

LAND UTILIZATION IN THE COOKSON HILLS

**LAND UTILIZATION IN THE COOKSON HILLS**

OKLAHOMA  
AGRICULTURAL AND MECHANICAL COLLEGE  
SEP 27 1938

**BY****RUSSEL EIMER KILGORE****Bachelor of Science****Oklahoma Agricultural and Mechanical College****1936****Submitted to the Department of Agronomy****Oklahoma Agricultural and Mechanical College****In partial fulfillment of the requirements****For the Degree of****Master of Science****1938**

LIBRARY  
A & M COLLEGE  
STILLWATER OKLA

SEP 27 1938

SEP 27 1938

A P P R O V E D

*W. B. Gernert*

Major Adviser

*Harace J. Harper*

Acting Head of Department of Agronomy

*D. C. McIntosh*

Dean of Graduate School

#### ACKNOWLEDGEMENT

Had it not been for the excellent cooperation and assistance of Dr. W. B. Gernert, Associate Professor of Agronomy of the Oklahoma Agricultural and Mechanical College; Mr. Charley Kilpatrick, Project Manager, and Mr. Richard L. White, Supervisor of Conservation of the Resettlement Administration, the executing of this paper would have been impossible.

Other persons who have rendered worthwhile assistance are Dr. Horace J. Harper, Professor of Soils of the Agronomy Department, Mr. Grant Foreman, Muskogee, and Mr. Chester A Luke of Muskogee.

The author wishes to express his sincere appreciation to those persons mentioned above and to all others who have helped in any way.

R. E. Kilgore  
April 30, 1938

## INTRODUCTION

The successful utilization of natural resources requires a knowledge of the nature and behavior of the elements involved, the evaluation of their relationships, and a skill in manipulating those that are controllable with reference to those that are fixed. As applied to hills agriculture legitimate utilization means maximum efficient conversion to economic use compatible with the permanent maintenance of soil values.

The nature of the problem discussed here is the economic application of soil conservation methods, reforestation, crop and pasture management together with the development of recreational facilities. In this paper we are concerned only with an area of land chosen by the Federal Government for the location of a Resettlement Project. The reason for the selection of this particular area by the Government will be set forth in a later chapter. As much of the land of Eastern Oklahoma is in a submarginal condition a thorough investigation of this area was conducted. Owing to the nature of the area the direct problem with which we are concerned, successful land usage, is not enough to evolve a satisfactory solution; therefore, an intensive study was made of the area from the time of the first settlers, following their operations through the years to the beginning of the Resettlement Administration.

## Table of Contents

	Page
Description of the Area - - - - -	1-5
Location - - - - -	1
Topography - - - - -	1
Climate - - - - -	5
Early History of The Area - - - - -	5-23
Inhabitants- - - - -	5
Land - - - - -	12
Historical Events - - - - -	18
Existing Conditions - - - - -	23-66
Social - - - - -	23
Economic - - - - -	27
Soil - - - - -	29
Soil Samples--Procedure and Results - - - - -	45
Vegetation - - - - -	48
The Resettlement Administration - - - - -	66-91
Purpose and Type of Project - - - - -	66
Rural Rehabilitation - - - - -	68
Land Utilization - - - - -	70
Soil and Water Conservation - - - - -	70
Reforestation - - - - -	78
Grazing - - - - -	79
Wildlife - - - - -	81
Recreation - - - - -	81
Miscellaneous Operations - - - - -	85
Future Management of the Project - - - - -	89
Summary - - - - -	91
Conclusion - - - - -	91
Literature Cited - - - - -	92

## Index to Pictures

No.		
1.	The Project Area on Highway No. 10 from the Northwest- - - -	2
2.	Home of Solomon Braggs - - - - -	11
3.	An Early Indian Burying Ground Which Has Been Converted - - Into a Cemetery.	11
4.	Graves in the Yard of A Cherokee Indian's Home - - - - -	13
5.	An Early Graveyard encased by Native Rock Fence - - - - -	13
6.	A Tombstone in an Indian Cemetery - - - - -	14
7.	A Pecan Log Which Grew in Green Leaf Creek Valley - - - - -	14

No.	Page
8. A Low Place Filled in With Soil Washed From Higher Ground	16
9. An Industrious Farmer Builds A Rock Wall to Catch Soil-- Washed From Higher Ground	17
10. Farm Tools Left to the Mercies of the Elements	17
11. A Sawmill in Operation in the Vicinity of Cookson Hills	19
12. A Typical Farmstead	19
13. An Abandoned House Once the Home of a Large Family	20
14. A Family of Cherokee Indian Children by Their Home	20
15. A Log Hut Built by a Freed Negro Soon After the Civil War	24
16. A Typical Family of the Cookson Hills	24
17. A Fishing Place on a Mountain Stream	26
18. A Typical Run-down Farmstead	26
19. A Large Gully Due to Erosion	28
20. Braggs, Oklahoma, Taken in 1935	30
21. Hummocks and Native Pasture Land Due to Wind Erosion	30
22. Native Forest Spurred with Bluestem Grasses	47
23. An Eroded and Rocky Mountain Side Covered by a Growth of Scrubby Hickory and Black Jack	47
24. A Native Meadow	49
25. An Abandoned Road Through Native Grass Land	50
26. A Weedy Pasture	49
27. One of the Better Farmsteads	67
28. Terraces in an Abandoned Field	67
29. A Farmstead on a Newly Purchased Resettlement Farm	69
30. A Newly Resettled Farm Wife With Her Flock of Rhose Islands	69
31. A Corn Field on One of The Newly Purchased Resettlement Farms	71
32. A Resettlement Farm Wife and Some of Her Products	71
33. One of the Conveniently Located Farm Ponds	74

34.	A Contoured Furrowed Pasture - - - - -	74
35.	A Terraced Abandoned Field - - - - -	75
36.	A Contoured Abandoned Field - - - - -	75
37.	A Terraced Field - - - - -	76
38.	Check Dams Made of Scrap Sheet Iron Across a Large Gully - - -	76
39.	Check Dams Built of Native Stone - - - - -	77
40.	A Check Dam Across A Gully in A Field Formerly Cultivated - - -	77
41.	Sassafras and Persimmon Sprouts Combined With a Dense Growth of Weeds on Land Which Was Formerly Covered by Native Grass - -	80
42.	The Earthern Dam Across Green Leaf Creek - - - - -	80
43.	A View of the East Shore of Green Leaf Lake - - - - -	83
44.	A View of the West Shore of Green Leaf Lake - - - - -	83
45.	A View of the Picnic Grounds - - - - -	84
46.	An Over-night Cabin on the East Shore of Green Leaf Lake - - -	84
47.	The Lodge - - - - -	86
48.	The Lodge - - - - -	86
49.	Rock Steps on One of the Nature Trails Ascending the Mountain West of the Lake - - - - -	87
50.	A Beauty Spot on the Lake Shore - - - - -	88
51.	A Scene From Look Out Tower - - - - -	88
52.	The East Boundary Fence of the Area - - - - -	90



## Index to Maps and Tables

## Maps

No.	Page
1. Location of Cookson Hills Project Showing Relation to Established and Other Proposed Land Use Projects and National Forests and Parks in Oklahoma - - - - -	3
2. Military Road Built in 1824 - - - - -	22
3. Original Vegetative Cover - - - - -	4
4-15 Representative Quarter Sections - - - - -	55-64
15. Location of Representative Quarter Sections - - - - -	64
16. Division of the Project Area - - - - -	72

## Tables

No.	Page
1. Climatic Summary by Months - - - - -	6
2. Legend for Interpretation of Maps No. 4 through 15 - - - - -	51 and 52

## DESCRIPTION OF THE AREA

### Location

The "Cookson Hills" Project is situated in Eastern Oklahoma about twelve miles southeast of Muskogee County near Braggs. (See Picture No. 1, Page No. 2 and Map No. 1, Page No. 3). It is rectangular in shape with an irregular boundary on the north, south, and east sides. Its greatest length north and south is thirteen miles, and its greatest width east and west is five miles. The area is bounded on the north by the U. S. Highway No. 62, on the east by Cherokee County, on the south by State Highway No. 10, and on the west by the Arkansas River.

The project is easily accessible as five railroads cross Muskogee County, four of which enter Muskogee and one passes along the west border of the area with a station at Braggs. There are also three U. S. Highways and one State Highway transversing Muskogee County which pass in the vicinity of the area. State Highway No. 10 passes through the area from Northwest to the Southeast corner.

Residents of a large territory are in an easy driving distance of this location. Distances of important cities are: Muskogee 18 miles, Ft. Smith 85 miles, McAlester 58 miles, Tulsa 79 miles, Oklahoma City 150 miles, Okmulgee 52 miles, Dallas, Texas, 315 miles, Ft. Worth, Texas 350 miles, and Springfield, Missouri, 195 miles.

### TOPOGRAPHY

The area comprises of two general physiographic divisions, one belonging to the Ozark Uplift including the mountainous portion; the other includes the prairie plains province which covers the prairie section. (See Map No. 3, Page 4). The mountainous division is inter-



Picture No. 1  
Entering the Project Area on Highway No. 10  
From the Northwest

MAP NO. 1

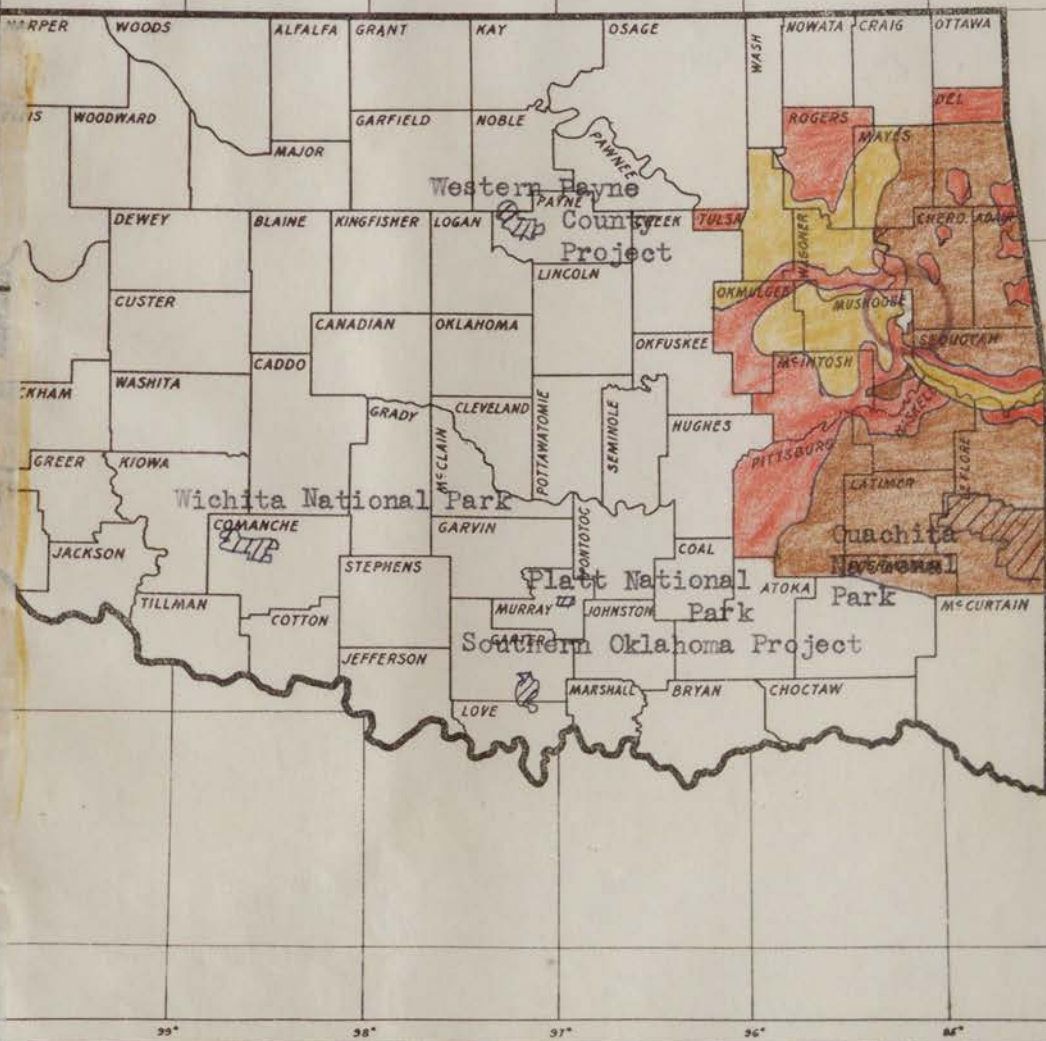
LOCATION OF COOKSON HILLS PROJECT SHOWING RELATION TO ESTABLISHED AND OTHER PROPOSED LAND USE PROJECTS AND NATIONAL FORESTS AND PARKS IN OKLAHOMA

LEGEND

1 Areas in which 20 percent or more of the whole number of arable farms are on land of such low productivity and so scattered or isolated that arable farming is undesirable and not economical and on such farms should be gradually replaced in its entirety by some other use, e.g. extensive grazing, forestry, or recreation and wildlife conservation. Area 3,662,820 acres.

2 Areas where 20 percent or more of the farms are too small to permit the introduction of pasture or forest or soil-protecting or soil-improving crops needed for the improvement or protection of poor or eroding land. Area 1,954,244 acres.

3 Areas in which 20 percent or more of the farms are subject to serious erosion which may be controlled without necessitating a change in size of farms as specified in 3A. Area 1,569,355 acres.



LEGEND

- PROJECT AREA BOUNDARY
- PRESENT HIGHWAYS
- EXISTING COUNTY ROADS TO BE MAINTAINED AS PARK ROADS
- SECONDARY ROADS TO BE MAINTAINED AS FIRE & TRUCK TRAILS
- PARK ROADS
- TRUCK TRAILS
- NATURE TRAILS
- SEWER LINES
- TELEPHONE LINES
- WATER LINES
- HOE WIRE FENCE
- CATTLE GUARDS
- FIRE BREAKS
- BEACH IMPROVEMENTS
- FORDS
- POWER LINES
- ENTRANCE GATES
- WARE HOUSE
- BATH HOUSE
- OVER NIGHT CABINS
- DWELLING
- LATRINE
- LODGE
- SHELTERS
- STORAGE HOUSE
- IMPOUNDING DAM
- DISPOSAL BED
- TANK CESSPOOL
- WATER WELL
- CLEARING & CLEANING RESERVOIR SITES
- NURSERY
- SAWMILL
- OVERLOOKS
- PICNIC GROUNDS
- FISH HATCHERY
- FARM PONDS

- NOTE: GENERAL LAND TREATMENT THROUGHOUT PROJECT AREA.
- 107 SKETCH MAPPING
  - 108 CLEARING LAND
  - 108 B PASTURE IMPROVEMENT
  - 123 SEEDING
  - 127 SODDING
  - 128 SOIL PREPARATION
  - 244 SIGNS
  - 401 CHECK DAMS
  - 402 DIVERSION TERRACES
  - 404 TERRACING
  - 408 CONTOUR RIDGES
  - 402 FIRE HAZARD REDUCTION
  - 604 STAND IMPROVEMENT
  - 605 TREE PLANTING
  - 804 FOOD & COVER
  - 807 LAKE & POND DEVELOPMENT
  - 809 PREDATORY ANIMAL CONTROL

JOBS DESIGNATED BY SUFFIX W TO BE INCLUDED IN SUPPLEMENT TO MASTER PLAN

Prairie  
Forest

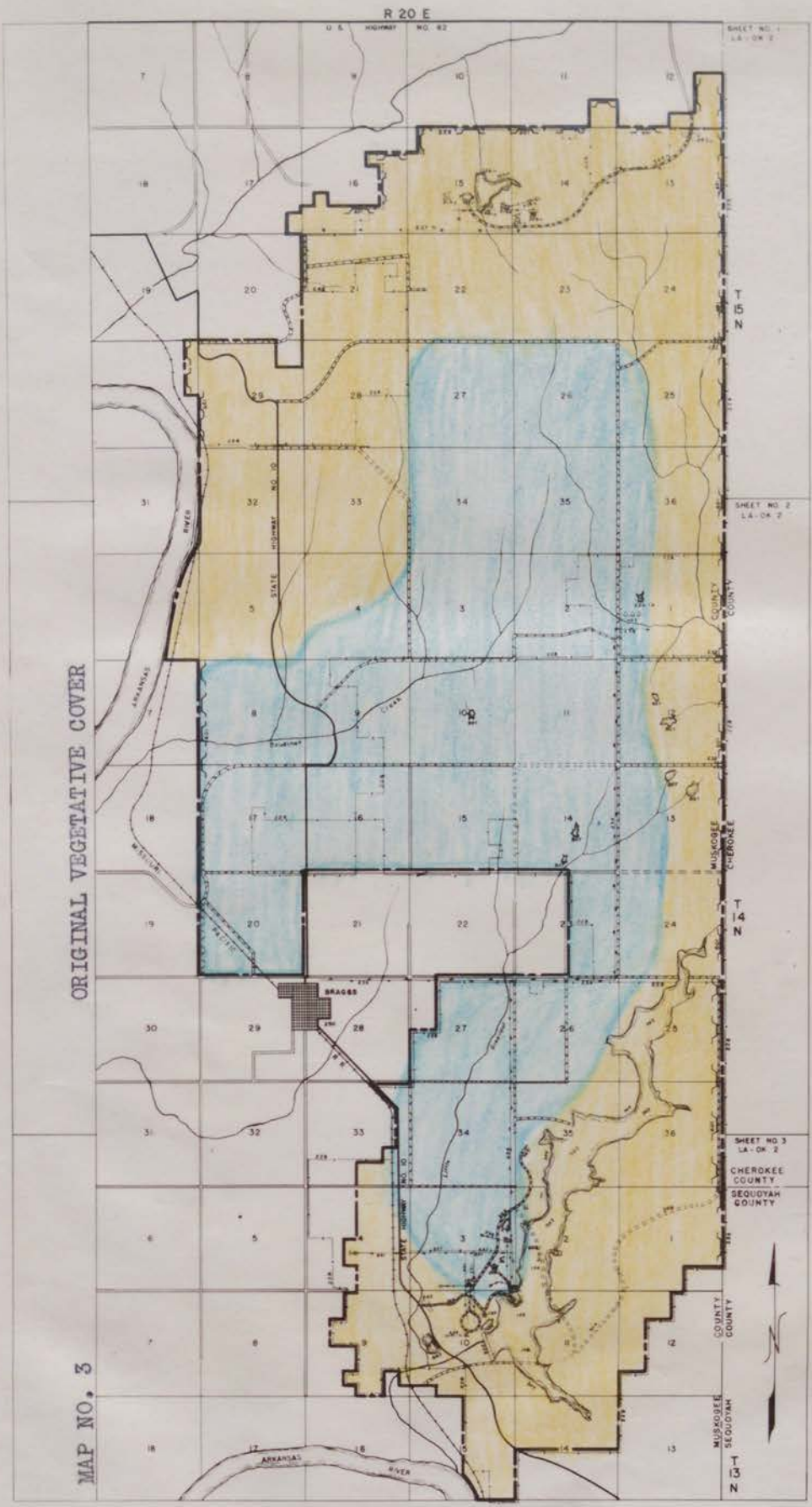
U.S. DEPARTMENT OF AGRICULTURE  
RESETTLEMENT ADMINISTRATION  
DIVISION OF LAND UTILIZATION  
REGION VIII PROJECT LD-OR-2  
COOKSON HILLS DEVELOPMENT PROJECT  
DEVELOPMENT MAP

SCALE  
0 2 3  
1/2 1 MILE

DRAWN BY - J. H. T.	DATE
CHECKED BY -	
APPROVED BY -	
REVISIONS:	

ORIGINAL VEGETATIVE COVER

MAP NO. 3



SHEET NO. 1  
LA. OR. 2

SHEET NO. 2  
LA. OR. 2

SHEET NO. 3  
LA. OR. 2

CHEROKEE COUNTY  
SEQUOYAH COUNTY

CHEROKEE COUNTY  
SEQUOYAH COUNTY

MUSKOGEE COUNTY  
SEQUOYAH COUNTY

rupted by numerous small streams and peaks which rise to a height of 1,000 feet. The prairie section, with an elevation of 400 to 500 feet, is nearly level to rolling and is broken in places by treeless ridges and round hills. The area is drained by small creeks which empty into the Arkansas River.

