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STUDY IN CONSERVATION.

The Ohio State University, Ph.D., 1960
Geography

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AN ANALYSIS OF LAND USE IN CENTRAL-NORTH FLORIDA:
A STUDY IN CONSERVATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Harold Milton Rose, B.S., M.A.

The Ohio State University
1960

Approved by:

[Signature]
Advisor
Department of Geography
PREFACE

The writer's interest in the subject of conservation extends back to 1954, at which time he was given the assignment of teaching a course in this area at the Florida A. & M. University at Tallahassee. After three years of teaching conservation the writer decided to pursue further graduate study with emphasis upon this aspect of geography. Prior to returning to Columbus in 1957, the writer had become quite familiar with the problems confronting Florida, the nation's third most rapidly growing state. In 1956, the writer received an appointment to serve on The Governor's Conservation Committee, an experience which proved invaluable. In order to finance further graduate study, the writer received a fellowship from the John Hay Whitney Foundation for the period 1957-1958 by proposing to undertake a rural land-use study of northwest Florida. Since that time it was decided to limit the areal extent of the proposed study area, but also to expand the scope of the study by including both rural and urban land use.

The present area, which embraces part of ten counties, was selected because it represented one of the more serious problem areas in the state. After considerable investigation of the physical qualities of this area, the writer
discovered that the tentative study area roughly coincided with a subdivision of a Thornthwaite moisture region. Realizing the potential of the Thornthwaite water budget concept, it was decided that a moisture subregion could be employed as the regional frame of reference. The writer believes this to be a useful device that can aid in the attainment of a state of conservation. The employment of the water budget by planning agents and technicians should result in increased efficiency in resource management within this section of Florida, where conservation is essential if the area is to develop to its maximum potential.

The writer would like to extend thanks to the many persons who have assisted in making this study a reality. From Dr. Alfred J. Wright the writer has received much inspiration and sound advice, which have been of utmost value. Thanks also go to Dr. Robert M. Basile for cartographic advice. To my wife, Ann, I owe much, for patience and understanding exhibited throughout this entire period of graduate study.
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INTRODUCTION

The purpose of this study is to point out problems of land use which have developed out of the interactions of human, cultural, and natural aspects of the environment occupying that area that we here refer to as Central-North Florida. The purpose of this study is not only to point out these problems, but to indicate what is being done and what might be done to accelerate the elimination of existing problems. In order to identify current problems it was necessary to inventory land-use patterns. It was found in some cases that these patterns did not occupy areas that were best suited for the existing type of land use. Thus, the problems that have developed are partially the result of faulty management decisions, lack of capital to carry out desirable practices, ignorance, and a weak land resource base. The elimination of problems associated with resource use has become popularly known as conservation.

A concerted effort, on the part of the American public, to eliminate problems of resource use, did not get under way until the first decade of the twentieth century. Since the first White House Conference in 1908, the conservation movement has gained momentum, but during the periods of extreme prosperity the interest in conservation
tends to wane. Individuals have clamored for a variety of reforms under the conservation banner as a result of the flexibility of the concept. The most popular definition of conservation today, as was true a half century ago, is that of "wise use." Recently Scott defined conservation as "a public policy which seeks to increase usable supplies of a natural resource by present actions."¹ This definition seems to be a very meaningful one. Although definitions of conservation are highly varied, they all imply positive value judgments.

Conservation research is undertaken by individuals representing an array of disciplines ranging from agriculture to zoology; although many of these disciplines focus their attention upon a limited area of interest. Geography, because of its traditional concern for spatial relationships, has become one of the more important disciplines engaged in conservation research. Melvin is of the opinion that the contribution made by geography to conservation is unique because of its emphasis on (1) areal differentiation in terms of environmental conditions, (2) areal differentiation in cultural phenomena, and (3) the study of interrelationships of environmental and cultural conditions.

as they function in specific regions. The geographer's contribution to conservation is centered around the use of certain problem-solving techniques. These techniques involve (1) definition of the problem, (2) survey, (3) analysis, and (4) synthesis. Bruckheimer feels that the emphasis on conservation should be reappraised, and goes on to say "little emphasis, none at all times, is given to the discussion of conservation problems as social problems—that is, problems of social policy, problems of action, problems of instrumentation which necessarily involve a discussion of social conditions and those values basic to a liberal democratic society." It therefore appears that the geographer should develop a better balanced approach to the solution of the problems of this systematic specialty.

There exists a variety of ways in which resource problems may be approached, but the following three represent those most frequently used: (1) an economics-
engineering approach, (2) the ecological approach, and (3) the ethical or esthetic approach.5 The approach employed in the study of resource problems largely depends upon the discipline or disciplines involved in the study. The first two currently appear to be more popular, but there are geographers who strongly defend the merits of the latter. Weaver recently reiterated the convictions of Aldo Leopold in which he stated "the conservational concept was imbedded in the realm of moral and ethical behavior of religion itself."6 It is believed that better resource studies might possibly be developed by harmonizing the various research techniques in attempting to understand resource problems.

The area under investigation is situated in the central part of mainland Florida, embracing approximately 5,630 square miles and includes all of Calhoun, Gadsden, Gulf, Franklin, and Liberty counties and parts of Jefferson, Jackson, Leon, Bay, and Wakulla counties. It was here that Anglo-saxon settlement developed its initial foothold in Florida, with early settlers coming largely from nearby states, but many coming from as far away as Virginia. The white man was preceded here by the Indians and later Negroes,


who found this a haven for runaway slaves. This area was the most densely settled part of Florida during the territorial period and by 1840 had a well established plantation economy. During the territorial period this area was known as "Middle Florida" because at this time development was largely confined to the area lying between Pensacola and Jacksonville. Presently the terms "Northwest Florida" and "The Big Bend" are employed by some to describe all or parts of the area.

Central-North Florida's economic position in the state has declined since 1840 from one of pre-eminence to one of stagnation, when compared with the rapidly expanding economy of the peninsula. The Civil War and its aftermath did much to impede growth in this section of the state, but in South Florida, the focus of most attention today, was not influenced by this tragedy, owing to the fact that development was not initiated here until a later date. The economic revitalization of the plantation economy in this area after the great conflict was slow and never reached its prewar level. The extension of railroads into the peninsula during the late 1800's did much to open America's last frontier.

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South Florida. Thus, today the peninsula is one of the fastest growing areas in the nation, whereas Central-North Florida, as well as other parts of the mainland, are only slow growing areas.
CHAPTER I

PHYSICAL QUALITIES

In undertaking a study in conservation it is necessary that we become familiar with qualities of the natural environment in order to assess accurately the potential of the region. The physical character of an area sets outer limits beyond which man can do very little with the aid of the available cultural equipment at hand. Some areas are blessed by having a favorable combination of physical qualities, whereas other areas have a limited number of desirable physical qualities, a situation which tends to exert great demands upon the region's inhabitants. It is the purpose of this chapter to investigate the qualities which make up what is generally considered the natural environment, and in so doing it is hoped that it will enable us to appraise more accurately the role of the environmental factor in the economy of Central-North Florida.

CLIMATE

The foremost environmental factor influencing the activities of man is climate, the dominant factor upon which Florida's precarious economy is based. The climate
of the state is far from uniform, with Central-North Florida possessing fewer of the desirable qualities that have made the peninsula a focus of migration and subsequent economic development. Although this is true, climate nevertheless plays a very important role in the economic life of the region.

Köppen classifies the climate of Central-North Florida as humid subtropical (Cfa), while Thornthwaite classifies it as humid mesothermal, with less than half of its precipitation occurring during the summer period and little or no moisture deficiency at any season (B'\(_4\)B'r'a). The elements of climate vary throughout the region in an east-west direction as well as north and south.

Precipitation

The mean annual precipitation for Central-North Florida is 56.1 inches, with the maximum difference between stations being five inches. Monticello, the easternmost station, receives 54.0 inches of precipitation annually, whereas Marianna, the northern and westernmost of the stations receives 59.0 inches. The difference in the amount of precipitation received by these stations is probably the result of Marianna's more northerly location, thereby coming under the influence of fronts more frequently during the winter and spring months. The difference in precipitation
received between these stations in summer and autumn is negligible.

Summer is the wettest season in the region with approximately one-third of the precipitation occurring at that time. A secondary rainy period occurs during spring with the bulk of the precipitation falling during the month of March at each station. Autumn, the driest period of the year, receives less than one-sixth of its precipitation at that time. The single station to receive a large share of its total precipitation during autumn is Carrabelle, a coastal station. This phenomenon is probably the result of occasional tropical storms along the coast during autumn.

The bulk of the region's precipitation is convective, beginning in late spring and predominating through early autumn. At other times there is a predominance of frontal precipitation. The nature of the warm season precipitation is both favorable and unfavorable to various aspects of the economy. The sharp downpours which occur almost daily during mid-afternoon are often responsible for raising ground water levels, which can be quite destructive in those areas characterized by urban sprawl, as well as other cultural developments. It is these torrential downpours that are responsible for accelerated erosion in the hilly northern parts of the region, and the rapid removal of plant nutrients from the soil. Persons dependent upon
the tourist trade as a source of livelihood welcome this type of precipitation, because only for short periods is there an absence of the sun. Having a large percentage of available sunshine also favors the production of a variety of crops in Central-North Florida.

The cyclonic or frontal precipitation of winter is characterized by overcast skies which linger for days. The precipitation falls more gently during this period, with rain occurring during a greater number of hours on each rainy day of winter than of summer. The winter rains produce less damage to the soil, but they discourage the development of a strong winter recreational center. To the south the influence of frontal activity is reduced as the frequency of invading air masses is reduced.

Temperature

Temperature and precipitation are usually considered the most important elements of climate and it is these factors which seriously hinder or promote the development of land resources. In Florida, temperature tends to be the critical factor influencing the stability of a very precarious economy. This is well illustrated by the occurrence of periodic freezes in the state, the last such freeze occurring during the winter of 1958. During the years when these exceptionally low temperatures invade the state, all aspects of the economy suffer severely, but seldom does Central-North Florida suffer as severely as the peninsula
with its recreation, citrus, vegetable, and cattle-based economy.

Within Central-North Florida the annual march of temperature proceeds from a mean January temperature of 54.1° F. to a mean July temperature of 81.6° F. At only one station does the average temperature of the lowest month occur at a month other than January, at Quincy, the lowest temperature occurs in December. The mean average temperatures of the three winter months vary from one to three degrees Fahrenheit. The average temperature of the three summer months exceed three degrees Fahrenheit at only one station, Carrabelle. This condition is somewhat anomalous for we generally think of coastal stations possessing higher winter temperatures and lower summer temperatures, but here the mean July temperature is 86.0° F., which is approximately five degrees warmer than any other station in the region.

The mean annual temperature is 68° F. whereas the annual range is 27.6° F. The greatest difference in the temperature of any two months occur between October and November at each station, with the mean monthly temperature varying between nine and eleven degrees. Thus, from November through March domestic heating is required. Another factor associated with temperature, is the increasing importance attached to the concept of the growing season. The growing season is the time which elapses
between the last killing frost of spring and the first killing frost of autumn. The average length of the growing season in Central-North Florida varies from 305 days in the south to 296 days in the north. Thus a vast range of crops could be produced here, providing the other physical qualities of the environment were favorable.

Potential Evapotranspiration

The concept of potential evapotranspiration is not frequently included in a discussion of the elements of climate, but realizing the influence of evaporation upon precipitation effectiveness it appears only logical to include this concept in order to obtain a more realistic appraisal of the amount of water available for plants. Potential evapotranspiration is defined as the combined evaporation from the soil surface and the transpiration from the plants when water supply in the ground is unlimited. Thornthwaite employed an empirical formula in order to calculate potential evapotranspiration, but indicates that it is a function of air temperature, and in the formula the length of day is combined with mean air temperature in order to make adjustments in seasonal and latitudinal relationships.

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Since potential evapotranspiration is largely a function of air temperature, the potential evapotranspiration curve tends to follow the annual march of temperature. Potential evapotranspiration is greatest at each station during the month of July and is at a low point during the month of January and December. It normally exceeds precipitation in the region during spring and early autumn. Nowhere in Central-North Florida do we have a complete dissipation of soil moisture, but during the period in which potential evapotranspiration exceeds precipitation, stored moisture is utilized, thereby reducing the amount in the soil. When precipitation again exceeds potential evapotranspiration the soil is recharged and the temporary deficit is alleviated.

The climatic factor in Central-North Florida represents the region's one outstanding physical quality, and it is this quality that will largely influence the nature of economic development in the region. Both temperature and precipitation favor the development of a seasonal recreational industry, as well as other aspects of a service-type economy. The influence of climate upon other physical qualities has done much to retard the developmental possibilities in other areas under the present state of technology.
GEOLOGY

In order that we may better understand the nature and character of surface configurations, soils, hydrography, and to some extent the distribution of plant associations, it seems only logical that we momentarily focus our attention upon the platform which supports these elements. Not only is it necessary that we view the platform, but attention must also be focused upon the pillars that support the platform. The materials forming the superstructure of Central-North Florida are young and weak; therefore, limits to the type of development that can take place here are somewhat apparent. Much of the surficial material was deposited during Pleistocene and more recent time, with no major formations extending beyond the Tertiary. Through the use of well borings igneous rock have been identified at approximately 5,000 feet beneath the surface.2 The description of geological formations will be presented in their proper time sequence.

Eocene Series

The Eocene series includes three stages of development in the state, but only two of these took place in Central-North Florida, the Claiborne and the Jackson. The Claiborne group includes the Tallahassee limestone which

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underlies parts of Leon, Wakulla, Calhoun, Jefferson, and Jackson counties. The Tallahassee limestone does not outcrop at the surface and has been identified only by well borings.

Like the Claiborne group, only one formation of Jackson age has been identified in Central-North Florida. This is the Ocala limestone which occurs near the surface extending from the Chattahoochee River westward. The Ocala limestone is yellowish-white in color and granular in texture. The nature of this material makes it readily soluble. The Ocala limestone is exposed at the surface in the northern half of Jackson County, and it is here that the Florida Caverns are located.

Oligocene Series

Five distinct formations were deposited in Central-North Florida during the middle and late Oligocene period. These include the Marianna limestone, the Byram limestone, and the Suwannee limestone, all of which are middle Oligocene in age. Matson and Sanford included within this group the Chattahoochee formation,3 but it has been placed in Miocene time by Cook.4 These three formations constitute the Vicksburg group.


4Cook, op. cit., p. 113.
The Marianna limestone, a soft white shaley limestone, is sometimes referred to as chimney rock, as a result of its frequently being used as a building material. The Marianna extends both east and west of the Apalachicola River resting unconformably upon the Ocala limestone. Regional outcrops of Marianna limestone have been observed only in Jackson County. Solution pits and other large irregular depressions have formed in these limestone strata, thereby giving it a rather unique topographic expression.

The Byram limestone sometimes called Byram marl rests conformably upon the Marianna limestone. The Byram, is a yellowish sandy limestone, which is both soft and porous. This formation is exposed along the Chipola River, and is thought to vary in thickness between 10 and 40 feet. After considerable weathering the lime is leached out of the Byram and a porous sandstone remains.

During late Oligocene two additional formations were laid down. These include the Suwannee limestone and the Flint River formation. The Flint River formation and the Suwannee formation merge in Jackson County, but do not occur elsewhere in the region. The Suwannee limestone, which is a hard yellowish limestone, was found initially along the Suwannee River beyond Central-North Florida. The Flint River formation is a highly porous, sandy and pebbly limestone and is largely confined to northern Jackson County.
Miocene Series

Three groups or stages of formations have been identified in Central-North Florida that are of Miocene age. These include the Tampa stage, the Alum Bluff stage, and the Choctawhatchee stage.\(^5\) This more recent grouping differs somewhat from an earlier one of Cook,\(^6\) and Matson and Sanford.\(^7\) Cook, unlike Vernon and Puri, fails to assign to the Tampa the status of stage, but referred to it as a formation.

According to Cook, the Tampa formation is characterized by much greater variability than is true of the older Ocala and Suwannee formations. This formation has been described by Matson and Sanford as a light colored limestone, varying from creamy white to light gray, containing thin beds of chert and sand. The Tampa is very extensive having been identified in Leon, Wakulla, Liberty, Gadsden, and Calhoun counties, but is only exposed along the valleys of the Apalachicola and Chipola rivers and in a small area in central Wakulla County. This formation is less soluble than the members of the Byram and Marianna limestones, and as a result the areas underlain by this material are characterized by fewer sinks and depressions.


\(^6\)Cook, op. cit., pp. 113-188.

\(^7\)Matson and Sanford, op. cit., pp. 95-148.
The Alum Bluff group of formations were put down upon the Tampa and consists primarily of micaceous sand, sandy clay, and fuller's earth. The Alum Bluff group is comprised of the Chipola formation, and the Shoal River formation. The Chipola formation is confined largely to the vicinity of the Chipola and Apalachicola rivers and might be described as a fine blue-gray to yellow argillaceous sand. The Chipola is more resistant than the other members of the group.

The Shoal River formation is similar in appearance to the Chipola, consisting primarily of fine sands and sandy clay, but is less resistant to erosive action than its associate. This formation is largely confined to the area west of the Apalachicola River and has been observed at the surface in northern Bay County.

The Hawthorn formation, which is composed of a gray phosphatic sand containing lenses of fuller's earth, is located east of the Apalachicola River and underlies most of Gadsden and northern Jefferson counties. A number of lake basins of considerable extent have also been weathered in parts of the Hawthorn in Leon County.

Pliocene Series

The Citronelle formation of Cook and the Lafayette formation of Matson and Sanford appear to be in question. The 1959 revision of Cook's map of geologic formations in
Florida by Vernon and Purif show no reference to these formations. This seems to imply that the formation is a terrace deposit of Pliocene age not occurring at the surface in Central-North Florida. Both Cook and Matson and Sanford had reference to the same formation although using different names. The formation has been described as a deposit of coarse sand and gravel that becomes highly stained on weathering. The Citronelle is thought to occupy areas of high relief in northern Gadsden, Liberty, Leon, and southern Jackson counties. The iron-stained uplands associated with the Citronelle are referred to by various names and in Leon County, the term Tallahassee red hills is employed to identify these uplands. Thus, the presence of high local relief in areas thought to be underlain by the Citronelle is indicative of the resistant nature of the material.

Pleistocene Series

On several occasions during the Pleistocene period Central-North Florida was invaded by the sea. These invasions are associated with the various interglacial periods which followed periods of Pleistocene glaciation. These numerous invasions were responsible for the creation of seven marine terraces extending inland from the shoreline. These terraces include the Brandywine, the Coharie,
the Sunderland, the Wicomico, the Talbot, the Penholloway, and the Pamlico. The heights of these terraces range from 25 to 270 feet.

These observations on the historical geology of Central-North Florida should give some insight into the developmental possibilities of the region under our present stage of technological development. It should now be quite obvious that the soils that develop upon this parent material will be largely characterized by a lack of plant nutrients, highly porous, and quite variable from north to south. The nature and arrangements of the geological strata should also serve to indicate the possible nature of terrain or surface features. Thus for the sake of throwing additional light on the nature of our land resource, we have taken a backward look at the evolution of the superstructure that supports the platform upon which human endeavors take place.

SOILS

The soils of Central-North Florida are characterized by a great deal of variation, thereby making way for a diverse pattern of land utilization. Investigations of the soils of the region began during the nineteenth century and have not as yet been completed. The soil survey of Gadsden County was completed in 1903,9 but no other county

in Central-North Florida has there been a complete survey, although reconnaissance surveys exist for the entire region.

The key to the understanding of the soils of the region is based on the operation of the soil forming factors. Two of the soil forming factors, climate and parent material (geology) have already been treated, thus there remains the necessity of commenting on the role of relief (terrain), organisms, and time. Climate and organisms tend to act upon the passive factors of terrain and parent material through time. The operation of these factors is responsible for the diverse characteristics possessed by the soils of the region.

Characteristics

The high temperatures and abundant year-round rainfall in the area are responsible for the occurrence of rapid chemical weathering. The wide distribution of the more resistant minerals, the leaching of soluble materials, intensive oxidation, and extensive deposits of clay in the subsoil is a reflection of the intensity of the weathering process. The rate of weathering, climate, and parent material have played the dominant role in influencing soil drainage.

In the well-drained areas, a very thin layer of organic matter accumulates as a result of the rapid rate of decomposition. The high annual temperatures are favorable for microbiological activity. The actinomycetes
make up a high proportion of the microbiological population, owing to their tolerance of pseudoarid conditions, which prevails over an extensive area covered by sandy textured material. In areas possessing highly acid soils, there is a pronounced decline in the actinomyces population and an increase in the mold population.

The base exchange capacity of these soils is primarily determined by the amount of organic matter present. It has been found that two millequivalents of exchange capacity per 100 grams of soil for each per cent of organic matter, occurs in most of the mineral soils of Florida. As the soils of the region are characterized by low organic matter content, they also possess low exchange capacities which tend to decrease with depth.

Impeded drainage characterizes areas with an accumulation of clay in the subsoil. Clay subsoils and hard-pan s have developed most extensively in the hilly areas of the region. Here a pronounced difference in soil color can be detected. Color, the most obvious characteristic of soil, varies with conditions of drainage.

10 L. G. Thompson, Jr. and F. B. Smith, Organic Matter in Florida Soils, Bulletin 433, University of Florida Agricultural Experiment Station, July 1947, p. 11.

11 Nathan Gammon, Physical Spectrographic and Chemical Analyses of Some Virgin Florida Soils, Bulletin 524, University of Florida Agricultural Experiment Station, August 1953, p. 21.
throughout the region. Soils which lie on slopes and are well drained are usually red, whereas the well drained soils of the more gentle slopes tend to be yellow. Grayish colors are dominant in areas of poor drainage. The strong red and yellow colors are a reflection of the influence of the soil-forming processes on the iron content of the soil, whereas dark gray colors are indicative of excess moisture.

Relief and texture largely determine the moisture retention capacity of the soils of a given area. The soils of the northern part of the region, because of their medium texture and a greater percentage of land in slope are considered well drained. To the south along the coast, where the relative relief is at a minimum, and the soils are coarsely textured, they are imperfectly to poorly drained. Drainage thus becomes an important factor in the picture of prevailing land-use patterns.

Classification

The soils of Central-North Florida are for the most part mature, with immature soils located along a narrow strip back of the coast and in the valleys of the streams flowing out of the uplands of the north. The mature soils fall into the great soil group classified by Marbut as Red and Yellow Podzols. Both the Red and the Yellow Podzols are found in the region. The broad differences characterizing these soils are so great, that only the general characteristics of the soils of the region are
described. For purposes of local planning a refinement of this order of generalization is necessary in order to determine the use potential of the soils of a limited area. In order to satisfy this demand, Marbut introduced the soil series and soil type at the lower end of his classification scheme. The most recent attempts of soil classification follow this scheme which is based on the dominant role of climate in the soil forming process.

The early classification of the soils of the region were largely based on the type of natural vegetation that the soils of a given area would support. In 1926, a grouping based on the descriptive physical characteristics of the soil itself was produced.\textsuperscript{12} The use of the term "classification" is probably a misnomer, for it appears that no uniform set of criteria were used for the purpose of describing the soils of the state. On the basis of the grouping by Harper, the following nine soil categories were identified: (1) deep dry sand, (2) sandy upland with clay subsoil, (3) flatwoods with clay or hardpan subsoil, (4) flatwoods with calcareous or phosphatic subsoil, (5) miscellaneous hammocks, (6) red loam calcareous, (7) red loam calcareous or phosphatic, (8) muck, and (9) poor soils.

The more recent groupings of Florida soils have followed the scheme devised by Marbut. During the past twenty years maps of Florida soils have been prepared by Henderson\(^\text{13}\) and Bryan,\(^\text{14}\) which show the distribution of soil associations. The classification and mapping of soils on the basis of geographical associations or groups include a number of soil series having a common parent material. Henderson grouped the soils of Central-North Florida as follows: (1) Norfolk-Red Bay group, (2) Marlboro-Greenville group, and (3) Norfolk-Orangeburg group. The first two groups include soil types that are sandy loam in texture, whereas the latter group is comprised primarily of sands. Henderson's grouping differs only slightly from that of Bryan, which was prepared at a later date. Bryan's grouping includes the following associations: (1) Orangeburg, Greenville, Red Bay, and Magnolia group, (2) Norfolk, Marlboro, Tifton, and Ruston group, (3) Leon, Immokalee, Portsmouth, Rutledge, and Plummer group, and (4) Lakeland, and Eustis group. Both, Henderson and Bryan, have grouped their soil associations on the basis of drainage characteristics and their associated effects.


Description and Distribution

The well-drained soil series of the region fall into two categories, those characterized by loamy subsoils and those possessing a loose sandy subsoil. The former series includes the Orangeburg, Greenville, Red Bay, Magnolia, Norfolk, Marlboro, and Tifton, and are referred to as rolling upland soils. The latter group, which includes the Lakeland and Eustis series, fall into the same category, but are excessively well drained owing to their sandy nature. The members of the loam group have been formed from a parent material of noncalcareous sands and limestones of marine origin. They are characterized by gray, grayish-yellow, reddish-brown, and brownish-gray surface soils and red and yellow subsoils that are sometimes mottled. The subsoil tends to be heavier textured than the surface soil, indicating the operation of the podzolization process. The excessively drained sands are generally light gray to brownish-gray in color and have developed on noncalcareous marine sands and clays.

The imperfectly to poorly drained sands and loamy sands occupy the areas referred to as the flatwoods. These soils include the members of Bryan's group three and four and are characterized by gray to black, and black to dark brown subsoils, and surface colors. The imperfectly drained soils are quite variable in character, some being highly acid depending on the nature of the
Figure 3

SOIL ASSOCIATIONS
OF
CENTRAL-NORTH FLORIDA

GULF OF MEXICO

AFTER BRYAN
parent material. Henderson refers to this soil group as groundwater podzols and indicates that the bedrock has had little influence on their development.  

Approximately fifty per cent of Central-North Florida is covered by members of this group, with the Leon series being most extensive.  

Alluvial soils in Central-North Florida occupy a limited acreage, being formed adjacent to the region's larger rivers. The Thompson, Johnston, Bibb, and Ochlockonee series occupy the first bottoms, but because of the problem of drainage are little used for agricultural purposes. The Ochlockonee series represents the most extensive member of this azonal group and is characterized by brown to grayish-brown surface and subsoil. With proper drainage these soils could possibly be utilized much more extensively in the region's agricultural system.  

Quality  

Up to this point we have been concerned only with the physical characteristics of the soils of Central-North Florida, but only in as far as the physical characteristics serve as indicators of the attributes of the soils for human use. Thus soils developing from calcareous parent material are naturally higher in inherent fertility than

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15J. R. Henderson, op. cit., p. 43.
those developing upon a deep mass of noncalcareous sand. Not only does the parent material influence the degree of fertility, but also influences the structure, which is an important factor in the utilization of cultivable land. Though there is a significant difference between the parent material of the northern rolling lands and the southern flatwoods, these differences have been minimized by the active influence of climate upon the surface formation. The Orangeburg, Greenville, Red Bay, and Magnolia have been classed as good agricultural soils by the Soil Survey Division. The Greenville and Magnolia groups have been considered the most fertile soils in the area. The Norfolk, Tifton, Marlboro, and Ruston when properly managed are good soils for general farming. They are generally planted to bright tobacco, peanuts, corn, cotton, and sweet potatoes, with much of the area in timber. The Orangeburg soils like the Magnolia and Greenville, are quite fertile for the region. Generally the same type of crops are planted on these soils as are planted on the Norfolk group. There is one exception here and that is the suitability of the Orangeburg and Magnolia group for the production of shade tobacco. The heavy textured

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17 Ibid., p. 1065.
clayey soils of the Tallahassee and Marianna Red lands are ill-suited for the production of this all important cash crop.

