AN ANALYSIS OF THE SPATIAL DISTRIBUTION OF THE RURAL FARM POPULATION IN DECATUR COUNTY, KANSAS: 1900-1988

by

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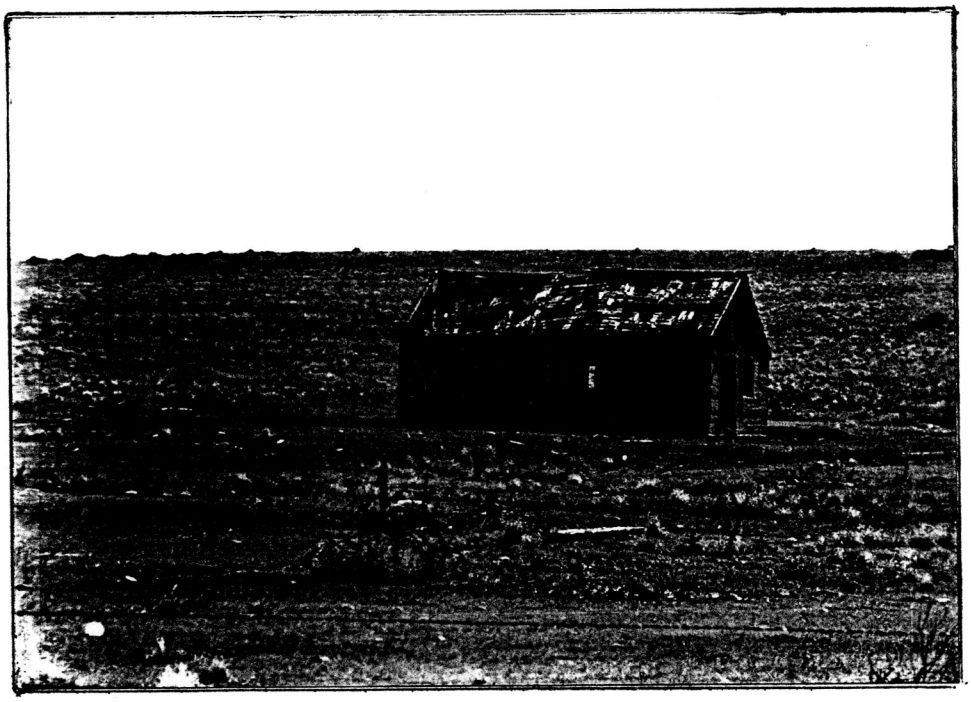
Chapter I

Introduction

Since the turn of the 20th Century, there has been an accelerating rate of technological and social change in America. Increased mechanization, improved transportation and communications have been developed. Each of these has had far reaching impacts on the manner in which people earn their living and their relationship with the environment. Rural America, like other segments of the population, has changed dramatically. The transition from subsistence to mechanized farming and the movement into a global economy has implications which, not only affected agricultural production techniques, but also, the structure of the rural population.

Decatur County, Kansas, which typifies many counties in the High Plains, has been affected by these changes. Farming enterprises are larger, in terms of areal extent, than ever before. This is reflected in declining rural population which has, in turn, impacted the landscape. Abandoned farmsteads and other rural residences are ubiquitous throughout the region. Population decline is evident through dilapidated buildings and other relics such as abandoned roadways (Photographs 1 and 2). Such rural farm population



Photograph 1. This is an example of a former rural residence approximately 7.5 miles northwest of Oberlin, Kansas.

Photograph 2. Many roads have been abandoned throughout the study period. This one is located 4 miles southeast of Oberlin, Kansas.

change is due, in part, to public policy and climatic conditions.

Problem Statement

The purpose of this study is to determine the spatial distribution of the rural farm population of Decatur County, Kansas for selected years from 1900 through 1988. It is hypothesized that change in the distribution of the rural farm population varied both spatially and temporally. Initially, bottomland areas were more heavily settled than other areas of the county. As a result, more rural residences were retained in the bottomlands even though population losses were pervasive. Also, central place functions and access to those functions provided by transportation routes, caused rural residences to agglomerate near the towns and along major roads within Decatur County. These and other factors which influenced changing population patterns will be identified and analyzed to describe the evolution of the present distribution pattern.

Study Area

Decatur County lies in northwestern Kansas (Figure 1). It is bounded on the north by Red Willow and

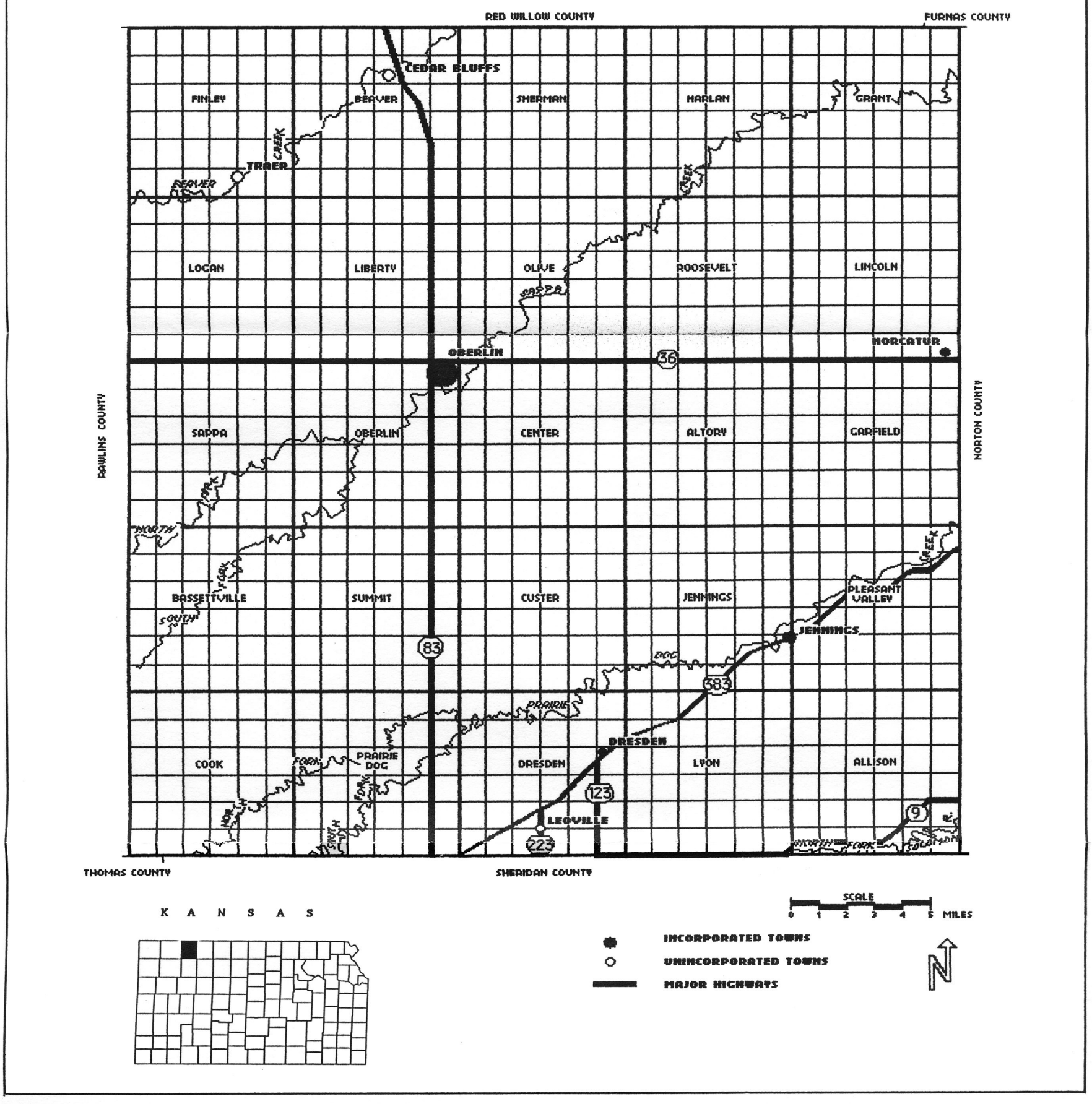


Figure 1. Decatur County, Kansas.

Furnas Counties in Nebraska, and in Kansas, Norton on the east, Sheridan and Thomas Counties to the south and by Rawlins County on the west (Northwest Planning and Development Commission 1979, 3).

In order to analyze the distribution of the rural farm population, the residences of the four incorporated towns of: Oberlin, Jennings, Dresden and Norcatur will be excluded from the study. However, the impact the incorporated towns have on rural settlement patterns in Decatur County will be discussed.

Justification

The affects of depopulation in the High Plains has manifested itself in various manners. Vacant buildings on the mainstreets of small towns and abandoned farmsteads across the rural landscape are the most visible indicators of depopulation. As these conditions have persisted, (since at least the 1930's in many communities), and because of the negative impacts of depopulation, (such as the erosion of tax bases), it is important to reach some understanding of the patterns and processes of depopulation. Such an understanding may provide insights into the future and provide useful information for policy makers.

An important aspect of geography is the study of patterns and processes of the human habitation on

earth, which include the distribution of the rural farm population. Therefore, the pattern of rural farm settlement and the process of farm consolidation lends itself to geographical evaluation. The temporal aspect is an important factor in assessing processes, and must be included within this study to show the evolution of the landscape over time. Carl Sauer felt an analysis of the landscape must include an understanding of both spatial and temporal relations (Sauer 1963, 326). This thesis encompasses much historical fact. However, because of its spatial aspect, it is considered geographical.

Additionally, the heart of the thesis contains maps which are used to convey the spatial variability of depopulation. Maps are also used to help the reader interpret the distribution of, and factors which may have contributed to the distribution of the rural farm population in Decatur County, Kansas. Therefore, "the study is geography in its purest form: the interpretation of spatial patterns" (Gerlach 1986, 1).

Similar studies, to this thesis have been conducted. Walter M. Kolmorgen and David Simonett studied grazing areas of Chase County, Kansas. The study included the examination of patterns of settlement by farmers and ranchers there. The methodology included studies of soils, land use and land parcel size. Also, the amount of arable and

non-arable land was correlated with patterns of ranching and farming (Simonett and Kolmorgen 1965, 260). Similar studies also include Lynell Rubright's Development of Farming Systems in Western Kansas, 1885-1915 (1977), and John R. Cyr's, Historic Landscapes of Cloud County, Kansas (1981). Both studies examine the landscape from a historical perspective.

To conclude, the justifications for this thesis vary. First, it is important to understand the processes which have facilitated the evolution of the landscape. Public policy and climatic fluctuations have affected settlement patterns in the High Plains. These processes which have shaped settlement patterns in Decatur County may have shaped settlement patterns elsewhere. Therefore, Decatur County can be considered a case study. Second, geographers such as Rubright and Cyr have conducted similar studies. This thesis is an extension of other works which have attempted to reconstruct the historic landscape in order to understand its present form.

Methodology

Some of the parameters outlined in Newcomb's article, "Twelve Working Approaches to Historical Geography" (1969) are applicable to settlement geography. One of his approaches "allows the

geographer to identify some prevalent aspects of a landscape which will demonstrate the evolutionary growth of the region (Cyr 1981, 13)". Using this theme, the pattern of rural residences was used to examine how the landscape evolved. The second of Newcomb's themes, to be utilized, is "Historical Regional Geography". This theme confines the study to a segment of time over a given portion of the earth's surface. The timeframe of this thesis ranges from 1900 to 1988 and Decatur County is the portion of the earth's surface which was examined.

In the context of Newcomb's framework, certain methodologies were used. First, literature which deals with various aspects of settlement geography was examined to derive a better understanding of the processes which have shaped the landscape. This included articles which ranged in topics from the settlement patterns of ethnic groups to depopulation. Also, literature and various data which provide a background of Decatur County's historical, physical and cultural attributes was discussed.

Particular attention was given to specific public policies which may have affected settlement patterns of the county. They were evaluated and their probable impacts upon the farm population and settlement patterns were assessed. For example the Agricultural Act of 1956 was analyzed to determine if it affected

farm population. Also, the temporal aspects of various public policies were correlated to changing farm populations.

Attention was also given to climatic fluctuations which may have affected population trends. Declining rural population was correlated with periods of abnormally low precipitation. Fewer farms during the 1930's and 1950's, for example, may have resulted more from droughts than other factors. In absolute terms, the impacts of climatic fluctuations on the number of farms were difficult to determine. However, they are variables which needed to be addressed.

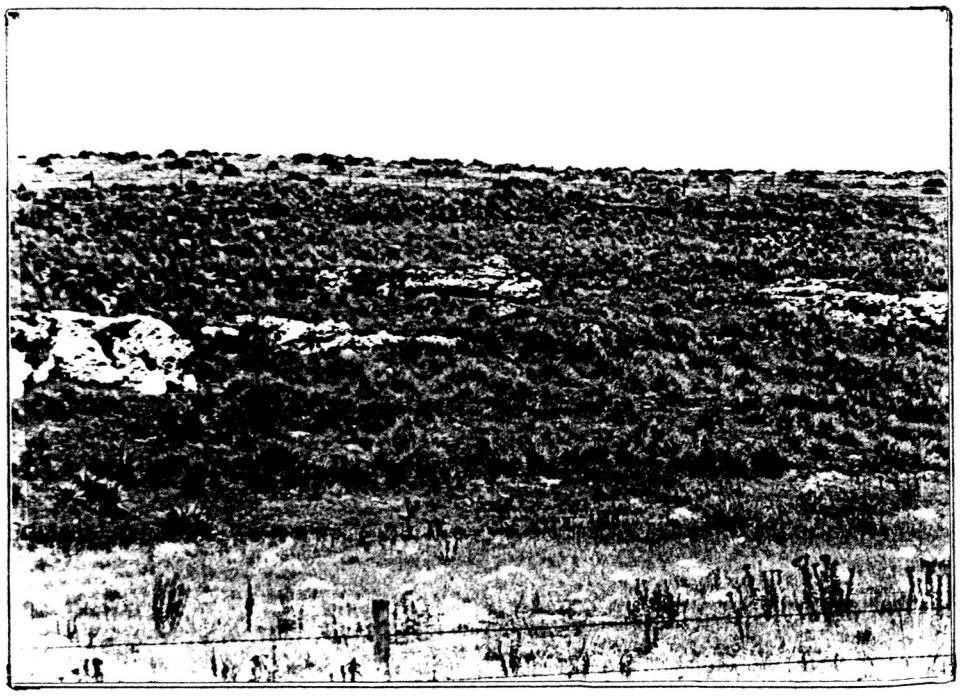
After the literature was reviewed and background information analyzed, data was collected from maps provided by the Registrar of Deeds office, Decatur County Abstract Company, both in Oberlin, Kansas, and the Kansas Department of Transportation in Topeka. The maps show the frequency of rural residences and other cultural features for various years. For this thesis, the years of: 1905, 1920, 1940, 1967 and 1986 were chosen because of data availability. An enumeration of rural residences per section (square mile) was then conducted. Maps were constructed to show the frequency and change in the number of rural residences both spatially and temporally. A field study was also conducted to verify rural residence sites by examining locations of dilapidated buildings, hedgerows and other

relics.

The cadastral and highway maps show the individual sections and their corresponding section numbers along with other features such as dwellings, cemeteries and churches. Filled squares indicate the location of individual residential sites. The highway maps use the terms "farm unit" and "dwelling (other than farm)" when showing locations of rural residences. The number of farm units and dwellings were counted for each section and choropleth maps were constructed from the raw data. This procedure showed the residential density for each section and helped determine overall patterns.

As mentioned earlier, data was taken from maps for the years: 19Ø5, 192Ø, 194Ø, 1967 and 1986. These dates are important because they closely correlate with historical events such as: the population maximum of the county (19ØØ), the the post WWI era and the Great Depression, and the post WWII era. They are also important when correlating the effects of public policy on the landscape.

A general soils map of Decatur County was also used in the analysis. This map not only showed the soil characteristics of the county, but was used to regionalize the county by delineating between "upland" and "bottomland" (Photographs 3 and 4). One characteristic of soil type concerns gradient. Rougher land was less densely settled initially, or depopulated



Photograph 3. Upland areas adjacent to the valleys are characterized by their ruggedness and lack of cultivation.

Photograph 4. The valleys of Decatur County, which are highly cultivated, contain the county's major streams.

more rapidly in comparison to areas of lower relief. Therefore, regionalization based on soil associations provided a framework in which to establish spatial differentials between areas of higher residential densities which might result from more level land and more fertile soils. Greater soil fertility may also enhance the ability of farmers to survive unfavorable economic conditions. This could help explain differences in the distribution of the rural farm population.

The next procedure of the analysis was to show the central tendencies and dispersion of the residences. The "mean center of population", as the name implies, was used to determine the location of the center of a population. This was accomplished by multiplying the frequency (weight) of farmsteads within a section by the x-y coordinates of the center of the section and dividing the sum by the total frequency. The resulting point was plotted. The location of the mean center is affected by the distribution and number of residences. This was done for the earliest cadastral map, which is 1905, 1940 and again in 1986, to determine if the central tendency of rural residence location had changed.

Another procedure which was useful in spatial descriptive statistics is the "Standard Distance Valve". This procedure calculates the length of a radius of a circle, and represents one standard

deviation from the mean center of a phenomena. It shows the actual degree of dispersion about the mean center. A circle drawn from the mean center using a radius of one standard distance valve should encompass 68% of the observations. Thus, the smaller the standard distance valve, the less dispersed the observations. This procedure was used to show how the dispersion of the rural farm population changed over the years.

The procedure to calculate the Standard Distance Valve requires the sum of the squared differences between the observations' x-y coordinates and the coordinates of the mean center to be divided by the total number of observations. The standard distance valve is calculated by the formula:

$$d=\sqrt{\frac{\sum_{i=1}^{n}(c\bar{x}-x)^2+(c\bar{y}-y)^2}{n}}$$

where d= the standard distance valve in miles;

x= x coordinate of the observation;

y= y coordinate of the observation;

cx= x coordinate of the mean center of the observations;

cy= y coordinate of the mean center of the observations;

n= number of observations.

For the purposes of this study, an estimated Standard Distance Valve was calculated. Calculating the estimated Standard Distance Valve is similar to calculating the Standard Distance Valve. However, the estimated Standard Distance Valve utilizes the center coordinates of each section instead of the coordinates for each individual point. Thus, it is an estimate but should be near the actual value.

Thesis Organization

Chapter II of this study examines literature which deals with various aspects of settlement geography such as: settlement patterns of ethnic groups, settlement patterns within regions, techniques of analyzing settlement patterns and depopulation. Each of these topics provides insights into settlement geography, and are useful in providing discernment into the patterns and processes of settlement which exists in Decatur County.