#### Climate

The annual precipitation is approximately 38 inches which as a rule is well distributed throughout the year. Droughts seldom occur and are of short duration. Severe droughts are on record for the years of 1838, 1888, 1889, and 1936. Severe floods on record occurred in the years 1840, 1849, 1851, 1910, 1915, 1923, and 1938. The growing season is ample for most kinds of fruits and crops. There are approximately 217 days per year that are free from killing frost. The average date of the last killing frost in the spring is March 30 and of the first killing frost in the fall November 2. The latest killing frost recorded in the spring is May 1 and the earliest recorded in the fall October 10. Table No. 1, Page 6, gives the climatic summary by months for this region.

#### EARLY HISTORY OF THE AREA

##### Inhabitants

A large part of the material used in this report on early history is legendary, but it was verified by residents of the area whose families have lived there for several generations. Many of the historical events did not occur directly in the area but in the vicinity.<sup>1,2</sup>

---

1. Thoburn, Joseph B., A History of Oklahoma, Warden Company, Oklahoma City, 1934

2. Dale, Edward E., Readings in Oklahoma History, Row, Peterson & Co., Evanston, Illinois, 1930

TABLE NO. 1

CLIMATIC SUMMARY BY MONTHS  
Based on Observation of the U. S. Weather Bureau

Average	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average Annual
* Rainfall	2.37	1.98	2.86	4.55	4.75	3.92	2.76	3.37	3.23	3.37	2.73	2.16	38.05
* Snowfall	3.2	1.9	0.05	0	0	0	0	0	0	T	0.1	0.8	6.5
* No. of days with .01 or more precipitation	7	6	7	9	9	9	6	7	7	6	5	6	84
* Minimum Temperature	27.6	32.0	39.1	49.9	58.1	66.8	72.6	69.7	62.6	50.5	39.8	30.6	49.7
** Maximum Temperature	48.0	53.3	61.8	72.1	78.9	88.4	93.9	94.2	86.7	75.1	60.5	50.2	72.1
** Mean Temperature	38.4	41.4	51.5	60.7	68.3	77.0	81.0	81.6	74.7	62.9	51.4	40.0	60.9
** Highest Temperatures	76	87	93	92	96	106	107	110	107	95	85	78	110
Lowest	-11	-11	10	23	36	48	53	48	36	16	15	-4	-11
** Prevailing Wind Direction	N	S	S	S	S	SE	S	S	SE	S	S	N	S

\* 25 years record at Fort Gibson

\*\* 18 years record at Muskogee

The exact date when pioneers first settled in this part of the Cookson Hills is not known; however, Indians of the Cherokee and Creek tribes began locating here soon after 1800.

Before continuing with the story it is desirable to relate how the Cookson hills received their name. An English lady wished to try her fortune in this new country of America. Being of a poor descent her only chance of getting across the Atlantic Ocean was by work. She secured a job as cook on a vessel bound for the land of the free. The captain of the ship allowed the woman to bring with her a small son whose name was Joseph. The crew on the ship called the boy "Joe the Cook's Son". After arriving in America, in about the year 1805, the boy assumed the name Joseph Cookson. He wandered around the country until about 1820, when he married a Cherokee Indian woman and settled down a few miles southeast of where the Project Area is now located. In later years he owned and operated a large ranch with head quarters in section 22, township 14 N, and range 20 E, which is a section of land within the boundary of the area but which will not be purchased by the Government.

It is reported that Joe was a kind man, having raised several orphan children. No person was ever turned away from his door. This is partly the reason the Cookson's have a bad reputation, as no questions were asked when a stranger wished to stay a while in their household. In this way many law-breakers were harbored unintentionally. It is commonly assumed that the entire Cookson Family was of a notorious nature. However, only one of the Cookson's, Levi who was the son of Joseph, was ever involved in crimes. Descendents of Joseph Cookson have lived in the area or near by since 1820, and his grandson lives on the bank of the Illinois River about ten miles east of the Area at the present time.



As recorded in history, the Indians were grossly mistreated. In Georgia the Cherokee Indians were forced to leave their homes in the better part and occupy the less desirable land. Removing the Indians to the remote parts did not satisfy the aggressive and rapacious white people of Georgia. They molested and harassed the red men until they were inveigled into trading their beloved and native homes for land in the midwest. When they began to migrate, the Cherokee Indians began settling just west of the White River in the eastern part of what is now the State of Arkansas. Most of the Indians that settled on this side of the Ozarks came up the Arkansas River on small flat boats. Some also came by foot from Arkansas and Mississippi where they had previously lived. As mentioned above, the area consists of a large prairie surrounded by many hills more or less wooded. The Indians chose to settle in the hills rather than on the prairie because the hills provided protection and ample wild fruits, berries, and game while the mountain streams were abundantly stocked with fish. For many years the Indians lived in these hills with their negro slaves unmolested by the white race.

The only white people in this part of the country were soldiers who were located at Fort Gibson, which was established in 1824, and an occasional explorer, adventurer, or writer. In 1848 and 1849 many of the eastern gold hunters passed through this section on their way to the gold rush in California. Slowly but gradually a few white people in search of good land and homes made friends with the Indians in this section and were permitted to live there. At an early date many squatters and people in search of free lands also tried to settle on this land which belonged to the Indians without permission, but they were repeatedly driven away.

During the Civil War the Indians of this vicinity were divided on their sympathy for the North and South. Many were Union Loyalist; others joined the Confederate forces because they owned slaves and wished to retain them. Many a bloody battle was fought among the Indians; however, only a few of the full blood Indians actually fought in the regular armies. Mostly gorilla warfare was carried on. Only one battle is actually known to have happened in the immediate area, which occurred in Section 24 just east of the McCrakin Ford. The McCrakin Ford was one of the few places where the Indians could cross Green Leaf Creek, and this ford is still used.

An interesting story of how the Creek received its name has been handed down. A clique of Cherokee Indians were on their way to battle. They were on foot and did not wish to go around the large creek to the ford; so they decided to swim across. One of the Indians who was chewing tobacco while swimming the river swallowed enough of the juice to choke and drowned. The word tobacco in the Cherokee language is "cholerkisty" which means "green leaf" in English. Thus, from then on until now the creek has been called Green Leaf Creek.

Soon after the Civil War the Missouri, Kansas, and Texas Railway Company began building a line across Oklahoma and Kansas to Texas. In about 1871 the road was completed to the present site of Muskogee and this was the beginning of the City of Muskogee. The following year the railroad was built on across the State, thus passing within a few miles of the area. With the coming of the railroad the white man began to pour into this section of the United States--many in search of work, others in search of fortunes, some hunters, traders and squatters. This was the beginning of the destruction of the prairies and native forests.

An Indian trading post was located at the head of Green Leaf Creek and in later years was called Green Leaf Town. This is one of the earliest Indian towns. In about 1882 a town was started on the banks of the Illinois River and was named Garfield after President Garfield. The post office was moved there from Green Leaf Town. In a few years shipments over the Iron Mountain Railway became heavy and the company wished to place a station close to a good loading point. After long deliberation the station was finally located and was named Braggs for Solomon Braggs who lived near the station. (See Picture No. 2, Page 11). At once a thriving town sprang up and many of the business places from the Indian towns in the territory moved to Braggs. The town was located in the center of a rich agricultural country. To the west was located the sandy land of the Arkansas River Valley; to the south were the rich lowlands of the Green Leaf Creek Valley and the flats between the mountains. Eastward and northward were the valuable grass lands known as the Braggs Prairie. The mountains and forested sections also contained valuable timber. The project area surrounds the town.

After the war the area was surveyed and each Indian and slave was permitted to file claims; The Indians received 160 acres of land, the negroes 40. Many tracts of land are still occupied by descendants of the original claimants. Some of the Indians were restricted from disposing of their land. Other Indians disposed of their holdings soon after the restrictions were moved by the Government. Thus, the white man gained entrance into this valuable prairie land. The majority of the white residents of the area came from the states of Arkansas, Tennessee, Mississippi, Georgia, and Kentucky. Families whose ancestors came from England, France, Germany, Sweden, and Russia live here.



Picture No. 2

Home of Solomon Braggs. House built of red oak logs between 1840-1860.



Picture No. 3

An early Indian burying ground which has been converted into a cemetery.

It is of common belief that many of the people who reside in the Cookson Hills are of a criminal nature, but actually this is far from true. However, many of the original settlers had committed minor crimes in their native states and settled here as a means of protection. Other early settlers decided to locate here because of the good land, bountiful meadows, and abundant water. The original settlers were as a whole good farmers and stockmen.

A conception of the time the area was settled and the mode of advancement made by the residents can to some extent be determined by the remains left by them. Informative remains left by the pioneers are few except for the homes, crude machinery, and graveyards. Small lots used for burying grounds are well distributed over the area. Various types of structure are used to locate the individual graves. The Indians constructed small shed-shaped houses over their dead. The negroes used no markers and the white population enclosed many of their graves with native rock fences. (See Picture No. 3, Page 11; Pictures No. 4 & 5, Page 13, and Picture No. 6, Page 14).

#### Land

As mentioned previously the area is made up of numerous small mountains which enclose the Braggs prairie. In the virgin state the forests were habited by many species of trees, the most important of which were: oak, hickory, black jack, ash, maple, elm, and walnut. (See Picture No. 7, Page 14). In the prairie and open parts of the area an unlimited amount of prairie grass grew, the dominant species of which were blue stem, switch grass, Indian grass, and numerous others.

For a number of years there was plenty of land for the settlers to cultivate and numberless acres of prairie grasses which could be used for grazing and hay. Vast natural forests with countless acres



Picture No. 4  
Graves in the yard of a Cherokee Indian's home.



Picture No. 5  
An early graveyard encased by native rock fence.



Picture No. 6  
 Tombstones in an Indian Cemetery  
 Note--Cherokee Language on tombstone to the left.



Picture No. 7  
 A pecan log which grew in Green Leaf Creek Valley--when cut was  
 over 100 years old.

of valuable timber was also at their disposal.

From the advent of the white man in the area large ranches were common. One of the first being the Cookson Ranch, another prominent ranch was the Walker Ranch. The men did not own a large number of acres, usually owning only one or two sections which were used for headquarters. The stock was grazed upon the open range. Conditions, however, soon changed as more and more of the land was occupied by settlers. All of the level land was put into cultivation and much hilly timbered land was cleared and cultivated. Countless acres of sloping prairie were plowed up.

A more detailed description of the soil types and series will be given under "Existing Conditions" on following pages, as the nature of the soil has changed very little. In reality the soils will remain the same for centuries, however, due to forces of nature, chemical reactions take place and erosion will transport much of the soil from one place to another. (See Picture No. 8, Page 16 and Picture No. 9, Page 17). In the virgin state the soils of the project were covered by natural vegetation according to their origin. The residual soils were occupied primarily by native prairies. The Ozark border soils were inhabited by forest. The alluvial soils were mainly in the lowlands where various types of vegetation grew.

Considering the three groups of soils together they formed a mass area of land which was very productive. The A horizon or top layer of soil consisted of sandy clay loam to a depth of from one to three feet. The B horizon consisted of sandy or shaley soils varying from six inches to eighteen inches in depth. The C horizon consisted of either solid sandstone, shale, or limestone. Stock furnished the bulk of the farmer's





Picture No. 8

Low place filled in with soil which was washed from higher ground. Note--rock wall higher than fence post.



Picture No. 9

An industrious farmer builds a rock wall to catch soil washed from higher ground. Note--Man to the left is 6 feet in height.



Picture No. 10

Farm tools left to the mercy of the elements.

income. Yields of such crops as corn, oats, cotton, and potatoes were very high. However, after a few years of cropping the yields were greatly reduced on the thin and poor hilly land. Serious droughts occurred and production was curtailed more and more. Poor farm management was practiced and it resulted in a decrease in the value of the land as sheet erosion soon became severe and large deep gullies were almost inevitable under this procedure. (See Picture No. 10, Page 17). Much of the valuable forest species were slaughtered without discretion. (See Picture No. 11, Page 19). The timber was used for rough lumber and cross ties. The forest became inhabited by a less desirable group of trees. The prairies were depleted by rapid over-grazing and mowing. Eventually many of the old farmsteads were abandoned, much of the run-down land was returned to open range, and the area as a whole assumed a highly dissipated aspect. (See Picture No. 12, Page 19 and Picture No. 13, Page 20).

#### Historical Events

Many historical events and significant happenings have occurred in this section of the state, dating back to long before it was occupied by white settlers. A few of the most important events will be mentioned and discussed here.

Bernard De LaHarpe, a French explorer, led his party across the western part of Muskogee County in about 1819; and again in 1822 he with his party ascended the Arkansas River to the present site of the City of Muskogee. In 1822 Thomas Nuttall, an English Scientist of Harvard University, made a trip into this section to collect botanical specimens and study geological formations. The Federal Government established a fort in 1824 at a point near where the Verdigris and Grand Rivers empty into the Arkansas River.



Picture No. 11

A sawmill in operation in the vicinity of Cookson Hills



Picture No. 12

A Typical Farmstead

Note--Barn at the left in a delapidated condition.



Picture No. 13  
An abandoned house, once the home of a large  
family.



Picture No. 14  
A family of Cherokee Indian children by their home.

This fort, which was named Fort Gibson after a captain of that name, was for a number of years the western outpost of the Federal Government. Famous men who were established at Fort Gibson at various times are: Robert E. Lee, Jefferson Davis, Zachary Taylor, and Sam Houston. Washington Irving, in 1832, sailed up the Arkansas River to Fort Gibson. From there he made a trip westward into the Indian territory, and from the material he collected on this trip wrote his famous book, "A Tour of the Prairie".

From the time of the settling of the Indian territory, the Arkansas River furnished the main line of travel and transportation. In 1826 what is now known as the old military road from Ft. Smith, Arkansas, to Fort Gibson was established. This military road passed through the present Cookson Hills Project Area. (See Map No. 2, Page 22).

The Cherokee and Creek Indians began locating in this territory soon after 1800. The Cherokee Nation was established by the Government in 1832. In 1824 the first newspaper in the Indian territory, "The Cherokee Advocate" was established at Tahlequah.

The Civil war had a pronounced effect in this region as the Cherokee Indians as a whole did not take sides with either the north or south and, therefore, were invaded numerous times by both armies. Because of the consequences of the war Indian slaves were freed and shared with the Cherokee Indians in their tribal funds. The "Texas Road" one of the old cattle trails crossing Oklahoma passed along just west of the project area to Kansas by way of Muskogee and Fort Gibson.

The M. K. & T. Railway was established in 1872. With the railroad came the white man in droves to the territory. The early Indian towns of Green Leaf and Garfield were established soon after the Civil War. The town of Braggs was established in 1881. Bacone College, the only school of

- PROJECT AREA BOUNDARY
- PRESENT HIGHWAYS
- EXISTING COUNTY ROADS TO BE MAINTAINED AS PARK ROADS
- SECONDARY ROADS TO BE MAINTAINED AS FIRE & TRUCK TRAILS
- PARK ROADS
- TRUCK TRAILS
- NATURE TRAILS
- SEWER LINES
- TELEPHONE LINES
- WATER LINES
- HOG WIRE FENCE
- CATTLE GUARDS
- FIRE BREAKS
- BEACH IMPROVEMENTS
- FORDS
- POWER LINES
- ENTRANCE GATES
- WARE HOUSE
- BATH HOUSE
- OVER NIGHT CABINS
- DWELLINGS
- LATRINE
- LODGE
- SHELTERS
- STORAGE HOUSE
- IMPOUNDING DAM
- DISPOSAL BED
- TANK CESSPOOL
- WATER WELL
- CLEARING & CLEANING RESERVOIR SITES
- NURSERY
- SAWMILL
- OVERLOOKS
- PICNIC GROUNDS
- FISH HATCHERY
- FARM PONDS

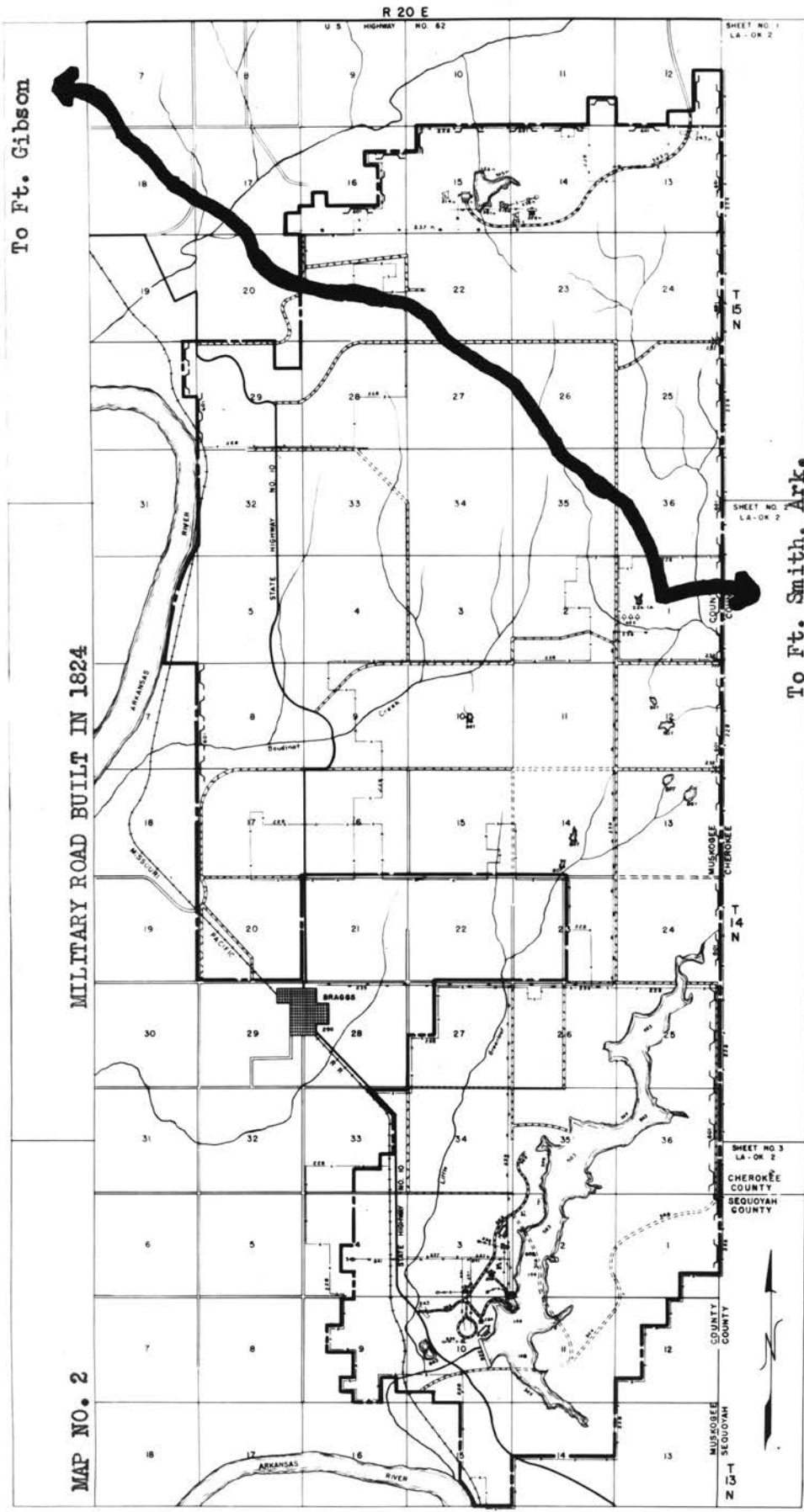
- NOTE: GENERAL LAND TREATMENT THROUGHOUT PROJECT AREA
- 107 SKETCH MAPPING
  - 108 CLEARING LAND
  - 108 B PASTURE IMPROVEMENT
  - 125 SEEDING
  - 127 SODDING
  - 128 SOIL PREPARATION
  - 244 SIGNS
  - 401 CHECK DAMS
  - 402 DIVERSION TERRACES
  - 404 TERRACING
  - 406 CONTOUR RIDGES
  - 602 FIRE HAZARD REDUCTION
  - 604 STAND IMPROVEMENT
  - 605 TREE PLANTING
  - 604 FOOD & COVER
  - 607 LAKE & POND DEVELOPMENT
  - 609 PREDATORY ANIMAL CONTROL

JOBS DESIGNATED BY SUFFIX "h" TO BE INCLUDED IN SUPPLEMENT TO MASTER PLAN

U. S. DEPARTMENT OF AGRICULTURE  
 RESETTLEMENT ADMINISTRATION  
 DIVISION OF LAND UTILIZATION  
 REGION VIII PROJECT LD-OK-2  
**COOKSON HILLS DEVELOPMENT PROJECT**  
 DEVELOPMENT MAP



DRAWN BY - P.M.F.	DATE
CHECKED BY -	
APPROVED BY -	
REVISIONS:	



To Ft. Gibson

MILITARY ROAD BUILT IN 1824

MAP NO. 2

To Ft. Smith, Arke

SHEET NO. 1  
LA-OK-2

SHEET NO. 2  
LA-OK-2

SHEET NO. 3  
LA-OK-2

CHEROKEE COUNTY  
SEQUIYAH COUNTY

MUSKOGEE COUNTY  
SEQUIYAH COUNTY

T 14 N  
T 13 N

R 20 E

U.S. HIGHWAY NO. 62

STATE HIGHWAY NO. 10

ARIZONA RIVER

MUSKOGEE RIVER

CHEROKEE RIVER

BRAGGS

MUSKOGEE CREEK

CHEROKEE CREEK

SEQUIYAH CREEK

higher learning for Indians, was established just outside of the city limits of Muskogee in about 1880. The second telephone line in the Indian territory was established from Muskogee to Tahlequah in 1886. The first Federal Court in the Indian Territory was established in Muskogee in 1889. The Sequoyah Convention, which was to discuss plans for making a state out of the Indian Territory, was held at Muskogee in 1905. In 1907 the Indian territory was admitted to the Union as a state and was called "Oklahoma"--- The Home of The Red Men. The region to the north, west, and east of the area was formed into a county with a county seat at Muskogee.