The Leon soils and other members of the groundwater podzols are low in natural fertility and have little agricultural value. Though in parts of the region, with proper management, they can be used to produce general farm crops on a limited scale. These soils are used largely for forestry and grazing.

The dry sands of the flatwoods are deficient in most plant nutrients and are ill-suited to the production of the general farming crops of the rolling uplands. These soils are used extensively for forestry and grazing, which represents their highest use under present conditions.

The quality of the soils varies in their suitability for agricultural production from the northern to the southern part of the region. In the 1957 Yearbook of Agriculture the northern general farming area is included in the "Southeastern Uplands," whereas the southern half of the area is included in the "Florida and Flatwoods" regional breakdown. The problem of the conservationist is to determine the extent to which these soils are used in keeping with their capabilities and to investigate the

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possibility for alternative economic opportunity in areas where the type of agricultural production is ill-suited to the natural environment.

**TERRAIN**

In analyzing any system of land use the role of surface configuration must be considered. Surface qualities frequently prove critical elements in the prevailing land-use system at a given place, while at others their role may be reduced to that of a permissive one. In Central-North Florida terrain is a critical element and one that serves to point out the direction that land-use patterns will follow. In the discussion of soils it was pointed out that the boundary between the rolling uplands and the flatwoods more or less separated the agricultural from the non-agricultural part of the region. Thus within this limited section of space terrain exerts a dominant influence on man's use of land.

The terms terrain and physiography are often used interchangably, but there is indeed a difference between the concepts. The term physiography as it is used by geologists and geographers usually connotes genesis of specific landscape features or groups of features. Terrain on the other hand may be used without reference to, or implication of, the origin of surface features. Thus the term terrain will be employed here to describe the nature of surface configurations.
Classification

Since the early 1930's there has been a move on the part of a few American and European geographers to emphasize the quantitative approach to the study of landforms. This approach has met with varying degrees of success and probably will be employed more and more by geographers and others, as the apparent value of quantitative studies increases. One of the most recent attempts at landform classification employing a quantitative approach was undertaken by Hammond. Hammond states that "for most geographical purposes, landform maps show actual characteristics of the existing surface rather than genetic interpretations. Those who are concerned with the relationships of the landform patterns to other patterns, physical or cultural, are more often concerned with the present surface forms than with the origins of that form."20

In order to classify landforms quantitatively one must employ certain differentiating characteristics. The characteristics frequently used are those of relief, slope, surface materials, and pattern. The first three criteria lend themselves well to measurement, whereas it is somewhat


20 Ibid., p. 35.
more difficult to measure satisfactorily the various horizontal and vertical arrangements of the latter.

Characteristics

The character of the relief of Central-North Florida can be represented by the construction of a relative relief map of the region which will give some indication of the nature of the terrain; it has also been pointed out that a map of relative relief indicates the character of the slope.\textsuperscript{21} Thus by employing a map of relative relief one can obtain some understanding of both relief and slope.

Relative relief of the region varies from almost zero to three hundred feet. The areas of greatest relative relief occur in south-central Jackson County, northern Liberty County, north-western Gadsden County, and central Leon County. The areas of greatest slope are also coincident with these areas of high relative relief. The southern coastal section is characterized by a relative relief of from 0 to 25 feet. But the region's best agricultural land is found in areas of intermediate relative relief. Agricultural land use is hampered on both the upper and lower end of the scale. Forest activity becomes dominant in those areas with relative relief of less than

100 feet. Forestry and grazing are also carried on in areas within the upper relief limits.

Slope, like relief, plays a very important role in determining the land-use pattern of the region. In the southern half of the region the slope is so gentle that marshy conditions are prevalent over much of the area. This problem of poor drainage serves as an obstacle to development. On the basis of relief and slope the region is described by Hammond as a nearly flat plain in the south and a rolling and irregular plain in the north. Surface materials other than soils include numerous small lakes and ponds. In areas where limestone is found near the surface, solution pits are numerous. The approximate area of water surface is rather extensive when one considers bays, lakes, and other inland water forms. Other surface materials which are significant are the areas occupied by marsh and sand. The former cover is an ephemeral one, extending and retreating with fluctuations of the groundwater table. Sand is everywhere present but is found in greater depth along the coastal areas where it serves as an amenity in attracting a growing recreational industry.

A cross sectional profile would reveal features typical of a recently emerged coastal plain. Broad, flat

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22 Hammond, op. cit., p. 39.
Interfluvies with narrow stream valleys are found in most of the southern part of the region. In areas of greater relief, dissection is somewhat more advanced, but there are still extensive flats in the upper level of the profile. The pattern of drainage is dendritic and coarse textured. In areas where limestone outcrops at the surface, streams disappear into subterranean channels. This pattern is quite noticeable in northern Jackson County extending westward from the Apalachicola River.

Some knowledge of the character of local terrain conditions should enable planners to devise systems of economic development that are well suited to existing conditions. The broad flat coastal areas have been the scene of limited development because of the difficulties encountered in the selection of an optimum use for this type of surface. The areas of greater slope in Central-North Florida represent the areas of maximum development, a condition that is somewhat paradoxical. Hammond's quantitative approach to the classification of landforms has much practical value and can aid in making the aims and objectives of conservation a reality.

HYDROGRAPHY

In evaluating the potentialities of a land-resource base one cannot overlook water as an integral part of that base. The water resources of Central-North Florida are rather extensive and sufficient to satisfy current demands.
The best approach to the region's water problems is the establishment of a sound water policy. The state acknowledged the need for such a policy in 1955 with the creation of a water resources study commission, whose duties were to investigate the nature of the water problems for the purpose of establishing a sound water policy.

Drainage Basins

Central-North Florida is drained by the following streams and their tributaries: (1) Bear Creek, (2) Apalachicola River, (3) Ochlockonee River, (4) St. Marks River, and (5) Aucilla River. Each of these drainage basins, with the exception of Bear Creek, extends beyond the confines of the region, reaching well into the states of Georgia and Alabama. The Apalachicola River watershed comprises approximately 20,000 square miles\(^2\) and is by far the largest and most complex of the watersheds embracing parts of Central-North Florida. The Ochlocknee River watershed lies adjacent to that of the Apalachicola and comprises an area of similar magnitude. The two eastern watersheds are somewhat smaller.

The concept of the drainage basin is becoming increasingly important as the unit for analyzing certain

regional problems. But, the drainage basin, like all other natural regions, is characterized by shortcomings, the foremost being the problem associated with the collection of statistical data. In 1936 The National Resources Committee revealed that the major problems confronting these drainage basins were associated with sewage disposal, treatment of municipal and domestic water supplies, navigation, drainage, and flood control.\textsuperscript{24} Since that time many of these problems have been alleviated through state and federal cooperation. The completion in 1957 of the Jim Woodruff Dam on the Apalachicola River at Chattahoochee, marks the greatest effort to date in attempting to reduce the problems associated with the lower Apalachicola drainage basin. The passage of the Small Watersheds Act in 1954 opened the way for the development of sound water conservation programs in the other watersheds of the region.

**Stream Characteristics**

In order to understand some of the problems which characterize these drainage basins, a knowledge of the character of the streams themselves must be set forth. The streams that drain the region are as a rule short and sluggish, exceptions being the Apalachicola and the Ochlockonee. The Apalachicola is formed by the confluence

\textsuperscript{24}Drainage Basin Problems and Programs, National Resources Committee, Washington, 1935, pp. 191-197.
of the Flint and the Chattahoochee rivers; it then flows approximately 113 miles to Apalachicola Bay. The river is 800 feet wide at places, narrowing in its downstream reaches. The Apalachicola possesses a very gentle gradient dropping approximately one foot every two miles. As the river flows through Gadsden and Liberty counties it is bordered by steep bluffs composed of yellowish-white chalk. The river's second bottom is rather marshy and supports some exotic hardwood species. The Apalachicola's major tributary, the Chipola, parallels it on the west for most of its length before finally joining it north of Apalachicola Bay.

The only other major stream in the region is the Ochlockonee, which does not exceed a hundred miles in length. The Ochlockonee originates on the coastal plain of south Georgia and flows in a southwesterly direction through the rolling uplands of Leon and Gadsden counties before turning toward the southeast and finally emptying into Ochlockonee Bay. Both Apalachicola and Ochlockonee bays are drowned river mouths.

NATURAL VEGETATION

A region's natural vegetation is largely dependent upon the influence of the physical qualities previously

\(^{25}\)Richard C. Dynes, op. cit., p. 27.
discussed and the activities of man, the latter exerting an influence out of proportion to that generally assumed. In Central-North Florida vegetative cover is very extensive and all counties in the region have at least 50 per cent of their area classed as forest land. In some counties the extent of forest land exceeds 80 per cent. This situation is indicative of the low quality of the land-resource base. Thus, many parts of Central-North Florida are reminiscent of frontier regions.

Plant Associations

Vegetational units in which physiogomy, structure, and floristic composition are relatively homogeneous are referred to as plant associations. These associations are largely influenced by the regional climate and secondarily by soils. Each plant association is characterized by one or two dominant species which tend to lend character to the association. Plant associations represent dynamic vegetational units that change through time with corresponding changes in the environment itself. Once a plant association establishes equilibrium with the regional climate a climax association is said to exist. Although climate is the most important element influencing climax development, other factors in the local environment may retard the development of the climax association and for long periods of time a subclimax may prevail. This is the situation that exists
over much of Central-North Florida, with its pine dominants forming a subclimax that is maintained by fire.26

Eventually it is believed that the pine dominants will be succeeded by oak-hickory which represent the climax formation associated with the climate region. Pine upon removal is generally succeeded by scrub oak, but because of the current economic value of these extensive stands of pine, the climax formation will be delayed even further by man's constant replanting of this valuable species.

Distribution

In Central-North Florida the major plant associations are grouped as follows: (1) longleaf-slash pine, (2) loblolly pine, (3) oak-hickory, (4) oak-gum-cypress, and (5) oak-pine. The distribution of these associations are largely influenced by conditions of drainage. The most extensive association in the region is the longleaf-slash pine association which generally occupies the mesic site. The drier uplands which include the Marianna Red Lands and the Tallahassee Red Hills are occupied by the oak-hickory association. These hardwood species form islands among the more extensive longleaf-slash pine communities. The loblolly association and the oak-gum-cypress associations are largely confined to the wetter sites. The more

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extensive oak-gum-cypress group parallels closely the hydrographic pattern of the region occupying the flat-floored valleys of the major streams. Only small isolated areas of the oak-pine associations are found within the region.

In 1912, Harper delimited the geographical divisions of North Florida and attempted to correlate the distribution of vegetation within his geographical divisions. It is apparent from Harper's description that hardwoods occupy the wetter and drier sites, whereas conifers predominate in areas of intermediate drainage.

The distribution of specific plant associations serves as an indicator of the developmental potential of the land. Coniferous species have a lower plant nutrient requirement than hardwoods, thereby indicating that sites occupied by hardwood associations are better suited for agriculture. The increased dependence upon the resources of natural vegetation in the region's economy is apparent, as a variety of wood using industries are being established in Central-North Florida.

In order to evaluate land-use patterns and problems growing out of the existing patterns, an examination of the quality, distribution and extent of the elements which

MAJOR FOREST TYPES
OF CENTRAL-NORTH FLORIDA
comprise the land-resource base is necessary. The foregoing sections have summed up the qualities of the individual physical elements that are considered by the writer as important aids in analyzing the regional problems growing out of current land-use practices. The land-resource base is only one aspect to be considered in this type of analysis, another and equally important aspect is the human element or human resources which are involved in the development of the land resource.
CHAPTER 2

POPULATION

Since conservation studies are man centered, it appears only logical that we become familiar with the characteristics of that group which will create and attempt to solve the economic and social problems growing out of man-land relationships. Too many studies in conservation become so involved in developing remedial measures which are employed in patching up aspects of the physical environment that the characteristics of the population as a key to the understanding and prevention of many land-use problems are overlooked. Thus by investigating the characteristics of the population of Central-North Florida we should be able to anticipate some of the problems that will arise out of man-land relations and thereby seek solutions to these problems before they become severe.

POPULATION TRENDS

In 1950, the ten counties comprising Central-North Florida contained 205,430 persons or 7.4 per cent of the state's population.1 While in 1830, this same area

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1It was decided for the sake of convenience to employ county statistics since the bulk of the counties' population is found within the delineated area.
contained approximately one-half of the state's population. Since 1940, growth in Central-North Florida has slowed down significantly. Five counties suffered losses between 1940-1950, and 1958 estimates indicate an additional county had been added to the group. Population changes also varied widely between 1930-1940, with but four of the ten counties registering losses. The downward trend has continued during each decade since 1930. But, at the same time, Florida has become the third fastest growing state in the nation. This reflects the lack of natural or cultural amenities that attract residents to other parts of the state (Table 1).

Franklin, Jefferson, Liberty, Wakulla, Calhoun, and Jackson counties are presently experiencing a declining pattern of growth, with the greatest per cent of change taking place in Liberty County. Two of the counties, Jackson and Jefferson, are primarily agricultural in which cotton was long the major cash crop. In these cotton counties large scale outmigration occurred from 1940-1950, this can largely be attributed to the increasing opportunities outside of the region during the war period. Because of the primary nature of the economy here, the non-white ratio is relatively large, and because of the

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2Population statistics for the period 1951-1958 are based on estimates prepared by Professor John N. Webb, College of Business Administration, University of Florida, Gainesville.
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<thead>
<tr>
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<td>20,686</td>
<td>+106.4</td>
<td>42,689</td>
<td>+48.9</td>
<td>63,600</td>
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<tr>
<td>Calhoun</td>
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<td>+10.8</td>
<td>8,218</td>
<td>-3.6</td>
<td>7,922</td>
<td>-1.3</td>
<td>7,800</td>
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<tr>
<td>Franklin</td>
<td>6,238</td>
<td>-3.0</td>
<td>5,991</td>
<td>-3.0</td>
<td>5,814</td>
<td>-1.7</td>
<td>5,700</td>
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<tr>
<td>Gadsden</td>
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<td>+4.9</td>
<td>31,450</td>
<td>+15.9</td>
<td>36,457</td>
<td>+27.9</td>
<td>46,700</td>
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<tr>
<td>Gulf</td>
<td>3,182</td>
<td>+54.2</td>
<td>6,951</td>
<td>+7.3</td>
<td>7,460</td>
<td>+18.7</td>
<td>8,900</td>
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<tr>
<td>Jackson</td>
<td>31,969</td>
<td>+7.1</td>
<td>34,428</td>
<td>+0.6</td>
<td>34,645</td>
<td>-1.4</td>
<td>34,100</td>
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<tr>
<td>Jefferson</td>
<td>13,408</td>
<td>-11.0</td>
<td>12,032</td>
<td>-13.5</td>
<td>10,413</td>
<td>-8.7</td>
<td>9,500</td>
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<tr>
<td>Leon</td>
<td>23,476</td>
<td>+25.7</td>
<td>31,646</td>
<td>+63.0</td>
<td>51,590</td>
<td>+51.2</td>
<td>78,000</td>
</tr>
<tr>
<td>Liberty</td>
<td>4,067</td>
<td>-6.6</td>
<td>3,752</td>
<td>-15.2</td>
<td>3,182</td>
<td>-12.5</td>
<td>2,800</td>
</tr>
<tr>
<td>Wakulla</td>
<td>5,468</td>
<td>-0.9</td>
<td>5,463</td>
<td>-3.8</td>
<td>5,258</td>
<td>-3.8</td>
<td>5,100</td>
</tr>
</tbody>
</table>

greater opportunities outside of the region for non-white workers, they accounted for the greatest per cent of change due to outmigration. The per cent of change of the non-white population as a result of outmigration was 29.5 per cent in Jackson County and 37.4 per cent in Jefferson County. The white population moved less readily on a relative basis, with Jackson showing a 19.3 per cent change due to migration and Jefferson 16.2 per cent.

Liberty, Wakulla, and Calhoun counties are less agricultural than the two counties mentioned above, but in 1950 approximately a quarter of the population was classified as farm population in Liberty and Wakulla counties, with the ratio being considerably higher in Calhoun County. Because of the limited supporting capacity of these counties, the downward trend since 1930 has prevailed in both Wakulla and Liberty counties and since 1940 in Calhoun County. Among these three counties the greatest change has taken place in Liberty County, which suffered losses exceeding 10 per cent in both decades since 1940. In 1957, Liberty County ranked 48th among the 67 counties in the state in per capita income, while Calhoun and Wakulla counties ranked 65th and 66th respectively. But, because of the character of the land, both Calhoun and Wakulla counties can support a slightly larger population on the same or higher level of living.
Franklin County represents the only non-agricultural county in the group losing population. In 1950, the farm population constituted only 0.9 per cent of the total. The rate of change in Franklin County has been very slow, with an absolute loss of only 538 persons since 1930. The greatest single source of income derived from the extractive industries in Franklin County is derived from the catch and sale of fishery products.

**TABLE 2**

**PER CENT OF CHANGE IN CENTRAL-NORTH FLORIDA'S POPULATION**

**1930-1958**

<table>
<thead>
<tr>
<th></th>
<th>1930-1940</th>
<th>1940-1950</th>
<th>1950-1958</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central-North Florida</td>
<td>+14</td>
<td>+28</td>
<td>+31</td>
</tr>
<tr>
<td>All of Florida</td>
<td>+22</td>
<td>+46</td>
<td>+60</td>
</tr>
</tbody>
</table>

Since 1950 population increased in only four of the ten counties of Central-North Florida, with each of these also experiencing population increases during the previous two decades. The greatest change since 1950, 50 per cent, has occurred in Leon County, in which Tallahassee, the state's capital, is located. The rapid increase in the population can be largely attributed to the pull exerted by the state's capital, with its demands for clerical workers and assistants and the additional pull of the educational institutions.
in the city of Tallahassee. In 1950, only 11 per cent of the population of Leon County was classed as farm population, this represents a 30 per cent decrease over the previous census period. Slightly more than half of the county's population resided in Tallahassee in 1950, with little change since. The greatest development in the county is occurring along Tallahassee's urban fringe, a type of growth which is typical of most American urban communities today. The second fastest growing county in the region is Bay County. In 1958, Bay County's rate of change was only slightly less than that of Leon County, but, like Leon County, the bulk of this increase has been attracted to its single major urban center, Panama City.

Bay County's most phenomenal growth occurred during the decade of the forties. The development of a sizeable war-time ship building industry at Panama City and the location of an air base immediately east of the city did much to attract people to the area. Bay County's population, like that of Leon's is largely urban. In 1950 only 1.8 per cent of the people were classed as farm population.

The third county experiencing continual growth since 1930 is Gulf County, a political unit which only came into existence during the twenties. In 1950, more than half of Gulf County's 7,460 residents lived in Wewahitchka and Port St. Joe, the latter constituting the county's only urban place. The continued growth of Gulf County can be partially
explained by the establishment of a large pulp and paper industry during the late thirties. The St. Joe Paper Company plant at Port St. Joe has served to attract several members of the chemical industry to this location. In 1956, more than 35 per cent of the personal income of Gulf County residents was secured from manufacturing; this ratio is considerably in excess of that of any other county in the region.

Gadsden County represents the fourth of the counties to register an increase in population over the period from 1930 to 1958. This county is essentially different from all of the others experiencing continual growth, being primarily agricultural in character. Like Jefferson and Jackson counties, the ratio of non-whites in the population is high. But, unlike the latter two counties, there was an absolute increase in Gadsden County's non-white population from 1940 to 1950, with in-migration exceeding out-migration. Since 1950, one might assume the greatest increase in Gadsden County's population has occurred around the urban center of Quincy, which is engaging in an all-out drive to attract industry. The stability associated with the region's agricultural specialty, shade-grown tobacco, has been primarily responsible for Gadsden County's increase in population over the years, as other agricultural counties in the region have declined.
REGIONAL DISTRIBUTION OF POPULATION

The bulk of the region's population inhabit the rolling uplands, with the space between the rolling uplands and the coastal settlements being very sparsely settled. The areas of greatest concentration are represented by the presence of towns and cities, with areas of lesser concentration surrounding such centers. The areas of secondary concentration occur in the largely agricultural sections of the region. In 1950, densities ranging from 30 to 100 persons per square mile prevailed over much of the largely agricultural parts of Gadsden County, with smaller areas of the same density occupying parts of Jackson and Jefferson counties. The greater part of the area of the latter two counties was characterized by densities ranging from 15 to 30 persons per square mile. Outside of the non-agricultural section of the region densities in excess of 15 persons per square mile are limited to the recreational and urban areas along the gulf coast and isolated central places on the drier lands of the interior.

Webb's 1958 estimate of the population of individual counties might lead one to conclude that the pattern of distribution has remained much the same, but with the areas of greatest concentration displaying an even greater intensity. The extent of concentration in the 30 to 100 persons per square mile undoubtedly increased in the area around Tallahassee and Panama City.
Figure 7

POPULATION DENSITY OF CENTRAL-NORTH FLORIDA

UNDER 15
15 - 30
30 - 100
100 AND OVER

AFTER BECKER
TABLE 3

CHANGING POPULATION DENSITY BY COUNTY, 1950-1958
(per square mile)

<table>
<thead>
<tr>
<th>County</th>
<th>1950</th>
<th>1958</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leon</td>
<td>75.3</td>
<td>113.8</td>
</tr>
<tr>
<td>Gadsden</td>
<td>71.8</td>
<td>91.8</td>
</tr>
<tr>
<td>Bay</td>
<td>56.7</td>
<td>84.5</td>
</tr>
<tr>
<td>Jackson</td>
<td>36.8</td>
<td>36.1</td>
</tr>
<tr>
<td>Gulf</td>
<td>13.4</td>
<td>15.8</td>
</tr>
<tr>
<td>Jefferson</td>
<td>17.4</td>
<td>15.7</td>
</tr>
<tr>
<td>Calhoun</td>
<td>14.2</td>
<td>14.0</td>
</tr>
<tr>
<td>Franklin</td>
<td>10.7</td>
<td>10.4</td>
</tr>
<tr>
<td>Wakulla</td>
<td>8.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Liberty</td>
<td>3.8</td>
<td>3.3</td>
</tr>
</tbody>
</table>


Other than this, the pattern of distribution has remained essentially the same, with minor changes in intensity characterizing the area just mentioned and possible a slight increase in density along the Gulf Coast.

RACIAL COMPOSITION

In land-use analysis racial composition is sometimes a key factor in helping one to understand the various problems of land use. This is probably more nearly true of the south than other sections of the nation as a result of the greater degree of racial heterogeneity, which is an outgrowth of the institution of slavery. Post slavery conditions resulted in the development of a system of land tenure in the south, the effects of which are still evident.
The Bureau of the Census, in classifying individuals according to race, employs two broad categories, white and non-white. The latter group generally included Negroes, Japanese, Chinese, and Filipinos; but, in most of the southern states the term non-white refers essentially to the Negro, since other non-white groups form an insignificant proportion of the total population. Thus the ratio of whites to Negroes point up some very interesting problems associated with patterns of land use in Central-North Florida.

The racial composition of the region has varied significantly since the period of settlement was initiated during the 1830's. By 1840, a plantation type economy prevailed in Central-North Florida, with settlement taking place on the more fertile uplands of the north. The plantation counties of Central-North Florida included Jackson, Gadsden, Jefferson, and Leon. This area comprised the northern extension of the "black arc," which extended southward to Marion County and was so named because of the predominance of the Negro element in the population.

In 1940, after more than a century, the non-white ratio in three of the former plantation counties was significantly greater than in the sparsely populated areas to

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the south. Table 4 illustrates the growing mobility of the region's non-white population (see page 60). In 1950, only three of the ten counties showed increases in the non-white element, with two of these taking place in the predominantly agricultural section of the region and the third occurring in rapidly growing Bay County. Although the region's non-white population is steadily declining, this group constituted 35 per cent of the total population in 1950, in comparison with 21.8 per cent for the state as a whole. In both Leon and Gadsden counties the greatest percentage of increase was due to an excess of births over deaths, which indicates a high fertility ratio, a characteristic generally associated both with the rural farm and non-white population. The unusually large increase of non-whites in Bay County can be attributed to in-migration. Here war-time activities afforded opportunities to all aspects of the population. It can be assumed that many rural whites and non-whites were drawn from adjacent counties by the lure of war industries, thereby creating population losses in those counties. Gadsden County was the only county in the region to register an increase in the proportion of non-whites in the total population from 1940 to 1950. This concentration of Negro population in Gadsden County can be largely explained on the basis of increased demands for agricultural labor engaged in the preparation and processing of shade-grown tobacco. This
highly specialized agricultural activity does not lend itself to mechanization, thereby creating a situation that tends to stabilize and attract non-whites.

**TABLE 4**

**NUMBER, PER CENT, AND PER CENT OF CHANGE OF THE NON-WHITE POPULATION, BY COUNTY, 1940-1950**

<table>
<thead>
<tr>
<th>County</th>
<th>1940 Number</th>
<th>1940 Per Cent</th>
<th>1950 Number</th>
<th>1950 Per Cent</th>
<th>Per Cent of Change 1940-1950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gadsden</td>
<td>17,511</td>
<td>55.7</td>
<td>20,468</td>
<td>56.1</td>
<td>+16.9</td>
</tr>
<tr>
<td>Leon</td>
<td>16,106</td>
<td>50.9</td>
<td>20,381</td>
<td>39.5</td>
<td>+26.5</td>
</tr>
<tr>
<td>Jackson</td>
<td>12,409</td>
<td>36.0</td>
<td>11,574</td>
<td>33.4</td>
<td>-6.7</td>
</tr>
<tr>
<td>Bay</td>
<td>4,221</td>
<td>20.4</td>
<td>7,165</td>
<td>16.8</td>
<td>+69.7</td>
</tr>
<tr>
<td>Jefferson</td>
<td>8,007</td>
<td>66.5</td>
<td>6,513</td>
<td>62.5</td>
<td>-18.7</td>
</tr>
<tr>
<td>Gulf</td>
<td>2,385</td>
<td>34.3</td>
<td>2,007</td>
<td>26.9</td>
<td>-15.8</td>
</tr>
<tr>
<td>Wakulla</td>
<td>1,846</td>
<td>33.8</td>
<td>1,627</td>
<td>30.9</td>
<td>-11.9</td>
</tr>
<tr>
<td>Franklin</td>
<td>1,997</td>
<td>33.3</td>
<td>1,496</td>
<td>25.7</td>
<td>-25.1</td>
</tr>
<tr>
<td>Calhoun</td>
<td>1,243</td>
<td>15.1</td>
<td>1,119</td>
<td>14.1</td>
<td>-10.0</td>
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<tr>
<td>Liberty</td>
<td>925</td>
<td>24.7</td>
<td>581</td>
<td>18.3</td>
<td>-37.2</td>
</tr>
</tbody>
</table>


Increases in the non-white population in Leon County represent a move from adjacent rural counties to the city of Tallahassee. The inclusion of university students as a resident of Tallahassee in 1950, was partially responsible for population increases among whites and non-whites. The period from 1940 to 1950 was one in which the percentage of out-migration on the part of whites exceeded that for the white group. The rate of natural increase among the
two groups was quite variable, with non-whites exhibiting
greater fertility in the largely agricultural counties.
The fertility ratio of whites was highest in the rural
non-farm sections of the region. The replacement percentage
is insufficient in those counties characterized by out-
migration to prevent a continual decline in the absolute
population of the counties involved.

The non-white population is less well prepared
educationally and financially to engage in extensive types
of land use. Therefore they have operated small uneconomic
farming units or served as farm laborers, but this represents
a declining trend. This situation has resulted in a de-
crease in the number of farms and modifications of the
agricultural system. The growing trend is toward the urban-
ization of both the white and non-white population. But,
because of limited economic opportunities in the region's
few urban places, non-white migration frequently takes
them out of the region and the state, whereas whites fre-
quently settle in one of the few cities or move to other
Florida urban centers.

