagebrush-grass range type is dominated by sagebrush (*Artemisia* spp.), cheat grass (*Bromus tectorum*), cluster tarweed (*Makia glomerata*), and forage bunchgrass species (App., 44).

Common bunchgrasses, such as bluebunch wheatgrass, Idaho fescue, and prairie junegrass are the major sources of forage (App., 44). In the last ten years, through improved land management practices, bunchgrasses have been able to compete with the forb species (App., 14).

The range condition through the sagebrush-grass
Figure 17. Watering pond for cattle in the Telocaset portion of the Range Land Use Division. The pond is fed by a spring on the L. S. Huffman ranch.

Photo (f) Source: Soil Conservation Service
Figure 18. Hog Valley Range condition. Figure-four and rock-jack fences indicate shallow soil. The range to the left is good, to the right, fair.
Photo (g)
Source: Soil Conservation Service
range type varies from poor to fair, with a carrying capacity of one animal unit to from 15 to 75 acres; whereas the bunch grass type range, dominated by common bunchgrasses, varies from fair to good with a carrying capacity of one animal unit to from five to 15 acres (App., 14).
CHAPTER V
AGRICULTURAL RESOURCES BASE

Agriculture is the most important contributor to the economy of Union County. The stability and prosperity of the farming economy is closely related to the varied agricultural base. Farms furnish field products ranging from seed, grain, fruit, hay and forage to animal products of meat, eggs, milk, and fur.

The natural conditions that resulted in the agricultural settlement of Union County still influence the presence agricultural pattern. Favorable climate, ample areas of level, productive land, adequate grazing resources, and a water supply have made the agricultural industry a stable adjustment to county's resource base. Crop failures due to the physical elements are a rarity (App., 26).

The agricultural base in Union County includes most of its area, grazing land as well as cropland (see figure 1). Most of the productive land in the county is in private ownership (see figures 21 and 14). Private ownership accounts for 99 percent Class II, 100 percent Class III, 100 percent Class IV, 51 percent Class VI, and less than 32 percent Class VII. Class I and VIII are not found in Union County (see figure 9) (see table
Union County contains a total of 590,301 acres in farm land, of which less than one-third is cropland. In order to correlate the figures in table 12 with the agricultural pattern of Union County, an overlay map, figure 21, has been developed.

During the period from 1924 to 1954, the land in farms increased by 40 percent. Cropland reflected an eight percent increase, pasture land and forest land accounted for the remainder. Wooded pasture increased from 86,591 acres to 169,836 acres, a net increase of 83,245 acres. The increase in wooded pasture land represents the most significant trend in farm land usage. In 1924, the wooded pasture accounted for 20.5 percent of the total land in farms; whereas in 1954 it was 34.9 percent (see table 12). This significant change indicates the gradual encroachment of farm land into the periphery of the Forested Region. The trend toward larger woodland pasture reflects the increased utilization of farm woodlots (App., 41).

Diversity is a means for avoiding the hazards of economic conditions. The tendency is to adjust crop patterns to allow rotation, even distribution of labor throughout the year, and to reduce the risk probability factor. Diversity of farming in Union County is evident
**TABLE 11**

Area in Land Capability Classes* by Land Use, 1951

<table>
<thead>
<tr>
<th>Land Use</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cropland</strong></td>
<td>54,100</td>
<td>52,840</td>
<td>15,410</td>
<td>96,540</td>
<td>122,350</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grassland</strong></td>
<td>1,400</td>
<td>6,850</td>
<td>31,650</td>
<td>18,720</td>
<td>155,160</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Woodland</strong></td>
<td>228,740</td>
<td>134,700</td>
<td>163,440</td>
<td>17,410</td>
<td>163,440</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unclassified</strong></td>
<td>55,500</td>
<td>59,690</td>
<td>47,060</td>
<td>325,280</td>
<td>658,360</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Public Ownership**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cropland</strong></td>
<td>66,500</td>
<td>61,000</td>
<td>124,500</td>
<td>61,000</td>
<td>640</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grassland</strong></td>
<td>248,260</td>
<td>265,720</td>
<td>513,980</td>
<td>3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Woodland</strong></td>
<td>311,760</td>
<td>326,720</td>
<td>642,120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unclassified</strong></td>
<td>56,140</td>
<td>59,690</td>
<td>47,060</td>
<td>637,040</td>
<td>1,300,480</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Area Total**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cropland</strong></td>
<td>54,100</td>
<td>52,840</td>
<td>15,410</td>
<td>96,540</td>
<td>122,350</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grassland</strong></td>
<td>1,400</td>
<td>6,850</td>
<td>31,650</td>
<td>18,720</td>
<td>155,160</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Woodland</strong></td>
<td>228,740</td>
<td>134,700</td>
<td>163,440</td>
<td>17,410</td>
<td>163,440</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unclassified</strong></td>
<td>55,500</td>
<td>59,690</td>
<td>47,060</td>
<td>325,280</td>
<td>658,360</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td>640</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Suitable for Cultivation:

1. Requires good soil management practices only.
2. Moderate conservation practices necessary.
3. Intensive conservation practices necessary.

No Cultivation: Pasture, Hay, Woodland, and Wildlife:

1. No restrictions in use.
2. Moderate restrictions in use.
3. Severe restrictions in use.
4. Best suited for wildlife and recreation.

Source: Soil Conservation Service
Figure 19. Strip farming in the Elgin Cricket Flat Land Use Division. The abandoned farm building reflects the trend in increased size and decrease in number of farms.

Photo (1)

Source: Soil Conservation Service
Figure 20. Water erosion in the fall grain area of the Pumpkin Ridge-Pleasant Grove Land Use Division.

Photo (m)

Source: Soil Conservation Service
<table>
<thead>
<tr>
<th>TABLE 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union County Land Use</td>
</tr>
<tr>
<td>(in acres)</td>
</tr>
<tr>
<td>1924</td>
</tr>
<tr>
<td><strong>Land Area (total)</strong></td>
</tr>
<tr>
<td>Land in farms</td>
</tr>
<tr>
<td>Cropland</td>
</tr>
<tr>
<td>Harvested</td>
</tr>
<tr>
<td>Pastured</td>
</tr>
<tr>
<td><strong>Summer fallow</strong></td>
</tr>
<tr>
<td><strong>Other (idle and failure)</strong></td>
</tr>
<tr>
<td>Pasture land 1/</td>
</tr>
<tr>
<td>Wooded</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Improved</td>
</tr>
<tr>
<td>Other farm land 2/</td>
</tr>
<tr>
<td>Land not in farms</td>
</tr>
</tbody>
</table>

nr. - not reporting
1/ Not including cropland pastured.
2/ Includes woodland not pastured.