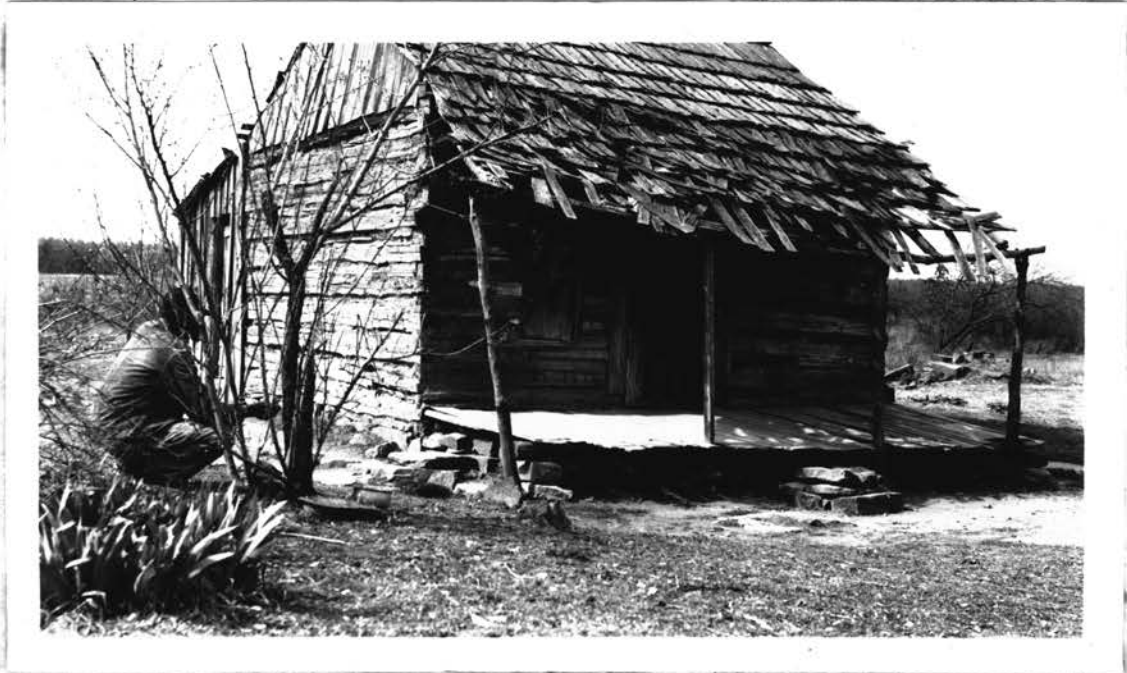
#### EXISTING CONDITIONS

##### Social

The Indian population has dwindled until at present only a few of them remain in the area. (See Picture No. 14, Page 17). These are the ones that are restricted from selling their holdings. One Indian who resides in the area is the last of the famous tribe of Natchezs. When he passes on the Natchez Indians will be an extinct tribe. The Natchezs are descendents of the Creek Indians and at one time were a distinct nation having their own language, government, and traits. The other Indians are of Cherokee birth only a few of which are educated. Also there are many "half breed" Indians because in early days there was a considerable amount of inter-marriage between the Cherokee and white settlers.

Some negroes also dwelled in the area. It is an interesting fact that these negroes are descendents of the original slaves of the Cherokee Indians which were brought from Georgia. After the Civil War the Cherokee Nation was forced by the Federal Government to set aside forty (40) acres of land for each freed negro. Many of them sold their land and soon were





Picture No. 15  
A log hut built by a freed negro soon after the Civil War. Note: The son of an old slave is to the left.



Picture No. 16  
A typical family of the Cookson Hills.

nothing more than slaves again as the proceeds were soon squandered. (See Picture No. 15, Page 24). Other negroes were more industrious and built homes on their land, took up farming, and secured a profitable living from this and selling of livestock.

The original white settlers were of a hardy type and descendants of pioneers who had struggled for their existence during several generations. Even after settling in the area they were faced by the problems of building permanent homes, securing a living from the land, and of educating their children in this wild country. As the soil decreased in fertility and the native meadows were denuded, the more progressive and industrious white settlers moved on to new territory leaving the more undesirable residents to take possession of the land. At present the area is inhabited by a mixed population of whites, Indians, and negroes with a standard of living far below normal and in a most undesirable society. (See Picture No. 16, Page 24). The education is at a low ebb, however, there are ample schools for the population. The greater number of people have received from a fifth to a sixth grade education. It is only a few of the younger generation who have completed the eighth grade and entered high school.

There are few recreational features except fishing and hunting.\* Some church activities are held in the school houses. Other than these acceptable entertainments are few. Notwithstanding the fact that the living conditions are mostly primitive and sanitation scarcely heard of, the majority of the families enjoy excellent health. The boast of many persons past sixty years of age is that they have "never been sick a day". Since hill life is not easy, one or two things may be assumed, Either hill life is conducive to long living, or only the fit can and do survive. Doctors are

---

\*(See Picture No. 17, Page 26)



Picture No. 17

A fishing place on a mountain stream.



Picture No. 18.

A typical run-down farmstead. Note--the gullied field to the right.

very seldom called as home remedies are used in case of illness. Diseases which are prevalent in the area are rheumatism, kidney, and heart trouble, typhoid, pneumonia, pyorrhea, and gingivitis. Much of the diseases are caused by undue exposure, inadequate shelter, and lack of proper clothing.

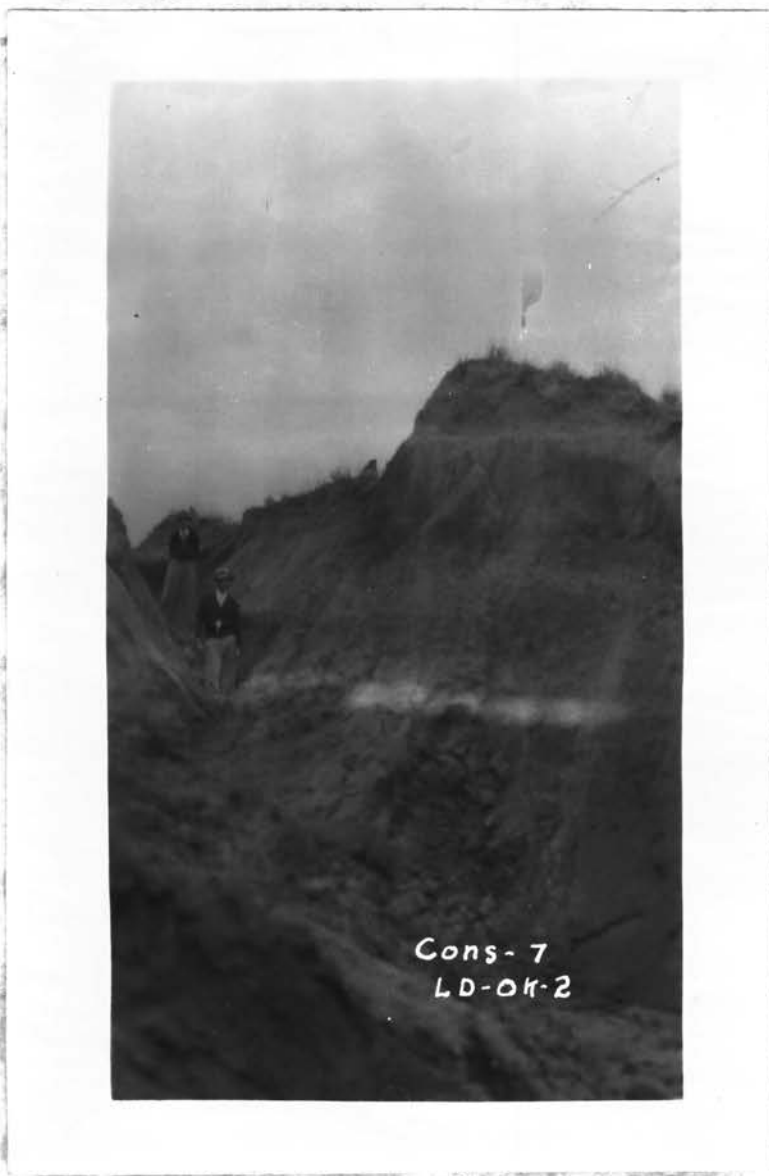
Legal marriages are few. Common law wives are numerous. Early marriages are the prevailing custom, as a girl over eighteen years of age is considered an old maid. Large families are common.

#### Economic

Although there are many large families in the area the average size is six persons. The ages of the male heads of the families ranges from 21 to 70 years, female heads from 16 to 70 years.

In the majority of cases the families have spent their entire life on a farm. Many, however, especially whenever conditions become such that the farm does not provide a living, follow various occupations such as the raising of strawberries, potatoes, cotton picking between crop seasons. In the days when the hills provided a living and very little effort for livelihood was required on the part of the families, it was easy for them to own their homes and farm land. At the present the homes consist of log cabins, shacks, and run down frame buildings. (See Picture No. 18, Page 26). The furnishings within the homes are inadequate as bare necessities are all that can be afforded. Barns and other outbuildings are in a run down condition and many have actually fallen over. Large farms are not uncommon, but the average farm size is less than forty acres per family. Of the forty acres around ten acres are in cultivation; the other is either abandoned or is too rough to cultivate. Erosion has taken a great amount of the farm land as very little of the original top soil is there now and large gullies are prevalent. (See Picture No. 19, Page 28).

Sixty-seven (67) per cent of the residents of the area are tenants,



Picture No. 19.

A large gulley due to erosion.

ninety (90) per cent of the farms are covered by mortgages; about thirty (30) per cent of the farms are abandoned and returned to open range. At present the forest and woodlands are valued at \$1.40 per acre, woodland pastures at from \$4.00 to \$5.00 per acre, and crop land at \$8.00 per acre.

Incomes have consistently dwindled until in the year of 1934 the average income for families living in the area was less than \$49.00.. Starvation seemed inevitable for a large number of the residents until relief work was begun. At the present time 76 per cent of the residents secure their living from their allotments on the Works Progress Administration Payrolls.

The trend of the economic status is well illustrated by the rise and fall of the town of Braggs. Soon after the location of a station at a point twelve miles southeast of Muskogee on the Iron Mountain Railroad a thriving town sprang up. During the first thirty years of its existence many business concerns located there. Among them were two banks, two cotton gins, a thirty room hotel, numerous merchandises, cafes, and garages. Traveling salesmen reported that Braggs was the best town between Ft. Smith and Coffeerville. Erosion became prevelant, production of crops was reduced and the prairies were denuded. Braggs began to decline and has continued to the present. (See Picture No. 20, Page 30). A shell of the former town is left. The population has dwindled from 700 to 200, both banks are closed, the hotel is abandoned, the gins operate only a few days each year, and only a few of other business concerns are left.

#### Soil

Before beginning a description of the present conditions of the soils a brief discussion of their origin will be attempted.



Picture No. 20  
Bragg, Oklahoma, taken in 1935. Note--to the left the  
large two-story hotel which is now abandoned.



Picture No. 21  
Hummocks on native pasture land due to wind erosion.  
Note: The mounds in the foreground.

\*The early geology of the area can be discussed only in a general way as many formations are involved which cover vast tracts of land. All of Oklahoma appears to have been a land surface for a great length of time before the Cambrian period. About the middle of the Cambrian times the sea advanced over most or all parts of the state depositing sand or mud in the shallow waters, but at times portions were elevated into land so that there are many breaks in the history of the rocks as revealed by the fossils.

During the Mississippian period the sea probably covered all of the region and rocks of considerable thickness were formed. During the Pennsylvanian times the region now included in Oklahoma was near sea level. Thus, there were great swamps in which large amounts of vegetation accumulated. From time to time the sea advanced over the area and beds of mud and sand were deposited over the accumulated vegetable matter preserving them. Thus, coal beds were formed. At or near the close of the Pennsylvanian age there were great movements of the earth's crust that resulted in the rocks, which had deposited in a level position, being bowed into folds or domes. Many of these out-cropped domes are noticeable in the area at present..

From all indications the sediments which form the project area were deposited during the Pennsylvanian period. The main formations included in the area are the Marrow group, which consists of Oolitic limestone interbedded with shale and sandstone; the Cherokee group which is mainly shale and sandstone; and the Winslow group which is a combination of sandstone, limestone, and shale.



<sup>4</sup> Some of the Characteristic fossils of the Morrow formation are:

Zaphrentis gibsoni	Cystodictya morrowensis
Lophophyllum profundum	Polypora elliptica
Michelinia eugeneae	Orbiculoidea missouriensis
Rhipideomella pecosi	Productus welleri
Meekella striaticostata	Spirifer poius
Productus morrowensis	Spiriferina transversa
Pentremites rusticus	Schizodus morrowensis
Delocrinus pentanodus	Platyceras parvum
Fenestella morrowensis	Gastrioceras brammeri
Rhombopora snideri	Griffithides morrowensis

Some of the characteristic fossils of the Winslow formation and Cherokee Shales are :

Pseudopocoperia squamosa	Chonetes mesolobus
Sphenopteris denticulata	Pustula nebraskensis
Pecopteris unita	Marginifera muricata
Neuropteris rarinervis	Spirifer cameratus
Annularia stellata	Composita subtilita
Lingula carbonaria	

<sup>5</sup> As stated above the soils of the area are comprised in three broad groups--residual soils including Gerald, Bates, and Leslie series; the Ozark border soils including the Hanceville series; and the alluvial soils including the Osage and Muskogee series. A discussion of the series, followed by a detailed outline of the types will be given. The interpretation of the results and the procedure for collecting, analyzing, and biological study on soil samples will follow the outline of the soil types.

#### Gerald Series

The Gerald series covers 11% of the area, or approximately 3,520 acres. The series is characterized by a grayish to grayish brown top soil to a yellowish brown silty clay subsoil. The topography varies from flat to strongly rolling but the surface is not badly dissected or broken. Surface drainage is good in the rolling areas but under-drainage is poor on

---

4. Gould, Charles N., Oklahoma Geological Survey Bulletin No. 35., Oklahoma City, 1932.

5. Jones, Grace B., Soils Survey of Muskogee County. U. S. Department of Agriculture, Government Printing Co. 1913

account of the imperviousness of the heavy clay subsoil. ~~The flat areas~~ comprise poorly drained late soils. The Gerald series is typically developed in the prairie sections of the area. The series is of a residual origin and is derived from interbedded sandstone and shale which sometimes occur as a bedrock substratum at comparatively shallow depths. There are two types of the Gerald soils present in the area.

The Gerald very fine sandy loam type covers about 8 per cent of approximately 2,560 acres.

I. Physical Characteristics

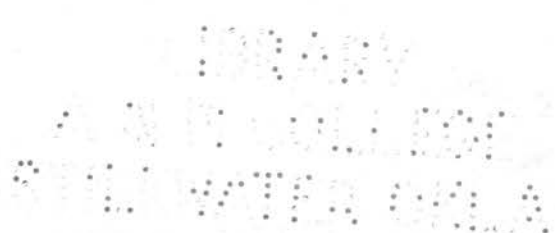
- A. Topography--Gently sloping and undulating to rolling prairie. Mounds and hummocks are numerous (See Picture No. 21, Page 30).
- B. Parent Material--Shales interstratified with thick bedded and fine grained, yellowish sandstone.
- C. Tendency of Soil Layers--
  - 1. Surface: Dark grayish brown loam to a depth of 4 to 8 inches underlain by a fine sandy loam.
  - 2. Subsurface: Light and sandy loam to a depth of from 1 to 3 feet underlain by solid sandstone.

II. Chemical Analysis of Soil Samples.

- A. Organic Matter - - - - - 3.7 per cent per acre or very low
- B. Potassium - - - - - 150 pounds per acre or low
- C. Phosphorus - - - - - Available phosphorus very low
- D. Calcium - - - - - 4 pounds per acre or very low
- E. Nitrogen - - - - - 1.75 per cent per acre or very low
- F. Reaction - - - - - Ph 5.5 or strongly acid

III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms.

- A. True Clover - - - - - Organism Present
- B. Soybean - - - - - Organism Absent
- C. Cowpea - - - - - Organism Present
- D. Vetch - - - - - Organism Present
- E. Alfalfa - - - - - Organism Absent



## IV. Dominant Vegetation

- A. Forest--elm (*Ulmus*), persimmon (*Diospyros*), sassafras (*Sassafras*) and hackberry (*Celtis*).
- B. Pasture--big bluestem (*Andropogon furcatus*), silverbeard (*A. ternarius*), little bluestem (*A. scoparius*), Indian grass (*Sorghastrum nutans*), switch grass (*Panicum virgatum*), and dropseeds (*Sporobolus*).
- C. Field--cocklebur (*Xanthium*), gaura (*Gaura*), and ragweed (*Ambrosia*).

\*  
V. Amount of Erosion

## A. Virgin Land

1. A slope  
Top soil--20 to 25 per cent removed  
Gully --Slight
2. B to C slope  
Top soil--25 to 50 per cent removed  
Gully -- Bad

## B. Cultivated Land

1. A slope  
Top soil--25 to 50 per cent removed  
Gully --- Bad
2. B to C slope  
Top soil--50 to 75 per cent removed  
Gully --- Serious

The Gerald fine sandy loam type covers about 3 per cent of the area, or approximately 960 acres.