AGE STRUCTURE

The age structure of the population sometimes serves
as a good indicator of a region's potential for economic
development. Problems tend to arise in those areas in which
the ratio of the dependent population increases faster than
that of the non-dependent group. The latter situation generally occurs where out-migration exceeds the rate of natural increase, and where high birth rates prevail. Both situations have characterized several of the counties of Central-North Florida during recent decades with increases occurring both in the under-5 group and the 65 and over group.

The problem of determining the scope of the productive ages is highly variable, depending on the culture and the predominant economy. The census bureau includes all persons between 14 and 65 as potential members of the labor force. Thus, this vast range of ages is employed to represent the productive element of the population. In areas with a labor intensive type of agriculture, this grouping might possess some validity, but with the growing complexity of our economic system, the age at which one enters the labor force is steadily rising. The amount of training required to prepare one to perform efficiently in our highly dynamic economy is largely responsible for persons entering the labor force at an older age.

In trying to determine the age groups which represent the productive population it seems justifiable to eliminate the group between 14 and 19, because the greatest number of persons in this age group are students, and may be considered dependent. The labor force is primarily composed of persons from 20 to 64 years of age, with 20 to 44
representing the period of peak performance or the central productive ages. Thus, we should think of persons from 20 to 44 as the core of the productive population. The higher incidence of health problems and accidents beyond the age of 45 tends to reduce the efficiency of this segment of the labor force.

In only two counties in Central-North Florida did there occur an increase in the central productive ages from 1940 to 1950. Bay County's 20 to 44 age group increased from 40.0 to 43.3 per cent of the population in 1950, while Leon County registered an 0.8 per cent increase over the same period. All other counties experienced relative decreases in this category, with Jefferson County's population including only 29.0 per cent in this age group in 1950.

The decline in the 20 to 44 age group represents out-migration in those counties involved. Migration largely takes place during the central productive period, thereby affecting the productivity of communities or areas in which migration exceeds the rate of natural increase. Increases in the 65 and over group characterized each of the counties experiencing a relative decline in the central productive group from 1940 to 1950. Since 1950 the over 65 population has probably increased both in a relative and absolute sense, since approximately one-third of the population in the 45 to 64 age group in 1950 would now be 65 and over,
plus the fact that there has probably been a significant increase in the number of retirees settling here. It is almost certain that the trend in most of the region's counties will show an increase in the ratio of the non-productive element of the population. Thus, these counties with declining productive populations will be characterized by maladjusted economies.

Land use in the region is largely extensive, with machinery replacing man as a tool of agriculture. The size of the holdings and pattern of ownership has shown signs of change with changes in the population. Intensive uses of the land, such as manufacturing and the development of urban centers are characteristic of those areas in which there was an increase in the ratio of persons in the productive age group in 1950. Central-North Florida is not characteristic of the state as a whole in its population age structure. In 1957, it was estimated that there had been a 45 per cent increase in Florida's central productive group.4 The largest percentage of this increase is due to net migration. In viewing the population estimates for the counties in the region it is highly unlikely that increases in the 20 to 44 age group occurred outside of Bay, Gadsden, and Leon counties. For only here are there situations that are

likely to serve as forces that would attract persons in this age category. Thus a continuation of this trend is likely to persist.

SEX RATIO

The sex ratio like other qualities of the population may lead to an understanding of the nature of existing land-use practices or the prevalence of specified types of land use. Pioneer areas are generally predominantly inhabited by males, with the arrival of females occurring after the pioneer character of the area has been largely eliminated.

In areas that are largely agricultural the variation in the sex ratio is generally low, particularly in the central productive group. Manufacturing regions often display a surplus of males over females, whereas centers of administration tend to exert a strong attraction for the female element of the population. Thus it is apparent that there is a strong correlation between the predominant economic activity of a place and its sex ratio.

In Central-North Florida the sex ratio in the central productive group varies with the type of economic activity. In the predominantly rural counties there is an excess of females over males. This is largely due to the fact that migration has primarily involved the outward movement of males. Depressed conditions during the decade of
Figure 8
Age, Sex, and Racial Characteristics of
Central-North Florida's Population
the 1930's resulted in the delay of marriages; thus during
the 1940's a large percentage of the male population
in the central productive group was footloose and could
migrate without great difficulty. Bay County represents
the single county in the region in which the number of males
exceeds the number of females in the central productive
group. The growth of manufacturing industries in Bay
County has been responsible for attracting more males than
females in this age range group. Leon County represents
the reverse situation, for here the ratio of females to
males is greater. The presence of a largely government-
based economy has done much to attract female labor in the
20 to 44 age group.

In the upper limits of the productive element of
the population the ratio of females to males is greater in
all counties involved with the exception of Bay.

In the age group from birth to 19 the sex ratio in
all counties is rather evenly balanced, with the number of
males frequently exceeding that of females. This situation
is fairly normal when one considers that the number of
male births in the United States is somewhat in excess of
female births. In the over 65 group, females again repre-
sent the greatest number, this can be attributed to the
longer life expectancy of women.
EDUCATION

The quantity and quality of education obtained by the population will in a large part serve as a barometer in determining the potential of the group. As society becomes more complex the need for formal education increases. In areas possessing a largely rural population the amount and quality of education is generally lower than that received by the urban populace.

There is a close correlation between the amount of education received, the occupational structure, and level of living. Thus education or the lack of it is in part responsible for certain land-use problems that tend to arise.

Quantity of Education

Quantitative data are frequently employed in evaluating population potential. Though this technique has apparent shortcomings it offers us the most readily available basis upon which to make generalizations regarding the efficiency of a universe.

In 1950, approximately 50 per cent of the population of Central-North Florida was over 25 years of age; this is the upper limit employed by the Bureau of the Census for the completion of formal education and it assumed to represent those actively engaged in earning a livelihood. Exceptions to this are largely found in urban areas where an increasing number of the population over 25 is involved in
the pursuit of graduate and professional degrees on a full- and/or part-time basis.

In attempting to evaluate the potential of Central-North Florida's residents we will employ the following educational groupings in the belief that it will enable us to assess the efficiency of the group: (1) 1 to 4 years of school completed, (2) 8 years of school completed, (3) high-school graduates, and (4) college graduates. There appears to be a high degree of correlation between these foregoing four year intervals of education and occupational structure in the United States. Persons falling in the first category are described as "functional illiterates"\(^5\) and generally are forced to accept the least desirable jobs and occupy the lowest rung of the socio-economic ladder. Where the population is comprised largely of this element the prevailing economic activity is of a simple nature, requiring the performance of simple, though often arduous and undesirable tasks. The percentage of the population over 25 falling into this category will be largely confined to the upper age groups (65 and over) with larger percent- ages being found among non-whites.

The number of persons terminating their formal education after eight years is on the decline, although significant variations exist within the various sections

of the country, as well as among racial groups. In today's complex economic system persons in the lower half of the 25 and over category are forced to except positions similar to those held by their parents who had only 1 to 4 years of formal training. The percentage of persons completing high school and college is on the increase, but those in the latter group still comprise a very small percentage of the total population. In 1950 only 24.3 per cent of the nation's over 25 population had completed high school, and only 4.3 per cent had completed four or more years of college.

**TABLE 5**

YEARS OF SCHOOL COMPLETED BY PERSONS 25 YEARS AND OLDER IN CENTRAL-NORTH FLORIDA, AND IN THE STATE

<table>
<thead>
<tr>
<th>Area</th>
<th>1-4 Years</th>
<th>8 Years</th>
<th>High School</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central-North Florida</td>
<td>20.6%</td>
<td>11.0%</td>
<td>13.1%</td>
<td>5.4%</td>
</tr>
<tr>
<td>The State</td>
<td>11.2%</td>
<td>14.3%</td>
<td>20.5%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

Source: Compiled from *The Seventeenth Census of the United States, 1950.*

From the above chart we can observe that Central-North Florida's educational record is less impressive than that of the state. One-fifth of the people in this area over 25 can be classed as functional illiterates, whereas the percentage of the population having completed elementary
and high school are both small. Paradoxically the percentage of the region's college graduates compares favorably with that of both state and nation.

The median number of years of schooling completed by Central-North Florida's residents varies from 9.7 in Leon County to 5.3 in adjacent Jefferson County, with the median for the region set at 7.5 years. The median number of years of schooling completed by the female element of the population in each county exceeds that for the male. The number of female high school graduates exceeds those of the male element in each county, whereas the number of female college graduates exceeds that of males in two-thirds of the counties. In each of the largely agricultural counties, the female element represents the better educated element of the population. In Bay and Leon counties, which possess the only largely urban areas in the region, male college graduates are present in greater number. The median number of years of schooling completed in these two counties are comparable to that of the state. It seems rather paradoxical that the female element should be the better educated when we consider the proportion of this element in the labor force. But in most largely rural areas males drop out of school to help maintain the family.

There also exists a substantial gap between the educational attainments of non-whites and whites. The median number of years of school completed by the non-whites
is 4.2 for the region, with the median for the state being 5.3 years in 1950. The educational level of non-whites tends to be lowest in those counties in which the non-whites ratio is highest. The exception to this is Leon County, which is characterized by a more diverse economy and the presence of a largely urban population. The amount of education received by non-whites is lowest in Jefferson County, a county that is more than 60 per cent non-white, followed by Wakulla, Gadsden, and Jackson counties.

During the 1957-1958 school year more than 20 per cent of the region's population was enrolled in the public schools; this was an increase over the previous ten year period. Thus there is a growing indication that the future population will be better educated than the present, but we have no assurance that this better educated group will remain in the region and contribute their talents toward the economic revitalization of the area.

Quality of Education

The quality, unlike quantity of education, is much more difficult to assess, but yet it plays a very important role in the success of the region's population. Quality of education must often be assessed by employing indirect means, and even then the results may prove highly inconclusive. The elements frequently employed in attempting to
assess quality of education are (1) the per capita amount spent for education, (2) teacher qualification, and (3) conditions of education facilities (libraries, buildings, etc.). It should be pointed out that these represent some of the more easily measured indices, but not necessarily the most important.

During the school year 1957-1958 the state of Florida allocated an average of $303.00 per pupil, this represents an increase of $33.00 per pupil over that of 1953-1954. During this same period the average allocation for Central-North Florida was $345.00 per pupil. This appears somewhat paradoxical when one considers the low economic status of the region and the slow rate of increase in school enrollment here, by comparison with other areas of the state. This situation can be partially explained by considering the higher cost of maintaining adequate educational units in the sparsely settled sections of the region. Thus the cost of education per pupil tends to decrease as the number of pupils increases. This becomes more apparent from the chart on the next page illustrating the average expenditure per pupil and school enrollment in each county of Central-North Florida.

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### TABLE 6

**AVERAGE EXPENDITURES PER PUPIL AND SCHOOL ENROLLMENT**

*IN CENTRAL-NORTH FLORIDA, BY COUNTY*

*1957-1958*

<table>
<thead>
<tr>
<th>County</th>
<th>Average Expenditure Per Pupil</th>
<th>School Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>$250.00</td>
<td>14,581</td>
</tr>
<tr>
<td>Gadsden</td>
<td>265.00</td>
<td>9,390</td>
</tr>
<tr>
<td>Jackson</td>
<td>284.00</td>
<td>9,552</td>
</tr>
<tr>
<td>Leon</td>
<td>302.00</td>
<td>14,451</td>
</tr>
<tr>
<td>Calhoun</td>
<td>305.00</td>
<td>2,165</td>
</tr>
<tr>
<td>Gulf</td>
<td>319.00</td>
<td>2,676</td>
</tr>
<tr>
<td>Jefferson</td>
<td>352.00</td>
<td>2,501</td>
</tr>
<tr>
<td>Franklin</td>
<td>416.00</td>
<td>1,376</td>
</tr>
<tr>
<td>Wakulla</td>
<td>435.00</td>
<td>1,430</td>
</tr>
<tr>
<td>Liberty</td>
<td>525.00</td>
<td>843</td>
</tr>
</tbody>
</table>


It is generally thought that the greater the expenditure for education per pupil the higher the quality of education, but the reverse situation seems to operate in Central-North Florida, with the highest quality of education being received in those counties with the lower per pupil
expenditures. The counties with the highest expenditures per pupil represent the poorest counties in the region, these being largely subsidized from state funds. The share contributed by the state to each county is largely determined by the county's ability to pay taxes. Thus counties like Liberty and Wakulla contribute a very small percentage toward the operation of the county's schools, though these two counties possess the highest per pupil expenditures in the region.

The employment of the qualification of teachers as an index for assessing the quality of education leaves much to be desired, since teacher qualification is largely based on amount of education. The number of Florida teachers without a Baccalaureate degree is on the decline, with the largest number being found in the poor rural counties of the north. The higher teacher salaries are paid by the more prosperous counties, with the poorer counties being less able to attract the better teachers.

The availability of certain physical facilities is also employed as a criterion determining the quality of education, but like the other criterion employed it does not produce clear-cut evidence of educational quality.

The quantity and quality of education will influence land-use practices as well as the overall regional economy.

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8Ibid.
The amount, as well as quality, of education received by the region's population will be determined by regional values and community interest. Until the populace becomes aware of the necessity for increased amounts of education, the existing pattern of land use will in all probability remain much the same.

LEVEL OF LIVING

The level of living of a group frequently reflects the strengths and weaknesses of the institutional machinery operating within a given type of environment. Granted that the natural resource base establishes outer limits, it is the cultural equipment of the group that largely determine the returns accruing from land-use practices.

The yardstick most frequently employed in attempting to evaluate level of living is per capita income or per capita disposable income. Other indices sometimes employed are adequacy of health facilities, adequacy of housing, and the amount of retail sales, but each of these elements is largely influenced by the availability of disposable income.

If per capita income is employed to evaluate Central-North Florida's level of living, we will find that it is very low. The average per capita income in the region in
1957 was $1,145,9 as compared with $1,775 for the state and $2,025 for the nation or approximately two-thirds that for the state and slightly more than one-half of that for the nation.

The variation in per capita income in the region is great. In 1957, Wakulla County ranked 66 among 67 counties, whereas Gulf County ranked eleventh. Only two of the counties in the region rank among the top one-third of the counties in the state in average per capita income, and these are Gulf and Leon.

Since 1950 the per capita income has increased throughout the region, but the increase is shown in current dollars rather than constant dollars, making it difficult to determine the extent of change in the level of living. Those counties characterized by population decreases will register increases in per capita income with smaller increases in total personal income; the reverse situation would characterize the rapidly growing counties. The smallest per cent of change in per capita income since 1950 has occurred in Gadsden County. While the highest per capita income is received in those counties possessing the better developed urban-industrial systems.

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TABLE 7

AVERAGE PER CAPITA INCOME IN CENTRAL-NORTH FLORIDA COUNTIES, FOR SELECTED YEARS

<table>
<thead>
<tr>
<th>County</th>
<th>1950</th>
<th>1954</th>
<th>1957</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf</td>
<td>1,134</td>
<td>1,448</td>
<td>1,826</td>
</tr>
<tr>
<td>Leon</td>
<td>1,076</td>
<td>1,337</td>
<td>1,582</td>
</tr>
<tr>
<td>Bay</td>
<td>1,047</td>
<td>1,766</td>
<td>1,515</td>
</tr>
<tr>
<td>Gadsden</td>
<td>1,113</td>
<td>1,133</td>
<td>1,182</td>
</tr>
<tr>
<td>Liberty</td>
<td>630</td>
<td>812</td>
<td>1,059</td>
</tr>
<tr>
<td>Jackson</td>
<td>674</td>
<td>900</td>
<td>1,048</td>
</tr>
<tr>
<td>Jefferson</td>
<td>571</td>
<td>755</td>
<td>923</td>
</tr>
<tr>
<td>Franklin</td>
<td>710</td>
<td>691</td>
<td>898</td>
</tr>
<tr>
<td>Calhoun</td>
<td>553</td>
<td>682</td>
<td>723</td>
</tr>
<tr>
<td>Wakulla</td>
<td>548</td>
<td>597</td>
<td>701</td>
</tr>
</tbody>
</table>


In 1956, Becker and Brubaker classified Florida counties on the basis of their population supporting potential. On this basis the counties of Central-North Florida were placed in the following categories: Group 1-Declining

or slowly growing small population with low levels of living and a rural forest-farm economy (Calhoun, Franklin, Gulf, Liberty, and Wakulla); Group 2-Declining or slowly growing small population with low levels of living and a rural farm-forest economy (Gadsden, Jackson, and Jefferson); Group 2a-Rapidly growing population of medium size with medium levels of living related to government payrolls and rural farm-forest economy (Leon); and Group 4-Rapidly growing population of medium size with medium levels of living with an urban dominated economy based on manufacturing, commerce and a transient tourist trade related to military payrolls (Bay). If one employs the indices used by Becker and Brubaker, then Liberty County possesses the lowest level of living in the region followed by Jefferson and Wakulla.

Variations in the characteristics of the population result in variations in the distribution of wealth derived directly or indirectly from the land resource base. In parts of the region the characteristics of the population are more favorable for the development of sound land-use practices than they are in others. In those areas containing large blocks of persons with four years

11The authors point out that Bay County ranks lowest of the four counties included in this group, but "it exhibits characteristics and tendencies that justify its inclusion."
or less of formal education the problem of obtaining maximum returns from the land will be great. This problem becomes most acute in those areas where the land resource base itself is very poor.
CHAPTER 3

SETTLEMENT

Settlement represents a cultural concept which reflects an independent or organized attempt on the part of man to adapt the necessary services required for survival to fit conditions of the environment. As changes occur in the cultural superstructure the settlement forms must be modified in order to remain compatible with the changing economic system. In the more primitive areas of the earth, settlement forms are highly ephemeral, whereas in areas possessing a highly complex economic system these forms are of a more permanent nature, representing tremendous amounts of investment capital. In the western world the terms rural settlement and urban settlement are frequently employed to indicate, in a general manner, the predominant economic activity. Because of the high degree of complexity which characterizes the American economic system and its associated socio-economic benefits, the rural-urban boundary has been weakened. Thus individual settlement forms may best be described at some point along a continuum, with rural and urban settlements representing opposite poles. Because of the changing nature of the economic activity of persons occupying these settlement
forms, the Census Bureau now breaks down rural settlements into rural farm and rural non-farm. Sociologists have coined the term "rurban" to describe forms possessing many of the characteristics formerly associated with both of these not too distinct units.

In rural areas settlement generally takes the form of isolated farm homes, hamlets, and villages. The residents are generally engaged in primary economic activities, requiring large per capita amounts of land. The rural village exists primarily as a service center, supplying the basic needs of rural residents. The number of rural settlements in the United States is steadily declining as the requirements for farm labor have declined and the attraction of urban centers has increased.

Urban settlements vary in size from 2,500 to the modern megalopolis. This settlement form is characterized by a great deal of variation, both in its internal and external aspects. The appearance of urban settlements is principally based on function and the culture of the predominant group. Most urban centers represent sites of secondary and tertiary economic activity with little land available on a per capita basis. Because we identify specific types of economic activity with types of settlement it seems logical that the prevalence of these settlement units should indicate the extent to which certain types of land-use or resource-use problems might arise.
RURAL SETTLEMENT

In 1950 Central-North Florida was largely rural, with approximately 58 per cent of its residents living in places of less than 2,500 people. The region's degree of rurality is approximately 44.0 per cent greater than that of the state. But Central-North Florida, like the state and the nation, is becoming less rural with each decade.

In utilizing the Census Bureau's two divisional breakdowns of rural settlements we should get a better picture of the distribution of economic activity in the sparsely settled parts of the region. The region's rural farm population is largely concentrated in the following four counties: (1) Jefferson, (2) Jackson, (3) Gadsden, and (4) Calhoun. Neither Jefferson nor Calhoun counties possesses a single settlement with more than 2,500 people. Wakulla and Liberty may also be added to the list of counties not having a single urban unit, but where rural population might be largely classified as rural non-farm. This indicates that a more diverse economy prevails here, and that agriculture is of minor importance in the economy of these counties.

Since 1930 there has been a reduction in the degree of rurality, based on farm population, in each of the more important agricultural counties, with the exception of Gadsden. In both 1940 and 1950, Gadsden County's rural farm population exceeded that of the rural non-farm element,
while Jackson County's rural farm element declined from 65.6 per cent in 1930 to 46.5 per cent in 1950. Thus the greatest loss in total population in Jackson County has been among the farm element. Jefferson County's rural element has responded similarly, with only 49.2 per cent classed as rural farm in 1950 in comparison to 59.9 per cent in 1940.

Mechanization and shifts in types of farms have led to increases in the average size of farms in each of the counties with more than a third of their population designated as farm population in 1950. These counties have also experienced an increase in the per cent of land in farms since 1940. The increase in the size of farms can largely be attributed to the consolidation of small holdings,

**TABLE 8**

**NUMBER AND PER CENT OF LAND IN FARMS IN CENTRAL-NORTH FLORIDA COUNTIES WITH MORE THAN ONE-THIRD OF THEIR POPULATION CLASSED AS RURAL-FARM IN 1950**

<table>
<thead>
<tr>
<th>Number of Farms</th>
<th>Per Cent of Land in Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1950</td>
</tr>
<tr>
<td>Jackson</td>
<td>3,662</td>
</tr>
<tr>
<td>Gadsden</td>
<td>1,285</td>
</tr>
<tr>
<td>Jefferson</td>
<td>1,083</td>
</tr>
<tr>
<td>Calhoun</td>
<td>622</td>
</tr>
</tbody>
</table>

as well as the expansion of agricultural land use in each of the preceding counties.

The scattered farmstead is characteristic of the largely agricultural counties. This pattern can be best observed in Jackson and Gadsden counties. In both of these counties a number of small service centers have evolved to serve the largely agricultural hinterland. These agricultural service centers are dispersed intermittently along major roads and range in size from less than 200 to more than a 1,000 people. The number of these service centers in Jefferson and Calhoun counties is limited. In both Jefferson and Calhoun counties the major towns are County seats with fewer than 2,500 people. Thus Monticello and Blountstown, the respective service centers in these two counties, serve both a commercial and political function.

Gadsden, unlike the other largely agricultural counties of the region, possesses at least one agricultural village which is characterized by a cluster of houses extending along the highway, but contain no commercial service establishment. This feature was not observed elsewhere in the region.

The region's rural non-farm settlements are largely confined to those areas with limited agricultural potential. Wakulla, Liberty, Gulf, and Franklin are 79.3, 75.0, 57.8, and 44.0 per cents rural non-farm, respectively.
One group of rural non-farm settlements are represented by small service centers, logging camps, and small communities which developed at the site of lumbering operations; most of these are currently on the decline. This pattern can be observed in various parts of Liberty, Calhoun, Gulf, Wakulla, and Franklin counties.

Communities such as Hosford, Telogia, Wilma, and Sumatra in Liberty County and Sopchoppy in Wakulla County are representative of centers largely dependent upon a rural forest economy. Other rural non-farm communities serve as dormitory towns for residents employed in the region's larger urban centers.

The second group of rural non-farm settlements have developed in response to recreational demands. These centers are generally small, but possess a coastal or water front location. Panacea in Wakulla County, Carrabelle and Lanark in Franklin County, and Mexico Beach in Bay County are representative of such centers.

The percentage of rural non-farm settlements is lowest in Gadsden County with 18.3 per cent, followed by Leon County with 27.2 per cent. In counties with one or more large urban centers the rural non-farm settlements accommodate a small percentage of the population.

URBAN SETTLEMENT

Central-North Florida, as has been pointed out, is largely rural, but there is much evidence to show that
rurality is giving away to urbanization. In 1930, the region was only 32 per cent urban, but by 1940 the proportion of urban residents had increased to 40 per cent. The 1950 ratio of 42 per cent urban compares unfavorably with the 65.5 per cent urban ratio for the state.

In 1940, six of the region's ten counties possessed at least one urban community. The only county with more than a single urban community was Gadsden, a county with a large rural-farm population and a declining rural non-farm population. Urban settlements in 1950 varied in size

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1940</td>
</tr>
<tr>
<td>Tallahassee</td>
<td>16,240</td>
</tr>
<tr>
<td>Panama City</td>
<td>11,610</td>
</tr>
<tr>
<td>Chattahoochee</td>
<td>7,110</td>
</tr>
<tr>
<td>Quincy</td>
<td>3,888</td>
</tr>
<tr>
<td>Marianna</td>
<td>5,079</td>
</tr>
<tr>
<td>Apalachicola</td>
<td>3,268</td>
</tr>
<tr>
<td>Port St. Joe</td>
<td>2,393</td>
</tr>
</tbody>
</table>

Source: Seventeenth Census of the United States, 1950.
from Port St. Joe with 2,752 residents to Tallahassee, the state capital, with 27,237 residents.

Tallahassee, Panama City, and Quincy experienced the most rapid rate of growth from 1940-1950. All other urban settlements in the region experienced only minor changes, with Apalachicola suffering a small loss in population. Port St. Joe was the lone urban center in 1950, not so classified during the previous census period. Estimates made by the Florida State Chamber of Commerce for 1959 indicates that the three most rapidly growing communities in 1950 have maintained their lead throughout the present decade. The 1959 estimates for Tallahassee, Panama City, and Quincy are 45,900, 33,900, and 8,400 respectively.¹ The rapid growth of Tallahassee and Panama City can be partially attributed to their ability to attract population from the adjacent rural labor pool. Quincy's growth is largely due to its "operation bootstrap" program in which it has devoted considerable effort to attracting industry.² The recent development of additional industrial establishments at Port St. Joe will probably


²On December 15, 1959, the city of Quincy annexed two additional areas which included more than 1,000 people. The estimated population of the city is now 10,000.
result in a population increase here. It has been predicted that by 1975 a continuous strip of urban settlements will extend from Mobile eastward beyond Tallahassee. This prediction appears to rest upon an invalid assumption, when one considers the amount of open space and wetlands presently separating Mobile and Tallahassee.

The urban settlements of Central-North Florida are quite similar to other southern urban centers in terms of function. Hart indicates that southern urban centers are dominated by three industry groups, manufacturing retail trade, and personal services. The region's smaller urban centers are centers of retail trade, with the exception of Port St. Joe, which is a manufacturing center. Hart classifies Panama City as a diversified city with retail trade subdominant, whereas Tallahassee is classified as a professional center. The professional center is defined as a center in which a combination of professional services, educational services, and public administration account for at least one-fourth of the labor force. In 1950,

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5Ibid.

6Ibid.
33.9 per cent of Tallahassee's work force was so employed.

More than 20 per cent of the labor force in both Tallahassee and Panama City in 1950 were engaged in personal services. The non-white element of the labor force largely monopolizes this job category throughout the urban centers of the south. Forty-three per cent of both Tallahassee's and Panama City's non-white labor force were engaged in personal services in 1950. Other urban centers in the region with a large proportion of non-white workers in the labor force are Port St. Joe with 43.8 per cent and Quincy with 48.3 per cent.

Four of Central-North Florida's urban centers are situated in the northern part of the region in the predominantly agricultural section. These centers are Tallahassee, Quincy, Chattahoochee, and Marianna, all located on U.S. Highway 90, which serves as the major east-west artery linking Jacksonville with Pensacola. The remaining urban centers possess coastal locations, with Panama City ranking seventh among the state's major ports. Port St. Joe and Apalachicola are classed as minor ports, with the former center making important gains in this area. Panama City and Tallahassee are becoming more important as tourist centers by virtue of their respective locations and facilities for handling the tourist trade. The smaller
Figure 9

DISTRIBUTION OF URBAN PLACES IN CENTRAL-NORTH FLORIDA
interior and coastal cities cater primarily to a local clientele.