Source: Census of Agriculture.
Figure 22. Grande Ronde Valley taken from Mt. Emily. Note the orchard in the foreground adjacent to the forested area.

Photo (c)

Source: Oregon State Highway Commission Photo.
in the marketing of over 50 farm products (App., 9).

NUMBER AND SIZE OF FARMS

Since 1910, the number of farms in the county has steadily decreased, with the exception of the depression years (see table 14). In 1954, there were 986 farms in Union County, a decrease of 106 farms since 1950 (App., 8). In 1954, the cash grain farm was the most numerous (see table 13). Since 1950, cash grain farms have increased by 52 percent. During this same period, dairy and livestock farms have decreased in number.

TABLE 13

Types of Farms in Union County

<table>
<thead>
<tr>
<th></th>
<th>1950</th>
<th>1954</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash grain farms</td>
<td>182</td>
<td>277</td>
</tr>
<tr>
<td>Other field crop farms</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Vegetable farms</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Fruit and nut farms</td>
<td>27</td>
<td>5</td>
</tr>
<tr>
<td>Dairy farms</td>
<td>116</td>
<td>88</td>
</tr>
<tr>
<td>Poultry farms</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Other livestock farms</td>
<td>230</td>
<td>193</td>
</tr>
<tr>
<td>General farms</td>
<td>184</td>
<td>134</td>
</tr>
<tr>
<td>Primarily crop</td>
<td>81</td>
<td>54</td>
</tr>
<tr>
<td>Primarily livestock</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Crop and livestock</td>
<td>82</td>
<td>75</td>
</tr>
<tr>
<td>Unclassified</td>
<td>327</td>
<td>273</td>
</tr>
<tr>
<td>Total</td>
<td>1,092</td>
<td>996</td>
</tr>
</tbody>
</table>

* Estimated number of Farms

Source: U.S. Census of Agriculture
A measure of the soundness of a farming community is the percentage of tenancy that exists. A trend of increased ownership indicates a healthy farm economy. Sixty-five percent of the farms in Union County are fully-owned by their operators. Twenty-five percent are farmed by part-owner, and the remaining 10 percent by tenants. Tenancy has decreased in the last 15 years by half, while part-owners have increased from 212 in 1940 to 246 in 1954 (App., 8).

Another measure of farming stability is the trend in average farm value. The value of farms in 1950 was $28,422 and in 1954 increased to $37,238. The value of the land per acre during this period increased by eight dollars.

**Farm Classes.** The trend of increase in the average farm size, in a region of limited agricultural land, reflects economic forces that tend to eliminate the less successful operators.

During the period from 1950 to 1954 the commercial farm total decreased by 2.4 percent. The significance of this decrease is not realized until table 15 is examined. It is noted that Class I and II have increased by over 100 percent; all other classes have decreased in number.
<table>
<thead>
<tr>
<th>Census of</th>
<th>All land in farms</th>
<th>Number of Farms</th>
<th>Average Size of Farms</th>
<th>Improved land in Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td></td>
<td>Acres</td>
<td>Acres</td>
</tr>
<tr>
<td>1910</td>
<td>395,769</td>
<td>1,309</td>
<td>302.2</td>
<td>163,499</td>
</tr>
<tr>
<td></td>
<td>29.6</td>
<td></td>
<td></td>
<td>41.8</td>
</tr>
<tr>
<td>1920</td>
<td>441,735</td>
<td>1,279</td>
<td>345.4</td>
<td>178,021</td>
</tr>
<tr>
<td></td>
<td>34.0</td>
<td></td>
<td></td>
<td>40.3</td>
</tr>
<tr>
<td>1925</td>
<td>420,029</td>
<td>1,218</td>
<td>344.9</td>
<td>155,736</td>
</tr>
<tr>
<td></td>
<td>32.3</td>
<td></td>
<td></td>
<td>37.1</td>
</tr>
<tr>
<td>1930</td>
<td>457,981</td>
<td>1,276</td>
<td>358.9</td>
<td>175,193</td>
</tr>
<tr>
<td></td>
<td>35.2</td>
<td></td>
<td></td>
<td>38.3</td>
</tr>
<tr>
<td>1935</td>
<td>463,536</td>
<td>1,339</td>
<td>346.2</td>
<td>167,456</td>
</tr>
<tr>
<td></td>
<td>35.6</td>
<td></td>
<td></td>
<td>36.1</td>
</tr>
<tr>
<td>1940</td>
<td>471,173</td>
<td>1,255</td>
<td>375.4</td>
<td>172,812</td>
</tr>
<tr>
<td></td>
<td>36.2</td>
<td></td>
<td></td>
<td>36.7</td>
</tr>
<tr>
<td>1945</td>
<td>495,694</td>
<td>1,192</td>
<td>415.9</td>
<td>175,297</td>
</tr>
<tr>
<td></td>
<td>38.2</td>
<td></td>
<td></td>
<td>35.4</td>
</tr>
<tr>
<td>1950</td>
<td>516,598</td>
<td>1,092</td>
<td>473.1</td>
<td>168,826</td>
</tr>
<tr>
<td></td>
<td>39.7</td>
<td></td>
<td></td>
<td>33.1</td>
</tr>
<tr>
<td>1954</td>
<td>595,301</td>
<td>986</td>
<td>583.4</td>
<td>179,297</td>
</tr>
<tr>
<td></td>
<td>44.2</td>
<td></td>
<td></td>
<td>31.2</td>
</tr>
</tbody>
</table>

Note - Part of Union County annexed by Baker in 1902. Total area of county for census year 1910 given as 1,335,680 acres, and given in the 1940 Census of Agriculture as 1,300,480 acres.