Background information dealing with topics from the early history of Decatur County, to land and farm policy are addressed in Chapter III. This chapter also provides insight into factors which determined the spatial pattern of both, the rural residences of Decatur County, and their change of density over time.

The analysis of data obtained from cadastral and

state highway maps is conducted in Chapter IV. This chapter determined the pattern of settlement for: 1905, 1920, 1940, 1967 and 1986. An examination of changes in the number of rural residences for each time interval of: 1905 to 1920, 1920 to 1940, 1940 to 1967 and 1967 to 1986 was also conducted. Additionally, mean centers of population and standard distance valves were used to determine the central tendency and dispersion of the rural residences. The results revealed the pattern of change in the location of the rural residences over time, and the background in Chapter III provides insights into the processes which were responsible for those changes.

Finally, Chapter V furnishes an overview of the study and more importantly, provides conclusions which explain the settlement patterns of Decatur County. The study should provide other analysts with insights and methodologies in which to further study the settlement patterns of Decatur County or other regions.

Chapter II

Literature Review

A variety of works have been written about settlement geography. Settlement geography pertains to the patterns and processes of human habitation of the earth, including rural depopulation. Settlement patterns are dependent upon a variety of cultural, political and physical constraints. This chapter of the thesis will survey literature pertaining to rural settlement patterns.

The rural settlement literature reviewed for this thesis can be categorized into four broad categories. First, research has dealt with settlement patterns of ethnic groups in specific areas, such as Germans in North Dakota. Second, many studies have dealt with settlement patterns within larger regions. These analyses are not particularly concerned with ethnicity; instead, they analyze settlements within a region such as the Great Plains. A third category deals with techniques of analysis. For example, techniques may include models for predicting the spatial behavior of rural settlement. Finally, some studies have dealt with the phenomena of depopulation and population movement within rural areas.

These themes are particularly relevant to this

thesis for several reasons. First, Decatur County has three major ethnic settlements consisting of Bohemians, Swedes and Germans. Second, those studies dealing with settlement patterns of a particular region such as, the Ozarks or the Great Plains, lend insight into settlement patterns found in Decatur County. Third, literature dealing with techniques of analysis reveals methods which may be considered for adoption in this thesis. Also, these articles reveal some of the shortcomings of those techniques. Finally, literature regarding depopulation and population movement is especially relevant for this thesis because depopulation has continued in Decatur County since the turn of the 20th century.

Settlement Patterns of Ethnic Groups

Much of the literature written about rural settlement patterns has been based on studies of particular ethnic groups. For example, Robert C. Ostergren analyzed a specific ethnic farming community. He studied how the maintenance of Swedish immigrant communities in Minnesota was dependent upon the transmission of land between family members.

Ostergren divided the study area into different communities based on dominant home districts and church affiliations. He investigated the number of farm

households and changes in the mean size of liquidated and inherited farms throughout the study years (1885-1915). Ostergren contends that inheritance practices of the Swedish communities do, in fact, play a major role in the maintenance of family and community in rural immigrant settlements.

Russel Gerlach conducted a study in ethnic geography in his book Immigrants in the Ozarks (1976). His focus was on the settlement patterns of various ethnic groups such as Germans, Swedes and French within the Ozark Highlands. Similar ethnic groups exist in Decatur County thus, his study provides useful insight. He examined various attributes which characterize each group. Additionally, Gerlach attempted to describe the ethnic landscape and the processes which produced them in the Ozarks.

Gerlach's methodology included the examination of structural occupance features such as the styles, numbers, sizes, conditions and patterns of arrangement which form farmsteads. This methodology can be used to to distinguish differences between ethnic groups. He also examined the spatial distribution of ethnic groups such as Swedish and German farmers in Lawrence County, Missouri. The two were distinguished by the German community's compactness as opposed to the more dispersed pattern of the Swede's (Gerlach 1976,134).

Gerlach conducted another study regarding settle-

ment patterns in the same region. Settlement Patterns in Missouri is a study of patterns of settlement from the pre-Civil War era to the present in Missouri. Gerlach examined topics which range from the patterns of settlement to the ancestry of the state's inhabitants. His methodology was used to examine the diffusion of ethnic groups such as the French into Missouri. He also studied the nativity of old-stock American population within the state. In addition, he put into perspective the ethnic settlement of the United States in relation to the ethnic settlement of Missouri.

In contrast to Gerlach's work, D. Aidan McQuillan examined factors which affect the success of immigrant farmers on the American grasslands between the years 1875 and 1925. His study area included Marion, McPherson, Rice and Cloud County, Kansas. His main thrust was an examination of farm size as a gauge of financial success. He also compared farm sizes of different ethnic groups. His study groups included Swedes, Mennonites and French-Canadians. He concluded by suggesting, farm size can be used as a gauge of financial success only if certain qualifications are considered. For example, government land grant policies, the availability of transportation and technological changes are important determinants.

Regional Settlement Studies

Regional settlement geography is not merely devoted to settlement patterns, but determinants of settlement. Not only are cultural variables such as ethnicity and agricultural practices important considerations in determining settlement patterns, but physical variables like terrain and climate are also influential. Therefore, systematic approaches such as Carl Sauer's The Geography of the Ozark Highlands of Missouri (1968) are important from a holistic perspective. This work is regional geography, but uses much historical fact. It also inspected the settlement patterns of the rural population. Sauer feels the study must "concentrate on the systematic and comprehensive scrutiny of individual areas, inquiring into the conditions of the past as well as into those now existing" (Sauer 1968, vii).

The study area for Sauer's research covered parts of: Arkansas, Missouri, Oklahoma, Illinois and Kansas. He examined various aspects of the physical environment such as, rock formations, erosion cycles and climate. All these factors contribute to the appearance of the landscape. The study also defined physical barriers which may inhibit certain kinds of economic activity and, therefore, affect settlement patterns.

Sauer also considered the "material resources" of

the region. He felt the location of various soil groups impacted the economic activity of the region. For example "Land values in the Ozarks are an expression chiefly of slope, kind of soil, and transportation conditions; secondarily of mineral, water, and timber resources" (Sauer 1968,43). The physical environment and associated mineral wealth, contributed to the settlement of the Ozark Highland.

George A. Van Otten (1981) took a different approach in researching rural settlement patterns of a specific region. He analyzed the spatial characteristics of farm organization strategies in the Williamette Valley of Oregon. His study investigated the spatial organization, including areal extent, degree of field scatter and tenure patterns within the region. He also examined factors which account for the spatial organization of the farms in the study area such as, economies of scale, land values and population pressures.

Van Otten's methodology included comparisons of farm populations and farm sizes of the Williamette Valley to national averages for the years 1950-1974. Additionally, Van Otten analyzed the spatial characteristics of sample farms to determine how and why they have increased in size. He concluded that social, economic and technological trends of the post-World War II era had enhanced development of large-scale spe-

cialized agriculture. Thus, small diversified farms declined in number. As prices for their crops decreased relative to costs, farmers either sell their farms, expand their operations or supplement their incomes with non-farm jobs (Van Otten 1981,70). He estimated, by the turn of the century, agriculture will be of minimal importance in the region.

Similar to Van Otten, Wayne Kiefer (1972) directed his analysis to the configurations of farm buildings, land use and types of agricultural production. He investigated the complex of agricultural settlement features in a north central Indiana township.

Kiefer's primary emphasis was on the design and construction of farm buildings. His ultimate goal was to classify the various types of buildings based on cultural influences. "In short, what processes have shaped the agricultural landscape, and what has their impact been" (Kiefer 1972,506).

John A. Alwin's study "Jordan Country- A Golden Anniversary Look" (1981) was a reexamination of Isaiah Bowman's study of Jordan, Montana. Both Bowman and Alwin examined the region in terms of its: agriculture, population, transportation, medical, educational and housing conditions.

The methodologies which both geographers utilized included an analysis of change in population for both the county and town of Jordan. Also, changes in the

average size and number of farms, acres of cropland and the numbers of cattle and sheep were examined. These comparisons were made for the years from 1920-1980. Maps were constructed which showed the location of farms in 1980 and locations of post offices in 1930 and again in 1980. Comparing meteorological records is also an important technique, and was used to help explain why farms have had difficulty in maintaining economic viability. This factor helped account for the steady population losses experienced in Jordan Country.

Wheat is the major crop of the Great Plains and Decatur County, Kansas. Studies have been conducted on the diffusion and persistence of this crop in Kansas and other regions. These studies reveal insights about the historical significance of wheat in Kansas and elsewhere. The article "King Wheat in Southeastern Minnesota: A Case Study of Pioneer Agriculture" (1957) by Hildegard Binder Johnson examined the historical pattern of wheat production in the Whitewater watershed of Southeastern Minnesota. Formerly, it had been assumed that wheat was the only crop grown in the region. Johnson studied production patterns in the area and found that wheat was the outstanding crop, but was not the only crop during the latter half of the 19th Century.

Johnson's study considered two factors which might explain the contemporary view of wheat's importance.

First, most contemporary literature deals with wheat as a cash crop. This does not reflect crops grown which may have also been significant. Second, Johnson states, "original data are self-evident with respect to precise declaration and round estimates of production: they reveal information that is lost in published totals" (Johnson 1957,362). Thus, data obtained from old records sometimes does not coincide with published reports.

Johnson finished the essay by declaring the notion of "King Wheat" is an over-simplification, much like the label of Corn-belt and Cotton-belt. Therefore, she insists we should avoid using labels to define regions, especially in the historic past.

The development of agriculture in the historic past most certainly influenced rural settlement patterns of Kansas. Lynell Rubright's Development of Farming Systems in Western Kansas, 1885-1915 (1977), examined impacts of the physical environment, the historical background, population trends and attributes of farms such as, size and tenure, on the development of agriculture in the region. Rubright studied Cheyenne, Logan and Hamilton Counties of Western Kansas. The analysis focused on the period of initial settlement of these counties, which roughly coincides with the settlement of Decatur County.

Techniques of Analysis

Ways of measuring spatial variations, or modelling distributions of rural settlement patterns are important considerations for any research in the field. Such methodologies provide a means in which conclusions can be drawn and results tested. For example, Robert Haining's article "Describing and Modeling Rural Settlement Maps" (1982) described ways of modelling the spatial distribution of rural settlements by using various techniques.

His methodologies included spectral analysis, which deals with objects in the frequency domain, and an approach which retains data in the spatial domain (Haining 1982, 215). Haining also produced maps showing the distribution of farmsteads. This technique is revealing in that it shows the spatial arrangement and densities of farmsteads.

Haining believed model building and theory development are interdependent. He believed rural settlement theory makes qualitative statements about the form of the point distributions and can make comparisons to theoretical outcomes (Haining 1982, 220).

Techniques of analyzing land entry and patent data for geographical investigation was the topic of an article by C. Barron McIntosh. The purpose of his

study was to examine the applicability of land entries and patents as pattern-producing criteria, identify some sources of entry and patent data, and illustrate some examples of the pattern and process of settlement progression (McIntosh 1976, 570). Such a methodology is important in reconstructing the landscape in the early years of rural settlement.

The distributions of phenomena across the landscape are fundamental to any geographic research. Therefore, literature has been devoted to methodologies which describe geographic distributions. Arthur H. Robinson and Reid A. Bryson (1957) developed a method of quantitatively describing phenomena of one class to phenomena of another class. The subject of their investigation was the rural farm population of Nebraska. They attempted to correlate rural farm population with precipitation. Data for the analysis were based on interpolated values from a map. In Nebraska, generally, rural farm population decreases from east to west as does precipitation. A similar scenario exists in Kansas which may help explain population densities in Decatur County. The article evaluated the strengths and weaknesses of their methodology and determined the methodology which they used can be practicable.

Depopulation and Migration in Rural Areas

Migration was inherent in the development of rural settlements. Robert Ostergren, in another study, examined the migration processes of various ethnic groups. His work "A Community Transplanted: the Formative Experience of a Swedish Immigrant Community in the Upper Middle West" (1979) is a study of a Swedish community, Rattvik parish, in which many of its members migrated to Isanti County, Minnesota. Ostergren discussed how famine was the reason for emigration in the 1860's.

An interesting component of Ostergren's study is the spatial organization of social life. Immigrants in the New World adopted much of the same social and institutional patterns of the Old World. For example, the parish church was at the highest level of organization in the New World, as it was in Sweden. In addition, fjardings and villages were other spatially definable tiers. Ostergren examined the spatial differentiation of these tiers. In addition, he also studied the social structure of individuals within the community by comparing the size of land holdings of particular members. He concluded by suggesting rural immigrant communities could be successfully transplanted and maintained. This is an important component to settlement of the Great Plains and Decatur County.

Sometimes external factors influence the migration of people and settlement patterns. John Hudson investigated how extra-regional influences of public and private decisions have transformed a portion of the northern plains from Indian reservation to open range to homestead frontier (Hudson 1973, 442). He analyzed migration patterns at the interregional level and changing settlement patterns at the local scale. His "focus is on the early stages of occupation rather than upon competitive adjustment in an established settlement pattern" (Hudson 1973, 442).

Hudson focused on two counties in the northern plains- Sanborn, in South Dakota, and Bowman, in North Dakota. His analysis compared temporal differences of settlement between the two counties and the impacts of various policies on settlement such as, the influence of the railroads. Hudson also studied various ethnic groups, such as Norwegians, which settled the region. His study provides additional perspectives in the movement of the American frontier.

In another study Hudson examined migration of various ethnic groups, such as Germans and Swedes, to North Dakota. The thrust of his second study analyzed the origins of the settlers who went to North Dakota in the late 1800's. He also studied the occupations of the settlers and how they varied spatially and temporally between various ethnic groups. For example,

German Russians settling in central Dakota, were most apt to return to the southeastern Dakota colonies for farm work, especially in years when their own harvests were poor (Hudson 1976, 262).

Depopulation has been a pervasive force which has shaped settlement patterns of many rural areas. This topic was addressed by Harley E. Johansen and Glenn V. Fuguiff in their article "Recent Population and Business Trends in American Villages" (1983). The article investigated the trends of depopulation in small towns. For example, they found 45 percent of towns in the United States which had less than 2,500 people lost population between the years 1960 and 1970. The article also discussed the economic activity of small towns and how its downward trend is reflected by population loss. Many small towns in the Great Plains have been losing population because of less economic activity, much of which has resulted from the declining number of farms.

Regions other than the Great Plains have experienced population losses. "Some Aspects of Farm Depopulation in Northeastern Ontario" (1977) is the title of an article written by Elizabeth S. Szplett and David B. Szplett. The article examined a methodology to predict the stability of the farm population using cluster analysis and multiple regression analysis. The variables which were used in the analysis included:

value of grain sales per farm, percentage of farms which are noncommercial, percentage of the population which is of British origin and distance to the North Bay.

The thrust of Elizabeth and David Szplett's paper was an examination of residuals from regression. The residuals were mapped to show three distinct patterns. First, there was a pattern of overprediction in areas of farm stability and underprediction in less stable areas. Second, a pattern of underprediction in subdivisions experiencing rapid urban growth existed. Finally, a pattern of overprediction in areas which had favorable environmental conditions and underprediction in areas of less favorable conditions was determined.

The question of how cultural differences between farmers impact the agricultural structure was examined by Jan L. Flora and John M. Stitz. They examined this phenomena within the context of commercial agriculture on the Great Plains. Their study was conducted in Ellis County, Kansas, which had two groups of ethnic Germans. The two groups included German Lutherans, who originated in Germany, and German Catholics, who emigrated from the Volga region of Russia.

The influences of land policies such as The Pacific Railroad Act of 1862, also impacted settlement patterns of the two groups. A change in land policy after 1879, which allowed farmers to homestead 160

acres instead of the initial 80 acres, dramatically increased the county's population. It increased nearly five times between 1870 and 1880 (Flora and Stitz 1985, 346). However, this did not impact the Volga Germans who had already settled the area.

Finally, the article discussed how ethnicity did not actually contribute to expansion in the settlement period. Instead, persistence allowed those settlers who remained, to expand their farming operations in the long term.

Conclusion

This varied literature has relevancy to this thesis. Many of the studies are useful for background, concerning not only rural settlement patterns, but also agriculture. However, it is important to consider the variability of agricultural practices throughout North America. Agriculture in the Ozarks or Minnesota differs from agriculture in the Great Plains in terms of scale and environmental conditions.

The comparisons of histories within the different areas are important. Historical perspectives provide useful background information and can be used as a means of comparison. Much detail is lacking, however, such as information concerning localized groups of farmers instead of entire ethnic groups. This infor-

mation would be helpful in establishing family settlement patterns which may persist for generations.

Much literature exists on the subject of rural farm settlement patterns in various regions. The literature has come from economical, sociological and geographical perspectives. Though much information is lacking in analyzing patterns of settlement in Kansas and more specifically, Decatur County, much insight about the development of rural settlement patterns can be inferred.

Chapter III

Background of Decatur County

Historical Background

Decatur County is named after Stephen Decatur who was a famous naval officer of the early 19th Century. The first expedition across Decatur County was by Fremont in 1843. The old Fremont Trail crossed Sappa Creek in northern Decatur County and was used by other expeditions years later. Also, a stage station was used as early as 1858 (Decatur County Historical Book Committee 1983,8).

The first Anglo-European settlers in Decatur County were trappers and hunters who resided during the winter of 1872 and 1873, which was some six years before the county was officially organized in 1879. They came and built a combination dugout and log structure in the northern part of the county along Sappa Creek. One of the trappers, Colonel Hopkins made a pre-emption filing on this land. "These were the first papers taken out in the county" (Decatur County Historical Book Committee 1983,8).

In April 1873, Bohemians who came from Omaha, Nebraska settled on Big Timber Creek, which is near the town of Jennings. This is the first evidence of an

ethnic group settling in Decatur County.

Towns like Westfield (later named Oberlin), Jennings, Norcatur and Dresden were platted. Sometimes they were not incorporated immediately upon settling and were even platted after 1900. For example, Norcatur was incorporated in 1901 but had been platted in 1885. Leoville, the youngest settlement in the county, was surveyed and platted in November 1920 (Decatur County Historical Book Committee 1983, 17-18). Dresden was one of the few towns platted even before a post office was established there.

Other towns such as Traer, Cedar Bluffs and Kanona were smaller communities which served as trade centers. The location of these towns was in response to a growing settler population or the location of the railroad. Indeed, transportation linkages were important and many times determined whether a community would survive. The best example of this is Allison, which was a thriving community that had a seemingly bright future. However, in 1888 the Rock Island Railroad was built ten miles from Allison. "The Rock Island road broke Allison and by 1903 the town site was nothing but an alfalfa field" (Decatur County Historical Book Committee 1983,18).