It appears that the 1960 census will reveal that the region has made significant gains in its level of urbanization. Thus the region is becoming more and more like the state and nation in its dominant form of settlement. A declining rural farm economy coupled with increasing employment opportunities in the region's urban places will do much to alter the present situation in respect to settlement. The problem presently associated with rural land use will be greatly modified and possibly reduced, but we can expect a growing list of ills to plague the region's urban settlements, as has been true of other regions in the country that are presently caught in the throes of a rural-urban transition.
CHAPTER 4

LAND-USE PATTERNS

Patterns of land use are influenced by conditions of the natural environment, the interplay of economic forces and existing social institutions. Within the last century several theories have been developed explaining the role of these elements in influencing land-use patterns. Most location theorists stress the operation of economic forces in determining these patterns. It has been pointed out by Firey that these theories can be grouped into the following three categories: (1) idealized descriptive schemes, (2) empirically rationalistic theories, and (3) methodologically rationalistic theories.¹ Only the latter two theoretical groupings make explicit utilization of the operation of economic forces. The methodological rationalists have primarily concerned themselves with mental constructs or pure theory, whereas the empirical rationalist attempts to explain existing land-use patterns on the basis of cost.

¹Walter Firey, Land Use in Central Boston, Cambridge, Massachusetts, 1947, p. 6.
Current location theory is based primarily on the work of Von Thunen and Weber. The former was concerned with agricultural land use, while the latter devoted his attention to industrial location. Isard indicates that Von Thunen and Weber employed different levels of inquiry in their analysis, but by employing the substitution relation between outlays for variable factors, their theories of location for the aggregate and the firm can be integrated. The weaknesses which characterize this type of location theory are generally attributed to the omission of social or institutional values. It is Firey's belief that values and interest cannot be overlooked in accounting for land-use patterns. Barlowe and Johnson, Ciriacy-Wantrup, and others contend that extra-market values often play important roles in establishing patterns of land use.

Land-use patterns themselves offer the best tangible evidence of malpractices in land use. Thus by observing these patterns it is often possible to detect the harmonious or disharmonious relationship existing between man and land. Disharmony frequently reveals itself in the physical

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3 Firey, *op. cit.*, p. 33.


deterioration of the land and the economic, social and physical deterioration of man over the long run. It is the objective of sound conservation policy to eliminate these malpractices in land use wherever they might occur, in order that the land might produce at its optimum level through time and that the benefits accruing from this state of production may be enjoyed by posterity.

The type of ownership of land in the United States is becoming increasingly an indicator of land-use potential. Public ownership of land has been on the increase since the decade of the thirties. During this period our policy regarding land ownership was reappraised and it was discovered that our previous policy of total private ownership had created problems that could not be easily solved by the private sector of the economy.

The Florida Planning Committee in 1935 recommended that an extensive tract in Central-North Florida be taken out of private ownership. Much of this land was already tax delinquent, a condition which in itself is generally indicative of disharmony between man and land, and in 1936 this area was acquired by the federal government for the purpose of creating Apalachicola National Forest. This 542,000 acre tract constitutes the principal segment of public land in the region. In 1959, Central-North Florida had 14.8 per cent of its land in public ownership. This proportion is somewhat higher than the 10.1 per cent figure
Figure 10

LAND USE AND OWNERSHIP IN CENTRAL-NORTH FLORIDA

- URBAN LAND
- CROPLAND
- PASTURELAND
- WOODLAND
- FOREST
- NOT PASTURED

PUBLIC

PRIVATE
for the state, but less than the 21.5 per cent of the publicly owned land in the nation. Other large segments of publicly owned land in Central-North Florida are used for military purposes, state parks and other recreational uses.

Privately owned land in Central-North Florida is largely commercial forest land, with farmland constituting only 30.7 per cent of the total area. In 1950, 48 per cent of the land in the state was classed as farmland, but only 5 per cent as cropland; whereas cropland constituted 29.4 per cent of the farmland in Central-North Florida. Thus farming is a more extensive economic user of land in Central-North Florida than it is in the state as a whole.

**LAND USE IN CENTRAL-NORTH FLORIDA**

We will now investigate the distribution of these land-use patterns in some detail in order to ascertain the degree of harmony that exists between man and land. In analyzing the land-use pattern we must forever keep in mind the qualities discussed in previous chapters. The variable which has not been discussed which will affect the pattern of land use is that of culture and social

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7If adjustments are made, by subtracting an extensive tract of cropland in Northwestern Jackson County which falls outside of our regional boundary, the proportion of cropland to total farmland in the region will be closer to 25 per cent.
GENERALIZED PATTERNS OF LAND USE IN CENTRAL-NORTH FLORIDA
institutions. Though these are intangible qualities created by man to satisfy both tangible and intangible goals, they sometime assume an all important role in their influence on land use. Land use and conservation are frequently approached from an ecological point of view. Glendinning explains the relationship between man and land as "essentially an ecological one," in which "there is mutual interaction as the land affects man and man affects the land, and the two are not logically subject to divorce ment." It is sometimes difficult for the land manager to understand the operation of the principles of ecology, thereby making it necessary to resort to ethics as a means of convincing the land user that new land management plans should be adopted.

AGRICULTURAL LAND USE

Agricultural land in Central-North Florida can be divided into the following components: (1) cropland, (2) pastureland, (3) woodland, and (4) land in farmsteads, roads, lanes, and other uses. Twenty-nine per cent of farmland in the region is cropland, with pasture constituting 38.6 per cent, woodland 30.4 per cent, and the land

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in farmsteads, roads and other uses comprising only two per cent. 9

**TABLE 10**

COMPONENTS OF AGRICULTURAL LAND USE AS A PER CENT OF THE TOTAL IN CENTRAL-NORTH FLORIDA,

BY COUNTY, 1954

<table>
<thead>
<tr>
<th>County</th>
<th>Cropland</th>
<th>Pastureland</th>
<th>Woodland</th>
<th>Farmsteads, roads, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson</td>
<td>36.9</td>
<td>32.1</td>
<td>22.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Jefferson</td>
<td>32.9</td>
<td>34.9</td>
<td>29.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Leon</td>
<td>30.1</td>
<td>38.8</td>
<td>40.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Wakulla</td>
<td>28.0</td>
<td>34.3</td>
<td>36.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Gadsden</td>
<td>26.7</td>
<td>25.2</td>
<td>44.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Calhoun</td>
<td>24.6</td>
<td>43.3</td>
<td>28.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Bay</td>
<td>18.7</td>
<td>41.8</td>
<td>34.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Liberty</td>
<td>8.4</td>
<td>37.5</td>
<td>19.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Gulf</td>
<td>2.1</td>
<td>70.9</td>
<td>25.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Franklin</td>
<td>1.3</td>
<td>67.2</td>
<td>30.6</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: Compiled from The Florida Agriculture Census of 1954.

9Pastureland as used here includes the census definition of cropland used for pasture and woodland used for pasture, as well as, land classified solely as pastureland. The use of this breakdown results in a reduction of the amount of land classed as cropland and woodland, but this seems justifiable considering the growing importance of livestock in the economy of the region.
The preceding table reveals in a general manner the pattern of distribution of agricultural land use. The table by implication also reveals information regarding the distribution of the quality of land. The quality of land generally tends to be highest in those counties in which the proportion of land in crops is highest. The average gross returns in order to magnitude from these agricultural uses on a per acre basis occur in the same order as they appear in the table, cropland, pastureland, and woodland.10 The table likewise reveals the importance of the farm wood-lot as an integral part of the agricultural economy of the region.

The permissive factor which influences the extensiveness of agricultural components is the condition of the natural environment, whereas, the impelling factors influencing the proportion of land in these components are the operation of economic forces and social institutions. The counties in which the percentage of cropland is highest have experienced a fairly steady decline in the acreage of cropland harvested over the past twenty-five years. This decline in acreage can be largely attributed to the following factors: (1) loss of farm population, (2)

10L. A. Reuss, Florida's Land Resources and Land Use, University of Florida Agricultural Experiment Station, Bulletin 555, November 1954, p. 31.
intensification of agricultural methods, (3) the prevalence of government subsidies, and (4) exhaustion of soils due to continuous cultivation.\textsuperscript{11}

\textbf{TABLE 11}

\textbf{ACREAGE OF CROPLAND HARVESTED IN CENTRAL-NORTH FLORIDA FROM 1929-1954, BY COUNTY}

<table>
<thead>
<tr>
<th>County</th>
<th>Acreage of Cropland Harvested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1929</td>
</tr>
<tr>
<td>Jackson</td>
<td>163,017</td>
</tr>
<tr>
<td>Jefferson</td>
<td>52,726</td>
</tr>
<tr>
<td>Gadsden</td>
<td>49,724</td>
</tr>
<tr>
<td>Leon</td>
<td>42,648</td>
</tr>
<tr>
<td>Calhoun</td>
<td>17,660</td>
</tr>
<tr>
<td>Bay</td>
<td>4,776</td>
</tr>
<tr>
<td>Wakulla</td>
<td>8,756</td>
</tr>
<tr>
<td>Liberty</td>
<td>5,796</td>
</tr>
<tr>
<td>Gulf</td>
<td>797</td>
</tr>
<tr>
<td>Franklin</td>
<td>37</td>
</tr>
</tbody>
</table>

\textbf{Source: Sixteenth Census of the United States, 1940 and The Florida Agriculture Census of 1954.}

Bay, Calhoun, Franklin, and Gulf counties each harvested a greater acreage of crops in 1954, than in 1929.

\textsuperscript{11}These factors have not operated continuously over the twenty-five year period. Factors one and two have been most influential in the present decade.
This increase can be partially explained on the basis of an expanding market for agricultural products in the Panama City market area and increasing mechanization. In each of these counties the quality of the land for agricultural utilization is low, but the increased acreage harvested is an indication that man through technology is find agricultural types that are suitable even to this somewhat inhospitable environment.12

Agricultural Land Use by Type of Farm

The type of farm concept is frequently employed to denote changes in the agricultural situation of a given area. This concept is based on the percentage of the total farm income derived from the sale of each farm commodity. Thus by employing Census Bureau data, changes in the regional agricultural pattern can be easily compared with those taking place during the previous census period. This type of data enables one to observe the dynamics of the market economy, as well as extra-market values on the agricultural picture of the region.

The Bureau of the Census has divided all commercial farms into these nine categories: (1) vegetable, (2) fruit

12The extent of the increase in the acreage in Franklin and Gulf counties are negligible, thereby indicating that the prospects for producing crops on an extensive basis are minor.
and nut, (3) cash grain, (4) cotton, (5) other field crop, (6) dairy, (7) poultry, (8) other livestock, and (9) general.\(^1\) In 1954, four of the nine types of farms prevailed in Central-North Florida, whereas, only three of these categories persisted in 1950. The general farm is the most prevalent in the region, with seven of the ten counties being classed as such.

In 1954, Reuss pointed out that the average expenditure per farm was highest for dairy farms in the state as a whole.\(^2\) If one considers the type of farms found in Central-North Florida, the highest expenditures per farm are associated with poultry operation, although only one county in Central-North Florida, Liberty County, derives the bulk of its farm income from the sale of poultry. The highest average value of land and buildings per farm in the state is associated with farms classified as fruit and nut. The highest average value of land and buildings per farms in Central-North Florida are found in Leon County, a county classified as one of the general farms. The

\(^{1}\) The criteria employed for the establishment of these categories is based on the per cent of total sales. When 50 per cent or more of the total sale is derived from any one of the categories employed, the farm is designated as belonging to that particular type. When less than 50 per cent of the total sale is derived from a single category, the farm is classified as a general farm.

\(^{2}\) L. A. Reuss, \textit{op. cit.}, p. 33.
MAJOR TYPES OF FARMS IN CENTRAL-NORTH FLORIDA
BY COUNTY, 1954

[Map showing the distribution of different types of farms in Central-North Florida by county.]
highest average number of workers per farm in the state is on vegetable farms, whereas farms classified as other field crop hold this distinction in Central-North Florida. Gadsden County, the only county in the region classed as an other field crop county employed an average of 4.2 persons per farm. Thus, one can generalize that other field crop farms are labor intensive, whereas poultry farms and other livestock farms are capital intensive.

If one considers the average size of the farm by type, it will be found that the largest farms in Central-North Florida are classified as other livestock, averaging 550 acres per farm. This is considerably smaller than the average for other livestock farms in the state as a whole. General farms and other field crop farms average smaller in size in the region than in the state, whereas on the other hand, the average size of poultry farms in Central-North Florida exceeds the state average.

The type of management can be expected to change as there is a shift from the general farm to a more specialized type of agriculture. Livestock, other field crops, and

15The two counties in the region classified as Other Livestock Farms, Franklin and Gulf, are scarcely suited to other types of agricultural pursuits on an extensive scale, owing to the infertility of the soil and the problems of drainage. Other livestock farms here, unlike those in Central Florida, are part of a different type of agricultural economy. A range livestock economy is characteristic of Central Florida, whereas a farm livestock economy prevails in Gulf and Franklin counties.
poultry farms will require management superior to that necessary to conduct operations on general farms. This is not to imply that sound and skillful management is not the desired object in all types of farming ventures, but because of the risk factor it is even more necessary in other types of agricultural operations.

The existence of the Government Price Support Program is partially responsible for the persistence of a general farm economy. The staple crops of the region, corn, cotton, tobacco, and peanuts all come under this program.

The General Farm

The general farm is the most widespread agricultural type in Central-North Florida and will probably remain so for some time to come. Although Bay, Calhoun, Gulf, Jackson, Jefferson, Leon, and Wakulla counties all are classified as general farming counties, there is wide variation in the type of agricultural land use which contributes the greater share of the income derived from the sale of farm products (See Table 12, p. 108).

The greatest share of the region's income derived from the sale of farm products in the general farming counties is received from the sale of field crops. The relative value of field crops ranged from 43.5 per cent of the value of farm products sold in Jackson County to 2.1 per cent in Bay County. Other livestock rank second to field crops in value.
TABLE 12

PER CENT OF INCOME RECEIVED FROM THE SALE OF FARM PRODUCTS IN THE GENERAL FARMING AREA OF CENTRAL-NORTH FLORIDA, 1954

<table>
<thead>
<tr>
<th>County</th>
<th>Dairy</th>
<th>Livestock</th>
<th>Poultry</th>
<th>Field Crops</th>
<th>Vegetables</th>
<th>Fruit &amp; Nuts</th>
<th>Horticultural Specialities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>31.6</td>
<td>17.7</td>
<td>25.8</td>
<td>2.1</td>
<td>2.3</td>
<td>10.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Calhoun</td>
<td>9.1</td>
<td>31.6</td>
<td>5.9</td>
<td>35.0</td>
<td>5.8</td>
<td>6.4</td>
<td>-</td>
</tr>
<tr>
<td>Gulf</td>
<td>20.0</td>
<td>47.5</td>
<td>3.8</td>
<td>3.8</td>
<td>0.8</td>
<td>0.8</td>
<td>5.1</td>
</tr>
<tr>
<td>Jackson</td>
<td>6.9</td>
<td>32.6</td>
<td>6.7</td>
<td>43.5</td>
<td>2.9</td>
<td>2.7</td>
<td>3.3</td>
</tr>
<tr>
<td>Jefferson</td>
<td>6.0</td>
<td>17.2</td>
<td>0.8</td>
<td>23.8</td>
<td>6.5</td>
<td>25.2</td>
<td>17.7</td>
</tr>
<tr>
<td>Leon</td>
<td>20.0</td>
<td>20.0</td>
<td>10.5</td>
<td>22.6</td>
<td>2.9</td>
<td>11.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Wakulla</td>
<td>7.1</td>
<td>47.0</td>
<td>13.7</td>
<td>24.2</td>
<td>0.6</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Compiled from C. C. Moxley, "Change and Growth in Florida's Agriculture," Economic Leaflets, Vol. 15, No. 8, August 1956.
The proportion of land in pasture in this seven county area is 39 per cent of the total, while cropland occupies only 28.7 per cent of the land in farms. The range in the ratio of pastureland to total farm land is small. Calhoun County's 43.3 per cent is the highest in the general farm group. But, all counties in the group have more than 30.0 per cent of their land in pasture. Jackson County, an important field crop producer, with 32.0 per cent of its land in pasture, has the smallest proportion of land.

Bay County, a minor agricultural county, has only 18 per cent of its agricultural land in crops where Jackson, a more important county agriculturally, utilizes 36.9 per cent of its farmland in crop production. Jefferson and Leon counties also utilize more than 30.0 per cent of their farmland in the production of crops. The trend is toward a reduction of the acreage in crops in the leading field crop counties and an increase in the ratio of pastureland to cropland.

The staple crops produced in the general farming counties are as follows: (1) corn, (2) cotton, (3) peanuts, and (4) tobacco. Tung nuts, watermelons and small grain are increasing in importance. Corn occupies 50.0 per cent of the cropland harvested, followed by peanuts, cotton and tobacco with 9.8 per cent, 1.8 per cent, and 1.1 per cent in cropland harvested, respectively. The growing season for
these crops varies from 90 days for some varieties of corn to 180 days for cotton. Peanuts and tobacco are ready for harvest from 100 to 150 days after planting. Corn is grown extensively in all of the general farming counties with the exception of Bay. Cotton, peanuts, and tobacco are found on a far less extensive scale due to the limited nature of the land on which these crops could be produced and the operation of federal acreage allotment.

**TABLE 13**

THE PERCENTAGE OF CROPLAND HARVESTED DEVOTED TO STAPLE CROPS IN THE GENERAL FARMING AREA OF CENTRAL-NORTH FLORIDA, BY COUNTY, 1954

<table>
<thead>
<tr>
<th>Crops</th>
<th>Corn</th>
<th>Peanuts</th>
<th>Cotton</th>
<th>Tobacco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>8.2</td>
<td>0.5</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>Calhoun</td>
<td>47.0</td>
<td>8.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gulf</td>
<td>49.1</td>
<td>0.12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jackson</td>
<td>51.0</td>
<td>25.0</td>
<td>5.1</td>
<td>0.14</td>
</tr>
<tr>
<td>Jefferson</td>
<td>51.0</td>
<td>2.9</td>
<td>2.5</td>
<td>0.78</td>
</tr>
<tr>
<td>Leon</td>
<td>57.0</td>
<td>2.4</td>
<td>3.2</td>
<td>0.22</td>
</tr>
<tr>
<td>Wakulla</td>
<td>63.0</td>
<td>20.4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Compiled from *The Florida Agricultural Census of 1954*. 
The ubiquitous corn crop is produced under a wide variety of conditions and on an extensive basis because of its ease of production. In all of the general farming counties with the exception of Wakulla, the bulk of the corn is harvested as grain, but here it is hogged off, or grazed and cut for silage. Mechanical corn pickers were employed in each of the general farming counties but Gulf in 1954. The number of corn pickers ranged from one picker for each 1500 acres of land in corn in Wakulla County to one picker per each 400 acres in Bay County. Neither of these counties produced corn on an extensive scale. The small ratio of pickers to acreage in Wakulla County reflects the limited amount of capital invested in agricultural equipment. Jackson and Jefferson counties with their extensive corn acreage employed one picker to each 950 and 485 acres of land in corn, respectively. The larger size of the average farm holding in Jefferson County will in part explain its ratio of mechanical corn pickers to land in corn.

Jackson County is the single most important producer of peanuts in the region, with Calhoun, Jefferson, and Wakulla counties representing less important peanut producers. Peanut operations are concentrated in southern Jackson and north central Calhoun counties, where they are grown on sandy loam soils. Mechanized harvesting of peanuts has reduced the labor requirements for a crop that was formerly considered labor intensive. Mechanization is greatest in
Figure 13. Corn is being harvested here on a patch farm that appears as if it was only recently cleared of trees. This holding is situated in western Leon County and indicates little in the way of sound farm management.
Figure 14. The harvesting of corn on institutional land south of the city of Tallahassee. Corn occupies the most extensive acreage of all field crops in the county, but much land formerly in field crops is now represented by pastureland and housing developments.
Figure 15. Threshing peanuts north of Altha in north central Calhoun County. Peanut production has become an almost completely mechanized operation, reducing the need for excessive amounts of labor. This is one of the most important peanut producing sections in Central-North Florida.
Jackson and Calhoun counties. Peanut acreage allotments exist in each of the general farming counties.

Cotton, formerly the most important crop in the region, in both an economic and social sense, retains only a vestige of its former importance. Cotton is adapted to the well-drained soils of the Marianna lowlands and the Tallahassee red hills and it is here that it has been important historically. Jackson, Jefferson, and Leon counties are still the leading cotton producing counties in the region. Cotton is produced principally by sharecroppers in Jefferson and Leon counties utilizing family labor on small plots averaging about four acres in size. The size of the cultivated plot is determined by current acreage allotments. The average yield in the eastern counties is approximately one bale per acre. Cotton production in Jackson County is carried on under more modern conditions. The number of tractors used in the process of cultivation is far more extensive than is true of Leon and Jefferson counties. In these two counties the hoe and the mule are still used extensively. Cotton is largely produced by Negro labor in the eastern counties, whereas both white and Negro labor are used on an extensive scale in Jackson County.

The declining importance of cotton in the economy of Leon and Jefferson counties is further evidenced by the lack of ginning facilities in either of these counties.
Figure 16. A cotton plot in northeastern Jefferson worked on shares. This farmer after trying unsuccessfully to establish himself in the industrial north, returned to the farm to pursue an established "way of life." The entire family was engaged in picking cotton on this wornout tract. This is a typical sight in Jefferson County, a county that is more than 60 per cent non-white.
Figure 17. Feed for this farmer's motive power is secured by collecting hay cut by county road employees. The mule team is the property of a small cotton farmer in northeastern Leon County. This indicates that the small patch farmer is still holding on wherever possible, although this largely represents conditions of a prior period.
Cotton produced here must be transported to Georgia for purposes of ginning. A large cotton gin is located at Malone in Jackson County, which handles most of the cotton produced there. Other evidence of the decline of cotton in the economy of these counties is the presence of abandoned farm houses throughout Central-North Florida. The continuous outmigration of the rural farm population in these cotton producing counties will no doubt result in a further decline in the importance of cotton in the economy of the region. Thus, the general farming area of Central-North Florida is following the trend currently in vogue in the southeast, that is the conversion from a one crop cotton system to one of grassland farming.

In three of the general farming counties tobacco production is carried on on a limited scale, with less than one per cent of the cropland harvested being given over to its production. Tobacco required soils of at least moderate fertility, therefore, its production is confined to Norfolk, Tifton, Marlboro, Orangeburg, and the Magnolia series. Both flue-cured and shade-grown tobaccos are produced in the region. Flue-cured tobacco is produced most extensively in Jefferson County, with a small quantity being produced in Jackson County. Shade-grown tobacco is produced on a more limited scale on lighter soils in Leon County. Shade production in Leon County represents a minor spillover from the major shade producing county to the west.
Figure 18. The farm herd is becoming an important element in the region's agricultural system. The above herd is about to be fed on one of Velda Dairy's holdings in north-eastern Leon County. This is an area that was formerly dominated by field crop operations, but is now in the process of becoming an important livestock area.
Tobacco is a labor intensive crop that occupies a relatively small proportion of harvested cropland, but produces high returns per acre. Flue-cured tobacco is controlled by the federal acreage allotments, but shade-grown tobacco does not come under federal control. Mechanization has made very little progress in the area of tobacco production. The persistence of the federal allotment program and the supply of cheap agricultural labor will largely influence the expansion or shrinkage in the production of these crops. The persistence of acreage allotments is an indication that production and demand are not in harmony.

The importance of the tung nut in the major tung producing counties is far greater than might be inferred from the acreage devoted to its production. Tung production was initiated in the state in 1920, but commercial production did not get underway until 1925. Thus tung production in the region known as the "tung belt" is of relatively recent origin. The tung tree is a subtropical plant and is very sensitive to climatic conditions. The young tree is readily damaged when temperature drops below


Figure 19. A tung orchard at the height of the growing season. The above orchard is situated in northwestern Jefferson County, leading tung producer in the region. This is a highly renumerative producing high returns per acre.
Figure 20. The harvesting of tung nuts in Jefferson County gets underway in late autumn and continues until February. The high demand for labor during this period is largely satisfied by women and children who pick the fallen nuts from the ground and place them in bags to be transported to the crushing mills.
18 to 20° F, but the winter temperature must be low enough for the tree to undergo a period of dormancy. Soil conditions also play a major role in locating tung trees, for these trees cannot thrive in areas of poor drainage and are somewhat intolerant of alkaline conditions, therefore, well-drained acid soils are selected for their production. Tung trees are produced on Ruston sandy loams and loamy sands in Leon and Jefferson counties and members of the Lakeland and Eustis series in Jackson and Calhoun counties. The average yield in the two principal producing counties is two tons or more per acre, while yield in the western counties is closer to one and a half tons per acre. The greater depth of sandy soil and the lower natural fertility of these soils are responsible for the lower yields in Jackson and Calhoun counties.

In 1954, Leon and Jefferson counties devoted 16,000 and 12,000 acres, respectively, to the production of tung trees. This exceeds that of all crops in Leon County and is exceeded only by corn in Jefferson County, although in 1959 the value of corn and tung oil in Jefferson County is expected to be about the same with corn occupying more than three times the acreage in tung trees. The number

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18Hicks, op. cit., p. 29.
19L. A. Reuss, op. cit., p. 41.
20Tallahassee Democrat, December 20, 1959, p. 39.
of tung trees planted in the general farming counties in 1954 was 2,345,000.\textsuperscript{21} This is far in excess of the 600,000 trees planted in all Florida in 1930.\textsuperscript{22} The number of tung trees in Jefferson and Leon counties is on the decline, whereas the number of trees planted in Jackson, Calhoun, and Bay counties is on the increase. More than three-fourths of the trees in Bay and Calhoun counties were non-bearing in 1954,\textsuperscript{23} while on the other hand 95 and 98 per cent of the tung trees in Leon and Jefferson county orchards were bearing trees.

Tung nuts, like cotton, require an abundance of labor during the harvesting season which begins in December and lasts until February. The nuts are gathered by women and their children who crawl on their knees through the orchard area in order to secure the fallen nuts.\textsuperscript{24} Thus stoop labor of a parasitic nature is employed in the harvesting of the nuts in the major producing counties. The process of extracting the oil from the nut is a highly mechanized one. Four of the state's five tung oil mills

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\textsuperscript{22}Hicks, \textit{op. cit.}

\textsuperscript{23}The production of tung trees in Jackson, Calhoun, and Bay counties are located largely to the west of our regional boundary.

\textsuperscript{24}The current wage paid for gathering tung nuts in Jefferson County is fourteen cents a bag.
are located in Central-North Florida, with two of the mills situated in Jefferson County.

The tung nut, although representing a relatively new domestic crop, is one that is currently being subsidized by the federal government. Excessive production of tung oil has resulted in a continuous decline in the price of the product. In 1952 the peak production of tung oil was reached in the state, and at that time the quoted price per ton of oil was $84, but in 1956 the price had declined to $64. The federal support price in the summer of 1959 was approximately $50 per ton.

In Jackson, Jefferson, and Calhoun counties, the production of watermelons is growing in economic significance. These counties devoted 3.1 per cent, 4.6 per cent, and 4.6 per cent, respectively, of their cropland harvested to watermelon production. In some cases watermelons are produced on a share basis. In 1956 the average yield for melons in the state was 385 per acre, while the average price quoted was $512 per thousand melons. Watermelons represent an extensive type of crop requiring little labor, but yielding moderately high returns per acre.

Oats have become the principal small grain in the general farming counties as a result of increased emphasis on livestock farming. The acreage of oats has increased from almost nothing in 1949 to approximately 3.0 per cent of the cropland harvested in 1954. Oat production is most
extensive in Jackson County, although Calhoun County is an important secondary producer. In Calhoun County oats is used in the rotation scheme with corn.25

The importance of livestock in the general farm economy is evidenced by the proportion of the total value received from the sale of livestock. The gap between income received from the sale of field crops and livestock is rapidly being closed in Leon and Jefferson counties. In Jackson County, where the proportion of land in farms is high, field crops still represent by far the most important source of income. Calhoun County's situation is similar to that of Leon and Jefferson, but is less diversified than either. Extensive areas of poor soils and poorly drained land has served to limit the spread of field crop production in Bay County. The nature of the terrain there is more conducive to the development of a livestock economy. Wakulla County received the greatest proportion of its farm income from the sale of livestock in 1954, but livestock production has declined in relative importance since 1949, at which time it was classified as a livestock county. The number of beef animals in Wakulla County is smaller than that in any of the region's other general farming counties. Gulf County is by far the least important county

25Personal correspondence with Mr. Thomas B. Jones, County Agent, Calhoun County.
in the general farming group from the point of view of land in farms and value of agricultural products. The natural environment is ill suited for the practice of agriculture on an extensive scale, but unlike some of the other minor agricultural counties in the region, is becoming a very important industrial and commercial county. Thus Gulf County with an environmental situation similar to Wakulla, Franklin, and to a lesser degree Liberty County, unlike these counties is increasing its numbers and prospering at a level unknown in these adjacent counties.