Source: U.S. Census of Agriculture, retabulated by Oregon State College Extension Service.
The amount of labor-saving machinery indicates the degree of modern mechanized farming methods. Union County farms in 1940 had 353 trucks, 324 tractors, and 964 automobiles. The census for that year also reported 43 farms had spent $2,502 on commercial fertilizers. In comparison, in 1954 there were 787 trucks, 765 tractors, 866 automobiles. The 1954 Agricultural Census reported 288 farms had spent about $174,000 on fertilizer. These data show the trend toward greater mechanization and indicate that fertilization practices are profitable and necessary. The decrease in the number of automobiles reflects the decrease in the total farming families.

TABLE 15
Union County Farms, by Economic Class

<table>
<thead>
<tr>
<th>Economic Class</th>
<th>1940</th>
<th>1950</th>
<th>1954</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Farms, total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class I (≥$25,000 or more sold)</td>
<td>2/</td>
<td>770</td>
<td>751</td>
</tr>
<tr>
<td>Class II ($10,000 to $24,999)</td>
<td>30</td>
<td>24</td>
<td>67</td>
</tr>
<tr>
<td>Class III ($5,000 to $9,999)</td>
<td>222</td>
<td>183</td>
<td>153</td>
</tr>
<tr>
<td>Class IV ($2,500 to $4,999)</td>
<td>830</td>
<td>185</td>
<td>132</td>
</tr>
<tr>
<td>Class V ($1,200 to $2,499)</td>
<td></td>
<td>58</td>
<td>47</td>
</tr>
<tr>
<td>Class VI ($250 to $1,199)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other farms</td>
<td>173</td>
<td>322</td>
<td>245</td>
</tr>
<tr>
<td>Part-time 1/</td>
<td>148</td>
<td>103</td>
<td></td>
</tr>
</tbody>
</table>

1/ Part-time farms include those with value of products sold of $250 to $1,199 and operator either reporting 100 days or more off-farm work or reporting other income exceeding value of agricultural produce sold.

2/ Farms reporting by value of farm produce sold, traded, or used by farm or household. Excludes farms with no produce sold, traded or used, and unclassified farms.

Source: Extension Service, Agricultural Economics, (statistics) Oregon State College, Corvallis, Oregon
CROP PATTERN

By the process of trial and error the present crop pattern of Union County has evolved. The farmers found that soil characteristics and climatic conditions materially affected the crops planted. Crops did better in certain areas than in others. The crop that was better adapted to the prevailing climatic regimen of a given area could better utilize the soil nutrients and would yield more. It was through the process of natural selection that crops became concentrated where the farmers could realize the greatest profit.

In 1916, Mr. P. H. Spillman, County Agent of Union County, wrote a short descriptive annual report illustrated with a series of sketch maps, which could be used to indicate the present farming pattern (12, annual report 1916, p. 1-2). A comparison of the Union County Farm Pattern and Public Land Carrying Capacity (figure 24) in 1956 shows that few changes have occurred in the 50 year period.

Spillman divided Union County into six agricultural utilization sections: (1) Government controlled forest reserves provided summer forage for cattle. (2) Bottom lands, closely related to the irrigated and subirrigated farms produced hay, grain, and livestock. (3) Orchards were cultivated where frost danger was minimized and
Figure 23. Wind erosion in the area north of Hot Lake in the spring of 1956. (Northeast corner of the Ladd Canyon Division.)
Photo (k)
Source: Soil Conservation Service
UNION COUNTY FARMING PATTERN
FEB. - DEC. 1916

LEGEND

- FOREST RESERVE
- HAY, GRAIN & LIVESTOCK
- FRUIT
- GRAIN
- IRRIGATED FARMING
- BOTTOM LAND & SUBIRRIGATED
- DAIRY (5 shown)

REFERENCE:
Extension Service, Union County Agent

Figure 24
irrigation water was available. (4) Grain crops were concentrated on the Sand Ridge. (5) The irrigated farming region was characterized by small farms. Small family dairies were scattered throughout the irrigated and subirrigated area. (6) The foothills were privately owned lands between forest reserve and the farming section. These foothills were used as summer range and fall and spring pasture (12, annual report 1916, 1-11).

In 1916, weed control was a major problem, and is still a major problem. The changes in the farming pattern most evident today are: (a) The fruit tree pattern west of Elgin no longer exists. (b) Cherry orchards are now dominant where apples had ascendancy. (c) A grass seed industry has become established; whereas in 1916 experiments on row planting of grass seed were carried on. (d) Grade A dairies have developed in the 1916 areas of family dairies. (e) Public land is apportioned into areas of rated carrying capacity (see figure 2).

As the agricultural pattern of the county has evolved, eight crops have become especially important—wheat, barley, grass, grass seed, alfalfa, peas, oats, and hay. On the basis of these crops and the associations, the crop pattern map was developed.
THE MAJOR ENTERPRISES

In acreage and value, field crops are currently the leading agricultural enterprises. In 1956, receipts from farm marketing of field crops amounted to more than 5.5 million dollars. Wheat sales alone accounted for almost half of the field crop receipts and occupied 32 percent of the acreage.

Wheat is grown under two farming methods: winter or spring wheat alternating with fallow or spring wheat alternating with dry field peas. On the valley soils from 30 to 40 percent of the wheat is sown in the fall and the rest in the spring. On the better-drained soils these proportions are reversed. The major part of the fall seeding is done between mid-September and October 1 and the spring seeding from March 1 to May 1.

Fall wheat, amounting to three-fourths of the total acreage, when not damaged by winter killing, yields better than spring wheat, as it ripens before the summer drought.

Government acreage restrictions on certain crops tend to concentrate the raising of these crops on the lands that produce the best yield. In the period before government wheat controls were in force, Union County produced about 12.2 bushels of wheat per acre. In 1956, 37,589 acres produced over 1.5 million bushels, more than
40 bushels per acre, an increase of 327 percent (App., 12). In general wheat presently is grown on the best wheat farming land available in Union County. This land is subjected to intensive farm management practices, measurement of which is the noted increase in the sale of fertilizers (App., 6).

In 1956, barley, occupying 19,500 acres produced .7 million bushels; oats on 7,000 acres produced .3 million bushels; and rye on 500 acres produced 12,500 bushels. Most of the rye, oats, and barley were used for feed and seed.

Hay, an important winter feed crop in the county, was grown on 34,000 acres and yielded 92,300 tons in 1956. Alfalfa is the most important hay crop in the county, occupying about 68 percent of the hay acreage. In 1956, 70,500 tons of alfalfa were cut from 23,500 acres. Alfalfa is fed to dairy and beef cattle, sheep, and swine, grown for seed, and used for fall pasture.

