1989


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From forest, stream, and sea: Aspects of self-sufficiency in the nineteenth century Louisiana diet. (Volumes I and II)

Whelan, James Patrick, Jr., Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1989

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FROM FOREST, STREAM, AND SEA: ASPECTS OF SELF-SUFFICIENCY IN THE NINETEENTH CENTURY LOUISIANA DIET

Volume I

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The Department of Geography and Anthropology

by

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B.A. San Francisco State University 1964
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December 1989
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A debt of thanks is also owed to several individuals who helped in the identification of the correct common and specific names of several species of birds. They include Dr. Gary Gaston, Dr. Roger Nasci, and Dr. Dave Parker of the Department of Biology; Dr. Shane Premeaux of the School of Business; Dr. Robert Rumsey, Wildlife Management professor, all of McNeese State University, and Dr. J. V. Remsen, Curator of Birds, The Museum of Natural Science, LSU. A debt of thanks is also owed to Whitney Autin of the Louisiana Geological Survey for allowing me to use the material on the quaternary geology of the Lower Mississippi Valley. I would also like to thank all those friends who encouraged and nagged me along the way. A last, but by no means least, debt of thanks is owed to Dr. Fred B. Kniffen whose advice, "Just write it!" kept me going when I might have been stymied looking for the right word or phrase.
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ABSTRACT

Studies of foodstuff self-sufficiency in the antebellum South have shown that during the middle third of the nineteenth century, as represented by the census years 1840, 1850 and 1860, certain regions of Louisiana suffered from meat production deficits. It has been assumed by most interested scholars that these deficits were overcome by importing pork and beef from the midwest or Upper South. Other possible sources of meat supplements that have not been generally considered are the wild game and fishery resources of the state. Hunting and fishing have long traditions as important activities in the South in general and in Louisiana as both subsistence and social activities. While the importance of these activities to general subsistence in the pioneer and frontier periods has been accepted, their continued use as food sources through the nineteenth century has generally been ignored. Archival collections and the contemporary literature show that a very wide variety of wild game and fishery resources were taken in Louisiana and neighboring regions of adjacent states. As the population and agricultural activities in Louisiana increased during the time period in question, the numbers and distributions of some game birds and animals were dramatically affected. Some increased in number while
others were driven to or over the edge of extinction in the state. Analysis of available data was conducted on estimated nineteenth century population numbers, range acreages, and carrying capacities, in conjunction with edible meat production ratios, for wild game and fishery resources. The results of these analyses show that a reliances on these as food sources could have made up all or substantial percentages of the projected meat deficits for the middle third of the century. While imports from other regions might not have been totally eliminated, locally available food sources could have substantially limited the size and importance of such imports.
CHAPTER 1: INTRODUCTION

Statement of the Problem

The question of foodstuff self-sufficiency in the antebellum South has long been of interest to scholars of several disciplines. Initially the concern of historians, in recent years the subject has been taken up by historical geographers and historical archaeologists. Historians, beginning with Callender (1909), concentrated their scholarship primarily on the production of domestic crops and livestock. A single exception appears to be Shingleton's (1972) article on the importance of hunting as a means of food production. Up through the 1960's, historians held to the opinion that the South, as defined in various limited ways, was not self-sufficient and that the region had to rely on food imports from the west and midwest. In a 1965 review of this position Fishlow began to question its accuracy. An increasing number of historians then began to argue that the South as a region was self-sufficient, even if particular subregions did suffer from deficit food production. These shortfalls were made up by imports from other parts of the South, rather than from outside the region. The region itself was more often
delimited in line with the definition used by the Bureau of the Census in the 1850s. The orientation of these studies continued to concentrate on domestic crop and livestock production, corn and pork, which reflected a view of the South as a single homogeneous region dominated by a single agricultural system.

By the late 1960's historical geographers showed increasing interest in the question of antebellum southern self-sufficiency, either as part of larger studies (Jordan 1967) or as a main topic of interest (Hilliard 1969b, 1972). Geographers also saw the South as comprising several identifiable subregions, each with its own agricultural system (Hilliard 1972). The concentration remained on the production of domestic crops and livestock, although Hilliard did acknowledge the importance of wild game and fishery resources as food sources in the pioneer period. The general tone, however, was that domestic production quickly surpassed the importance of wild food resources, continued use of which was ancillary at best.

Basic to archaeological studies, either prehistoric or historic, is the question of subsistence. Interest in peoples' foodways has been intensified with the development of zooarchaeology. The fundamental nature of archaeology dictates a primary interest in the subsistence patterns of
individual sites, then small subregions, and finally larger areas. Thus, historical and zooarchaeologists begin by discussing the food habits of particular sites. Since the material remains of such sites usually contain the bones of both domestic and wild animals and fish, the historical zooarchaeologist realizes from the start that both groups of animals contributed to the local or regional diet. Because it is a relatively young field, and because historical archaeological research has not been conducted in equal amounts in all states, conclusions regarding diet are limited in scope to small subregions, e.g., the coastal Carolinas or Spanish Florida. Site reports and regional discussions do provide data on the wild resources used and the possible extent of that use, and thus can contribute to the general topic of self-sufficiency.

Historical studies of antebellum southern self-sufficiency have tended to concentrate on the South as a whole or on larger subregions such as the Upper, Middle or Lower South. One exception to this practice was an analysis of the Cotton South by Gallman (1970) using 1860 census data from specific farms. While he concluded that the south was normally self-sufficient, Gallman was able to identify specific farms that did not produce enough food to meet their needs. Another exception was the work of Hutchinson and Williamson (1971) who used census data for the
individual states. They concentrated on pork production and consumption, and were able to identify states that were in a deficit position with regard to pork production during the middle third of the nineteenth century. One of these states was Louisiana. Hilliard (1969b, 1972), in his study of subsistence of the Cotton South, used census data at the county level. Like other scholars, Hilliard placed the greatest emphasis on pork and corn production, although he does discuss beef, mutton, chickens, and various additional plant crops other than corn. As did Hutchinson and Williamson, Hilliard was able to show that for the census years 1840, 1850, and 1860, Louisiana was in a deficit position with regard to pork production. While Gallman was able to identify specific farms in Louisiana that suffered meat deficits, and Hutchinson and Williamson could list the entire state as not producing enough pork, his use of county level census data allowed Hilliard to identify particular deficit regions of the state including the parishes along the Mississippi River and the southern Louisiana parishes generally. Both studies project that the shortfalls in pork production were made up by imports from the midwest or Upper South.

There is another possible source from which this meat deficit could have been made up. Shingleton (1972) and Bruce (1977) have discussed the importance of hunting in the
South. Bruce emphasizes the social aspect of the hunt among the planter elite, whereas Shingleton give equal emphasis to the social aspects and subsistence importance of the activity. Hunting and fishing have long traditional standings of importance in the South, dating back to colonial times. They have remained important activities to the present day, particularly in Louisiana. They have not been just social activities, but were important means of supplying food for the tables of many people in the nineteenth century. The modern importance of hunting, particularly of illegal night hunting, provides additional support for the historic role of this activity from the diachronic point of view that what is of importance today has its roots in the past. In general the potential contributions of wild game and fishery resources to the nineteenth century diet of Louisiana have been ignored.

It is the basic hypothesis of this study that much of the mid nineteenth century pork deficit of Louisiana could have been made up through a reliance on the wild game and fishery resources of the state. This is based on several factors: (1) Hilliard's recognition of the importance of hunting and fishing as food sources in the frontier and pioneer periods; (2) the fact that in parts of Louisiana, the frontier lasted until near the end of the nineteenth century if not into the twentieth; (3) evidence from present
day Louisiana which clearly indicates that the importance of hunting and fishing activities have not diminished; and (4) Shingleton’s emphasis on hunting as a continuing important food source in the South through the antebellum period at least. The major portion of this work will provide the background material needed to test the hypothesis and to show the potential meat contributions from various wild game and fishery resources.

**Organization and Methodology**

The historical geographical nature of this study necessitates that most of the research be archival and library oriented. The variety of topics discussed as background material for the hypothesis proposed requires the examination of published and unpublished nineteenth and twentieth century sources. Reviews of existing literature will occur as necessary in the pertinent chapters.

This first chapter presents a brief background and the major hypothesis of the work. It also describes the organization of the work and the methodology employed in the data collection activities and analysis of the findings.

Chapter 2 is a description of the physical setting of Louisiana in some detail. This detail is necessary since
the ecological divisions of the state employed later are based on the factors of the state's climate, geomorphology, soil, and vegetation patterns. The material presented in the section describing the geomorphology is currently in press and represents the latest interpretations of the quaternary geology of the Lower Mississippi Valley. The material was made available by Whitney Autin of the Louisiana Geological Survey, and the permission to use it is greatly appreciated. The discussion of Louisiana soils is based on the 1962 general soils map of the state compiled by Lytle and Sturgis. This map employs the soil classification system adopted by the U. S. Department of Agriculture in 1938. When the ecological divisions of the state were formulated by St. Amant and the Department of Wildlife and Fisheries in 1959, the newer comprehensive Soil Classification System had not been presented. The ecological zones were based on the older 1938 USDA system. The ecological divisions are described in the last section of this chapter.

The question of Southern foodstuff self-sufficiency is discussed in Chapter 3 beginning with a definition of the concept of self-sufficiency. The arguments for and against antebellum self-sufficiency are examined through a review of the literature beginning with Callender's early stand against the concept. The con argument is followed through
its major proponents up into the 1960's and into a last gasp expression in the 1970's. The pro argument first appears in the 1960's and continues into the present. There is no lack of discussion or data on the antebellum period. While most of it was presented by historians, historical geographers began to show an interest in the late 1960's. The postwar period is another matter. Self-sufficiency as a topic of interest seems to disappear for historians with the end of the Civil War, with one or two exceptions. Fortunately, there is some scattered data on the late nineteenth and early twentieth centuries that can be used as a basis of discussion regarding the effects of the war and reconstruction on food availability in the South.

The next chapter, 4, examines the question of self-sufficiency in nineteenth century Louisiana. Although the sources are more limited, there is adequate information to support a short discussion of both the antebellum and postwar periods. The fact that Louisiana suffered from meat production deficits during the middle third of the century is documented and a possible reliance on wild food resources is suggested.

Chapter 5 discusses the development and importance of hunting and fishing traditions in the South from colonial times up through the nineteenth century. A general
discussion of the topic is followed by an examination of the value of these activities to various social, economic, and ethnic groups. It begins by looking at the importance of hunting to frontier settlers and continues to discuss its role among the planters, plain folk, herdsmen/hunters, squatters/poor whites, blacks/slaves, and townfolk. All of these groups engaged in, and often relied on, hunting and fishing either as a social or subsistence activity. While the discussion is oriented to the South as a whole, the importance of these activities for each group in Louisiana is noted.

Over the course of the nineteenth century Louisiana was transformed from a virtual wilderness to a mostly settled and well populated state. Much of the development of the state was in terms of agriculture although lumbering also became important during the last two decades. Because these activities result in major changes in land use, which in turn affect wild game and some fishery resources, Chapter 6 examines the effects of human activity on these wild life resources. The early effects of Native American activities are discussed since Indian farming and land clearing had established a basic pattern of land modification that was often adopted by early settlers. Crude types of farming and the use of fire to clear forest lands had major effects on the numbers and distributions of wild game. Forest species
often suffered as their range disappeared. Species which came to be known as farm game animals benefited initially from these activities and from the clear cutting of the upland forests. Their numbers tended to increase as improved farm land acreages increased during the century. Most of the discussion in this chapter is based on various wildlife management and land use and wildlife studies. While the emphasis is on the South as a region and the effects of human activity on game and fish in general, the pertinence of the discussion to Louisiana is noted where possible.

The remaining chapters focus almost entirely on Louisiana, although data from neighboring regions of Mississippi, Arkansas, and Texas are used when appropriate to the discussion. Chapter 7 presents the species of wild game and fishery resources that were hunted or taken in the region during the nineteenth century. Occasionally, data from the early twentieth century are used. The determination of the list of species taken, which are given in Appendices 1 and 2 as well as in Chapter 7, required a great deal of archival work. Most of the plantation record collections in the Louisiana and lower Mississippi Valley collection of the Louisiana State University Libraries were examined. Source documents included letters, annual statements from brokers, daybooks, and plantation and
personal diaries. A substantial amount of published nineteenth century travel records and diaries were also examined as were theses and dissertations in various fields ranging from home economics to history, historical archaeological reports, and some secondary sources. Because of the use of archaic or French names for some species, particularly birds, it became necessary to consult a variety of persons to determine the correct modern identifications. All of these people are noted in the acknowledgment section of this work.

Once the list of wild game and fishery resources had been put together, it was necessary to determine the past or present distributions and abundance levels of the species in Louisiana. Past distributions of most species were not available, nor were their levels of abundance. Estimates of these figures for a limited number of species were available and have been incorporated into the discussions. The information gathered is presented for each species taken, arranged by related groups such as mammals, birds and so on. This data was abstracted from numerous publications dealing with the wildlife and fishes of Louisiana and adjacent areas.

Chapter 8 details hunting and fishing activities in nineteenth century Louisiana and bordering regions. The
discussion is organized by ecological division and each source is discussed in pertinent detail. The sources include extracts from the archival record, contemporary nineteenth century diaries, reports on the faunal remains from historic archaeological excavations, and various secondary sources. They include actual references to and descriptions of hunting or fishing activity, the results of market hunting as documented by observations of species for sale in town markets, species lists from zooarchaeological reports, among others.

The potential contributions of some wild game and fishery resources toward making up the mid century meat deficits are presented in Chapter 9. It is not possible to discuss the potential contributions of each species listed in the appendices, because the necessary data are not available. Most of the mammals are included but the species of birds are quite limited. The majority of birds hunted and killed during the nineteenth century are now classed as nongame species and have not been of much interest to wildlife management students until recently. There is no information on their past distributions or abundance levels, and generally no information on modern population numbers in the state. It is thus not possible to develop any estimates of how many were killed or could have been killed on an annual basis. The archival and other nineteenth century
documentation is not detailed enough to suggest what either of these figures might have been. This is true as well for those species for which past population and range estimates are available. The lack of data is unfortunate since some species of birds were hunted to near extinction in Louisiana during the late 1800s. Market hunters killed birds such as the marbled godwit and eskimo curlew by the thousands. Their carcasses were hauled to market by the wagon load. It is entirely possible that their contributions to the nineteenth century diet could have been as great as some of the game birds hunted.

After a brief introduction, Chapter 9 discusses the likely harvest rates of various species based on wildlife management studies. Then various methods for determining edible meat portions for these species or groups of species are examined to provide a basis for estimating the potential annual yields. It is important to note that the discussions of meat yields in this chapter are all hypothetical. There is no way to determine the actual numbers of animals or fish taken, nor to know the actual amounts of meat provided by them. What is presented are conservative estimates of sustained yield harvest figures and edible meat contributions. The remaining sections of the chapter examine specific groups of species such as forest game, farm game, waterfowl, and so on. The potential edible meat
contributions of each species or group is presented and these are combined for total meat contribution estimates for 1840, 1850 and 1860 at the end of the chapter.

The final chapter, 10, presents a general discussion of the conclusions of the research including a statement as to whether or not the initial hypothesis is tenable on the basis of the information presented. Following this chapter are the references and the two appendices.
CHAPTER 2: THE PHYSICAL SETTING

This chapter presents a discussion of the natural environment of Louisiana. It begins with a brief general overview of the state and then details the climate, geomorphology and topography, soils, and vegetation. Such an expanded discussion is required as background for the presentation of the Ecological Divisions at the end of the chapter. These regions are based on the variations of climate, landforms, and vegetation that occur in different areas of the state.

Louisiana lies in the south-central part of the United States, Figure 1. Its maritime coastal position allows a diversity of landforms and climates. A subtropical location results in long growing seasons and abundant, varied plant and animal life. Much of the landscape variety is contributed by the Mississippi River which links the sea to the interior of the continent. As one of only two states (the other is Florida) to lie completely within the Gulf Coastal Plain, Louisiana has generally low relief. The highest point in the state is Mount Driskill at 535 feet. However, much of the state comprises alluvial valley, terraces, and grassy prairies that stand less than 100 feet above sea level. The coast is lined with broad, wet marshlands backed by generally low hills that extend across
Figure 1. Study Area: Louisiana
the inland portion of Louisiana. These hills were produced primarily by the erosion of a gently elevated sea bottom and later alluvial valley deposits. Throughout the state are numerous streams and lakes that comprise an extensive, highly complex drainage pattern flowing toward the gulf.

Louisiana has a climate subject to varying marine and continental influences which is characterized by heavy rainfall, mild winters, and hot summers. It is a productive climate that allows the growing of a wide range of food and cash crops. Much of the state lies in the natural vegetation zone known as the yellow pine belt or piney woods, which extends from the Carolinas to Texas. Also present are bottomland hardwoods, upland hardwoods, bottomland cypress, prairie grassland, and coastal and interior wetland marsh vegetation. These different associations provide habitats for numerous fur bearers, non-game and game animals and birds (Kniffen, Gregory and Stokes 1987; Newton 1987; Kniffen and Hilliard 1988).

**Climate**

In general terms, Louisiana is classified as having a humid subtropical climate with sultry summers and wet, mild winters (Koeppen Cfa). Such a classification, however, is
only a generalization based on average weather data and has rather limited applicability when actual patterns of spatial and temporal variations of climatic regions are considered (Muller and Willis 1978; Shih, Dietrich and Opperman 1985).

Climate can also be described through the use of synoptic weather types that will result in detailed descriptions of the climate for the region around a baseline station (Muller 1977). Because such descriptions are based on a wide variety of data, they may be too complicated to allow for transformation into very generalized descriptions of climate such as are based on long term averages of temperature, precipitation, first and last frosts, and so on.

South Louisiana

Eight synoptic weather types applicable to coastal Louisiana have been developed from the data taken at first-order stations of the National Weather Service and displayed on daily weather maps (Muller 1977, Muller and Wax 1977, and Muller and Willis 1983). They tend to be descriptive of the region immediately around those stations. A comparative analysis of synoptic weather types determined from stations at Lake Charles and New Orleans
indicated close similarities of the conditions associated with each type at both locations (Muller and Wax 1977). It is not clear, however, how far inland such similarities would extend. It is also not clear, to this writer, how applicable climatic descriptions based on synoptic weather types would be to previous centuries when most, if not all, of the necessary data sets are not available. For a more generalized description of the climate of South Louisiana we must still rely on the less detailed long term average data.

The average annual temperature for South Louisiana is 68.5°F with an average annual range from 83°F in August to 53°F in January. The warmest month is delayed as a result of the moderating influences of the Gulf and coastal wetlands. The average annual temperature range is less than in the north as are the record highs of 103°F at several locations and low of 0°F at Clinton. The growing season in South Louisiana ranges from 250 days in the northwest to more than 350 days in southeastern Plaquemines Parish. In the northern Florida parishes the growing season is less than 240 days long. The less variable daily and seasonal temperatures, shorter winters, and longer growing season in the south result from the region’s proximity to the Gulf of Mexico.
The average annual precipitation of South Louisiana ranges from less than 54 in. in the extreme southwest to about 64 in. in the southeast. This region of the state has two rainy seasons; the wetter coming in July and August and a less rainy wet season in December and January. The driest period of the year occurs in October and November, although April through June may also be dry. Spring is quite unpredictable in terms of rainfall, while the fall is reliably dry. The winter rainfall in South Louisiana results from frontal interaction between Gulf and Canadian air masses. Summer rainfall results mainly from convectional processes. The almost daily showers that fall during the summer help keep the maximum temperatures lower than they would be otherwise (Shih, Dietrich and Opperman 1985; Newton 1987; Kniffen and Hilliard 1988).

North Louisiana

The average annual temperature for North Louisiana is 66 °F, with an annual range from 82 °F in July to 49 °F in January. Although temperatures above 110 °F and below 0 °F are rare in Louisiana, higher and lower readings have been recorded in the northern part of the state: 114 °F at Plain Dealing and -16 °F at Minden. These temperature extremes and the annual range reflect the distance of North Louisiana
from the moderating influences of the Gulf of Mexico and the coastal wetlands, as well as the more frequent inflows of Sonoran and Canadian air masses. The region has a growing season of from 250 days in the southwest to 220 days in the northeast with the first frost occurring between November 11 and November 16 and the last frost between March 1 and March 25.

The average annual precipitation for North Louisiana ranges from 46 in. in the northwest corner (Caddo Parish) to slightly over 60 in. in the southeast (Rapides and Avoyelles parishes). This distribution reflects distance from the moisture-laden Gulf-Bermuda High air mass and the closer proximity of the dry Sonoran and Canadian highs. An added factor is that air flows from the Gulf usually turn northeastward over South Louisiana, leaving the north open to invasion by drier air masses. Summer precipitation in North Louisiana is primarily the result of convection and occurs as single, short, moderately heavy falls of rain. In the winter frontal interaction is the major cause. It produces longer, slower, more frequent, lighter falls of precipitation. Thus, the winter season is noticeably moister than the summer which may have a number of dry months running from May through October (Shih, Dietrich and Opperman 1985; Newton 1987; Kniffen and Hilliard 1988).
The winter and spring precipitation patterns for the entire state are the result of frontal interaction. During the winter invading cold air masses from the north often stall over central and South Louisiana. They are overrun by warm, moist Gulf air, often resulting in prolonged frontal rain. This interaction and stalling contributes to the high precipitation area centered on Rapides and Avoyelles parishes. The unpredictability of spring rainfall throughout the state results from the unreliability of the frontal systems. This, in turn, is caused by the varying locations of the jetstream and various high pressure centers that influence Louisiana (Shih, Dietrich and Opperman 1985; Newton 1987).

In summary, the climate of Louisiana can be described as humid subtropical, with mild winters and hot summers, abundant, well-distributed precipitation, and high humidity. One result of the high humidity and resulting cloud cover is that Louisiana receives only about 50 percent of possible sunshine. Winter and springtime weather is dominated by frontal activity and an outward (Gulfward) monsoon effect. Summer provides continuous hot weather and isolated convection induced storms. The fall is reliably dry, dominated by Sonoran and Canadian air masses.
Geomorphology

Louisiana encompasses approximately the lower 285 straight-line miles (456 km) of the Lower Mississippi Valley and its adjacent Tertiary Uplands. The valley's width varies from about 24 to 120 miles (40 to 200 km). The river's chief tributaries in Louisiana are the Red and Ouachita rivers. The Quaternary geologic history of the region is not well known since the pertinent topical, geographical, and temporal data needed for reconstruction is not balanced. Thus, the tendency has been to perpetuate outdated interpretations and concepts. Continued acceptance of the results of earlier works are due to a lack of readily available revisions or syntheses. Since current knowledge often has been assumed to be accurate and comprehensive, the acceptance of and prominence accorded to earlier works has generally discouraged the initiation of new studies.

An example of the lack of balance in our knowledge can be seen in a comparison of the deltaic plain and alluvial valley regions. The deltaic plain has a history of well-balanced studies done in progressively greater detail. These have built on well founded concepts and have included periodic attempts at synthesis. Hundreds of thousands of core borings and hundreds of radiocarbon dates have provided the basis for establishing the stratigraphy and chronology
of the deltaic plain. In contrast, although the stratigraphy and chronology of the alluvial valley have been intensively explored, they are not yet well understood. There are few undisputed radiocarbon dates for any Holocene or Pleistocene alluvial sequence. No specific regional chronostratigraphic studies have been attempted for several decades.

Much of the problem stems from the publication of Fisk's (1944) geologic investigations of the Lower Mississippi Valley. Fisk established the assumptions and models used in most subsequent investigations of the region. While Fisk's work with sedimentary processes are classic and are generally still considered valid, his interpretation of stratigraphy and chronology have been refined somewhat: such as his ideas on terrace formation, valley entrenchment, and climatic influences on river regimes, among others. Limited attempts at revision or initiation of new studies has been largely the result of the acceptance of Fisk's work as definitive.

The following discussion is derived from a new synthesis of the geology of the Lower Mississippi Valley (Autin, et al. in press) and the most recent geologic map of Louisiana (Snead and McCulloh 1984) unless otherwise indicated.
The primary geologic structural element affecting the stratigraphic patterns of Louisiana is the southerly plunging syncline of the Mississippi Embayment. Additional features affecting the stratigraphic patterns of the state include the Sabine Uplift and Monroe Uplift in the north and the Wiggins Arch (anticline) just north of the Florida parishes. These features have influenced stream gradients, local base levels, and the development of drainage patterns during the Quaternary.

Based on geographic, geologic, and topographic distinctions, Louisiana can be said to have four main physiographic divisions: 1) Tertiary-age Uplands in North Louisiana; 2) Pleistocene alluvial and deltaic landforms including terrace remnants, valley trains, and blanket graveliferous deposits; 3) the Holocene alluvial valley of the Mississippi and other rivers' floodplains; and 4) the Holocene deltaic plain at the mouth of the alluvial valley and its associated chenier plain to the west (Figure 2).

Geomorphic Processes

Before discussing these physiographic regions, it is helpful to briefly review the geomorphic processes that affected their development. Largely as a result of the prominence accorded Fisk's (1944) work, tectonics and sea-level variations were thought to be the only significant
Figure 2. Physiographic Divisions of Louisiana (after Autin n.d.)
geomorphic processes affecting the Lower Mississippi Valley and much of Louisiana. Outside the region of the deltaic plain the importance of these processes have been greatly overemphasized, as were the effects of slope changes on stream patterns. Rather, it has been changes in base level, which affect both aggradation and degradation, that have dominated the location and shape of virtually all Lower Mississippi Valley landforms. Base level changes result primarily from four different processes: 1) variations in rates and patterns of sediment yield; 2) glacioeustatic changes in sea level; 3) tectonics, especially subsidence; and 4) climatic changes which influence stream discharges and patterns.