The number of beef animals as well as acreage in improved pasture is rapidly expanding in all of the general farming counties with the exception of Wakulla. Farmers in this area are actively engaged in producing successful grass crops. Improved pastures involve (1) planting better varieties of grass, (2) fertilization, (3) weed control, (4) drainage, and (5) improved grazing management. Both grasses and legumes are used on improved pasture. Pensacola bahia and coastal bermuda grass have been found to be well suited to solid conditions in northwest Florida, while legumes are represented by lupine and crimson clover, which are planted as winter annuals. Beef production in

Central-North Florida is primarily on a farm-herd basis, whereas in peninsula Florida the range-herd is the dominant form of beef enterprise.

The Field Crop Farm

Gadsden County is the only field crop farming county in Central-North Florida. This county is situated entirely within the rolling uplands and possesses soils that are very good by regional standards. The availability of cheap farm labor exceeds that of any other county in the region. Corn represents the most extensive crop in the county, with 73.5 per cent of the cropland harvested planted to this crop in 1954. Peanuts, cotton, oats and tobacco are also included in the field crop system. Tobacco far exceeds all other field crops as a source of cash income, although occupying only 9.8 per cent of the cropland harvested. The large returns received from the sale of tobacco has boosted Gadsden County to the seventh position among the 67 counties in the state in value of agricultural production.

Tobacco in Gadsden County has long been produced for the cigar market. Production was started more than a century ago and was marketed initially by John Smith, a

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28Technically the classification is other field crop, but the repeated use of this term is rather awkward.
Figure 21. In eastern Gadsden County beef production is becoming more important. The heavy Greenville soils in this area are not conducive for the development of the county's major crop, shade tobacco.
Gadsden County resident in 1830. At the turn of the century tests were conducted in the county which demonstrated leaves grown under shade were comparable to cigar wrapper tobacco purchased from Sumatra. This led to the development of the county's important shade-grown tobacco industry.

Shade tobacco requires a tremendous amount of labor and capital, but the land requirements are small; the average plot occupying approximately five acres. Kincaid estimates the cost of producing an acre of shade tobacco at approximately $2,000 while labor requirements average 1,500 man hours per acre per season. The elements represented on the cost side of the ledger in shade production are capital outlays for farms, irrigation facilities, shade cloth, commercial fertilizers, seed, and labor. Fifty per cent of the non-fixed cost in shade production represents the cost of labor. Although labor represents approximately half of the non-fixed costs, the unit costs are low, when compared with the unit cost for other non-fixed elements. For instance, in 1959 the price of seed was $2.50 per ounce.

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29Sidney W. Martin, *Florida During the Territorial Days*, Athens, Georgia, 1944, p. 115.


31Ibid., p. 7, 23.

32Shade tobacco seed in Connecticut sells from $8.00 to $10.00 an ounce.
while the average wage earned by farm laborers was approximately $4.00 per day. Irrigation facilities which are more extensive here than elsewhere in the region, servicing approximately 4,000 acres, also represent a large capital outlay.

Gadsden County's tremendous demands for labor is satisfied by the availability of a large non-white population which has become skilled in the techniques of producing shade tobacco over the years. The situation here is similar to conditions prevailing over much of the cotton south prior to World War II, that being the presence of a large non-white population which is tied to the land by a single crop. The possibility of mechanization in the processing and production of shade tobacco would probably result in a change of the complexion of Gadsden's population.

In Gadsden County tobacco is king. Chardon has indicated the need for agricultural diversification, but states, "the rate of diversification increases only when tobacco prices are down, with a tendency to return to tobacco when prices are raised."33 There was some evidence in 1954 that diversification was taking place as the value of livestock and poultry approximately doubled its 1949 value. Recently attention has been focused upon vegetable

33Roland E. Chardon, "An Examination of Some Agricultural Diversification in Gadsden County, Florida" (Unpublished Master's thesis, Florida State University), 1959, p. 28.
Figure 22. An exterior view of tobacco being produced under shade in Gadsden County. The shade cloth is used to simulate conditions prevailing in Sumatra, which was once our major source of cigar tobacco. The cloth used in producing shade represents one of the high fixed costs in cigar tobacco operations.
Figure 23. An interior view of a shade operation during the growing season. The string extending down from the shade covering is used in supporting the tobacco stalk. Irrigation pipe can also be seen here and represents another important element in the cost of shade tobacco production.
Figure 24. The harvesting of shade tobacco in Gadsden County is a labor intensive operation. The above photo illustrates what appears to be the utilization of all of the members of a family in the harvesting operation.
Figure 25. The preparation of shade tobacco for the market is a task largely handled by Negro women, who constitute approximately one-half of the labor force in Gadsden County. This illustrates the parasitic nature of cigar operations in the county, which are currently fighting the application of the minimum wage law to this type of employment.
production as a means of increasing agricultural diversity. A State Farmers Market has been established at Quincy to aid in vegetable marketing; this is the only such market west of Jacksonville. Agricultural specialization seems firmly entrenched with little change occurring in the agricultural economy in the foreseeable future, unless there occurs a revolutionary change in the production and processing of shade tobacco, that would tend to give other locations a comparative advantage.

The Poultry Farm

The poultry farm as a dominant commercial type is relatively new in Central-North Florida, having attained this status between 1949 and 1954. Poultry is intermediate in its capital requirements by comparison with other commercial types and is a very limited user of land and labor. Liberty County, a county which has continuously lost population during the past three decades has altered its farm economy in order to adjust to economic and natural conditions. The high ratio of the dependent population and lack of capital are socio-economic factors largely responsible for the shift from a livestock economy in 1949 to a poultry economy in 1954. The rapid growth of the process of urbanization and the decline in the rural farm population in Leon County created an extended market for poultry products. More than half of the county's land is public owned, this
is an apparent indicator of its physical suitability for agriculture. In 1954, 71.0 per cent of the value of the county's agricultural sales were received from poultry. Emphasis has been placed on broiler production. The number of poultry farms increased from 15 in 1949 to 47 in 1954, with the average value of farm products marketed more than doubling on a per farm basis. At the same time there occurred a 50 per cent decrease in the number of livestock farms. The decline in the importance of livestock may also be implied from the limited amount of improved pasture in the county. Although livestock production has declined in importance, approximately one-fourth of the farm income is still derived from this source. Like the general farming and field crop areas of Central-North Florida, the largest share of the county's harvested cropland is in corn. Corn, cotton, and peanuts occupy 71.5, 0.2, and 0.6 per cent of the 2,861 acres harvested, respectively. Almost half of the corn acreage is hogged off, a situation that does not exist elsewhere in the region. The cropland harvested, like the population, steadily declined since 1929. It appears that the agricultural future of Liberty County will be based on the production of products which require limited acreage, limited labor and only moderate amounts of capital. The future of the poultry industry will be influenced principally by the condition of the market.
Other Livestock Farms

The existence of another livestock-type area in Central-North Florida is a statistical illusion. Franklin County with only 6.3 per cent of its land in farms and only 65 acres of cropland harvested in 1954, is the least agricultural of all the counties. Franklin County's socio-economic and natural environmental situation is somewhat similar to that of Liberty County in terms of agricultural potential.

Franklin County in 1954 with nine livestock farms received 68.0 per cent of its farm income from this source. Poultry and dairying accounts for 20.0 and 7.2 per cent of the value of agricultural income, respectively. The average value of livestock products marketed per farm in 1954 was approximately $5,200. Only Wakulla County received less per farm than Franklin from the sale of livestock in the region. Another indication of the undesirability of land for agriculture can be inferred from the per acre value of agricultural land which was approximately $17.00 in 1954, a figure almost 50 per cent less than that of the next highest. The outlook for agriculture in Franklin County is rather bleak.

Non-Commercial Farms

The preceding analysis has concerned itself only with the nature and type of commercial farms distributed
Figure 26. The abandoned farm shack situated south of Malone in Jackson County. Abandoned farm shacks are increasing in number as the size of the farms increase and out-migration of the region's non-white population is accelerated.
throughout Central-North Florida. However, the greatest number of farms in the area are classified as non-commercial, being residential or part time farms. It is on these farms that the greatest problems are likely to occur. The subsistence farmer is generally least well prepared to cope with the environmental situation because of a lack of capital and a lack of education. The subsistence farm is generally small and is given over to the production of field crops and vegetables. Many of the present subsistence farms were formerly classed as commercial farms. The decline in the price of the farmer principal cash crop, cotton, and the availability of alternative employment opportunities in the growing urban centers were responsible for the present change in status.

34Residential farms are those farms on which the annual sales value of farm products is less than $250. Part time farms include those with value of products sold ranging from $250-$1,199 and operated reporting 100 days or more off farm work or reporting other income exceeding the value of agricultural products sold.
Figure 27. The above farmer is typical of the growing number of non-commercial farmers in Central-North Florida. Availability of urban employment has led to a reduction in the number of full time farmers, but many former full time farmers are still reluctant to completely sever their ties with the good earth. The above plot is situated in south-eastern Gadsden County.
TABLE 14

PER CENT OF NON-COMMERCIAL AND COMMERCIAL FARMS IN
CENTRAL-NORTH FLORIDA, BY COUNTY, 1954

<table>
<thead>
<tr>
<th>County</th>
<th>Residential</th>
<th>Non-Commercial</th>
<th>Total</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf</td>
<td>59.0</td>
<td>30.6</td>
<td>89.6</td>
<td>10.4</td>
</tr>
<tr>
<td>Bay</td>
<td>63.5</td>
<td>21.2</td>
<td>84.7</td>
<td>15.3</td>
</tr>
<tr>
<td>Liberty</td>
<td>47.5</td>
<td>31.8</td>
<td>79.3</td>
<td>20.7</td>
</tr>
<tr>
<td>Franklin</td>
<td>55.5</td>
<td>20.4</td>
<td>75.9</td>
<td>24.1</td>
</tr>
<tr>
<td>Wakulla</td>
<td>62.0</td>
<td>10.7</td>
<td>72.7</td>
<td>27.3</td>
</tr>
<tr>
<td>Leon</td>
<td>49.0</td>
<td>14.4</td>
<td>64.4</td>
<td>36.6</td>
</tr>
<tr>
<td>Calhoun</td>
<td>32.4</td>
<td>30.0</td>
<td>62.4</td>
<td>37.6</td>
</tr>
<tr>
<td>Gadsden</td>
<td>36.8</td>
<td>16.6</td>
<td>53.8</td>
<td>36.6</td>
</tr>
<tr>
<td>Jefferson</td>
<td>32.5</td>
<td>18.0</td>
<td>50.5</td>
<td>49.5</td>
</tr>
<tr>
<td>Jackson</td>
<td>27.8</td>
<td>16.1</td>
<td>43.9</td>
<td>51.0</td>
</tr>
</tbody>
</table>

Source: Compiled from The Florida Agriculture Census of 1954.

The proportion of non-commercial farms is highest in those counties in which agriculture is of little importance. Thus, Gulf, Bay, Liberty, Franklin, and Wakulla counties have a large percentage of these agricultural holdings. The greater number of non-commercial farms can be found within the leading agricultural counties in the region. Jackson with 1,321 non-commercial farms has the greatest number, followed by Leon, Gadsden, Jefferson, and Calhoun. Jackson County contains more than twice the
number of non-commercial farms found in all five of the minor agricultural counties combined. Therefore, the problems arising from the presence of subsistence farms are concentrated in those areas where agriculture is an established way of life.

The non-white element of the population constitutes a large proportion of the non-commercial farm operators. This is especially true in Leon and Jefferson counties, but somewhat less true in Jackson and Gadsden. Brubaker, in describing the situation in Leon County states that "Part time farming persists among Negroes; off-farm work in 1950 was highest ever recorded. Forty-seven per cent of all farmers reported working off the farm at some time, and 35 per cent worked off a hundred days or more, while 60 per cent reported that their outside income exceeded farm income." Much idle land was observed during the summer of 1959 on subsistence farms throughout northeastern Leon County. Most of these small holdings were operated by Negroes who were engaged in urban employment in the city of Tallahassee. In talking with several of these farmers, there appeared a manifest desire among them to be able eventually to return to the land. While this desire is prevalent among the elders, their teenage children expressed an equally strong desire to abandon the rural farmstead.

The game preserve or hunting club, referred to locally as a plantation, is an extensive holding generally non-commercial in nature, on which the production of quail is the primary objective. Brubaker estimates that these holdings occupied three-fourths of the best farm land in Leon County in 1950. This type of holding has increased in extent during the last decade, with the bulk of the holdings concentrated in Leon and Jefferson counties. The general opinion of local residents is that these plantations operate in direct conflict with good farming practices. Most plantations are financed by northern capital and are managed by professional managers. Much local resentment appears to exist with regard to this northern invasion and control over local lands.

The extent of agricultural land use in Central-North Florida is largely influenced by conditions of the natural environment, while the pattern largely reflects the influence of economic forces and social institutions. Agriculture is carried on extensively on the rolling uplands of Jackson, Gadsden, Leon, Jefferson, and Calhoun counties, whereas the sandy flatwoods area is of negligible importance with only a limited area of land in farms. The growth of local

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36 It should be pointed out here that not all of the game preserves in the region are non-commercial operations.

37 Brubaker, op. cit., p. 111.
markets for specific agricultural products has resulted in the alteration of the agricultural pattern. The role of government has been to restrict the acreage of specified crops in order to bring supply and demand more in line, as well as to offer local farmers information regarding the best methods and systems to be utilized under local conditions.

Central-North Florida is becoming less important as a producer of field crops requiring large amounts of labor, but is becoming an important livestock producing area. This new agricultural trend is more in line with the physical and socio-economic conditions of the region and should aid in eliminating some of the region's former agricultural problems. Thus the dawn of a new agricultural era is on the horizon, which corresponds to changes in other aspects of economic development in the region and throughout the southeast.

FOREST LAND USE

Forest land represents the single most extensive form of land use in Central-North Florida, as is true of the state. Approximately 80 per cent of the land in the region was classified as forest land in 1959;38 this

38Forest land is defined as lands which are at least five per cent stocked with trees and capable of producing saw timber or wood products, and land from which trees have been removed but which has not been developed for other uses.
represents an increase of one per cent since 1949. Only two counties in the region possess less than the 66 per cent ratio of forestland to total land in the state. It is apparent that there is some overlap in what the Bureau of the Census classifies as farmland and what the South-eastern Forest Experiment Station classifies as forestland. Thus the Census Bureau designation of woodlands in pasture and woodlands not pastured fall into the category of forestland as employed by the latter agency.

The presence of extensive stands of timber in Central-North Florida is an indication of the quality of the land and its suitability for widespread development. The economic yields from the sale of forest products on a per acre basis is very low. Reuss pointed out in 1952 that the average value per acre of land in commercial forests was $2.72, while that in hay, the least remunerative crop, was $17.00 per acre. While this is true, many persons are aware of the indirect benefits reaped by the presence of a forest cover which cannot be easily measured in terms of money income. The outlook for forestry activities in the region is very bright. The rapid growth of the population of the state offers increased markets for forest products. The fact that trees mature faster here than in other major forest producing areas gives it an additional advantage.

But the future success of the region's forest activity will be principally influenced by management practices. Efficient practices can be anticipated on industrial and public holdings, but problems will likely occur on the many small holdings and farm woodlots throughout the region.

In 1949 the region's forest cover extended over 3,482,600 acres, a 4.1 per cent decline in acreage was observed in 1959, with forestland occupying only 3,340,000 acres. The greatest per cent of change occurred in Jefferson County which experienced a 13.8 per cent decline in acreage. Gadsden was the only county in the region to increase its forest acreage from 1949 to 1959. The greatest change occurred in those counties which are primarily agricultural. This is a good indication that improved pasture is replacing non-commercial and non-profitable stands in these counties. This reasoning breaks down in trying to analyze the situation in Gadsden County. The increase here might possibly have resulted from the sale to pulp companies land formerly in farm woodlots on run down farms in the southwestern part of the county.

Characteristics of the Forest Land

The site quality of forestland in Central-North Florida varies widely with the better sites for forestry synonymous with those for agriculture. The quality of the site is reflected in the average tree height. The site
quality of the rolling uplands in the northern part of the
region is rated generally good, with limited areas being
rated as very good. The flatwood section to the south is
rated only fair in site quality. But good sites can be
found on alluvial flats in the flatwood section. The best
sites in the region are located in parts of Gadsden, Leon,
and Jefferson counties.

On the good sites, pine may attain heights of 65 to
74 feet in a period of fifty years, while the fair forest
sites produce trees whose average height ranges from 55
to 64 feet within the same period. The better sites in
the region can be correlated with the distribution of the
Norfolk Red Bay soil group, whereas the good sites are
synonomous with the distribution of the Marlboro-Greenville
group. Kaufman estimates that pine stands on good sites
will yield approximately 280 board feet per acre per year,
whereas poor sites will yield only approximately 160 board
feet per acre per year. The extent of good forest sites
are approximately equal throughout the region. The poorer

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40 Henry F. Becker, op. cit., p. 43.

41 Robert L. Barnes and Charles W. Ralston, Soil
Factors Related to Growth and Yield of Slash Pine Plantations,
Bulletin 559, University of Florida Agricultural Experiment
Station, 1955, p. 15.

42 Clemens M. Kaufman, "Has Forestry a Future in
Figure 28. Slash Pine, one of the most important commercial species in the region, occupies the mesic site. The above seventeen year old stand is situated in northern Wakulla County.
Figure 29. The nature of the surface materials in Leon County has resulted in the occurrence of numerous lakes and depressions. The above photo indicates the widespread dispersion of cypress stands along the outer edges of a shallow pond in northwestern Leon County.
Figure 30. Densely forested alluvial tracts aid in retarding agricultural development along the valley floors of the region's major streams. This hardwood stand is located adjacent to the Chipola River, a tributary of the Apalachicola. The narrowness of these stream valleys further reduces their utility.
Figure 31. Marshland is not restricted to the low lying coastal areas. This tract is situated in northeastern Jefferson County in a region of rolling topography. In the background can be seen the ubiquitous pine stand.
sites will be almost exclusively in pines, whereas the better sites will yield some hardwoods with pines predominating. On the good and very good sites forest stands have to compete with agricultural land uses. The poorer sites are dominated by forest stands, for here agriculture is of little importance.

The Distribution of Forest Types in Central-North Florida

Forest types are frequently separated into two major categories, softwoods and hardwoods. The region's principal softwoods are longleaf pine, slash pine, loblolly pine, cypress and cedar. The principal species of hardwoods in the region are sweetgum, yellow poplar, chestnut oak, ash and hard maple. Other hardwood species common to the region are tupelo, soft maple, red oak, hickory and beech.

The softwoods presently occupy the greatest acreage, but hardwoods are becoming increasingly more important in the regional economy. In 1949, using the saw timber category, the amount of softwood in the region was 2,557,100 board feet, as opposed to 1,563,800 board feet of hardwoods. In 1959 softwoods of saw timber size have increased by 47.0 per cent of 736,400 board feet. Trees of saw timber size were more extensive in all but two of the counties in 1959. The extent of softwoods of saw timber size declined in Bay, Gadsden, Gulf, and Jackson counties, but increased in the other counties of the region. Hardwoods increased
in Gadsden, Gulf, Jackson, Leon, Liberty, and Wakulla counties. The decrease in the quantity of saw timber in Bay and Gulf counties might possibly be associated with the presence of pulp mills in these counties, although pulp mills can utilize smaller trees. Softwoods are distributed extensively throughout the region, with the percentage increasing in areas of sandy soils. The greatest proportion of hardwoods is found on the well drained uplands and on the flat valley bottoms of the major rivers.

Forest Ownership

Forest holdings in Central-North Florida are controlled principally by private enterprise. In 1958 approximately 79.1 per cent of the commercial forest holdings were in private ownership with the remaining 20.9 per cent in public ownership, but the proportion of forest land in private ownership in Central-North Florida is less than the 89.5 per cent share for the state. The privately owned commercial forest stands in the region can be separated into two categories of ownership, industrial and agricultural. Industrial holdings account for approximately 53.0 per cent of the privately owned forest land, while

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43 Preliminary Forest Survey Statistics for Northwest Florida, 1959, Southeastern Forest Experiment Station, October 1959.

approximately 46 per cent is controlled by pulp and paper companies. Three paper companies own land in some or all of the counties in the region. The bulk of the industrially held forest land is owned by the St. Joe Paper Company with its pulp and paper mill at Port St. Joe in Gulf County. The remaining five per cent of the industrially owned forest land is controlled by other wood using industries.

**TABLE 15**

**THE AMOUNT OF FOREST LAND OWNED BY PULP AND PAPER COMPANIES IN CENTRAL-NORTH FLORIDA, BY COUNTY, 1959**

<table>
<thead>
<tr>
<th>County</th>
<th>St. Joe Paper Company</th>
<th>International Paper Company</th>
<th>Buckeye Cellulose Corp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>192,133 acres</td>
<td>36,376 acres</td>
<td></td>
</tr>
<tr>
<td>Calhoun</td>
<td>62,338 acres</td>
<td>56,042 acres</td>
<td></td>
</tr>
<tr>
<td>Franklin</td>
<td>71,977 acres</td>
<td>8,796 acres</td>
<td>164,860 acres</td>
</tr>
<tr>
<td>Gadsden</td>
<td>46,763 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gulf</td>
<td>181,581 acres</td>
<td>4,853 acres</td>
<td></td>
</tr>
<tr>
<td>Jackson</td>
<td>2,979 acres</td>
<td>14,057 acres</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>80,505 acres</td>
<td></td>
<td>24,940 acres</td>
</tr>
<tr>
<td>Leon</td>
<td>53,561 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liberty</td>
<td>132,175 acres</td>
<td></td>
<td>15,820 acres</td>
</tr>
<tr>
<td>Wakulla</td>
<td>53,500 acres</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Personal correspondence with the individual companies.
Agriculturally classified forest land refers primarily to the farm wood lot. These holdings are generally small and suffer from a lack of sound management. The most acute problems associated with forest management occur on these small holdings, which only serve as an adjunct to the principal source of income. The extensive control of commercial forest land by pulp and paper companies should eliminate many management problems in the region and lend assurance to the small operator that sound management is a paying proposition. The publicly owned forest land is 20.2 per cent federally controlled with the remaining one per cent under state and municipal control. Eighty-five per cent of the federally owned forest land is located in Leon, Liberty, and Wakulla counties. Publicly controlled forest land generally occupies land that is of little desirability for agriculture. These sites are becoming important sites in the development of the region's recreational resources.

Trends in Forest Land Use

The use of land for commercial forestry is increasing in importance, while the total acreage of land in trees declined during the past decade, better management practices more than made up for this loss in acreage. The extent of the acreage classified as forest land is less significant than the condition of the stand in forest holdings.
The ownership of land by pulp companies is increasing, thereby reducing the number of small inefficient operators whose primary objective is short-run profits. The holdings owned by pulp and paper companies are of such extent that the most beneficial management practices can be easily inaugurated. Pulp and paper companies are also finding use for hardwoods in their operations. These companies, subsidiaries of larger corporations whose life expectancy is infinite, will assure continuous production of a very important raw material and also continue to engage in basic research which is in part responsible for increasing the life expectancy of our forest resources, as well as expanding the market for forest products.

Lumbering and naval-stores operators, formerly the most important wood users in the region, have declined in importance. The practices employed by the small operators here were responsible for the depletion of the original timber stands. The bulk of the timber presently being cut represents second growth. A number of towns in Central-North Florida represent former logging camps and towns that were abandoned after the area had been cut over and abused by destructive forest practices. The abandonment of these towns left them without a source of income. Many of the residents of these former lumber camps resorted to farming in areas hardly suited to agriculture, thereby creating additional problems. Lumbering operations and
naval stores are more important today in Liberty and Wakulla counties than elsewhere in the region.

Although hardwood production is on the increase, both public and private operators are engaged in timber conversion operations. These conversion operations are primarily concerned with the removal of scrub oak which succeeds pine. Thus many former pine plots are being replanted to this economically important species as unwanted scrub oak is removed. The prospects for forestry in the region are improving as the national demand for forest products continue to increase. The latest evidence of the growing importance of the forest industry in the region has been the introduction of two furniture producers in Gadsden County and the expansion of the St. Joe Paper Company's facilities to produce corrugated sheets from hardwoods. It does not appear at this time that any increase will occur in public ownership of forest land.

RECREATIONAL LAND USE

The use of land for recreational purposes is becoming increasingly more important in the nation as the trend toward urbanization continues, the work week is reduced, the level of living is raised, and as the proportion of the dependent element of the population increases. The operation of these factors give people more time and income, thereby increasing their demands for recreation.
We are concerned here with outdoor recreation and the land that is devoted to it. The concept of recreational land use is very difficult to define, for the individuals concept of recreation is highly variable; therefore recreational land use frequently overlaps other types of land use. Outdoor recreation is an important aspect of tourism which is vital to the economy of the state. Although the role of recreation in the economy of Central-North Florida is less important in a relative sense than the role played by it in the state's economy. But increasingly the region is finding ways to capitalize on its recreational resources.

Both publicly and privately owned recreational land exist in Central-North Florida, with public recreational land being somewhat easier to identify, because of its more easily defined functions. Although this is true it would be difficult to determine just how much public or privately owned land in the region should be classed solely as recreational land.

Publicly Owned Recreation Land

Publicly owned land utilized completely or in part for recreation includes state parks, state forests, national forests, wildlife refuges and reserves. The state parks have been developed primarily for purposes of recreation and the maintenance of some special environmental amenity in an essentially unaltered form. National forests, state
forests and other publicly owned land is only secondarily concerned with satisfying recreational demands. The recreational facilities in each of these use forms vary greatly with its location.

State Parks

There are three state parks located within Central-North Florida, with a fourth located slightly west of the regional boundary. These parks include Florida Caverns State Park, Torreya State Park, and Killearn Gardens State Park. Neither of these parks existed prior to 1935, the most recent one being acquired in 1953. Torreya was the first of the state parks to be developed. This park embraces 1,098 acres and occupies a site on the eastern side of Apalachicola River in northern Liberty County. The site was reserved for public use because of the presence of the rare torreya and yew trees, plus the presence of Confederate fortifications overlooking the river. The park includes a picnic area and shelter, facilities for fishing and bunkhouses that may be used for overnight camping. Annual attendance declined from 19,158 persons during 1956-57 to 12,176 persons during the 1958-59 season.45 The rather remote location and limited outlets might possibly account for the recent decline in attendance.

45Personal correspondence with Mr. W. A. Caldwell, Assistant Director, Florida Board of Parks and Historical Memorials, October 26, 1959.
Florida Caverns State Park was acquired in 1937. It was during this year that a mining engineer from the National Park Service discovered the presence of these limestone caverns. The caverns were developed in the Ocala limestone which is overlain by the Suwannee and Marianna limestones. The facilities present at Florida Caverns includes picnic areas, tent camping areas, and shower and laundry facilities and a nine hole golf course. Florida Caverns are located on the Chipola River, about three miles north of the city of Marianna. Annual attendance at the caverns has continuously increased since 1956. The total annual attendance during the 1958-59 season was 57,414 persons which is approximately 66 per cent greater than the attendance at Torreya during the same period.