## I. Physical Characteristics

- A. Topography--moderate slopes to low hilly ridges.
- B. Parent Material--Sandstone
- C. Tendency of Soil Layers--
1. Surface--1 to 6 inches of dark grayish sandy loam.
  2. Subsurface--At a depth of from 6 to 20 inches the sandy clay is underlain by sandstone.

\* A legend for use in interpreting the amount of erosion in all series tables.

- |                            |                                     |
|----------------------------|-------------------------------------|
| A slope -- 1 to 3 per cent | Gully erosion:                      |
| B slope -- 3 to 6 per cent | Slight--gullies beginning           |
| C slope -- 6 to 9 per cent | Bad--not crossable with farm tools. |
| D slope -- over 9 per cent | Serious--gullies uncontrollable     |

## II. Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	3.55 per cent per acre or very low
B. Potassium	- - - - -	150 pounds per acre or low
C. Phosphorus	- - - - -	Available phosphorus very low
D. Calcium	- - - - -	5.5 pounds per acre or very low
E. Nitrogen	- - - - -	1.1 per cent per acre or very low
F. Reaction	- - - - -	Ph 5.3 or strongly acid

## III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms

A. True Clover	- - - - -	Organism Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Present
D. Vetch	- - - - -	Organism Absent
E. Alfalfa	- - - - -	Organism Absent

## IV. Dominant Vegetation

- A. Forest--elm (*Ulmus*), persimmon (*Diospyros*), silverbeard (*A. ternarius*) and hackberry (*Celtis*).
- B. Pasture--big bluestem (*A. furcatus*), silverbeard (*A. ternarius*), little bluestem (*A. scoparius*), Indian grass (*Sorghastrum nutans*), switch grass (*Panicum virgatum*), and dropseeds (*Sporobolus*).
- C. Field--cocklebur (*Xanthium*), gaura (*Gaura*), and rag weed (*Ambrosia*).

## V. Amount of Erosion

### A. Virgin Land

#### 1. B to C slope

Top soil 0 to 25 per cent removed

Gully slight to bad

### B. Cultivated Land

#### 1. B to C slope

Top soil 25 to 75 per cent removed

Gully bad to serious

### Bates Series

The Bates series covers 13 per cent of the area or approximately 4,160 acres. The soils of the Bates series are typically dark gray and the subsoils are yellowish and mottled red in the upper part and in the deeper sections are mottled with yellow and red. They have a level to steeply rolling topography and are usually well drained. These soils are present along the hilly slopes through the central section of the area.

This series is residual in origin and is derived from sandstone and shale rocks.

The Bates stony loam covers about 13 per cent of the area, or approximately 4,160 acres.

#### I. Physical Characteristics

A. Topography--Nearly level to undulating steep slopes and high ridges.

B. Parent Material--Residual from sandstone and shale rocks.

C. Tendency of Soil Layers--

1. Surface--On the virgin land a dark brown silt loam of about 4 to 8 inches is found combined with many small stones. In the cultivated fields the silt has been more or less removed and a sandy clay layer is left.

2. Subsurface--At depth of from 6 to 12 inches a sandy clay layer which is from 2 to 3 feet thick is underlain by sandstone.

#### II. Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	2.7 per cent per acre or very low
B. Potassium	- - - - -	225 pounds per acre or high
C. Phosphorus	- - - - -	28 pounds per acre or medium
D. Calcium	- - - - -	4 pounds per acre or very low
E. Nitrogen	- - - - -	1.67 per cent per acre or very low
F. Reaction	- - - - -	Ph 6.7 or slightly acid

#### III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms.

A. True Clover	- - - - -	Organism Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Present
D. Vetch	- - - - -	Organism Present
E. Alfalfa	- - - - -	Organism Absent

#### IV. Dominant Vegetation

A. Forest--oak (*Quercus*), black jack (*Quercus*), sumach (*Rhus*), and hickory (*Hicoria*).

B. Pastures--A mixed growth of the above forest tree and some native grasses--namely: sandhill bluestem (*A. hallii*), Turkey foot bluestem (*A. furcatus*), and little bluestem (*A. scoparius*).

#### IV. Dominant Vegetation--Continued

C. Field--Practically none of this land has been cultivated.

#### V. Amount of Erosion

##### A. Virgin Land

1. B to C slope	Top soil	25 to 50 per cent removed
	Gully	Bad
	Top soil	50 to 75 per cent removed
2. D. slope	Gully	Bad to serious

#### Leslie Series

The Leslie series covers about 8 per cent of the area, or approximately 2,560 acres. The Leslie soils are typically black, with dark gray or mottled, compact, tough clay subsoils. The topography varies from steep to rolling mountain sides and has poor drainage due to the compact clay subsoil. Fragments of limestone and shale are usually present to some extent in the soils and subsoils. There is, ordinarily, an underlying stratum of alternating bedded limestone and black fissile shale from which the soil is derived as a residual product.

The Leslie stony loam type covers about 8 per cent of the area or approximately 2,560 acres.

#### I. Physical Characteristics

A. Topography--Steep to rolling mountain sides and undulating valleys.

B. Parent Material--Sandstone, limestone, and shale.

C. Tendency of Soil Layers--

1. Surface--The surface soils are a dark brown to black clay loam varying from 3 to 12 inches deep. Many limestone rocks cover the surface.

### C. Tendency of Soil Layers--Continued

2. Subsurface--The subsoils are yellowish to a yellowish red clay intermingled with various sizes of limestone rocks and in certain tracts shale areas occur. Underlying these are beds of limestone and shale.

### II. Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	2.35 per cent per acre or very low
B. Potassium	- - - - -	160 pounds per acre or low
C. phosphorus	- - - - -	41 pounds per acre or high
D. Calcium	- - - - -	6.5 pounds per acre or very low
E. Nitrogen	- - - - -	1.97 per cent per acre or very low
F. Reaction	- - - - -	ph 6.0 or medium acid

### III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms

A. True Clover	- - - - -	Organisms Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Absent
D. Vetch	- - - - -	Organism Absent
E. Alfalfa	- - - - -	Organism Absent

### IV. Dominant Vegetation

- A. Forest--oak (*Quercus*), hickory (*Hicoria*), black jack (*Quercus*), elm (*Ulmus*), ash (*Fraxinus*), and walnut (*Juglans*).
- B. Pasture--A mixed growth of the above forest tree and some native grasses--namely: bluestem (*A. hollii*), turkey foot bluestem (*A. furcatus*), and little bluestem (*A. scoparius*).
- C. Field: ragweed (*Ambrosia*), button weed (*Diodia*), and three-awn grass (*Aristida*).

### V. Amount of Erosion

A. Virgin Land	
1. B to C slope	Top soil 25 to 50 per cent removed Gully Slight to bad
2. C to D slope	Top soil 25 to 75 per cent removed Gully Slight to serious
B. Cultivated Land	
1. A to C slope	Top soil 25 to 75 per cent removed Gully Bad to serious

## Hanceville Series

The Hanceville soils covers about 61 per cent of the area or approximately 19,520 acres. They are characterized by varying shades of brown surface soils to a reddish brown, moderately friable subsoil. The topography is hilly slopes to rough and rocky mountainous land. These soils are derived from sandstone and shale and are well drained.

The Hanceville stony loam type covers 8 per cent of the area, or approximately 2,560 acres.

### I. Physical Characteristics

- A. Topography--Steep slopes, high ridges, and small flats upon the slopes.
- B. Parent Material--Sandstone
- C. Tendency of Soil Layers--
  - 1. Surface--Very stony, sandy soil mixed with clay; presence of rocks very noticeable.
  - 2. Subsurface--8 to 16 inches layer of heavy clay and beneath this solid layers of sandstone.

### II. Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	2.61 per cent per acre or very low
B. Potassium	- - - - -	150 pounds per acre or low
C. Phosphorus	- - - - -	Available phosphorus very low
D. Calcium	- - - - -	5.5 pounds per acre or very low
E. Nitrogen	- - - - -	0.88 per cent per acre or very low
F. Reaction	- - - - -	Ph 5.4 or strongly acid.

### III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms

A. True Clover	- - - - -	Organisms Present
B. Soybean	- - - - -	Organisms Absent
C. Cowpea	- - - - -	Organisms Present
D. Vetch	- - - - -	Organisms Absent
E. Alfalfa	- - - - -	Organisms Absent



#### IV. Dominant Vegetation

- A. Forest--This type of land is largely forested with only a few cleared places being cultivated. The forest species are: post oak (*Quercus*), hickory (*Hicoria*), black jack (*Quercus*), elm (*Ulmus*), green ash (*Fraxinus*), walnut (*Juglans*), and buckeye (*Aesculus*).
- B. Pasture and Field--little bluestem (*A. scoparius*), button weed (*Diodia*), three-awn grass (*Aristida*), and dropseeds (*Sporobolus*).

#### V. Amount of Erosion

##### A. Virgin Land

- |                 |          |               |                  |
|-----------------|----------|---------------|------------------|
| 1. B to D slope | Top soil | 50 to 75      | per cent removed |
|                 | Gully    | Slight to bad |                  |

##### B. Cultivated Land

- |                 |          |              |                  |
|-----------------|----------|--------------|------------------|
| 1. B to C slope | Top soil | 50 to 100    | per cent removed |
|                 | Gully    | Very serious |                  |

The Hanceville fine sandy loam covers about 53 per cent of the area, or 16,960 acres.

#### I. Physical Characteristics

- A. Topography--undulating to rolling hilly slopes and steep stream slopes; also many flat benches and small plots along streams.
- B. Parent Material--Sandstone
- C. Tendency of Soil Layers
1. Surface--about 3 to 4 inches of brown sandy loam underlaid by a friable reddish brown sandy soil about 4 to 8 inches thick. In many cases the sand has been eroded away and rocks of various sizes are all that remains.
  2. Subsurface--weathered sandstone and underlaid by solid sandstone.

#### II. Chemical Analysis of Soil Samples

- |                   |           |                                    |
|-------------------|-----------|------------------------------------|
| A. Organic Matter | - - - - - | 2.85 per cent per acre or very low |
| B. Potassium      | - - - - - | 200 pounds per acre or medium      |
| C. Phosphorus     | - - - - - | 8 pounds per acre or low           |
| D. Calcium        | - - - - - | 4.45 pounds per acre or very low   |
| E. Nitrogen       | - - - - - | 0.65 per cent per acre or very low |
| F. Reaction       | - - - - - | Ph. 6.0 or medium acid             |

### III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms.

- A. True Clover - - - - - Organisms Present
- B. Soybean - - - - - Organism Absent
- C. Cowpea - - - - - Organism Present
- D. Vetch - - - - - Organism Present
- E. Alfalfa - - - - - Organism Absent

### IV. Dominant Vegetation

- A. Forest--post oak (*Quercus*), hickory (*Hicoria*), black jack (*Quercus*), and elm (*Ulmus*).
- B. Pasture--big bluestem (*A. furcatus*), little bluestem (*A. scoparius*), Indian grass (*S. mutans*), switch grass (*P. virgatum*) ragweed (*Ambrosia*), and gaura (*Gaura*).
- C. Field--Button weed (*Diodia*) and three-awn grass (*Aristida*).

### V. Amount of Erosion

#### A. Virgin Land

- 1. B to C slope            Top soil    25 to 60 per cent removed
- Gully        Slight to Bad

#### B. Cultivated Land

- 1. B to C slope            Top soil    50 to 100 per cent removed
- Gully        Bad to serious

#### Osage Series

The Osage series covers about 3 per cent of the area or approximately 960 acres. These soils are dark gray to almost black. The topography is level as the soils are of an alluvial nature which wash from the sandstone and shale soils of the prairie regions. They are poorly drained and subject to overflow. They are found mainly in the valleys of the small creeks.

The Osage loam type is the dominant soil of the Osage series. The other types occupy only a very small acreage and are of a similar origin and structure to it.

## I. Physical Characteristics

- A. Topography--Level to gently sloping creek bottoms.
- B. Parent Material--sandstone and shales which are residual from prairie soils
- C. Tendency of Soil Layers--
  - 1. Surface--A dark brown to silty clay loam underlaid by slightly lighter colored material of about the same texture.
  - 2. Subsurface--Several feet of sandy clay and clay which grades into solid sandstone.

## II. Chemical Analysis of Soil Samples.

A. Organic Matter	- - - - -	3.9 per cent per acre or very low
B. Potassium	- - - - -	125 pounds per acre or low
C. Phosphorus	- - - - -	12 pounds per acre or medium
D. Calcium	- - - - -	5 pounds per acre or very low
E. Nitrogen	- - - - -	1.94 per cent per acre or very low
F. Reaction	- - - - -	Ph. 6.1 or medium acid

## III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms

A. True Clover	- - - - -	Organism Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Present
D. Vetch	- - - - -	Organism Present
E. Alfalfa	- - - - -	Organism Absent

## IV. Dominant Vegetation

- A. Forest--Hackberry (Celtis) and elm (Ulmus)
- B. Pasture and Field--As very little of this type of soil is utilized as pasture, native grasses are present only in the outer edges. The weeds are of very little importance as they are usually annual weeds which come up after the crop has been laid by.

## V. Amount of Erosion

A. Virgin Land		
1. A slope	Top soil	0 to 25 per cent removed
	Gully	slight
B. Cultivated Land		
1. A slope	Top soil	0 to 25 per cent removed
	Gully	Slight

## Muskogee Series

The Muskogee series covers around 1.5 per cent of the area, or approximately 450 acres. These soils are characterized by a grayish to grayish brown surface with yellowish friable and somewhat heavier sub-surface soil. Water-rounded chert and sandstone pebbles are of common occurrence on the surface and in the subsoils. These soils consist of old alluvium. They occupy high stream terraces. Weathering has reached an advanced stage in the surface soil, but is not nearly so complete in the substratum. The topography varies from flat to gently rolling. The drainage is good as these soils are very sandy throughout. This series is representative of a large area in Muskogee County; however, only a small corner is taken in by the project area.

The Muskogee very fine sandy loam type covers about 1 per cent or approximately 400 acres.

### I. Physical Characteristics

- A. Topography--Flat to gently rolling and undulating higher terraces.
- B. Parent Material--Residual from prairie sandstone and shale.
- C. Tendency of Soil Layers--
  1. Surface--The surface soils are characterized by white to gray sandy loam layer of about 4 to 12 inches deep intermingled with small pieces of chert, sandstone, and coarse sand.
  2. Subsurface--A sandy clay layer which is underlain by a coarse river sand to a depth of from 3 to 20 feet.

### II. Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	1.34 per cent per acre or very low
B. Potassium	- - - - -	17.5 pounds per acre or medium
C. Phosphorus	- - - - -	Available phosphorus very low
D. Calcium	- - - - -	7 pounds per acre or very low
E. Nitrogen	- - - - -	0.38 per cent per acre or very low
F. Reaction	- - - - -	Ph 6.2 or medium acid

### III. Biological Study of Soil Samples to Determine Presence of Leguminal Organisms.

A. True Clover	- - - - -	Organism Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Present
D. Vetch	- - - - -	Organism Present
E. Alfalfa	- - - - -	Organism Present

### IV. Dominant Vegetation

- A. Forest--black jack (*Quercus*), red oak (*Quercus*), post oak (*Quercus*), persimmon (*Diospyros*), sassafras (*Sassafras*), and plum (*Prunus*).
- B. Pasture and Field--sandhill bluestem (*A. hallii*), little bluestem (*A. scoparius*), three-awn grass (*Aristida*), dropseed (*Sporobolus*), and button weed (*Diodia*).

### V. Amount of Erosion

#### A. Virgin Land

	Top soil	25 to 50 per cent removed
1. B to C slope	Gully	Bad
	Top soil	25 to 75 per cent removed
2. C to D slope	Gully	Serious

#### B. Cultivated Land

	Top soil	25 to 75 per cent removed
1. A to C slope	Gully	Serious

#### Rough Stony Land

The classification "Rough Stony Land" comprises steep rocky slopes and rock outcrops which have no agricultural value. This land supports a stunted growth of oak and some hickory. It occurs as narrow bands occupying the steeper slopes and encampments of the mountains and includes steep stony land, bare ledges, and outcrops of sandstone and limestone. Therefore, a complete outline was deemed unnecessary; however, soil samples were taken and analyzed, the results of which are as follows.

### Chemical Analysis of Soil Samples

A. Organic Matter	- - - - -	4.25 per cent per acre or very low
B. Potassium	- - - - -	200 pounds per acre or high
C. Phosphorus	- - - - -	30 pounds per acre or high
D. Calcium	- - - - -	13 pounds per acre or very low
E. Nitrogen	- - - - -	3.16 per cent per acre or very low
F. Reaction	- - - - -	Ph 7.0 or neutral

### Biological Study of Soil Samples to Determine Presence of Leguminal Organisms.

A. True Clover	- - - - -	Organism Present
B. Soybean	- - - - -	Organism Absent
C. Cowpea	- - - - -	Organism Present
D. Vetch	- - - - -	Organism Present
E. Alfalfa	- - - - -	Organism Absent

### Soil Samples---Procedure and Results

Representative samples of soil were collected from each soil type and placed in double sterilized burlap sacks. Approximately two pounds were reserved for chemical analysis. The analysis was conducted in the soils laboratory at the College. The procedures used for the various tests are: Reaction--The "OK" Soils Test; Organic Matter--The Potassium Dichromate Oxidation Test; Nitrogen--The Kgehldahl Test; Calcium--Ammonium Oxalate Test; Potassium--The Bray Procedure; Phosphorus--Harper's Easy Soluble Phosphorus Test.

The results are quoted as available nutrients. From these data it is concluded that all the soils in the area are very low in essential plant food, and that only an acid resistant type of crop should be grown.

Convinced that leguminous crops are important in any agriculture and that to be most useful they must be inoculated, an inoculation test was conducted to determine if the desired organisms were contained in the soil. Materials used were: soils samples, sterilized gallon cans, sterilized lespedeza, hop clover, soybean, alfalfa, and vetch seeds.

Five cans were filled from each sample of soil and a legume planted in each can. Contamination was avoided as the test was conducted in the college green house and distilled water used. Organisms of the cowpea, vetch, and true clover were found most prevalent. From these data it is assumed that organisms which occur are either natural or have been introduced by chance as the legumes on which they occur are mainly pasture crops.

Since all the soils of the area are closely related and of a common origin, it is deemed unnecessary to consider each type separately. However, a desirable division can be made according to the topography and vegetation; thus, dividing the area into two groups--the mountainous and forest sections and the prairie sections.

In the mountainous sections, where once valuable forests grew, a stunted growth of trees which are of practically no value except for fire wood and posts now abound with a young growth of post oak, red oak, and hickory. Many plots have been cleared and cultivated; however, due to the hilly nature and sandy character, erosion started and profitable cultivation could be practiced only a few years. (See Picture No. 22, Page 47). The valuable timber was ruthlessly cut and made into cross ties and rough lumber; the weedy species of trees soon spread over the land.

Rapid over-grazing and forest fires, which the residents thought were essential, have retarded the growth of trees and destroyed all growth of grass and shrubs. Consequently, all that is left of this once valuable region is a seriously eroded and gullied land which is covered by scrubby, valueless forest. (See Picture No. 23, Page 47).



Picture No. 22  
Native forest spurred with bluestem grasses.



Picture No. 23.  
An eroded and rocky mountain side covered by a  
growth of scrappy hickory and blackjack.



The prairie section, before the invasion of the early settlers, was covered by native grasses which in former years grew 6 to 8 feet high. (See Picture No. 24, Page 49). The more desirable parts were soon put into cultivation. A poor system of farm management was practiced as the rows were plowed up and down the slopes and little care was taken of the pastures. (See Picture No. 25, Page 50). Accordingly, the pastures were denuded and the fields were subjected to erosion. All that is left of these natural prairies is countless acres of eroded and weedy pastures, cultivated fields which are seriously eroded and low in fertility, and vast areas of abandoned land which have been returned to open range because of their non-productiveness. (See Picture No. 26, Page 49).