The early history of Decatur County, from the late 1870's until 1900, was a time of rapid population expansion. In about 25 years, the county went from a

handful of settlers to over 9,000. There was a variety of factors which may have lured people to Decatur County such as, cheap, plentiful land and a seemingly favorable climate. However, some settlers may have been lured there by favorable publicity such as the article written by C.S. Burch of Chicago, Illinois in 1885 and published in the Cattle-Sheepman Book. In his article he vaunts the county's favorable points. For example, "...it is infinitely rich in the higher pastoral features, whose lines of grace and beauty can never have adequate portraiture." He goes on to say, "...with bright sunshine over 300 days of the calendar year, make up the typical seasons and climate of Decatur County and give the highest average health to be found between the two oceans" (Decatur County Historical Book Committee 1983, 45). Whether it was the lure of cheap land, the promise of a new future or the accolades of people such as Burch, Decatur County became increasingly settled.

Physiography

Decatur County is located in the High Plains physiographic region. This region covers approximately the western one-third of Kansas and extends into adjacent areas of the surrounding states. The eastern limit of this physiographic subprovince of the Great

Plains, is delineated by the scarp created by Fort Hays limestone which is found well east of Decatur County. Structurally, the rocks underlying Decatur County consist of Tertiary and Quaternary sediments lying over the Cretaceous sediments common to the Great Plains (Rubright 1977,39).

The topography of Decatur County can be characterized as gently rolling. However, more rugged areas are found where streams and drainageways have dissected the landscape. These areas are best suited for grazing, which is the predominant land use there. Total relief in Decatur County is 640 feet. However, elevational changes are usually subtle averaging 10 to 15 feet per mile (Self 1978,49). Elevations range from 2,330 feet in the channel of Sappa Creek at the Norton County line to about 2,970 feet above mean sea level near the Rawlins County line (Northwest Kansas Planning and Development Commission 1979,25).

Soils

Soils are an important factor when considering the economics and resultant settlement patterns of the county. The availability of fertile soil may have determined whether a particular farmer would be able to produce adequate crops. This was especially true during marginal economic conditions in which a modest

disparity in yields could spell the difference between success or failure.

Four general soil associations are found in Decatur County. First, the Holdredge-Uly association, found on the uplands, is characterized with a nearly level to moderately sloping gradient. This soil, like the other soils in the county, is deep, well drained and has a silty or loamy subsoil. The second, the Coly-Uly-Holdredge association, is found on gently sloping to moderately steep areas. The third, the Uly-Coly- Penden association is found on moderately sloping to moderately steep areas. Finally, the Bridgeport-McCook association contains a silty subsoil and is found in stream terraces, flood plains, and alluvial fans. This soil is nearly level to gently sloping (U.S. Dept. of Ag., Soil Conservation Service, Decatur County, Kansas 1986).

Water Resources

Decatur County, like much of Western Kansas, has limited surface water. Open water impoundments can be found in many areas of the county, but are diminishing because of silting caused by erosion from nearby fields. The only other sources of surface water include: Beaver Creek, Sappa Creek, Prairie Dog Creek, and the North Fork of the Solomon River. The

availability of open water and the flow of the major streams fluctuate with rainfall, and therefore, are not reliable sources of water.

Groundwater is found throughout much of the county. It is situated in the Ogallala formation and in shallow alluvium and terrace deposits. Groundwater is the principle source of water for domestic, industrial and agricultural uses. Irrigation is not as widely practiced in Decatur County as in some neighboring counties because groundwater deposits are not as extensive. For example, in 1978 only 11,975 acres were irrigated compared with 62,498 in neighboring Sheridan County (U.S. Dept. of Commerce 1978). Irrigation was implemented during relatively recent times in the county, with most occurring after World War II. Even though irrigated land comprises a fraction of the nearly 576,ØØØ acres of the county, it may be significant because it encompasses the most productive areas of the county and thus, may influence the pattern of settlement. Additionally, prior to the development of irrigation, the proximity of water, whether from surface or underground supplies for domestic use, may have greatly impacted the pattern of settlement.

Climate

Decatur County has a middle latitude steppe or semiarid climate. One characteristic of this climate is water loss through evaporation at the earth's surface exceeds the annual water gain from precipitation (Self 1979,64). This is important because the region is susceptible to drought. The mean annual precipitation at Oberlin is 20.71 inches with a mean annual temperature of 52.9 degrees Fahrenheit (Northwest Kansas Planning and Development Commission 1979,24). The growing season in Decatur County, which begins in early May and extends into early October, is among the shortest in Kansas at 150 days (Self 1978,57). Therefore, Decatur County is not only susceptible to drought, but a shorter growing season.

The availability of adequate precipitation is essential for crop growth. Rainfall is not distributed evenly throughout the year with 80 percent occurring during the growing season. Winter precipitation is very light and usually falls in the form of snow. The effects of sunshine, wind and low humidity combine to remove snow which is a help to livestock producers because pastures remain open for grazing (Rubright 1977,54).

Precipitation in Decatur County, like other areas of the High Plains, is highly variable. Precipitation

averages have little meaning because of their large fluctuations. For example, between 1900 and 1987, the lowest annual precipitation recorded in Oberlin was 9.57 inches (1936), while the highest was 34.66 inches (1965) (U.S. Dept. of Commerce 1936, 1965). A study conducted by Wayne Palmer, on drought in Western Kansas, concluded that wet periods and drought "occurred 37 percent of the time (by month), and near normal conditions occurred only 12 percent of the time" (Rubright 1977,54). Rubright goes on to say that in Wallace County (near the Colorado state line), 37.7 percent of the years between 1885 and 1915 experienced less than 15 inches of precipitation which is the amount considered adequate to grow grain crops. Between 1900 and 1987, Decatur County experienced only 12 years (13.8 percent) below 15 inches (U.S. Weather Bureau, Kansas 1900-1987). According to Rubright, dry years tend to cluster and are especially troublesome to farmers (Rubright 1977,54).

The most serious environmental hazard of the High Plains, like many other agricultural regions, is drought. As mentioned earlier, drought tends to cluster. Figure 2 shows the variability between the decades of the 20th Century. Notice how the 1930's and 1950's are well below the mean of 20.71 inches. Other notable droughts occurred between 1900 and 1902 and 1910-1917 (Self 1978,58). However, because of great

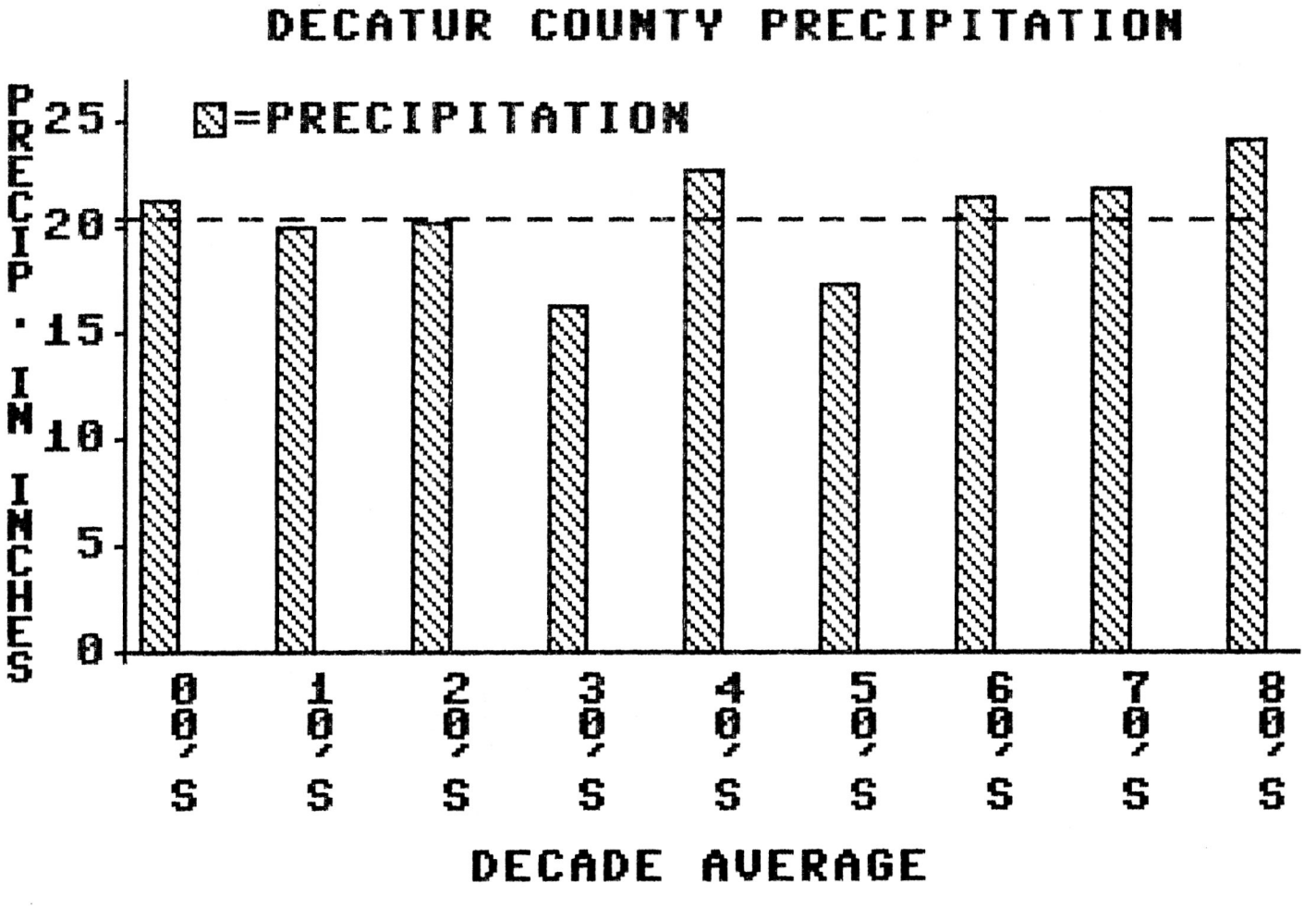


Figure 2. Precipitation averages per decade.

fluctuations in precipitation, one or two years of drought may be followed by above normal precipitation.

Droughts were most certainly responsible for the demise of many farms in the High Plains. Even though Decatur County has more abundant rainfall than points farther west, it too, suffered from drought. Therefore, the effects of climate must be considered when addressing population change and the resultant change in the settlement patterns.

Vegetation

Decatur County lies in the transition zone between the mixed and the short grass prairies. The mixed prairies contain bluestem and grama grasses, while the short grass prairie is dominated by grama and buffalo grass. These grasses are found in the upland regions of the county. The semiarid climate of Decatur County is given as the most important factor when explaining vegetation patterns. Other factors such as landform types and soil types also influence vegetation patterns. For example, the north facing limestone bluffs near Cedar Bluffs, contain stands of cedar trees. Their existence results from thinner soils along the bluffs and perhaps, protection by the escarpment from desiccating winds.

Similarly, floodplain vegetation consisting of a

variety of trees such as, cottonwood and ash can be found. These trees have been used commercially in Decatur County on a limited basis. Their availability in the floodplains supplied firewood to nearby residents. This was an important factor especially during marginal economic conditions (R.J. Metcalf 1989), and before rural electrification was established in the late 1930's and early 1940's (Benedict 1966,338). Even though wood has been used as firewood in Decatur County, it is found primarily in narrow bands near riparian areas, especially near the larger creeks.

Grasses are the most important vegetation type in the county. The impact of grasses on Decatur County is great. Most crops in the county are members of the grass family such as wheat and corn. The grasses which did not succumb to the plow have provided grazing forage for cattle and protection to soil from erosion. Also, the fertile soils of the county, like other parts of the prairies, are developed under grassland cover (Self 1978,69). Therefore, the prairies were considered a resource which attracted many settlers into the region.

Transportation

Currently, Decatur County has 91 miles of State

and Federal highways, and 190 miles of upgraded county roads. U.S. Highway 83 is the major north-south highway and U.S. Highway 36 is the major east-west highway. U.S. Highway 83 extends from the Rio Grande River in southern Texas to Canada. U.S. Highway 36 connects Denver, Colorado to Indianapolis, Indiana and is a major truck route through northern Kansas. A third federal highway, U.S. 383, traverses through the southeast corner of the county and passes through Jennings and Dresden (Northwest Kansas Planning and Development Commission 1979,29). The construction of these major highways did not occur until well after settlement had ensued, however; early cadastral maps show an extensive road system which connected farmers to the surrounding towns. Moreover, as depopulation of the county progressed many roads were abandoned and condemned (Cadastral Maps of Decatur County 1905 and 1920 and State Highway Maps 1940, 1967 and 1986).

The railroads were of major significance to the settlement of Decatur County. Railroads were most important in determining the economic viability of towns because they provided not only passenger service, but also a means to ship grain to eastern markets. As mentioned earlier, when the railroad was built ten miles north of Allison, that community lost its fight for survival. Thus, the location of railroads may have been more important to the survivability of towns than

they were to farms. As of 1989, three lines of two railroads serve Decatur County. The mainline of the Rock Island Lines, which links Colorado Springs and Denver to Chicago and other cities, passes through Jennings and Dresden parallel to U.S. Highway 383. The Burlington Northern Railroad also passes through the county. One line serves Norcatur and Oberlin, terminating in Oberlin. The other line serves the unincorporated communities of Traer and Cedar Bluffs. There is no longer passenger service provided by these lines (Northwest Kansas Planning and Development Commission 1979,29).

Population

Decatur County reached its population maximum in 1900 (Self and White 1986,16). This was unlike surrounding counties which came as much as 50 years later. For example, nearby Thomas County did not reach its population maximum until 1950. Adjacent Rawlins, Norton and Sheridan Counties reached their population maximums in 1930. This is not to say Decatur County was settled 30 to 50 years prior to the surrounding areas, its population simply peaked and began to wane earlier. This may have been a reflection of initial oversettlement caused by such factors as abnormally high rainfall or the perceptions of the economic

potential of the county.

According to Self, (who used 1970 as a statistical base), of the 105 counties of Kansas, twelve reached their population maximum in 1890; eighteen in 1900; thirteen in 1910; seven in 1920; and twenty-one in 1930 (Self 1978,86). He goes on to say, that of those seventy-one who reached their population maximums 40 years prior to 1970, fifty-seven contained no city of 5,000 or more. This situation occurs in Decatur County.

There has been a steady decline in the population of the county since the population maximum was reached in 1900. Table 1 shows this relationship. Each successive decade, with the exception of the 1920's, reveals substantial population losses. The 1930's, 1940's and 1960's showed the greatest losses, running as high as 16.8 percent in the 1940's. The downward trend has continued and the 1980 population was less than half of the 1900 population (Northwest Kansas Planning and Development Commission 1979,18).

As a result of population losses, population density has declined. In 1900, population density was 10.26 persons per square mile. By 1940, it had declined to 8.26. By 1980 it had further declined to slightly more than 5 persons per square mile. These figures include the clustering of the population in the four incorporated towns. If the density of the rural-farm population is calculated, the figure becomes

Table 1

Decatur County Population Trends

Year	Population	Percent Change
1900	9,234	
		-2.8
1910	8,976	
		-9.5
1920	8,121	
		+9.2
1930	8,866	
		-16.2
1940	7,434	
		-16.8
1950	6,186	
		-6.6
1960	5,778	
		-13.7
1970	4,988	
		-9.6
1980	4,509	

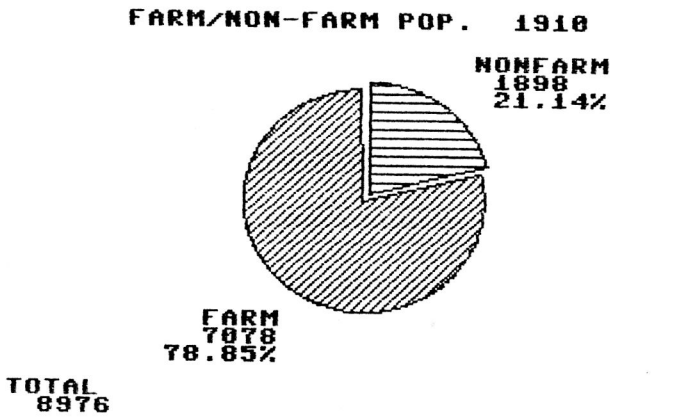
Source: Decatur County Planning Study, 1979.

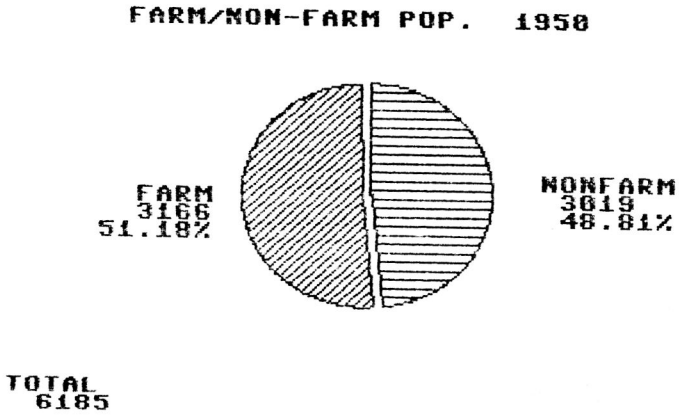
only 1.78 persons per square mile in 1980.

Decatur County has four incorporated cities which had 1980 populations as follows: Dresden 84, Jennings 194, Norcatur 226 and Oberlin 2,387. In 1980 the county had a population of 4,509 (U.S. Dept. of Commerce 1980,18-14). The population residing in the four towns represented over 64 percent of the county's population. Only 1,609 persons lived outside of these city limits.

The trend of migration from rural farm areas to rural non-farm areas has persisted throughout the study period. In 1910 (the first year government statistics showed the rural non-farm population of Norcatur and Jennings, however, Dresden was not yet included), the rural non-farm population of Decatur County was slightly more than 21 percent of the total. Only, 1,898 of the county's 8,976 lived in towns at that time (U.S. Dept. of Commerce 1930,346). However, by 1950, the county population declined to 6,185, but the total rural non-farm population was 3,019 or 48.8 percent (U.S. Dept. of Commerce 1950,18-165). The trend continued and by 1980 the rural non-farm population of Decatur County was 2,900 or 64.3 percent of the total county population (Figure 3).