Other small grains occupied 10,700 acres and produced 21,800 tons of hay. In addition, 20,000 tons of hay were cut from 16,000 acres of plowland pasture.

In 1956, 19,617 acres were devoted to the raising of high-quality, weed-free seed crops; 5,500 acres were planted to peas and the remainder to grass seed. Grasses are concentrated in the Imbler area; however, there is
no set pattern for peas. The nitrogen-fixing characteristic of the pea makes it a popular soil management crop (App., 12).

The 1956 peas yield was approximately 8.5 million pounds; grass seeds yielded about 2.25 million pounds. Fescues accounted for about 1.6 million pounds of the grass seeds (App., 53).

In the vicinities of Imbler, La Grande, and Cove fruit is of some importance. In 1956, the fruit crops contributed $128,695, or about 1.2 percent of the county total gross value of agricultural production. Cherries occupy the largest acreage (480) with commercial apples (300) following. Together these fruits make up about 85 percent of the acreage. The principal cherry varieties are: Lambert, Royal Anne, Bing, and Black Republicans. Roman Beauty, Delicious, Jonathan, and Winter Banana are the chief apple varieties (App., 20).

Farm wood cropping has become an important addition to the annual income of farmers owning forest land. In 1954, 95 farms reported the sale of over 22 million board feet of timber for $224,038. Unfortunately the scarcity of sawtimber has caused many farmers to cut more than the annual growth replaces (App., 2). The tendency of farmers with wooded lands has been to cut immature trees to supplement their farming income.
Figure 25. Mt. Emily. This view shows the farming pattern of Grande Ronde Land Use Division. Alfalfa is seen in the background and harvested wheat in the foreground.

Photo (h)

Source: Author
Figure 26. Orchard area of the Cove Land Use Division. Mt. Harris is to the right. Note dark patterns of trees which mark the path of Catherine Creek as it meanders on the valley floor.
Photo (i)
Source: Author
Competition among the sawmills for the timber land along with the educational efforts of public agencies have focused the farmers' attention on the potential of well-managed farm forests (App., 3).

According to the Agricultural Census of 1954, 223 farms were engaged in the raising of livestock and poultry. Some farms were devoted entirely to livestock or poultry farming; whereas others kept animals or fowl in combination with other enterprises (see table 13).

In 1956 there were 36,000 head of beef in the county. The beef enterprises accounted for over 40 percent of the $2,761,574 derived from the sale of livestock.

Dairying is practiced in the vicinity of Elgin, La Grande, Union, and Cove where close proximity to local markets, the availability of feed stuffs, and quality of pasturage combine to place dairying second to beef production in total value. In 1956, dairy products had a market value of $895,500. The present emphasis in the enterprise is on increased production of fluid milk for shipment to markets outside the county (App., 22).

The number of milk cows decreased from 8,200 in 1943 to 3,600 in 1952. Between 1952 and 1956 the number increased to 4,000. The increase in the dairy herds is characterized by a greater number of Brucellosis-free,
registered dairy cows (App., 12).

The 12,500 sheep found in Union County are mainly distributed as farm flocks. Sheep are raised primarily for meat, but add about 50 percent of their value to the income of the farmer through sale of wool. The total value of sheep in 1956 was $143,162.

Scattered throughout the county are small numbers of swine. In 1956 they totaled but 8,000 and contributed $269,808 to the farm income. The trend in the county is shifting toward the greater production of swine.

Poultry products sold in 1956 returned $256,358 to farmers. The poultry raised supplies the local needs and a surplus for shipment out of the county (App., 5).

Mink farming is a recent addition to the farming pattern of the county. There are five mink farms located in the Grande Ronde Valley. In 1956 there were 1,500 breeder females. Climate is conducive to mink raising in Union County, but high transportation costs for cereal and meat ration is the major limiting factor in the economy of this enterprise (App., 23).

AGRICULTURAL-BASED INDUSTRIES

Food processing plants in Union County are closely related to the farming economy. There are only ten plants (see figure 27). They add value to the local farm
DISTRIBUTION OF MANUFACTURING & PROCESSING PLANTS IN RELATION TO THE POPULATION DISTRIBUTION

Legend:
Union County Population in Census of 1900 was 18,988. Oregon State Board of Census, on the basis of growth trend, estimated population of 1906 to be 18,935.
Urban population 18,935 1906 est.
Rural - 5,056
500 Population
20 Population

Manufacturing and Processing Plants

- Concrete Products Plant - one plant
- Mill Processing Plant - one plant
- Four Mill - three mills
- Seed Processing Plant - one plant
- Lumber Mill - two mills
- Creamery and Milk Products - two plants

REFERENCES:
Reproduced from:
Union County Clerk, County Assessors, County Judges,
County Audit Supervisor.
Oregon State Board of Census

Manufacturing & Processing Plants:
Union County Industrial Development Corporation
Oregon State Development Commission, Civil Defense Agency,
Manufacturing Competition Commission.
LANDFORM
UNION COUNTY
OREGON

Scale in Miles
5 0 5 10 15

REFERENCE-
USFS 1/4" Ranger District Base Maps

Figure 27
DISTRIBUTION OF MANUFACTURING & PROCESSING PLANTS IN RELATION TO THE POPULATION DISTRIBUTION

Legend:
- Union County Population in Census of 1950 was 17,820. Oregon State Board of Edum estimated the population of 1966 to be 19,350.
- Urban population 18,360. 1950 est.
- 5,190
- 1,000
- 500
- 100
- 25
- Manufacturing and Processing Plants:
  - Concrete Products Plant - one plant.
  - Coal Processing Plant - one plant.
  - Plywood Mill - 896.
  - Coal Processing Plant - one plant.
  - Lumber Mill - five mills.
  - Sawmills and Wood Products: - two plants.

Scale in Miles

REFERENCE:
- USFS 1/4° Ranger District Base Maps

Figure 27
products and create employment for 62 persons. The pay-
roll was $238,979 in 1956 (App., 68).

The food processing industries are grouped into
four categories: meat (3), flour (3), seed (2), and
creameries (2). The hub of the industry is the La
Grande-Island City area where three meat packing plants,
two creameries, two flour mills, and one seed processing
plant are located. There are, in addition, one seed
processing plant in Imbler and a flour mill in Union
(see figure 27). Production satisfies local demands and
the surplus is exported to eastern and western markets
(App., 54).