Eleven representative quarter sections of land were chosen which more clearly shows the condition of the soil. Maps No. 4 to 14 give a detailed view of the existing conditions, farm layout, erosion, vegetative cover, etc. Map No. 15 gives the location of the eleven quarter sections. Table No. 2 gives the Legend for interpreting the above mentioned maps.

### Vegetation

The vegetative cover now growing in the area can be separated into two divisions--namely: Forest, and Pasture and Field.

The forest species are:

Coffee Bean	( <i>Gymnocladus dioica</i> )	Mulberry	( <i>Morus alba</i> )
Cedars	( <i>Juniperus virginiana</i> )	Maple	( <i>Acer nigrum</i> )
Cottonwood	( <i>Populus deltoides</i> )	Black Oak	( <i>Quercus ilicifolia</i> )
Wild Cherry	( <i>Prunophora pennsylvanica</i> )	Black Jack	( <i>Quercus marilandica</i> )
Elder	( <i>Sambucus canadensis</i> )	Red Oak	( <i>Quercus texana</i> )
Am. Elm	( <i>Ulmus americana</i> )	White Oak	( <i>Quercus alba</i> )
Hickory	( <i>Hicoria ovata</i> )	Post Oak	( <i>Quercus stellata</i> )
Hackberry	( <i>Celtis mississippiensis</i> )	Pecan	( <i>Carya illinoensis</i> )
Honey Locust	( <i>Gleditsia triacanthos</i> )	Walnut	( <i>Juglans nigra</i> )
Black Locust	( <i>Robinia Pseudo-acacia</i> )	Willow	( <i>Salix nigra</i> )
Winged Elm	( <i>Ulmus alata</i> )	Hickory	( <i>Hicoria microcarpa</i> )
Sassafras	( <i>Sassafras variifolium</i> )	Wild Plum	( <i>Prunus spp.</i> )



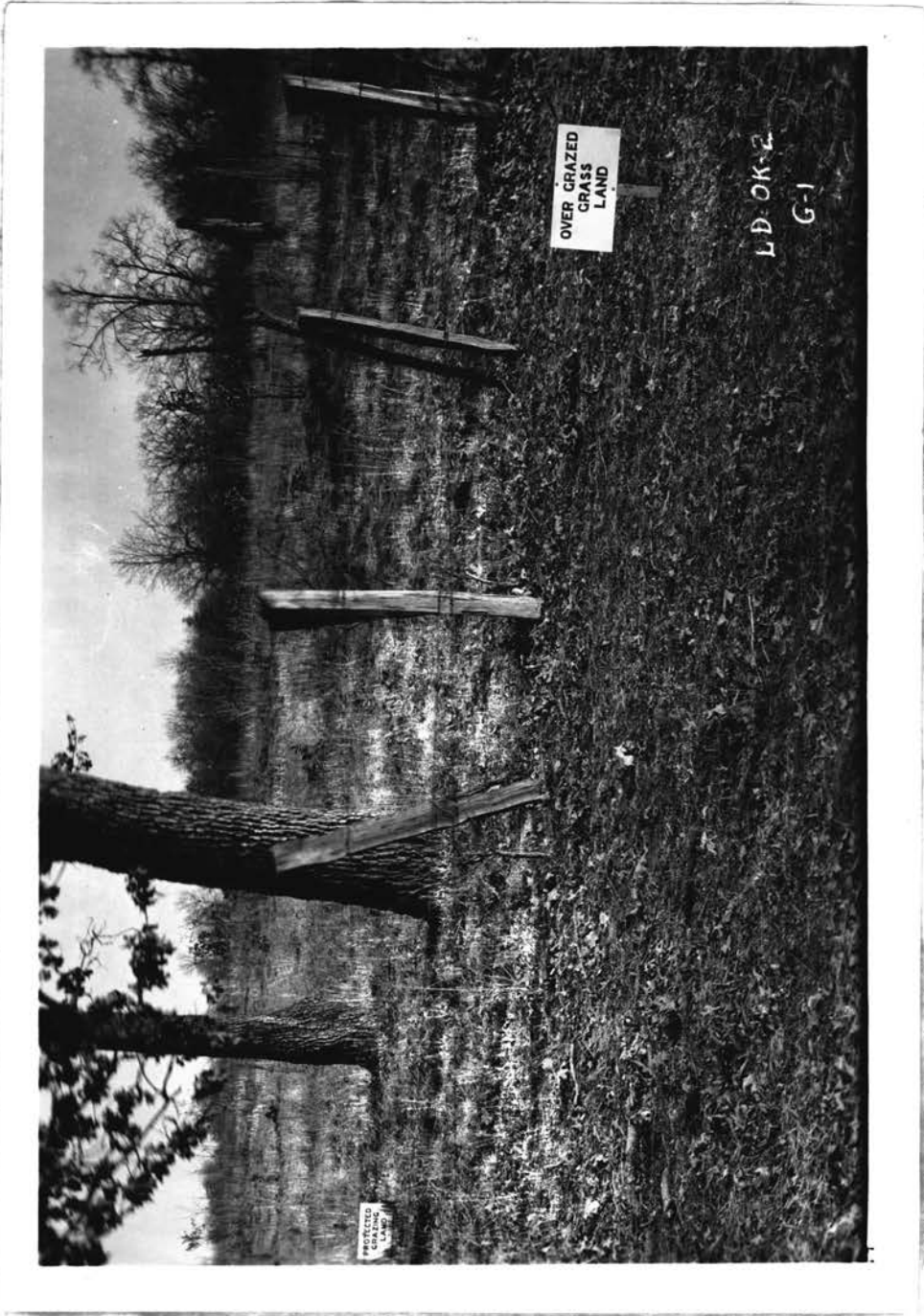
Picture No. 24

A Native Meadow Note--Measuring stick in the foreground is  $3\frac{1}{2}$  feet in length.



Picture No. 26

A weedy pasture. The tall weeds are Gaura. Measuring stick in the foreground is 3 feet high.



Picture No. 25. Adjoining pastures—one protected and the other seriously overgrazed.

Table No. 2.

## LEGEND FOR INTERPRETATION OF MAPS NOS. 4-15

	Project Boundary
	Section Line
	Subdivisions of Section (Unfenced Boundary)
	Public Road
	Gravel Road
	Field or Construction Road
	Fence
	Culvert
	Small Gully
	Deep Gully
	Deep Gully in easily erosible soil.
	Intermittent Stream
	Stream
	Ridge Line
	Lake or Pond
	Spring
	Gravelly Areas
	Rocky Areas
	Rock Outcrop
	Occasional Trees
	Heavily Wooded Areas
	Soil, slope, erosion, and land use boundary
	Buildings
	School
	Church

Table No. 2--Continued

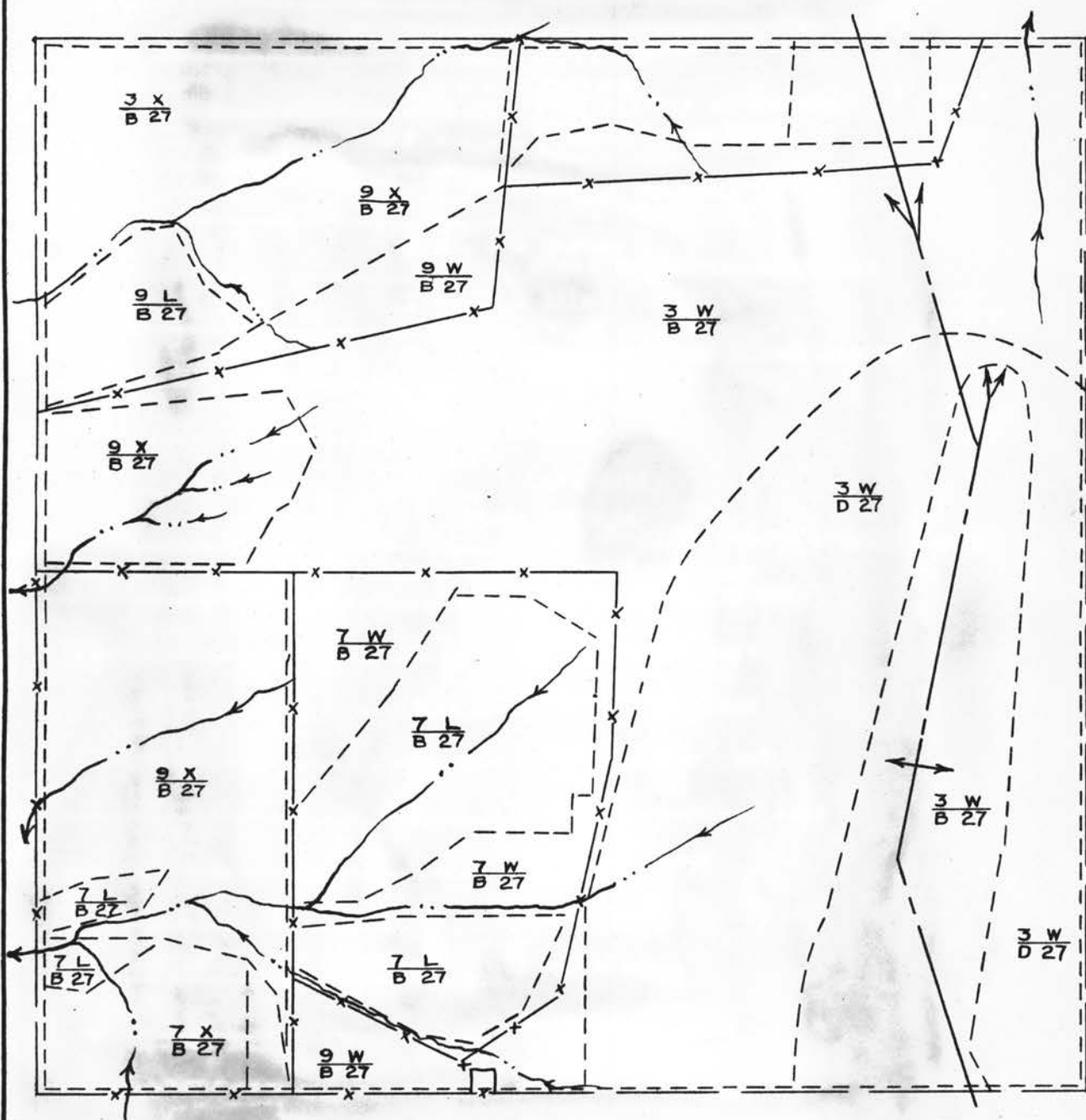
## Land Use

P - - - - Pasture  
F - - - - Forest, Heavy Woods  
W - - - - Wooded Pasture  
M - - - - Meadow  
X - - - - Idle  
H - - - - Farmstead and Miscellaneous  
L - - - - Cultivated

## Slope Groups

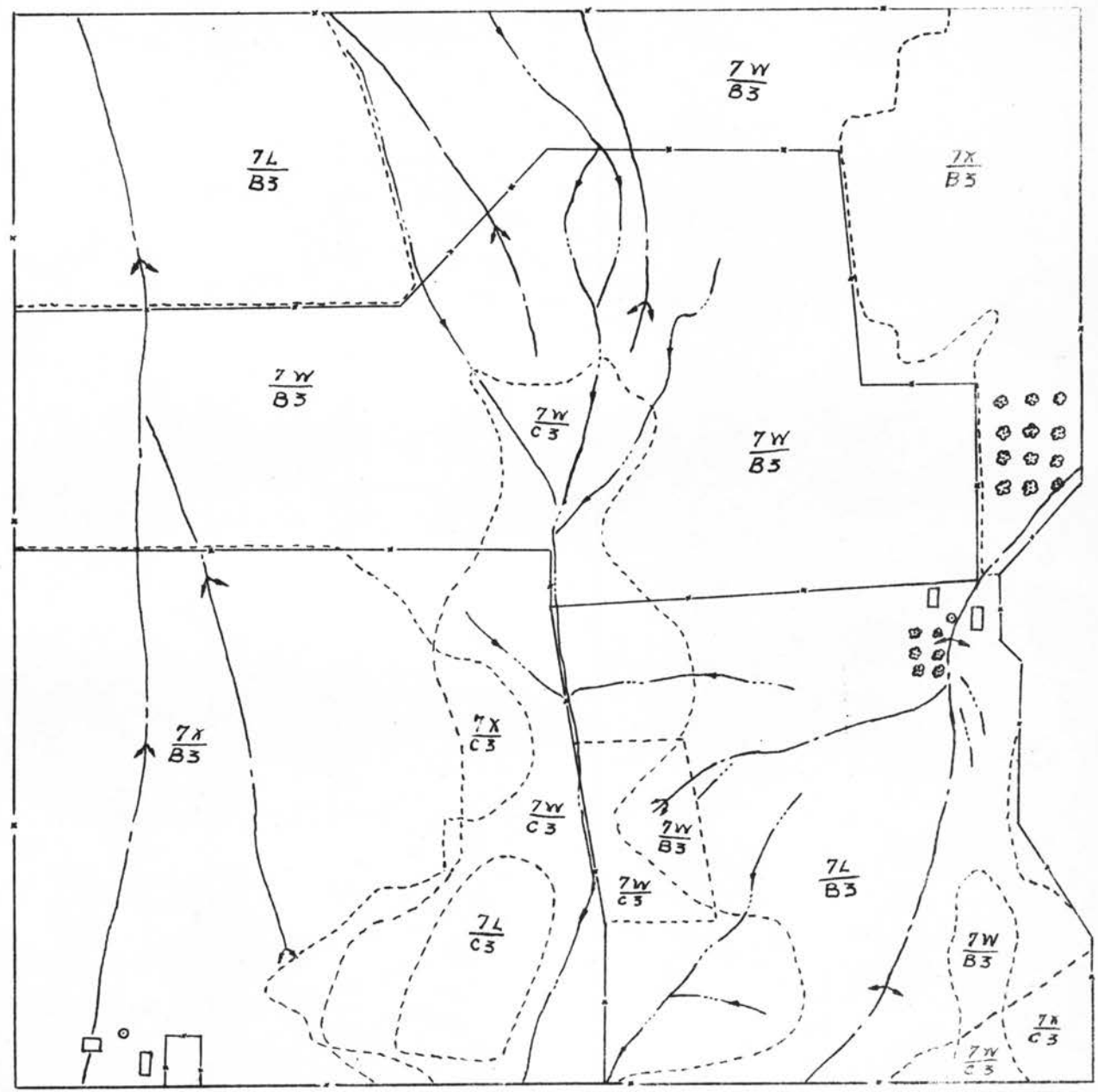
AA - - - - 0 to .5 per cent  
(Alluvial soils only)  
A - - - - .5 to 3 per cent  
B - - - - 3 to 6 per cent  
C - - - - 6 to 10 per cent  
D - - - - 10 per cent and over

MAP NO. 4



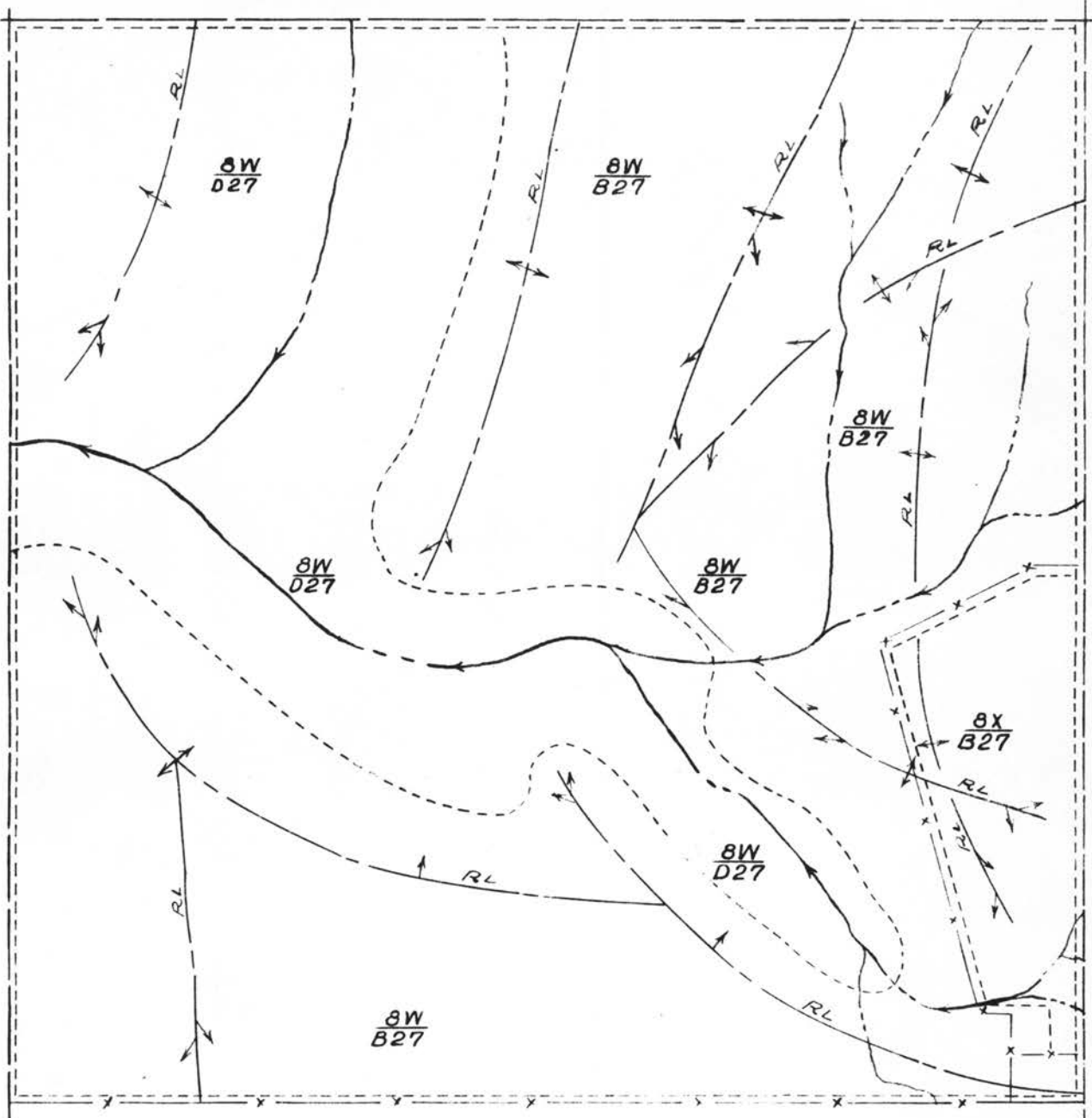
FARM MAP	
NW 1/4 SEC. 22-T15N-R20E	JOB 107
PLANE TABLE: C. E. W.	6-27-37
TRACED: P. H. F.	SCALE 1" = 400'
APPROVED: R. L. W.	

MAP NO. 5



FARM MAP	
SE 1/4 S 24 T 15 N R 20 E	Job 107
Platetable: C.S.	3-5-37
Traced: C.S.	Scale 1"=400'
Approved R.L.W.	

MAP NO. 6



FARM MAP	
NW $\frac{1}{4}$ SEC. 5-T14N-R20E	JOB 107
PLANE TABLE: C.E.W.	4-26-37
TRACED: H.S.W.	SCALE 1"=400'
APPROVED: R.L.W.	