The population statistics reveal two interesting points. First, the population has shown a decrease since it reached its maximum in 1900, with the greatest





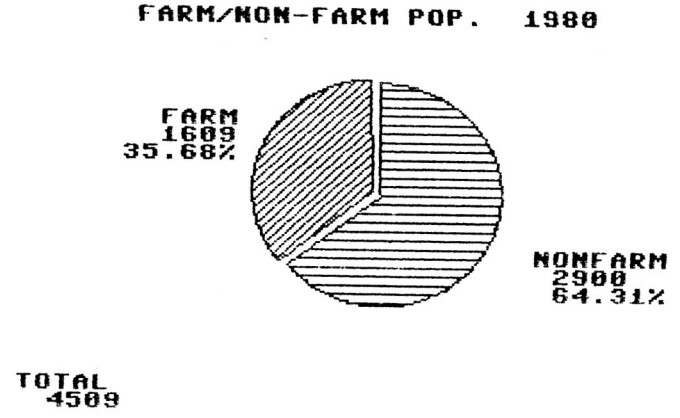


Figure 3. Percentage of farm and non-farm population in Decatur County.

losses occurring since 1940. The statistics show a 19.49 percent decrease from 1900 to 1940 and a 34.4 percent decrease between 1940 and 1980. Second, in spite of a larger percentage of the population living in the four incorporated cities, the overall population is still decreasing. Thus, inmigration into the four incorporated towns was at a slower rate than the county's overall outmigration rate.

A final component of the population analysis concerns the foreign born population. The number of foreign born persons residing in the county has steadily decreased. In 1900, 7.5 percent of the population was foreign born (U.S. Dept of Commerce 1910,164). By 1960, 1.0 percent were foreign born (U.S. Dept. of Commerce 1960,18-165). Of these, the largest groups consisted of Germans, Swedes and Bohemians.

Cadastral maps containing the surnames of landowners give some indication of the areal extent of these various ethnic groups. Also, in some instances churches are still the center of these communities. In Decatur County, Swedes settled primarily in Bassettville Township and some of the surrounding areas. Even in the 1980's the Lund Covenant Church holds services and many of the congregation are of Swedish heritage. The Immaculate Conception Catholic Church of Leoville (unincorporated) serves the predominantly German Catholic areas of Dresden and surrounding townships. In the

Jennings area, many persons of Bohemian (Czech) heritage reside. A revival of Czech heritage was initiated in 1965 with the beginning of an annual Kolache Festival which lasted several years (Decatur County Historical Book Committee 1983,16). Also, near Jennings the Bohemian Hall, which is a local landmark, was built in 1906 as a meeting place for the Western Bohemian Fraternal Association. The Bohemian Hall was used for various social and cultural events.

Changing Structure of the Farm

In conjunction with the declining rural farm population, a loss of farms has ocurred. The loss of the rural farm population is expressed on the landscape by the number of abandoned farms and rural residences. In 1900, during the county's population maximum, there were 1,593 farms in Decatur County. The number of farms declined steadily throughout the study period. By 1920, there were 1,320; 1940, 1,174; by 1964, 692; and by 1987, 486 (U.S. Dept. of Commerce 1925, 1940, 1964 and 1987).

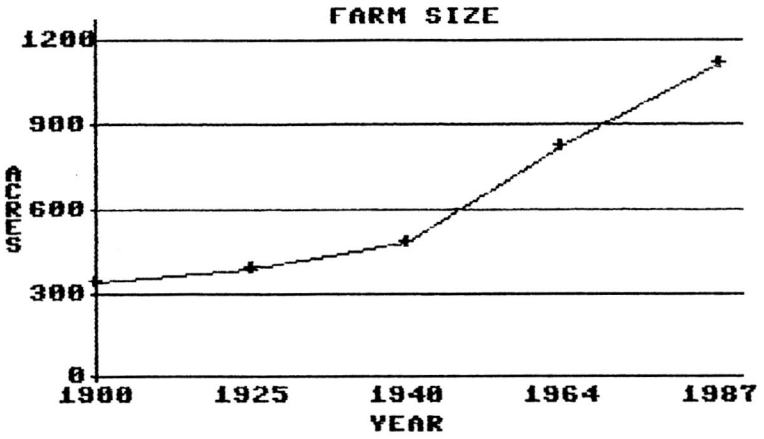
As a result of the declining number of farms, the average size of the remaining farms has increased. In 1900, the average size farm was 338.6 acres. This value had grown to 478.8 acres by 1940 and in 1987 had reached 1,118 acres (U.S. Dept. of Commerce 1925, 1940,

1964 and 1987). As mentioned earlier, the county's rural farm population declined throughout most of the study period which contrasted with increasing farm size (Figure 4). Many factors contributed to these changes such as, increased mechanization of agriculture and poor economic conditions. Poor economic conditions were especially evident from the years 1921-1934 because of a severe deflationary cycle which intensified the pressure between low crop prices and high costs of inputs (Genung 1954, 5).

The amount of cropland has changed as well. In 1900, government statistics showed Decatur County had 239,533 acres of cropland. This value rose to 359,940 in 1940 and declined slightly to 356,393 acres in 1987 (U.S. Dept. of Commerce 1925, 1940 and 1987). Fluctuations in cropland may reflect changing crop prices, increased mechanization and government programs to control production.

The cropping characteristics of Decatur County has changed over time. In 1900, corn was the major crop with 103,787 acres planted while only 38,922 acres of wheat were grown (U.S. Dept. of Interior 1902, 164). By 1920, and continuing throughout the remainder of the study period, wheat supplanted corn as the major crop. By 1987, there were 93,716 acres of wheat but only 17,512 acres of corn (U.S. Dept. of Commerce 1987, 2).

Irrigation has been developed in Decatur County



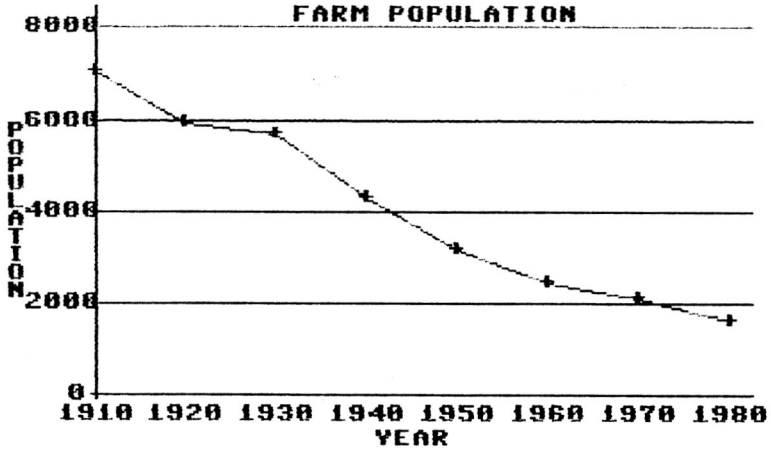


Figure 4. Farm size versus farm population. Source: U.S Dept. of Commerce.

since World War II, and by 1987 totaled 10,433 acres (U.S. Dept. of Commerce 1989, 2). Nearly all of the irrigated land lies in the valley regions of the county.

Land and Farm Policy

Public land policy most certainly influenced the settlement patterns of the rural population in Decatur County. The Ordinance of 1785 or the United States Land Survey, set the stage for settlement, and to a large extent, determined the pattern of settlement because of its regular grid pattern. The land was parcelled into 36 sections (6x6 miles) per township. Each section could be subdivided into quarter sections (160 acres) or less. Because of its uniformity, this method of land parcelling created a somewhat regular settlement pattern.

The Homestead Act of 1862 provided affordable land for homesteaders. It was also a much more orderly attempt at distributing unsettled public lands. Formerly, the dispensing of public lands was chaotic and was sometimes laced with corruption. However, the "Pre-emption Act" of 1841 was the first true attempt to orderly dispense land, and was used by Colonel Hopkins when he acquired land in Decatur County. Though this policy existed until 1891, the Homestead Act was used

more extensively in meting out public land.

The Homestead Act allowed many landless farmers to acquire land. However, as the better lands were homesteaded, marginal lands farther west were being homesteaded as well. They began to farm land unsuited for crop farming or that could be farmed more successfully only in large units. Settlers were at the mercy of nature and droughts caused many to lose their farms (Benedict 1966, 20).

According to Benedict, "there was a tendency for the Congress to adhere to concepts and patterns of action which had evolved as a means of settling areas farther east" (Benedict 1966,21). The conditions of the West, especially the region west of the 100th meridian, were very different from those areas farther east. With a different climate an entirely new set of problems existed. Even though the area had unpredictable rainfall much of the land was excellent for grazing and the riverbottoms could be used to grow supplemental feed crops. Also, the water supplies could be used for livestock.

The Homestead Act was one of the driving forces which led to the settlement of Decatur County. It provided inexpensive land for a multitude of homesteaders. One of the biggest criticisms of this policy was that the amount of land granted was not adequate to earn a living. No doubt this problem

became more evident after the turn of the century when increasing mechanization created a redundant labor force.

There has been a longstanding recognition that capital has been a substitute for labor as industry and agriculture have mechanized. In 1910, 74.6 percent of farm inputs were labor, 16.7 percent capital and land was 8.7 percent. By 1980, labor constituted approximately 10 percent, while capital comprised 90 percent (including land)(Heady, Haroldsen, Mayer and Tweeten 1965,12-13). The result of replacing farm labor with capital is the dislocation of redundant farm labor to urban areas seeking jobs. Therefore, the depopulation of Decatur County has resulted not only from market and climatic fluctuations, but by capital infusion.

Credit for capital investment in agriculture in the early years was sometimes difficult to obtain. The Commodity Credit Corporation was created by executive order in 1933 to "buy, sell, and make loans to farmers on agricultural commodities for the purposes of increasing agricultural production, stabilizing prices, assuring adequate supplies, and facilitating the efficient distribution of agricultural commodities" (Cochrane and Ryan 1981, 132). To reaffirm their commitment to this end, Congress authorized a charter for the Commodity Credit Corporation in 1948. Some of

the provisions include: (1) "Make available materials and facilities required in connection with the production and marketing of agricultural commodities." (2) "Procure agricultural commodities for sale to other Governmental agencies, foreign governments, and domestic, foreign or international relief or rehabilitation agencies, and to meet domestic requirements." (3) "Carry out such other operations as the Congress may specifically authorize or provide for" (Cochrane and Ryan 1981, 137). The government now had "an agency and instrumentality of the United States, within the Department of Agriculture, subject to the general direction and control of its Board of Directors" (Cochrane and Ryan 1981,137). With the creation of the Commodity Credit Corporation and the enactment of various farm legislation, the government had much more influence on agriculture.

Government policy has also been directed at land use. At certain times overproduction has depressed commodity prices. Also, marginal land has been put into production which has caused the loss of topsoil. One of the earliest soil conservation bills was "The Soil Conservation and Domestic Allotment Act of 1936" the purpose of this bill was "To promote the conservation and profitable use of agricultural land resources..."(Benedict 1966, 350). The thrust of this legislation, however, was to increase farmers buying

power, nevertheless, it created an awareness about the problem of soil erosion. Subsequently, conservation practices were adopted by farmers.

"The Soil Bank", which was passed within the Agricultural Act of 1956, was directed at reducing production of surplus farm commodities. One of its provisions was to pay farmers "rent" to idle land which was a conservation measure to protect soil, water, forest and wildlife resources. Twenty-one million acres were "banked" in the "Acreage Reserve Program" (Cochrane and Ryan 1981, 78). Some farmers who opted for this program received sufficient enough incomes to retire from farming. This program may have been responsible for some rural depopulation in Decatur County and other areas.

A recent policy which was used to reduce surpluses and idle land was the Payment-in-Kind (PIK) program of 1983. The farm economy had been deteriorating and President Ronald Reagan reversed his "free market" farm policy. Under the PIK program farmers agreed to idle one-third of their cropland which was normally devoted to growing wheat, feed grains, cotton and rice. In return they received cash payments and "in kind" bonuses of surplus stocks. Farmers idled 83 million acres (Congressional Quarterly 1984, 15). This program had the positive effect of increasing farmers incomes plus, the bonus of reduced erosion. The PIK program

has been given credit for helping many farmers continue farming. Thus, PIK may have temporarily slowed depopulation in Decatur County.

Another recent farm bill, "The Conservation Title of the Food Security Act of 1985" was passed which may have affected population change by bolstering farm income. "The political process focused predominantly on the commodity and trade sections of the act and the big ticket economic provision designed to assist farmers through the bleak years of the mid 1980's" (Benbrook, 440). Another goal of this legislation was to prevent soil erosion by idling land. During the years 1986, 1987 and 1988, 5,344 acres of erodable cropland were idled in Decatur County (Barrett 1989). This farm legislation, like PIK, may have slowed depopulation in Decatur County during the 1980's.

Public land policy has also been responsible for shaping the settlement pattern of the rural population in Decatur County and elsewhere. The U.S. Land Survey helped fashion settlement patterns. The Homestead Act was responsible for much settlement in the region. Inadvertently, it may also have been partly responsible for Decatur County's overpopulation (in terms of economic carrying capacity) at the turn of the century.

Monetary policy and government farm policies have caused the rural farm population to diminish in Decatur County. The substitution of labor with capital has

created a redundant labor force. Government programs to idle land has also shaped the rural landscape by altering land use and allowing some farmers to retire from agriculture.

Conclusion

There are forces which have been instrumental in shaping the pattern of settlement in Decatur County. Since the county was first visited by white men in the 19th Century, the forces of nature and man have contributed to the pattern of settlement which exists in 1988. The physical elements of soil, water, climate and vegetation are determinants of agriculture productivity which sometimes determine the success or failure of farming operations in the county. Government farm and monetary policy are also dynamic forces which have caused depopulation in the county. Thus, the landscape reflects a nexus of circumstances which have shaped it.

Chapter IV

Patterns of Change

Introduction

The previous chapter dealt with some of the causal effects public policy and the natural environment had on the distribution of the rural farm population in Decatur County. This chapter will utilize the aforementioned background and proposed methodology to determine how the distribution of the rural farm population has been expressed on the landscape throughout the study period.

An examination of the patterns will reveal areas which have either gained or lost rural residences for each of the four time intervals. In the context of public policy and environmental conditions, an attempt will be made to explain these patterns. Additionally, the mean center of rural residences and an estimated standard distance valve will be calculated in order to determine the movement and dispersion of Decatur County's rural farm population.

The Settlement Pattern of 1905

Data for the initial year of the study, 1905, was

derived from the official cadastral map of Decatur County. The frequency of rural residences was greater at this time than at any other time during the study period. The enumeration of rural residences reveals a frequency of 1,494 (does not include residences in platted areas of Kanona, Traer, Cedar Bluffs and Clayton). The year 1905 was only five years after the county reached its population maximum in 1900. Therefore, this data closely represents the maximum number of rural residences.

Figure 5 shows the distribution of rural residential frequencies. Notice there are few areas in the county showing less than one rural residence per square mile. The mean for the county, during this time, was 1.66 rural residences per square mile. This value disputes the common notion of "one farm on every quarter". Therefore, the overall density of rural residences was far less than what has been commonly thought.

However, there were areas which had at least four rural residences per square mile. First, the area along Beaver Creek had a fairly large number of sections with at least four rural residences per square mile. (See Figure 1 for referenced locations.) Unusually high density areas were found near the unincorporated towns of Cedar Bluffs and Traer (located along Beaver Creek). Second, another region of high

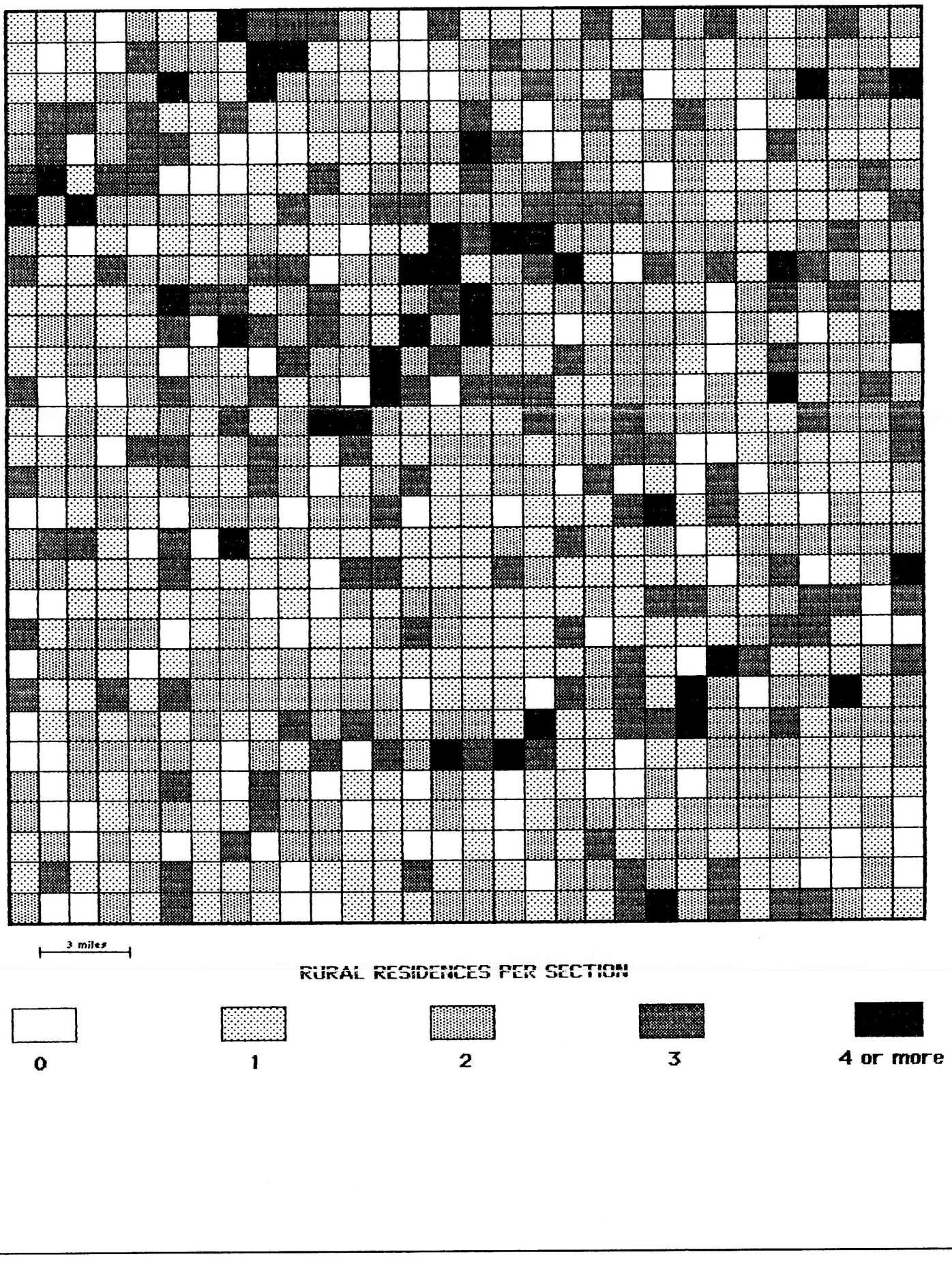


Figure 5. The settlement pattern of 1905. Source: Ogle, 1905.

density was found along Sappa Creek, especially, from Oberlin northeastward. This area appears to have had the highest rural residential density in the county during 1905. Finally, the Prairie Dog Valley was also more densely settled than most vicinities of Decatur County. This was particularly true near Dresden, Jennings and Clayton (which lies almost entirely in Norton County). Minor areas in the county also contained more than four rural residences per square mile. The area along Sappa Creek in the northeast corner of the county was one of these and is particularly interesting because it supported the small hamlet of Lyle. Lyle was the location of a post office, church and several businesses at the turn of the 20th Century. The few remaining sections which contained at least four rural residences were randomly scattered throughout the county.