Killearn Gardens State Park was acquired in 1953 and is located on Lake Hall, some five miles north of Tallahassee in Leon County. Killearn Gardens is the smallest of the region's state parks with only 306 acres. The gardens themselves embrace only 30 acres. During the 1958-1959 season a picnic area and beach area were opened resulting in a severalfold increase in attendance. The favorable location of Killearn Gardens near the region's largest city should result in the full use and enjoyment of its facilities. The annual operational cost of Killearn Gardens is
some $3,000 less than the cost of operating Florida Caverns State Park, but the attendance at the former is now almost double that of the latter. St. Andrews State Park, located west of Panama City and not really within our region, serves more persons annually than the three parks combined on an operating budget slightly less than that of Florida Caverns State Park. The location of St. Andrews State Park near a large population center and its coastal location are primarily responsible for its greater use.

National Forest

The Apalachicola National Forest is the only one of Florida's three national forests located in Central-North Florida. This holding was acquired by the federal government in 1936. Additional land was annexed to the forest in 1938, after which the area west of the Apalachicola River was referred to as the Wilma district, while the eastern section was referred to as the Wakulla district.

The production of timber on a sustained yield basis is the primary objective of the forest, but within this vast tract of more than a half-million acres, several recreation areas have been developed. In 1958 the following recreation areas existed in the forest: (1) Old Fort Gadsden, (2) Silver Lake, (3) Wright Lake, (4) Camel Pond,
and (5) Porter Lake. Old Fort Gadsden is a historical site located on the Apalachicola River in western Franklin County. Facilities for fishing, picnicing, and boating prevail here. Silver Lake is located in the Wakulla district only a few miles west of Tallahassee. Silver Lake includes a beach and facilities for swimming and picnicing. This site has been leased by the federal government to a private concessionaire. Wright Lake, Camels Pond, and Porter Lake are all located in the Wilma district and have facilities for swimming, fishing, and boating. The comparative isolation of these recreational areas will result in their being little used as long as other more accessible areas prevail. The most recent recreation area to be developed in the forest is Blue Sink, which is located south of Tallahassee and being developed as part of a five year program of the U.S. Forest Service. Blue Sink has a small beach and facilities for swimming and picnicing.

Hunting is permitted on extensive acreages of wildlife management lands in the region. The primary hunting regions are found in Apalachicola National Forest. Simmons Pasture covering 67,000 acres of wood and swampland in Wakulla and Leon counties was opened for the first time in ten years to public hunting in 1956. The Wildlife

47 The Tallahassee Democrat, August 2, 1959.
48 The Tallahassee Democrat, November 22, 1956, p. 20.
Management area in Liberty County embraces 110,000 acres and possesses a large population of deer and bear. The third management area in the region is located outside of Apalachicola National Forest and embraces more than 100,000 acres in Gulf, Calhoun, and Bay counties. Deer and quail represent the major game forms.

Reservoirs

The region's single reservoir is a newly acquired addition which might aid in the promotion of public recreation. The reservoir known as Lake Seminole covers 37,500 acres, most of which is located in Georgia. The reservoir was developed as a result of the construction of Jim Woodruff Dam, which was completed in 1957, after almost ten years in construction. The dam is located about one and one-half miles northwest of Chattahoochee, Florida, in Gadsden County. This multiple purpose project was constructed primarily for the purpose of improving navigation on the Chattahoochee and Flint rivers and providing hydroelectric power for the area. The development of a recreational area on Lake Seminole is of secondary importance, but may be considered a by-product of the projects primary functions. Several public boat landings have been constructed along the shores of the lake and the Florida

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49Personal correspondence with Mr. F. G. Turner, Assistant Chief, Engineering Division, U.S. Army Engineer District, Mobile, May 21, 1959.
Figure 33. A Gulf Coast beach located west of Panama City used primarily for recreational purposes. Recreation in this area is of growing importance as population continues to increase and recreational facilities are easily accessible to the region's inhabitants.
Figure 34. An undeveloped recreation strip along the Gulf Coast in Franklin County. The slowness of development here can be partially attributed to the sparsity of traffic, the narrowness of the beach, and sparsity of population. Peninsular point seen in the background is currently undergoing extensive development in anticipation of increased demands for recreational facilities.
Game and Fresh Water Fish Commission has developed a management area west of the lake in Jackson County. As the demands for recreation increase many of these isolated public facilities will be utilized far more extensively than is now the case. Thus at present the region's recreational resources are being under used.

Privately Owned Recreation Land

Most of the privately owned recreational land fronts on the Gulf of Mexico, but only a small part of this land has actually been developed for recreational purposes. The development of recreational facilities is being carried forward to St. George and Dog Island, which parallel the coast for some considerable distance. Recreation, as we have defined it, is a part of the objective of the developers. But utilizing the term very loosely, we can say that recreational demands are responsible for these developments. These developments will produce much needed tax money in Franklin County. The future development of private recreational sites will be governed by the demand for such facilities. Traffic flow records might serve as an indicator of the potential market for recreational development in those areas where recreational resources are in abundance.
Figure 35. The above holding located in northeastern Jefferson County represents a tract utilized primarily for recreational purposes. This rolling and well maintained tract is a part of the 20,000 acre Pinkney Hill Plantation or game preserve. The rise of this type of holding has resulted in the decrease in the number of small farms in the area.
Figure 36. Coastal areas in Central-North Florida are largely poorly drained making development somewhat costly and difficult. The above photo depicts a section of poorly drained land being utilized for recreational purposes. This section of St. Marks National Wildlife Refuge is situated west of Sopchoppy in Wakulla County.
URBAN-INDUSTRIAL LAND USE

Our rapidly growing urban industrial society is an increasingly important consumer of land. Although this is true, urban-industrial sites still occupy only a limited amount of land. Urban-industrial land use represents an intensive use whereas all other forms of land utilization thus far discussed have represented extensive uses of land. It appears appropriate to combine these two forms of land use under one heading if we take into consideration the fact that the bulk of our industry is concentrated in urban areas. Thus one might attribute the rise of the urban form as we know it in the twentieth century to the development of specialization in manufacturing.

Florida's urban centers have experienced rapid growth during the present decade, both in number of inhabitants and areal expansion. The basis for the development of urban forms in Florida has been less dependent upon manufacturing activity than for the nation as a whole. But, since 1950 urban growth and industrial growth have largely developed hand in hand. Central-North Florida's urban industrial growth has been spotty and has developed at a very much slower rate. But the importance of the urban-industrial complex is increasing in several of the counties in the

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50The word industry used here refers to manufacturing industries.
Figure 37. A segment of the Tallahassee Central Business District, which extends approximately three blocks north and south of this intersection. Tallahassee is the region's largest urban center and the state's capital.
region, whereas in others, this land use form and socio-economic system has made little progress.

Characteristics of Urban Land

Cities generally develop upon sites that are easily accessible surrounded by a productive hinterland, where water is readily available, protected from many of the vagaries of the natural environment and afford the possibility for expansion. Once an urban center has developed, the demand for certain facilities are largely determined by the existing value system. The greatest competition for available land in American cities today is occurring in the area of residential land use and manufacturing land use or industrial sites.

Distribution of Industry

Industrial or manufacturing activity in Central-North Florida is largely concentrated in two principal urban areas, Tallahassee and Panama City. Following these two centers in industrial importance are Port St. Joe and Quincy. The largely rural counties are of little importance in the region's industrial development. Therefore, the urban-industrial system is concentrated in Bay, Leon, and Gulf counties, and to a lesser extent Gadsden and Jackson counties. The manufacturing payrolls in these counties in 1958 ranged from more than $11,000,000 in Bay County to
slightly less than $2,000,000 in Jackson County.\textsuperscript{51} In 1954 there were approximately 260 manufacturing establishments in the region which employed 3.2 per cent of the estimated population for that year. The greater number of these establishments were small with an average of approximately 25 workers per establishment. The value added per employee in these small establishments is low. But the state has established as one of its objectives an attempt to increase the value added per employee,\textsuperscript{52} which ranged from $13,518 per employee in Bay County to $2,891 per employee in Gadsden County.\textsuperscript{53} The difference in value added per employee is a reflection of the variation in industrial types which prevails throughout the region.

The predominant industrial type is the low valued added by manufacturing type, which is mainly associated with the production of lumber and wood products excluding furniture. This is a raw material oriented industry of which some aspect is found in almost every urban place in the region. In value added per employee, the lumber and wood products industry ranked second from the bottom in the


state in 1954, with only apparel and related products lower. This industry holds the same position in respect to salaries and wages paid per employee, rising only above that of tobacco manufacture. Lumber and wood products are of major importance in the economy of twenty-three counties in the state based on the number of employees, number of establishments, and wages and salaries. Central-North Florida placed four counties among this twenty-three county group, with Leon County ranking second. The other counties in the region in which wood products industries are of major importance are Gadsden, ranking eleventh, Jackson ranking seventeenth, and Calhoun ranking twenty-first. The 49 establishments in the four counties averaged 40 employees per establishment with an average annual salary of $2,000 per employee.

Central-North Florida is also the location of two of the state's ten paper and pulp plants. The St. Joe Paper Company at Port St. Joe, which has been operating since 1937 and the International Paper Company at Panama City in operation since 1931, represent the region's two major industries. The average salary in the paper and pulp industry in 1954 was $4,350 per annum.54

54This figure represents a state average. The Florida Development Commission does not publish the number of employees or the wages and salary figures when a county possesses only one plant representing a single industry.
Manufacturing activity generally occupies a limited area, but its impact on the economy of a given region is greatly in excess of its areal demands for land. The importance of the urban-industrial system in Central-North Florida is growing, but as late as 1957 only two counties received more than 25.0 per cent of their support from manufacturing activity. A more valid picture of the manufacturing impact on Central-North Florida might be had by comparing it with manufacturing in the other 57 counties in the state.

TABLE 16

RANK OF MANUFACTURING ACTIVITY IN CENTRAL-NORTH FLORIDA

ON A COUNTY BASIS, BY EMPLOYING SELECTED CRITERIA,

1954

<table>
<thead>
<tr>
<th>County</th>
<th>Value Added by Mfg.</th>
<th>Mfg. Income Per Employee</th>
<th>Number of Mfg. Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>6</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Calhoun</td>
<td>46</td>
<td>56</td>
<td>48</td>
</tr>
<tr>
<td>Franklin</td>
<td>50</td>
<td>66</td>
<td>63</td>
</tr>
<tr>
<td>Gadsden</td>
<td>18</td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td>Gulf</td>
<td>Not available</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Jackson</td>
<td>29</td>
<td>43</td>
<td>28</td>
</tr>
<tr>
<td>Jefferson</td>
<td>54</td>
<td>62</td>
<td>53</td>
</tr>
<tr>
<td>Leon</td>
<td>17</td>
<td>39</td>
<td>19</td>
</tr>
<tr>
<td>Liberty</td>
<td>53</td>
<td>48</td>
<td>49</td>
</tr>
<tr>
<td>Wakulla</td>
<td>58</td>
<td>32</td>
<td>60</td>
</tr>
</tbody>
</table>

Figure 38. The St. Joe Paper Company plant above is the single most important industrial payroll in Gulf County, which ranks first in per capita income in Central-North Florida. The pulpwood in the foreground which is awaiting processing has been largely secured from extensive company holdings throughout the area.
Figure 39. The International Paper Company plant at Parker, a suburb of Panama City, is one of the two pulp and paper operations in Central-North Florida. This operation, like the one at Port St. Joe, occupies a waterfront location and employees approximately 1,300 persons, making it one of the largest industrial employers in the region.
Figure 40. The Newport Industries Naval Stores Processing plant at Telogia in Liberty County represents one of the region's formerly important industries. This is an area largely dependent upon a rural forest economy with a continuously decreasing population and low level of living.
Figure 41. The above industry, a wood preserving operation, represents one of Tallahassee's most recently established industrial plants. This is one of the many wood products industries which are distributed throughout Central-North Florida. This operation employs only three persons.
It is evident from the use of selected criteria that Central-North Florida is a minor manufacturing region within the state. Only two counties could actually be considered major manufacturing counties. In each instance the major manufacturing counties have waterfront locations and engage in manufacturing activity that is atypical of that carried on elsewhere in the region.

Trends in Urban Industrial Development

Urban-industrial development is on the increase in Bay, Leon, Gadsden, and Gulf counties. Since 1957, thirty-two additional manufacturing establishments have come into operation in the region; twenty-four of these are located in the above four counties. Forty-four per cent of the new industrial establishments are classified as lumber and wood products industries. Thus there is a continuation in the promotion of the old established industrial line.

Panama City is becoming the most diverse industrial center in the region, having added primary metals, apparel and related products, and additional wood products facilities since 1957. Port St. Joe has attracted three high-value-added type operations during the last three years. The most recent of these is the Michigan Chemical Company which started operations in the summer of 1959. The Allied Chemical and Dye Corporation and the Glidden Paint Company represent the earlier additions to the chemical group. The
establishment of these plants at Port St. Joe can be partially attributed to the presence of the St. Joe Paper Company,55 which supplies a by-product raw material utilized by the latter two companies. Port St. Joe, unlike the other urban-industrial centers is the home of a limited number of manufacturing establishments, but possessed the second largest industrial income in the region in 1956. Tallahassee and Quincy complete the group of actively growing urban-industrial centers. In both of these centers an array of small establishments dominates the industrial scene, with lumber and wood products industries maintaining their importance. Only one of the six industries that have come to Tallahassee since 1957 fall outside of this category. Quincy, a city which is putting forth special effort to attract industry, is becoming more diverse, but is attracting only low value-added types of industry. Since 1957, the following types of industry have come to Quincy: (1) food and kindred products, (2) furniture and fixtures, (3) machinery except electrical, and (4) lumber and wood products, excluding furniture. These four plants were expected to offer employment to approximately 220 persons.

Calhoun, Jackson, and Franklin counties have each attracted from one to three new manufacturing establishments

55Personal correspondence with Mr. R. C. Brent, Jr., Woodland Division, St. Joe Paper Co., October 2, 1959.
during this period. The largest of these new industries is a sawmill at Carrabelle, which will possibly employ 80 persons. Prior to the construction of this plant, there were only 48 persons engaged in manufacturing in Franklin County. In 1959 the number of manufacturing establishments in the region had reached 273, of which 60.5 per cent were located in Bay, Leon, and Gadsden counties. Leon leads with 68 establishments, followed by Bay with 51 and Gadsden with 45. Although the number of manufacturing establishments increased in each county, the number of persons engaged in manufacturing declined in four of the ten counties.

The rapid increase in construction activity is another indication of the growing importance of the urban-industrial system. Construction activity can be measured by denoting (1) the reported valuation of buildings constructed, (2) the number of building permits issued, (3) total annual construction payroll, and (4) the number of employees engaged in construction activity. Extensive building activity is going forward in the three most populous counties with the center of this activity focused on Tallahassee, Panama City, and Quincy. In 1958 the total reported valuation of construction activity in these three centers was


\[\text{Ibid.}\]
$13,320,000, $3,518,000, and $614,000, respectively. The number of building permits issued for residential constructions followed the same order with Tallahassee accounting for 627, which was three times the number issued to Panama City, the second most rapidly growing city during the year. From 1950-1956, building activity was more feverish in Panama City than of its interior rival, but since that time construction activity has quickened in Tallahassee. The number of construction workers, as well as income received from construction, is greater in Leon County than that of manufacturing activity. This situation does not occur in any of the other important manufacturing counties. In 1958, the total annual salaries paid to manufacturing employees was more than double that received by employees in construction in both Bay and Gadsden counties.

It appears that the future growth of the urban-industrial system in the region will be largely confined to Leon and Bay counties. Gadsden, Jackson, and Gulf counties will be the centers of secondary growth, with no community in either of these counties expected to surpass a population of 15,000 within the next decade. Panama City

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might possibly attract segments of the state's rapidly growing electronics industry with the development of missile testing and tracking facilities along the north gulf coast. Tallahassee remains essentially an administrative center in which the present type of industry will continue to dominate. The lack of skilled labor and the remoteness of the interior centers will serve as barriers to the development of high value added manufacturing types. Panama City and Port St. Joe hold the greatest prospects for the development of the type of industry that is now invading the state, because of their favorable location.

MINERAL LAND

Central-North Florida to date has only been a minor producer of minerals of economic importance. But there is hope that in the present decade petroleum and heavy mineral production might be initiated. But, at this time, land classified as mineral land is very limited and the only mineral currently mined is fuller's earth.

Fuller's Earth

Fuller's earth, a clay mineral with a high absorbent capacity has been mined in the region continuously since 1895.60 It is confined to the Hawthorn formation of the

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Alum Bluff group, which extends eastward from Liberty County across Leon and Gadsden counties into Georgia. The commercial production of the mineral is limited to Gadsden County.

In 1959, only three companies were engaged in mining fuller's earth, which was valued at $4.5 million in 1957. This represented approximately two-thirds of the value of all clays produced in the state. The companies engaged in the mining of the mineral are (1) The Floridin Company, Inc., (2) Magnet Cove Barium Corporation, and (3) Minerals and Chemicals Corporation of America. The Floridin Company has been engaged in the mining of fuller's earth continuously since 1910 and is the second largest producer in the Florida-Georgia area. This company was recently purchased by the Pennsylvania Glass Sand Corporation, but continues to operate under the same name and management. The Floridin Company owns 6,500 acres of land in Gadsden County, while the holdings of the other producing companies are less extensive.

Fuller's earth or attapulgite, as the mineral is sometimes called, is mined by the open pit method. Dragline excavators and other earth moving machines are employed to

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61 Information secured through personal correspondence with Mr. D. H. Mowell, President, The Floridin Co., October 25, 1959.

62 The Tallahassee Democrat, August 6, 1959, p. 1.
remove the overburden. The market for fuller's earth has been expanding for more than a decade, owing to the increased uses for the product. Fuller's earth was originally used to absorb coloring matter and oil from animal and vegetable matter. The name fuller's earth was applied to this montmorillonitic clay because it was used by fullers to remove grease from woolen cloth. The largest single use for this clay mineral at present is as an absorbent. Other important uses are as a catalyst, it is used in the production of drilling mud by the petroleum industry, and its more recent use in the production and processing of insecticides.

Potential Mineral Resources

There are those looking forward to the day when Central-North Florida will be more than the producer of a single mineral. The machinery is already in operation to attempt to make this desire a reality. In 1959 two petroleum companies leased land from the state and initiated drilling operations. This does not represent the first attempt to locate this fugitive resource in the region. In 1945, nine test wells were drilled by the Pure Oil Company in Bay, Calhoun, and Gulf counties to no avail. The present drilling operations are being carried out on off shore or submerged land.

63James L. Calver, op. cit., p. 62.
The current off shore drilling operations are being conducted by the Coastal Petroleum Company and the California Petroleum Company, a subsidiary of Standard Oil of California. The state granted the Coastal Petroleum Company a lease to 4,500,000 acres of submerged land on the basis that it will receive one-eighth of all oil produced. The Commonwealth Oil Company has also leased submerged lands extending from three to ten miles from the shore adjacent to Gulf and Bay counties, as well as other counties to the west. There is still some question regarding the legal status of these lands. Current drilling is being carried on in the same formation that has produced oil in Alabama.

The second mineral resource which might possibly be found in the sands of Central-North Florida's coastal area, is the ore of titanium. The increased demand for titanium can be partially attributed to the development of our missile program. The titanium base alloys have been described as strong as structural steel alloys but weigh only one-half as much as steel; they retain their strength at high temperatures, where other structural metals lose strength, and they also possess great resistance to corrosion.65

64The Tallahassee Democrat, November 18, 1959, p. 23.
The Heavy Minerals Company recently opened a titanium processing plant at Panama City. The discovery of these two potential resources would hardly affect the current land-use pattern. The petroleum operations being situated on offshore lands could result in the development of an aspect of land that is often ignored in land-use studies.

MILITARY LAND

Central-North Florida, like other parts of the state, has relinquished control of selected sites for military purposes. Generally land acquired by the federal government for military installations is of little value. Two Air Force bases are presently located in the region along with a missile tracking station and a radar station.

In Bay County a narrow strip of land covering approximately 22,000 acres, separating East Bay and the Gulf of Mexico, is the site of Tyndall Air Force Base. This air base was opened in late 1941 and has been in continuous operation since that time. Tyndall originally served as an Air Force gunnery school, but is presently serving as a weapons employment center. The presence of this military installation is an asset to Bay County, considering that 800 civilians are employed at this installation.

A second Air Force base is located in northern Jackson County. The 2,852 acre tract that serves as the
site for this base is state owned land that has been leased to the city of Marianna.66 Graham Aviation, a division of Pittsburgh Institute of Aeronautics, a civilian contract school, leased this tract from the city in 1953 and utilizes it to train Air Force officers and cadets. This was originally an Army Air Base during World War II. Thus technically this installation is not an Air Force base, but a civilian flying school set up for the purpose of training military personnel. The base employs 750 civilians and has annual payrolls of $4,200,000.67

The most recently acquired sites for military use are those housing the missile tracking station on Cape San Blas, in Gulf County, and the radar tracking station at Carrabelle, in Franklin County. These sites occupy a limited acreage, but their future importance to the region and the nation will probably be of inestimable value.

This chapter has recognized the several forms of land use which exists in Central-North Florida and has pointed out where and on what scale these land-use forms occur. It was stated in the outset that land-use patterns should lend some indication as to where and to what degree disharmony should arise out of man-land relationships. By

66 Personal correspondence with Mr. Zack A. Cullens, Director of Personnel, Graham Aviation, October 26, 1959.

67 Ibid.
considering the pattern and distribution of the features of
the natural environment, and the distribution of population,
we will attempt to explain the reasons for the existing
disharmony in the region. The following chapter will be
concerned with the land-use problems which have developed
as a result of man's choice in producing the existing land-
use patterns.
CHAPTER 5

LAND-USE PROBLEMS

The existence of land-use problems is indicative of the disharmony which prevails between man and land, and to a lesser extent between man and man. These problems arise as a result of man's attempts to utilize land which is ill suited to perform the desired tasks, but because of customs, limited education, lack of capital, and public policy, this activity is promoted. The task of eliminating these problems, completely or partially, is frequently thought of as conservation, whose objectives are to insure both present, but more especially future, generations adequate and unimpaired stock of the nation's resources.

The combination of a poor land base and an inadequately equipped population has done much to create land-use problems in Central-North Florida. The inauguration of a plantation system of agriculture more than a century ago did much to create many of the problems that presently confront the region's inhabitants. But, as is generally the case, man is not concerned with the long-run effects. The historical sequence of agricultural land use has not been the single producer of resource problems in the area,
although they were initiated early during the period of settlement. Widespread abuse also occurred at the turn of the century in the heavily forested coastal areas, when lumbering activity represented an important source of income. Many of the problems growing out of other forms of land use are more recent in origin and should be handled with less difficulty.

By employing the problem approach we are by implication advocating the remedial measures which are typical of conservation studies. This is an acknowledged weakness, which may be eventually eliminated as deeper insights are gained in treating these problems. This should eventually lead to the development of effective measures which will result in the elimination of some of the causal elements. It is apparent that more emphasis should be focused upon the human element in conservation studies and this will probably show up more frequently as more conservation research is undertaken by individuals representing the social sciences. Much of the basic conservation research carried out to date represents the work of persons in the physical and biological sciences. What is now needed is more understanding between individuals in the social, physical, and biological sciences in order that studies of a more meaningful nature might result.

Problems growing out of each of the major land-use types prevailing in Central-North Florida will now be
investigated in order to ascertain what might be done to eliminate them, thus assuring all of the region's residents a higher level of living, in the present, as well as the future.

PROBLEMS OF AGRICULTURAL LAND USE

The problems arising out of agricultural land use in Central-North Florida are both social and physical in nature. The prevailing agricultural system has left its mark not only on the land, but also on its occupants. The problems of agricultural land use vary with the distribution of agricultural types and variations in the nature of the physical environment. The degree of rurality in Central-North Florida is an indicator of the importance of agriculture in the regional economy and likewise indicates the necessity for a sound program of agriculture land use which will result in improving the lot of this large segment of the population.

In 1955, the United States Department of Agriculture listed Central-North Florida as a major problem area. Several criteria were employed in establishing such areas: (1) net income of full-time farmers, (2) level of living, and (3) size of the operation. Each qualifying criterion can be applied to Central-North Florida, thereby designating

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it as a serious problem area. Areas so designated are among the lowest fifth in the nation in terms of level of living, at least half of the commercial farms are low-production units and the residual income of the farm operator and his family in 1940 was less than $1,000 annually.²

The bulk of Central-North Florida's agricultural enterprises take place on the red and yellow podzols of Jackson, Calhoun, Gadsden, Leon, and Jefferson counties. Located here are members of the Orangeburg, Greenville, Magnolia, Norfolk, Marlboro, and Ruston Soil Associations, which are the best agricultural soils in the region. Only a limited number of soil associations comprising the groundwater podzols to the south are suited for the development of a general farming system. Thus both inherent fertility and the conditions of drainage have more or less set the outer limits of agricultural land use under the present state of technology.

Even on the best soils, the level of agricultural productivity is low, and on the poorly drained land of the southern group of counties there were only thirty farms that grossed more than $10,000 from the sale of farm products out of the 365 farms in this productivity category. The following table does much to illustrate the level of

²Ibid.
agricultural productivity in the region, by measuring farm operator productivity.

The efficiency of farm operators is highest in Gadsden County followed by Jefferson and Leon in the predominantly agricultural sector of the region. Gadsden County was the only important agricultural county in the region with less than 50 per cent of its commercial farms falling into economic classes five and six. Paradoxically, Leon and Jefferson counties which rank relatively high on the upper end of the scale, (classes one and two) also rank high on the lower end (classes five and six). Jackson, Leon, and Jefferson counties with approximately two-thirds of their farms grossing less than $2,500 are typical of the south in the proportion of farms falling into the aforesaid category.

The low level of operator efficiency has been attributed to several factors among which are the nature of land tenure, the level of education of the farm operator, the availability of capital, the size of the operation, and the suitability of the prevailing agricultural type to the

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3The Department of Agriculture separates all commercial farms into six categories based on the gross sales of farm products.


### TABLE 17

**PER CENT DISTRIBUTION OF COMMERCIAL FARMS BY ECONOMIC CLASS, 1954**

<table>
<thead>
<tr>
<th>County</th>
<th>Class I ($25,000 or more)</th>
<th>Class II ($10,000-$24,999)</th>
<th>Class III ($5,000-$9,999)</th>
<th>Class IV ($2,500-$4,999)</th>
<th>Class V ($1,200-$2,499)</th>
<th>Class VI ($250-$1,199)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calhoun</td>
<td>1.3</td>
<td>2.1</td>
<td>11.7</td>
<td>28.0</td>
<td>31.8</td>
<td>24.8</td>
</tr>
<tr>
<td>Gadsden</td>
<td>15.7</td>
<td>14.7</td>
<td>17.0</td>
<td>14.1</td>
<td>22.7</td>
<td>15.5</td>
</tr>
<tr>
<td>Jackson</td>
<td>1.8</td>
<td>2.9</td>
<td>10.5</td>
<td>23.7</td>
<td>32.9</td>
<td>28.4</td>
</tr>
<tr>
<td>Jefferson</td>
<td>3.6</td>
<td>6.6</td>
<td>12.6</td>
<td>13.3</td>
<td>27.8</td>
<td>35.9</td>
</tr>
<tr>
<td>Leon</td>
<td>6.2</td>
<td>3.6</td>
<td>6.8</td>
<td>14.2</td>
<td>33.4</td>
<td>36.0</td>
</tr>
<tr>
<td>Liberty</td>
<td>19.8</td>
<td>10.5</td>
<td>19.8</td>
<td>9.2</td>
<td>41.0</td>
<td></td>
</tr>
<tr>
<td>Bay</td>
<td>3.6</td>
<td>13.3</td>
<td>20.4</td>
<td>13.3</td>
<td>31.4</td>
<td>18.1</td>
</tr>
<tr>
<td>Gulf</td>
<td>11.0</td>
<td>27.7</td>
<td>33.2</td>
<td>27.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Franklin</td>
<td>10.0</td>
<td>22.2</td>
<td>67.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wakulla</td>
<td>4.3</td>
<td>13.0</td>
<td>45.5</td>
<td></td>
<td></td>
<td>37.0</td>
</tr>
</tbody>
</table>

Source: Compiled from *Florida Agricultural Census of 1954.*
conditions of the natural environment. It would be very difficult to say which of these factors has the greatest influence upon operator efficiency because of apparent interrelations.