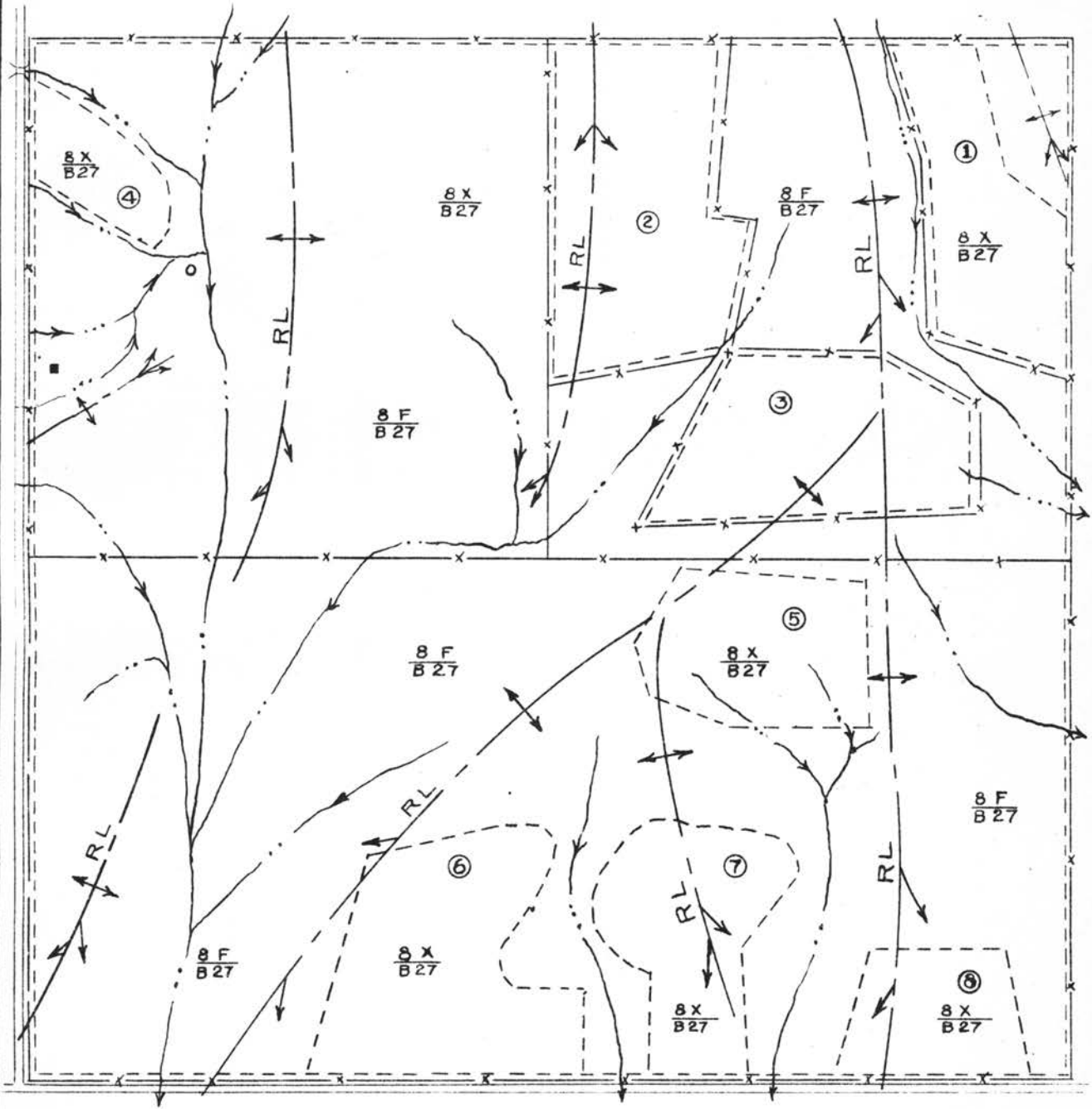
MAP NO. 7



FARM MAP

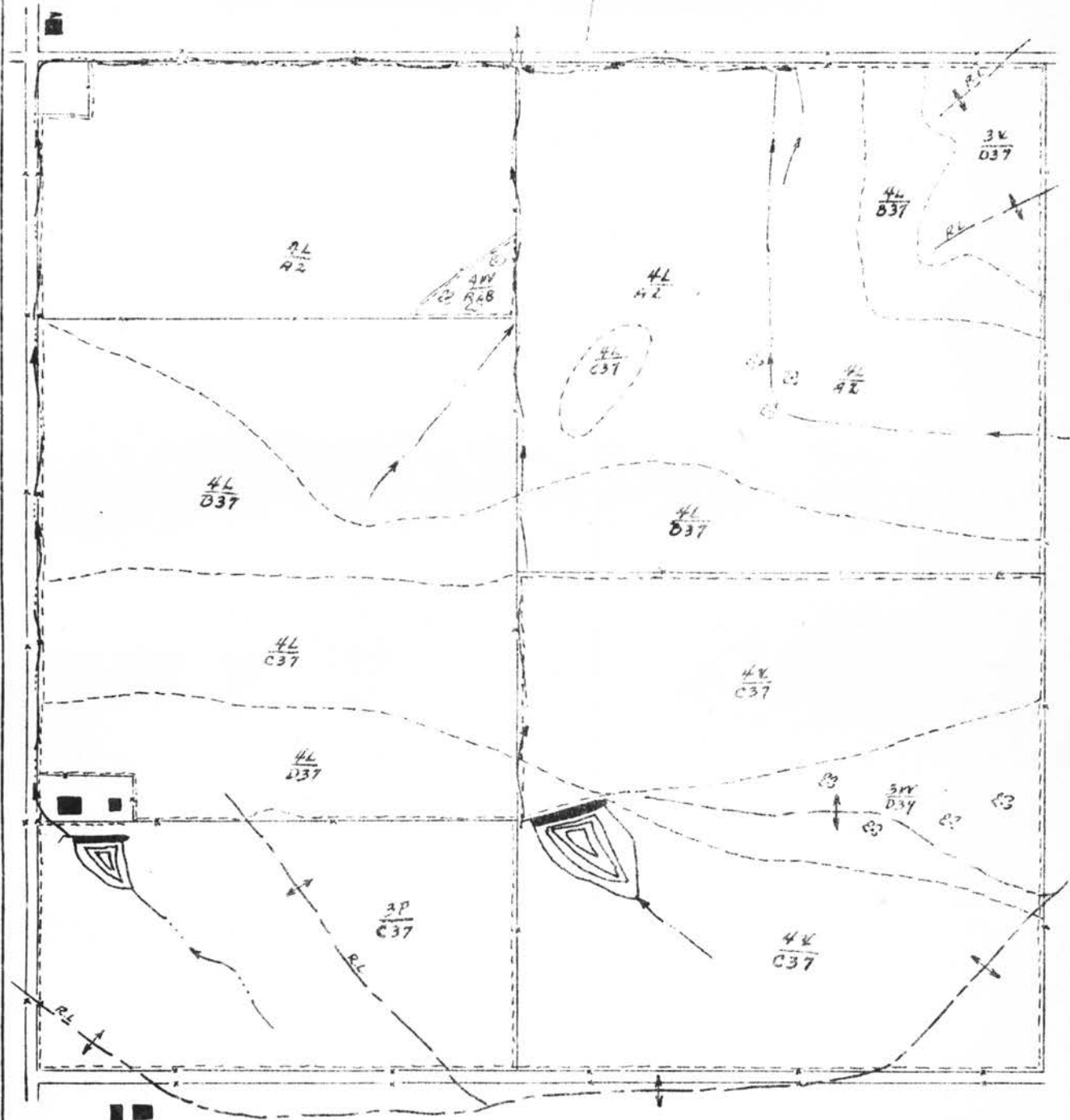
NE 1/4 Sec 4 T14N, R20E	Job 107
Plane Table: CEW	4-22-37
Traced: H.S.W.	Scale 1"=400'
Approved: RLW.	

MAP NO. 8



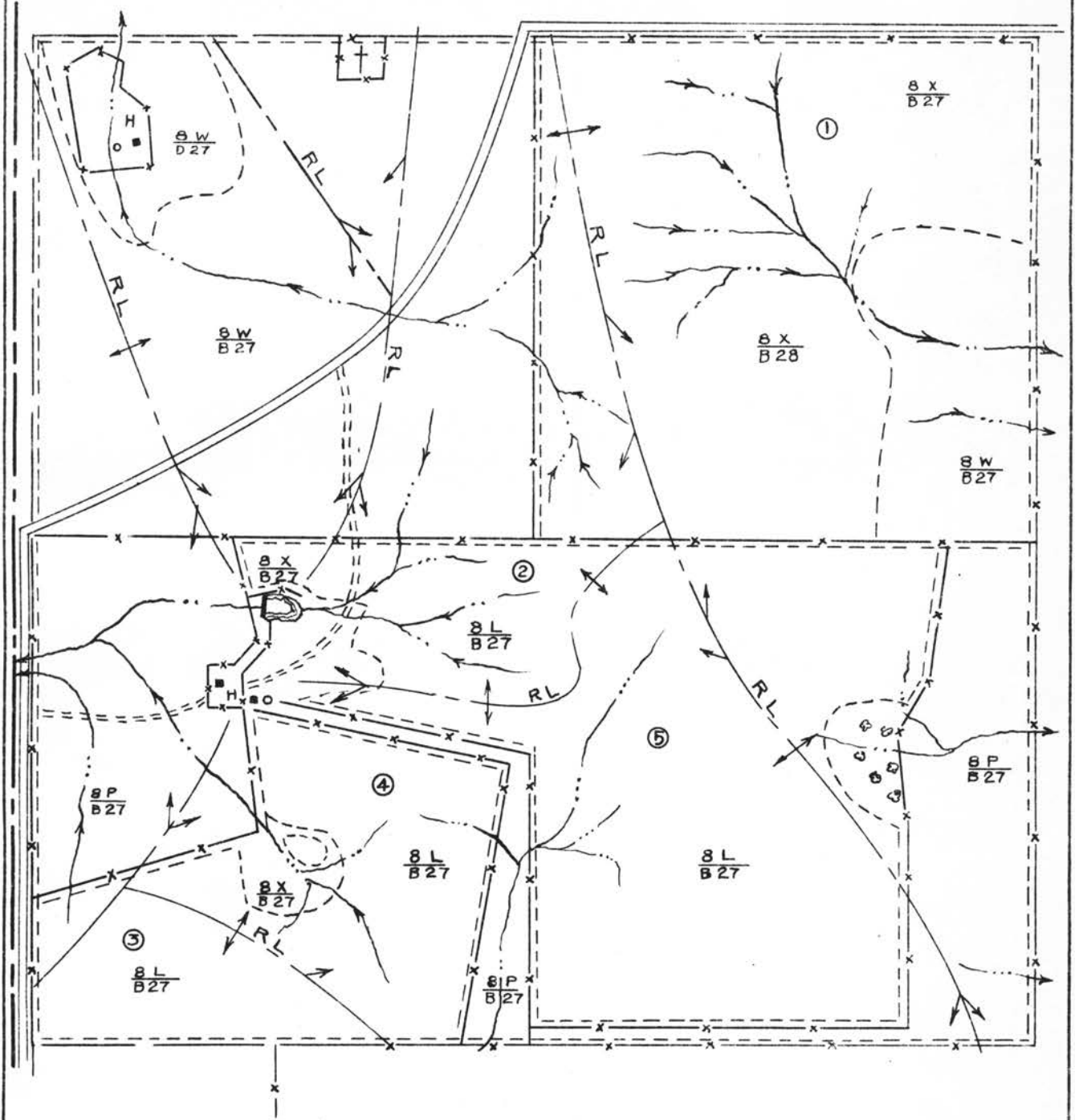
FARM MAP	
SW 1/4 SEC. 3-T14N-R20E	JOB 107
PLANE TABLE: C. E. W.	4-22-37
TRACED: P. H. F.	Scale 1" = 400'
APPROVED: R. L. W.	

MAP NO. 9



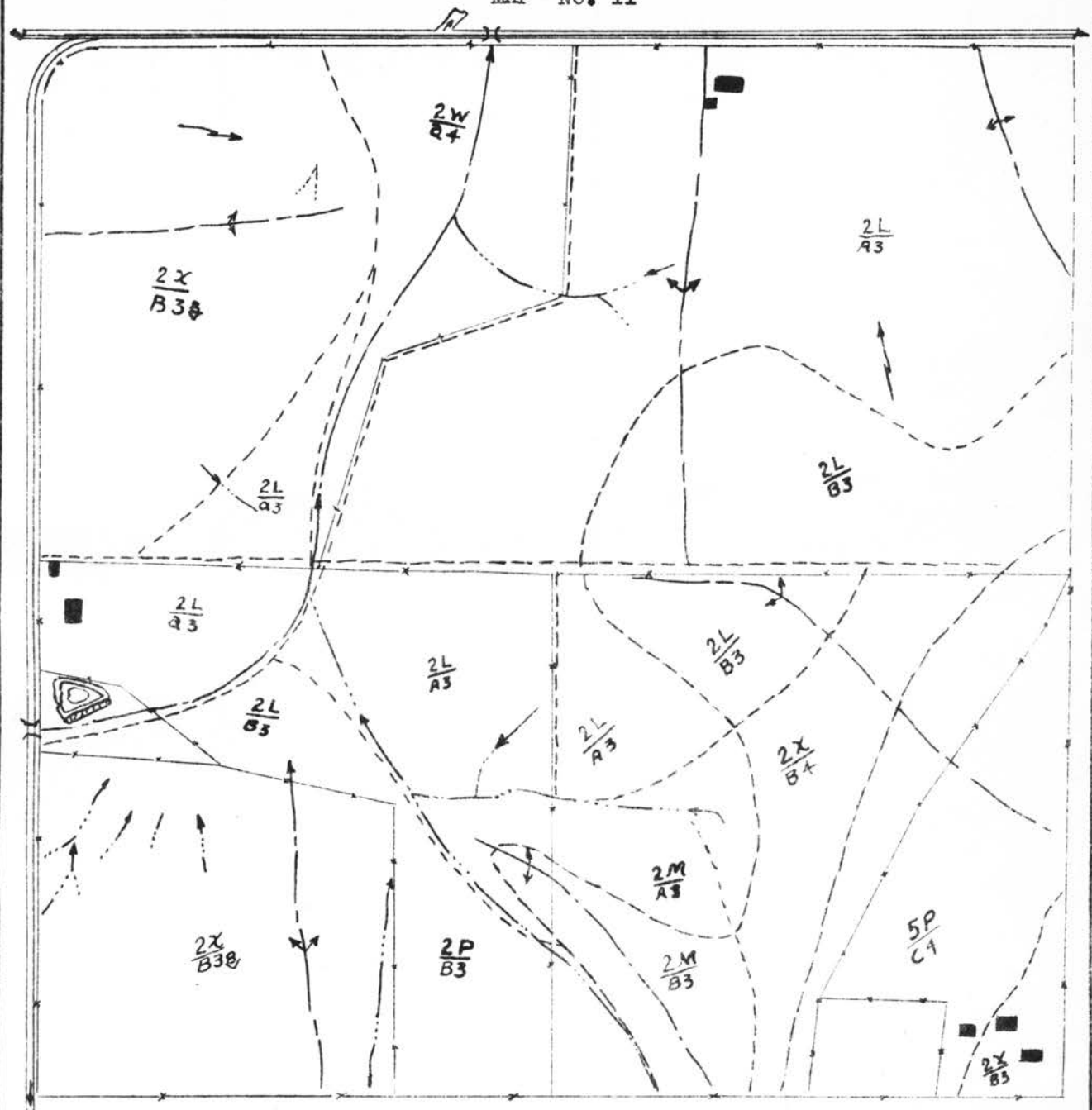
FARM MAP	
MW 1/4 S12, T11N, R20E	Job 107
Plane Table: R.L.W	1-29-37
Traced: R.L.W	Scale ~ 1" = 400'
Approved: R.L.W	

MAP NO. 10



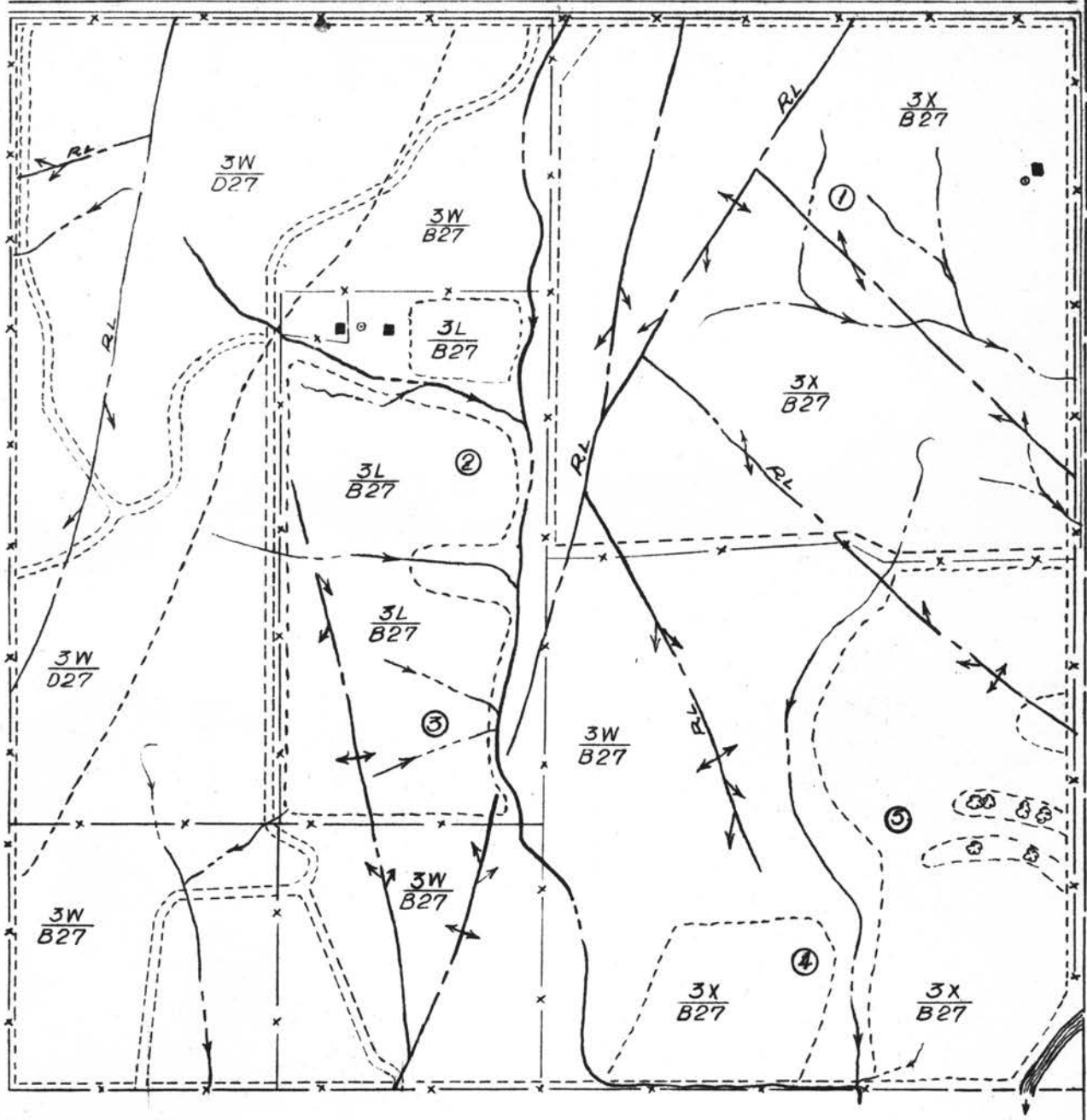
FARM MAP	
NW 1/4 SEC. 17-T14N-R20E	JOB 107
PLANE TABLE: C.E.W.	5-3-37
TRACED: P.H.F.	SCALE 1" = 400'
APPROVED: R.L.W.	