The seed processing plants are instrumental in
producing and retaining a high standard in Union County's
seed production.
CHAPTER VI
MINERALS

Union County has never been systematically explored for its mineral potentials. The available information concerning mineral resources is limited to early studies and accounts of known mines. A realistic estimate of the potentials in Union County therefore cannot be made until a systematic exploration has been conducted (App., 58).

METALLICS

Gold and silver were discovered in southern Union County in 1879. The six peak metal production years were from 1889 through 1894. During these years 95 percent of the total gold and 42 percent of the total silver reported was mined (see table 16). The last mining activity was reported in 1954. The Little Nugget of Rainbow Group, located at the headwaters of the Grande Ronde River, recovered a small quantity of gold during the development of hydraulic operations (App., 57). Several other mines are located in the southern section of Union County (see figure 2).

Platinum and iridium have been detected in trace amounts in the Eagle Cap Forest Area Land Use Division.
### TABLE 16
Production of Gold, Silver, Copper, and Lead, 1879-1956

<table>
<thead>
<tr>
<th></th>
<th>Fine Ounces</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gold</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lode</td>
<td>13,369</td>
<td></td>
</tr>
<tr>
<td>Placer</td>
<td>13,729</td>
<td></td>
</tr>
<tr>
<td><strong>Silver</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lode</td>
<td>4,934</td>
<td></td>
</tr>
<tr>
<td>Placer</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td><strong>Copper</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>726</td>
</tr>
<tr>
<td><strong>Lead</strong></td>
<td></td>
<td>1,357</td>
</tr>
</tbody>
</table>

*byproduct

Source: Bureau of Mines, Region 1, Albany, Oregon

The ores are too lean to mine economically. Copper ore deposits have been claimed north of Elgin, but these claims have not been proved. The high cost of labor and materials and the fixed price of the metals has made it uneconomical to operate the few mines located in the county (App., 57).

**NON-METALLICS**

The mining of industrial minerals in Union County is limited to sand, gravel, stone, and clay. A volcanic cinder deposit, located in the North Powder Land Use Division, is reportedly too weathered for construction usage. Diatomite deposits in the southern portion of the Range Area Land Use Division are small and undeveloped.
Clay, sand, and gravel deposits in the La Grande Area Land Use Division represent the only mineral resources currently utilized in Union County. In the last two years road construction has provided the largest market (App., 75). In 1956 total mineral production amounted to $320,991, substantially the same as in 1955 (App., 57).

A thermal spring is located midway between Union and La Grande on State Highway No. 203. Locally, this spring is known as "Hot Lake". The Hot Lake Sanitorium, once a thriving hotel, now houses retired or elderly tenants.

Near the confluence of the Grande Ronde River and Catherine Creek an exploratory oil well proved unsuccessful.
CHAPTER VII
RECREATIONAL RESOURCES BASE

The outdoor recreational resource potential of Union County is closely correlated with its physical base. Climate, water, natural vegetation, wildlife, and topography combine to form varied recreational assets. The utilization of these assets is limited mainly by individual preferences and means.

The benefits derived by the county from recreational resources attractions are difficult to calculate since the financial benefits are widespread. The tourists visiting the county spend thousands of dollars for food, services, and equipment.

NATURAL ASSETS

The Blue and Wallowa Mountains are the most striking natural assets of Union County. They form a backdrop for all other recreational activities.

Noted for its beauty, the Eagle Cap Wilderness Area, a forested area, figure 14, is located in the Forested Land Use Division. Accessibility to this natural playground, richly endowed with fish and game, is aided by packers who serve this subdivision of Union County. The packers furnish guides, rent horses and pack mules for
hunting and fishing trips. During 1957 approximately 11,000 visitors spent some 30,000 days in the Eagle Cap Wilderness Area, but statistics are not available to show the percentage of visitors in the Union County part of this Wilderness Area (App., 42).

**Fishing.** Fishing, a popular recreation, is enjoyed by the native population as well as the tourists. Access to the Wilderness Area is retarded by snow until July but fishing is good from July through September. When the lower sites dry up, the Wilderness Area, where Eastern brook trout (*Salvelinus fontinalis*) and Mackinaw rainbow trout (*Salvelinus namaycush*) are found, comes into use.

From May until the close of the season in June, Catherine Creek is good for salmon and steelhead trout (*Salmo gairdneri*) fishing. The first of the salmon, the Chinook (*Oncorhynchus tshawytscha*), are usually caught in May, although high water conditions make angling difficult. Lower water conditions and the abundance of fish make June the most successful month for angling (see figure 32).

In certain areas of the La Grande Watershed, fishing is good from about April 28 to July 4 (see figure 32). In the valley portion, characterized by sloughs, the following warm water game fish are caught: large mouth
Figure 28. Elk herd on winter-spring range seven miles southwest of La Grande. Photographed during big game census.
Photo (t)
Source: Oregon State Game Commission
Traverse Lake within the Wilderness Area. Echo Lake is in the background. Both lakes are stocked with small eastern brook trout. Excellent deer hunting, good fishing, and camping.

Photo (u)

Source: Oregon State Game Commission
Figure 30. Catherine Creek. A family is enjoying the overnight facilities. This State Park is on Oregon State Highway No. 203, southeast of Union.

Photo: (r)
Source: Oregon State Highway Commission Photo.
Figure 31. Spout Springs snow sports area. Winter sports are in operation from November until spring.
Photo(s)
Source: Oregon State Highway Commission
LEGEND:
- Herd Census Boundary
- Bow Hunting Area
- Area of Big Game Conflict with Agriculture.

ELK/C/FORAGE—Elk compete with livestock for forage.
DEER/C/CROPS—Deer foraging in orchards & crops.

Winter Herd Concentrations
D=Deer  E=Elk

Upper Limits of Steelhead & Salmon Fishing.

Worm Water Game Fish Habitat (stocked)

Trout

FISH AND GAME DISTRIBUTION

REFERENCE:
FISH AND GAME AGENTS, REGION 4,
GAME COMMISSION, LA GRANDE.
LANDFORM
UNION COUNTY
OREGON

Scale in Miles

5 0 5 10 15

REFERENCE-
USFS 1/4° Ranger District Base Maps

Figure 32
Figure 32
black bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), brown bull-head catfish (*Ictalurus nebulosus*), yellow bull-head catfish (*Ictalurus natalis*), and small mouth bass (*Micropterus dolomieu*). The North Powder River is lightly fished on the Union County tributary side, since irrigation needs of farmers deplete the fish-carrying capacity of the streams.