The types of tenure arrangements which have prevailed in the southeastern United States since the Civil War are to some extent responsible for the low level of operator efficiency. But tenancy is on the decline throughout the region, with the bulk of the present tenants classed as cash tenants. The number of share croppers has declined as the non-white farm population has declined. The only county in the region with as many as 25 per cent of its tenants classed as share croppers is Gadsden County, yet the proportion of tenancy in this county is lowest among the agricultural counties in the region.

In correlating tenure arrangement with operator efficiency in the United States it was found that efficiency declined in the following order: (1) managers, (2) part owners, (3) share-cash tenants, (4) share tenants, (5) full owners, and (6) share croppers.6 It is rather paradoxical that full owners would represent an inefficient group, but when one considers that the greater number of full owners are operators of small holdings, then the situation becomes more understandable. In the major

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6W. Webster Johnson and Raleigh Barlowe, loc. cit., p. 273.
agricultural counties of Central-North Florida the percentage of full owners is as follows: Calhoun 86, Gadsden 65, Jackson 56, Leon 51, and Jefferson 46. The ratio of full owners declines as the per cent of non-whites in the population increases in each of the major agricultural counties, with the exception of Gadsden.

In four of the region's leading agricultural counties there appears to be a definite relationship between the per cent of farms in economic classes five and six and the ratio of non-white farm operators. But, Gadsden County, with 40.0 per cent of its farm operators classed as non-white, had only 38.2 per cent of its farms grossing less than $2,500 from the sale of farm products during the same period. Jefferson, Leon, and Jackson counties, with non-white operators constituting 59.0, 58.0, and 32.6 per cent of all farm operators in 1954, respectively, contain more than 60 per cent each, of the low production farm units. The rate of tenancy is also highest in these counties, with approximately one-third of the farm operators in Leon and Jefferson counties holding only limited rights in the land they cultivate.

The larger share of low production farm units is farmed for the most part by persons on small holdings, with little capital and little knowledge of sound farming practices or agricultural market conditions. The low median educational attainment is also in part responsible for
many low production farm units throughout the region.
Jefferson County with a median educational attainment of
5.3 years, the lowest for the region, also has one of the
highest proportions of low production farm units.

Small farm holdings are operated for the most part
by non-whites and the aged element in the population. With
an increase in the number of elderly persons in the popu-
lation as a result of increased life expectancies and the
rise of retirement farms, the number of small farms has
not declined as rapidly as might be thought. Many persons
on reaching old age will sell or lease parts of their farms,
but continue to farm on the remaining parcel. The per-
sistance of these small farming units through the years
has created problems of a serious nature throughout the
region. Perry indicates that among the non-white farmers
in Central-North Florida, the maintenance of these small
unproductive units has become a way of life.7

Another outstanding problem arising out of agri-
cultural land use is that of low income per farm laborer.
This problem is closely associated with the previous problem
of low productivity per farm. Although the level of income
of farm laborers varies little from the highly productive

7B. L. Perry, Jr., "Alternative Economic Opportunities
on the Land for Negro Veteran Institutional On-The-Farm
Trainees in the General Farming Area of Northwest Florida,"
(Unpublished Ph.D. dissertation, Cornell University) 1954,
p. 8.
farm unit to that of the low productive farm unit, the big difference between these operating units is the amount of labor used, which is largely determined by the prevailing agricultural type. Livestock, dairy, poultry, and grain operations generally require only limited amounts of labor, whereas tobacco, cotton, fruit, and nuts and other commercial field crops are labor intensive. Counties suffering population losses are shifting from labor intensive operations to capital intensive operations.

Agricultural labor is largely recruited from the ranks of the large rural non-white population. Non-white farm labor constituted 98.0 per cent of the farm labor employed in Jefferson County in 1950, 95.0 per cent in Gadsden, 81.0 per cent in Leon, 65.0 per cent in Jackson, but only 10.0 per cent of that employed in Calhoun County during the same period. The shade-grown tobacco producers of Gadsden County exhibit a greater degree of dependence upon this labor pool, because of the necessary skills involved, than is true of the other largely agricultural counties. In 1950, 50.0 per cent of Gadsden County's non-white labor force were classified as farm laborers; this included both males and females, with the latter being almost equally as important numerically in the farm operations of the county as were males. In 1959 farm laborers in Gadsden, Jackson, Jefferson, and Leon counties received approximately $4.00 per day or less than fifty cents
The demand for agricultural labor is declining as the farming system is being modified throughout the region. This decline in the demand for agricultural labor has been reflected in the decline of population in each of the rural counties with the exception of Gadsden. One might surmise that a modification of the existing agricultural system could develop as a result of the decline in the rural farm population during the present generation.

The major physical problems that have developed out of agricultural land use in the region are problems of water control, soil erosion, and soil depletion. The Soil Conservation Service lists erosion, lack of organic matter in the soil, and water control in this order, as constituting the major problems in Jackson, Calhoun, Jefferson, Leon, and Gadsden counties. In Bay, Gulf, Franklin, Liberty, and Wakulla counties water control becomes the most important problem followed by lack of organic matter and limited erosion.

In the rolling uplands erosion is considered moderate, occurring for the most part in the form of sheet erosion. In several local areas erosion has reached the gullying stage. The areas in which erosion is most severe are those

\footnote{Information obtained through interviews with local Negro County Agents and farm laborers in these counties.}

\footnote{Personal correspondence with Mr. H. G. Dosher, Area Conservationist, January 21, 1960.}
areas on which the traditional southern field crop type agriculture has been prevalent. Thus erosion is a major problem in those areas that are most dependent upon a row-crop economy.

The depletion of soil nutrients has resulted from the continuous production of robber crops on the same plots, and the rapid rate of leaching that is so characteristic of tropical and humid subtropical areas. These soils are deficient in organic matter which tends to decrease as temperature and rainfall increase. As a consequence of the decreases in organic matter there is a corresponding nitrogen decrease in content of the soil. Organic matter not only serves as a stabilizer of plant nutrients, but is also an important agent in influencing soil structure. Thus the depletion of plant nutrients from the soil is not solely man-induced; he nevertheless accelerates the rate of depletion.

The problem of water control in the past has been one of rather limited importance in the predominantly agricultural sector of the region, but has always served as a limiting factor on the lands of the coastal counties. Water control has come to mean more than the removal of excess water from the soil, and is now also associated with the artificial application of water to the land during periods of moisture deficiency. On the lands of the coastal counties the problem of drainage remains an important one...
and establishes rather narrow limits to land utilization. But the problem of excess water is not limited to the coastal counties, for sections of wetland may be observed in parts of agricultural Jefferson, Leon, and Calhoun counties. Irrigation was being practiced on a limited scale in all counties in the region in 1954, with the exception of Wakulla. In 1950, only Gadsden and Jackson counties reported farms having irrigation systems. At this time Gadsden reported 200 such operations, whereas Jackson reported only three.10

Gadsden County reported fewer farms operating irrigation enterprises in 1954, but the extent of irrigation had been increased. Leon County displaced Jackson in the number two position, in the extent of irrigation facilities in 1954, but both might be considered minor operators when compared with their shade tobacco producing neighbor. The problems of water control will most likely occur on high production farms, while the problems of erosion and soil depletion will characterize the low production units.

The problems created by faulty land use and poor management decisions cannot be solved overnight. In order to eliminate these problems from the private sector of the economy, it will be necessary for private and public efforts

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to be coordinated in a joint program set up for this purpose. The participation of public agencies in this program is vital in order that societal objectives may be protected against the sometimes disharmonious objectives of the individual. A survey of the land-resource base is very necessary in order to determine the possibility of agricultural success in the present. Such a survey may be physical or economic in nature, but must usually be undertaken by some public agency, because of the cost involved and the potential benefits that might be derived by society from such undertakings.

Land-resource inventories generally take the form of a soil survey and consequent classification, topographic mapping and various types of economic land classification. A complete and detailed survey of Central-North Florida soils is lacking, although the initial detailed soil survey in the state was completed for Gadsden County in 1903. Present soil conservation recommendations are made on the basis of reconnaissance surveys. Since a detailed soil survey has not been undertaken in this region, a soil capability map for the entire area does not exist. The topographic coverage of the area is almost complete, with much of the survey work being carried out during the past decade. The use of aerial surveying techniques has made this task much less expensive and time consuming. The
only sizeable area remaining to be mapped is located in Gadsden County and a small area in western Jefferson County.

In 1954, Perry utilized the Cornell system of economic land classification in developing a preliminary classification for Jefferson, Leon, Gadsden, Jackson, and Wakulla counties. This classification was designed to determine the possibility of success in agriculture. The following map identifies sectors of varying degrees of probable success in agricultural undertakings.\(^{11}\) According to Perry six economic classes occur in the region and may be described as follows:

Class I land - comprises all areas in which the possibility for financial success in any use by private individuals or corporations is very small. This land should be purchased by public agencies or owned by private individuals for non-monetary purposes such as recreation.

Class II land - comprises all areas that are submarginal for full-time commercial farming and for part-time farming but suitable to a small extent for forestry and some grazing of range cattle. Such areas could also be used effectively for wildlife and sporting reserves and for other recreational purposes.

Class III land - comprises all areas suitable for part-time farming but in which chances for financial success are too small to expect full-time farming to continue for long. Caution should be exercised in expanding capital investment for farming purposes.

\(^{11}\)The extension of this classification to include Liberty, Calhoun, Franklin, Gulf, and Bay counties was undertaken by the writer and is based on general observations of the nature of conditions along this low-lying section of the coastal plain.
unless such capital is invested in forestry, pecan or tung oil production, and range cattle production, and then on a part-time basis. Any intensive agriculture should be carefully confined to scattered small areas of better soils than occur in this class.

Class III-X land - comprises areas of land Class III in which the change to extensive full-time farming operations could be profitable provided land could be purchased in large contiguous tracts.

Class IV land - comprises areas that are marginal for full-time commercial farming. The chances for success are moderate as long as price relationships are favorable and the resources are used with utmost care.

IV-X - comprises areas in which the changes in farms organization, farm size, and farming practices, or additional woodlot management, intensive beef production, dairying and further concentration in livestock production may raise the long-run income expectancies considerably.

Class V - comprises areas suited to intensive land use. The chances for financial success over the years is medium to good. Land will support 50 per cent of the productive man-work units in intertilled crops, with good farming practices. The use of more machinery, fertilizer, spray materials and the like in general will yield good returns when prices are favorable.

V-Z - comprises areas potentially capable of yielding class V income in which there is a lag in farm business adjustments. Good farming practices are not carried out and non-real estate capital are not applied intensively, consequently this land produces inadequate income for maintenance of buildings and equipment at present day prices.

Class VI - comprises all areas that are particularly well suited to intensive farming. Chances for financial success over the years are good to excellent. Moderate returns can be obtained from small farms. Resources are
strong enough to support over 50 per cent of the production-man-work units in inter-tilled crops. High investments in land, buildings and equipment and in non-real estate inputs are justified. The kind of land use is more settled because high incomes have permitted capital accumulation that has enabled adoption of technological improvements and other adjustments in farming.\textsuperscript{12}

Another type of economic land classification that might aid in the solution of agricultural problems is that designed to aid in the equitable assessment of taxes on rural lands. Faulty tax assessments frequently result in the promotion of agricultural practices that enable one to produce sufficient capital to take care of the tax burden for a few years before the land has to be abandoned. Tax delinquency is not a major problem at the present time in Central-North Florida, but during the period of the 1930's the acreage of delinquent land was quite extensive; most of this land was acquired by the federal government. In 1958 a limited acreage of tax-delinquent lands prevailed in each county in the region, with the exception of Leon and Gulf.

Once land classifications have been completed this information should be disseminated among the rural farm population. Information of this nature can be made available by organizing an adult education program which might be conducted by the Extension Service or the Vocational

\textsuperscript{12B. L. Perry, Jr., \textit{op. cit.}, pp. 200-203.}
A SUGGESTED ECONOMIC LAND-CLASIFICATION FOR CENTRAL-NORTH FLORIDA
Agriculture programs. The Soil Conservation Service makes extensive use of information gathered from rural land inventories in aiding individual farmers to cope with the specific conditions which characterize their tracts.

The elimination of many of the region's low production farm units will probably occur as the educational level of the population increases, or as alternative economic opportunities are provided, and as effective federal programs designed to help the small farmer are undertaken. The raising of the educational level of the population has the effect of channeling many previous would-be farmers into other occupations. Thus the maintenance of a system of agricultural inheritance is on the way out. As the educational level of the rural population is raised, increased outmigration occurs, resulting in the reduction of pressure on the land. The raising of educational levels should also equip those persons who remain on the farm to be able to better cope with the problems of farming. It is no longer true that economic aspects of farming can be handled by the most poorly educated people in society. Problems of farm management are complex, considering the number of variables that effect a farm operation.

The question of alternative economic opportunity does not present a great deal of hope. Tallahassee is the only major industrial and service employer in that part of the region where the problem of low production farm units
is most acute. The educational attainment of the potential employee is so low that the type of job opportunities which prevail would only slightly improve his position, although it might result in an improvement in the general farm situation. In many instances low income employment of the type open to the employee enables him to continue his farming operation on an uneconomic basis. The increase in a substantial type of alternative economic opportunity is in part dependent upon the qualifications of the labor force.

The role of government in the elimination of these units has been questioned. The passage of the Agricultural Act of 1956, the Soil Bank, represents an attempt on the part of the federal government to improve the farm situation. This act has come under attack recently, as there are many who question its merits. Raushenbush indicates that the greatest merits of the Soil Bank lies in the effective promotion of the "Conservation Reserve" plan.13 The "Conservation Reserve" part of the Soil Bank promotes the subsidization of the farmer who takes land out of crop or livestock production and substitutes recommended conservation practices. The "Acreage Reserve" part of the program has as its objective the limiting of the amount of land in

specified crops in order to firm up the price of these commodities. The "Acreage Reserve" program enables many of these small inefficient producers of cotton, peanuts and flue-cured tobacco to stay in business. The "Conservation Reserve" idea has been adopted by some of the farmers, but it is unlikely that it appeals to the small farmer, especially those with less than ten acres. In Leon County approximately 20 per cent of the farms were in this category in 1954, and in 1959 the average rate paid to farmers participating in the "Conservation Reserve" program was $12.00 an acre. Small cotton producers on the other hand could expect to gross approximately $500.00 from a four acre allotment.

The problem of low wages cannot be easily solved because of the many socio-economic factors involved. But, the raising of the educational level and the creation of alternative economic opportunity are likewise moves in the right direction. As was pointed out the farm labor force is overwhelmingly non-white and is therefore handicapped in its competition for other types of employment. The shift toward a mechanized agriculture will do much to reduce the necessity for this large block of labor. The decline in available farm employment should serve to keep individuals in school for a longer period of time, thereby

14Tallahassee Democrat, September 28, 1959, p. 11.
preparing them to be better able to take advantage of alternative economic opportunities, both in and outside of the region. This problem will most likely remain in Gadsden County, even when it is reduced elsewhere. The great demand for cheap labor in tobacco production will continue for some time to come. Here the high birth rate among Negroes serves as the stabilizing element, which tends to reduce the frequency of outmigration. In 1958, three out of every four children born in Gadsden County were born of Negro parents. On July 1, 1959, the estimated non-white ratio was 60 per cent\textsuperscript{15} or an 8,000 increase in the non-white population, compared with an increase of 2,000 in the white population since 1950. Unless the birth rate is reduced among this element of the population little can be done to raise farm wages.

The physical problems which have evolved out of rural land-use practices can be handled somewhat more easily than the social problems, in that remedial practices are more easily inaugurated. But, even here there are obstacles that retard the utilization of conservation practices. Small farmers cannot always afford to practice conservation especially if the benefits to be derived are deferred too far in the future. The passage of the Soil Conservation Act in 1937 was designed to eliminate some of the financial

\textsuperscript{15}Population of Florida, Tallahassee, January 1960, p. 18.
burden associated with the development of soil conservation techniques. During this same year the Florida legislature passed an act which made possible the creation of soil conservation districts. The organization of districts in the state was initiated in the western counties and moved east and south.16 The first district to be created in Central-North Florida was the Chipola district, organized in May 1940, and included parts of Jackson and Calhoun counties. Within eighteen months after the creation of the Chipola district, districts were established covering all of the major agricultural counties in the region. The most recently created districts include Wakulla and Franklin, which were established in 1950 and 1952, respectively. The following table illustrates the extent to which conservation practices supervised by district technicians were being utilized in 1958.

On an areal basis the greatest effort has been expended on reducing the loss of plant nutrients. This can be demonstrated by the amount of land on which crop rotation and stubble mulching are practiced. Cover crops also aid in returning plant nutrients to the soil, as well as reducing the amount of soil erosion. As is to be expected crop rotation is practiced extensively in those

<table>
<thead>
<tr>
<th>County</th>
<th>Contour Farming (Acreage)</th>
<th>Cover Cropping (Acreage)</th>
<th>Stubble Mulching (Acreage)</th>
<th>Pasture Improvement (Acreage)</th>
<th>Terraces (Miles)</th>
<th>Farm Drainage (Acreage)</th>
<th>Crop Rotation (Acreage)</th>
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<tbody>
<tr>
<td>Bay</td>
<td>1,871</td>
<td></td>
<td></td>
<td>5,869</td>
<td>5</td>
<td>4,956</td>
<td>2,086</td>
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<tr>
<td>Calhoun</td>
<td>2,155</td>
<td>2,500</td>
<td>2,000</td>
<td>16,502</td>
<td>269</td>
<td>8,875</td>
<td>10,585</td>
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<tr>
<td>Franklin</td>
<td></td>
<td></td>
<td>281</td>
<td>4,025</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gadsden</td>
<td>29,716</td>
<td>41,035</td>
<td>35,323</td>
<td>2,268</td>
<td>1,145</td>
<td>46,186</td>
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<tr>
<td>Gulf</td>
<td>17,200</td>
<td>7,550</td>
<td>37,669</td>
<td></td>
<td></td>
<td></td>
<td>1,640</td>
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<tr>
<td>Jackson</td>
<td>20,000</td>
<td>80,000</td>
<td>43,000</td>
<td>1,356</td>
<td>5,000</td>
<td>80,000</td>
<td></td>
</tr>
<tr>
<td>Jefferson</td>
<td>24,889</td>
<td>50,287</td>
<td>50,498</td>
<td>26,472</td>
<td>2,084</td>
<td>574</td>
<td>38,651</td>
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<tr>
<td>Leon</td>
<td>39,741</td>
<td>39,958</td>
<td>39,787</td>
<td>1,110</td>
<td>4,237</td>
<td>43,524</td>
<td></td>
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<tr>
<td>Liberty</td>
<td>250</td>
<td>810</td>
<td>2,095</td>
<td>1</td>
<td>1,198</td>
<td>810</td>
<td></td>
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<tr>
<td>Wakulla</td>
<td>6,662</td>
<td>7,143</td>
<td>3,444</td>
<td></td>
<td>30</td>
<td>6,071</td>
<td></td>
</tr>
</tbody>
</table>

counties in which corn occupies the greatest acreage. Terracing and contouring, measures designed to reduce erosion, are largely confined to the rolling upland. The amount of land in improved pasture represents more than a 50 per cent increase since 1954. This is an indication that field crop production is being deemphasized further. The extent of drainage enterprises give some indication of the importance of this aspect of water control in the region's agricultural counties. There has also been an increase in the number of farm ponds, with Gadsden, Leon, and Jefferson the leaders. The number of farm ponds tend to increase as livestock production becomes more important.

The incorporation of the bulk of these techniques have been inaugurated on the high production farm units in the region. The obstacles barring extensive installation of these practices on low production farm units are lack of capital and negative attitudes. An example of the high cost of some of these measures can be observed in Gadsden County where tile drainage is being utilized for the first time. The installation of tile drains in this area averages approximately $150.00 per acre.\textsuperscript{17} Elsewhere in the region the open ditch is used for drainage purposes. This represents an extreme example, but many low production farm units

\textsuperscript{17}The Tallahassee Democrat, November 30, 1959, p. 13.
Figure 43. A section of Apalachicola National Forest on which scrub oak is being removed to facilitate the planting of valuable pine species.
could not afford a fraction of this cost to install soil conservation techniques.

Efforts are being directed toward the elimination of problems of agricultural land use in Central-North Florida through combined cooperation of both public and private agents. The elimination of socio-economic problems associated with this form of land use will in all probability be more difficult because of the firmly entrenched value system which is characteristic of the region. But with the elimination of physical problems there will naturally be attendant modification in problems of a socio-economic nature. The transition from a field crop economy to a livestock economy will do much to modify the nature of conditions prevailing in the region. Some of the most obvious results of this move will be the decline in the rural farm population, the increase in the size of agricultural holdings and an alternation in the racial composition of the population. This modified agricultural system should result in renewed economic stability for the region and its residents.

PROBLEMS OF FOREST LAND USE

Problems of forest land use are not as readily observed, as they are in the case of agricultural or other uses upon which large segments of the population are directly dependent for support. Approximately 75 per cent
of Central-North Florida is classified as forest land, but the bulk of the people are residents of farms, villages, and cities which tends to minimize the role of forestry in the regional economy. The heavily forested regions are very sparsely populated, nevertheless these areas serve as the basis for the numerous wood using industries which have developed throughout most of the region.

The problems growing out of the utilization of lands for forestry are concerned with conditions of the stand, which are directly related to cutting practices, the prevention of fires, the eradication of insect pests and diseases, and the modification of various institutional obstacles. Forested tracts were the first to receive the attention of the conservationist during the 19th century, but problems of forest land use still represent an important element in the overall conservation picture in the nation. The public must be educated in the importance of forest land in the regional economy before widespread interest in the condition of this all important resource can be aroused. Since there is no large "forest block" to lobby for political changes affecting the status of forest land it is often overlooked as being relatively unimportant. But the rise of industrial giants in the area of wood use may alter this former attitude of nonchalance.
Conditions of the Stand

In order to eliminate many of the problems associated with forest land use, an inventory of the conditions of the stand is necessary. Such inventories were made possible under federal supervision by the passage of the McSweeney-McNary Act in 1928 in which regional forest experiment stations were established to carry out this work. In 1949, Northwest Florida had 14 per cent of its forest land in sawtimber, 19 per cent in pole timber, 17 per cent in seedlings and saplings, and 50 per cent was classed as poorly stocked and unstocked forest land.

These conditions of stocking are typical of the conditions prevailing throughout the forested areas of the south. The growing stock in Northwest Florida increased by more than 350,000 cords from 1949 to 1959, at which time the growing stock included 35,764,000 cords. Central-North Florida in 1959 contained 66 per cent of the growing stock in Northwest Florida. This increase in growing stock over a ten-year period indicates that the growth rate exceeded that of drain. The amount of cull timber has declined by approximately 50 per cent since 1949 as a result of improved management practices.

18Northwest Florida includes the counties of Central-North Florida plus the remaining six counties in the Florida panhandle.

In 1959, the available saw timber in Central-North Florida totaled 5,307,800 board feet, which represents a 22.6 per cent increase since 1949. This increase in saw timber inventory is an indication that conditions of stocking are being improved. Only two counties, Bay and Calhoun, possessed fewer board feet of saw timber in 1959 than in the preceding ten year period. Rapid expansion of available saw timber occurred in Liberty, Gadsden, Gulf, and Leon counties during the same period.

Softwoods constituted 62.5 per cent of the region's growing stock in 1949, but in 1959 comprised only 57.0 per cent. Longleaf pine constituted approximately 40 per cent of the softwoods in 1959; this represents a slight decrease over the previous ten-year period. Longleaf, slash and loblolly pine, constitute approximately one-half of all of the current growing stock. Tupelo and red oak are the more important hardwoods. The stocking conditions of slash pine exceed those for all other members of the pine group. This is an indication of the growing importance of slash pine in the regional economy. The rapid growth rate of this species makes it ideally suited for use in pulp operations.

Conditions of the growing stock are frequently correlated with type of ownership. As with the nation the bulk of the region's forest land is in private ownership. Publicly owned forest land comprises less than 20.0 per cent of the total. Conditions of stocking are generally
poorest on the farm woodlot and other private holdings of less than 5,000 acres. These small landowners cannot profitably engage in sound management practices without the aid of a subsidy. It is with this group that the problems of forest land use loom largest. The more extensive farm woodlots are located in Gadsden, Jackson, Jefferson, and Leon counties, for the forestry is only adjunct to the farming operation and frequently receives only limited attention.

More than a third of the forest land in Central-North Florida is owned by pulp and paper companies. The St. Joe Paper Company, the International Paper Company, and the Buckeye Cellulose Corporation are the principal owners of industrial forest tracts. The former company owns more than a million acres of forest land here, with the proportion ranging from 55 per cent in Gulf County to 22 per cent in Liberty County. Both the St. Joe Paper Company and Buckeye Cellulose control almost half of all land in Gulf and Franklin counties respectively. Management practices on paper company lands represent the latest silvicultural techniques based on frequent plantings and thinning operations. Conditions of stocking on these lands come close to representing the optimum.

Publicly owned forest land is principally represented by Apalachicola National Forest. Other less extensive lands are owned by the state, counties, and municipalities.
Publicly owned forest land, like that owned by pulp and paper companies, is subject to sound management practices. The prevailing practices on these lands are used to establish a pattern that should be followed by small land holders. Improved management practices are sponsored by the Florida Forest Service and through an Industrial Forestry program sponsored by regional members of the Southern Pulpwood Conservation Association. The ultimate objective is to promote sustained yield forestry on all forested land throughout the region.

Cutting Practices

In viewing forest land use from a conservational point of view, practices of timber removal must be taken into consideration. The method of removal largely influences the productivity of the tract, although cutting practices will vary with the nature of the stand and the market for the product. Cutting practices in Central-North Florida have improved on private holdings through the aid of the state's farm forestry program. Four farm foresters are available to serve the owners of small woodland tracts within the region. The forester aids the farmer in selecting the trees to be removed and also makes available sound marketing information which enables the farmer to reap better financial returns. Similar aid is sponsored by pulp companies whose outlook for the future is brightened by increasing the life expectancy of this resource.
Land controlled by public agencies and large corporations employ techniques which make sustained yield possible. Clear cutting is the prevailing practice on land where the product is destined for the pulp market. Once a strip has been cleared, the area is immediately reseeded. Mechanical planters are now employed on an extensive scale in order to accelerate the seeding process. Large companies encourage seeding among farmers by supplying them with a free supply of seedlings.

The "cut out" and "get out" policy which prevailed at the turn of the century when Central-North Florida was an important lumber region, has almost ceased to exist. Today the advantages of judicious cutting are realized by most persons engaged in forestry for a profit. The remaining holdouts represent the small land holders who cannot always afford to engage in sound conservation practices. But, the development of the farm forestry program is doing much to eliminate these holdouts, thus eventually sound cutting practices should prevail throughout the region.