MAP NO. 11



FARM MAP	
NW 1/4 Sec 16 T14N R20E	Job 107
Plane Table: C. S	1-5-37
Traced : T. P	Scale 1" = 400'
Approved: RLW	

Map NO. 12

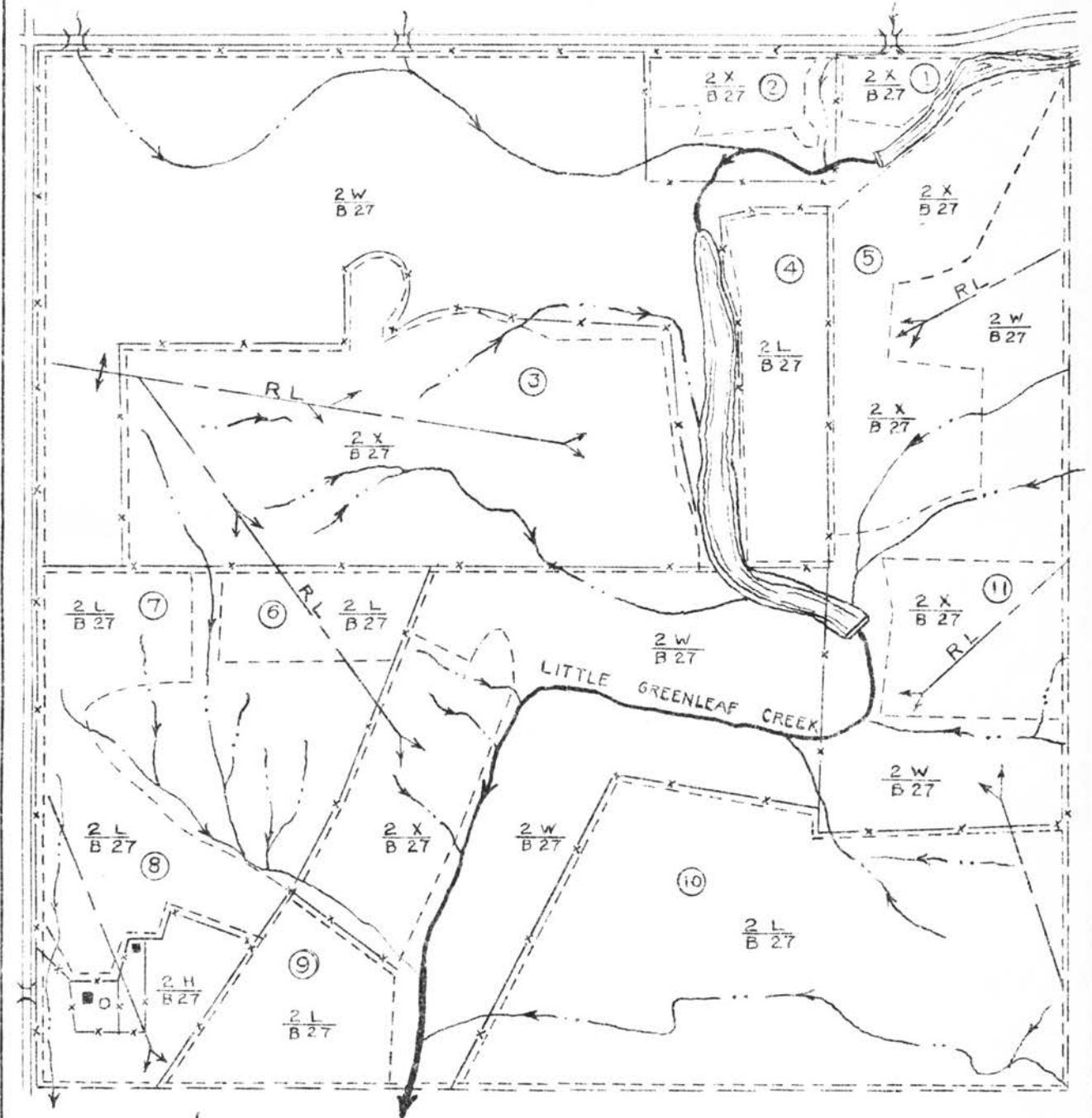


**FARM MAP**

NE 1/4 SEC. 24 T14N. R20E  
 PLANE TABLE: C.E.W.  
 TRACED: H.S.W.  
 APPROVED: R.L.W.

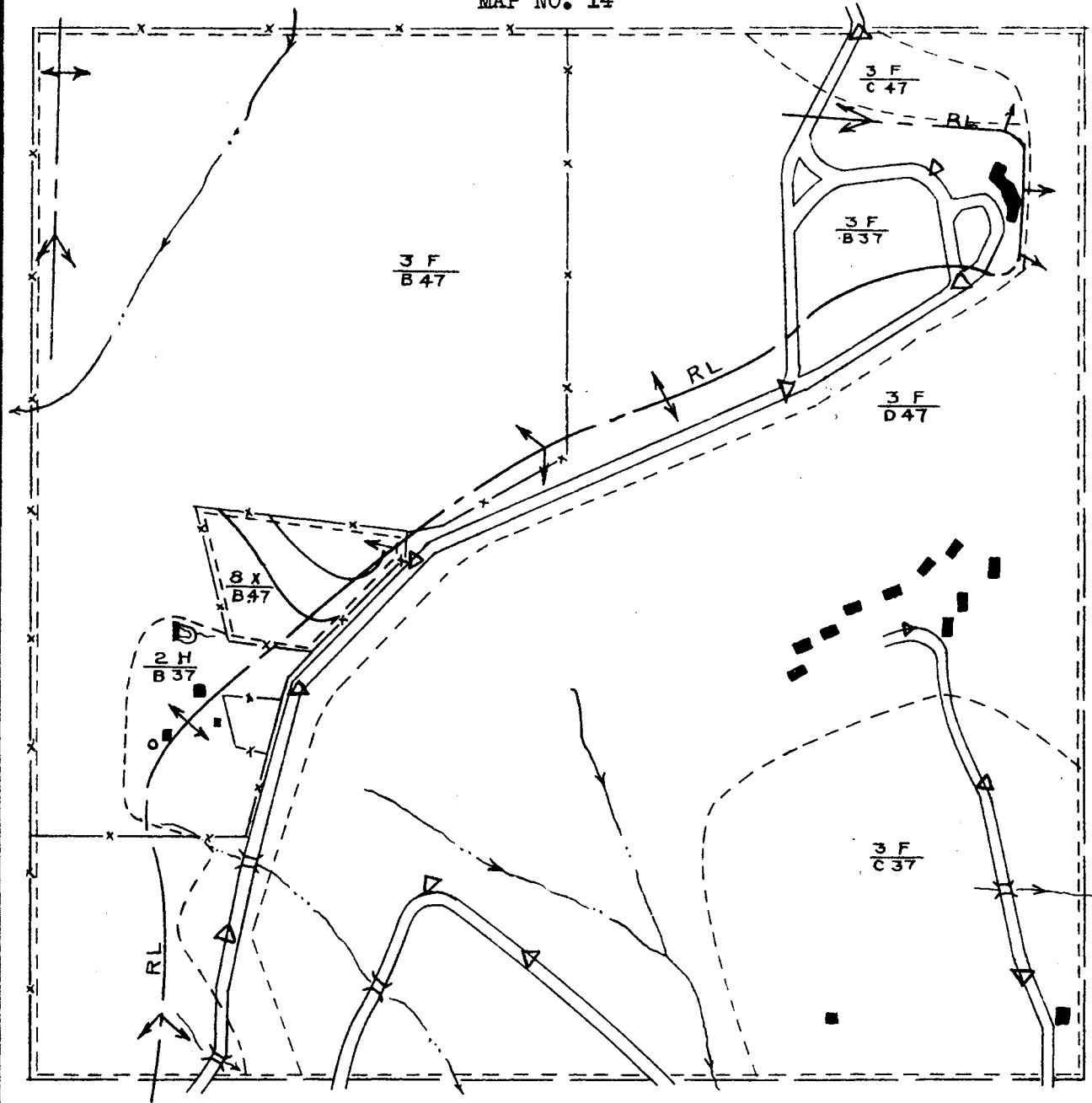
JOB 107  
 5-6-37  
 SCALE 1" = 400'

MAP NO. 13



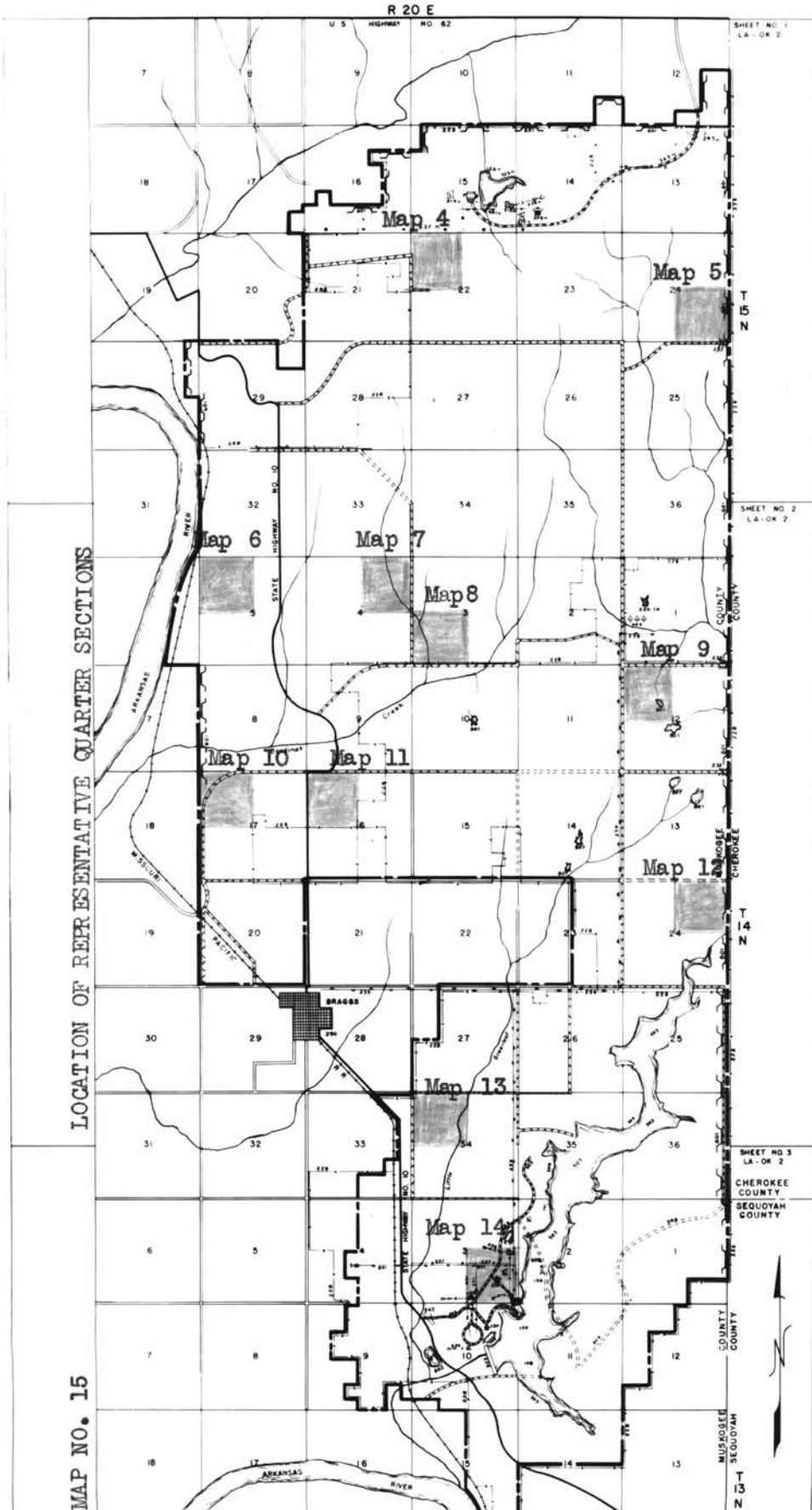
FARM MAP	
NW¼ SEC. 34-T14N-R20E	JOB 107
PLANE TABLE: C.E.W.	5-11-37
TRACED: P.H.F.	SCALE 1"=400'
APPROVED: R.L.W.	

MAP NO. 14



FARM MAP	
SE 1/4 SEC. 3-T13N-R20E	JOB 107
PLANE TABLE: L.D.B.	5-27-37
TRACED: P.H.F.	SCALE 1" = 400'
APPROVED: R.L.W.	





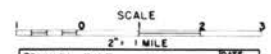
- PROJECT AREA BOUNDARY
- PRESENT HIGHWAYS
- EXISTING COUNTY ROADS TO BE MAINTAINED AS PARK ROADS
- SECONDARY ROADS TO BE MAINTAINED AS FIRE & TRUCK TRAILS
- PARK ROADS
- TRUCK TRAILS
- NATURE TRAILS
- SEWER LINES
- TELEPHONE LINES
- WATER LINES
- HOE WIRE FENCE
- CATTLE GUARDS
- FIRE BREAKS
- BEACH IMPROVEMENTS
- FORDS
- POWER LINES
- ENTRANCE GATES
- WARE HOUSE
- BATH HOUSE
- OVER NIGHT CABINS
- DWELLING
- LATRINE
- LODGE
- SHELTERS
- STORAGE HOUSE
- IMPOUNDING DAM
- DISPOSAL BED
- TANK CESSPOOL
- WATER WELL
- CLEARING & CLEANING RESERVOIR SITES
- NURSERY
- SAWMILL
- OVERLOOKS
- PICNIC GROUNDS
- FISH HATCHERY
- FARM PONDS

NOTE: GENERAL LAND TREATMENT THROUGHOUT PROJECT AREA.

- 107 SKETCH MAPPING
- 108 CLEARING LAND
- 108 B PASTURE IMPROVEMENT
- 125 SEEDING
- 127 SODDING
- 128 SOIL PREPARATION
- 244 SIGNS
- 401 CHECK DAMS
- 402 DIVERSION TERRACES
- 404 TERRACING
- 406 CONTOUR RIDGES
- 602 FIRE HAZARD REDUCTION
- 604 STAND IMPROVEMENT
- 605 TREE PLANTING
- 604 FOOD & COVER
- 607 LAKE & POND DEVELOPMENT
- 609 PREDATORY ANIMAL CONTROL

JOB'S DESIGNATED BY SUFFIX 'A' TO BE INCLUDED IN SUPPLEMENT TO MASTER PLAN

U.S. DEPARTMENT OF AGRICULTURE  
 RESETTLEMENT ADMINISTRATION  
 DIVISION OF LAND UTILIZATION  
 REGION VII PROJECT LD-OK-2  
**COOKSON HILLS DEVELOPMENT PROJECT**  
 DEVELOPMENT MAP



DRAWN BY - J.M.F.	DATE
CHECKED BY -	
APPROVED BY -	
REVISIONS:	

## Forest Species continued from Page 49.

Black Haw	( <i>Viburnum prunifolium</i> )	Redbud	( <i>Cersia canadensis</i> ).
Red Haw	( <i>Crataegus</i> spp.)	Dogwood	( <i>Cornus florida</i> )
Persimmon	( <i>Diospyros virginiana</i> )	Buckeye	( <i>Aesculus pavia</i> )
Catalpa	( <i>Catalpa speciosa</i> )	Sumac	( <i>Rhus glabra</i> )
Green Briar	( <i>Smilax rotundifolia</i> )	Blackberry	( <i>Rubus</i> spp.)
Dewberry	( <i>Rubus villosus</i> )	Holly	( <i>Ilex</i> spp.)
Green Ash	( <i>Fraxinus lanceolata</i> )		

The percentages of the dominant species are: black jack (*Quercus marilandica*) 50%, hickory (*Hicoria ovata*) 20%, red oak (*Quercus texana*) 5%, American Elm (*Ulmus Americana*) 5%, and miscellaneous 15%.

## The pasture and field species are:

Broom Weed	( <i>Amphichyris dracunculoides</i> )	Dock	( <i>Rumex</i> spp.)
Snow-on-the-Mountain	( <i>Euphorbia marginata</i> )	Thistles	( <i>Sonchus</i> spp.)
Bitter Weed	( <i>Helenium tenuifolium</i> )	Sandbur	( <i>Senchus</i> spp.)
Dandelion	( <i>Paraxacum officinale</i> )	Ragweed	( <i>Ambrosia</i> spp.)
Horse Weed	( <i>Erigeron canadensis</i> )	Plantain	( <i>Plantago</i> spp.)
Partridge Pea	( <i>Camaecrista fasciculata</i> )	Aster	( <i>Aster</i> spp.)
Crab Grass	( <i>Digitaria sanguinalia</i> )	Ironweed	( <i>Vernonia</i> spp.)
Prairie Clover	( <i>Petalostemon</i> spp.)	Thistle	( <i>Cirsium</i> spp.)
Yarrow	( <i>Achillea millefolium</i> )	Gaura	( <i>Gaura</i> spp.)
Big bluestem	( <i>Andropogon furcatus</i> )	Cocklebur	( <i>Xanthium</i> spp.)
Sandhill Bluestem	( <i>A. hallii</i> )	Foxtail	
Little Bluestem	( <i>A. scoparius</i> )	Grass	( <i>Setaria</i> spp.)
Silvery Beard	( <i>A. tenarius</i> )	Wild Barley	( <i>Hordeum</i> spp.)
Silver Beard	( <i>A. saccharoides</i> )	Button Weed	( <i>Diodia teris</i> )
Switch Grass	( <i>Panicum virgatum</i> )	Nightshade	( <i>Solanum</i> spp.)
Indian Grass	( <i>Sorghastrum nutans</i> )	Milkweed	( <i>Asclepias</i> spp.)
Bermuda	( <i>Cynodon dactylon</i> )	Evening	
Pasplums	( <i>Pasplum</i> )	Primrose	( <i>Onethera</i> spp.)
Panicums	( <i>Panicum</i> spp.)	Prickly Pear	( <i>Opuntia</i> spp.)
Drop seeds	( <i>Sporobolus</i> spp.)	Blazing Star	( <i>Liatris</i> spp.)
Purpletop	( <i>Triodia flava</i> )	Vetch	( <i>Vecia</i> spp.)
Tickle Grasses	( <i>Eragrostis</i> spp.)	Vetching	( <i>Lathyrus</i> spp.)
Tickle Grasses	( <i>Lepteloma</i> spp.)	Wire Grass	( <i>Stipa</i> spp.)
Prairie Three-awn	( <i>Aristida oligantha</i> )	Smartweed	( <i>Polygonum</i> spp.)
Purple Three-awn	( <i>A. purpuea</i> )	Pigweed	( <i>Amaranthus</i> spp.)
Johnson Grass	( <i>A. halapense</i> )	Sun Flower	( <i>Helianthus</i> spp.)
Lamb's Quarter	( <i>Chenopodium album</i> )	Morning	
Sensitive Briar	( <i>Desmanthus</i> spp.)	Glory	( <i>Ipimoea</i> spp.)
Sweet Clover	( <i>Melilotus</i> spp.)	Lespedeza	( <i>Lespedeza</i> spp.)
Carolina Clover	( <i>Trifolium carolinenum</i> )	Peppergrass	( <i>Lepidium</i> spp.)
Hop Clover	( <i>Trifolium dubium</i> )	Rattlebox	( <i>Crotalaria</i> spp.)
Wild Bean	( <i>Strophostyles</i> spp.)	False Indigo	( <i>Baptisia</i> spp.)
Lead Plant	( <i>Amorpha canescens</i> )	Wild Alfalfa	( <i>Psoralea</i> spp.)
Tick Trefoil	( <i>Meibonia</i> spp.)	Loco Weed	( <i>Astragalus</i> spp.)

The vegetation in the area has receded from desirable species to the less valuable ones at the present fully 90 per cent of the area is covered by weedy species of forest trees, grasses, and herbs.

#### THE RESETTLEMENT ADMINISTRATION

This section of Eastern Oklahoma has degraded to such a point that the inhabitants are living more like primitive men than in a modern civilization. Earning power was reduced, farm lands and pastures failed to yield a substantial production, homes have deteriorated and the social relations are on a very low plane. (See Picture No. 27, Page 67). Seventy-six (76) per cent of the families are now on relief; 90 per cent of the farm land is mortgaged; and the total possessions of the average family is valued at less than \$100. Realizing these conditions were un-American, the Federal Government has stepped in and instituted a Resettlement Project in this territory.