Thief Valley Reservoir, on the North Powder River, is stocked with large mouth bass and bull-head catfish (App., 83).

**Wildlife.** Wildlife is a major attraction to an outdoor recreational area. Union County has an abundance of Rocky Mountain elk (*Cervus canadensis*) and mule deer (*Odocoileus hemionus*). The distribution and census of this big game are shown on figure 32. With the exception of the Grande Ronde Valley, all of Union County is good elk and deer range.

The natural habitat of the principal game birds is in the agricultural areas, but intensive agricultural practices tend to destroy these habitats. This has made high level stocking in Union County economically unsound and has resulted in decreased stocking.

Geese are insignificant as game birds in the county, whereas duck and pheasant hunting are popular. Mallards (*Anas platyrhynchos*), pintails (*Anas acuta*), green winged
teal (*Anas carolinensis*), and ring necked pheasant (*Phasianus colchicus*) are bagged throughout the Grande Ronde Valley.

Blue grouse (*Dendragapus obscurus*) and ruffed grouse (*Bonasa umbellus*) are found in the Forested Area. Mountain quail (*Oreortyx picta*) are scarce and do not attract hunting effort (App., 82).

DEVELOPED ASSETS

The value of recreational resources is enhanced by the development of tourist facilities. Roads, trails, parks, picnic areas, hunting areas, and other facilities serve to make Union County recreation more convenient. The recreational facilities are found distributed throughout the county.

Federal, state, and county governments as well as private enterprises, have played a part in making the utilization of recreational resources more accessible (App., 77). The facilities available throughout the county are indicated in figure 33.
Figure 33
Figure 33
CHAPTER VIII

POPULATION

SETTLEMENT

The upland basin of Union County was aptly described
by Robert Stuart, the first white man to see it, 150
years ago. He noted in his diary that he and his men
entered the "Big Flat", now known as the Grande Ronde
Valley, on August 3, 1812 (25, p. 78).

Thirty-one years later John C. Fremont commented on
the characteristics of the Grande Ronde Valley, by say-
ing, "A place -- one of the few we have seen in our
journey so far -- where a farmer would delight himself
to establish, if he were content to live in the seclu-
sion it imposes." (5, p. 1).

Historians have set 1861 as the year that the Grande
Ronde Valley was opened by permanent settlers. By 1863
the settlers had organized a county. The name given the
county reflected the patriotic fervor of the settlers
during the Civil War.

Settlement was slow until 1884 when the construction
of the railroad speeded up the influx of population (5,
p. 1-4).

The county's boundaries were periodically subjected
to adjustments. Between 1887 and 1915, parts of Union
County were annexed to Wallowa, Umatilla, and Baker Counties. The last changes were made in 1913 and 1915. Parts were exchanged with Umatilla and Wallowa Counties. In 1915, the present outline of Union County was established (App., 63).

**POPULATION PATTERN**

In the period between the 1940 and 1950 census, Union County population increased by only 3.2 percent compared with an increase of 39.6 percent for the state. The total in 1950 was 17,962 (38, p. 242). From 1910 to 1950 Oregon increased in population by 126 percent; whereas Union County during the same period increased by only 11 percent. These data suggest population stability in Union County.

The distribution pattern of the population within the county is shown in figure 27. It will be noted by examination of table 17 that in 1950 over 68 percent of the total population lived in the urban areas.

There are eight major urban areas in Union County (see figure 27). The largest urban concentration is found in La Grande, the county seat. An additional 600 persons, not enumerated in the census data, compose the student body of the Eastern Oregon College (App., 61).
Figure 34. La Grande, the county seat, holding over half of the total county population, is the industrial center of Union County. Photo (a) Source: California-Pacific Utilities Company

Figure 35. Eastern Oregon College in La Grande. A full four year course of study leading to the Bachelor of Science in Education is offered here. Photo (b) Source: Evening Observer, La Grande
TABLE 17

Concentration of Urban Population in Union County

<table>
<thead>
<tr>
<th>Cities</th>
<th>1950</th>
<th>1956</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Grande</td>
<td>8,635</td>
<td>9,100</td>
</tr>
<tr>
<td>Elgin</td>
<td>1,223</td>
<td>1,397*</td>
</tr>
<tr>
<td>Union</td>
<td>1,307</td>
<td>1,367*</td>
</tr>
<tr>
<td>North Powder</td>
<td>403</td>
<td>412</td>
</tr>
<tr>
<td>Cove</td>
<td>282</td>
<td>300</td>
</tr>
<tr>
<td>Imbler</td>
<td>149</td>
<td>149</td>
</tr>
<tr>
<td>Island City</td>
<td>138</td>
<td>147</td>
</tr>
<tr>
<td>Summerville</td>
<td>73</td>
<td>83</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12,210</td>
<td>12,955</td>
</tr>
</tbody>
</table>

*Figures established by actual enumeration

Source: Oregon State Census Board

**Rural Level of Living.** A measure of the standard of living in an agricultural county is suggested by the rural level of living index.

Since 1940 the rural population of Union County has maintained a level of living index close to the average index of Oregon (see table 18). Union County's slow population growth after 1920, with respect to Oregon, would suggest that a balance between the resource base and the population had occurred earlier in Union County than in the state as a whole. The rural level of living index, when compared with the Oregon average, suggests the ability of the population to more fully utilize its resource base.
TABLE 18
Rural Level of Living
(U.S. County Average, 1945 = 100)

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>1945</th>
<th>1950</th>
<th>1954</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>112</td>
<td>137</td>
<td>150</td>
<td>169</td>
</tr>
<tr>
<td>Union County</td>
<td>111</td>
<td>122*</td>
<td>130*</td>
<td>159*</td>
</tr>
</tbody>
</table>

*Combination of Union and Wallowa Counties

Source: App., 8

**Employment Pattern.** The distribution of the working population of Union County strongly reflects its resources base. In 1956, according to the Oregon State Tax Commission, there were 5,486 wage earners in Union County (App., 65). An indication of the employment pattern of Union County is given in tables 19 and 20, compiled from State of Oregon Unemployment Compensation Commission data and tables. In addition an estimated 1,300 work on the farms of the county.
### TABLE 19