Variations in patterns and rates of sediment input had significant but limited effect in the Lower Mississippi Valley in Louisiana. The main example is Macon Ridge a Mississippi River valley train land form. As the Wisconsin glaciation reached a maximum, tremendous amounts of outwash were released into the lower valley. This resulted in rapid aggradation and the building of Macon Ridge. As the glaciers waned the amount of outwash carried into the lower valley declined and stream patterns were able to change from braided to meandering accompanied by stream incision and lateral planation. This event marked the initiation of Holocene valley aggradation.
Glacioeustatic variations in sea level were responsible for large-scale shoreline transgressions and regressions along the Gulf coast, but these had little effect on base-level changes north of the deltaic and chenier plain. Stream entrenchment and valley filling were significant in the lower valley, but even there, the effects were limited to the area south of Baton Rouge and not of the magnitude formerly assumed by Fisk. Also affecting the deltaic and chenier plain is tectonic subsidence: the net result of sea-level rise, faulting, crustal downwarping, and consolidation of sedimentary deposits. Subsidence has had only minimal effects in the alluvial valley of the Mississippi River.

The effects of climatic change in the lower valley are uncertain. Evidence suggests that changes in the seasonality of precipitation may have increased the size of streams and caused changes in stream patterns and terrace formation. Possible climatic effects are evident from late Wisconsin surfaces including large paleochannel and meanderbelt features. Analysis of Ouachita River paleochannels suggest discharge rates five to ten times greater than the present, with channel widths two to three times modern ones, and meander radii and wave length twice the modern size. Similar patterns are found associated with
the Sabine River.

Physiographic Divisions

The Tertiary-age Uplands of Louisiana are located primarily to the north of the Kisatchie Wold. West of the Red River the oldest exposures date to the Paleocene with younger Eocene rock encircling them. Between the Red River and the Ouachita Valley the deposits are of Eocene age. These uplands are composed of continental, fluvial, deltaic, and marine deposits laid down during cycles of marine transgression and regression (Murray 1961).

These uplands correspond to Kniffen and Hilliard's (1988) hills relief division, in which are found the highest elevation and greatest local relief of the state. With the exception of the Red River valley it is a region of narrow local streams. Belted topography is the result of epirogenic uplift and degradational forces that produced and eroded the relatively flat topped Sabine Uplift. The center of the uplift, the Dolet Hills, is partially encircled by resistant sandstone and gravel-capped ridges which comprise the Nacogdoches and Kisatchie Wolds. The scale and orientation of these ridges has allowed the development of some trellis drainage in the region. The Kisatchie Wold
provides the most pronounced and continuous hill section of Louisiana, although the highest point, Mount Driskill (535 ft. elevation), and greatest local relief (385 feet) are associated with the Nacogdoches Wold. The latter is generally less pronounced and less continuous (Kniffen and Hilliard 1988; Murray 1961; Newton 1987; Thornbury 1965).

Pleistocene-age landforms in Louisiana primarily comprise terrace remnants of ancient alluvial valleys and coastal regions. These remnants are widely distributed along valley margins and extend upstream along tributaries throughout the Lower Mississippi Valley. The Marksville (Avoyelles) Prairie and Bastrop Hills are typical examples of Pleistocene fluvial terraces. The Southwest Prairies and Florida Parishes are characterized by fluvial and deltaic remnants and their transitions to coastal deposition environments. These Pleistocene terrace remnant areas equate to the Terraces Region as delimited by Kniffen and Hilliard (1988).

It should be noted that in terms of elevation, degree of local relief, and vegetation the northeastern Florida Parishes, St. Helena, northern Tangipahoa, and Livingston, are more similar to the Hills region of northern Louisiana than they are to the rest of the Terrace region where loess deposits are thinner affecting patterns of dissection. This
is largely due to the uplift effect of the Wiggins arch in southern Mississippi. In terms of age and mode of formation, however, this area is definitely Pleistocene terrace territory (Kniffen and Hilliard 1988).

The terrace formation concept developed by Fisk (1944) included four sets of matched terraces that represent valley entrenchment as a response to glacial-stage processes and valley filling as a result of interglacial-stage processes. The four sets of terraces were then correlated to the four identified periods of Pleistocene glaciation. The previously accepted glacial chronology has undergone substantial revision as accumulating evidence indicates substantially more than four periods of glacial advance during the Pleistocene. Current theory suggests that many of the Pleistocene terrace remnants are the result of later erosion by streams. Due to the incomplete state of our knowledge concerning Pleistocene landforms in the Lower Mississippi Valley, the terrace remnants have been grouped into four complexes, each of which consists of multiple components of varying origin: Upland, Intermediate, Prairie, and Deweyville.

The Upland Complex is the oldest and most widespread unit in the region. It is most abundant east of the Mississippi alluvial valley where it occupies approximately
the northern half of the Florida Parishes. West of the
valley it occurs in a generally southwestward widening belt
from Sicily Island across central Louisiana into Texas. This
complex is part of an extensive Coastal Plain formation, the
Citronelle, that extends from Virginia to Texas. This once
regionally widespread graveliferous blanket now occurs as
erosional remnants. The complex is either late Pliocene or
early Pleistocene in age, or both. The Citronelle formation
was not recognized by Fisk (1938) who assigned these upland
deposits to his Williana and Bently terrace formations.
Although the processes involved in the development of this
complex are not yet documented, one hypothesis considers the
Upland complex to be a nonglacial Plio-Pleistocene fluvial
deposit, in which the various Pleistocene terrace levels are
primarily erosional rather than depositional in origin.
Part of the uncertainty results from the fact that the
deposits of central Louisiana have not been studied for over
forty years.

The Intermediate Complex is the least known of the
four. It is the smallest unit in areal extent in the Lower
Mississippi Valley and comprises the Montgomery terrace as
identified by Fisk. Age estimates place the complex as
dating from a pre-Illinoian interglacial possibly up to the
Sangamon interglacial, a period of over one million years.
Although components of this complex can be differentiated
from the neighboring Upland and Prairie complexes on the basis of lithology, pedologic features, slope, and degree of dissection, the principal criterion is an intermediate topographic position. Small remnants of the Intermediate Complex are found in the Florida parishes along the East Feliciana-East Baton Rouge and St. Helena-Livingston Parish borders. It is more extensive in west-central Louisiana where it runs from northern Evangeline Parish through northern Allen to encompass almost all of Beauregard Parish. It is primarily fluvial in origin, though there may be some Mississippi River deltaic deposits in central Louisiana.

The Prairie Complex is a widespread sequence of at least two depositional units under a single designation. The relationships between the units is loose and controversial, reflecting the current lack of knowledge. The presently-identified boundaries of the complex include deposits of fluvial, colluvial, deltaic, estuarine, and marine origin. The Prairie Terrace was first recognized by Fisk (1938) in the Red River Valley. It was identified as the youngest of his four Pleistocene interglacial fluvial units. As a result of numerous studies over the past forty plus years, the Prairie complex is now seen to comprise two or more major units, the primarily aggradational cycles of which likely culminated during the Sangamon Interglacial and the Farmdalian interstadial high sea-level stands. The
Prairie Complex is the most widespread Pleistocene unit in the state. It occupies most of the southern half of the Florida Parishes and extends inland up the Pearl and Bogue Chitto river valleys. In southwestern Louisiana, the complex extends from the Sabine valley in Calcasieu Parish northeast through Evangeline to the Mississippi Valley and southward to the coastal marshes and chenier plain. Outcrops are found in western Avoyelles Parish (the Marksville Prairie), northeastern Rapides Parish and up Little River and its tributaries, and also associated with other riverine systems in North Louisiana.

The Deweyville Complex was first described along the Sabine River in 1950. Comparable deposits have since been recognized along the Red, Ouachita, Calcasieu, and Pearl rivers. Situated between the Prairie complex and the Holocene floodplains, it is a multi-level degradational sequence. Because its lower levels sometimes lie at or below present floodplain levels, some Deweyville terraces may have been covered by Holocene aggradation. The complex is characterized by meander belt features, ridges, swales and abandoned channels, that are two to three times the size of modern counterparts. Development of this complex was largely a response to climatic change which brought about changes in seasonality and intensity of precipitation rather than just an increase in total amounts. It is not,
therefore, an interglacial or interstadial stage aggradational feature. Radiocarbon dates and other evidence indicate an age from 30,000 to 8,000 BP, during the later stages of the last major deglaciation.

Stratigraphic studies of some Pleistocene units are made difficult by blanketing loess deposits. In the Lower Mississippi Valley loess occurs as a series of layers draped unconformably over the pre-existing topography to which it conforms in shape. The layers thin out away from the main valley. Loess occurs in a band about 15 to 20 miles (25 to 30 km) wide from western Kentucky to south of Baton Rouge. Remnants of at least two loess sheets have been identified on both sides of the valley in Louisiana: a single sheet overlying Intermediate and Prairie complexes in southwestern Louisiana, one on Macon Ridge, another on the Bastrop Hills, and two sheets in the western Florida Parishes. These loess deposits comprise silt deflated from active and recently abandoned valley trains of early and late Wisconsin age as well as earlier cycles.

The Holocene floodplain of the Lower Mississippi Valley represents a period of meander belt formation. Despite the fact that much of the record is exposed, it may be the least understood physiographic division. Based on archaeological and other evidence, it has been confirmed that until the
beginning of the Holocene the lower Mississippi River was in a braided regime. The transformation to a meandering regime began at the latitude of Baton Rouge about 12,000 BP and progressed upstream to the vicinity of Cairo, IL by about 9,000 BP (Krinitzsky and Smith 1969; Saucier 1981). The depositional features of the Holocene floodplain are responses to deglaciation, base level rise, and regional climatic change. Alluvial valley deposits are largely the result of lateral accretion by meandering stream systems.

Meander belt features typically consist of a 3 to 10 m thick top layer of lenticular clays, silt, and fine sand. They are deposited primarily in point bar and natural levee environments. These deposits are occasionally interrupted by clay and silt masses up to 40 m thick, linearly deposited in abandoned channels and swales. Underlying these top stratum deposits are a silt, sand, and gravel substratum of point bar and channel lag deposits. Located between meander belts are thick clay and silt overbank sediment sequences deposited in backswamp environments. These measure about 20 m in thickness near Natchez and increase to about 30 to 35 m in the Atchafalaya Basin. All meander belts undergo progressive narrowing and the mean grain size of sediment decrease downstream. These reflect declining sources of sand in the main stream and a progressive inhibition to lateral migration as a result of the increasingly thick
backswamp deposits of resistant clays.

During the past 9,200 years the Lower Mississippi River has occupied five meander belt positions as shown in Figure 3 (Saucier 1981). Various studies during the past forty plus years have shown that meander belt initiation and abandonment are relatively slow processes and that two or more meander belts were commonly occupied concurrently for centuries. Some complications in establishing the chronostratigraphy of the five meander belts have arisen from the occupation of abandon belts by tributary streams and possible changes in upper Mississippi River discharge rates resulting from episodes of Holocene climatic change.

In the alluvial valley of Louisiana north of Natchez, three meander belt trends developed along the eastern and western sides and down the center of the Tensas/Yazoo Basin. In this area meander belts 2 and 4 were occupied concurrently. South of Natchez only two trends developed. The early trend of belts 1 to 3 ran southwest to near Marksville and then down the western side of the valley. This trend flowed through the deltaic plain into the Teche and Maringouin deltaic complexes. The second trend included meander belts 4 and 5. South of Marksville this trend followed the eastern side of the valley and gave rise to the St. Bernard and later deltaic complexes. Occupying the area
Figure 3. Sequence of Holocene meander belts and subdeltas in the Mississippi (after Saucier 1981)
between the two South Louisiana trends is the Atchafalaya Basin, a region marginal to active Holocene sedimentation.

Changes in meander belt trends, particularly from one side of the valley to the other, strongly influenced the lower reaches of upland tributaries lengthening or shortening courses, changing gradients and base levels, and sometimes resulting in terrace formation. Such changes in meander belt trends also directly affected the development of the deltaic plain complexes.

The Mississippi River deltaic and chenier plains comprise one of the most intensively investigated regions of the earth. These plains are the result of regressive coastal processes which build delta complexes, and transgressive processes that rework delta complexes and mudflats and create shoals, barrier islands, and cheniers. The deposition of sediments required in these processes is directly related to the position of the Mississippi River meander belt trend in operation during a given period of time. Numerous published studies and an abundance of unpublished government file data verify the presence of six Holocene delta complexes in coastal Louisiana: the Maringouin, Teche, St. Bernard, Lafourche, Plaquemines, and Atchafalaya. These delta complexes developed seaward as sea level rose to near its present level and the rate of rise
slowed beginning about 7,300 BP. As the complexes prograded seaward the deltaic plain was constructed. Its development occurred concurrently with that of the major meander belts. The chenier plain began to form between 2,800 and 2,500 BP as reworked deltaic deposits were transported west by longshore currents. A brief, concise discussion of the chronology of the deltaic and chenier plain development is presented in Autin et al. (in press). The chronology is given in Figure 4.

Soils

Soil has been defined by pedologists as "the naturally occurring, unconsolidated, mineral or organic material at the earth's surface that is capable of supporting plant growth" (Canada Soil Survey Committee 1978:14) [CSSC]. A soil's properties vary with depth and are determined by the interaction of climatic factors and organisms, as influenced by local relief and moisture regime, acting on geological materials and resulting in genetic horizons that differ from the parent material. Soils' characteristics also vary from place to place as a result of variation in the pedogenic factors that govern its development. This requires a system of classification that will be a means of organizing information and ideas in a way that appears logical and
DELTÂ AND CHENIER PLAIN

Figure 4. Delta and Chenier Plain Chronologies
(after Autin N.D.)
Age in
radiocarbon years
useful. Various soil classification systems have been
developed through time including one based on color and
structure devised by a Chinese engineer about 4,000 years
ago (Baldwin, Kellog and Thorp 1938; CSSC 1978).

In 1938 the United States Department of Agriculture
(USDA) officially adopted a soil classification system that
combined Russian concepts of soils as natural bodies with
horizons that reflect the influence of pedogenic factors,
particularly climate and vegetation with the American system
of soil types based largely on geological material and
texture. This system, based primarily on
soil/climate/vegetation relationships, was widely accepted
in the United States and much of the rest of the world. The
1938 USDA system employed a genetic classification based on
soil-forming conditions and processes. An integral part of
the system was the relationship between the soil and other
aspects of the environment. This meant that the
distribution of major soil categories could be successfully
compared with the distributions of other major environmental
complexes, particularly climate and vegetation. Because of
this, it has been generally popular with and favored by
geographers (Gabler et al. 1987; McKnight 1987).

The 1938 USDA system, however, did not satisfy soil
scientists. Thus, in 1960 the Soil Conservation Service of
the USDA presented an entirely new system, The Comprehensive Soil Classification System or Seventh Approximation. This system is based solely on intrinsic properties of the soil itself, rather than on the environment, genesis, or properties it would possess under virgin conditions. The CSCS is a generic system rather than genetic, and while the system is well suited for modern agriculture, its categories do not have clear relationships with other environmental components. On the other hand, the genetic bias of the 1938 USDA systems appears well suited for broad-scale geographic uses (Gabler et al. 1987; McKnight 1987).

The soils of Louisiana will be presented using the categories of the 1938 USDA system, Figure 5. This classification is favored for two reasons. First, as noted above, its genetic bias makes it more geographically oriented than is the CSCS system. Second, the ecological divisions used as a framework of organization for following sections of this dissertation were based in part on soil types as defined by the 1938 system.

Soil is a natural complex that develops from the interaction of five pedogenic factors: climate, time, physical site, parent material and biota. As climate is the overriding factor, given sufficient time, regions sharing the same climate will tend to have very similar soils. In
Figure 5. The Soils of Louisiana. Based on Lytle 1962
the case of a single region with a generally uniform climate, such as Louisiana, it will be the physical site that will determine much of the ultimate quality of the soil. Since all of Louisiana generally receives similar amounts of insolation and precipitation, differences in soils correlate primarily with differences in terrain. While the parent material may strongly influence the ultimate type of soil that develops, it is of little importance in Louisiana where the majority of the surface is covered by recent or compacted alluvium ranging from a few days to seventy million years in age. This includes the coastal plain areas, terraces, and alluvial valleys. The remaining surfaces are either loessial deposits or marsh growth (Newton 1987).

Soil types are grouped into three main orders: Zonal, Intrazonal and Azonal (Baldwin, Kellog, and Thorp 1938; CSSC 1978). Zonal or mature soils have well developed characteristics that reflect the active pedogenic factors such as climate and organisms, particularly vegetation. These, depending on the topography, may range from fertile to infertile. Intrazonal soils make up one category of immature soils. They have more or less well-defined characteristics that reflect the dominance of a local factor such as relief or parent material over the normal effects of climate and vegetation, and suffer from interrupted
development. The second category of immature soils, the Azonal soils, lack well-developed characteristics due to their youth or to some condition of relief or parent material.

The following discussion of the six general soil areas of Louisiana is based on data drawn from several sources. These include The Soil Survey Division, Bureau of Chemistry and soils (1938, endsheet map), Lytle and Sturgis (1962), Newton (1987), Kniffen and Hilliard (1988), and Autin et al. (in press).

Zonal Soils

Louisiana has two general soil areas that are classed as zonal soils. The first occupies the pine forested sandy and clayey hill areas of the western, north-central parts of the state and the northeast Florida Parishes. These uplifted areas have hill or Coastal Plain soils that occupy approximately 6,800,000 acres. This soil area includes three groups of geographically associated major soil series, each of which occurs in a particular type of landscape. These soils developed from unconsolidated sands, sandy clays and clays of Tertiary, early Quaternary and Pleistocene age marine and stream sediment deposits. Originally laid down
as level plains during different periods of marine
transgression and regression, they now occupy hilly
dissected areas with elevation ranging from 100 to 500
feet.

The Ruston - Orangeburg - Bowie - Beauregard
association occupies about 2,500,000 acres of sandy hill
lands of the north-central, central, western, and
southeastern parts of the state. The Shubuta - Kirvin -
Nacogdotches - Luverne series is found in the northern part
of the state covering approximately 2,000,000 acres. It is
an association of red hill soils which developed from Eocene
age parent materials. The Susquehanna - Sawyer - Boswell
association occupies about 2,300,000 acres of rolling pine
hills of the western and central parts of Louisiana where
elevations range from 200 to 400 feet. These soils
developed from Paleocene and Eocene age clays. All of these
soils are deep, mature and leached. They are generally
infertile as a result of severe sustained leaching and
erosion and range from low to moderate in organic matter and
mineral plant nutrients. Classed as pedalfers, they are
typical of well-drained areas unders a warm, humid climatic
regime. In general, they are suitable only for timber and
grazing activities.

The second zonal soil region is the Loess Covered Hill
and Terrace area, sometimes called the Bluffland soil area. The Loess Covered Hills are found in the southeastern part of the state from West Feliciana Parish into Washington Parish. These hills are composed of wind-blown silts of 10 to more than 50 feet in thickness in West Feliciana Parish and from 2 to 3 feet thick in Washington Parish. This is a dissected plain, with elevations of 125 to 350 feet, whose relief includes gentle to steep slopes, narrow ridges, ravines and escarpments. The Loess Covered Terraces comprise level to gently sloping benches of the Bastrop Hills, Macon Ridge, and the western wall of the Mississippi Valley from near Chicot State Park to south of New Iberia. The elevations are generally 15 to 40 feet above the local floodplain. The Bluffland soil area includes three groups of associated soil series.

The Memphis - Loring - Grenada - Calloway loessial soils association developed from Pleistocene age silty materials in West Feliciana, northwest East Feliciana, and northwest East Baton rouge Parishes. The Lexington - Providence - Bude association of Loessial Hills soils is located where a shallow mantle (2 to 3 feet) of silty material overlies Pleistocene age sandy materials. They extend from East Feliciana into Washington Parish and also cap Sicily Island in the northeast part of the state. Covering approximately 1,528,000 acres of the state is the
Lintonia - Richland - Olivier - Calhoun association. It includes the siltly soils of Macon Ridge, the Bastrop Hills, Opelousas Ridge and the terraces of East Baton Rouge and Ascension Parishes. All of the soils of these series are generally low in organic matter and plant nutrients except for some better drained soils where these components are present at moderate levels. The Loess Covered Hill and Terrace soils are generally mature, deep, relatively fertile, and easily eroded. They cover about 2,430,000 acres. These soils are medium to strongly acid and are used mainly for pasture and forest.

**Intrazonal Soils**

The intrazonal soils of Louisiana form two general soil areas: the Flatwoods and the Coastal Prairies. The Flatwoods soils occupy approximately 3,800,000 acres and are found primarily in the southwestern part of the state between elevations of 25 and 120 feet, and in the southeastern Florida Parishes at elevations of 5 to 100 feet. Flatwoods soils also occur in the central, northern and northwestern parts of Louisiana at elevations of 100 to 260 feet above sea level. These are areas that are flat to nearly flat and that have slow surface drainage and subdrainage. They are regions of sandy, silty and clayier materials of Pleistocene
and Miocene age. These soils are generally deep and strongly profiled with an acidic A horizon.

Flatwoods soils include only the Caddo - Beauregard - Hammond - Wrightsville series. They generally occur in level, nearly level and undulating areas. These acidic soils are generally low in organic matter and mineral plant nutrients. Poor soil drainage is due to the presence of siltpans or claypans and relatively high water tables.

The Coastal Prairies cover approximately 1,660,000 acres of level to undulating plains in southwestern Louisiana with elevations ranging from 3 to 40 feet. This is a region of late Pleistocene age floodplain and deltaic sediments of the Mississippi and Red Rivers. The underlying sediments are chiefly clays deposited in backswamp situations and are overlain in broad areas by silty sediments. The Coastal Prairies comprise a single major soil association, the Crowley - Midland - Lake Charles series. These soils contain moderate amounts of organic matter and most plant nutrients, however the level of available phosphorus is low. They have deep, strong fertile profiles with a well developed claypan between the A and B horizons. Originally these soils had a covering of tall bunch and other coarse grasses.
Azonal Soils

Louisiana has two major regions of azonal soils: the Coastal Marshes and the Recent Alluvium of the alluvial valleys and floodplains of the major rivers. These soils are located in the Holocene alluvial valleys and deltaic plains regions. The larger region is that of Recent Alluvium which encompasses approximately 9,371,000 acres. The largest component is the Mississippi Valley floodplain including the Boeuf and lower Ouchita Basins, the Tensas Basin, the Atchafalaya Basin, and the Mississippi meander belt. Other rivers contributing to this region are the Red, Sabine and Pearl along with their tributaries. The general relief features of the area include the nearly level to gently sloping natural levee ridges, the level levee backslopes, and the level or depressed basins and back swamps. Soil textures range from silty to sandy on the levee crests, are generally stratified medium to fine textured sediments on the backslopes, and dominantly clayey in the backswamps and basins. The levee crests and ridges are 2 to 20 feet above the backswamps. These recent alluvium soils are deep, very fertile and lacking in profiles. This soil area includes seven associated soil series.

The Baldwin - Cypremont - Iberia series covers about 274,000 acres in the south-central part of the state. The
soils developed on Mississippi River alluvium deposited along Bayou Teche and its distributaries. Because of their early Holocene age, these soils have some horizon development. The soils of this series contain moderate amounts of organic matter and are moderately well supplied with mineral plant nutrients. The Commerce - Robinsonville - Mhoon - Crevasse series occupy approximately 1,070,000 acres of better drained Mississippi alluvial soils. They occur on natural levee ridges paralleling the stream channels. These soils contain moderate to high amounts of mineral plant nutrients and moderate amounts of organic matter.

Approximately 3,060,000 acres of recent alluvium comprise the Sharkey - Tunica - Swamp clays association which includes the backswamps and backlands of the Mississippi River. The backlands are poorly drained level areas between the backslopes of the natural levee ridges and the wet backswamps. Large areas of the swamp clay deposits are covered by one to 3 feet of peat or muck. These soils contain moderate to high amounts of organic matter and mineral plant nutrients. Large areas of this association are frequently flooded.

The Yahola - Norwood - Miller - Perry association includes about 1,827,000 acres of recent alluvial soils of
the Red River. The soils of this series contain moderate amounts of organic matter and high amounts of mineral plant nutrients. The Gallion – Pulaski – Portland – Perry association is an area of mixed older alluvium comprised of approximately 1,225,000 acres. These are deposits from the Ouachita, Arkansas and Mississippi Rivers and are located in the northeastern part of Louisiana, along the west side of Macon Ridge. The soils of this association are low in organic matter and mineral plant nutrients. The major part of the area consists of forested backswamps. The Sharkey – Gallion – Herbert – Perry association contains approximately 1,053,000 acres in the south central part of the state. It includes soils derived from mixed Mississippi and Red river alluvium in an area of extensive backswamps and basins. These soils contain moderate levels of organic matter and moderate to high amounts of mineral plant nutrients.

According to Lytle and Sturgis (1962), in part of the lower Ouachita Basin (number 15 on their soil map), the bottomlands of the smaller streams are occupied by the Bibb – Ochlockonee – Chastain – Waverly association. This alluvium covers approximately 862,000 acres comprised of silty sediments from loessial areas and sandy clayey sediment from Coastal Plain areas. These soils have low to moderate levels of organic matter and mineral plant nutrients. Most of the area is frequently flooded.
recent map prepared by B. J. Miller (Kniffen and Hilliard 1988:72) designates this region as being occupied by Flatwood type soils. This discrepancy cannot be settled at the present time.

The second azonal soil area is the Coastal Marsh comprising about 4,825,000 acres. This is a low wet plain along the Gulf of Mexico with elevations ranging from sea level to 3 or 4 feet. The mineral soils materials are stream and tide deposited silty and clayey sediments which are covered in places by 2 to 12 feet thick layers of peat and muck. The area includes numerous sand and shell beach ridges (cheniers) with elevations of 2 to 9 feet. The Coastal marsh peats, mucks and clays are classed as land types and not as soil series. The marsh clays are dark gray and are high in organic matter and mineral plant nutrients. Large areas of these clays are covered with peat and muck. Two soil types, Harris and Palm Beach, are present in the marsh. The Harris soils are dark gray clays. Palm Beach soils are fine sands or sandy loams which occur on beach ridges in the western part of the area.