#### Purpose and Type of the Project

There are two chief purposes that promoted the inception of the Eastern Oklahoma Land Utilization Project. The first is to give the families who reside within this submarginal area an opportunity to regain the standard of living enjoyed before they were reduced to less than a hand-to-mouth existence by increased number of resident families, the lack of proper care of the soil, the over-pasturing of grass land, and the clearing of timbered hill sides unsuited for cultivation. The second purpose is to demonstrate proper land utilization by restoring the land to its original productivity with soil conservation methods, the building of lakes and ponds, revegetation, reforestation, and establishing a recreational center. (See Picture No. 28, Page 67).



Ex. Con. - 8  
LD-OK-2

Picture No. 27  
One of the better farmsteads



LDOK2  
CONS36

Picture No. 28  
Terraces in an  
abandoned field.

The Government program is separated into two main divisions--namely: rural rehabilitation which consists of purchasing good farming land and relocating the residents of the area, and land utilization which consists of purchasing the land within the area and the introduction of land management practices.

### Rural Rehabilitation

Farmers moved from the area and now occupy good farming land either in Muskogee County or an adjoining county. This gives them a chance to continue producing crops with which they are familiar under general weather conditions to which they are accustomed. Several families have been moved to each community, but not in such a manner as to have the appearance of colonization. Of necessity these families will adjust themselves to the established community in which they are now located.

The number of persons in each family is the deciding factor on the size of the farm to be purchased. The farms are principally valley land; however, some upland farms were secured. The average on the bottom land runs 55 acres and on the upland around 175 acres per farm. The cost of the land was \$45 per acre, or a total cost of \$3,600 for an average farm. On farms which did not have suitable farmsteads new homes and out-buildings were built. (See Picture No. 29, Page 69). The average cost for the individual farmer was \$2,300 for an average farm. On farms which did not have suitable farmsteads, new homes and out-buildings were built. (See Picture No. 29, Page 69). The average cost for the individual farmer was \$2,300 for improvements. This cost included construction of the house, outbuildings, fences, and the well. In order to operate these farms the families made loans through the Government that averaged \$800 for operation and subsistence goods, which



Picture No. 29

A farmstead on a newly purchased resettlement farm. Note: the five-room house, chicken house, and barn.



Picture No. 30

A newly resettled farm wife with her flock of Rhode Island Red Chickens.

included livestock, seeds, and feed. These farms are to be purchased from the Government by the residents on an amortization plan, at 5 per cent interest with 40 years in which to liquidate the total cost of the land and farmstead.

Each family is under strict supervision of a farm manager and home economist which are similar to county and home demonstration agents. Farm plans are worked out each year covering suitable rotations and choice of crops. Livestock of good quality was purchased in order to sell the offsprings at a better price. (See Picture No. 30, Page 69). Certified foundation seed stock was purchased in order to insure good crops and to raise seed for sale. (See Picture No. 31, Page 71).

During the first year of operation supervisors of these farms were well pleased with the crops and livestock increases. (See Picture No. 32, Page 71). Sixty-five (65) per cent of the clients were able to pay their operating loans in full and to make a substantial payment on the total investment. Thus, it can easily be assumed that these people were not entirely a shiftless group but partly were victims of circumstances and in need of an opportunity.

#### Land Utilization Demonstration

The Land Utilization section can well be separated into five divisions--namely: soil and water conservation, grazing, reforestation, wild life, and recreation. (See Map No. 16, Page 72).

#### Soil and Water Conservation

Thousands upon thousands of years were required for nature to build the soils contained within the area. However, only a comparatively short time elapsed between the settling of the area and the almost complete destruction thereof. Sheet erosion has removed from 25 to 100



Picture No. 31

A corn field on one of the newly purchased resettlement farms.  
Note--the man in the foreground is nearly 6 feet in height.



Picture No. 32.

A resettlement farm wife and some of her products.





per cent of all the top soil in the area and gullies are so numerous that fields are difficult to cultivate. Most of the erosion in the area is due to uncontrolled water. Thus, by building ponds and lakes in which to store surplus moisture and by making mechanical structures to divert the water to these, further erosion can be prohibited and the land will have a chance to regain some of its fertility. Farm ponds covering from 1 to 10 acres are placed in the area at convenient watering places for livestock. These ponds are also used as fish hatcheries and landing places for migratory water fowl. (See Picture No. 33, Page 74).

At the writing of this paper land development was in full operation. All pastures that are not excessively steep or hilly are to be contour furrowed. (See Picture No. 34, Page 74). A narrow ridge plowed from the upper side only is used and furrows are spaced from 15 to 20 feet apart. The ridges are seeded to either native grasses, bermuda grass, or legumes. (See Picture No. 35, Page 75). All fields are to be taken out of cultivation and, where practical, seeded to native grasses, bermuda, or legumes. On the more sloping land terraces are to be constructed, (See Picture No. 36, Page 75), and on the more nearly level land contour furrows will be used. (See Picture No. 37, Page 76). Gully erosion will be controlled in the pastures and fields by check dams made of rock, tin, brush, and poles. (See Pictures No. 38, Page 76 and No. 39, Page 77). The upper and lower sides of each check dam will also be sodded with bermuda. Trees are planted along each gully and especially around the check dams.

Many of the native meadows have been protected for the past two years; consequently a good seed crop was produced. The method of seed-



Picture No. 33  
One of the conveniently located farm ponds.



Picture No. 34  
A contour furrow pasture.



Picture No. 35  
A terraced abandoned field. Note--  
The bermuda grass growing on the rocks  
and gravel.



Picture No. 36  
Contoured abandoned field.



Picture No. 37  
A terraced field.



Picture No. 38  
Check dams made of scrap sheet iron across a large gully. Note:  
The small trees growing in the foreground.



Picture No. 39  
Check dams built of native stone.



Picture No. 40  
Check dams across a gully in a field which was formerly cultivated.  
Note: The seedling trees which were planted among the dams.

ing native grasses was by scattering the mature seed stalks which were mowed on the land to be seeded. The legumes which were planted are: hairy vetch, Korean and common lespedeza, alfalfa, sweet clover, black medic, yellow hop clover, cowpeas, and bur clover. Other than the native grasses which will be seeded are bermuda, Italian rye and sudan. These are sown with cyclone seeders at the rate of about four to five pounds per acre. This thin seeding was done in order to cover a larger acreage of land with a limited amount of seeds. It is hoped that by the above operations and controlled grazing much of the prairie can be revegetated and that within a few years much of the vegetative cover will be restored.

#### Reforestation

Countless acres of good forest timber, which required centuries to grow, were ruined by the lack of care, forest fires, and greedy lumbermen in only a few years. Methods of improving these run-down forests are stand improvement, planting of desirable species, control of forest fires, and other recognized forestry practices.

In order to accurately care for the planting of new species of forest trees a nursery was installed in which the seedlings are to be grown. This nursery covers approximately 30 acres of land and is amply supplied with water for irrigation purposes. It has a potential production of about one million pines and cedars, and about five million species such as coffee bean, mulberry, catalpa, post oak, red oak, locust, etc. The production of seedlings in the locality where they are to be planted is desirable because better adapted species can be produced and they are obtainable at the time best suited for planting with much less expense involved. The nursery is valuable not only from the standpoint of reforestation of the immediate area but can be used

strational value of a small nursery is also very important. Seeds used in planting the nursery are gathered from trees in the area.

Approximately 15,000 acres of the original timbered land has been set aside for reforestation practices. The planting of seedlings will be done only on land that was originally forest and cleared for cultivation, on cut-over forest land, gullies and check dams, and in a few demonstrational plots over the area. (See Picture No. 40, Page 77). The seedlings will be planted about one foot apart in the rows which are spaced two feet apart and on the contour.

Stand improvement consists of removing the undesirable species such as black jack, elm, and persimmon, cutting the deformed and diseased trees, and of thinning the stand to where each tree left will have an opportunity to develop into a good lumber tree.

Forest fires are controlled by the building of several look-out towers whereby they might be located. Fire hazards are reduced by cleaning up fence rows and other places where fires could start and by building truck trails to combat the fires in case they should get started.

#### Grazing

Approximately 9,000 acres of land will be set aside for grazing purposes and 3,000 acres of land will be used as a meadow. The land set aside for pasture purposes is in much need of improvement. As is previously stated all the pastures of the area are in a run-down condition. Improvement work to be done is reseeding of native grasses and legumes, control of weeds, persimmon and sassfras sprouts. (See Picture No. 41, Page 80). The pastures will be contour furrowed and where gully erosion is serious check dams will be used. As yet the exact





Picture No. 41  
Sassafras and persimmon sprouts combined with a dense growth of weeds  
on land which was formerly covered by native grasses.



Picture No. 42  
The earthen dam across Greenleaf Creek  $5\frac{1}{2}$  miles south of  
Braggs, Oklahoma.

plan for management of the pasture has not been completed. It is assumed that the pasture will either be leased out to private concerns or will remain under the control of the Government. A demonstration grazing set up will be used on various systems of grazing, rotation, deferred, supplemental, and others. It is further assumed that none of the area will be grazed until such time when the new growth of grass is sufficiently established as not to be harmed by either tramping or pasturing.

#### Wild Life

These hills were at one time covered with an abundance of all kind of wild game and fish. However, due to the plundering of the settlers and so-called sportsmen of the cities, the supply has dwindled until now a majority of the species are extinct. It is the desire of the agency to replenish the area with all kinds of wild life.

Restocking the area with game is to be accomplished by releasing wild turkey, quail, pheasants, prairie chickens and by filling the lakes and ponds with fish. Food and cover plots have already been established and planted to grains which will be left for feed and protection of the new game. Breeding ponds have been built for fish. These ponds also will be used for landing and nesting places for ducks and geese. The area will be used as a restocking ground for the surrounding territory and state as it will be patrolled at all times and only a limited amount of the game will be killed.

#### Recreation

Approximately 2,000 acres of land have been set aside as a recreational park. The park will consist of a lake, hunting and fishing grounds, picnic area, over-night cabins, bath house and beech, scenery trails, and lodge.

About 900 acres have been cleared for the basin of a large lake which will be supplied by the spring-fed ever-running waters of big Green Leaf Creek which has a water shed of 5,500 acres. At a point near State Highway No. 10 and five and one-half miles south of Braggs a 59 foot dam has been constructed. (See Picture No. 42, Page 80). This dam is built between two precipitous hills which form natural abutments. The dam is of earthen construction with native rock riprapping on the water front side. The spillway consists of a large basin which is of ample size to care for the over-flow of the lake. The lake will be used for fishing, boating, swimming, and as a landing place for water fowl. (See Picture No. 43 and Picture No. 44, Page 85).

The hill at the north end of the dam is called "picnic hill", and it is here that the almost level surface has been cleared of all under brush, landscaped, and made into a restful picnic area. Rustic benches and tables made of logs four and five feet in diameter are spaciouly and conveniently placed under well pruned native oak trees. (See Picture No. 45, Page 84). Near these tables are built natural stone and iron grills, all placed within easy distance to the incinerators.

From the picnic area an almost mountainous and well-graded road winds its way down the east side of the hill to the lake shore. Here is a bath-house and a wide sandy beach. The bath-house is built of a rustic native stone and contains dressing rooms, showers, check rooms, rest rooms, and an elaborate drinking fountain. An attractive concession room embraces the front entrance. Ten over-night cabins are conveniently placed on the lake shore. (See Picture No. 46, Page 84). These cabins are built of native stone containing from two to four rooms, each including a screened porch, shower, toilet, and clothes closet.



Picture No. 43  
A view of the east shore of Greenleaf Creek.



Picture No. 44  
A view of the west shore of Greenleaf Creek.



Picture No. 45  
A view of the Picnic Grounds.



Picture No. 46  
Overnight cabin on the east shore of Greenleaf Creek.

Massive table rocks are used for the mantle shelves of the enormous chimneys. These fireplaces are equipped with cooking cranes and hooks. A spacious lodge built of native stone stands on the edge of the hill to the west of the lake body. (See Picture No. 47 and Picture No. 48, Page 86). Two-inch cedar doors lead into the museum and dining hall. The dance hall, or lounge and game room, which has numerous casement windows on the east and west sides, is 55 feet in length and 35 feet wide. A huge chimney occupies the south end and immense oak timbers support the rafters. The room will be furnished with handmade oak and cedar furniture. From a hall leading from the museum a well equipped kitchen and dining room are entered to the right. The dining room is 40 by 20 feet and contains 24 tables, seating approximately 100 guests. The lodge also contains a dressing room, rest rooms, a concession room, and a general store room.

Several miles of nature trails have been constructed which lead from the lodge to the beach and cabins, and along the lake shore for miles. These trails form a winding stair which descends the sides of Green Leaf Mountains and furnish wonderful natural scenery. (See Pictures No. 49, Page 87 and Nos. 50 and 51, Page 88). From the lodge can be seen the clear water of Green Leaf Lake for miles. This recreational park will be open to the public and the average family can use it as charges will be nominal.

#### Miscellaneous Operations

A job of this kind is a gigantic undertaking as much skilled labor is involved. The completion of the project required specialist in the line of civil and mechanical engineering, real estate, agronomy, agricultural engineering, ecology, rock masonry, carpentry, trucking,



Picture No. 47

The Lodge



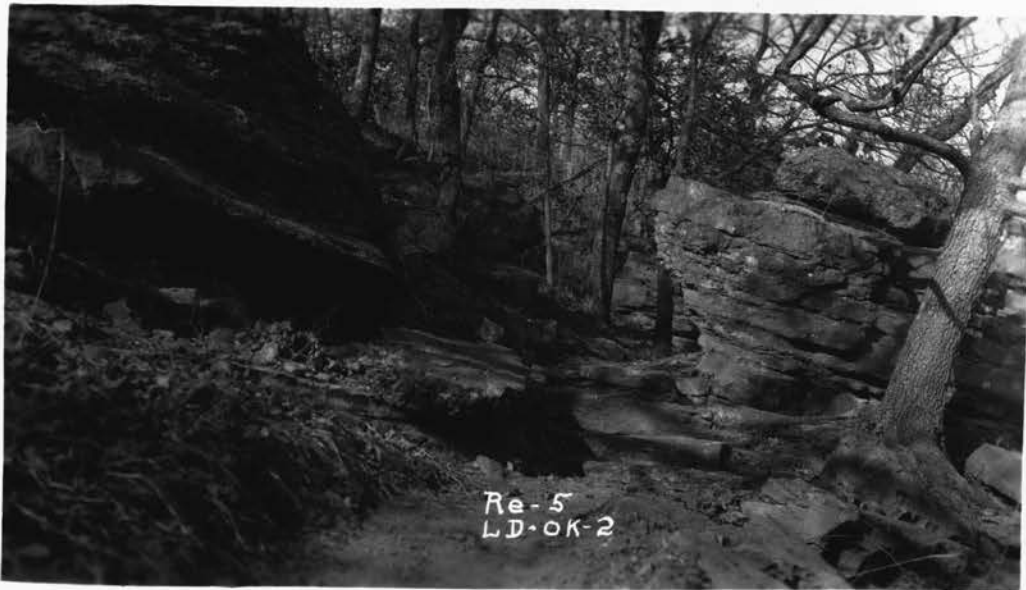
Picture No. 48

The Lodge



Picture No. 49  
Rock steps on one of the nature trails ascending  
the mountain west of the lake.





Picture No. 50

A beauty spot on the lake shore.



Picture No. 51

A scene from Look-Out Tower. Note: Arkansas River in the background.

mechanics, farming, and other trades. Since this project was installed as an emergency relief program all the labor possible was performed by common laborers, requiring the services of a minimum number of specialists in each line to train the unskilled workers. Men who never worked a day in their life off the farm have been taught trades to their liking. Men were also shifted from job to job so that each man could gain a general knowledge of various trades. The amount of improvement of the unskilled workers is very remarkable. However, if one should compare the first over-night cabin built with the last he would find that the quality of the workmanship has improved ten-fold.

Some of the operations which were required in the completion of the project but which is deemed unnecessary to enlarge upon are obliteration of the farmsteads, obliteration of existing fences, enclosing of the entire area by cattle and hog proof wire, (See Picture No. 52, Page 90), the reversion of existing roads to grass land, building of telephone lines and electric lines, installation of water system which will furnish cool spring water for the lodge, bath house, and cabins, building of a park road, clearing of the lake bed, building of gates, cattle guards, removal of school houses, building of structures such as care taker's home, storage house, and barns, and many more smaller jobs too numerous to mention.

#### Future Management of the Project

At such time when the development of the project is completed the management will be turned over to a competent Government organization. The exact division of the Government which will handle the project has as yet not been decided upon. It has been suggested that the management be turned over to the Oklahoma A. & M. College and that the var-



Picture No. 52

The east boundary fence of the area  
Note: A fence passing through a native  
forest which was cleared in order that  
the fence might be constructed.

ious phases of the project be carried on under experimental operations, the proceeds thereof being turned over to the management agency.

#### Summary

A study has been made of a tract of land included in the Resettlement Administration Project Area. The past, present, and future of the area was considered. The problems involved were people, land, and vegetation. A solution of the problems considered are relocation of the residents on better farms in near-by communities; soil conservation methods for improvement of the sub-marginal land; and reforestation, revegetation and the development of a recreational park. It is assumed that these operations will embrace an excellent land utilization program.

#### Conclusion

The project has a far reaching importance not only in a completed state but also in the developmental stage, as the teaching of trades to common laborers will improve the society of the state and remove many of these people from relief rolls. A breeding place for future criminals has been removed. More than 200 families have been started on their way to financial independence. A much needed recreational park for Eastern Oklahoma, Southern Kansas, Western Arkansas, Northern Texas, and Louisiana has been developed. A Land Use Program for developing sub-marginal land which heretofore believed impossible has been accomplished.

## Literature Cited

1. Bailey, L. H., the Nursery Manual, The Macmillian Co., N. Y.
2. Britton, N. L., North American Trees, Henry Holt & Co., N.Y., 1908
3. Dale, Edward E., Readings in Oklahoma History, Row, Peterson & Co., Evanston, Illinois, 1930.
4. Fimell, H. H., Handbook of Soil and Water Conservation Practices, Soil Conservation Service, Amarilla, Texas, 1936.
5. Gould, Charles N., Oklahoma Geological Survey Bulletin No. 35, Oklahoma City, Oklahoma, 1932.
6. Hitchcock, A. S., Manual of Grasses, U. S. Department of Agriculture.
7. Jones, Grove B., Soils Survey of Muskogee County, Oklahoma, U.S.D.A. Government Printing Office, Washington, D. C.
8. Klinka, K. D., The Great Soils Groups of the World, Thomas Murby Co., London
9. Leopold, Aldo, Game Management, Charles Schribner's Sons.
10. McCall, A. G., Field and Laboratory Study of Soils, John Wiley and Sons Inc., New York.
11. Robinson, B. L. & Ferland, Gray's New Manual of Botany, American Book Co., N. Y.
12. Robinson, G. W., Soils, Their Origin, Constitution and Classification. Thomas Murby Co., London.
13. Russell, R. J., Soil Conditions and Plant Growth, Longsman and Green Company, 1932.
14. Silveus, W. A., Texas Grasses.
15. Snider, L. C., Oklahoma Geological Survey Bulletin No. 27, Oklahoma City, Oklahoma, 1916.
16. Staten, H. W., etal, Agronomy Manual for Oklahoma, Soil Conservation Service, Salina, Kansas.
17. Theburn, Joseph B., A History of Oklahoma, Warden Company, Oklahoma City, Oklahoma, 1914.
18. Tourney, J. W., and Korstian, C. F., Seeding and Planting in the Practice of Forestry, John Wiley and Sons Inc. New York.
19. Wilson, C. P., The Artificial Reseeding of New Mexico Ranges, New Mexico Experiment Station Bulletin No. 189.

Typist: Ruby J. Kilgore

1938