The areas of highest rural farm populations in Decatur County were consistently located in regions which contained the Bridgeport-McCook soil association. This soil type is located in the valleys or "lowlands" of the county (Figure 6). The Bridgeport-McCook association is well drained, has a noncalcareous surface layer and a low aspect. Water availability also contributed to the desirability of these areas for settlement. Therefore, the environmental elements of soil and water were important components for

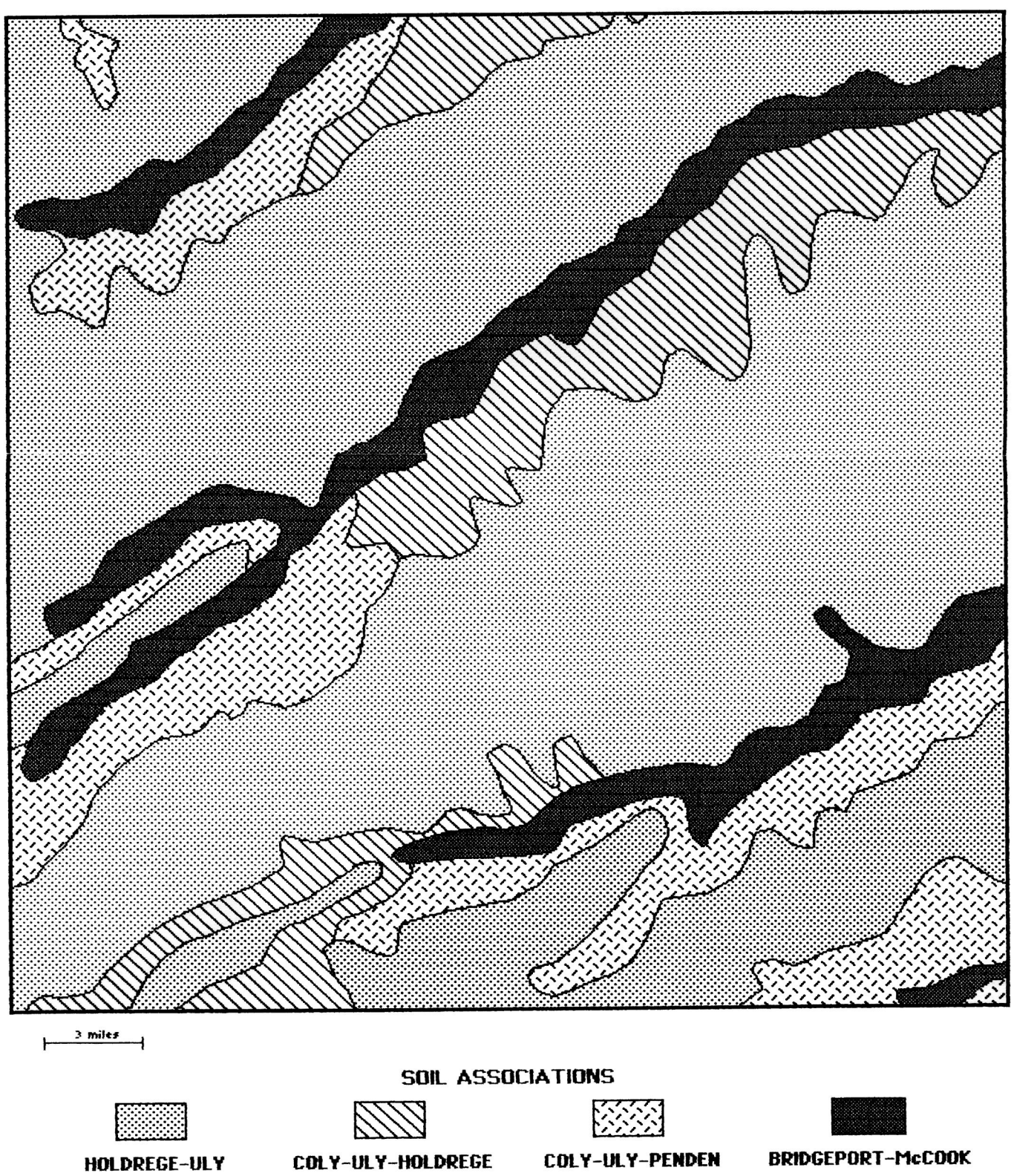


Figure 6. General soil associations of Decatur County, Kansas. Source: U.S. Dept. of Agriculture, 1986.

determining farm sites and, ultimately, they determined settlement density. Carl Sauer (1968) found similar conditions in the Ozarks. Various soil groups and their characteristics affected, not only land values, but settlement patterns.

In contrast to the more heavily settled areas, some regions of Decatur County were sparsely settled in 1905. These regions can be characterized as "upland" areas. The least settled areas of Decatur County were located in narrow bands south of the three major creeks and north of the North Fork of the Solomon River. These regions contain the Coly-Holdrege and Uly-Coly-Penden soil associations. Characteristics of these soils are their calcareous nature, slopes of up to 30 percent and are occassionally located in rock outcroppings. Another "upland" soil group, which is found in the interfluval areas, is the Holdrege-Uly association. This soil is located on gentler slopes, ranging from 1 to 3 percent, than either the Coly-Uly-Holdrege or Uly-Coly-Penden soils (U.S. Dept. of Agriculture 1986). In contrast to the Bridgeport-McCook soil associations, the Coly-Uly-Holdrege and Uly-Coly-Penden soils offer conditions which are less desirable for cultivation and are generally used as rangeland. Typically, livestock grazing requires more acreage than does cultivated agriculture for comparable incomes thus, the density of settlement in these areas is lower. However, the

characteristics of the Holdrege-Uly soils, which are found on the interfluves, allow for cultivation. The interfluves, while not as heavily settled as the valleys, are more densely settled than the other "upland" areas adjacent to the valleys. The primary reason is their relatively low gradient which facilitates cultivation.

The Settlement Pattern of 1920

Between 1905 and 1920 the number of rural residences decreased by sixty-seven to 1,427. As a result, the density of rural settlement also declined (to 1.58 rural residences per square mile).

In 1920 the areas which showed the highest frequency of rural farm residences were again, located primarily in the valleys of the major river and creeks (Figure 7). The Beaver Valley continued to have a high frequency of rural residences. As in previous years, this was especially true near the unincorporated towns of Traer and Cedar Bluffs. Second, areas within Sappa Valley had an especially high frequency of rural farm residences particularly near Oberlin. Overall, higher frequencies extended down the Sappa Valley to the Lyle community in the northeastern corner of the county. The Prairie Dog Valley also showed a similar pattern to the one in 1905, with the majority of higher frequencies

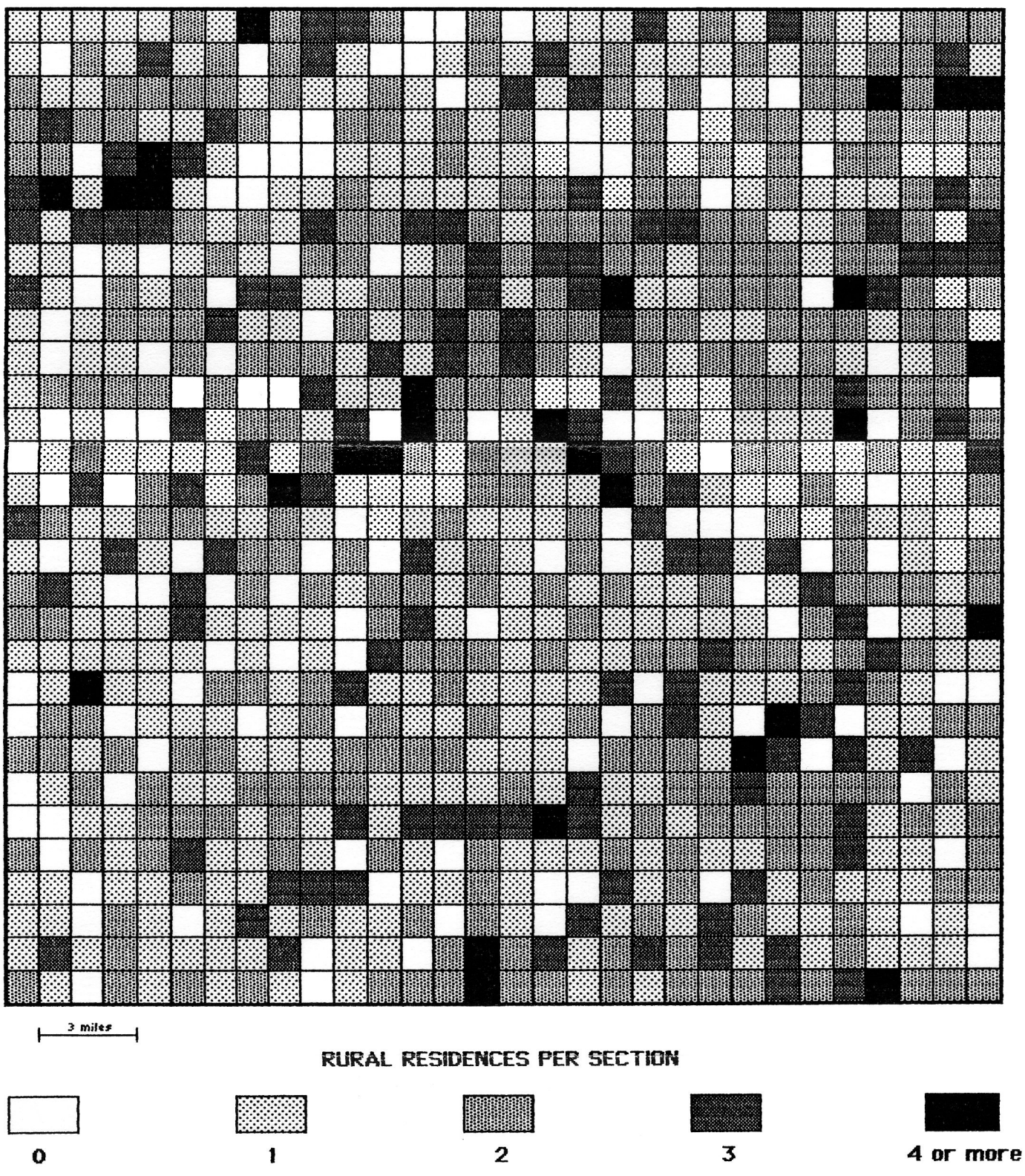


Figure 7. The settlement pattern of 1920. Source: Ogle, 1920.

near Dresden, Jennings and Clayton. Also, areas adjacent to Kanona, Allison and Leoville, none of which was incorporated, had higher than usual numbers of rural farm residences. Additionally, higher frequencies were found near Norcatur. These areas represented nearly all of the highest frequencies of rural residences, with at least four rural residences per square mile, however; a few localities with at least four residences per section were scattered throughout the county.

As in 1905, few sections of the county were without residences. Terrain, related soil associations, and other factors, were again major determinants of settlement patterns. Areas adjacently south of Beaver Creek, Sappa Creek, Prairie Dog Creek and north of the North Fork of the Solomon River again, had the fewest residences. Also, the interfluves of the major streams were less densely settled than the valleys or areas in proximity to the towns.

Change Between 1905 and 1920

As stated earlier, between 1905 and 1920 the number of rural farm residences had declined by sixty-seven (Figure 8). The decline in the number of rural residences (4.47 per year) was reflected by two factors. First, there were periods of drought during

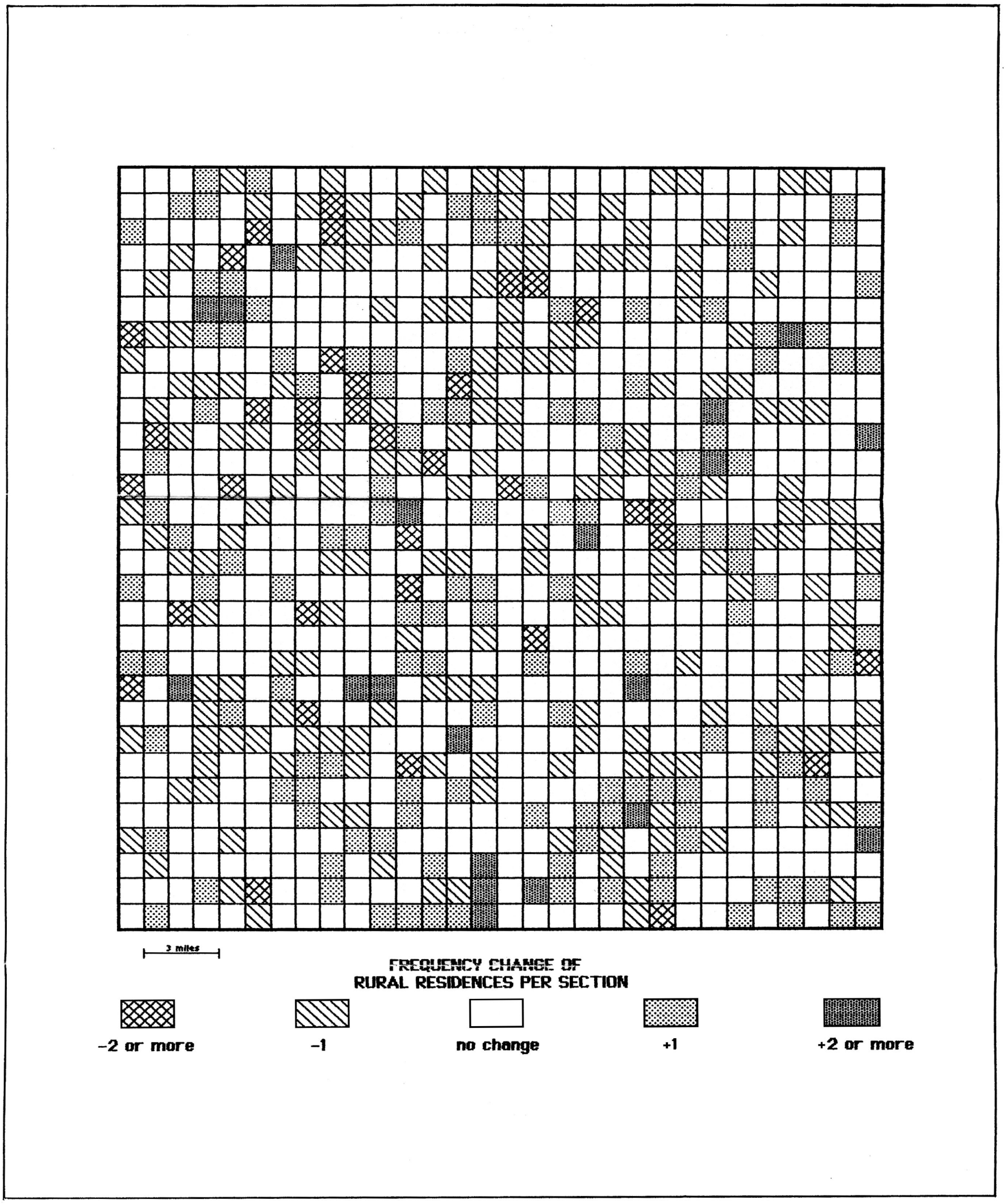


Figure 8. Change of rural residences per section between 1905 and 1920.

the 1910's which may have resulted in some farmers going out of business. Second, during the period of 1905 to 1920, more mechanization was being introduced into agricultural production. This created redundancy in the work force of the agriculture sector. As a result, some people were forced to abandon the land and seek employment elsewhere, especially urban areas.

Figure 8 has shown how areas north and west of Oberlin appear to have suffered losses. However, the greatest concentration of losses seems to have occurred just northwest of Oberlin. In general, no area of the county, during this period, seems to have escaped the loss of rural farm residences.

The figure also shows areas which actually gained rural farm residences. The areas of greatest gain were adjacent to the incorporated towns of Oberlin and Norcatur, and the unincorporated towns of Traer and Leoville. Leoville experienced the greatest increase. Leoville was not platted until 1920, thus, the increase in residences reflects its later development.

The southern half of the county seemed to experience more gain of rural residences than the northern half. One reason may have been the later settlement of the southern part of the county especially, near Leoville.

The more stable areas of the county were not located in regions near the valleys or towns. Instead,

they seem to have been located in the interfluve areas and rougher lands ("uplands") adjacent to the valleys. Most of these areas were not as heavily settled initially. They probably would not attract anyone at a later date since they were not highly productive areas (the county's population was also declining).

This pattern of change may have resulted from several factors. First, sod houses were being replaced by more permanent frame structures during this time. In some instances, new frame houses were built by families on adjacent land they owned. Thus, some areas showed abandonment while adjacent areas showed gains of rural residences.

Second, existing homes were sometimes moved to new sites. This may not have been pervasive throughout the county, however; it may explain how some sections either gained or lost rural residences. Decatur County cites accounts of house moving which took place there during this time period.

Change may have resulted because certain areas were oversettled (in terms of economic carrying capacity), such as northeast of Oberlin in the Sappa Valley. Since this area was more heavily settled at the turn of the century, farms there may not have had enough good land to be economically viable during difficult times. As poor economic conditions, drought, or floods in low lying areas pervaded the region, some

farmers may have been forced out of business. In contrast, areas in the southern part of the county which had not been as heavily settled may have been able to support more farmers and, thus, experienced the addition of more rural residences. Finally, the perception of economic opportunity in Oberlin, which provided an alternative to farming, may have siphoned off some of the rural population in its proximity. In sum, there may have been a myriad of conditions which caused changes in the distribution of the rural farm population during this time interval.

The Settlement Pattern of 1940

By 1940 Decatur County had 1,242 rural farm residences, a loss of 185 from 1920 (Figure 9). The trend of population loss throughout the county manifested itself, not only in a lower population, but fewer rural residences. The result was a decline in the density of rural farm residences to 1.38 per square mile.

As Figure 9 has shown, the greatest concentrations of rural residences are, again, near Oberlin and Jennings. The unincorporated areas of: Cedar Bluffs, Traer, Kanona and Leoville were also more heavily settled. Notice the lack of heavily settled areas adjacent to Norcatur (see Figure 1 for town locations).