Natural Vegetation

Plant geographers classify plants on the basis of
lifeform, that is, the physical structure, size and shape of the plant. Use of this system establishes five major lifeform categories: trees, shrubs, lianas, herbs, and mosses and lichens. The ways in which these lifeforms associate produce four major ecosystems: forests, savannas, grasslands, and deserts. These ecosystems are based on a structural interpretation of the appearance or physiognomy of the association of plants that dominate region (McKnight 1987; Newton 1987). The structuralist approach identifies three major plant association types in Louisiana: forest, savanna, and grassland. The forests of the state include the upland pine and hardwood forests and the various bottomland associations. The only savanna in Louisiana comprises the flatwoods. The grasslands consist of the coastal marshes and the prairies. The natural vegetation patterns of Louisiana are depicted in Figure 6.

FORESTS

Two types of upland pine forest are native to Louisiana. They are characteristic of the tertiary hill and early Pleistocene terrace regions of northwestern Louisiana and of the Florida Parishes. They are part of the more-or-less continuous yellow pine belt that extends from Texas to the Carolinas.
Figure 6. Natural Vegetation of Louisiana.
Texas to the Carolinas.

**Mixed Forest**

The mixed or shortleaf pine-oak-hickory forest occurs in northwestern Louisiana and in the Bastrop Hills, that part of the state that receives most of its rain in the winter. The dominant crown layer is composed of shortleaf pine, white and black oaks, and hickories with some loblolly pine present. The understory typically contains, dogwood, redbud, yaupon, and haws. Streams crossing the area are characterized by bottomland hardwood associations of hackberry, deciduous oaks, and gums. Wet, swampy sites permit a cypress-gum swamp forest association (Kniffen and Hilliard 1988; Newton 1987; Lockett 1970).

The mixed forest of the Florida Parishes has a slightly different makeup with the crown layer dominated by deciduous oaks, pine, and beech. The deciduous oaks include white, black, and red oaks with holly, dogwood, ironwood, and sourwood also present. This is a region with a thin mantle of loess covering a sandy substrate (Delcourt 1975).

**Longleaf Pine Forest**
The longleaf pine forest is located in the gulfward portion of the upland pine belt in central Louisiana and the Florida Parishes. These are regions of lighter, drier terrace and hill soils. West of the Mississippi the canopy is dominated by longleaf and shortleaf pine. Loblolly pine, sweet gum, southern oak and mockernut hickory may also be present. In the Florida Parishes, slash pine and spruce pine, which occur naturally only east of the Mississippi River, are codominants (Kniffen and Hilliard 1988). The shrub layer of this forest, while not well developed, includes huckleberry, haw, and dogwood west of the river, with honeysuckle and wild azalea also present in the Florida Parishes. Also present in the understory are postoak, blackjack and blue jack oak. The bottom herb layer is dominated by fire-tolerant bluestem grasses. Stream valleys and baygalls of these regions contain bottomland hardwood and swamp forest associations (Newton 1987; Kniffen and Hilliard 1988; Campbell 1986; Lockett 1970).

Upland Hardwood Forest

Regions of Louisiana with superior loessial soils and considerable local relief are dominated by upland hardwood or bluffland forest (Delcourt 1975). The major locations include Macon Ridge, the western Mississippi valley wall
from the vicinity of Chicot State Park to south of New Iberia, the Five Islands region near the coast, and West Feliciana Parish. This forest represents a southern extension of what is a generally more northerly association. Its presence in Louisiana is due to the cool shady settings resulting from deep erosion in the loessial soil regions. West of the Mississippi River the canopy is dominated by holly, magnolia, and beech, with liveoak, deciduous oaks, some pine, yellow poplar, and hickory. The understory consists of dogwood, redbud, cherry, holly ash, and other trees. The herb layer comprises various ferns, jack-in-the-pulpit, virgin’s bower, trillium, and others. Also present in this association are true mosses, Spanish moss, and several lianas, with canebrakes on the bluffs and swamp forest in the wet sites (Newton 1987; Kniffen and Hilliard 1988; Lockett 1970).

In West Felicians Parish the bluffwood forest dominants are magnolia, holly, and beech. Other trees include white oak, dogwood, ironwood, shagbark and mockernut hickory, sweetgum, bay, hornbeam, redoak, white ash, linn (basswood), sourwood, box elder, elm, red maple, Spanish oak, water oak, yellowwood, tuliptree, and mulberry. This is a region of mesic sites with rich soils (Delcourt 1975; Campbell 1986; Lockett 1970).
**Bottomland Hardwood Forests**

This forest association is found throughout the Holocene alluvial valleys and floodplains of Louisiana, as well as in most low wet sites. The actual tree associations vary with elevation. Three main types of bottomland forest have been identified.

The *swamp or first bottom forest* is located in basins between natural levee ridges. These are seasonally flooded, low-energy settings, with a distinct dry season under natural conditions. The dominant trees include bald cypress and tupelo-gum. Also present are swamp oak, swamp red maple, pumpkin and green ashes, water locust, and black willow. Since the seeds of most of these trees, including the cypress, will not germinate in standing water, the dry season is necessary. Also occurring along the margins are buttonbush, swamp privet, virginia-willow, swamp dogwood, and woody vines such as greenbriers, poison ivy, and virginia creeper. *Natural levee or second bottom forest* occurs on areas not subject to long inundation such as natural levees, abandoned point bars, and high islands. The second bottom forest is dominated by deciduous oaks, liveoak (south of a line running between Opelousas and Baton Rouge), American elms, pecan, sugarberry, persimmon, magnolia, water
hickory, green ash, and beech. The understory may include
dogwood, hawthorn, red mulberry, swamp privet, planertree,
buttonbush, and vines. Canebrakes occur on crevasses and
oldfield sites. Deciduous oaks, gums, and hackberry become
dominant on the levee backslopes (Newton 1987; Kniffen and

The frontland forest is located on the battures of the
natural levees. These are zones of active sedimentation
which are continually disturbed by running water and the
rapid buildup of new sediment. Such processes limit the
plant species that can occupy the area. The frontland
forest is dominated by black willows with cottonwoods, sweet
gums, green ash, sycamores, pecan, redgum, sugarberry, and
locust also present. The understory commonly contains box
elder, red maple, mulberry, swamp privet, and planertree.
In some places blackberry and switchcane occur. A fourth
type of bottomland hardwood forest occurs in the southwest
prairies region. These gallery forests occupy the banks of
small streams where erosion has cut through the underlying
claypan allowing the development of larger root systems.
The crown layer consists of deciduous oaks, gums, hickories,
and loblolly pine (Newton 1987; Kniffen and Hilliard 1988;
Campbell 1986; Lockett 1970).

In West Feliciana and East Baton Rouge Parishes,
bordering the Mississippi River, two types of bottomland hardwood forest have been identified. The swamp forest is essentially the same as in the rest of Louisiana and is dominated by tupelo-gum and cypress, with an understory of swamp cyrilla, virginia creeper, gallberry, and bayberry. The second expression of the bottomland forest, the magnolia-beech-holly association, occupies ravine and tributary stream bottoms. Also present, along with the dominant trees, are sassafras, black walnut, cherry, laurel, chinquapin, cowlick (silverbell), blackgum, black locust, black oak, sumac, and sycamore (Delcourt 1975; Campbell 1986).

SAVANNA

The **flatwoods** comprise the only savanna region found in Louisiana. It is an area transitional between the forests and the grasslands. Originally the flatwoods consisted of widely spaced stands of longleaf and loblolly pines intermixed with continuous stands of palmetto and wiregrass. Scattered throughout the region were small areas with deciduous oak and broomsedge covering, plus yaupon, wax myrtle, sweet and black gum, and chinquapin as well as other species. Relatively pure stands of longleaf forest were maintained by regular burning. The fire-resistant longleaf
pines were able to survive fires that would kill hardwoods and other pines. The origins of this savanna region are uncertain. There is continued debate as to whether it was a strictly natural ecotone, man-made, or man-enlarged. Scattered through the region were baygalls and sloughs containing cypress, gum, and bay dominated forests (Newton 1987; Kniffen and Hilliard 1988; Campbell 1986; Lockett 1970).

GRASSLANDS

The grasslands of Louisiana are divided into the dry prairies and the wet marshes. The prairies exist in two main contexts: the southwest prairies and the upland prairies; while two primary types of marsh, fresh and salt, can be differentiated on the basis of the salinity of the water.

Southwest Prairies

These grasslands are part of a coastal prairie belt that runs discontinuously from Texas to Georgia. In Louisiana they occupy the interfluves between streams which dissect the region into a number of small prairies. Ancient Red
River courses trend southwesterly across the area, and the tops of some of the ancient natural levees are occupied by bayous and coolies. The native vegetation was composed of wetland species including bluestem grasses, water grass, and switch grass, along with hibiscus, brownseed paspalum, indiangrass, tall dropseed, blue star, sumac, and elderberry. Scattered randomly across the region were small prairie lakes (platins and marais) with scattered forests of red maples, gums, cypress, bays, and deciduous oaks (Newton 1987; Kniffen and Hilliard 1988; Campbell 1986; Lockett 1970).

**Upland Prairies**

Scattered through the northeast and central parts of the state and around Baton Rouge were small irregular grasslands. These meadow-like prairies occurred in upland hardwood, longleaf pine, and shortleaf pine forests. Examples are the Marksville (Avoyelles) Prairie, Buhers Plain, and Holloways Prairie. The native vegetation of these meadow-like open areas included bluestem grasses, indiangrass, switch grass, eastern gamagrass, sumac, cedars, and pecans. The origins of these and the southwest prairies are uncertain, although edaphic and other physical factors appear to be more responsible in the southwest.
prairies. The debate centers on whether the prairies were natural or man-made. Early travelers' accounts provide evidence that historic Indians maintained these grasslands by annual burning. The result of such a practice was to create or maintain a forest-grassland ecotone which was very attractive to many game animals of both ecosystems (Newton 1987; Kniffen and Hilliard 1988; St. Amant 1959; Campbell 1986; Lockett 1970).

**Coastal Marsh**

The vegetation and variations of the coastal marshes have been described in great detail by O'Neil (1949). In brief, the marshes have a complete herbaceous cover. The region is completely and continuously saturated which results in an anaerobic environment preventing decay. Thus, the soil has an organic component in excess of one quarter. Differences in vegetation are due to variations in the degree of salinity of the water. The inland edge makes up the fresh marsh. It is maintained by influxes of fresh water from streams flowing coastward. The fresh marsh has an unstable base because fine clay particles are held in suspension rather than settling out. The vegetation cover includes roseau cane, cattail, iris, saw grass, pickerel weed, and three-corner grass. The latter extends into a transitional
brackish-water marsh. Slight elevations with firmer bases are covered with willows. Pimple mounds in the marsh were once occupied by isolated longleaf pines.

Bordering the Gulf of Mexico is the salt marsh. The salt marsh is maintained by salt water which enters the marsh through stream channels, particularly during periods of low discharge. Salt water is also driven into the marsh during storms. Because clay particles flocculate out of salt water, the base is firmer than in the fresh water marsh. The vegetation is dominated by salt-tolerant species including salt grass, spartina, smooth cord grass, and black rush. On relict beach ridges in the marsh are small stands of liveoak-palmetto savanna which includes prickly pear, bluestem grass, and Spanish moss. These ridges are composed of sand and shell resulting in very porous soil. Stands of mangrove occur in the muddy brackish water around the modern delta and Barataria Bay. This is the plant's poleward limit, but while killed off by infrequent freezes, the mangrove grows back (Newton 1987; Kniffen and Hilliard 1988; Campbell 1986; Lockett 1970).

Ecological Divisions of Louisiana

The accurate description of past or present game
conditions in Louisiana requires the recognition of certain factors. First, all animals are basically restricted to certain ecological niches within specific communities. The ecological niche has been defined as the position or status an organism has within its community and ecosystem. The community is comprised of all the populations occupying a given area, while the community and habitat, or abiotic environment, in functional interaction comprises the ecosystem. Thus, the distribution and production of individual species are strongly influenced by environmental factors. Second, the environment is in turn determined primarily by factors of the habitat: soils, topography and climate. It is important to note that the term habitat has different meanings depending upon the context in which it is used. The habitat of an organism or a population includes not only the abiotic environment but other organisms as well. With reference to the community, on the other hand, the habitat would include only the abiotic environment. The interplay of the abiotic environment and the community results in the establishment of certain natural ecological divisions that provide various types of animal ranges. Such natural divisions or ecosystems, include forests, prairies, marshes, and swamps (St. Amant 1959; Odum 1959; Shelford 1963).

It is also important to realize that man-made
boundaries seldom coincide with natural ecological divisions. They have no control over the distribution of game, nor can political or other boundaries, parish, ward or state, be easily incorporated into a study of natural distributions. The range of game animals is not often influenced by human determined lines on a map. Because of this, for the purposes of this study, a division of Louisiana into seven natural areas developed by The Louisiana Wildlife and Fisheries Commission will be used (St. Amant 1959). These seven zones were established primarily on the basis of their soils, topography and natural ecological differences. Secondary factors included differences which resulted from human use of the land. The seven zones are depicted in Figure 7.

Northwest Louisiana Uplands

This, the largest of the seven natural ecological divisions in the state, includes an area of more than 7,700,000 acres covering all or part of 18 parishes. Geologically, this hilly region is the oldest part of the state, as well as being the highest and most heavily eroded topographically. The section is uniform in character and quality over the entire area. Originally, the entire region would have been covered with extensive forest that can be divided into pure
STATE OF LOUISIANA
1. Northwest Louisiana Uplands
2. Upper Mississippi - Tensas - Ouachita - Red River Bottomlands
3. Southwest Louisiana Terrace Lands
4. Lower Mississippi - Atchafalaya Bottomlands
5. Southwest Louisiana Prairies
6. Coastal Marshes
7. Southeast Louisiana Terrace Lands

Figure 7. Ecological Divisions of Louisiana (after St. Amant 1959)
pine (43 percent), pine-hardwood (28 percent), and mixed bottomland hardwood (27.8 percent) zones. The mixed bottomland hardwood forest forms an intricate interlacing pattern throughout the pine-hardwood forest in which it is confined to the drainage courses and lower areas.

The entire area of virgin forest of the Northwest Louisiana Upland would have offered excellent range for forest game. A major result of farming activity in the hill region has been the establishment of some of the best farm game conditions in the state. One other major benefit for all game is that little, if any, of the region is ever subjected of serious flooding (St. Amant 1959).

**Upper Mississippi, Tensas, Ouachita, & Red River Bottomlands**

This division includes approximately 4,500,000 acres of all or parts of 17 parishes located in the Upper Mississippi River Bottomland and in the bottomlands of the Red, Tensas, and Ouachita Rivers. Even though it consists of recently deposited river alluvium and supports bottomland hardwoods it is differentiated from the Lower Mississippi division on the basis of different soil types, higher elevation hardwoods, and differences in crops. While this region lies at higher elevations that the lower Mississippi floodplain,
much of it is still subject to backwater flooding by the Mississippi and Red Rivers (St. Amant 1959).

Southwest Louisiana Terrace Lands

The Southwest Terrace or Pine Lands region comprises over 3,600,000 acres which include all or parts of Sabine, Vernon, Rapides, Allen, Beauregard, and Evangeline parishes. The region was originally covered by a nearly solid stand of longleaf pine (over 3,000,000 acres) with 475,000 acres of pine-hardwoods and 490,000 acres of scrub oak and mixed bottomland hardwoods. In the northern parts of the zone the scrub oaks, predominantly post, blackjack and sandjack, are very common, while in the poorer drained southern area myrtle becomes more prominent. The region is interlaced with streamlets and larger streams. Along these the pine-hardwoods form a transitional zone between the bottoms and the hills. The hardwoods are limited to the bottoms of the largest streams and island-like areas of standing water called "bay galls" (St. Amant 1959).

Lower Mississippi-Atchafalaya Bottomlands

This division includes over 4,000,000 acres comprising all
or parts of 17 parishes along the lower Mississippi-Atchafalaya systems. Historically the area was covered by various mixed hardwood forests and cypress-tupelo and red gum swamp forests. The mature hardwood forests formed an extremely dense canopy that resulted in an understory of dense canebrakes and palmetto. The cypress-tupelo areas were constantly underwater. Thus the region was not good game country being generally too dense for anything other than bear (St. Amant 1959).

**Southwest Louisiana Prairie Lands**

The Southwest Prairies division of Louisiana consist of approximately 2,350,000 acres. They form the only extensive natural prairie lands in the state and include all or parts of Calcasieu, Jefferson Davis, Acadia, Evangeline, and Allen parishes. The only forested lands of the region are located along stream courses or fringe low swampy areas. These small blocks of forest are pine and pine-hardwoods on the northern fringe of the region bordering the Southwest Louisiana Pinelands, and bottomland hardwoods and cypress-tupelo fringing the lower courses of the Vermilion river and Bayous Nezpique and des Cannes. The entire region has poorly drained subsoil due to an underlying claypan (St. Amant 1959).
The Coastal Marshes

The Coastal Marsh division of over 4,000,000 acres includes all or parts of 11 parishes. The vast majority of the region is tidal marsh, with forest making up only 1.8 percent. The forests are chiefly scrub cypress-tupelo and wetland hardwoods with liveoak-palmetto savanna on beach ridges, natural levees and cheniers. A detailed ecology of this region has been described by O’Niel (1949). Briefly, it can be stated that the coastal marshes may be divided into fresh, brackish and salt water areas as one moves from high land to the open Gulf of Mexico. The marshes may also be divided from east to west into delta, subdelta, and prairie zones (St. Amant 1959).

Southeast Terrace Lands

The Southeast Terrace Lands include over 2,800,000 acres of the Florida Parishes. This area is based on the same Quaternary "terrace" units as are the Southwest Louisiana Terrace Lands but is separated ecologically for two main reasons. First, it is separated from the southwest section by a wide natural ecological barrier of the Mississippi and
Atchafalaya Bottomlands. Second, the soils of the Florida Parishes are more fertile than those of the Southwest Terrace Lands. The Southeast region is covered primarily by three major forest types: pine, pine-hardwood and mixed bottomland hardwoods. The pine and pine-hardwood associations predominate on poor sandy soils in the easternmost parishes of Washington, St. Tammany and Tangipahoa. Bottomland hardwoods are found along the numerous streams that flow southward into the Pontchartrain Basin (St. Amant 1959).
The foodways of the antebellum South have long been of interest to scholars. Historians, historical geographers, and historical archaeologists have examined and discussed aspects of the subject. Basically the questions asked are what did southerners eat and where did they get it. For the historian and the geographer, this is but part of a larger discussion of regional interrelationships and self-sufficiency. For the archaeologist it is basic to discussions of subsistence. This discussion began among historians early in the twentieth century and has resulted in some disagreement. Much of the dissent appears to have been due to a lack of agreement on terminology, particularly with reference to "self-sufficiency" and "the South." The term "self-sufficient" suggests a state of independence, the ability to get along without help. Consider for example, the American vision of the pioneer: self-reliant, self-supporting, supplying all his or her needs from the bounty of nature. Yet, who made the pioneer's tools, the axe, gun, knife, that allowed some dominance of nature? From where did the pioneer obtain the crockery used in food preparation, storage, and eating? Immigrants to colonial America were heavily dependent on goods they brought with them and that they continued to receive from their
homelands. Carole Shammas (1982) has shown that in the 1760s, for example, approximately one-quarter of all per capita income was spent on European and other imports. James Lemon, in an examination of household consumption patterns, calculated that in the two decades preceding the Revolution, eighty percent of the farmers in Chester and Lancaster counties, Pennsylvania, sold commodities in the marketplace, and that, on average, about forty percent of the farmer’s production was sold (Lemon 1967). From as early as the seventeenth and into the eighteenth centuries, pioneer farmers on the forest frontier engaged in buying or bartering for items such as salt, coffee, tea, and ammunition. They sold or bartered butter, cheese, honey, grain, lumber, and livestock (Fite 1976). Although the transactions may have been small, they were of a commercial nature. Only the most isolated pioneers approached a high level of self-sufficiency.

It is possible that early pioneers were, or could have been, self-sufficient in terms of food production. Hilliard (1972) has noted that the typical American farm in the pre-Civil War period was highly independent and self-supporting, producing a diverse assortment of plants and animals that answered the farmer’s needs. But he also wrote that "individual farm units rarely were diversified enough for each farmer to produce all the agricultural
products he needed" (1972:2). Shammas (1982) noted that by the eighteenth century the traditional English diet had been Americanized. Products that were grown more easily in the colonies and were more easily processed frequently replaced the old nutritional staples. This modification of the basic diet should have facilitated a move towards self-sufficiency in the colonies. Such a development was blocked, however, as a greater level of food crop specialization was achieved by farmers. The result was that "home production for home consumption" became even less likely.

Indications suggest that commercial agriculture was, in fact, developing in North America as early as the eighteenth century. Individual farm unit self-sufficiency was giving way to commercial agriculture, and local agricultural self-sufficiency was apparently being replaced by larger regional networks (Hilliard 1972; Shammas 1982). By the nineteenth century, regional identities had developed and the interregional flow of goods and services established. It is at the regional level, primarily, that the topic of self-sufficiency has been examined. The discussions of regional self-sufficiency have been directed almost totally toward domestic food production, and the argument has been whether or not the South, as a region, was able to supply its own food needs.
Contributing to the arguments about southern self-sufficiency has been the problem of regional delimitation. One would expect that defining the boundaries of the South would be relatively easy and straightforward. That, however, has not been the case, particularly among historians. There is a persistent lack of a clearly defined South in much of the historical literature. If the regional limits are not defined, a meaningful comparison of opposing arguments becomes very difficult. The lack of a standardized region, "the South", induces doubt regarding the arguments of scholars using a restricted regional definition. It is difficult to understand this lack of agreement among historians, particularly since as early as 1854 J.D.B. DeBow, writing for the U.S. Census Office, delimited a South that included sixteen states plus the District of Columbia (Table 1). DeBow's South differs little from the region as described by Zelinsky (1973:118, Fig. 4.3) and Hart (1976).

It has generally been those scholars using a restricted delimitation of the South (one that usually excludes Kentucky, Missouri, Arkansas, Texas, and occasionally Tennessee) who have concluded that the region was not self-sufficient (Callender 1909; Schmidt 1939; North 1961; Fogel 1965a, 1965b). Those scholars employing a broader definition, more in line with DeBow's for example, have
found the South to have been at least potentially self-supporting (Fishlow 1965; Gallman 1970; Jordan 1967; Lindstrom 1970; and Hilliard 1969b, 1972).

Table 1. The South as Defined in Various Sources.

|——|——|——|——|——|——|——|
| AL | x | x | x | x | x | x |
| AR | x | x | x | x | x |
| DE | x | x | x | x | x |
| DC | x | x | x | x | x |
| FL | x | x | x | x | x |
| GA | x | x | x | x | x |
| KS | x | x | x | x | x |
| KY | x | x | x | x | x |
| LA | x | x | x | x | x |
| MD | x | x | x | x | x |
| MS | x | x | x | x | x |
| MO | x | x | x | x | x |
| NC | x | x | x | x | x |
| OK | x | x | x | x | x |
| SC | x | x | x | x | x |
| TN | x | x | x | x | x |
| TX | x | x | x | x | x |
| VA | x | x | x | x | x |
| WV | x | x | x | x | x |

* Two different versions of the Cotton South.

_ Antebellum Period _

The parameters of all the discussions concerning southern self-sufficiency were best defined by a set of
questions stated by Sam B. Hilliard:

"If... we assume that the South (or parts of it) imported a large part of its food needs, then several vital questions are raised: 1) Where did the food come from and what effects did its sale have on the economy of the producing area? 2) What role did interregional trade have in development of transportation networks? 3) What effects did this trade have on the overall national economy? 4) How did it effect the southern economy, e.g., was it a drain on resources or a boon to agricultural specialization? 5) How did it affect regional development and regional loyalties? 6) What were the effects on southern agriculture? 7) How did it relate to the plantation-slave regime?"

(1972:3-4).

Hilliard did not attempt to treat all these questions, nor did any of the other scholars who have written about the major topic. As will be seen in the following discussion, a number of the questions are touched on at various levels of intensity, but none of the works reviewed provide complete answers. In fact it is the first part of the first question which has received the most attention.

The question of regional self-sufficiency was first raised by Guy Callender when he described the general character of the internal commerce of the pre-Civil War United States.

Its basis was a territorial division of labor among the three great sections of the country resting upon foreign commerce. The South was able to devote itself chiefly to the production of a few staples, turning out a great surplus of them for export and depending upon the other two sections for much of its agricultural produce,
nearly all of its manufactures, and to a large extent for the conduct of its commerce" (1909:274).

Callender stated that mixed farming could not be conducted profitably by slaves and that planters were glad to obtain their agricultural supplies from other producers. This practice provided the first secure market for goods from the West and Northwest, a region in which Callender placed Kentucky and Tennessee (1909:273,277).

Using excerpts from various nineteenth-century sources, Callender presented a picture of large scale importing of foodstuffs: corn

imported from the northern states in large quantities... Immense numbers of cattle, hogs, horses, and mules are driven from the western country annually into [South Carolina]... The bacon is almost entirely imported from the Northern States, as well as a considerable quantity of Indian corn... On this plantation as much Indian corn was raised as was needed, but little bacon, which is imported from Ohio... The shipments of provisions from Cincinnati to New Orleans and other down river ports, show that large supplies leave that city for the South... Cincinnati sent its lard, candles, pork, etc., to New Orleans to be carried up by the coast packets to Bayou Sara and Baton Rouge... (Callender 1909:290, 292, 299, 318).