Union County Employment and Payrolls in Covered Industries, 1956

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employed</th>
<th>Yearly Payroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural services, forestry, fishing and mining</td>
<td>9</td>
<td>42,533</td>
</tr>
<tr>
<td>Contract construction</td>
<td>109</td>
<td>474,525</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,346</td>
<td>5,132,678</td>
</tr>
<tr>
<td>Transportation, communications and other public utilities</td>
<td>139</td>
<td>529,788</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>785</td>
<td>2,451,732</td>
</tr>
<tr>
<td>Finance, insurance and real estate</td>
<td>67</td>
<td>254,806</td>
</tr>
<tr>
<td>Service industries</td>
<td>199</td>
<td>502,335</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,654</strong></td>
<td><strong>9,388,397</strong></td>
</tr>
</tbody>
</table>

Source: Oregon State Employment Office

### TABLE 20

Estimated Average Monthly Employment of Government and Railroad Employees

<table>
<thead>
<tr>
<th>Agency</th>
<th>Average Monthly Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government</td>
<td>50</td>
</tr>
<tr>
<td>State government</td>
<td>360</td>
</tr>
<tr>
<td>County government</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>322</td>
</tr>
<tr>
<td>Non-education</td>
<td>156</td>
</tr>
<tr>
<td>Railroads</td>
<td>650</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,538</strong></td>
</tr>
</tbody>
</table>

Source: Oregon State Employment Office
CHAPTER IX
TRANSPORTATION AND ENERGY FACILITIES

Union County reflects its relative isolation from the Pacific Northwest markets in much the same way that the Pacific Northwest reflects isolation from the markets of the United States.

ROADS

A good grid of county and state roads serves the internal needs of the county; whereas the bulk of the county imports and exports move by railroad (App., 76).

The Oregon Trail Highway, U.S. Highway 30, forms a main artery of travel across the county. State Highway 82, nearly equal in quality to U.S. Highway 30, runs in a northerly direction into Wallowa County. A number of good county and state roads form branches from U.S. Highway 30 providing access to the more important outlying points. The highway pattern is shown on figure 36.

In 1952, the Ladd Cutoff routed U.S. Highway 30 directly south of La Grande by-passing Union, Telocaset, and North Powder. Realignment studies in Union County have not been made on the economic effect on Union or North Powder (App., 75).

Service roads in the Forested Region of Union County are inadequate at present for a balanced cutting program
HIGHWAY NETWORK OF UNION COUNTY

Figure 36
Figure 37. North Powder Land Use Division, viewed from Ladd Canyon Cutoff.
Photo (e)
Source: Oregon State Highway Commission
and fire protection (App., 39). High cost of construction and maintenance have been major deterrents in the way of building these service roads.

RAILROADS

An economy based primarily on agricultural products and raw materials derived from forest resources, marketed outside the county, is heavily dependent upon reliable routes of communication.

The Union Pacific Railroad System provides transportation facilities to Union County, connecting the county with markets in the east and west.

The Oregon-Washington Railroad Navigation Company, the Big Creek, and Telocaset Railroad are parts of the Union Pacific Railroad Company system in Union County (App., 76).

The mainline of Union Pacific runs southeast through the county. West of Union the railroad turns south through the Telocaset saddle and enters Baker County. One branch stretches from La Grande north through Elgin and terminates at Joseph, in Wallowa County. A logging railroad connects Pondosa with the main line railroad at Telocaset (see figure 39).

The railroad supports about 650 workers. These Union County railroad men receive monthly pay totaling
RAILROAD, ELECTRIC POWER AND
NATURAL GAS GRID OF
UNION COUNTY

REFERENCE: UNION PACIFIC RAILWAY COMPANY, CALIFORNIA
PACIFIC UTILITIES COMPANY, SALT LAKE PIPE COMPANY,
PACIFIC NORTHWEST PIPELINE CORPORATION

- SAN FRANCISCO
- SACRAMENTO
- OAKLAND
- SAN JOSE
- LOS ANGELES
- SAN DIEGO
- TUCSON
- PHOENIX
- EL PASO
- HOUSTON
- NEW ORLEANS
- MEMPHIS
- CHICAGO
- CINCINNATI
- HOUSTON
- DALLAS
- AUSTIN
- SAN ANTONIO
- HOUSTON
- EL PASO
- ALBUQUERQUE
- SANTA FE
- PHOENIX
- TUCSON
- LOS ANGELES
- SAN FRANCISCO

- UNION PACIFIC RAILWAY COMPANY
- CALIFORNIA-PACIFIC UTILITIES COMPANY
- SALT LAKE PIPE COMPANY
- PACIFIC NORTHWEST PIPELINE CORPORATION

- MEDICAL SPRINGS
- PONDSIDE
- SALT LAKE PIPELINE COMPANY has a produce line which now extends to the rail lines.
Figure 38
RAILROAD, ELECTRIC POWER AND NATURAL GAS GRID OF

UNION COUNTY

REFERENCE-
USFS 1/4° Ranger District Base Maps

Figure 38
about $210,000. This monthly payroll is an important factor in the economic stability of Union County (App., 76). The contribution of the railroad payroll to the gross county income was especially noteworthy during the depression years (App., 9).

**Freight Costs.** The history of freight rates in the Pacific Northwest is complicated by many factors and circumstances. The complaints of shippers are about rates rather than service. It is contended that the grain freight rates from Union County to Portland are unjust as compared with grain rates from other points of origin in the Pacific Northwest. The competitive situation has changed somewhat in recent years with better highways and more efficient trucks. This means that commodities formerly tied to rails, such as grain, now have a choice in manner of transportation; they may move by truck or by railroad (App., 70). Individual farmers have been known to truck their own wheat to Portland (App., 86).

**ENERGY FACILITIES**

**Electricity.** The Eastern Oregon Division of the California-Pacific Utilities Company distributes electric power within Union County. This power system, a member
of the Northwest Power Pool, is connected to the 230 KV tie-lines, figure 38, between the Bonneville Power system and the Idaho Power Company and provides an ample potential supply of power for industry and domestic demands (App., 69).