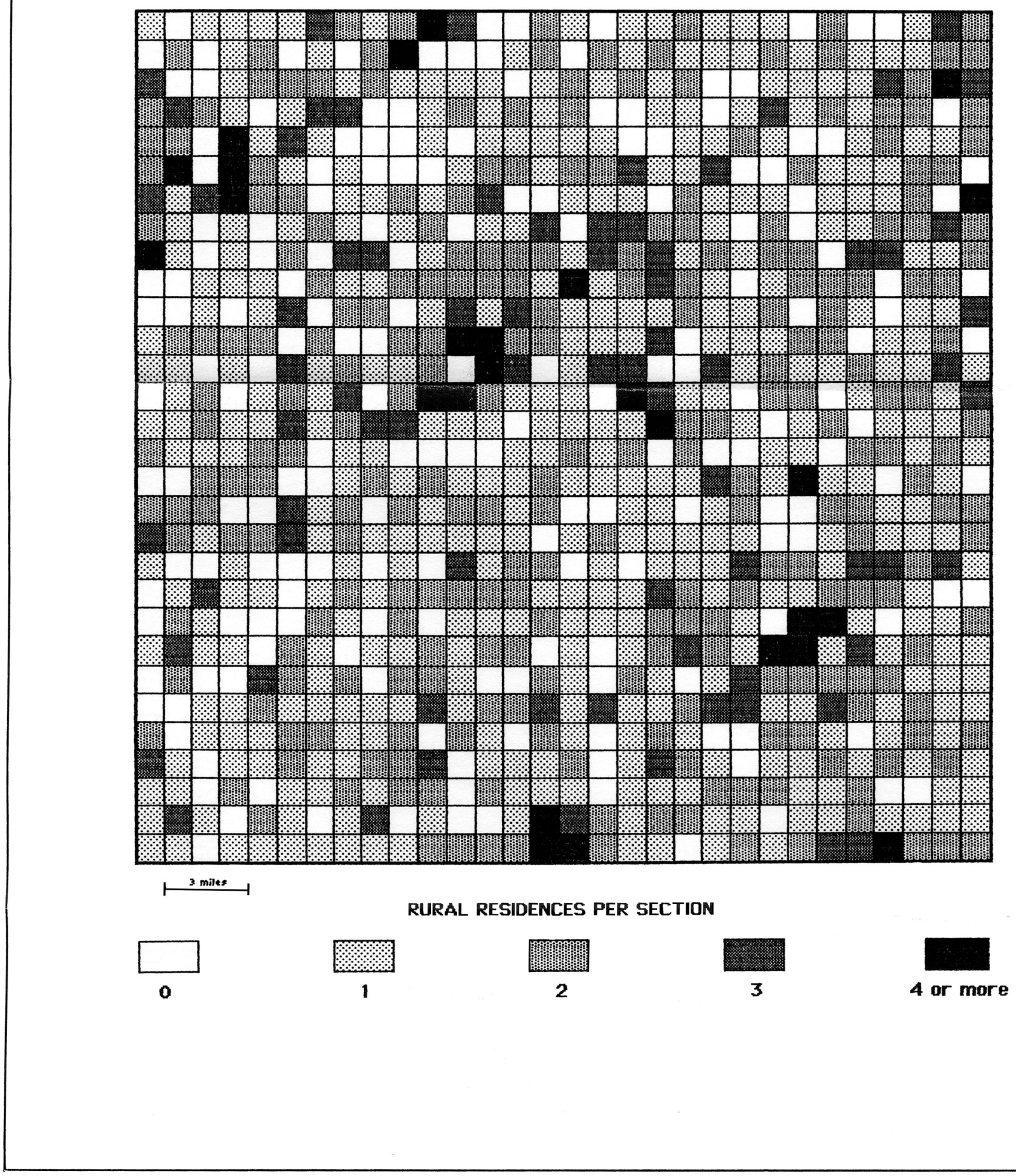


Figure 9. The settlement pattern of 1940. Source: Kansas Dept. of Transportation, 1940.

A possible explanation may be derived from its location. Norcatur is not located in or near any of the valleys and their associated environmental advantages. These areas had been more densely settled in former times. Thus, Norcatur may not have had the locational advantage which Oberlin enjoyed to support a larger rural farm population.

As expected, the same pattern of sparse settlement was found on "upland" regions near the valleys. The interfluves are also less inhabited than valley regions or areas adjacent to the incorporated towns. Overall, as in previous years, very few square miles of the county did not have at least one rural residence.

Change Between 1920 and 1940

The number of rural residences declined between 1920 and 1940. The rate of loss increased over the previous interval to 9.25 rural residences per year. This was nearly twice the rate of the 1905 through 1920 interval. The rate of decrease was greatest between 1930 and 1940. As Table 1 has shown, the county experienced a population decrease of 16.2 percent during the 1930's after a modest increase of 9.2 percent during the 1920's.

Figure 10 shows the change in the number of rural residences in Decatur County for the period of 1920

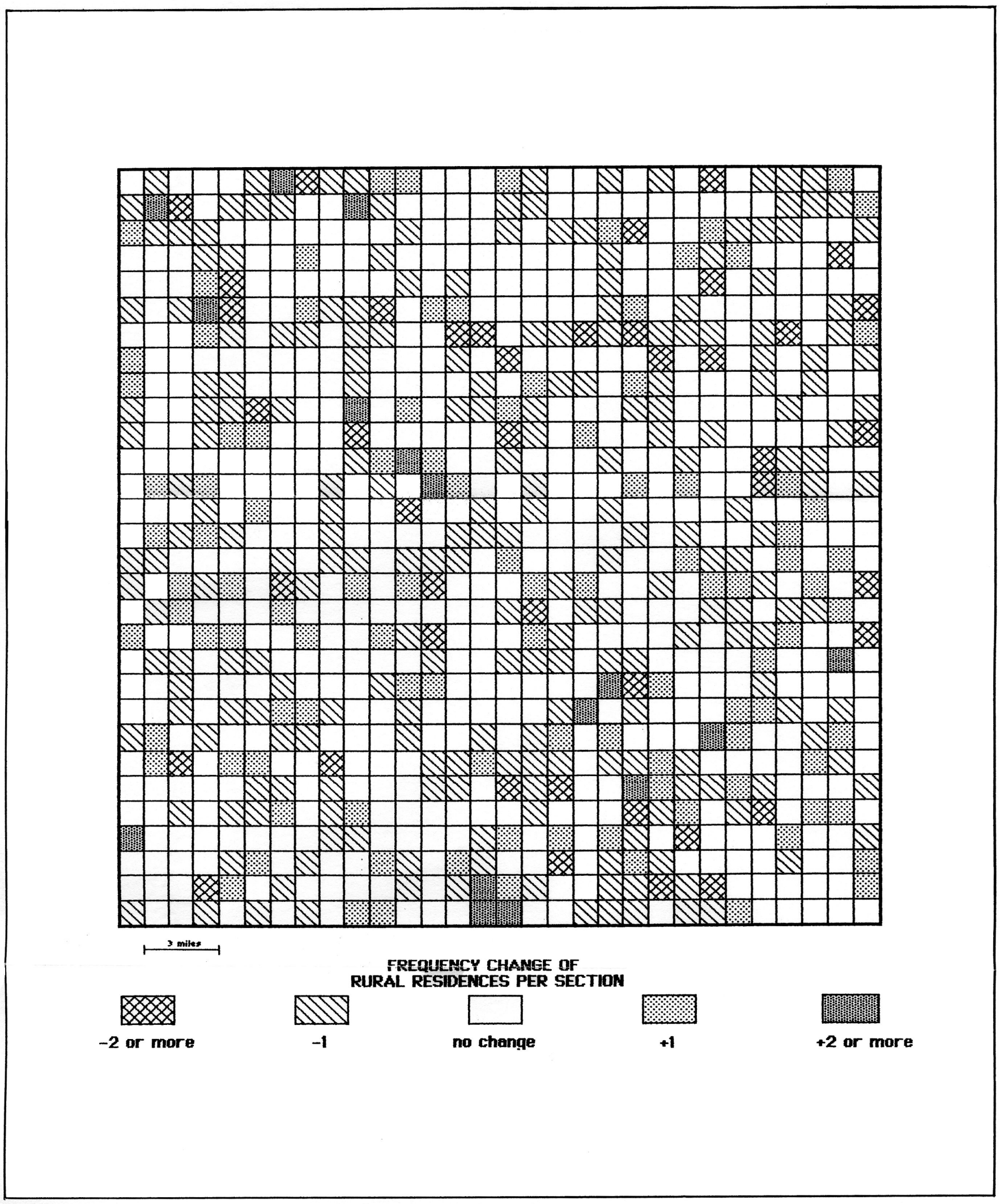


Figure 10. Change of rural residences per section between 1920 and 1940.

through 1940. Concentrated areas of decline were found in the northeast portion of the county and areas south of Jennings and Dresden. This pattern may be explained again, as a result of higher farm densities than the land could support, thus, resulting in population losses.

The figure also shows concentrated areas in the county which realized gains in the number of rural residences. These areas were scattered throughout most of the county. First, surrounding areas of two of the incorporated towns, Oberlin and Jennings, experienced increases of rural residences. The unincorporated town of Leoville also experienced an increase in some of its adjacent sections. The areas surrounding Traer and Cedar Bluffs encountered both gains and losses in the number of rural residences.

As in previous years, the areas which showed the most stability were the regions which were sparsely settled, such as those in "upland" areas adjacent to the valleys. Most sections which did not have a residence in 1920 did not have one in 1940. Since the population had declined during those years, it was unlikely regions would be resettled which resulted in many square miles having no change.

Changes in the pattern of rural residences from 1920 through 1940 resulted from some of the same reasons previously stated. Poor economic conditions of

the 1930's coupled with drought, most certainly caused many farmers to discontinue farming. Even government action which created the Commodity Credit Corporation in 1933 could not stop the tide of farm failures (Benedict 1966,332). However, the frequency of rural residences in some sections was sometimes affected by the movement of people over short distances and not necessarily their emigration from Decatur County. In many instances the more successful farmers could purchase defunct farms by paying the back taxes. In some cases, if a recently acquired farmstead was in better condition than the one currently occupied, some farmers may have elected to reside at the new location.

The Settlement Pattern of 1967

The number of rural residences continued to decline in the ensuing years. By 1967 only 766 rural residences were enumerated (Figure 11). The density of rural residences also declined to .85 per square mile. This is slightly more than half the density of 1905 (1.58 residences per square mile).

Areas of greatest rural residential density were more clustered in 1967 than in the past. As a result of the decline in numbers of rural farm residences since 1940, the patterns of settlement were also more definitive. Areas of greatest concentration of rural

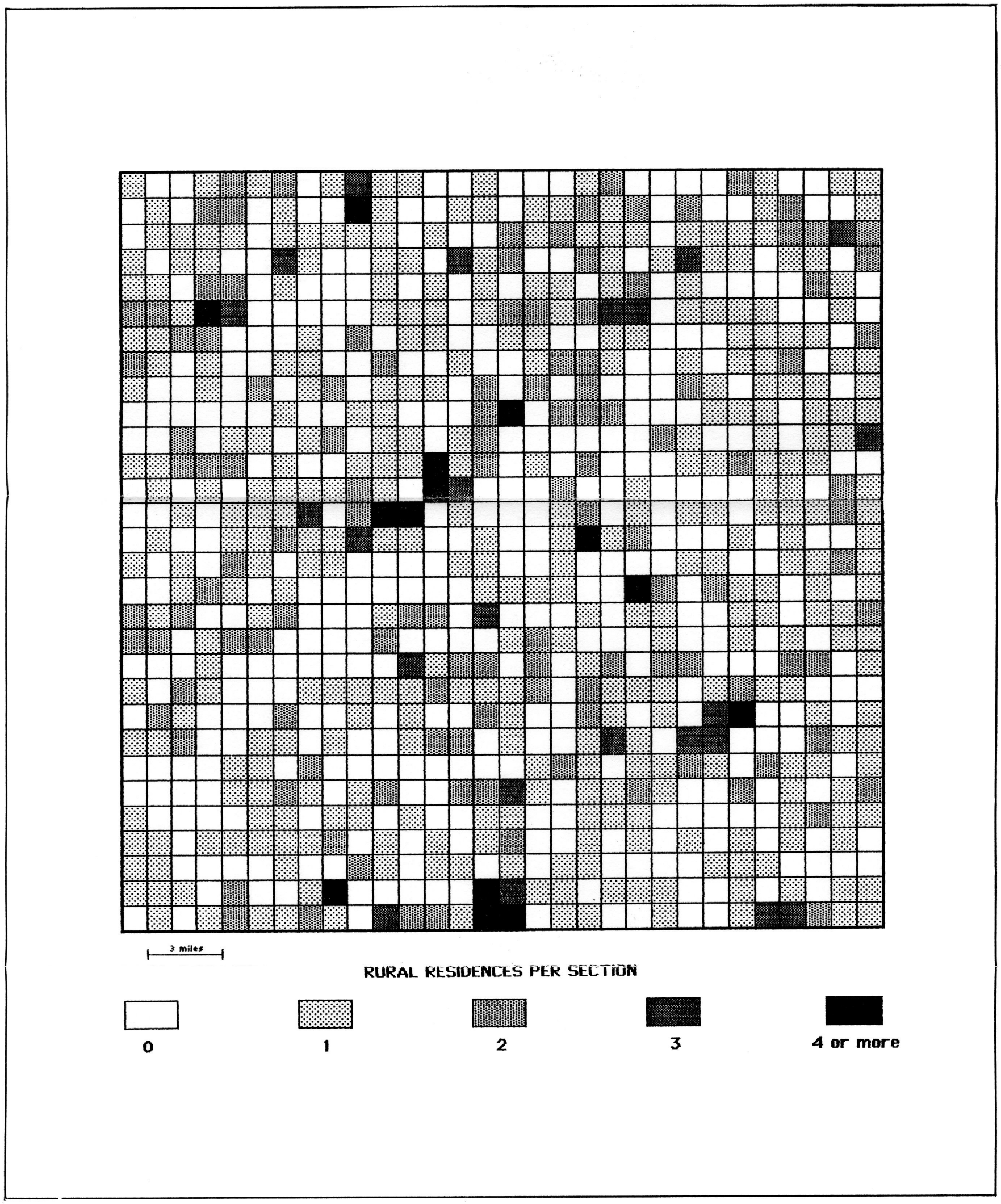


Figure 11. The settlement pattern of 1967. Source: Kansas Dept. of Transportation, 1967.

residences were located in adjacent areas of Oberlin and Jennings. The unincorporated areas of: Leoville, Cedar Bluffs, Traer and Kanona also had higher concentrations. Again, the valley areas seemed to contain more rural residences than were contained in either the interfluves or the rougher lands adjacent to the valleys.

Because of the large number of rural residences abandoned between 1940 and 1967, many areas of Decatur County became void of people. The relatively uninhabited "upland" regions, especially, those adjacent to the valleys became better defined. Also, the interfluves showed more sections which contained no rural residences. Even so, some areas of the interfluves had relatively high concentrations of rural residences such as the region between Dresden and Oberlin. A possible explanation is this region may contain either more fertile soils or the land has a lower gradient than surrounding areas. In either case, fertility or gradient, the land may have been more productive, thus, allowing the farming enterprises there to maintain economic viability.

Change Between 1940 and 1967

During no other period of the study did the number of rural residences decline as much as they did between

the years 1940 and 1967 (the 1940 figure of 1,242 declined to 766 in 1967). The rate of decline at this time was 17.63 rural residences per year. This compares to 4.47 from 1905 to 1920 and 9.25 from 1920 to 1940.

Figure 12 shows the pattern of change for the period. It indicates locations which lost rural residences. This is especially true in areas adjacent to Oberlin. Pull factors originating in central places tend to attract people (Clawson 1966, 500). Economic opportunity along with goods and services provided there are the main impetuses in attracting increasing numbers of people. However, the population losses were so great in Decatur County during the period from 1940 to 1967, even the goods and services provided by the towns did not attract development adjacent to them.

Another locality which experienced high losses was south of Jennings. A possible explanation is this region was still losing population as a result of abnormally high residential gains it experienced between 1905 and 1920. The number of rural residences continued to decline in most areas of the county.

Even though much of Decatur County was losing rural residences, a few showed marginal gains. These areas were again scattered throughout the county. However, the unincorporated towns of Leoville and Traer seemed to have experienced the most gain, albeit small. Areas gaining residences may have been in response to

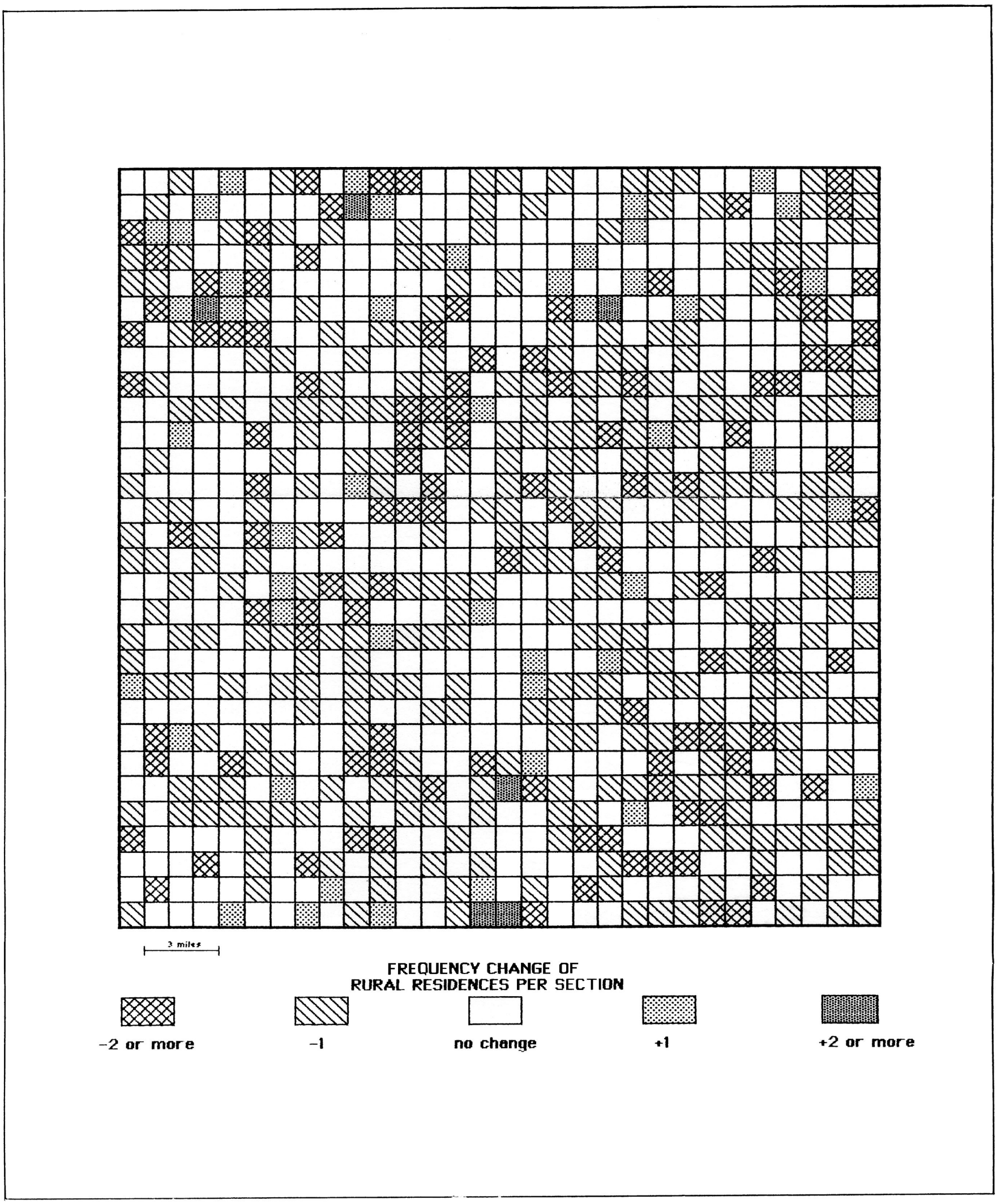


Figure 12. Change of rural residences per section between 1940 and 1967.

people retiring from farming who either sold their farms or rented them out. As a result, these farmers and their families may have desired to continue living in the same community in which they had previously. Thus, some retired farmers and those who took over their farming operations, either built new homes or reoccupied former residences. As a result, some sections experienced gains while others experienced losses. Therefore, the pattern of change in an area may be misleading because it could simply reflect the movement of people from one locality to another.