This view of southern dependence on western foodstuffs was further developed by Louis Schmidt:

"The rise of internal commerce after 1815 made possible a territorial division of labor between the three great sections of the Union—the West, the South, and East....The South...depending on the West for a large part of its food
Schmidt outlined a pattern of commerce in which the "Middle West" provided its farm products to southern planters in return for molasses and sugar. He described the South as having devoted itself to the production of plantation staples such as cotton and as having become the first important market for foodstuffs from the Middle West (1939:801). His argument was weakened when he noted that the percentage of total receipts at New Orleans comprised of western products declined from 58 percent in 1820 to 23 percent by 1860, and that "the products of the Ohio and Upper Mississippi valleys shipped to New Orleans were no longer for export but were for consumption on the plantations" (Schmidt 1939:802-3). The western dominance theme was continued when Schmidt said that the Mississippi River was being replaced as a transportation artery by "the southern railroads" which carried commerce from the West to the South and that large droves of livestock were driven south annually to supply the planters and commercial centers (Schmidt 1939:803). It should be noted all of the "southern railroads" identified link Kentucky and Tennessee with other parts of the south, not with the Middle West or Northwest.

Douglas North (1961) continued on the path charted by Callender and Schmidt. He stated that between 1815 and the mid-1840s, the South was the primary market for western
foodstuffs, and that the expansion of the cotton South was
the main mechanism behind a growing demand for corn, hogs,
bacon, pork, and so on. Even after the mid-1840s, when the
East replaced the South as the main market for western
produce, the South remained dependent on the West.
Interestingly, there is no discussion of or consideration
given to the possibility that some of the western trade to
New Orleans may have been transshipped to the Northeast
during the first half of the century. North, like Callender
before him, excluded Kentucky, Tennessee and Missouri from
the South and places them in the West (1961:Table L-IX:257).
He defined the South as "a region characterized by
production for the market of a number of agricultural
staples in which slave labor was both the major capital
investment and an important intermediate product" (North
1961:122).

By the mid-1960s some scholars had begun to challenge
the prevailing view of West to South foodstuffs flow. Among
the first was Albert Fishlow who wrote that "the southern
social structure, with its large numbers of land-owners with
few slaves or none at all...[is]...suggestive of an economic
organization with...widespread self-sufficiency...
(1965:194). He did not deny a large scale movement of goods
from the West down the Mississippi to New Orleans, but
stated that very little, less than twenty percent, of the
goods were consumed in the South. Unfortunately, like his predecessors, Fishlow did not adequately delimit the South as a region. He did recognize, however, with regard to the border states of Kentucky and Tennessee that "in their commitment to slavery, size of farms, ethnic character of population, and indeed, in the case of Tennessee its considerable production of cotton, these states were part of the South" (Fishlow 1961:194).

In a 1969 article which will be discussed below, Sam Hilliard noted that in addition to "an impressive quantity of data" which indicated movement of substantial quantities of food into the South, "a lack of geographical perspective in historical interpretation, has led to an assumption of a widespread deficiency in the region's food supply" (Hilliard 1969b:461). Such a lack of perspective and geographical awareness was evident in two articles in which Robert Fogel critiques Fishlow.

Fogel's basic argument was that a sizable portion of western produce was shipped to the South through the East, and focuses on trade routes between the West and the South Atlantic States via the ports of New York, Philadelphia, and Baltimore (1965a, 1965b). Unfortunately the earliest report on such shipments that he can use is for the year 1881-82. He was able to provide data that wholesale prices of most
food commodities were lower in New York than in New Orleans in 1859, and implied that shipping costs from North Atlantic ports to the South Atlantic States would have been cheaper than shipping costs from New Orleans. Fogel also argued for pork and beef deficits in the South Atlantic States, but his argument involved a lot of "ifs" regarding swine carcass weight and human meat consumption rate changes through time. Also, he did not mention that almost $1,700,000 worth of animals were sent to South Carolina from Kentucky and Missouri in 1835, and another $2,000,000 worth of animals in 1836 from the same Upper South states (Genovese 1972:143-44; Jordan 1967:667). The point being that meat deficits were being made up by other parts of the South, not necessarily the West. Though never stated, Fogel’s articles contain implications that all grain products shipped from St. Louis and all hogs slaughtered at Cincinnati were of strictly northern or western origin (1965a, 1965b).

At another point, in arguing against a statement by Fishlow concerning southern cattle inventories, Fogel stated that "on a per capita basis cattle inventories in the south exceeded that of the rest of the nation...in 1860 only if one lumps Texas and Arkansas together with the South Atlantic and Eastern Gulf States" (1965a:208). This represents an implicit assumption that these states are not part of the south. Yet in the second article, Fogel stated
in a note that both Texas and Arkansas are part of the South (Fogel 1965b:note 6). He continued his argument against southern self-sufficiency by noting that some data suggest large numbers of Texas cattle were sold in Louisiana and other Gulf States in the 1850s (1965a:208). One may argue that parts of Texas, e.g., West Texas are not part of the modern South, as does John Fraser Hart (1976), but Fogel cannot have it both ways. He cannot bar Texas in one breath and include it in the next. Such geographical gaffes only weaken his argument and detract from the fact that he may be quite correct that not all goods shipped South went down the Mississippi. It should be remembered that after Texas achieved independence, much of the eastern part of the state became the western extremity of the great Cotton Belt of the Lower South (Jordan 1967).

Fogel's articles would seem to represent the final stand in favor of a strong southern reliance on western foodstuffs in the antebellum period. In an examination of self-sufficiency in the Cotton South, Robert Gallman stated that the region "was normally self-sufficient in food. In good years—and perhaps even average years—there were surpluses for sale to nonfarm population within the region and outside it" (1970:6). His study was based on the analysis of data from a 5,229 cotton country farm sample extraced from the manuscript census of 1860.
Gallman’s major hypotheses were that large plantations in the region were typically self-sufficient in basic foodstuffs and that the region as a whole was normally self-sufficient to the extent that good years produced surpluses. Production levels of both grain (corn) and meat indicated only occasional needs for purchased supplements. Within the sample only farms with less than twenty improved acres (11.2 percent of the total) did not match the national average for per capita grain output, all other farms exceeded it. The larger farms, those with more than fifty improved acres (60.5 percent of the sample) produced surpluses beyond human and livestock food needs (Gallman 1970:6–7, 9). On the sample farms the surplus meat production equaled nearly thirty percent of the total meat output. Extrapolation of this figure to the entire Cotton South indicated that the total meat surplus for the region "would have been large enough to feed all of the slaves and one-sixth of the free men living in the South outside the sample universe" (Gallman 1970:19).

Thus, Gallman’s analysis suggested that not only was the Cotton South self-sufficient in the production of basic foods, but that it could have supplied needs existing outside the region. This represented an attempt by large planters to provide for their own needs. When this goal was
not met, the cause usually reflected developments that resulted in diminished returns for all agricultural production.

Along with Fishlow and Gallman, Diane Lindstrom (1970) argued that the rural South was largely self-sufficient in terms of grain production, primarily wheat and corn. Lindstrom divided the south into three subregions: the Upper South including Kentucky, Tennessee, Virginia, and North Carolina; a Middle South comprised of the interior counties of Louisiana, Mississippi, Alabama, South Carolina, and Georgia; and the Lower South which equates with a narrow coastal belt extending southward from North Carolina to the Louisiana parishes adjacent to the lower Mississippi River. Her analysis was based on trade flow statistics collected from "contemporary southern newspapers, railroad reports, and periodicals" (Lindstrom 1970:101).

The Upper South was part of the rich grain belt that, in the East, extended from Pennsylvania to North Carolina. It produced grain in excess of its own needs and above the southern average. The region was able to engage in the large-scale export of both corn and wheat. As a rule the Middle South had no need to import grain; the cotton producers of the region normally met their own needs, and sometimes produced a surplus. In the late 1840s and 1850s
the interior county farms of Alabama, Georgia, and South Carolina were able to ship wheat and corn to cities of the South Atlantic and Gulf coasts. The Middle South may have had to import some grain from the Upper South during the early 1850s to supplement a succession of poor harvests (Lindstrom 1970).

As a region, the Lower South was generally in a deficit position with regard to grain production and had to depend on imports to supplement local production. The import patterns can be classed as follows: (1) The lower Mississippi river parishes and Gulf coast cities drew upon the West and Upper South. (2) Centers on the South Atlantic coast imported grain from the eastern grain belt, primarily Virginia and North Carolina. (3) During the 1850s the South Atlantic area also drew upon the cotton-counties of the Middle South. Most of these imports were destined for urban consumption. During the 1840-1850 period the lower Mississippi River parishes and Gulf coast cities did provide a limited market for western grain. Much of the grain that arrived at New Orleans, however, was from the Upper South states of Kentucky and Tennessee. The same patterns were noted by Terry Jordan (1967) although he would include Arkansas and Missouri as Upper South grain suppliers to the Lower South. Batesville in northern Arkansas, for example, served as the departure point for shipments of stock and
goods down river. In 1841, one Batesville firm sent down river twelve flatboats loaded primarily with stock (Batesville News 1841). In fact, when all the upriver grain and flour imports from the Upper South states and the West (Ohio, Indiana, Illinois, Wisconsin) are taken into account only twenty percent or less was consumed in the South (Lindstrom 1970:111).

In 1971 William K. Hutchinson and Samuel H. Williamson presented what may have been the first statement that the South as a region was completely self-sufficient: "there does not appear to have been much reason for any great degree of dependence upon Kentucky and Tennessee and no reason at all for dependence of the South upon the Midwest for food supplies" (1971:609). The authors used the census returns for 1840, 1850, and 1860 as a basic data source for livestock and feed production amounts. They noted that the most important classes of food were meat, pork and beef, for humans and grains and vegetables for human and nonhuman consumption. The primary plant foods were corn, wheat, oats, peas, and potatoes (1971:592). Previous studies, e.g., Gallman (1970), relied on the use of "formal feeds" to determine pork slaughter weight levels. Formal feeds are defined as "those feeds planted and harvested to be directly fed to the stock" (Hutchinson and Williamson 1971:593). The authors considered all feed sources: corn, potatoes, peas,
beans, as well as grazing and mast feeding. They also used the results of controlled condition feed experiments to determine potential slaughter weights of hogs.

The results of their analysis, based on a swine slaughter ratio of 66.7 percent, indicated that the South was for the most part self-sufficient and did not have to rely on the West for food supplies. The only state showing deficits in meat production was Louisiana. The results also indicated that within the South there was little need for intraregional dependence. Thus, the southern planter-farmer was not a single crop agriculturalist, but rather produced sufficient foodstuffs to meet the needs of himself and the region as a whole (Hutchinson and Williamson 1971:607).

In a recent book Grady McWhiney (1988) touched briefly on the subject of southern livestock. He noted that in 1860, the South contained over two-thirds of the nation's swine and that only about twenty percent of these were slaughtered for market sales. An additional sixty percent were slaughtered for home consumption, however, resulting in an annual slaughter rate of eighty percent, a substantially higher figure than those proposed by most scholars (Hutchinson and Williamson 1971; Hilliard 1969b, 1972).

Concerning the use of census data for livestock production numbers, McWhiney presented a caveat when he wrote:
"southern animals doubtless were worth considerably more than the government records indicate because there was every reason for owners to undercount the actual number of livestock they reported to tax collectors and census takers" (1988:52).

Thus far the discussion of the self-sufficiency debate has centered on the works of historians. As noted earlier, other scholars, historical geographers and historical archaeologists, have also examined various aspects of the topic. The latter group has only recently become interested and, due to the limitations of their data bases, have not yet developed arguments regarding the South as a whole. Foremost among geographers studying the southern food supply has been Sam Hilliard. In a series of publications he has employed that geographical perspective so often lacking among historians.

Unlike many of the scholars reviewed above, Hilliard has not viewed the South as a single homogeneous region, nor as an area dominated by a single agricultural system. He recognized that within the South there were a number of separate agricultural regions: cotton, rice, sugar, tobacco, mixed farming, and herding. Each of these had its own system of food supply. Some developed high levels of specialization in only one or two cash crops and thus had to
depend to varying degrees on outside sources. Even in terms of the four basic commodities: pork, beef, corn, and wheat, the subregions varied from those that produced huge surpluses to those that relied almost exclusively on imported food (Hilliard 1969b, 1972, 1975).

Hilliard's main concentration was upon the cotton kingdom of the Gulf South. Even though he discussed all of the basic commodities and a few minor ones (potatoes, peas, other garden plants, sheep, and fowl) much of the emphasis was on pork. County census data provided the basis for determining hog production levels. Based on a slaughter weight yield of 140 pounds per hog, an average annual per capita consumption rate of 150 pounds per adult, and an annual slaughter rate of fifty percent, an annual production level of 2.20 hogs per adult consumer was needed to avoid a deficit. Any county showing less that 2.20 swine per adult consumer was presumed to represent a pork deficit area. The major southern regions where pork production fell below their needs were coastal South Carolina and the Mississippi River and southern parishes of Louisiana (Hilliard 1969b, 1972).

These two deficit regions are areas in which the commercial nonfood crops sugar and rice were important. As with other nonfood crop areas, basic commodity production
was low. Perhaps more so than the Cotton South, the sugar and rice areas required huge imports of meat and grains. Hilliard concluded that some western foodstuffs moved into the South, but this was not the result of a region unable to feed itself. Instead, it reflected the lack of a commercial meat packing industry in the South and the lack or weakness of intraregional trade and transport. Also the major deficit regions were located along major transportation routes or on the coast which likely kept food transportation cost relatively cheap. The dependence on extra-regional foods was real, but not of great importance. Each agricultural region solved its food problem as its situation required. "As a region ...the south...was, despite the exceptions noted, largely feeding itself" (Hilliard 1972:235).

Although Hilliard has been foremost among historical geographers looking at antebellum southern food production, other geographers have discussed aspects of the subject ancillary to other topics. Terry Jordan, discussing of southern influence on mid-nineteenth century Texas noted that there is little question the slave cotton Lower South was a food-deficit region that had to import food from other areas. Much of the deficit was made up by shipments of surplus food crops from the Upper South and the Midwest, areas that also sent large amounts to international markets.
In a discussion of trans-Appalachian antebellum economic development, Carville Earle wrote that "with respect to the West-South trade, several studies demonstrated only a modest flow of provisions to southern markets" (1987:173). Also, studies of plantation agriculture revealed that most plantations produced sufficient foodstuffs to meet their own needs. Even though the Ohio Valley states along with Missouri, Tennessee, and Iowa produced nearly sixty percent of the national corn output by 1840, relatively little corn (or corn equivalents in livestock, meat, and whiskey) became part of the interregional trade. The corn export from this region was only three percent of its output in 1839 and only nine percent in 1857. Corn and livestock production largely remained in the Middle West for household consumption or for the intraregional trade (Earle 1987).

It is not possible to say that the question of self-sufficiency for the Antebellum South has been finally answered. Clearly, recent scholars argue that the South was virtually self-supporting with regard to foodstuff production and that any imports of food products from the West were of no great importance. There is substantial evidence for the movement of goods into the South via the
Mississippi River, across the Southern Appalachians, and coastwise from the Northeast. Some so far unanswered questions are: Where did the raw foodstuffs originate? What quantity of the goods shipped from Cincinnati and St. Louis originated in the West and Northwest and how much might have come from Kentucky, Tennessee, Arkansas, or Missouri? None of the literature reviewed above answer those questions, which also lie beyond the scope of this paper. With regard to the Mississippi River trade, Hilliard (1975) has written: "A number of factors make a detailed assessment of the Mississippi River trade difficult" (1975:203). One of the major factors is that the data on downriver shipments of foodstuffs are incomplete. Another problem results from the variations in container size and type which would result in inaccurate totals of receipts. Thus, the problems of raw foodstuffs points of origin may never be solved.

The container size problem holds true for shipments up river from New Orleans as well. In the archival literature there are numerous references to shipments of various foodstuffs in barrels, such as mackerel and oysters, kits of mackerel, boxes of salmon, lobster, and sardines, not to mention hogheads of pork. There are no indications of the size of the barrels or boxes or of what kits and hogsheads are in terms of volume.
Postwar Period

If the Antebellum South was basically self-sufficient, as it appears to have been, what about the Postbellum South? Was this self-sufficiency maintained or did a dependence on extra-regional food supplies develop? Unfortunately, this topic appears to be of little interest to scholars. The importance of self-sufficiency and interregional linkage seem to vanish with Appomattox. The history of the New South has emphasized political reconstruction in the post-war period and the politics of the era. There have relatively few studies of the economic history of Reconstruction and the New South, and these have not resolved many basic questions about what happened—much less the hows and whys (Woodman 1977). Agricultural, social and economic histories of the New South are more concerned with the rise of sharecropping and tenancy than with the question of commodity flows. The question of postbellum southern self-sufficiency is further complicated by a lack of agreement concerning the effects of the Civil War on the southern economy (Woodman 1977).

Some scholars have argued that the rise of sharecropping and a developing merchant monopoly of the competitive market resulted in widespread southern poverty. Others have blamed the war and emancipation for the postwar
disruptions that hampered the southern economy. It is generally agreed that the southern economy was in poor shaped compared with the rest of the nation until early in the twentieth century (Woodman 1977). Part of this problem may have been the fact that in the years prior to the Civil War, the South became increasingly isolated from the rest of the country. Additionally, the processes resulting in such isolation continued after the war (Hilliard 1969a).

Not all the South suffered to the same extent. Studies comparing various agricultural regions or economic classes indicate significant differences in degrees of self-sufficiency. In a comparison of farmers in non-plantation states and counties with farmers in plantation areas, Ferleger concluded that the former "were more likely to achieve a higher degree of self-sufficiency than farmers in the plantation areas" (1984:329). The farmers in food-crop producing regions were less likely to use credit, more likely to accumulate assets, and more apt to adopt more modern technology and farming techniques. Farmers in plantation areas and the planters as well were forced to rely heavily on credit and the continuation of cotton agriculture using antebellum agricultural techniques (Ferleger 1984).

Most of the discussion of postwar southern agriculture
and economics centers on the Cotton South, which Marable (1979) has described as being overwhelmingly rural, existing, in effect, as a colony for the rest of the nation. The plantations of this region did survive the war as large landholdings, albeit the pattern of operation changed with the rise of tenancy. Not only had plantations survived the war, it seems that large landholdings increased in number if not in size in the postwar period. McDonald and McWhiney (1980) noted that as many as 80 percent of farms in the late antebellum Lower south were operated by owners. In the postwar period this figure declined. By 1930 more than one million white and nearly seven hundred thousand black families were tenants or sharecroppers. By the end of the first decade of the twentieth century the number of whites who controlled more than five tenant families, which equates to more than twenty people, was nearly identical with the number who had owned twenty or more slaves in 1860.

Even though the cotton plantation of the postwar period was less self-sufficient than its antebellum predecessor, it was successful in a way. The maintenance of antebellum agricultural techniques was largely the result of southern white attempts to control the black freedmen. The re-establishment of a labor-repressive system of agriculture in the Cotton South through the Black Codes and their
successors, gave planters little incentive to progress. Thus, there were no real attempts to mechanize or introduce techniques that would increase efficiency. As late as 1900 southern sharecroppers had to rely on hand tools and mule power (Wiener 1978). From the mid-1870s until the 1920s, there was remarkably little change as southern agriculture stagnated with crop yields and outputs per acre changing little from year to year (Wiener 1978; Fite 1979).

While food-crop farmers and cotton region planters were succeeding in their own ways, a tremendous number of antebellum white farmers and black freedmen were sinking into what McDonald and McWhiney have termed "peonage" (1980). The pattern of events is illustrated by data available on parts of Alabama and Mississippi. Between 1880 and 1930 farms operated by owners in these states declined from 54 percent to 27 percent. Over the longer period from 1860 to 1930, per capita hog production in this region fell by 80 percent while per capita corn production declined by over 50 percent. The region was transformed from being a net exporter of food to an importer of food. Meanwhile farms were decreasing in size and the cotton production was declining drastically (McDonald and McWhiney 1980).

In essence the small white farmers and freedmen of the South became totally entangled in the sharecropping trap.
Even though the plantation economy was disrupted by the Civil War, the planter class continued to own a disproportionate share of the land. In 1870 40 percent of the land was owned by 5 percent of the population, and the wealthiest 20 percent of the population owned nearly 75 percent of the land. As noted above this wealthy stranglehold on the land apparently increased during the rest of the nineteenth century. Early in the postwar years, the freedmen, in essence, forced their former masters to adopt the sharecropping system, and blindly walked into the trap (McDonald and McWhiney 1980).

The recent emphasis by historians on the rise of tenancy and sharecropping has produced interesting results. It was not the white planter or merchant who forced tenancy on the black freedmen, rather it was the freedmen who demanded tenancy over wage labor (Orser and Holland 1984; Davis 1982). To the freedmen sharecropping or tenancy was a means of obtaining a measure of independence, a way to get out from under planter control that was part of the wage-contract labor system. The desire for independence and control of a piece of land was such that the freedmen were willing to risk uncertain crop yields and output prices (Shlomowitz 1979). Contemporary reports clearly illustrate the attitudes of the blacks. Freedmen would "starve and go naked before they will work for a white man if they can get
a patch of ground to live on, and get from under his control" (G.A.N. 1867:69). "The dream of the wage-earner is to become at least a renter" (Dillingham 1896:201). The availability of wage labor became scarce and what was available so unreliable that planter/landowners had little choice to accede to the system of sharecropping and tenancy (Brooks 1912, cited in Orser and Holland 1984).

The entrapment of the small white farmers took longer and was more complex. The initial factor was the destruction of the livestock that had formed their capital. The destruction was both a direct and an indirect consequence of the war. Armies on both sides of the conflict stole or impressed nearly everything edible they encountered. Then in the chaos of the first years following Appomattox, roving bands of freedmen stole much of what was left. Hog production declined by over 2.5 million in eight of the former slave states (McDonald and McWhiney 1980). Throughout the South significant decreases in the numbers of livestock occurred between 1860 and 1870; the number of horses declined by 29 percent, cows by 32 percent, and swine by 35 percent (Cowdrey 1983). Disastrous as this was for the small farmers it was not fatal. It is estimated that as many as two-thirds of them still owned their land in 1880 (McDonald and McWhiney 1980).
The second factor that led to their entrapment developed as a byproduct of the new relationships established between the great landlords and their tenants and the landlords and their own financial overlords. The landlords discouraged tenants from raising food which provided no profit to the landlord. Many landlords were dependent on northern credit which made them beholden to outside suppliers. They did not buy foodstuffs from the small farmers. Rather, the development of the corn-hog-feedlot industry with lower priced hogs and the spread of the railroads with cheap rates made it more advantageous to import needed foodstuffs and retain ties with northern creditors than to buy them locally (McDonald and McWhiney 1980).

A third factor in the decline of the small farmers was the appearance of fencing laws which brought an end to the open range system of herding. This undermined the small farmer/herders' ability to produce and transport their stock. The traditional transportation system of the trail drive was seriously impaired. A second aspect of the new fencing laws has to do with the nature of the stock. Thermodynamically, the pig is not well adapted to hot climates. Essentially it is a creature of forests and shaded riverbanks. Penning up southern range hogs condemned them to a life of filth and disease and eventually near if
not actual extinction. Depriving the farmer/herders of their hogs condemned them to life as commercial plow-farmers. Every year more of them became cultivators, and considering the overall situation of the times, they had little chance of succeeding. Lacking a proper background for their new lifestyle, lacking a market for food crops, they were forced into cotton cultivation. In the process they were forced into debt and lost their lands. Although some had the choice of work in textile mills or lumber camps, most of them became trapped in "the peonage of the tenant and cropping system" (McDonald and McWhiney 1980:1118).

The freedmen's economic position was no better than it had been when he was a slave. Emancipation had little effect on it, nor on the system of cash crops which had required slavery. The effects of sharecropping not only held the blacks down it also drove many former white landowners into a cycle of poverty which was almost impossible to break (Hilliard 1969a; Marable 1979; Taylor 1980). It was not only the small white landowner who was caught, many Mississippi Piney Woods planters were wiped out due to the loss of their labor supply, buildings, livestock and often their land in the early postwar period (Kelley and Spillman 1976).
The prevailing attitudes and situation of the postwar Cotton South have been described by Ulrich Phillips:

...in the Lower South the extremely high prices of cotton in the reconstruction period caused a new and greater dependence upon the fleecy staple. The main object of life was apparently to raise cotton. Neglect corn and meat... buy every essential thing, so as to have more hands for cotton production; this was the practice of the South. Let the agricultural organization degenerate and small farms replace the remarkably efficient plantation system, let the soil be worn out, let the people move to Texas for fresh lands, let disorder reign and the planters be driven to town, leaving the negroes to lapse back toward barbarism --let almost anything happen provided all possible cotton is produced each year (Phillips 1968b:76).

For Phillips it was the breakdown of the plantation as a single functioning unit into a number of small tenant farms that resulted in decreased production of both cash crops and food crops (Phillips 1968a). He also reported another aspect of the foodstuff problem. By 1880 the population of the cotton belt had increased considerably, but far less of the basic food (corn, meat, wheat, potatoes) was produced than in 1860. The Cotton South came to rely on the Northwest as the primary source of food (Phillips 1968b).

Other contemporary observers reported on the situation. In 1902 George Washington Carver wrote that "it is not unusual to see so-called farmers drive to town weekly with their wagons empty and return with them full of various kinds of produce that should have been raised on the farm"
(Carver 1902, cited in Fite 1979:9). Census reporters of the period often described tenants and croppers as having no bread for their tables and noted that blacks were worse off than they had been under slavery (Cowdrey 1983).