Fire, Insects and Diseases

The condition of the forest stand is severely affected by the activity of insect pests and the ravage of disease and fire. These elements are responsible for reducing the productivity of land classified as forest land. Concentrated efforts are being made to eradicate the former through
research, while efforts to reduce the number of forest fires are taking the form of more effective legislation. The problem of forest fires in Florida is largely a social problem and to some extent, one of deviant behavior. In 1952, approximately 94 per cent of the state's forest fires were man induced, and of this number 44 per cent were incendiary. By 1959, the problem of incendiary fires had diminished considerably. The reason for this trend is explained as follows: (1) a better educated public, (2) the passage of laws which make it a felony to start a forest fire, and (3) the employment of a staff of investigators to apprehend incendiary.21

There are several fire-protection plans in the state, but the countywide fire control plans appear to be most effective.22 This plan is initiated when 50 per cent of the landowners in a given county petition to have this question placed on the ballot during a general election, after which it must be approved by a majority of the voters. If such a resolution is passed the county commissioners are


21Personal correspondence with Mr. R. A. Bonninghausen, Chief, Forest Management, Florida Board of Forestry, February 16, 1960.

22Hubert Marshall and Robert J. Young, Public Administration of Florida's Natural Resources, Gainesville, 1953, p. 79.
authorized to enter into a cost-share agreement with the Florida Forest Service. In 1952, Gadsden and Jefferson were the only counties in Central-North Florida that were not fully protected. Because of the nature of the terrain here the problem of combatting forest fires is reduced. Fire fighting crews are well trained in the use of the latest fire fighting equipment, enabling them to bring forest fires under control in a minimum time period. Fire towers are distributed throughout the region to aid in the detection of fires, while fire breaks are a common sight on the farm woodlot, a measure designed to confine the forest fire to a limited area. This latter measure of fire control is sponsored by the Soil Conservation Service, whose technicians aid local farmers in designing adequate breaks. The annual damage resulting from fire, leaves much forest land in Central-North Florida in an unproductive state. In order to increase the productivity of forested tracts the incidence and extent of forest fires in the region must be reduced.

The problem of insects and disease is being rapidly brought under control in Central-North Florida yet there are still areas under attack. At present the insect problem is primarily associated with damage rendered by the bark beetle and the pine saw fly. The bark beetle is the more destructive of the two pests in Central-North Florida and even its activity is highly localized. The damage
inflicted by the bark beetle is generally identified by conducting aerial surveys. From the air the damaged stand can be readily detected and thus pinpointed on a map, which can be used by ground crews in their assault on the enemy. Salvage and sanitation logging represent the chief means of eliminating this pest. Newly planted seedlings have recently been attacked by reproduction weevils, but this problem is being handled by dipping seedlings in a chemical formula prior to planting.

The diseases resulting in the greatest timber loss in Central-North Florida are fusiform rust and needle cast. In some areas as much as 80 per cent of a pine stand may be damaged by rust. The resulting mortality rate is high, thereby indicating that something must be done quickly in order that much forest land will not be forced out of production. Needle cast unlike rust does not result in mortality but greatly retards the growth rate of the attacked trees.

The problem of insects, disease, and fires on forested tracts in Central-North Florida is being rapidly reduced through continual research and the passage of effective legislation. Until recently, although legislation existed to handle incendiaryist, the enforcement of this legislation had been somewhat lax. The future productivity of the extensive forested holdings in Central-North Florida is dependent upon an educated and intelligent public...
which will back the necessary legislation and advocate the allocation of funds for forest research purposes. The wood-using industries which are so important in the regional economy are dependent upon a constant supply of forest resources.

Forest Taxation

The methods of taxing forest land may largely determine the state of conservation. Holders of small forested tracts are encouraged to engage in cutting practices that will result in non-continuous yields in areas where an ad valorem tax prevails. An ad valorem tax tends to shift the time preference rate toward the present. This tax is one of regression and leads to a state of depletion. The forest-yield tax has been substituted for the ad valorem tax in several states with encouraging results. In Florida the negative influence of the ad valorem tax is sometimes reduced by assessing forest land as unimproved land.23 Thus in local areas the problem of forest taxation may be reduced depending on the practices of local tax assessors.

Problems of forest land use are not wholly confined to the maintenance of a forest cover for purposes of supplying needed wood products, but are also associated with the maintenance of a proper ecological balance. Many indirect benefits are afforded the region's occupants such as

23Ibid., p. 93.
watershed protection, recreational areas, and wildlife habitat by the maintenance of forest stands under conditions of proper stocking.

RECREATIONAL LAND-USE PROBLEMS

Outdoor recreation in Central-North Florida takes place primarily on publicly owned land set aside for that purpose. The growing interest in recreation has largely come about as a result of higher wages, the shorter working period, and the trend toward urban living. This being the case, only a small segment of the population is likely to enjoy the lands set aside for recreational purposes. The bulk of the land being utilized by outsiders entering the region as tourist and by a small segment of the urban population residing in close proximity to these facilities, Thus the single most important problem in the area of recreational land use is the location of these facilities.

Location of Recreational Lands

The location of recreational lands plays a very important role in the extent of their use in Central-North Florida. The bulk of the public lands which were set aside primarily for recreational purposes have been situated in areas which were rather remote from centers of population and lines of accessible transportation. These tracts frequently represent land which is ill suited for the development of higher uses. In situations where the
above conditions do not prevail, publicly owned recreational lands serve a greater number of visitors annually. To illustrate this point we can compare the attendance records and annual upkeep cost of Florida Caverns State Park and Torreya State Park, both located within Central-North Florida, and we will find that in 1957 the attendance at the former was approximately five times as great as the latter, while at the same time the annual upkeep was less than three times as much. Florida Caverns located within a very prosperous agricultural county, near a major east-west artery of transportation is frequented much more often than the more remotely located Torreya State Park, which also offers fewer attractions.

This problem may be partially alleviated as the demand for recreational land increases as a result of increases in urban population and corresponding increases in interest in outdoor recreation. Thus eventually much of the now little used recreational tracts within Apalachicola National Forest and elsewhere may attract large crowds and aid in justifying their existence. But, with the expansion of private recreational facilities in more accessible areas the offering a greater variety of activity, public facilities may become less important in meeting the recreational needs of the region. Increased use of public recreational sites may be brought about through cooperation with educational institutions. Planned educational
tours might do much to increase the intensity of use on lands of historic interest, which also possess certain natural features that are unique.

Conflicts With Other Land-Use Types

Conflicts in the use of land for recreational purposes and other use forms occur throughout the region. An example of this situation can be observed along stretches of the Gulf Coast, where recreational interest and industrial interest are in conflict. In Gulf County the industrial use of coastal locations represent a higher use status, benefiting a greater number of persons, thereby relegating to recreational use sites that are less desirable for industry.

The most outstanding example of conflict in land use in Central-North Florida is that between recreational and agricultural land use. This problem is most widespread in Jefferson and Leon counties. In these counties large tracts of land including up to 20,000 acres have been purchased by northern absentee owners and developed as hunting clubs. Local residents feel that this land should be utilized in the general farming system. The primary objective of the owners of these "plantations" or hunting clubs is the production of quail for recreational purposes. The operators of these holdings generally carry on a complete farming operation, of a non-commercial nature. The
conflict that often occur between the plantation operation and the general farm operation involve the purchase of hunting rights or bird rights and the restriction of land for agricultural use. The plantation owner frequently buys all the land surrounding small farm operators, thereby creating agricultural islands amidst these game preserves. When this situation arises the plantation operators are able to exert economic pressure upon farm operators in order to promote their objectives. The benefits derived from the presence of these plantations are a reliable tax source and the elimination of small inefficient farm operators.

URBAN-INDUSTRIAL LAND-USE PROBLEMS

In the United States the rise of cities have been paralleled by increased industrial activity, thereby leading to the development of an urban-industrial system. In Florida prior to the 1950's the urban-industrial system was largely concerned with the promotion and marketing of services, but recently many communities have turned their attention toward manufacturing activity, a function most frequently associated with urban development.

In Central-North Florida rapid development has taken place in the old established centers of Tallahassee and Panama City, as is true of such smaller centers as Quincy, and to a lesser extent Port St. Joe. The increased
demands for land in these and other areas has created a variety of problems of which the following are among the most serious: (1) need for an effective water control system in newly developed suburban areas, (2) improper location of industry, and (3) provision of adequate housing in towns and cities throughout the region. Problems of urban-industrial land use are frequently bypassed by conservationists for various reasons of which their complex nature is probably one of the most important.

Problems of Industrial Land Use

Problems of industrial land use are frequently associated with the location of industries within the community and the type of industry. Where there are no regulations governing industrial location, manufacturing industries are frequently established amidst residential developments, often resulting in decreased property values. Many small communities, which are characterized by declining populations and stagnant economies, seek to attract industry as means of survival. But, the type of industry generally attracted under such conditions represents an unstable firm, which will gain more than it will give the community by settling at this location. Many communities are currently developing industrial parks in order that industrial establishments will be housed on sites which will be advantageous both to the locating firm and the community. Quincy,
in Gadsden County, has made a move in the right direction by sponsoring the establishment of an industrial park which will be used to attract new industry, but will at the same time serve to eliminate conflicts between industrial and residential uses of land. Marianna, in Jackson County, is making similar plans.

In the larger cities where a greater variety of industrial activity is carried on, city planners should see that industrial developments are judiciously located and undesirable industrial types should be discouraged. There often arises conflicts between established economic activities and newly developed activities. Industries characterized by noxious odors, noises, unattractive facilities and harmful waste materials will exert a detrimental influence in those centers whose economic base is dependent upon the provision of services, and especially those catering to the tourist trade. There seems to exist an antimanufacturing industry attitude in the city of Tallahassee, whose economy is based on the sale of services. Although this is true, Tallahassee has gained several new manufacturers in the last few years which are compatible with the existing economy, among them is the Lonestar Boat Company.

Many problems growing out of industrial land use might be solved through the inauguration of sound city and county zoning regulations. The local Chamber of Commerce and agencies like the Florida Development Commission can
do much to encourage the development of economically stable industries in Central-North Florida. In many of the region's communities there will be an increasing demand for land to be used for industrial purposes, but caution should be exercised in attempting to attract industry to these areas.

Problems of Housing

The region's larger urban centers experienced a construction boom during the decade of the 1950's that will in all probability spill over into the 1960's. Although if one compares construction activity in the larger centers of Tallahassee and Panama City with construction activity along the east coast from Brevard County southward, it becomes relatively minor. The problems of housing are chiefly associated with the selection of desirable sites and the elimination of substandard housing units.

The development of additional housing units in the urban centers of Central-North Florida have sprung up for the most part on the fringes of the central city. This movement to suburbia has not been without its problems. In some instances housing developers have not seriously taken into consideration the nature of the terrain upon which many of these packaged developments have been constructed. Thus in many parts of the region rising groundwater levels during period of excessive rain result in flood damages to homes and property, as well as creating
problems of sewage disposal. In order to avoid such situations stronger building codes are necessary, and once established should be enforced. Cities usually inherit these problems through the process of annexation. Tallahassee represents a typical situation with regard to this type of problem.

The problems associated with suburban housing developments are created by the region's growing middle class, whereas the problems of adequate housing and the elimination of slums directly affect lower income groups. The problem of supplying adequate housing and the elimination of slums is currently receiving major attention, because of the role it plays in regional development.

Two programs have been set up that are designed to supply inexpensive housing for people currently residing in housing that is considered sub-par. The earlier of these programs is associated with the creation of public housing authorities during the decade of the 1930's. In places where population exceeds 2,500 persons, a city housing authority may be created, whereas county authorities must be developed where there is no municipality of this size or larger. In 1959, there were 43 housing authorities in the state of which 38 were municipal.24

Four municipal authorities have been established in Central-North Florida for the cities of Apalachicola, Marianna, Panama City, and Quincy. Municipalities of fewer than 2,500 people in the region have become a part of unique organization known as the Northwest Florida Regional Housing Authority, which represents 21 counties. The municipalities represented here are Altha, Blountstown, Carabelle, Cottondale, Malone, Smeade, Havana, Monticello, and Wewahitchka. Rental units have been completed within two of the city authorities and in three of the smaller municipalities. The request for public housing in the smaller municipalities has taken place in counties experiencing declining populations, with one exception. These smaller municipalities function principally as agricultural service centers and are largely peopled by the old and the young. If Carabelle, Monticello, and Wewahitchka receive their request for 150 rental units each, public housing will accommodate approximately 60 per cent, 25 per cent, and 45 per cent of the population of these centers, respectively.

In order to qualify for public housing the applicant must be a member of a low income family. The income level established by the authority makes persons eligible for such accommodations if their annual income ranges from $1,920 to $3,600. The upper income level is applied
to families including at least five persons. The average monthly rentals for public housing in the region in 1959 ranged between $25.00 to $29.00. The majority of Florida's public housing residents fall in the 50 to 64 age category. A high degree of correlation exists between residents of public housing and persons receiving public assistance. The counties requesting public housing in Central-North Florida had approximately 6.0 per cent of their population receiving public assistance in 1959. Franklin County was high with 11.0 per cent of its population dependent upon public aid and Gadsden County was the low with approximately 4.5 per cent. Franklin County has also requested the greatest relative number of housing accommodations.

Public housing has not solved all of the problems associated with slum conditions. Many of the social problems that were thought to have grown out of slum conditions still prevail in areas where slum dwellings have been replaced by recently created public housing projects. Sociologist tend to agree that the clustering together of former slum residents under new shelter does not result in a significant reduction of these problems.

The federal government enacted legislation in 1949 which through the cooperation of private developers was designed to aid in eliminating slum conditions. This is the so called Urban Renewal Program. In order for a community to qualify for aid under the urban renewal program
it must submit a workable program to the Federal Housing and Home Finance Administrator for approval. Under an approved workable program a community is committed to the attainment of the following objectives: (1) comprehensive community planning as is embodied in a master plan, (2) adoption and enforcement of adequate building and welfare codes and ordinances, (3) detailed analysis of blighted neighborhoods to determine treatment, (4) establishment of an administration organization to carry out the program, (5) plans for housing displaced families, and (6) community-wide citizen participation and support.27

In November, 1959, the Florida Supreme Court overruled a previous decision which now allows Tampa and Tallahassee to proceed with plans enabling them to receive the benefits of the urban renewal program. Other communities in the state are now eligible for this aid on the passage of local enabling acts. In December of 1959, seven communities had workable programs that were approved by the Atlanta office of the Housing and Home Finance Agency. Bristol, Blountstown, Carrabelle, Chattahoochee, Monticello, Tallahassee, and Wewahitchka28 represent the communities for which worable programs have been approved. Plans


for public housing have been approved for four of these communities.

Tallahassee is moving forward in an attempt to initiate slum clearance at an early date. The people indicated their interest in the urban renewal program on February 23, 1960, by voting 2 to 1 in favor of it. The initial area to be cleared is a 35 acre tract south of the state capitol. This area includes 112 residential structures which are occupied by approximately 400 persons. It appears that the problems of relocating these families will be a very difficult one, even with the Federal Housing Administration program facilitating the construction of homes by private developers for sale to displaced persons with no down payment and a 40 year mortgage. Only about one-half of the persons residing in the area to be cleared can qualify for this type of housing because of the $2,400 minimum annual income required for eligibility for Federal Housing Administration loans. Strong opposition to public housing in Tallahassee and other communities will serve as an obstacle to slum clearance where residents of substandard housing cannot qualify for housing under the urban renewal program because of the minimum income ruling.

As Central-North Florida's urban centers have increased in population and area, they have been confronted

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29Tallahassee Democrat, November 19, 1959, p. 1.
with additional problems. The problems of industrial land use can be partially solved by the introduction of new zoning regulations and through the creation of industrial parks. In doing this, conflicts among various types of land use in urban areas could be reduced. Urban housing problems likewise require careful study and can only be solved by thinking in terms of community welfare. Many decisions in the area of housing result only in the shifting of problems from one site within a community to another, in order to satisfy the demands of groups that stand to reap financial gains.

OTHER LAND-USE PROBLEMS

Land-use problems on military and mineral lands in the region are of a minor nature at the present. The big problem which frequently characterized strip mining operations is the prevalence of open pits partially filled with water and the presence of ubiquitous spoil banks which dot the landscape after the mining operation has ceased. One company operating in this area states that mined over areas are restored to their original condition wherever possible. In several states laws have been passed making it mandatory for mining operators to restore the area to something resembling its original condition. There has been talk of such a law in Florida.

There is at present no apparent problem involving the region's military land. If the gulf area becomes a
future launching site for missiles there will probably be created a nuisance problem, but the advantages of having a missile launching station in this area will outweigh the complaints of noise voiced by residents.

In the future the region will be characterized by increasing conflicts among the existing types of land use, unless sound zoning ordinances are established and enforced. Many of the urban communities are presently utilizing zoning ordinances in an effort to correct future land use abuses, but little has been done in the way of introducing rural zoning ordinances. The building boom that is currently underway in the peninsula is slowly moving into the panhandle. Signs indicating the availability of home sites on former pasture and forested tracts are becoming more and more evident in the western part of the region. The elimination of current and future problems cannot take place in a region principally inhabited by an uninformed and uncooperative citizenry. Conservation and speculation hardly go hand in hand.
SUMMARY AND PROSPECTS

Central-North Florida, an area occupying more than 5,000 square miles situated approximately midway between the state's eastern and western limits, was Florida's cultural hearth during the territorial period. This section is currently one of the state's lesser developed settled areas, which is partially the result of changing human response to environmental conditions. The post civil war period saw the shifting of the frontier beyond the mainland and into peninsula Florida with complete peripheral development a reality after the turn of the century. Thus the twentieth century has witnessed the rise of an American playground along the Atlantic and Gulf sections of the peninsula, and a corresponding decline in plantation economy of the mainland, which was largely centered in Central-North Florida.

The maintenance and promotion of a field-crop economy along with the exploitation of the region's forest resources in the early 1900's has led to the creation of problems that have left their imprint upon the region's occupants as well as the land they occupy. This is an area of low per capita income, with two-thirds of the counties in the state with per capita incomes higher than the region's two most
prosperous counties, while only one county was characterized by a lower per capita income than the region's poorest county in 1957. The predominant system of land use has been largely responsible for the region's plight and a modification of that system is necessary if Central-North Florida is to regain its former position of prominence in the economy of the state.

The primary objective of this study is to point out problems growing out of resource utilization and to suggest means of alleviating these problems. In 1956 the Governor's Committee on Conservation on which the writer served, indicated that there was a need for identifying resource-utilization problems on a local basis and this might best be done by persons who were directly affected by their existence. Thus this is an attempt to inaugurate a policy on a regional scale in the hope that it and similar studies might be used as guides in the implementation of an effective land policy. This study like most land- or resource-use studies must of necessity follow an inventory approach in order that the status of the region's resources can be carefully evaluated. Although most conservation studies are topical in nature and are primarily limited to a single resource, the regional conservation type study is of growing importance. No doubt the studies directed by Colby
in Kansas and Illinois recently are typical of the type of conservation studies to come.¹

The approach employed here is designated by some conservationists as the concept of use, as opposed to that of harmony and balance,² although this distinction is not always clear cut. To others this might be thought of as the engineering-economic approach to resource research, whose objectives are "maximizing, in total and in per capita terms, the output of raw materials, labor, and other factors of production."³ The basic conflicts which are inherent in conservation were constantly kept in mind, for conservation can never become a reality until these conflicts are resolved. Thus attitudes and value systems largely determine the state of conservation. Likewise McNee recently points out that economic geographers are currently becoming more and more concerned with the social values involved in conservation and regional economic


Let us now sum up the role played by the critical factors in the region's economic development.

THE ROLE OF THE PHYSICAL ENVIRONMENT IN REGIONAL DEVELOPMENT

Central-North Florida's physical environment is not one which is conducive to the development of an array of economic activities on a firm and permanent basis. The presence of natural resistances in the form of poor soils, extensive marsh and fluctuating water levels have done much to retard economic development and create problems of land use. The several problems which have developed out of conditions of the physical environment actually reflect the state of the arts and resistance to change on the part of the region's occupants. Thus it becomes very difficult to determine the importance of these natural resistances, for they are so closely tied up with the operation of cultural resistances, that Ullman says "the environment is essentially neutral, its role being dependent on the stage of technology, type of culture, and other characteristics of a changing society." Although this is essentially true, the conditions of the physical environment limit the

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extent and point out the direction that economic development should take.

This is not an area that is completely devoid of factors which favor economic development along sound lines; the one big positive factor being climate. Thus this particular environmental resource tends to offset the negative influence exerted by various other natural resistances. The mild year-around climate favors the expansion of recreation as an important means of livelihood. This area may also become one of the state's more important havens for retirees, especially since many of the amenities of the peninsula can be secured here at a lower cost. This condition may be somewhat shortlived as the development of the more desirable sites in the peninsula will lead the development companies into areas that have not as yet been tapped for "package development" and "tailored communities." If and when Central-North Florida becomes the site of developmental activity much land currently in agricultural holdings will of necessity be withdrawn from production. This will possibly result in short-run gains, but because of the many variables that enter the picture it is unrealistic to assume these benefits will be of a long range nature.

THE ROLE OF POPULATION IN REGIONAL DEVELOPMENT

The probability of an increase in numbers and an alteration in character of the population suggests a
modification of the present state of conservation and resource development. The estimated population of Central-North Florida on July 1, 1959 was approximately 271,000 or a 32.1 per cent increase since 1950 in comparison with a 71.9 per cent increase for the state during the same period.6

The resulting increase in pressure on regional resources will require improving the quality of population in order that it may successfully meet the challenge of developing new resources to satisfy these increased demands. The greatest absolute as well as relative change in the region's population has occurred in Leon, Bay, and Gadsden counties, which serve as the foci for rural migration. The former two counties are better equipped to handle population increases than all other counties in the region. Here migration from rural farm areas to such centers as Tallahassee, Panama City, and Quincy has resulted in the increase in the size of farms and the removal of inefficient farm operators. This should also result in raising the level of education among the children of these former rural residents which will result in their becoming more essential to the operation of the regional economy.

The operation of the push and pull theory of migration should result in the outmigration of persons for which few or no opportunities exist within the region. This situation will have to be reversed in order that the region may drain talent from other areas that is peculiarly suited to undertake the task of regional development at some desired level. Unless there occurs an increase in the quality of population and available investment capital the region will be unable to support a larger population at anything like the optimum level. It has been predicted that Florida will be the fastest growing state in the nation during the present decade, this being true Central-North Florida must be prepared to handle its share of that growth. This will result in the further modification of the landscape with new land uses replacing present uses. These shifts in land use will not take place without the creation of conflicts in interest, which can only be settled by taking into consideration the welfare of the entire population and acting accordingly.

THE ROLE OF SOCIAL INSTITUTIONS AND INSTITUTIONAL VALUES IN REGIONAL DEVELOPMENT

Social institutions play a significant role in the development of conservation in a democracy. Conservation in the United States has been promoted since its inception by the federal government and branches of state and local
government. The bulk of the work that has been done in this country under the conservation banner, has been carried out with federal capital. The effectiveness of government conservation programs have been seriously hampered by a lack of coordination among government agencies engaged in this type of work. The multiplicity of government agencies with overlapping interest and conflicting approaches has served as an obstacle in creating an intelligent and effective conservation program.

State and local governments have been confronted with similar problems with regard to the development of a state of conservation. Many state governments have their own conservation divisions, departments, bureaus and etc., but these are frequently agencies whose interest are restricted to the management and development of only a few of the state's resources. In Florida the Board of Conservation is charged with the responsibility of supervising the Geological Survey, the Division of Salt Water Fisheries, and the Division of Water Survey and Research,\(^7\) aside from this agency there are thirteen other resource-administering agencies in the state. Thus it becomes apparent that there is little integration or coordination in resource development and management at the state level. White thinks

\(^7\) Hubert Marshall and Robert J. Young, Public Administration of Florida's Natural Resources, Gainesville, 1953, p. 132.
that there is little possibility that states will increase their responsibility in the area resource management in the future, probably because "most states lack the diversity of interest in their political base necessary to cope with strong interest groups, so that only a few deal with resource problems responsibly." There is a serious need for the coordination of Florida's resource administering agencies and grass root planning at the local level if sound resource development is to be realized.

The possibility of the development of a strong coordinated and integrated federal and state conservation agency is rather remote in many parts of the country, because of the conflicts in interest at the different governmental levels and the maintenance of strong sectional attitudes. In Florida this situation has even become apparent at the local level, with persons and groups thinking in terms of the welfare and development of sections within the state. This situation is hardly conductive to the promotion and development of a sound conservation program that seeks to guarantee an improvement in the status of resources for the future. Florida, like most of the southern states, has adopted an attitude of limited federal participation in state affairs, making coordination of

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federal and state agencies concerned with resource management rather difficult and sometimes prevents the promotion of conservation on a meaningful scale. Thus value differences which originate in time and space handicap local, regional, and national development.

PROSPECTS

The immediate outlook for Central-North Florida, when compared with the more rapidly developing areas of the state, is only moderately favorable. But the rise of planning agencies and other interest groups may do much to change this area from one of economic stagnation to one of economic growth and development. The anticipated rapid development of the state can hardly occur without ramifications of this development being felt throughout its political domain. The future of the region will be largely influenced by the nature of shifts in patterns of land use in order to take advantage of new opportunities.

In all probability short run gains will accrue in Central-North Florida if the trend in agricultural land use continues in the direction of larger farm holdings, with emphasis on grassland farming and livestock production. It appears desirable to promote the development of dairying and poultry enterprises as the region's population shifts from rural to urban living. The rapidity and extent of these changes will indicate the degree of emphasis that
should be placed on this type of economic development. The future of most of the region's field crops, with the exception of shade tobacco, is dependent upon government subsidies and the resistance of the region's farm population to change. It appears desirable to reduce the extent of agricultural land in order to eliminate many of the current problems that plague the area. Thus this would release land to be utilized in a manner that is more in keeping with its physical capabilities and market potential.

Forestry will continue as an important segment in the regional economy, although a gradual shrinkage in forest acreage can be anticipated. This shrinkage in all probability will be offset by more efficient processing and utilization of forest products. Forest ownership is becoming more and more concentrated in the hands of a few giant companies which should do much to improve the status of the forest stock. The maintenance of sound forest stock promotes long-run gains as a result of the nature of the resource itself. The greatest gains in the future will probably occur in the areas of industrial and recreational development. With the development of a better qualified work force, the region should be able to attract more high value added type industries. By improving the labor force Central-North Florida may eventually attract elements of the state's rapidly growing electronics industry, thus placing it in the mainstream of Florida development. An
increase in the region's population and anticipated increases in the number of tourist frequenting the region should serve as a catalyst in promoting the acquisition and development of adequate recreational sites.

Land use in Central-North Florida during the present decade will respond largely to economic stimuli, but attitudes and value systems will serve as checks to retard the changes from a rural farm-forest economy to that of an industrial-recreational economy similar to that which prevails in the more prosperous sections of the state. The adoption of a sound regional conservation policy will be retarded by conflicts regarding the concept of the "future" and the promotion of schemes designed to benefit the few, but which fail to guarantee the region's occupants long-term security.
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AUTOBIOGRAPHY

I, Harold Milton Rose, was born January 6, 1930, at Nashville, Tennessee. My childhood was spent in Mt. Pleasant, Tennessee, where I completed my secondary education in May 1946. In June 1946 I entered Tennessee A. & I. State College from which I received the B.S. degree in 1950. In January 1951 I was inducted into the Army, serving twenty-two months with a medium artillery unit, the latter part of which was served in Germany. In September 1953 I entered The Ohio State University to pursue a Master's degree in geography. After four quarters of residence I received the Master's degree. In September 1954, I was employed as an instructor of geography at Florida A. & M. University at Tallahassee. It was here that I met and married the former Miss Ann Louise White, a native of Pittsburg, Kansas, in December 1955. In 1957, after three years of teaching I decided to pursue further graduate study and was awarded a John Hay Whitney Fellowship, as well as a graduate assistantship by The Ohio State University. Since July of 1957 I have been actively engaged in study leading to the Ph.D. in geography. I served as a graduate assistant throughout March of 1960, at which time I was appointed to the rank
of assistant and given two sections of an introductory course. In June I will receive the Ph.D. degree and return to Tallahassee and the position at Florida A. & M. University from which I have been on leave of absence since 1957.