There were many square miles which did not change. Many of these areas contained no rural residences, especially those located in rougher terrain. This can be explained because the rougher areas were less desirable for cultivation but more desirable for grazing, which is land extensive. In other regions of the county, such as the interfluves, the pattern of no change could be explained by the relative stability of some farming operations which either by design or accident, had managed to remain in business. Finally, since the county was experiencing continual population decline, it was not likely most areas would experience a gain in occupancy.

Many changes in the pattern of rural farm residences, during this period, resulted from factors induced by public policy which facilitated access to

capital. As previously stated, the industrialization of agriculture continued. In fact, during the post WWII era, the rate of agricultural industrialization was similar to, if not greater than, the industrialization rate of the U.S. economy as a whole. By this time, human and animal power were almost completely replaced by increasingly larger and more efficient machinery. As a result, labor provided by the farm population was becoming increasingly redundant; it was being supplanted by capital (Cochrane and Ryan 1981, 5). Capitalization for agriculture was made more accessible by such entities as the Commodity Credit Corporation and local banks (Cochrane and Ryan 1981, 23). Therefore, easier access to capital was probably the single most important factor contributing to rural depopulation during this time.

Public policy such as the Agricultural Act of 1956 not only affected crop production and land use, but rural population. Within this legislation was the provision for the "Soil Bank" which paid farmers "rent" to idle land (Cochrane and Ryan 1981, 147). If sufficient income could be derived from government payments, a farmer may have elected to relinquish farming altogether.

Nature may have also played a role in the evolution of rural settlement patterns in Decatur County. As Figure 2 has shown, the 1950's were

unusually dry, surpassed only by the 1930's in terms of duration and intensity. The impacts of drought also may have been manifested by the greatly reduced number of rural residences during this time.

The Settlement Pattern of 1986

Since the initial year of the study, the number of rural residences continued to decline. In 1986, there were only 631 occupied rural residences in Decatur County in contrast to the 1967 value of 766 (a loss of 135). This represented a density value of .70 residences per square mile. Thus, the density of rural residences declined along with the overall population (which by 1980 had dropped to 4,509).

Figure 13 shows the pattern of rural residences in Decatur County for 1986. By far, the greatest number of rural residences were located adjacent to Oberlin. Lesser areas, but still significant, were again found in the hamlets of Leoville, Traer and Cedar Bluffs. With the exception of the central places, generally, the highest densities of rural residences were found in the valleys. This pattern existed throughout the study period. A less significant pattern of rural residences also seemed to exist near the highways throughout the county. This is especially true in proximity to Oberlin.

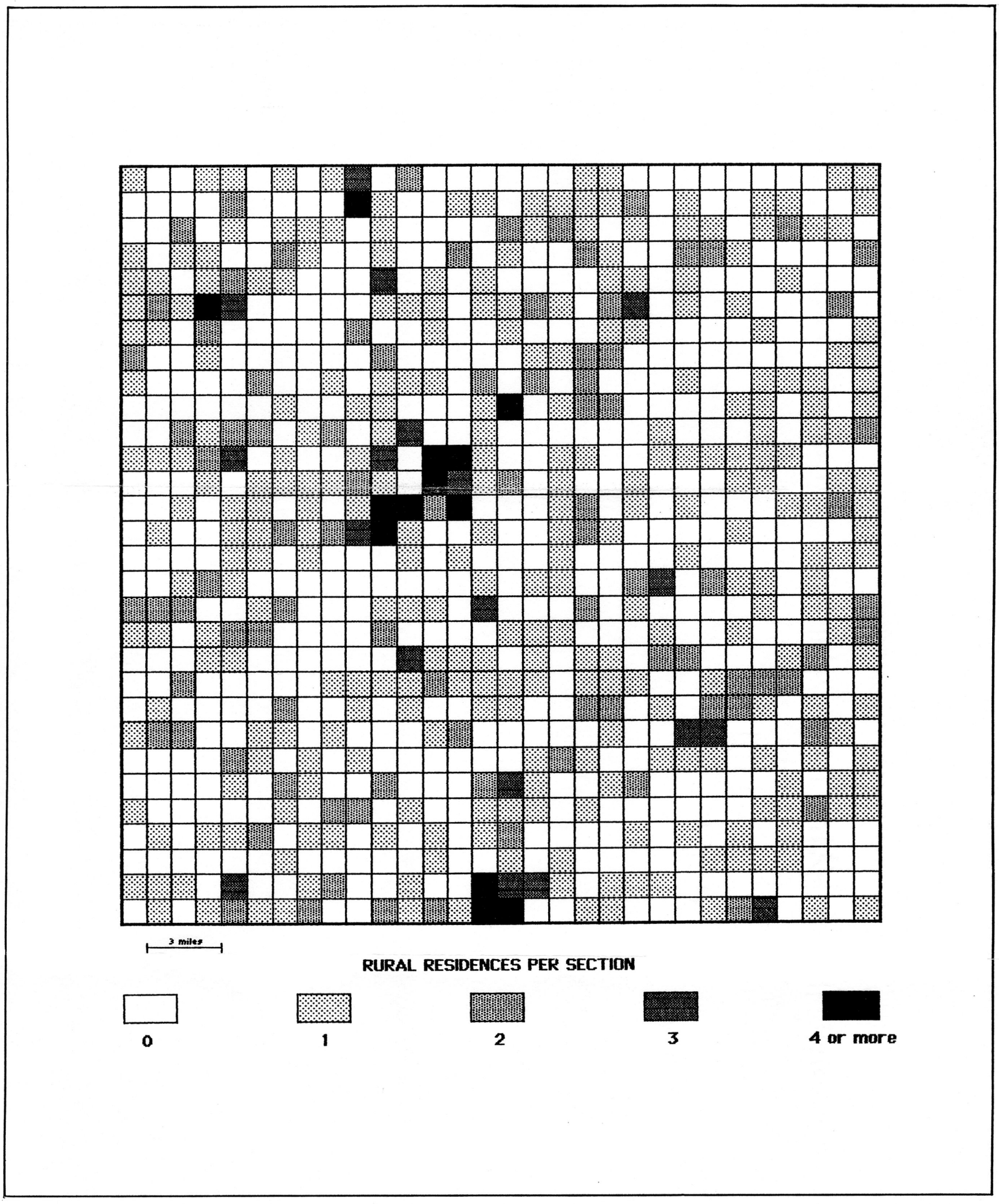


Figure 13. The settlement pattern of 1986. Source: Kansas Dept. of Transportation, 1986.

The least settled areas of Decatur County were still those which had existed previously, especially, the upland areas adjacent to the valleys. The interfluves also incorporated many sections which were uninhabited. By this time, the majority of sections which contained rural residences had only one; fewer still contained two.

Change Between 1967 and 1986

From 1967 to 1986 the number of rural farm residences continued to decline. By 1986, rural residences numbered 631 which was a reduction of 135 since 1967. The rate of decline slowed to 7.Ø5 residences per year compared to 17.69 between 194Ø and 1967. Therefore, the rate of change diminished from the previous time interval.

As mentioned earlier, the number of rural residences in Decatur County continued to decline. Figure 14 shows this pattern. No single area of the county dominated the pattern of loss.

Figure 14 also shows areas in Decatur County which gained rural farm residences. The areas which experienced the greatest gain were near Oberlin. Also, some sections along the major highways gained residences. The remainder of the sections which gained residences were randomly scattered throughout the

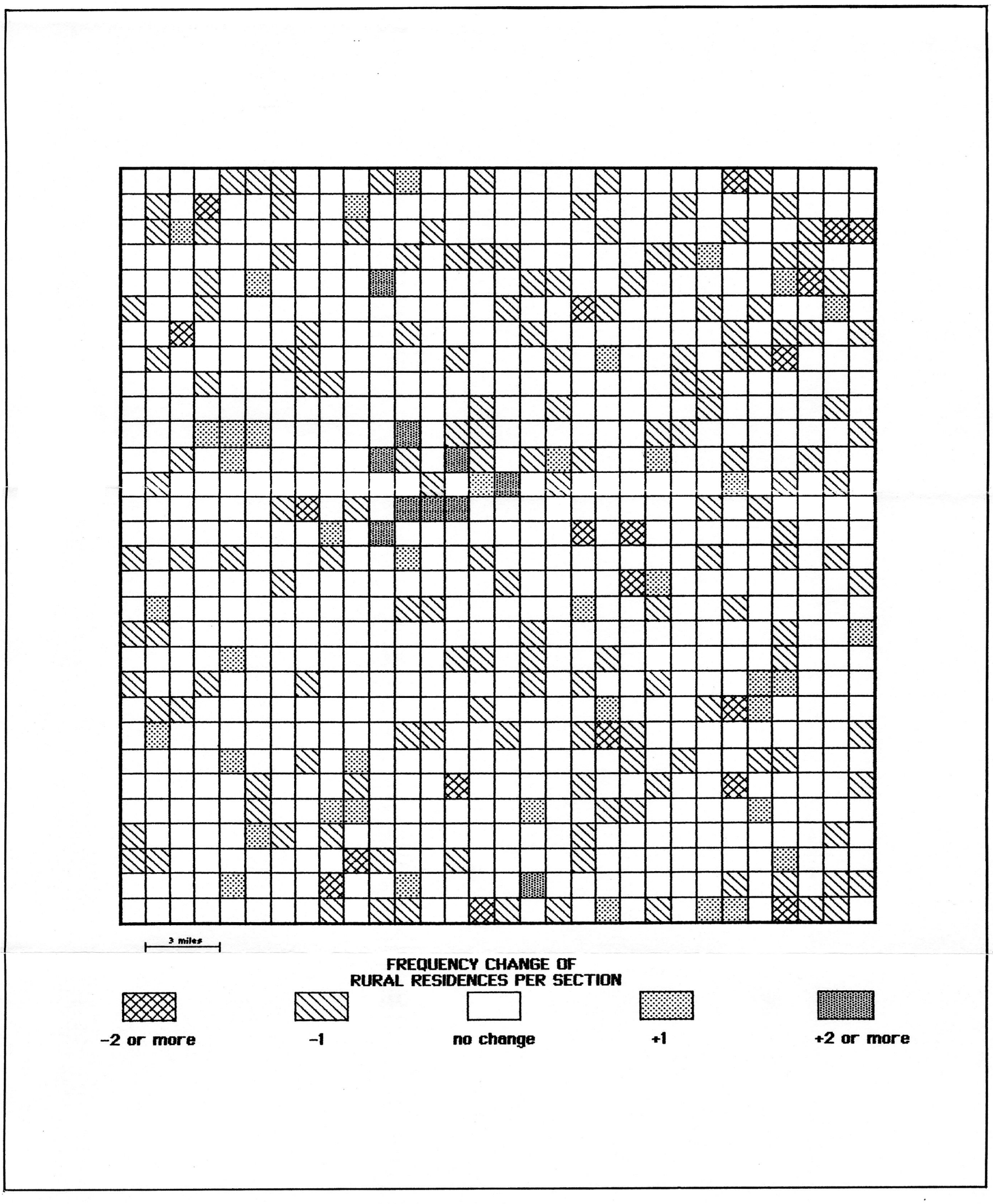


Figure 14. Change of rural residences per section between 1967 and 1986.

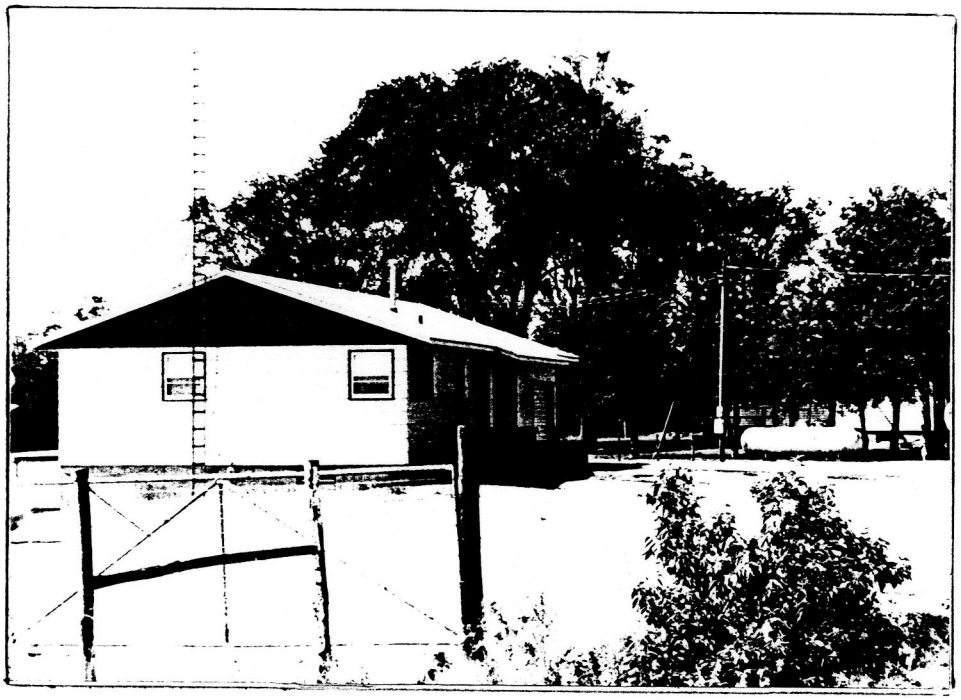
county.

The sections which showed no change were quite numerous throughout the county. No particular clustering existed which might reveal a pattern. The numerous areas which had not shown change, again, resulted from many sections in the county being continually uninhabited throughout the study period.

Changes in the pattern of rural farm residences, in Decatur County during this time interval, were also influenced by those factors previously mentioned such as, the substitution of labor with capital and additional public policy regarding agriculture. One legislative act, the Payment-in-Kind Program or PIK program of 1983, affected not only farm income but land use (Congressional Quarterly 1984, 15). In addition to idling land, this program elevated farm income which probably helped sustain some farmers at least for the short term. Thus, during the period of PIK and shortly afterward many farmers benefitted financially. However, the PIK program's effects were relatively short lived because the 1980's farm recession, which was a deflationary cycle, caused many farmers to relinquish their livelihoods from agriculture.

The pattern of change during this time revealed more rural residences located near Oberlin and along the major highways (Photographs 5 and 6). The importance of better transportation in attracting

Photograph 5. An example of a new rural residence. This home is located east of Jennings, Kansas along Highway 383.



Photograph 6. This home was built adjacent to an older residence. It is located 6 miles west of Oberlin, Kansas approximately .5 miles north of Highway 36.

people either to the towns or enticing them to build homes near better roads, cannot be overlooked. The major highways were paved beginning in 1940. U.S. Highway 36 was paved from Oberlin eastward in 1940 and 1941, and westward from Oberlin in 1954. The remaining highways were paved in the following years: U.S. Highway 83, 1953; U.S Highway 383, 1960; State Highway 123, 1951; State Highway 223, 1960; and State Highway 9, 1955 (McDivitt 1989). Since highways make goods and services offered by central places more accessible, they most certainly attract development, which seemed to be the case in Decatur County. The greatest number of rural residences built near Oberlin or near the major highways has occurred since World War II, especially during the period of 1967 to 1986.