Much additional evidence indicates that in the postwar period, the South became less able to feed itself than it had been before the conflict. The established agricultural system reinforced a boom in cotton which retarded any diversification of crops (Cowdrey 1983). In antebellum Mississippi, for example, cotton had been the agricultural mainstay. It rapidly returned to that position in the postwar period. Food crops and livestock, the basic foodstuffs, were often ignored in an effort to grow more cotton (Kelley and Spillman 1976). These basic foodstuffs, including bacon, flour, and corn, were imported from Upper South or northern cities. There is some evidence to indicate the magnitude of such imports.

Robert Fogel, in arguing against Albert Fishlow's claim for pre-eminence of the Mississippi route in antebellum commodity flows from the West, presented actual and estimated shipping data from the postwar period. He noted that statistics collected by the southern Railway and Steamship Association for the year 1881-82 strongly indicate that the "overwhelming proportion of southern bound western
goods" were shipped via New York and Baltimore (Fogel 1969a:201). Coastal shipment records from Middle Atlantic ports for 1890 show a total of more than 2.5 million tons of south bound goods passing through New York, Baltimore and Philadelphia. Fogel provided an estimate of south bound goods passing through New York in 1872 as totaling over one million tons (1969b:218). These data clearly support the contention that southern farmers were buying food imported from the North and West.

Reformers of the period reacted by calling it economic stupidity when farmers bought basic food products which they could have raised themselves (Fite 1979).

Even had a farmer or sharecropper desired to adopt new and better agricultural methods or raise more food crops he faced many problems. First, creditors insisted that cotton be raised as a condition of their loans. Second, the majority of southern farmers had been so locked into cotton production that they did not have the skills necessary to raise other crops and livestock. Third, perhaps the most important factor, was a lack of access to the capital needed to change their farming practices. If by chance a farmer did have the desire and knowledge required to improve his operations, there was no source of credit to which a sharecropper might turn. There was no money with which he
might buy land, livestock, or machinery, nor for experiments with new crops. The postwar South desperately lacked banking facilities. Had they been available, sharecroppers and other poor farmers lacked adequate security for regular commercial loans. Their credit came from the merchant who bought their cotton. These local merchants were able to control not only the flow of trade but also the relative accessibility to and of credit. Credit was extended to sharecroppers and farmers at rates of 100 percent interest in some cases (Somers 1965). The merchants, through their control of credit, were able to dictate that farmers in their debt grow only cotton, since cotton could always be sold (Fite 1979; Marable 1979).

Another serious barrier to economic advancement for sharecroppers and farmers was illiteracy. Many of them, perhaps most, could not read and thus had no access to the information on improved farming techniques available through various agricultural journals and official government publications. Without the necessary knowledge even the desire, will, and money would not have helped (Fite 1979).

The condition of the farmers and sharecroppers was further worsened by the destruction during the war and in the early postwar years of their cattle and swine. This probably increased the incidence of malnutrition in the
South. There is little if any evidence that diseases associated with malnutrition existed in some parts of the antebellum South, Louisiana for example (Taylor 1980). The slave diet had consisted of a pork and cornbread base supplemented by beef, fish, game, and domestic and wild plant foods. The sharecroppers diet was limited in variety and nutritional value. Pork and cornbread still formed the basic diet but there was little supplementation with other foods. The pork eaten was generally commercially produced corn-fed pork which had a much higher fat content and less nutritional value than the typical range hog of the South. Reliance on this new source of pork resulted in a nutritionally poor diet which contributed directly to the increase of pellagra as well as making many people more susceptible to other nutrition deficiency diseases and other diseases in general (Taylor 1980; McDonald and McWhiney 1980).

There can be little doubt that in the postwar period much of the South was dependent upon extraregional sources of food. This would have been particularly true of the major plantation regions such as the coastal zones and the lower Mississippi Valley. As a result of the Civil War and the following period of reconstruction the South had been transformed from a virtually self-sufficient region to one of dependence in which the tenants and sharecroppers were
perhaps worse off than the antebellum slaves had been.
CHAPTER 4: LOUISIANA: AS IT WAS

The regional focus of this dissertation is considerably narrower than the South as a whole. My concern is with Louisiana and with certain aspects of the nineteenth century diet. Louisiana is not a microcosm of the South. In fact, Louisiana, in some ways, is not even part of the South. The northwestern and southwestern regions are more western than southern (W.P.A. 1941), and New Orleans is of course unique, not only in the South, but in the nation (Lewis 1976). The degree of self-sufficiency found in most of the antebellum South was not found in Louisiana.

Antebellum Period

Those studies which have analyzed antebellum food production results show that Louisiana was in a deficit position (Hilliard 1969b, 1972; Gallman 1970; Hutchinson and Williamson 1971). Several reasons can be given to explain either a neglect of food production or a deliberate decision to purchase supplies. A number of these derive from certain aspects of the function of the plantation. The plantation existed to produce wealth by growing a cash crop. Food self-sufficiency necessitated the diversion of time and labor from the cash crop into a distinct food crop effort. Reliable foodstuffs were available through merchants in port.
cities such as New Orleans. The planter could order food through the broker who handled his cash crops and accounts. Local food crop markets were poorly developed. This fact worked against plantation production of food crop surpluses as well as plantation purchases of locally produced foodstuffs. A pattern of absentee landlords resulted in overseer management of the plantation and, generally, overseers do not seem to have been efficient food crop production managers.

A factor not necessarily related to the plantation system was the ease with which pork could be obtained from external sources. Deficit parishes along the Mississippi River were largely a product of proximity to the river. Other Mississippi Valley plantations were located on or near navigable streams all of which acted as transportation arteries. Western or Upper South pork was easily and often cheaply obtained. Another important factor of the food deficit areas, such as southern Louisiana, was the role of urban places. Unable to produce their own food, cities like New Orleans had to rely on imports from elsewhere, generally out-of-state (Hilliard 1969b, 1972).

The deficit levels for Louisiana depend upon the figures used for annual slaughter rate and average consumption rate for pork. Hilliard and Hutchinson and
Williamson estimated these rates, but at different levels. Hilliard proposed a 50 percent annual harvest rate of the swine population and an average adult consumption rate of 150 pounds of pork (1969b, 1972). Hutchinson and Williamson used a slaughter rate of 66.7 percent and an adult male consumption rate of 180 pounds of pork per year. As a result, estimates for the potential pork supply and demand differ as do the negative residual figures as can be seen from Table 2. Hilliard's estimates tend to be substantially lower than those of Hutchinson and Williamson. In either case, several thousands tons of pork had to be obtained elsewhere every year.

Table 2. Potential Pork Production, Consumption and Residuals (1000s of tons).

<table>
<thead>
<tr>
<th>Year</th>
<th>Supply</th>
<th>Demand</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1840</td>
<td>11</td>
<td>21</td>
<td>-10</td>
</tr>
<tr>
<td>1850</td>
<td>21</td>
<td>31</td>
<td>-10</td>
</tr>
<tr>
<td>1860</td>
<td>22</td>
<td>43</td>
<td>-21</td>
</tr>
</tbody>
</table>

A. After Hilliard (1972:214, Table 15).

<table>
<thead>
<tr>
<th>Year</th>
<th>Supply</th>
<th>Demand</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1840</td>
<td>8.1</td>
<td>25.2</td>
<td>-17.1</td>
</tr>
<tr>
<td>1850</td>
<td>14.6</td>
<td>37.0</td>
<td>-22.6</td>
</tr>
<tr>
<td>1860</td>
<td>15.8</td>
<td>49.9</td>
<td>-34.1</td>
</tr>
</tbody>
</table>

B. After Hutchinson and Williamson (1971:605, Table 6).
Not all of Louisiana suffered from food production deficits, but the identification of specific regions depends upon the level and type of analysis of food production data. Hutchinson and Williamson (1971) apparently used state level data as the basis of their analysis. They are, thus, unable to specify what regions of Louisiana were in a deficit meat production state. A corn production analysis of a sample of about 5200 cotton country farms by Gallman (1970) was able to identify specific deficit farms on the Mississippi and Red rivers, but did not define deficit regions. Hilliard's (1969b, 1972) use of county level census data allowed him to define particular regions of the South that were deficit areas.

All of the deficit regions identified by Hilliard had low ratios of swine to people. In these deficit areas, the one common element was an alternate supply of meat. Thus the deficits did not cause any major hardships, even in Louisiana which never came close to meeting her estimated minimum pork consumption levels. For example, in 1840 the 323,000 swine present equated to a per capita adult consumer ratio of only 0.92, the ratio for the 597,000 swine existant in 1850 was 1.15, and based on 635,000 swine in 1860 the ratio was 0.90. Hilliard (1969b) has estimated that the break even level was 2.20 swine per adult consumer. It is clear that deficit regions in Louisiana relied on imported
Hilliard identified these deficit regions as the lowland parishes along the Mississippi River and the southern Louisiana parishes. In addition most of the parishes in eastern Louisiana suffered from pork deficits. Hilliard notes that the sugar parishes had relatively high populations which resulted in heavy demand. Andrew Durnford of St. Rosalie Plantation in Plaquemines Parish, for example, relied upon the market, probably New Orleans, for his main foodstuffs: corn, pork, and fish (Whitten 1984). New Orleans has been identified as a major contributor to Louisiana's pork deficit by Hilliard and by Hutchinson and Williamson. The latter note that if the population of New Orleans were removed, Louisiana would have been a surplus producer in 1840 and 1850, and the estimated deficit for 1860 would have been much smaller (Hutchinson and Williamson 1971).

Louisiana provided the major southern market for extraregional pork. Though some imported pork was reshipped up river the urban population of New Orleans was the major consumer: 12,000 tons in 1840, 24,000 tons in 1850, and about 36,000 tons by 1860. This of course was only part of the pork shipped annually into the Crescent City. There were, in fact, four main beneficiaries of New Orleans pork:
1) the city's urban population; 2) inhabitants of Louisiana outside of New Orleans, including planters, in which case pork that had moved into the city was sold to consumers upriver or located on the streams and bayous of lower Louisiana; 3) the crews and passengers of the ships and steamboats that plied the port of New Orleans; 4) plantations and towns on the Mississippi and its tributaries in the state of Mississippi (Hilliard 1969b).

Pork was not the only food commodity to flow into New Orleans. Imports of corn, beef, and wheat were also large. Much of the commercial output, including foodstuffs, of the entire Mississippi-Ohio-Missouri-Tennessee drainage basin funneled through New Orleans. Some of the food commodities were exported almost as fast as they arrived, while much of the rest went to fill the hungry stomachs of the South. It is quite likely that a portion lay on the docks or in warehouses to spoil. Although considerable quantities of corn and meal was shipped into New Orleans, the immense crops produced elsewhere in the South usually limited the regional demand. New Orleans and other urban centers of the Gulf Coast consumed fair amounts, but the trade was generally less important than that of wheat and flour, which was quite erratic. The amounts of these products received annually fluctuated widely but the general trend was upward. The beef shipped down river into New Orleans
appears to have gone primarily to fill the demand of the city and of ships and steamboats needing provisions. Little was left for resale to planters of Louisiana or of Mississippi (Hilliard 1975). Evidence of the demand in New Orleans is seen in the faunal analysis sections of archaeological reports of projects conducted in and around the city (Castille et al. 1982, 1986; Gobalet 1986; Reitz 1984b; Reitz and Ruff 1982; Ruff and Reitz 1984).

There is little doubt that some antebellum Louisiana planters preferred to purchase rather than raise their foodstuffs. Those planters that relied on extraregional food sources appear to have made a deliberate decision, which once made, was followed with fair regularity.

**Postwar Period**

Louisiana was hard hit during the war. Even though the Mississippi Valley and South Louisiana had fallen under federal control in 1863, the countryside suffered from war-time depredations. Food and livestock were commonly commandeered by the armies. Confederate and Union troops alike ransacked and pillaged the countryside. In 1863 the Teche Country was stripped by the Army of General Banks (Shugg 1939). The Natchez District (comprised of Madison,
Tensas, and Concordia Parishes in Louisiana and Warren, Claiborne, Jefferson, Adams, and Wilkinson counties in Mississippi) suffered raids from several sides. In April 1863, for example, Union troops confiscated livestock, grain and garden crops from Ion Plantation. Several plantation buildings were burned at that time, and the mansion house was burned by Union troops in September 1864. During that year Union troops also made foraging raids into southwest Mississippi and eastern Louisiana from their base at Natchez (Wayne 1983).

General pillaging in the district continued into the fall of 1865. During the last two years of the war Confederate troops conducted raids on the plantations of Union sympathizers and Yankee lessees. In the vicinity of Vicksburg lessees were forced to abandoned over one-third of the land rented during 1864-65. In many cases, military raids were accompanied by looting, about which little could be done (Shugg 1939; Wayne 1983). There was yet another group active in the appropriation of planter property. Freedmen were reported to have stolen horses and other stock from the plantations of their former owners (Wayne 1983). Planters were not the only ones to suffer. By the end of the war farmers and planters, rich and poor, had lost over fifty percent of the horses, mules, hogs, cattle, and sheep they had owned in 1860 (Shugg 1939).
The effects of the Civil War and the several periods of reconstruction that followed can be briefly described with reference to different groups. In the late 1860s the planters were, for a time, prostrate and their plantations were in ruins. The land was almost worthless due to loss of slaves essential for cultivation and the war-time destruction of the levees. As Roger Shugg wrote: Louisiana "emerged from the Civil War with less than half of its former wealth" (1939:194). About two-thirds of that loss was caused by the abolition of slavery, which cost the state over one-third of its assessed wealth. In the black belt parishes of the Mississippi River bottoms the blow was particularly severe because slaves had exceeded all other property in value. Emancipation removed a major part of the planter's assets that could have functioned as security for a loan (Shugg 1939).

After the war, the major needs of the planters were to repair the land, organize a system of labor, and, perhaps most importantly, establish credit to replace the capital that had been lost. By the mid 1870s debt was the central problem facing most planters. Whereas it had previously been a convenience of business, it became a necessity of life. As a result property was often mortaged at between fifty and twenty-five percent of its actual value, when
money was even available (Wayne 1983). There was a severe lack of capital in New Orleans, as well as poor banking facilities. There were no banking accommodations worthy of the name in the hill country of the Louisiana-Mississippi border or in many other district of the latter state (Somers 1965).

Some planters, unable to mortage their property, were driven to more desperate straits and had to resort to selling portions of their lands. In the Natchez District, and elsewhere most likely, a significant number of planters were forced to forfeit their land for nonpayment of taxes during the mid 1870s. For some this was a blessing in disguise. They were able to save their land in the long run by having friends buy it at low prices at public auction. The original owner was later able to buy it back at a reduced price (Wayne 1983). The plantation system in Louisiana did survive. More than that, it actually expanded after the war. Between 1860 and 1880 the number of plantations in the state nearly tripled. This multiplication was accompanied by an increase in tenancy and absentee ownership (Shugg 1939).

In contrast, the number of farms in Louisiana shows a decrease between 1860 and 1880. This reflects a sharp drop in numbers up to 1873. It was followed by an increase to
only slightly less than the prewar level, though tenancy spread faster than ownership. While the war may have taken greater toll of farmers than planters, farmers survived reconstruction better than did the planters. It was easier for many farmers to rebuild. They very often had no levees to repair and did not require large high interest loans (Shugg 1939).

After the war, nests of small landholdings continued to operate, interspersed among the large plantations. In the Sugar parishes, for example, many farms continued in operation and to interact with the plantations. Small amounts of cane were grown and sold to the large landholders. More importantly, a great deal of foodstuffs moved from the farms to the plantations. In Iberville Parish many small Cajun farmers planted from five to twenty acres, about twenty percent seeded in cane, the rest in corn and sweet potatoes. Throughout the southwestern parishes farmers maintained a diversity of crops. Though they may have specialized in rice as a staple, they never gave up all of their self-sufficiency. In areas of abundant timber and less fertile soils, the Florida parishes, southwestern pine flats, and some northern uplands, farmers often turned to commercial lumbering. But they did not give up raising their own food crops. The piney woods farmer was generally better off after the war than was the planter. He lacked
the latter's major expenses of levee repair, high interest loans, and costly labor. His small cotton crop, worked by himself, returned proportionally more cash than the planter received for his larger crop. The piney woods farmer maintained his prewar self-sufficient ways, producing most of the food his family required. In essence he remained a backwoodsman who tilled the soil (Shugg 1939).

As noted previously, in much of the Antebellum South cotton had been the agricultural mainstay. It rapidly regained that position after the war with the result that some cotton farmers ignored the basic foodstuffs in order to grow more cotton (Kelley and Spillman 1976). In Louisiana's upland cotton parishes the farmers split into two groups, the cotton farmers and the self-sufficient farmers. The latter concentrated on raising foodstuffs and, perhaps, a little cotton, while the former increasingly emphasized cotton and planted fewer and fewer food crops. Although the majority of both groups were poor, those who failed to grow a diversity of crops were the poorest (Shugg 1939). It was this latter group that would eventually lose their land and be caught in the sharecropping trap.

The group that likely suffered the most, particularly in terms of disappointment was the freedmen. After the war the average black family in Louisiana was quite possibly
worse off in terms of clothing, shelter and food than it had been in the antebellum period. There is, for example, little if any evidence that diseases associated with malnutrition existed in the state in the prewar period. The slave diet had consisted of a pork and cornbread base, but it had been supplemented by beef, fish, game, and fruits and vegetables. The postwar diet consisted of a fattier, less nutritious pork and cornbread, which resulted in a high incidence of nutritionally based or related diseases (Taylor 1980). This was particularly true for the freedmen in the cotton parishes where sharecropping and tenancy dominated. Caught in the trap of peonage, these freedmen never had a chance. They never received the "40 acres and a mule" they had been promised. They were forced to raise cotton at the expense of food crops. And, though they may have perceived that they were less controlled by the landlord than they had been by their antebellum masters, that was not the reality of their situation. The freedmen in the sugar parishes, where gang-labor predominated may have been somewhat better off simply because sugarcane production was not really amenable to the share-labor system. Thus its evils were avoided (Shugg 1939; Taylor 1980).

In summary, the evidence clearly indicates that throughout the nineteenth century parts of Louisiana were never self-sufficient. In the antebellum period this was
particularly true of the large plantations of the Mississippi River parishes and much of South Louisiana. There is no evidence to suggest any change in this pattern in the postwar period. It is more likely that areas of the state that had been self-sufficient in antebellum times became less so in the aftermath of the war and reconstruction. Even in those areas where some self-sufficiency was maintained, it appears to have been primarily in food crops and not necessarily in livestock. With over fifty percent of the state's livestock being lost by the end of the war, a much greater reliance on other meat sources must have developed.

Most of the research reviewed above has concentrated on self-sufficiency in terms of either grain or livestock supplies, with the exception of Hilliard's (1972) analysis of the full range of southern food sources. And even those studies that emphasize the production of grains, mainly corn, recognize its main function as swine and cattle feed. In turn, the primary emphasis in discussion of livestock production has centered on pork with cattle seen as an ancillary product. Thus Hutchinson and Williamson (1971) have argued that some livestock, such as chicken and mutton, were not important food sources. The measure of self-sufficiency for the South then comes down to the per capita production ratios of pork. The deficits in pork
supplies noted for Antebellum Louisiana by Hutchinson and Williamson (1971) and by Hilliard (1969b, 1972) are thought to be compensated for by the importation of extra-regional pork and beef. While there is no doubt that extra-regional sources were important in supplying the needs of meat deficit areas, particularly New Orleans, another source of meat foodstuffs has generally been ignored.

Hilliard (1972), while emphasizing the importance of domestic livestock, particularly pork, in the southern diet, does allow that wildgame and fisheries were an important source of food in the early frontier days. Though never specifically stated, the implication is left by Hilliard that the passing of the frontier led to greater reliance on domestic meat sources throughout the South. And more by implication than by statement, the frontier in Louisiana seems to pass with the development of the cotton economy. This may have been true for the cotton and sugar plantation areas and even for those yeomen farmers emphasizing cotton cultivation. But throughout much of Louisiana there were small farmers who did not partake of the staple cash crop pattern. Rather, they grew small amounts of cotton, cane or rice while emphasizing food crop production, or planted small gardens while they let their cash crop, cattle and hogs, run loose in the woods. For many of these Louisianians and for parts of Louisiana outside the cotton
and sugar parishes, the frontier lasted through the Civil War and beyond. For many of them, their meat came from their abilities with gun, trap and fish line, not from domestic hogs or cattle.
CHAPTER 5: HUNTING AND FISHING TRADITIONS

As indicated in previous chapters, most scholars who write about the food habits of the South or the problems of self-sufficiency in the region have concentrated on and emphasized the importance of pork and corn. With few exceptions, the consumption of wild game and fish has only been mentioned in passing and thus depicted as incidental. Though pork was a cherished part of the southern diet, several authors indicated that game and seafood were widely consumed. Shingleton (1972) noted that the contemporary sporting literature and travelers' accounts indicate that the South may have been a land of venison and wild fowl rather than a land of hogmeat. Southerners, including Louisianians, delighted in the hunt. It was one of the more popular sports in the antebellum period. For some it was a leisure and social activity, but for many others hunting was a necessary activity that provided meat for the diet. Hunting was a male pastime. Some men lived for the freedom and exhilaration of the chase, but for most hunting and fishing was a necessary adjunct to farming or herding. Well into the nineteenth century and beyond, southerners continued to eat game. The larger animals came to the table less often as their numbers decreased, but this deficit could be made up from the increasing numbers of farm game.
animals. Fishing was also an important source of food, and, in this case, the quarry does not appear to have suffered any significant depletion until well into the twentieth century. One influential factor in the importance of fish as a food source was the early pattern of settlement along rivers, streams, bayous, and lakes. Fish were so plentiful and easily taken that women were able to catch them in their spare time. The so-called "universal pastimes" of hunting and fishing were enjoyed by all levels of society and both races. Whites and blacks both hunted and fished enthusiastically when time permitted (Hatfield 1933; Suarez 1954; Padgett 1963; Shingleton 1972; Bruce 1977; Rohrbough 1978; Taylor 1982; McWhiney 1988).

The tradition of "rights to hunt and fish" began early in the settlement of the Atlantic coast region. By the late seventeenth century colonists in the Carolinas had developed a point of view that defended free access to wild game.

Here prosperity hath a large Scope, there being no strict laws to bind over Privileges. A Quest after Game being as freely and peremptorily enjoyed by the meanest Planter [settler] as he that is highest in Dignity, or wealthiest in the Province. Deer and other Game that are naturally wild, being not immured or preserved within Boundaries, to satisfy the Appetite of the Rich alone. A poor Laborer that is Master of his Gun, etc., hath as good a claim to have continued Coarse of Delicacies crowded upon his Table, as he that is Master of a Great Purse (Lawson, History of North Carolina, cited in Cowdrey 1983:50).
This concept of the freedom of the forest, the freedom of
the hunt, continued through the succeeding centuries. In
the mid 1800s Elliot, writing about the Carolinas, stated

The right to hunt wild animals is held by the
great body of the people, whether land holders or
otherwise, as one of their franchises; which they
will indulge in at discretion; and to all possible
limitations on which, they submit with the worst
possible grace!" (1859:285-86).

Hunting was so prevalent in this region that Elliot also
noted that game was being destroyed at an alarming rate, and
that the "manly pastime" of hunting might not be possible in
another generation (Elliot 1859). The prevailing attitude is
further emphasized by the fact that juries generally were
very benevolent toward poachers. The widely held opinion of
the day was that the people's right to hunt could not be
curtailed even if it meant trespassing on another's property
(Shingleton 1972).

The quest for wild game and fish has remained an
important element of the southern lifestyle to the present
day. A mail survey conducted by the Louisiana Department of
Wildlife and Fisheries in 1984-85 provided estimates of the
numbers of hunters and the numbers of hunting trips made
(Table 3). The Department estimated the annual kill of some
game animals to be 130,000 deer, 3.5 million squirrels, and
1.5 million rabbits. A 1985-86 survey indicated 400,000
quail taken, approximately 6,500 turkeys harvested, over 2
million doves, 1.2 million ducks, 92,000 geese, and 263,000 woodcock taken as well.

Table 3. Estimated Number of Hunters and Total Hunting Trips Made, by Species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Estimated No. Hunters</th>
<th>Total Hunting Trips Made</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer</td>
<td>198,000</td>
<td>2,655,000</td>
</tr>
<tr>
<td>Squirrel</td>
<td>237,000</td>
<td>2,220,000</td>
</tr>
<tr>
<td>Rabbit</td>
<td>157,000</td>
<td>800,000</td>
</tr>
<tr>
<td>Bobwhite</td>
<td>32,000</td>
<td>220,000</td>
</tr>
<tr>
<td>Dove</td>
<td>114,000</td>
<td>800,000</td>
</tr>
<tr>
<td>Waterfowl (Ducks, Geese, Coots)</td>
<td>131,000</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Turkey</td>
<td>15,600</td>
<td>118,000</td>
</tr>
<tr>
<td>Gallinule</td>
<td>4,300</td>
<td>20,000</td>
</tr>
<tr>
<td>Rail</td>
<td>7,400</td>
<td>35,000</td>
</tr>
<tr>
<td>Snipe</td>
<td>21,800</td>
<td>200,000</td>
</tr>
<tr>
<td>Woodcock</td>
<td>50,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Raccoon</td>
<td>41,000</td>
<td>800,000</td>
</tr>
<tr>
<td>Fox</td>
<td>10,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Bobcat</td>
<td>5,200</td>
<td>50,000</td>
</tr>
</tbody>
</table>

Estimates are based on 1984-85 mail survey by Louisiana Department of Wildlife and Fisheries and National Hunting and Fishing Survey 1980 (Calhoun and Dore 1988). With regard to fishing, it is estimated that more than one million Louisianians take part. Over 410,000 sportsfishing licenses were sold in 1978-79 and this was thought to reflect only about one half of the state's sportsfishermen (Louisiana Department of Wildlife and Fisheries [LDWF] 1980). Fishing activities include fresh and salt water finfishing, sport crawfishing in which the average person participates 0.49 times during the summer,
sport frogging, sport shrimping and crabbing, as well as sport oystering. There are no figures available on the catches of any of these activities (Calhoun and Dore 1988).