**Natural Gas.** In addition to the electric power, Union County is supplied with natural gas. The supply of natural gas is provided by a transmission pipeline that transverses Union County.

**Petroleum.** Parallel to the natural gas transmission pipelines is buried a petroleum products line. This line does not supply Union County. The passage of these lines through Union County is strictly an expedience to reach the larger markets of the far Northwest (App., 49). The sale of natural gas to Union County is incidental.
CHAPTER X
CONCLUSIONS

The economy of Union County is oriented to the local resources base. The relative stability of the population during the past four decades indicates that the potentials of this base were recognized and developed in the first 50 years of the county's existence.

A near optimum population appears to be presently living in the county. Opportunities for broadening the two major bases of the economy, agriculture and forestry, are distinctly limited.

Agriculture is of prime importance to the existence of Union County. The greatest potential for further agricultural development is found in the water resource base. More arable cropland could be irrigated in the late season with a dependable water supply. Reservoirs for irrigation storage also would have beneficial uses in preventing or reducing annual flood damages.

Forest resource is no longer plentiful, because excessive harvesting has exceeded the net annual growth. Unless tree farming is accepted and practiced, the continued operation of the lumber industries is threatened.

Minerals are not important contributors to Union County's economy, nor is there any indication of a future
in the development of this resource base.

Further development of the recreation assets of the county offer limited prospects for supporting additional Union County residents. The development of water storage facilities could increase the recreational attractions of the county.

County interest, in a large measure, should be turned toward improvement of the stewardship of its resources base to assure a stable economy. The program of sustained yield forestry must become an integral part of the economy. Range improvement must be carried forward and the other agricultural resources must be managed in a progressive manner and with a long view.
BIBLIOGRAPHY


APPENDIX

SUBJECT SPECIALISTS INTERVIEWS

AGRICULTURE

Public Servants


3. Fergerson, Walter M. Work Unit Conservationist, (First Union County Soil Conservation District), Jeffers Bldg., Albany St. and Highway 82, La Grande, Oregon.


5. Gavin, Charles G. Extension County Agent for Livestock, Union County, La Grande, Oregon.


12. Sidor, Ted. Extension County Agent, Union County, La Grande, Oregon.
14. Winkel, Tony. Range Planner. (First Union County Soil Conservation District), Jeffers Bldg., Albany St. and Highway 82, La Grande, Oregon.

Farming

15. Asper, Mitchell. Telocaset, Oregon


21. Hibberd, Dick. Imbler, Oregon. (Union County Cattleman of the year 1954.)


23. Johnson, Donald B. La Grande, Oregon. (Mink farmer)


26. McKinnis, Don. Imbler, Oregon. (Member of several Economic Planning Councils.)


29. Robinson, Ralph. La Grande, Oregon. (Chairman of 1st Union Soil Conservation District; Board of Supervisors.)

30. Scoggin, Forest. Union, Oregon. (Supervisor of the 1st Union Soil Conservation District, Area Director of National Association of Soil Conservation Districts.)

31. Schaad, R. W. Fruitdale, La Grande, Oregon. (Ex-County Agent of Union County; Chairman of Union County Extension Farm Crops Committee.)

32. Standley, J. Dale. Route 1, La Grande, Oregon. (Union County Grassman of 1955.)


34. Robinson, Benjamin. Imbler, Oregon.

35. Robinson, Ralph. La Grande, Oregon. (Chairman of 1st Union Soil Conservation District Board of Supervisors.)


37. Teeter, T. S. Imbler, Oregon.

38. Wilde, Grant W. Route 2, La Grande, Oregon.

FORESTS


42. Moravets, F. L. Chief, Division of Forest Economics Research, Pacific Northwest Forest and Range Experiment Station, Portland 8, Oregon.

43. Parsons, Glenn B. Forester, Mount Emily Lumber Company, La Grande, Oregon.


45. Skovlin, Jon M. Range Manager. Field Experimental Station, Starkey Experimental Forest and Range, Pacific Northwest Forest and Range Experiment Station, Blue Mountain Research Center, U.S. Forest Service, La Grande, Oregon.

46. Trappe, James M. Research Forester (General), Blue Mountain Research Center, U.S. Forest Service, La Grande, Oregon.

47. Wing, Harold R. Forest Manager, Umatilla Indian Agency, Bureau of Indian Affairs, Dept. of Interior, Pendleton, Oregon.

MANUFACTURING


51. Collins Pondosa Sawmill, Pondosa, Oregon.

52. Crippen, H. L. Manager, Western Stud Mills, Inc., Elgin, Oregon.


56. Oregon Trail Lumber Company, Union, Oregon.

MINING AND GEOLOGY


SETTLEMENT

60. Bennett, Frank B. President, Eastern Oregon College, La Grande, Oregon.
63. Chantry, Earl L. County Clerk, County Courthouse, La Grande, Oregon.
64. Dahlstrom, John A. County Assessor, County Courthouse, La Grande, Oregon.
TRANSPORTATION AND ENERGY

69. Albert, E. K. President, California-Pacific Utilities Company, 405 Montgomery Street, San Francisco 4, California.


71. Downs, Eldon. Owner and Manager, Municipal Airport, La Grande, Oregon.

72. Evers, C. W. Traffic Manager, Union Pacific Railroad Company, Portland, Oregon.


74. McCarthy, Kathryn L. Tariff Rates Agent, Union Pacific Railroad, La Grande, Oregon.

75. Paxson, G. S. Assistant State Highway Engineer, State Highway Department, Salem, Oregon.

76. Waddell, H. E. Station Agent, Union Pacific Railroad Company, La Grande, Oregon.

RECREATION


80. Schmeiter, Fred. Secretary-Manager, Chamber of Commerce, La Grande-Union County, La Grande, Oregon.
WILDLIFE


WATER RESOURCES

84. Browne, Orn. Regional Project Development Engineer, Bureau of Reclamation, Regional Office, Region 1, Boise, Idaho.


86. Cooper, Bill. Union, Oregon. (Member: State Soil Conservation Committee; Secretary 1st Union Soil Conservation District; Co-Chairman Grande Ronde Valley Flood Control Committee, 1956)

87. Cochran, George T. Attorney at Law, La Grande, Oregon.

88. Lane, Don J. Executive Secretary, Water Resources Committee, Salem, Oregon.


90. Stanley, Lewis A. State Engineer, Water Resources Department, Salem, Oregon.