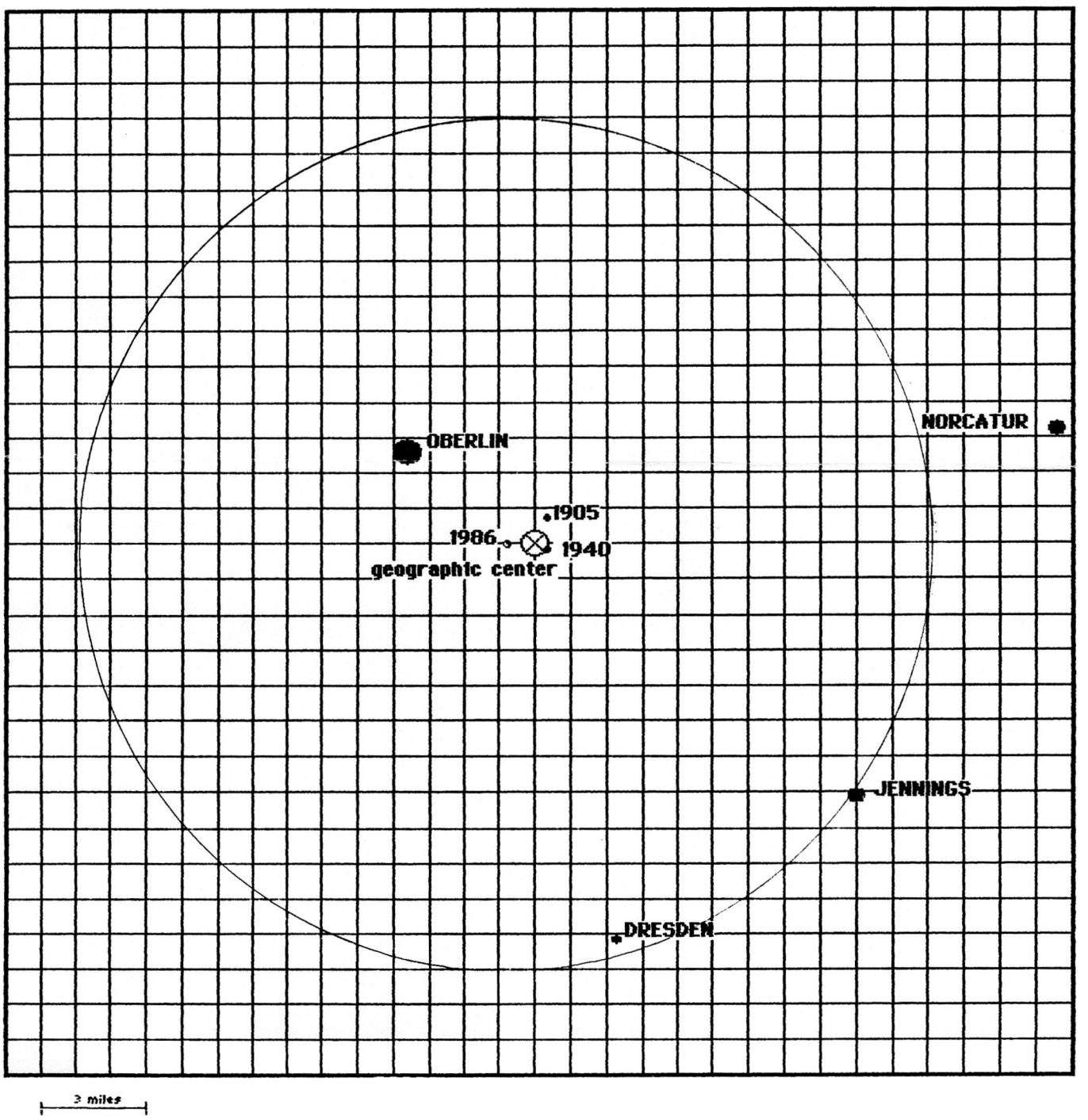
To some degree, there has been an "urbanization" process in which the lure of central places such as, Oberlin and the access provided by hard-surfaced roads attracted limited development. This was also evident by changes in the rural farm and rural non-farm populations shown in Figure 3. The relationship between the rural farm and rural non-farm populations indicated more people were moving into the towns and abandoning the more rural areas. In contrast, those areas which were located far from the incorporated towns and highways generally trended toward fewer rural residences. These findings are consistent with the

opinion of Marion Clawson. Clawson thought when considering costs and services provided by central places, farmstead relocation near them was a sensible alternative to residing at great distances from central places (Clawson 1966, 500).

The Mean Center and Standard Distance

As outlined in the methodology, finding the mean center of rural residences of Decatur County is a modus operandi which, essentially, summarizes their distribution. One utility of finding the mean center is its ability to track the historical movement of the population. In conjunction with the mean center, the standard distance valve shows the areal dispersion of the residences. These two procedures analyzed the central tendency and dispersion of the rural residences for Decatur County during the years 1905, 1940 and 1986.

The mean center was calculated for each of the three years (Figure 15). In 1905, the mean center of rural residences in Decatur County was located approximately three-fourths of a mile north-northeast of the geographic center of the county. Since Decatur County is thirty miles by thirty miles square, finding the geographic center was not difficult. Thus, the mean center which tended slightly east and north of the



STANDARD DISTANCE VALYES

1905: 12.00 miles **1940: 12.189 miles** **1986: 11.99 miles**

Figure 15 The mean center and standard distance valves for 1905, 1940 and 1986.

geographic center, reflected two conditions. First, the relatively dense settlement of the Sappa Valley, at this time, tended to skew the mean center northward. Second, Oberlin had few rural residences adjacent to it and therefore, did not influence the distribution greatly. An important point is that the mean center of rural residences was near the geographic center of the county. This was caused by two factors. First, areas near the geographical center of the county more heavily settled. Second, the more heavily settled areas of the southeast and northwest sections of the county were nearly equidistant from the geographic center of the county. Therefore, their net effect on the location of the mean center was negligible. These conditions caused the mean center of rural residences and the geographic center to nearly coincide.

By 1940, the mean center moved slightly more than one mile south from its 1905 position. This placed it approximately one-third of a mile southeast of the geographic center of the county. This movement was caused, primarily, by losses of rural residences northeast of Oberlin in the Sappa Valley, and the addition of residences associated with the development of Leoville.

The mean center of rural residences migrated approximately one mile westward by 1986. This position was nearly 3/4 of a mile due west of the geographic

center of the county. The migration of the mean center reflected the growing number of rural residences adjacent to Oberlin and decreased numbers in other parts of the county. Again, the mean center is less than one mile from the geographic center of the county.

Estimated standard distances also revealed patterns of distribution. As defined in the methodology, the estimated standard distance valve is the radius of a circle which encompasses 68 percent of the observations and is analogous to the standard deviation. The estimated standard distance for 1905 was 12.00 miles; for 1940, 12.189 miles; and for 1986, 11.99 miles. These values, like the mean center, varied little; probably because the change in the distribution of the rural residences, for the county as a whole, was fairly uniform. Moreover, the nearly constant estimated standard distance valve reflects the uniformity of rural residential (population) loss throughout the study period. Notice the 1986 value of 11.99 was the smallest of the three sample years. This smaller value represented a less disperse pattern for that year in comparison to the other two sample years. The slight decrease in the estimated standard distance valve may reflect the clustering of residences near Oberlin and the general decrease elsewhere in Decatur County.

The mean center and estimated standard distance valve measured the centrality and dispersion of the

rural residences of Decatur County. Even though changes were slight during each of the three sample years, the results provided information to make inferences regarding change. For example, losses of residences northeast of Oberlin or the addition of rural residences in Leoville caused both the mean center and the estimated standard distance valve to vary, although only slightly.

Conclusion

In conclusion, the intent of this chapter was to show the spatial arrangement of the rural residences of Decatur County and changes in their density and distribution for selected years. Initially, the rural areas had much greater densities than in later years, although, not as dense as commonly believed. Public policy and climatic conditions have contributed to changes in the density and distribution of rural residences over the years, as population continued to decline.

Changes in the rural settlement pattern have occurred in specific areas of the county such as, northeast of Oberlin in the Sappa Valley, and those sections adjacent to Oberlin. Overall, most of the county has suffered substantial losses of rural residences throughout the time span. However, adjacent

areas to Oberlin seem to have faired the best in attracting rural residences.

Finally, as a result of relatively uniform changes in the spatial arrangement of the rural residences, their mean center has varied little. The mean centers were also in proximity to the geographic center of the county. These uniform changes in the settlement pattern are also reflected by minor changes in the values of the estimated standard distance valves which described the dispersion of the rural residences.

Chapter V

Summary and Conclusions

Summary

Since the beginning of the 20th Century technological and social change have had far reaching impacts on the landscape. Decatur County, like many rural areas, has been affected by these events. Farming operations are larger in terms of areal extent and the rural farm population has declined dramatically. This fact is evident by omnipresent dilapidated buildings and abandoned roads.

The purpose of this thesis was to determine the historical spatial distribution of the rural farm population of Decatur County, Kansas. It was hypothesized that change in the distribution of the rural farm population varied over time and space. Certain environmental conditions such as soil types and climatic fluctuations, along with various public policy issues, have been determinants in the evolution of the landscape.

The analysis was based on data gathered from cadastral and highway maps of the county for the years: 1905, 1920, 1940, 1967 and 1986. Rural residences were enumerated for each of the study years. These data were

mapped showing both the distribution of rural residences for each of the study years and changes in the pattern for each of the four time intervals: 1905-1920, 1920-1940, 1940-1967 and 1967-1986. The central tendency and dispersion of rural residences was analyzed by finding their mean center and calculating an estimated standard distance valve for the years 1905, 1940 and 1986. These methodologies allowed, to some degree, a reconstruction of the historic landscape.

The initial year of the study, 1905, contained the greatest number of rural residences. Areas of greatest density occurred in the valley areas; particularly; northeast of Oberlin while areas of lowest density occurred in upland areas adjacent to the valleys.

The pattern of settlement in 1920 was somewhat similar to the one of 1905. However, the more heavily settled areas northeast of Oberlin had decreased in numbers; although, they still had rather high densities in comparison to other regions of the county. Lowest density areas of settlement were again in adjacent upland areas south of the Beaver, Sappa and Prairie Dog creeks and north of the North Fork of the Solomon River.

Change in the number of rural residences from 1905 to 1920 was relatively small. However, sections which gained residences were more numerous in southern

Decatur County, principally, near Leoville, while areas in northern Decatur County generally, lost more residences than they had gained. The region of greatest decline occurred primarily to the west and north of Oberlin.

The pattern of settlement by 1940 revealed again, the number of rural residences was greatest near the incorporated areas of Oberlin and Jennings, and the unincorporated hamlets of Leoville, Cedar Bluffs and Traer. Regions of the county which contained the fewest rural residences were, again, upland areas near the valleys.

The pattern of frequency change between 1920 and 1940 was mixed over the county. However, areas near the county's central places seemed to attract development of rural residences. Sections which lost rural residences showed little clustering and were found throughout the county.

The number of rural residences declined dramatically by 1967. The pattern of heavier concentrations of rural residences near central places continued, as did patterns of lower frequencies in areas of rougher terrain near the valleys.

Change between 1940 and 1967 was the most dramatic of the entire study period. The county lost 476 rural residences during this time which represented a declining rate of 17.63 rural residences per year.

The pattern of settlement was well defined in 1986. Valley areas, especially those near central places were more heavily settled. Upland areas were generally less settled, with the least densities located in the rougher terrain near the valleys.

The area which showed the greatest increase in the number of rural dwellings between 1967 and 1986 was in proximity to Oberlin. Another secondary pattern emerged near the major highways. These areas of increased rural residences were overshadowed by the considerable losses which occurred during this time interval. Between 1967 and 1986 the number of dwellings decreased by 135 which again, reflects the overall population loss of Decatur County.

The mean center of rural residences, throughout the study period, was located near the geographic center of the county which suggests a rather uniform loss of residences. It may also suggest that macro-scale factors such as, monetary policy and farm legislation have been the most responsible for depopulation in Decatur County. However, the mean center moved slightly toward Oberlin by 1986 which reflected this areas' increased rural residential density. At the same time, the estimated standard distance valve showed little change and hovered near 12 miles for each of the three sample years. This again, reflected the uniformity of population loss throughout

the study period. However, the standard distance valve was the smallest in 1986 (11.99 miles) which indicates a slight increase in the clustering of the rural residences. A possible explanation is the increased clustering of rural residences located in proximity to Oberlin.

Conclusions

Since the initial year of the study, 1905, each successive study period contained fewer rural residences. This was in response to the nearly continual depopulation experienced in Decatur County. Change varied, with most areas of the county losing rural residences, while a few areas gained residences particularly, near Oberlin. In general, however, the county experienced widespread rural residential losses throughout the study period.

Various factors for change were given, although, a nexus of conditions have contributed to the nearly continual loss of farms and associated rural residences. Macro-scale factors such as the substitution of labor with capital which has been facilitated by entities such as the Commodity Credit Corporation, banks and other lending institutions have impacted rural residential densities. The nearly uniform mean center and standard distance valves suggest these, and

other external forces caused much of Decatur County's depopulation. The substitution of labor with capital is perhaps the most fundamental cause for the declining number of farms. As long as capital is available to buy increasing amounts of land and larger farm equipment, smaller farms will give way to larger farming enterprises. The redundant farm labor will then be forced to seek livelihoods elsewhere, usually though, not in Decatur County. Therefore, unless policies facilitating increasing farm size slow, it is unlikely the trend of population loss will end anytime soon.

Public policies in conjunction with adverse climatic conditions exacerbated population loss. Droughts of the 1930's and 1950's were especially severe. These droughts, by themselves, did not play a large role in decimating farming operations. Instead, drought coupled with poor economic conditions resulted in the demise of many farms.

In regards to the county's pattern of settlement, several facts have become clear. First, the densities of rural residences experienced in former times were not as great as the commonly held notion of "one farm on every quarter". It is true several areas of Decatur County contained at least four residences per square mile, especially northeast of Oberlin. However, the vast majority of sections contained two or three

residences, with many areas containing zero.

One of the most clearly defined regions of the county was the upland areas adjacent to the valleys. These locales, even at the turn of the century, were relatively unsettled and differed from adjoining areas. This fact can be attributed to higher gradients and poorer soils found in these regions. As time progressed and the county's population decreased, the upland areas contained still fewer rural residences. Thus, the upland areas near the valleys were nearly void of settlement and became increasingly distinct from the bottomlands and interfluves.

In contrast to the unsettled areas of Decatur County, the valley regions were the most densely settled. These areas seemed to retain more farms than adjacent upland areas not only because they were more heavily settled initially, but because of their environmental advantages such as better soil and more available water. These advantages may have been partially responsible for a greater number of farms persisting throughout most of the study period. Because farm size has increased throughout the period, it may be speculated that bottomland farmers expanded their farming operations at the expense of adjacent upland farms.

Other areas of higher rural settlement density include those sections in proximity to Oberlin and

along the major highways. Pull factors created by central places seemed to have influenced locational decisions by some people. Not all people living near Oberlin are directly involved with agriculture, and the bucolic setting provided by the countryside is a pull factor which has also influenced locational decisions. The development of hard-surfaced highways also affected locational decisions people made. Hard-surfaced roads allowed ready access to goods and services provided in central places. Goods and services provided not only by incorporated towns within Decatur County, but surrounding communities as well were more accessible than ever before. Therein lies the attractiveness for locating rural residences near hard-surfaced roads.

During most of the study period a paradox has occurred. While the county has suffered substantial population losses over the years, the proportion of the population living in the four incorporated towns increased from 21.14% in 1910 to 64.31% in 1980. This pattern was caused by quondam farmers moving into the towns seeking jobs or retirement. Thus, the towns became a magnet for the rural farm population. A similar condition was found by Cyr (1981, 95) which showed a decline in the rural farm population and an increase in the urban and non-farm population of Cloud County, Kansas.

Remarks for Future Research

The procedure utilized in this thesis to reconstruct the landscape seems to have been an effective one. However, it is important to mention some of the shortcomings of applying cadastral and state highway maps, which were employed in this study, for enumerating dwellings. First, in the case of Decatur County, early cadastral maps contained the locations of rural residences. In later years, especially those after WWII, the cartographers did not use this practice; instead, they only showed land ownership. Therefore, highway maps which were first constructed in 1940 by the Kansas Department of Transportation were used to enumerate rural residences. Another shortcoming was the symbolization for each map type was different, albeit small. For example, the highway maps showed rural residences which were not necessarily associated with farm units such as, tenant housing. All housing units were enumerated regardless of whether they were associated with a farm unit or not. Cadastral maps made no distinction between tenant housing or farm unit which also includes farm residences.

Determining the number of rural residences was especially problematic using the cadastral maps. Symbolization which showed features such as: land owner names, ownership boundaries, roads and riparian areas

cluttered the maps to the degree it became difficult to discern symbols representing rural residences. In contrast, the state highway maps were easier to read because they had much less symbolization.

The final problem concerned data accuracy. The cadastral and highway maps utilized in this study, sometimes contained errors in both the location and quantity of rural residences. These errors were either caused by inaccurate data collection, or by lag time between data capture and map construction. Fieldwork revealed high levels of accuracy in the most recent sample year. Verification of former sample years is difficult because many of the farmsteads have been completely obliterated. Therefore, much faith must be put into either the maps or eyewitness accounts regarding earlier sample years. Even with these shortcomings, a reasonable picture of rural settlement in Decatur County was reconstructed.

In conclusion, further research into the patterns and processes of rural depopulation has merit. This thesis along with such works as "Jordan Country- A Golden Anniversary" by John A. Alwin and John Cyr's Historical Landscapes of Cloud County, Kansas have dealt, in varying degrees, with rural depopulation. Such analyses will serve to enhance the understanding of how external determinants such as public policy influence the pattern of rural depopulation. Such

information may assist rural planners in developing strategies which will enable rural areas to compete in a rapidly changing world of economic, political and social realities.

Appendix A

Summary by Township

Township	1905	1920	1940	1967	1986	Change 1905 1920	1920 1940	1940 1967	1967 1986
Allison	45	55	54	31	21	10	-1	-23	-10
Altory	60	54	50	27	19	-6	-4	-23	-8
Bassettville	49	44	39	24	21	-5	-5	-15	-3
Beaver	62	49	47	37	35	-13	-2	-10	-2
Center	59	60	54	28	31	1	-6	-26	3
Cook	50	44	38	21	18	-6	-6	-17	-3
Custer	52	49	38	29	21	-3	-11	-9	-8
Dresden	51	71	68	57	53	20	-3	-11	-4
Finley	65	76	64	50	42	11	-12	-14	-8
Garfield	60	53	48	29	22	-7	-5	-19	-7
Grant	66	67	54	31	17	1	-13	-23	-14
Harlan	60	49	38	37	27	-11	-11	-1	-10
Jennings	66	62	62	38	29	-4	0	-24	-9
Liberty	65	53	50	25	22	-12	-3	-25	-3
Lincoln	66	74	52	32	20	8	-22	-20	-12
Lyon	60	65	49	18	13	5	-16	-31	-5
Logan	62	50	45	26	25	-12	-5	-19	-1
Oberlin	68	66	55	39	40	-2	-11	-16	1
Olive	91	78	62	32	29	-13	-16	-30	-3
Pleasant Valley	67	56	55	28	25	-11	-1	-27	-3
Prairie Dog	43	51	46	33	25	8	-5	-13	-8
Roosevelt	63	65	47	23	18	2	-18	-24	-5
Sappa	54	46	45	24	21	-8	-1	-21	-3
Sherman	57	43	40	28	20	-14	-3	-12	-8
Summit	53	47	42	19	17	-6	-5	-23	-2
	1494	1427	1242	766	631	-67	-185	-476	-135

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AN ANALYSIS OF THE SPATIAL DISTRIBUTION OF THE RURAL FARM POPULATION IN DECATUR COUNTY, KANSAS: 1900-1988

by

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ABSTRACT

Decatur County, Kansas is part of the High Plains agricultural region of Western Kansas. Since its population maximum was reached in 1900, it has experienced a nearly continual population decline. Population decline is attributed to changing social, economic and technical conditions. Numerous rural residences in the county have been abandoned.

This thesis reconstructed the historic landscape and explained its development by considering the effects of public policy and environmental conditions. The early years of the study revealed a region which was much more settled than the latter years of the study. The heaviest settled areas were located within the valleys of: the Beaver, Sappa and Prairie Dog creeks and the North Fork of the Solomon River. Adjacent "upland" areas were not as extensively settled, initially, and later became nearly void of people.

Finally, the impact central place functions had on the landscape cannot be overlooked. Accessibility provided by hard-surface roads to obtain goods and services located within the county's central places played an important role in determining the evolution of the landscape. This was especially true near Oberlin which in the latter years of the study experienced the greatest increase in rural residences.