Twentieth century studies of Louisiana food habits reveal a continued reliance on wild game and fisheries resources. Wild game consumed in Evangeline Parish include squirrel, duck, rabbit, quail, dove, and deer, much of which was killed by a family member (Fontenot 1980). A wide variety of marine and freshwater fishery resources continue to be consumed. Salt water varieties include flounder (sole), red fish, red snapper, stingray, and tarpon. Coastal waters supply crabs, shrimp, crawfish, oysters, white and speckled trout, sheepshead, red fish, Spanish mackerel, and pompano. Freshwater lakes and streams provide bream, croaker, gaspergou, freshwater drum and sheepshead, eels, sunfish, a variety of bass, turtles, catfish, and gar. While some of these are caught, much of the fish is bought (Hatfield 1933; Fournet 1939; Fontenot 1980).

This modern preoccupation with wild game and fish must have historical precedents not only in Louisiana but in the South as a whole, and not just in terms of sport. The modern taste for wild food resources also reflects similar tastes in the past. People do not change their food habits without substantial reason; "men eat what they can get from
the environment....given a choice they eat what their ancestors have eaten before them" (Jacques May, quoted in Lowenberg et al. 1974:119). As Hilliard has noted "many elements of the southern diet persisted throughout the nineteenth and well into the twentieth century" (1969a:13). This statement should apply to 'possum and catfish as well as pork, chicken, and corn bread. In the Atchafalaya Basin hunting has always been an important activity providing the local inhabitants with a substantial part of their diet. As recently as the late 1930s game provided the staple dish at two of the daily meals during the hunting season (Comeaux 1969).

The historical consumers of wild game and fisheries resources can be divided into several groups: 1) the frontier settlers who depended on these resources for survival, 2) the planters, for whom hunting was often a social event, 3) the small planters and farmers, or plain folk, for whom hunting may have been a sport, but who also consumed the kill, 4) the herdsmen/hunters of the Piney Hills and marginal agricultural regions, who obtained much (possibly most) of their food from nature, 5) the squatters/poor whites, who, like the frontier settlers, often depended on fishing and hunting for survival, 6) the blacks, both antebellum slaves and postbellum tenants and sharecroppers, for whom wild game and fish may have been a
primary source of protein, and 7) the town folk, who often
had only to walk a short distance from the door to hunt or
fish in a near pristine wilderness, and for whom market
hunters and fishermen provided a steady supply of nature’s
bounty. The relationships of each of these groups to
hunting and fishing will be explored briefly.

Frontier Settlers

The early pioneer settlers who moved westward and
southwestward from the Appalachians were relatively
independent. The first settlers on the frontier had no
choice but to depend on game and fish for subsistence until
they had cleared a patch of ground and planted some crops.
Few of these early settlers cultivated gardens or
vegetables, relying instead on corn meal bread, pork and
wild game. Considering the abundance of game during the
pioneer period, there was no lack of food although the
variety might have been limited. Reportedly, the early
settlers much preferred buffalo to other meats (Taylor
1982), but the woods bison was never overly abundant east of
the Mississippi. Partially as a result of this, the black
bear played an important role in the frontier economy. The
limited supply of bison meant that until a settler could
establish his hogs, bear fat was almost the only source of
grease for cooking. Although hungry people would kill a bear anytime they could, fall kills were preferred because at that time the bears were fat. Venison, however, became the staple diet when the buffalo were gone. When bread was not available, the breast of wild turkey often served as a substitute (Creecy 1860; Dick 1948; Hilliard 1972; Taylor 1982).

The heavy dependence on wild game and fish resources that existed during the early frontier period declined rapidly in those areas where agriculture became dominant. As farm production increased a shift from wild foods to farm produced foods occurred. For most people this transition from wild to domestic foods was rather gradual. The early dependence lessened as farms produced and as the larger game animals diminished in number. The decrease in the supply of the larger game animals was concomitant with increasing settlement densities. Still, in many parts of the South, large game such as deer were taken in large numbers for food on the eve of the Civil War. The major changes in diet occurred in the more densely settled parts of the South. Most farmers and planters retained some frontier eating habits and took game, fish and gathered foods from the still existant large areas of unimproved land. The amount of unsettled land throughout the South supports the axiom of historians of the region that much of the South was still
frontier at the outbreak of the Civil War (Hilliard 1972; Taylor 1982).

This was particularly the case in the Old Southwest. As Gerstaecker wrote "The western settlers, and particularly those in the south-western states, are not very fond of hard work; in those wild regions they prefer cattle raising and shooting, to agriculture" (1855:130). A somewhat biased statement, perhaps, but it does suggest the frontier status of the region. While people settling north and south of the Ohio River in the 1820s moved aggressively to pursue commercial agriculture, people in Arkansas hunted, trapped and grazed livestock. They generally pursued an existence that was lonely and solitary; one consistent with their remote frontier location (Rohrbough 1978). In Texas Anglo-American settlers lived off a plentiful supply of wild plants and animals on first arrival. In regions like the Red River country hunting proved easy due to the abundant supply of game. Young Andrew Davis, for example, was able to keep the larder supplied with bear meat and venison armed only with a light Choctaw rifle. Texas became famous for its game animals and men hunted to feed their families or to barter or sell. Hunting was a major pleasure of the frontier life. A successful day's hunt, alone or with friends, provided food for the hunter's table and often for the neighbor's as well (Doughty 1983, 1987).
Louisiana was particularly blessed, not only with resident game but also migratory fowl and the fishery resources. The state, more so than any other southern state, had numerous freshwater streams and lakes and thus an abundance of freshwater fish. The coastal marshes and inshore waters provided easy access to brackish and salt water fisheries. The early French settlers in Louisiana introduced the eating of crawfish, frogs (both legs and body), turtles, and the clam *Rangia cuneata*, which Comeaux referred to as a mussel (Comeaux 1969). Of these only the clam seems to have been dropped from the diet in South Louisiana. With the exception of New Orleans, Louisiana developed a primarily agricultural population that was accustomed to providing part of its subsistence from the land, nearby lakes and streams, and the sea (Padgett 1963). Much of Louisiana, particularly in the central and coastal regions remained what Owsley has called an interior frontier through the postbellum period and into the early twentieth century. For example, in the Cajun Parishes of St. Martin, Iberian, Evangeline, and Acadia the bayous remained the major transportation routes until early in the twentieth century. There were no state highway projects in the region prior to 1915 (Hodges 1972). The inhabitants of these interior frontier regions will be discussed in following sections.
Planters

Hunting was very popular with southern planters who often participated in single day or week long camp hunts. While many Southerners hunted out of necessity, planters often felt that gathering meat was the least important aspect of the hunt. For many members of planter society proper hunting was related to social class. The network of social ties that developed in planter society was reflected in a connection between hunting and privilege. The hunt, for most, was a social occasion and was patterned after a general image of aristocracy. In addition many southern sportsmen valued the camaraderie of the hunt as well as the status (Shingleton 1972; Bruce 1977).

Most southern sportsmen believed that to kill an animal with any practical intent was extremely detrimental to good hunting. Hunting for food, it was thought, inevitably led to killing for quantity using any means. Such behavior was contrary to the "spice of chivalry" that every sports hunter should have. The hunt always took precedence over the meat. William Elliot claimed that the worst use one could make of his game was to eat it himself (Bruce 1977:262). Thus for most southern planters, the point of the hunt was
not simply to kill animals. What was valued was the process of the hunt which produced a sense of belonging to nature. The rejection of purely practical hunting clearly represents an elitist attitude, since it was something that only an elite could afford to do (Bruce 1977). Likely because of this attitude, elite planters are thought to have been the group least involved in incessant hunting. Their overseers, however, apparently took advantage of the proprietors' absences too hunt with little control. Some overseers even refused to accept a position that restricted their hunting rights (Shingleton 1972).

In the lower Mississippi Valley hunting and fishing were important activities among the planters. William Sparks (1882) noted that in western Mississippi the chase for the fox and the deer pervaded the higher social classes and that squirrel hunts were fairly common at plantations around Natchez. Thomas Dabney, a Mississippi planter from Hinds county, for several years participated in two week long camp hunts. Dabney was devoted to hunting and fishing, and always took his rifle along whenever he rode through his fields. In an 1852 letter to his son Charles, Dabney wrote "We had a fair hunt under the circumstances, having killed sixty-seven deer. I think they obviously diminish each year" (Smedes 1981:135-36). French planters in Louisiana maintained among "their ancient amusements" the hunting of a
variety of game. Included in their techniques was night-time jack-lighting or fire-pan hunting (Davis 1936; Flint 1968). Hunting among Louisiana planters was not just for amusement or social comraderie. Timothy Flint wrote that while visiting a plantation on Bayou Rapides between Alexandria and Natchitoches "We had for supper, duck-pies, coffee, and claret. In the morning duck-pies, milk, custards, coffee, and claret" (1968:264).

Many Louisiana planters engaged in hunting or fishing on a fairly regular basis. An examination of plantation records, diaries and letters does not indicate any aversion to eating the results of the hunt. Many of the hunting and fishing parties appear to have been primarily individual or family affairs (DeClouet Papers; Ker Family Papers; Purvis Family Papers). Other collections contain some reference to hunting or fishing expeditions with a small group of neighbors or as a large social affair (Spyker diary; DeClouet Papers; Conner Family Papers). One West Feliciana planter, Bennet H. Barrow, kept a fairly detailed diary of his activities between 1830 and 1850. During the period 1837 to 1845 he recorded 202 hunting or fishing trips, ranging from a low of eleven in 1837 to a high of 36 in 1838. Most of the hunts were for deer, but other prey was taken as well: wild turkey, fox, wildcat, bear, duck, woodcock, alligator, geese, rabbit, and pigeon. Barrow seldom
identified the fish caught although he does mention trout, perch, buffalo fish, and bar fish (Davis 1936).

While much of this antebellum activity was for the individual or social enjoyment of the hunt, in the postbellum period some planters record the need for the hunt to put food on the table. For example, Isaac Erwin, a planter who lived on Gross Tete in Iberville Parish, wrote in his diary on June 10, 1867: "we live very poor having onely very little Meat and no flour I have to hunt for Meat to Morrow if Kind Providence spares me." And on June 18, 1868 he wrote: "I am compelled to hunt to get Meat to eat. having nothing else to depend on" (Erwin Diary 1866-68). Another example is recorded in a letter from Louis A. Bringier Jr. of Houmas Plantation in Ascension Parish to his brother Brouse: "charley went out hunting yesterday in the Brule and Killed two deer, and this morning he Killed another, so your see we cannot starve as long as charley is supplied with powder and buck-Shot" (Bringier Papers, letter, Oct. 30, 1884).

Not all Louisiana planters recorded hunting or fishing activities in their journals, diaries or correspondence. However, the annual statements from their brokers in New Orleans record the purchase of bags of shot, kegs of powder, the occasional gun, fish hooks, and fish line (Stirling
Family Papers; Palfrey Papers). Thus, even though these activities were not always recorded, the evidence clearly supports the importance of the quest for wild game and fish as a food source as well as a leisure activity throughout the nineteenth century.

Plain Folk

It must be noted here that in many ways the next three categories of consumers (plain folk, herdsmen/hunters, and poor whites/squatters) tend to blend together with reference to their dependence on wild game and fisheries resources. Descriptions of the subsistence patterns of yeoman farmers are not much different from those of the herdsmen or poor whites in many cases. To some extent this may be due to the fact that the larger, more agricultural oriented farmers appear not to have been adequately described in the contemporary literature. Understandably, they may not have impressed travelers as much as the planters, poor whites, and herdsmen appear to have done. We can only surmise that, as Hilliard (1972) suggested, as their farms became more productive, their reliance on wild game and fish declined. Whereas for those small farmers and other inhabitants of agriculturally marginal regions, the reliance on these resources remained a subsistence necessity.
The "plain folk" as used here corresponds generally with what has also been called the midlands backwoods culture (Jordan 1986) and the Upland South culture (Newton 1974; Otto 1985). A major trait of this group was a strong dependence on hunting, fishing and the gathering of wild plant foods. This dependence is evidenced in various travelers' reports. In fact, the backwoods plain folk depended more upon the wild than upon the farm, particularly for meat. These people generally inhabited piney woods regions where soils were often poor but where wild game of all kinds was abundant. The average small farmer was a skilled marksman and fisherman. Hunting and fishing afforded healthy recreation for the men and boys while amply supplying the table with food. It was out in the woods with his rifle or rod that this farmer-hunter was truly in his element. Some even sold venison in the markets of nearby towns. The fruits of the hunt were standard fare at backwoods social gatherings. At log-rollings the host provided supper which often include a dish called burgoo or burgoo. This was a pot pie consisting of a mixture of vegetable and an assortment of wild meats such as squirrel, turkey and venison. House warmings and weddings were also celebrated with feasts composed primarily of wild game (Dick 1948). Hunting and fishing remained integral parts of plain folk culture through the nineteenth century and the food
provided by these activities was never totally supplanted by pork or beef, though these may have become more important late in the period (Welsh 1901; Weaver 1945; Dick 1948; Eaton 1949; Hilliard 1972; Jordan 1986).

**Herdsmen/Hunters**

Throughout much of the piney woods region west of the Appalachians no navigable streams ran and no railroad penetrated. This area remained frontier territory until well after Appomattox. Large portions of this region had remained public domain until after the Civil War. It was an area that was bountifully stocked with game and where the sparse settlers grazed livestock as their chief means of livelihood (Owsley 1969; Taylor 1982).

The herdsmen/hunters were among the first people to move west and occupy the available public lands between 1800 and 1860. The Southern settlement pattern consisted of two main waves, the first of which was the herdsmen who wished land on which to graze their livestock, hunt, and raise a small truck garden. The second major wave consisted of agriculturalists seeking good arable land. The herdsmen pioneered such land since it made for good pastures as well as good cropland. As the agriculturalist moved in the
herdsmen were forced out. They either had to settle as farmers to remain or to withdraw to a new frontier to maintain their way of life. This pattern was endlessly repeated throughout the South into the late nineteenth century. By the 1840s farmers had settled in such numbers that the herdsmen were being forced into the mountainous regions or the piney woods. There they found sanctuary from the pursuing farmers (Dwsley 1949; 1969).

The herdsmen were a major element of the settlement of the South. For the century preceding the Civil War they were the typical pioneers, but they were not all the same. These pioneer herdsmen can be divided into two classes. The first were the true pioneers, the "cutting edge" of settlement. They settled where game was plentiful. Their primary occupations were hunting and trapping; livestock grazing was a secondary activity. These were the least settled ones, constantly moving in search of better pastures and more game. The second class made up the main body of the pioneers. They were genuine herdsmen for whom hunting and trapping were secondary though necessary activities. They settled in zones of unsurveyed lands that were a reasonably safe distance from the unsettled Indian borders. Even this group moved from frontier to frontier in response to increasing pressure from agricultural settlers. Eventually, only the piney woods and mountainous areas were left open to
Herdsmen/hunters had appeared in Louisiana and Mississippi by the first decade of the nineteenth century. Timothy Flint (1968) described the inhabitants of West Florida as poor, indolent, and devoted to raising livestock, hunting and drinking whiskey. John Claiborne (1906), in his record of a trip though the piney woods of Mississippi, noted that many of the men spent their days in the woods herding cattle or hunting the abundant deer, some of which likely ended up on the tables of country taverns. The pine forests of the river counties of Mississippi contained an abundance of deer and the canebrakes were full of bear. The herdsmen of the region combined the pursuits of hunting and stock raising, which provided most of their support. William Sparks described the children as running wild "hallooing and yelling in pursuit of rabbits and opossums" (1882:332). Similar patterns of herdsmen lifestyle existed also in Louisiana, though they appear to be little documented (Shugg 1939).

Squatters/Poor Whites

In the general settlement pattern of the South, the herdsmen were not always followed immediately by the
agriculturalists. In some cases another group preceded the farmers. These people have been referred to in the literature as squatters. In general, their lifestyle parallels that of the herdsmen but without the livestock. These temporary settlers depended primarily on the bounty of the wild for their subsistence. These were the first crude homemakers. Agriculturalists in a small way, they detested the plow and loved the free life of the hunter. As population increased and the range was partially subdued, hunting became precarious and the squatter would sell out his rights and move on to a new frontier where there were few if any people and the game abounded. Most of the squatter's energy and activity was directed toward hunting. These people tried to be self-sufficient with a rude tillage supplemented by hunting and fishing. They sometimes raised poultry, but generally there were more than enough wild fowl to fill their needs (Peck 1837; Weaver 1945; Dick 1948; McWhiney 1986).

The "poor whites" are a rather diverse category, a catch-all for groups that do not fit neatly into the other classes of consumers. They include those called "poor white trash" but also some piney woods dwellers, country Creoles, Cajuns, as well as Islenos from the Canary Islands. What they all have in common is that they were poor. One of the first of these to appear were the Cajuns. When Americans
began moving into South Louisiana they bought out the better lands along the rivers and bayous. Many displaced Cajun farmers, rather than resettling in the same areas on less productive lands, withdrew into the cypress swamps of the Atchafalaya and other basins and built new homes on the high ground. In the swamps the Cajuns developed into skilled hunters and trappers. Their diet was based on staples such as crab, fish, crawfish, supplemented by shrimp, bullfrog, and wild fowl (Shugg 1939; Comeaux 1969). In the 1870s poor Creoles in Lafourche were subsisting on rice, fish, and wild fowl; and for the swamp Cajuns of Bayou Jesse in the Attakapas marsh, their food was game and fish (Shugg 1939). Another group that settled in a similar environment were the Islenos, Spaniards from the Canary Islands. In the Terre-aux-Boeufs between Lakes Lery and Borgne they lived by hunting and fishing (Crete 1981).

By the beginning of the Civil War, all the good agricultural land in Louisiana had been claimed and the poorer people were being confined to the less desirable regions, the gulf coast marshes and the piney woods. In the northern uplands of Jackson, Bienville, Claiborne, and Bossier Parishes many nonslaveholders lived more by the gun than the plow. And in the piney woods around Natchitoches and Shreveport a countless number of emigrants settled in the forest. There they built log cabins and lived by
hunting and fishing. In the Winn Parish area on the eve of the Civil War settlers were opening a new frontier. The abundant natural resources, timber, fish, game, and furs, provided an alternative to commercial and subsistence agriculture (Shugg 1939).

An 1861 discussion of "Poor White Trash" in the pine barrens reported

They despise labor because it is wearisome, and their repugnance of it is only conquered by a fine prospect of shooting deer.... The boundless forest of pine and natural lawns are his parks and their game his quarry. ...along these [streams] he spends his days catching trout or stalking for deer (DeBow's Review 1861:367).

Although derogatory and biased, this quote is descriptive of the activities of those who preferred hunting to farming, a basic colonial-early American frontier lifestyle. Similar patterns of existence continued in the Big Thicket of East Texas and in parts of Louisiana well into the twentieth century (Taylor 1982).

**Blacks/Slaves**

It is not possible to discuss slaves' access to wild resources without considering the activities of their owners. As noted above, hunting and fishing were popular activities among the planters, sometimes more for the social
comraderie than for the quarry. In many parts of the south slaves ate whatever the masters ate, though the slaves' portions may have been the less desirable parts. Where fish and game were abundant both masters and slaves participated in the activities of hunting and fishing. Many planters encouraged their blacks to hunt or trap those animals that preyed on domestic livestock or farm crops. Night time hunts for raccoons or opossums, which provided both hides and flesh, did not interfere with the daily work routine. When work was not pressing, particularly during the summer, entire slave forces were occasionally given a day off to go fishing (Riley 1909). It is likely that one of the most cherished privileges the slaves enjoyed was hunting. In coastal regions of the South fish and shellfish were an important part of the diet. On many plantations there were slaves whose primary duties in the summer and fall were to keep the big house, and likely the quarters, supplied with fish. One South Carolina planter generally supplied his labor force with an abundance of fish on a weekly basis. Some slaves became expert hunters and had the responsibility for providing game for the plantation (Weaver 1945; Dick 1948; Shingleton 1972; Taylor 1982).

Of all the consumer groups discussed here, wild game and fishery resources were probably most important for the slaves. The standard slave ration of pork and cornmeal,
while providing adequate caloric levels, was seriously deficient in most nutritional requirements (Whelan 1983). As Taylor (1980) has suggested the lack or minimal incidence of nutritional diseases among slaves in antebellum Louisiana is a strong indicator that they consumed at least some wild resources when compared to the higher levels of incidence of pellagra and other dietary diseases in the postbellum period. Solomon Northup, in his autobiography, wrote of the importance of opossum and fish when the weekly ration of pork was insufficient, went bad, or was never dispersed (Eakin and Logsden 1968). Some slaves had masters who never provided enough food. The slaves were forced by necessity to add self-procured foods, which included raccoon, opossum, ground hog and fish to augment their meager diet (Blassingame 1972; Genovese 1974).

Throughout the slavery period much of Louisiana and Mississippi was a frontier. Thus, it would be expected that fish and wild game would supply part of many slaves' diets. Opossum and raccoon were hunted at night on the slaves' free time. This and other hunting provided necessary recreation for some slaves. Many Louisiana plantations kept a man hunting and fishing on a full time basis; other planters encouraged their slaves to avail themselves of the resources of the streams and lakes. Some planters, like Levin Covington of Adams County, Mississippi, seined the streams
near his plantation on a regular basis. The catch supplied his family, his slaves, and often his neighbors as well. Horace Gather, who owned a plantation near Vidalia, often served his slaves corn bread, boiled potatoes and boiled catfish for breakfast and supper. On Governor Roman's plantation breakfast for the field hands often included dried fish (Weaver 1945; Dick 1948; Taylor 1963, 1982; Moody 1976).

There is a very real lack of information concerning the use of wild game and fisheries resources by blacks in the postwar to early twentieth century period. There is also a lack of studies of black tenants and sharecroppers in the postwar nineteenth century. Studies of tenants were conducted, however, in the 1930s under the auspices of the WPA. Unfortunately, the sections on diet refer only to store bought food purchases and the possible use of gardens. The studies do indicate a poor diet resulting in nutritional diseases such as pellagra, scurvy, beriberi, nutritional edema, and nutritional anemia (Woofter 1936; Holley et al 1940). There is no reason to think that postbellum blacks were any better off. Even studies which report specifically on dietary practices refer only to store bought or domesticated foods (Atwater and Woods 1896). An occasional reference to hunting or wild game consumption by blacks in the early twentieth century can be found. A 1932 thesis
about rural families on Bayou Plaquemines reported that the blacks killed and ate thousands of rabbits every winter (Hyde 1932). Nutritional and food habit studies were also conducted on black tenants in the Yazoo-Mississippi delta in the late 1920s. The studies point out that, like the blacks in the Atwater-Woods Alabama study, the subjects consumed a diet low in meat and milk. It was suggested that such a diet might explain the prevalence of pellagra in the region and among blacks in particular. The Mississippi reports also show that some wild resources were being exploited. In one study the use of fresh fish, rabbit, and opossum was noted. While in another, squirrel was included as one of the foods provided by the farmer (Dickins 1928a, 1928b, 1929). Archaeological excavations at the black residential quarters of a pre-World War I cypress sawmill at Chacahoula, Louisiana showed that a variety of wild game and fisheries resources were taken, including raccoon, opossum, turtles, wild fowl, and alligator (Kelley 1988; Whelan and Pearson 1988). These activities may reflect traditions that date back to the postbellum period. If such is the case, we may assume that various natural food resources remained important for post Civil War blacks.
Townfolk

Hunting and fishing were not activities restricted to the inhabitants of farms, plantations, or marginal rural areas. The typical villager or townsman had only to walk a block or so to find an ideal hunting or fishing place (Suarez 1954; Taylor 1982). In addition the markets in many towns and cities provided a selection of almost any native game or fishery resource at quite reasonable prices (Fontenot 1980). Fish caught in the Atchafalaya were sold in the surrounding towns which also provided a market in which raccoons were sold to blacks as food (Comeaux 1969). Fresh and dried shrimp from Barataria and Grand chenier areas were sold in the French Market in New Orleans (Cole 1916; Becnel 1962). The French Market carried a wide range of fisheries products such as crabs, crawfish, croakers, pompanos, Spanish mackerel, trout, sea turtles, flounder, stingrays and grouper. Wild game available included alligator (bought mostly by blacks), plover (sandpipers), ducks, pelicans, sea snipe, and 'possum (Cole 1916). These and other game such as deer were provided by a class of professional market hunters. Market hunting likely provided a profitable and acceptable lifestyle for some who were classed as poor whites. During the middle of the nineteenth century a strong demand developed among the hotels and wealthy
citizens of the south for venison. To satisfy this demand the professional market hunters came into existence; they lived or settled in areas where game was abundant. One such area was Greene County, Mississippi which supplied deer and other game to the Mobile market (Claiborne 1906; Shingleton 1972). Other unimproved areas throughout the South provided game range the exploitation of which filled the needs and desires of many urban dwellers.

Not all townfolk relied on the markets as a source of wild game or fish. Rowland Chambers, a dentist who lived in Satartia, Mississippi and Richmond, Louisiana in the late 1850s often went hunting or fishing. He records several instances of deer hunting, fishing, or shooting robins from the road in front of his home for supper (Chambers Diaries). William Johnson, a free Black in Natchez, who started as a barber and became a land owner kept a quite detailed journal from 1835 to 1851. During the fifteen year period of 1836-1850, Johnson averaged 16 hunting or fishing expeditions per year. The number ranged from a high of 29 in 1843 to a low of one in 1848. While many of the trips were solo, Johnson was often accompanied by one or two other people. He also notes the hunting and fishing trips of friends and acquaintances. During this period Johnson killed a great variety of game ranging from small birds to deer and alligator (Hogan and Davis 1951). For the sportsmen
and hunters of New Orleans local plantations provided hunting locations. Etienne de Bore's sugar plantation on the Mississippi River contained a lake where ducks, moor hens, snipes, and plover congregated. It was also a weekly gathering place for the elite of New Orleans. Sometimes these hunting parties turned into massacres. At one such event over 48,000 plovers were shot in a single day (Crete 1981).

Additional information on the use of wild game and fisheries resources can be obtained from historic sites archaeology reports. Material recovered from excavations of late eighteenth to mid nineteenth century residential and commercial site locations in Charleston, South Carolina and Savannah, Georgia contained the remains of a wide variety of wild food resources. These included deer, opossum, squirrel, raccoon, mink, Canada Geese, mallards, turkeys, herons, rails, small passeriforme birds, freshwater turtles, sea turtles, sea catfish, sheepsheads, drums, and mullets. Although mink might not normally be thought of as a food animal the conditions of the bones and their context within the site suggest that this species was consumed (Wood 1985; Reitz 1986a, 1986b). Excavations of an 1830s residential site in Washington, Arkansas produced remains of deer, squirrel, turkey, ducks, flickers, mallards, catfish, suckers, and sunfish (Ruff 1986; Stewart-Abernathy and Ruff
In Louisiana most of the urban historic sites archaeology has been undertaken in New Orleans, and all of the urban faunal data examined to date relate to the Crescent City. Numerous excavations of residential and commercial sites ranging from lower to middle socioeconomic class have been conducted. A general listing of the game and fishery resources consumed at these sites includes deer, rabbit, opossum, raccoon, squirrel, turkey, mallards, other ducks, geese, greenwinged teal, northern shoveler, rails, quail, heron, egret, turtles, bullfrogs, catfish, sheepshead, freshwater drum, and red and black drum (Castille et al. 1982; Reitz and Ruff 1982; Reitz 1984; Ruff and Reitz 1984; Gobalet 1986).

The preceding discussion of the various consumers of wild game and fisheries resources clearly shows that hunting and fishing and the take from these activities were very important in nineteenth century Louisiana and the South as a region. While the social and recreational appeals of the hunt or of a fishing party were sufficient justification for some, to many of these consumers hunting and fishing were necessary to provide food for the table. It is unfortunate that little if any reliable quantifiable data on the results of hunting and fishing during this period exists. But
clearly, while the townfolk and city dwellers may have been
eating primarily pork and beef, out in the countryside deer,
fowl, and fish were just as important if not more so.
The non-domestic animals that makeup the faunal component of the biota can be characterized in numerous ways. From the viewpoint of a hunter or fisherman the basic division would be into game and nongame animals. The characterization of game species changes through time, and the identity of nongame species is a function of the identification of game species. "Nongame" is an administrative term that is applied to that subset of animals that are not hunted, harvested, or intentionally removed by humans (Anderson 1985). Species currently identified as game (Burts and Carpenter 1980; LDWF 1987b) were considered such in the nineteenth century. However, many species of birds that would have qualified as game in the past are now classed as nongame species. It is necessary, therefore, to define a basis for what constitutes game. For this purpose, I will use the definition given by St. Amant: "all types that were taken by man for food or clothing and those types seriously hunted as predators are considered as game" (1959:36). Historically, the ornithologist George J. Durham of Austin, Texas, in the late 1860s interpreted the term "game" as referring to any animal that hunters or sportsmen considered edible and worth their attention (Doughty 1983:94). Not all of the potential game
species will be discussed. Those that were primarily viewed as predators, the flesh of which is not noted as being eaten, will be excluded. This group includes primarily the raptor species of birds and a few species of mammals, such as bobcat. Although there are references from various parts of the United States indicating that bobcat was eaten on occasion, none have been found for Louisiana.

Most of the wildlife species that have been of major interest to man depend on a vegetational subsere or succession stage below that of climax. With very few exceptions, wildlife in general, displays a marked affinity for subclimax plant associations. Thus, the basic condition of the wildlife landscape is variety: a mixture of forest, brush, grass, and weeds, as well as lakes, ponds, and streams. This mixture represents what is termed a disturbance community, a subsere resulting from the interruption of the process of succession. For the continent as a whole, the historical record clearly indicates that in prehistoric times this pattern was a fire landscape. Fire was the main agent of the disturbance necessary to the rejuvination of the quality and distribution of a vegetational composition to which wildlife increase responded (Komarek 1966; Miller 1963; National Research Council [NRC] 1970).
Within each forested section of the continent are numerous species of edge-dwelling or thicket-inhabiting birds and mammals. Whenever a subsere is initiated by opening the woodland canopy, these species spread and increase. Their patterns of life depend upon a transitory condition and as succession progresses toward climax they will disappear. In forested areas wild turkey habitat, for example, must include park-like mature timber, with an open understory. Another part of the range must be composed of herbaceous vegetation -- grassy and weedy openings of 2 to 3 acres. In these the young can sun and dust and find their diet of insects. Such conditions can be developed and maintained by burning. A similar need for an edge environment is apparent in many races of cottontail. Among larger species deer are attracted to similar situations where they browse upon the brush of the secondary succession stages (Miller 1963; NRC 1970).

Edge environments and their associated grassland, savanna, and transitional communities are subclimax communities initiated and perpetuated by periodic burning over long periods of time. Fire plays an important role in that in its absence vegetative debris accumulates rapidly. The role of burning has not been primarily to kill, but to prune away the old and the dead, to remove the undesirable so that the new and vigorous may prevail. The role of fire
in Louisiana was particularly important in creating and maintaining the state's large and small prairies and grasslands, as well as their associated edge environments. Grasslands are generally thought to be of two main types: (1) those determined primarily by climatic conditions on unleached pedocal soils with dry subsoils, and (2) those which replace forest destroyed by fire or cutting or both, or which are maintained against forest development by conditions which favor burning. According to Sauer (1950), however, on soils which permit deep rooting, there is no basis for a climatic grassland climax. It is generally accepted that the grasslands of Louisiana are partially, at least, the result of periodic burning, perhaps initiated by lightning but then continued by humans (Ellis et al 1969; NRC 1970).

**Changing Game Conditions**

Changes in vegetational patterns, as regions move through the stages of succession, have a major effect on game conditions. In Louisiana the game conditions, that is, distributions and abundance, have changed from the early pre-European era up to the present. The basic causes are changes that have taken place in land use practices. The basic changes in land utilization and their effect on game
conditions can best be illustrated by dividing the history of land use into four stages. These are: Stage I, the pre-European period up to 1800; Stage II, 1800-1880; Stage III, 1880-1925; and Stage IV, 1925-1950+. As can be seen, each of the first three stages is shorter than its predecessor, because as settlement and development progressed less time was required to change land use patterns enough to markedly affect game conditions. The general trends in game abundance during the period from 1700 to 1950 are shown in Figure 8 for selected species. The population terms, abundant, absent, rare, etc., which designate the amount of game at various times are species specific and are based on the available historical evidence (St. Amant 1959).

Stage I

It has been generally assumed that, in pre-European and early historic times (up to 1800), game was abundant everywhere. This was not necessarily true. Even relatively abundant game species, such as deer, bear, couger, turkey, furbearing animals, and squirrel tended to be concentrated on good ranges and scarce on poor ranges. Waterfowl and migratory shorebirds utilized vast wintering areas in Louisiana, and their abundance or scarcity reflected the success of the preceding breeding season rather than hunting
Figure 8. Relative Abundance of Game (1700 - 1950).
pressure or land use. The populations of the more common animals would be most affected by breeding success, disease, and natural hazards that might affect nesting or feeding areas. This is not to deny any impact on the environment by the activities of the American Indians (St. Amant 1959).

The native American had inhabited the continent for thousands of years and had been a significant modifier of the flora and fauna. In the southeast in particular his use of two of the major factors introducing change in land use, periodic burning and agriculture, had significant effects on the natural environment.

Fire

While we cannot establish the frequency and intensity of burning in the southeast in pre-Columbian and early contact time, our knowledge of plant ecology coupled with descriptions of vegetation and the use of fire by native Americans contained in the diaries of early travelers indicate that extensive areas were burned with relatively high frequency. It is likely that wherever the plant cover would burn, it was burned repeatedly. Burning had definite beneficial effects, some of which were quite evident and undoubtedly known to its practitioners. Fires opened thick growth areas and made hunting easier. They also discouraged mosquitoes and destroyed other vermin and pests. Historical
accounts by early settlers led Bourne and Wells to report in the first volume of the *American Journal of Science* in 1819 that Indians burned the grasslands and forests to improve travel and hunting and to improve pasture and browse for certain animals (Stewart 1963:123). Research has shown also that burning makes certain kinds of vegetation more succulent and palatable, as well as increasing their protein content, which immediately benefited browsing and grazing animals. Burning was also a major factor in establishing diversity in the environment by increasing prairie and open, park-like forests with prairie-like flora (Ellis et al 1969; Kniffen, Gregory, and Stokes 1987; NRC 1970; Schmidt 1978; Stoddard 1963).

The Indians of the southeast practiced a form of habitat management that was most probably quite intentional. One benefit of clearing and burning was to attract certain forms of wildlife. A number of species of birds are attracted to recently burned areas. These include robins by the hundreds or thousands, flocks of mourning doves, native sparrows, and flickers and other woodpeckers that become ground feeders on the burns. In the Gulf States particularly, the common snipe may frequent burned-over low ground in great numbers. The burning of the marsh removes dense marsh grass roughs and exposes seed-bearing plants for waterfowl feeding. It also provided important sprout growth
for waterfowl browsers such as the Canada goose. Modern management has shown the importance of fire in sustaining proper habitat for bobwhite quail and wild turkey. This is particularly true in the pine forests of the coastal plains where without fire young pine forest may take over within a period of five years. Bobwhite and turkey may actually flock to burns almost before the fire is out. Burning maintains and rejuvenates desirable shrubs, forbs, and grasses. It also benefits the white-tailed deer by pruning its preferred browse plants. It is also reported that, in Louisiana, the Indians, after burning or clearing the land, planted seeds of the wild plants that the game animals fed upon (Anderson 1985; Kniffen, Gregory, and Stokes 1987; Miller 1963; Stoddard 1963).

**Agriculture**

Native American agriculture was particularly significant in the deciduous forest regions as a disturbance factor supplementing the effects of widespread burning. Indian agriculture, while rather rudimentary in technique, was nonetheless widespread. The major crops were maize, beans, squashes, and sunflower. Most cropping was done by hoeing and hilling in forest clearings created by girdling trees and burning, typical slash-and-burn practices. The true spatial extent of Indian agriculture may never be
known. By the time early explorers and settlers entered an area native populations had often been drastically reduced. Initial contacts with Europeans introduced exotic diseases which spread rapidly among the Indians who had little or no resistance to the pathogens. In Louisiana, for example, between the time of the De Soto enterada in the 1540s and subsequent French exploration around 1700, the Indian population along the Mississippi river in north Louisiana had declined by about 80 percent. It is quite likely that those species of wildlife that depend upon disturbance communities had declined in numbers by the beginnings of European settlement in the region (Hilliard 1972; Kniffen, Gregory, and Stokes 1987; NRC 1970).

Of course, not all signs of Indian agriculture had disappeared. While traveling through Georgia in 1773, William Bartram found extensive signs of agricultural clearings along the Altahama River. In his journal he provided a description of the old field plant successions that were taking over the abandoned fields: "an ancient Indian field, verdured over with succulent grass, and chequered with coppices of fragrant shrubs...nearly encircled with an open forest of stately pines...." And then on land once inhabited by the Creek Indians, he noted that "their old fields and planting land extended up and down the river, fifteen or twenty miles from this site"
(Bartram 1980:32,34).

The faunal relationships of the deciduous forest are fairly clear. Bobwhite quail, for example, undoubtedly extended its range wherever openings were created and it succeeded especially well on the seed-bearing herbs and brushy fringes of agricultural fields. When the fields were abandoned because of declining fertility, forced movement of the Indians, or when the Indian was wiped out by some disaster, the invading second growth vegetation went through a subsere highly productive of foods for gallinaceous birds such as bobwhite quail, as well as for rabbits and larger species like deer. In addition the forest openings fitted nicely into the life pattern of the wild turkey. Other species that likely benefited include the fox squirrel and crow. Woodland species such as the grey squirrel were adversely affected. On the whole many of the game animals of the time benefited significantly from the activities of the American Indian (NRC 1970; Schmidt 1978).

Stage II

The period from 1800 to 1880, was a time of increasing European settlement and the growth of farming of a crude nature. The agricultural techniques used by southern whites were, in many ways, very similar to those of the Indians. In the antebellum period, southern whites employed extensive
cultivation methods that relied on hand labor and livestock for power. These methods resulted in noncontiguous fields with associated bush, briar, and weedy patches and semiabandoned or fallow fields that were close to the Indian system. The rotation pattern of one-third cash crop, one-third corn or cowpeas, and one-third fallow, often used in Louisiana, coupled with the wild bush, briars, and weed patches along ditches and farm edges provided ideal food range and cover for species such as bobwhite quail, dove, and rabbit. Most forested areas of Louisiana remained virtual wilderness because hand labor and poor transportation methods impeded large scale lumbering. Still, where whites settled and farmed parts of the forest were removed. Forest clearing for agricultural purposes increased the edge environment. Additional use of the forest for fuel and construction added to this development. The forest clearing affected some animal species adversely, primarily those such as bison and grey squirrel that depended on climax communities rather than on subsere environments (Anderson 1985; Hilliard 1972; St. Amant 1959).

Hunting pressure during this period had differential effects on game species. Forest game species were little affected because they could assimilate large amounts of hunting pressure without serious impact on the breeding stock. Also, forest game, such as deer, squirrels, and
turkeys, readily adapted to hunting pressure, learning to skulk and hide once the pressure increased. Other species suffered due to their market value, slow breeding rate, or the ease of taking them. Bear, cougar, and some shorebirds were the hardest hit. Bear and cougar reproduce slowly and could not survive the hunting pressure that saw 125 bears killed by a single hunter in Iberville Parish in 1853 (Plaquemine *Southern Sentinel*, Dec. 23, 1853). Waterfowl and turkey though hunted heavily, generally survived better. This was due in part to the facts that they had more rapid breeding rates and higher levels of abundance than the large game animals. Some of the migratory shorebirds that wintered in Louisiana were very nearly extirpated. Two examples are the marbled godwit and the Eskimo curlew that migrated into south Louisiana in vast numbers. They were slaughtered by the thousands for shipment to the market. By the end of the period their numbers had been so depleted that market hunting became unprofitable and ceased (St. Amant 1959; Lowery 1974b; Kozicky 1967).

Deer were hunted heavily for the food and hide markets during Stage II. However, they were abundant enough, had extensive enough range, and bred fast enough too sustain the harvest. They survived the period without showing much of a decline in numbers. In fact, during these periods of land clearing and forest exploitation browse and forage supplies
became more plentiful and deer may actually have increased their numbers. The same appears to have been true for squirrels and furbearers, although the latter were not heavily impacted until commercial trapping began in the twentieth century. These species apparently remained plentiful until the end of Stage II (St. Amant 1959; Halls 1978).

Much of the human impact on wildlife comes not from the fact that man is a predator, but from the fact that he is a competitor seeking to raise domesticates on land already supporting wildlife. Man's greatest effect upon wildlife does not result from the direct action of killing, but indirectly through the destruction of wildlife habitat. Yet, some affects of agricultural exploitation improve wildlife habitat and increase some wildlife populations. These species learned to live with man by feeding off his agricultural produce and the wild foods of his farm edges and learning to reproduce under limited nesting conditions in close proximity to human habitation. There were, thus, two sets of processes affecting the wildlife landscape. One set, which included the increase in human population and its concomitant expansion of agriculture, worked toward a decrease in habitat and a subsequent decrease in wildlife populations. The other set of processes, which involved the creation of special habitats suited to certain wildlife
species, tended to slow habitat destruction and to increase the populations of selected species. Those species that actually thrived on land use change came to be known as farm game. As a result of the changes in land use, species such as bobwhite quail, cottontail rabbits, deer, raccoons, opossums, and the edge-inhabiting fox squirrel prospered with increased range and numbers. Other species including the woodcock and killdeer extended their ranges into new agricultural regions. Some wildlife species as noted earlier, suffered from the expansion of agricultural activity (Hilliard 1972; NRC 1970).

**Stage III**

The time period from 1880 to 1925, "represents a time in the history of Louisiana when the State may be said to have emerged from the wilderness," (St. Amant 1959:43). This stage also marks the end of the interior frontier in Louisiana. By the end of the period the land was settled and well-inhabited. The processes of settlement and development wrought havoc on the game resources. Millions of acres of game ranges were destroyed with no thought given to conservation or restoration. The primary factor in this destruction was the decimation of practically all of the virgin forests by the "cut out and get out" oriented lumber interests. The elimination of the forest destroyed all the
large game ranges, and the remnant populations of bear and
cougar were all but extirpated. Deer also suffered, being
reduced to a relatively low population by the combination of
range loss due to agricultural development, lumbering
activity, and heavy unregulated hunting pressure. In some
parts of the south and east, in fact, at the end of the
nineteenth century white-tailed deer populations were at
their lowest in history. The wild turkey all but vanished
with the forests. Squirrel and furbearers were least
affected by the drastic change in land use, though they did
lose much of their upland range (St. Amant 1959; Halls
1978).

Farm game were either little affected or actually
benefited from the Stage III changes. In fact the abundance
of many upland wildlife species increased with the expansion
of agriculture. The key to this increase was man's
establishment of a checkerboard of new subseres resulting
from clearing, frequent burning, logging, moderate grazing,
and the planting of small field of grain crops. Bobwhite in
particular attained a short-term population peak that likely
will never be matched. The direct cause for their increase
was the great expanse of excellent range that developed in
the cut-over pinelands and the expanding, yet still crude,
farming of the period. It was the cut-over pinelands from
which bobwhite benefited the most due to the plant
succession which furnished a maximum of bobwhite food for the first five to eight years. This succession included great quantities of native legumes such as beggar weed, partridge peas, and wild lespodezas as well as many miscellaneous seeds. However, the newly exposed land quickly lost the small amount of fertility that had built up when it was forest floor. Continued succession resulted in the establishment and dominance of wire grass and broom sedge roughs and a great decrease in bobwhite foods and bobwhite. As can be seen from Figure 8 dove and rabbit reacted in patterns similar to that of the bobwhite, though the decreases through Stages III and IV were not as great (Ellis et al 1969; St. Amant 1959).

In general, Stage III represents the period during which the general game resources of Louisiana declined to such a point that it became necessary to formulate and establish strict laws governing the harvest of game. Thus, in 1904 the State legislature passed a series of laws protecting nongame birds, setting seasons and bag limits for game animals and game birds, and protecting fish in the fresh waters of the state (Form Letter from Robt. W. Faulk, July 28, 1904 in Purvis Papers). In December of that same year a Ouachita Parish game ordinance was passed (Purvis Papers).
The developments of Stage IV lie beyond the scope of this dissertation.

It has been possible to determine approximate Stage I population levels for some species of game animals, deer, squirrel, bobwhite, and turkey. The approximate carrying capacities of present day ranges are known and the extent of past range acreages can be estimated. Thus productivity of such ranges in past years can be estimated as well. The range acreages vary with each species and are portions of the 29,000,000 acres that make up the land area of the State of Louisiana (St. Amant 1959). This data will be used in the next chapter which discusses species distribution and abundance.

Human impacts on the fishery resources appear to have been negligible during the nineteenth century. No regulations concerning fish or their habitats were established until the early twentieth century. None of the literature examined suggests any serious depletions of any of the species taken nor any harmful impacts on their environments. The same appears to be true for the reptiles and amphibians and the crustaceans that were used as food sources in the 1800s.
Relative Importance of Game Species

Of the various species of mammals, birds, fish, etc. used as food sources during the nineteenth century some were more important than others. This section will briefly review those that appear to have been the most used. Unfortunately, a lack of data does not allow an interpretation of importance based on the numbers of a species taken. Rather we must rely on the number of ecological divisions of the state in which the hunting, fishing, etc. took place. This will undoubtedly inflate the importance of some species and limit that of others. For the purposes of this discussion, the taking of a species in at least four out of seven ecological divisions will be used as the main criteria of importance.

Throughout the South, particularly in the antebellum period, white-tailed deer was, without doubt, the most important game animal. As Gohdes (1967) pointed out, the frequent references to it in the old game laws indicate that deer hunting was the most notable field sport of the Old South. It provided the greatest amount of meat on a per animal basis, as well as providing hides for use at home or sale. In Louisiana, the deer is the only mammal reported as taken in all seven ecological divisions. Throughout Stages I and II the state contained a reservoir of unimproved land
that generally provided good habitat. It was not until Stage III that the combined effects of large-scale logging, agricultural expansion, and unregulated hunting had significant effects on the deer population. The loss of feeding range and cover resulted in a dramatic decrease in the number of deer throughout the state with the exceptions of the coastal marshes, which even today are difficult to hunt, and the bottomland forests of the Mississippi and Atchafalaya basins, which became havens of refuge for the white-tail.

According to the historical data the next most important mammals, with respect to the number of regions in which they were hunted, were the black bear, raccoon, squirrel, and opossum. All were taken in six different regions. It is unlikely that bear was ever an major source of food as such, though in early settlement periods, it provided an important source of fat. It is not possible to speculate about historic bear populations in Louisiana as modern density figures are not available, but in some parts of its modern range in North America the bear densities have reached as high as one per square mile (Leopold et al 1981). Like the squirrel, the raccoon was fond of corn as a number of plantation record references indicate. As noted in a letter from an overseer to his employer "the Coons is just begining to brake down our corn I expect we will have plenty
of coon meat in the course of a week I shall hunt them every
night from now on" (Letter from J. D. Richardson to St.J. R.
Liddell, July 13, 1855, Liddell Papers). Thus the killing of
raccoons limited depredations on the corn crop as well as
supplying a source of meat.

The two species of squirrel were present in large
enough numbers to provide a common source of food throughout
Louisiana. The fact that the species occupied somewhat
different habitats meant that as one declined in response to
land use changes, the other likely increased. Almost every
landholding outside the urban areas provided habitat for
either the fox or the grey squirrel. While small
individually, squirrels were present in numbers sufficient
to easily fill the stewpot. The killing of squirrels had a
double benefit. Not only did they provide a food source,
but also, since they were fond of corn, it was wise to
reduce their numbers around newly cultivated fields (Taylor
1982). The opossum was a popular food animal throughout the
South. It was especially favored by blacks, more so than by
the white population, and, being easily hunted without guns,
it was especially important in the antebellum slave diet.
The opossum was one of those animals that benefited from the
land use changes of Stages II and III, and likely extended
its range and numbers during the nineteenth century.
Next in importance are the cougar or panther, taken in five regions, the northern raccoon, five regions, and the rabbit, four regions. While the historical data illustrate that cougar were hunted and eaten, their numbers were never large enough to provide an important source of food. The limited regional use of rabbit is somewhat surprising. Hilliard (1972) has stated that among small game rabbit was the "unquestioned favorite." The two species found in Louisiana made the rabbit virtually ubiquitous in the state, yet it is reported as being hunted in only four of the seven ecological divisions. This may be an artifact of the historical record. If rabbit hunting was as common as Hilliard suggests, some people simply may not have mentioned it in their writings. The fact that the cottontail was a farm game species assures that it was present wherever farming took place.

Among the birds, the most important representatives include the various species of geese and ducks, particularly the mallard, the bobwhite quail, and the wild turkey. The mallard was taken in all seven of the ecological divisions, while the quail and turkey were taken in six. It is not possible to estimate the numbers of these species killed or the frequencies with which they were taken. The geese and ducks were available statewide in suitable habitats during their migrations and in many parts of the state as winter
residents. The number and availability of bobwhite quail likely increased in the 1800s as human activity increased the extent of the disturbance communities to which it was adapted. The same may be said of the wild turkey, or at least that human impact on the landscape helped maintain numbers and range through much of the nineteenth century. Other commonly hunted birds, taken in at least four regions, include geese, common snipe, pigeon, and woodcock. Several shorebirds should be mentioned here. Although limited to the southern and southwestern parts of the state, the whooping crane, sandhill crane, marbled godwit, and Eskimo curlew were important prey of market hunters. All were extirpated from the state or were driven close to that point as thousands were slaughtered for the market. As food sources, they may have been more important in urban areas than in the countryside.

Among the fishery resources, the apparent favorites include the buffalo fish, the catfish, the gar, and what is referred to as perch or trout. These fish were taken in at least four of the seven ecological divisions. The various species of the buffalo, catfish, and gar are all virtually statewide in their distributions and thus would have been available to most fishermen. Buffalo fish were taken in all of the regions except for the Southeast terrace lands or Florida Parishes. Catfish and gar were caught in five
regions. The exceptions were the Southwest and Southeast terrace lands. No fish in the perch/trout category were reported for the Northwest uplands nor the Florida Parishes. There is no way of knowing exactly what fish fall into this last grouping. Several different species present in Louisiana are referred to as perch or trout.

Although several of the species of turtles enjoy statewide distribution, of all the reptiles and amphibians only one type, the softshell turtle, was taken in at least four ecological divisions. It was not reported as being collected in either the Northwest uplands nor in the Florida Parishes. The lack of exploitation of this resource is not too surprising as, on the whole southerners were not too fond of such foods. With regard to the crustaceans, their distributions limited their use as food sources. The most widely exploited was the crawfish which was reported for the Upper and Lower Mississippi River zones and for the Florida Parishes. Use of shrimp and crab would have been limited by their distributions in the coastal zone. Although, it must be noted that oysters were shipped north in barrels and, similar practices could have been applied to shrimp and crab. What might have been a more important factor was that of cultural preference. While the French heritage of South Louisiana found these shellfish acceptable, the predominantly Anglo population outside the Lower
Mississippi-Atchafalaya basin may not have considered them edible.
CHAPTER 7: SPECIES DISTRIBUTION AND ABUNDANCE

In the course of this research some problems of species identification were encountered, with regard to birds in particular, but also including some fishes. In many of the archival documents and contemporary diaries regional, ethnic, or European names for various birds and fish were given. For example, bobwhite quail were also referred to as partridge or pheasant. Also some ethnic names were misspelled (beckeroach or becca roache for bec croche). In most cases discussions with biologists, wildlife management faculty and students, and some Cajuns provided a correct identification. A few species have remained unidentified and are listed in Appendix 1 by the name given in the original source. Appendix 1 contains a complete list of all species here identified as game and fishery resources.

The distributions and abundance estimates of the various game and fishery species have been taken from a variety of sources. These include for mammals Lowery (1974a) and St. Amant (1959); for birds Lowery (1974b), Oberholser (1938), and St. Amant (1959); for reptiles Dundee and Rossman (1989); for saltwater fish Gowanloch (1933/1965), Hoese and Moore (1977), and van Beek et al (1981); for freshwater fish Gowanloch (1933/1965) and Douglas (1974); and for crustaceans Larson et al (1980) and...
van Beek et al (1981). Historic distributions and abundance of selected species have been determined as completely as possible from historic sources by St. Amant, who cautioned that observations of abundance of the species recorded were not likely to be sound:

> Early observers based descriptions of abundance and rarity in a great many cases on the relative amount of one species as compared with another or else they compared estimates with European conditions rather than basing these estimates on a density per unit area studied, (1959:36).

The population/abundance estimates, particularly of early writers, are extremely relative. The estimates are defined by such terms as abundant, occasional, rare, etc., and the meanings vary with the individual observer and the time period in which the observations were made (St. Amant 1959:45). Thus, bobwhite, cougar, otter, and bobcat, for example, were all reported to be rare or only occasional. While this may have been true for bobwhite which had limited range available, the other species had access to extensive and excellent range. The low abundance estimates likely resulted from the wary behavior of these species or their low numbers when compared with more numerous species. For this discussion, estimates of historic abundance will follow St. Amant and the other sources noted above.

As will be apparent in the following pages carrying
capacity data, population estimates, and range acreages for many of the species discussed are not available. This is particularly true of the present-day nongame species of birds. Carrying capacity has generally been defined as the number of healthy animals that the habitat can maintain indefinitely on a given unit of land, without harm to the species or the habitat. A basic implication in such a definition is reference primarily to food supplies. But there are other aspects of the habitat that will affect, not only the carrying capacity, but also the actual production levels. These would include nesting, brooding, and resting cover at least. Even though actual carrying capacities are not known general levels of abundance and regional presence can be provided (Mautz 1978).

**Mammals**

The following discussion of mammal distributions and abundance is based primarily on Lowery (1974a) and St. Amant (1959). Other sources will be used as needed.

**White-tailed deer**: Deer were apparently abundant and widespread over the present area of Louisiana. It has been estimated that during Stage I there existed about 23,000,000 acres of good deer range, which is estimated to have produced a maximum average of one deer to 50 or 60 acres. This yields an estimated total population of about 400,000
for the entire state. The deer were not spread evenly about, but appear to have been concentrated in the mixed pine-hardwood forest and the edge ecotones bordering the prairies and meadowlands. Neither the longleaf pinelands nor swamp and dense river bottoms supported large populations. It is not only population densities that vary between habitats, the size of individual animals vary as well. In Louisiana's fertile bottomland hardwood forests a 2 and one-half year old buck outweighs bucks of the same age in the less fertile upland parishes by as much as 51 pounds (Halls 1978). Most of the better range remained intact through Stage II as lumbering did not begin to seriously impact the virgin forest lands until about 1890. The white-tailed deer is the most adaptable and most widespread of all North American big-game animals. It can withstand a substantial hunting harvest if its range is maintained. Also, on better parts of the range, the white-tail can achieve a high reproductive rate, which may compensate for heavy predation (Leopold, Gutierrez and Bronson 1981).

Bison: At one time present in moderate numbers over most of Louisiana, the bison became rare or absent by the end of the eighteenth century. It was most prominent in the grasslands and meadows, generally rare in the forests. The last recorded specimen was killed near Monroe in 1803. Only one other nineteenth century reference to bison has been
found, it refers to smoked buffalo tongue being brought into Shreveport in the 1830s and 1840s (Carruth 1970).

**Black bear:** Apparently widespread and fairly abundant historically, the black bear was most numerous in the heavily wooded areas and switchcane thickets of the Mississippi River bottomland forest from the Arkansas border south into the Atchafalaya Basin and swamps of central south Louisiana. It may have been more numerous in winter for according to du Pratz (1774), the bear were sometimes driven south ahead of early snows prior to hibernation. Actually, the black bear does not truly hibernate. In colder parts of its range, it will retire to a den and become dormant (Leopold, Gutierrez and Bronson 1981).

**Northern raccoon:** The raccoon was apparently abundant and widespread over the entire state, likely being present in every parish. This is probably the most versatile and adaptive of the North American carnivores (Leopold, Gutierrez and Bronson 1981). As a semiaquatic species, the raccoon would have been more abundant in the bottomlands and in southern Louisiana, and was found in its greatest numbers in the coastal belt in the late 1920s. Terrebonne Parish led in production of pelts, followed by St. Mary and Lafourche (Arthur 1931). Like other small furbearers, the raccoon probably remained abundant until near the end of the
nineteenth century when its range was greatly reduced by lumbering, drainage operations, and farming. Based on trappers' estimates the raccoon population as late as the early 1950s ranged from about one million to as high as two million. Its flesh is considered highly edible.

**Fox squirrel:** The fox squirrel, the largest of the arboreal squirrels, is distributed statewide being absent only in the coastal marshes, on coastal islands, and from some isolated cheniers. Though common to abundant throughout the wooded portions of the state, it prefers rather open situations in hardwood forests or in tracts of mixed pine-hardwoods. Some are found in deep swamps in the southern part of the state.

**Grey squirrel:** The grey squirrel is found statewide wherever there are trees except for the cheniers in the coastal marshes. It is abundant in virtually all the forested areas of the state, but prefers the bottomlands and wet swampy areas. In mixed hardwood and pine forest habitat, oaks must be present as one component (Leopold, Gutierrez and Bronson 1981). Squirrels, in general, were quite abundant through Stage II, but tended to be most concentrated in the mast-producing mixed oak and hardwood regions. Pure stands of pine, the marshes, and the treeless prairies supported the smallest populations. The major
decrease in population occurred as a result of the lumber industry which significantly reduced the range. Originally squirrels were supported by about 22,500,000 acres of good range which produced an estimated pre-European population of 20,000,000.

**Swamp rabbit:** The swamp rabbit is abundant and found statewide. Its main concentrations are located in heavily wooded areas and the coastal marshes.

**Eastern cottontail:** The eastern cottontail ranges widely over most of the state being absent only from parts of the coastal marshes. It is most frequent in fairly open country and grasslands.

As of 1959 the rabbit remained among the least studied of all game animals. No data were available on range acreage or population levels (St. Amant 1959). The role of the rabbit as a game animal in the nineteenth century is not clear, although Hilliard (1972) has stated that it was the unquestioned favorite among small game species and that it was used more frequently for food than was the deer. It was consistently reported to be abundant and statewide in distribution. Like other farm game the rabbit may not have reached its population peak until Stage III land use patterns developed. It has been suggested that the relatively clean floors of the virgin forest were probably
not as good rabbit range as the more highly productive areas that developed after clear cutting and the increase in crude farming. Cottontails can withstand high levels of predation because of high reproductive rates and a wide diversity of habitats (Leopold, Gutierrez and Bronson 1981).

**Opossum**; The opossum is quite common throughout Louisiana. It occurs in nearly all wooded areas and in the coastal marshes. Like the raccoon and other small furbearers, the opossum was numerous in early time and likely remained such until the land use changes of Stage III took place. It was not until these changes occurred and fur began to be a luxury rather than a necessity that small furbearer populations began to be impacted. Opossums are enormously prolific and can sustain a high predation level without becoming scarce (Leopold, Gutierrez and Bronson 1981). It is thought that opossum numbers in the early 1950s were slightly smaller than those of raccoon, and a similar pattern may have existed in the past. In the late 1920s, the greatest concentrations were found in Terrebonne, Lafourche, Calcasieu Parishes, in that order (Arthur 1931).

**Cougar**; The cougar, or panther as it is often known in Louisiana, has always been reported as being rare. Its original range included most of the state’s hardwood forests, but it was likely most numerous in bottomland
swamps bordering the Mississippi, Tensas, Ouachita, Black, and Atchafalaya Rivers. The main prey of the cougar are deer, and where these are abundant the cougar may reach densities of about one per 20 square miles (Leopold, Gutierrez and Bronson 1981). The few reports of its presence, even in the previous century, may be a result of the animal's wariness. Still, the cougar may never have been common in the state. When we consider that its daily range may be as great as 50 miles, it would not take many individuals to cover the entire state. Although we might not normally consider cougar a food animal, Lowery (1974a) reported that, based on personal experience, its flesh was edible and that it was quite tasty. Du Pratz noted in regard to eating cougar "His flesh when boiled tastes like veal, only it is not so insipid," (1774:263). There are several references from early nineteenth century East Feliciana that panther steak was not an uncommon dish (Skipwith 1972). Taylor (1982) noted that William Byrd and others thought that cougar made fine meat.

The last three species of mammals listed in Appendix 1, bobcat, muskrat, and otter, may not represent food animals. Although bobcat were shot fairly often, the reference was generally in terms of their role as predators. It must be mentioned that William Byrd, at least, thought that bobcat was quite edible (Taylor 1982), but this is the only such
reference located. The taking of muskrat and otter is
mentioned only by Dennett (1876) with no indication of their
being eaten. I will briefly describe their distribution and
abundance but will not include them in subsequent
discussions of potential food sources.

**Bobcat:** The bobcat has virtual statewide distribution,
particularly where there are heavily wooded areas or other
suitable isolation. It is particularly prevalent in the
dense wooded areas of the Mississippi alluvial plain and
northwest and west Louisiana, but is generally absent from
the coastal marshes. The bobcat’s distribution generally
parallels those of the deer and turkey. Though no attempts
have been made to determine population levels of the bobcat,
trapping of the animal by predator-control crews suggest
densities ranging between one cat per 1,600 acres to one cat
per 4,000 acres. The bobcat’s diet is dominated by rabbits
and rodents, but sporadic depredations on poultry and
livestock have earned it its reputation as a nuisance
predator (Leopold, Gutierrez and Bronson 1981).

**Common muskrat:** This small furbearer is currently
present throughout the southern part of the state that
corresponds closely to Newton’s South Louisiana (1987:1). It
is particularly numerous in the coastal marshes and along
bayous and lakes. According to O’Neil’s (1949) in-depth
study the heaviest concentrations occur in the subdelta marsh. Modern muskrat populations in northeast Louisiana are thought to be immigrants from Arkansas who first appeared in the mid 1960s. Historic evidence indicates that through most of the nineteenth century the Louisiana muskrat population was quite small. Historic Indians of Louisiana did eat muskrat and use its pelt for clothing. As Lowery noted, quoting from a November 1700 entry by Jacques Gravier, S. J. in the *Jesuit Relations*, among the Tunica Indians: "Most of the men have long hair and have as their dress only a wretched deerskin. Sometimes they, as well as the women, also have mantles of turkey feathers or muskrat skins woven and well worked." Then in December of the same year, Gravier wrote concerning the Houmas Indians: "The women wear a fringed skirt, which covers them from the waist to just below the knees. When they go out of their wigwams they cover themselves with a robe of muskrat or turkey feathers" (Lowery 1974a:23). The next positive reference was made by Audubon and Bachman in 1846 when they listed the muskrat as present in Louisiana (ibid:23). O'Neil, in his 1949 treatise on the muskrat, mentioned a reference in an early surveyor's record that indicated a dense population and possible eat-out in the Barataria-Lafitte region as early as 1840. The field notes of another land surveyor, William J. Henry, contain descriptions of probable muskrat
eat-outs in the Turtle Bay area of Jefferson Parish in 1873 (O'Neil 1949). Speculation suggests that in the late nineteenth and early twentieth centuries a small muskrat population was able to expand greatly as a result of marsh burning which increased the stands of three corner grass, the rodent's favorite food, and a reduction in the number of predators, notably the alligator. If such was the case, muskrats would not have been a significant food resource, even had they been eaten. Muskrat flesh is considered an excellent and palatable food, in such areas as Baltimore and Washington, D. C., but it has not been recognized as such in Louisiana. The primary reason for this is the designation of the animal as a "rat," (Arthur 1931).

**Nearctic river otter**: Presently restricted to wet areas of marshlands, streams, and swamps of the coastal region, the otter probably occurred statewide in similar favorable situations in the past. The current otter population is not known, but trappers estimates suggest a range from 1,000 to 10,000 through the first half of this century. Trapping results suggest statewide densities ranging from one pelt per 1,000 acres to one pelt per 2,700 acres. The small size of the estimated populations do not suggest that the otter would have been an important food animal in the past.
Birds

The following discussion of bird species distributions and abundance is based primarily on data provided by Lowery (1974b) and Oberholser (1938), although much of the data on waterfowl comes from Williams and Chabreck (1986). Many of the birds listed as food sources in Appendix 1 may come as a surprise. However, contemporary records clearly document such use. And as Taylor wrote: "Southern frontiersmen ate almost any animal available to them...The pioneer ate rabbit, of course, and also quail, passenger pigeon, robins, and almost any other bird..." (1982:8). This practice did not end with the pioneer. A taste for many birds continued through the nineteenth century in Louisiana and into the present if the truth were known about poaching activities.

Waterfowl

In a checklist of birds of Louisiana, Lowery (1974b) lists 36 species of waterfowl comprising 6 species of geese and 30 species of ducks. North American waterfowl belong to the Anatidae family which is divided into two subfamilies and eight tribes. This classification is based on the birds' habitat use and feeding behavior. The subfamilies are the Anserinae which includes the geese, swans, and whistling ducks, and the Anatinae which comprises all other
ducks, as well as the teals and mergansers (Anderson 1985). Archival and contemporary nineteenth century sources identify 2 species of geese and 11 species of ducks as being taken for food. Three of these species of ducks are known to breed in Louisiana: mottled duck, wood duck, and hooded merganser. All other species of waterfowl are winter visitors.

Louisiana contains approximately 7,000,000 acres of waterfowl range including about 4,000,000 acres in the coastal marshes, about 1,000,000 acres of cypress-tupelo swamp, and nearly 2,000,000 acres of lakes and rivers. The quality of the range varies from excellent in the coastal marsh to good, when food is available, on lakes and rivers. This waterfowl range is not evenly distributed over the state. With respect to quantity and quality, this waterfowl range may be divided into three areas (see Figure 9). These areas are (1) north Louisiana which comprises all or part of 27 parishes north of Alexandria, (2) south central Louisiana encompassing all or part of 17 parishes situated between Alexandria and the coastal area, and (3) 20 parishes comprising the coastal and lower Atchafalaya regions (St. Amant 1959).

North Louisiana

The extent of the waterfowl range in this area is
Figure 9. Waterfowl Regions of Louisiana (after St. Amant 1959).
primarily dependent on fall and winter rains as well as fluctuating water levels carried by the backwaters of the various rivers. Estimations of the total available range run from 200,000 acres in dry years to 1,000,000 acres during high water periods. The range is variable in type as well as quantity. It consists of open water lakes, backwater lakes, periodically flooded cypress brakes and oak flats, and the Red, Ouachita, and Mississippi Rivers. The distribution of range in this region is such that the best areas are highly localized in a few small areas. The two main areas are the Ouachita-Tensas system including associated backwater swamps and Catahoula Lake and the bottomlands of the Red River south to Alexandria. A third area consists of the cutoff lakes along the Mississippi River (St. Amant 1959).

South Central Louisiana

This area consists of a belt lying across the south central portion of the state and includes all of the southwest pinelands, the Florida Parishes, and several bottomland parishes bordering the Mississippi and Atchafalaya Rivers. This area contains what is probably the smallest and least productive waterfowl range in the state. It has been estimated that only about 6 percent of the winter waterfowl population of Louisiana uses this area.
This should not be surprising because the piney hill parishes contain only a few sloughs that waterfowl can use. The main areas used by waterfowl in this region include (1) the swampy areas of Avoyelles, St. Landry, and Point Coupee Parishes along the Atchafalaya and Red Rivers; (2) the backwater areas of Avoyelles Parish which floods annually and includes many channel scar lakes; and (3) the Lake Maurepas-Blind River Swamp in Ascension, Livingston, St. James, St. John, and Tangipahoa Parishes. The first two areas provide good waterfowl range (St. Amant 1959).

Coastal Marsh

This region with its bordering swamps likely constitutes the largest general waterfowl wintering area in the country. While the total area exceeds 5,500,000 acres, only about 4,000,000 acres of fresh and brackish water marshes and swamps provide good waterfowl range. The general quality of the range in this area is highly variable due to high tides, hurricanes, droughts, etc. The most used waterfowl areas of the coastal region include the fresh water areas around the Mississippi delta and the larger fresh and slightly brackish areas behind the cheniers in southwest Louisiana. Although only about 60 percent of the recent waterfowl kill comes from this region, it is assumed that up to 90 percent of all the ducks and geese wintering...
in Louisiana spend some time in the marsh area (St. Amant 1959).

Waterfowl Distribution and Abundance

**Canada goose**: This species was previously a common transient through most of Louisiana and a common winter resident of the coastal marshes and prairies. It generally was present from late September through late April, and frequented streams and lakes. Some geese stayed on flats along the Mississippi River.

**Snow goose**: The snow goose has been a common to abundant winter resident in the coastal marshes of Louisiana. The birds arrive by the tens of thousands in October and depart in late April and early May. They are also found on the prairies and meadows inland from the marshes. They are primarily transient in central and north Louisiana along the Mississippi Flyway.

**White-fronted goose**: This goose was a common to fairly common winter resident, arriving in late September and staying until mid April. It wintered in the Gulf Coast region on prairies and marshes west of the Mississippi River. The most important wintering area was the southwest corner of the state. Previously it was considered to be a marsh goose, feeding in shallow marshes on the landward edge
of coastal lagoons and in "sea rim" marshes adjacent to beaches.

**Mallard**: The mallard is the most widespread winter resident of all waterfowl in Louisiana, and is, in fact, the most abundant and most successful duck in North America. These birds arrive in mid October and leave by mid April, though some appear to be year-round residents in some locales. Major concentrations of the species occur in the lakes and flooded bottomlands of the Red, Ouachita, and Mississippi Rivers in north Louisiana, on and around Catahoula Lake, throughout the Atchafalaya Basin, in the fresh marshes and swamps of southeastern Louisiana, and in the marshes of southwestern Louisiana. Because it is a highly adaptable species, the mallard may occur anywhere that food and water are available. Favored habitats include flooded hardwood bottoms, cypress and buttonbush swamps, open-water lakes, and fresh to brackish marshes. It is known to frequent natural sanctuaries such as sand bars or large lakes during the day, thus escaping the guns of hunters. Mallard densities determined for the coastal zone for the period 1969–78 ranged from 21.1/sq mi on the fresh marsh to about 4/sq mi in the brackish marsh. Census data from Miller's lake in Evangeline parish for 1976 gave densities of 18/sq mi in areas dominated by watershield, 17/sq mi in buttonbush swamp, and 7/sq mi in tupelo swamp
(Leopold, Gutierrez and Bronson 1981).

**Mottled duck**: This species is a permanent resident that commonly nests in the marshes and the southwestern Louisiana prairies. Primarily a bird of the coastal marshes it can be found from the Pearl River westward to the Sabine. The species occurs equally in the southeastern and southwestern parts of the state. The most important habitats are the fresh to brackish marshes. The mottled duck in one of several types that as nonmigratory local populations evolved into different species from the parent mallard species (Leopold, Gutierrez and Bronson 1981). Fall and winter surveys conducted during 1969-78 showed that densities varied seasonally by habitat reaching a maximum of 2.4/sq mi in the intermediate marsh in late October. Over the course of the winter the mottled duck gradually shifted from the fresh toward the brackish marsh achieving high densities there in February and March. These birds prefer shallow wetlands for nesting and are particularly attracted to wetlands that are periodically flooded.

**Black duck**: The black duck is a fairly common winter resident from October to March. It occurs chiefly in south Louisiana but is also present in the northern part of the state.

**Gadwall**: This is a common winter resident of the
coastal regions of south Louisiana from early October until late April. It is especially common in Cameron Parish but can be found as far north as Point Coupee Parish. Though generally less common in the interior, in favorable conditions it will rank fourth or higher among the dabbling ducks.

**Northern pintail:** The northern pintail is a very abundant winter resident of Louisiana arriving in mid September and staying through early May in some areas. The bird's preference for shallow open areas results in an uneven distribution across the state, with large concentrations found locally and only a few birds in other areas. The main wintering area is in the southern region. Typically 70-80 percent of the birds winter in the marshes. Others can be found in the Mississippi River delta and the marshes about Lake Borgne. In north Louisiana the most important wintering locality is Catahoula Lake. Northern pintails exhibit a preference for shallow open ponds and lakes, marshes with dense stands of annual grasses and sedges, and will use large, shallow lakes with abundant aquatic plant growth. Highest winter densities of about 17/sq mi were recorded in the fresh marsh in late November and of about 15/sq mi in the intermediate marsh in late December. Because pintails enter Louisiana from the Central Flyway, most pass over the northwestern and western parts of
the state, with progressively fewer passing through central and eastern Louisiana.

**Green-winged teal:** This species occurs as a common winter resident throughout the state. The birds arrive in late September and leave by late April. The main wintering area is in the southern half of the state, particularly in the coastal marshes. They are mainly transients in the northern region. Their migrations appear to occur across the entire state. Green-wings are highly adaptable, using a variety of habitats that range from flooded timber to tidal mud flats. The largest concentrations occur in the open shallow fresh and intermediate marshes of the coastal zone. Preferred feeding areas are large open mud flats of 12 to 25 acres, with less than 4 inches of water. Here they feed on the seeds of marsh plants such as millets, bulrushes, spike rushes, and smartweeds (Leopold, Gutierrez and Bronson 1981). Highest densities of over 36/sq mi occurred in December in the intermediate marsh. Through most of the winter densities of 19-23/sq mi were present in fresh marshes, while the brackish marsh had densities of about 15/sq mi in December. Habitat studies on Miller’s Lake in Evangeline Parish recorded densities of 51/sq mi in areas dominated by watershield during January through March.

**Blue-winged teal:** This teal is primarily a migratory
transient in late summer - early autumn and in the spring. The migrant blue-wings are the earliest ducks to appear in Louisiana, arriving in numbers by the last week in August. They are generally gone by early November. Some blue-wings remain in the marshes all summer to breed, and some are present during the winter as well. Oberholser (1938) listed them as permanent residents throughout the greater part of the state.

**Northern shoveler**: This is one of the most common winter resident ducks in Louisiana, arriving in late September and staying until early May. They are generally only transient in north and central Louisiana. Primary wintering grounds are the coastal marshes of southwestern Louisiana and around the delta of the Mississippi River. The birds prefer shallow fresh or brackish areas with extensive mud flats, particularly the "soupy mud flats" that result from active land accretion. In inland marshes their preference is for shallow ponds with abundant floating or submerged aquatic vegetation. Highest densities of just over 11.5/sq mi were recorded in the intermediate marsh, although greater numbers of northern shovelers were located in the adjacent but much more extensive fresh and brackish marshes.

**American wigeon**: This species, previously known as
Baldpate wigeon, is a common winter resident over all of Louisiana, although it is most abundant in the coastal area. The main body of the birds arrives in October and departs in late April or early May.

**Wood duck:** The wood duck is a common permanent resident throughout Louisiana in highly wooded swamps and bayous. Winter concentrations tend to be greater in the southern part of the state than in the northern third. As the wood duck is dependent on wooded environments for food, shelter, and nesting, its way of life is related directly to forested wetlands. The most important habitats are the interior bottomland hardwood forests associated with the larger rivers. Additional favored habitats include cypress-tupelo swamps with buttonbush understories, wooded lakes, and wooded sloughs. In coastal areas wood ducks are usually found only in timbered estuaries and on marsh ponds near wooded areas. Roosting areas typically included wooded sloughs, beaver ponds, flooded stream bottoms, and natural lakes. Heavy hunting and habitat destruction in the late 1800s and early 1900s caused a dramatic decrease in the population. For a time it was thought that the wood duck might become extinct in North America (Leopold, Gutierrez and Bronson 1981). How seriously this might have affected the species population in Louisiana is unknown.
C**anvasback duck:** This species is a fairly common to locally common winter resident from early November to early May in south Louisiana. It is a rather uncommon visitor and transient in the north. Historically, the main wintering areas for the canvasback have been in the southeastern part of Louisiana, especially around the mouth of the Mississippi River. The species also uses the bays and marshy lakes west of the lower river and in the Atchafalaya Basin. Relatively large numbers winter on large lakes in northwestern Louisiana on a regular basis. Oxbow lakes, such as False River, have been traditional wintering areas. The preferred habitat of the canvasback is fresh or slightly brackish water areas with abundant submerged or floating aquatic vegetation.

**Lesser scaup:** The lesser scaup is primarily a winter resident arriving in early October and staying into May. A few are almost always present on some of the larger lakes in the summer. This species occurs throughout Louisiana in suitable habitats, but the great majority of the population winters in the south. The largest concentrations occur on the bays and large brackish lakes from just west of the Chandeleur Islands to Sabine Pass. The lesser scaup uses almost any aquatic habitat, and is believed to be the most versatile of the diving ducks that winter in the area. It is the most common of the diving ducks. The single most
important requirement for lesser scaup habitat is water that is open and free of anything that might interfere with a takeoff. Because of this they are not found in wooded areas. They tend to favor the large oxbow lakes along the Mississippi River and Catahoula Lake in the northern part of the state and the large inland lakes of the south as well as the brackish lakes and bays such as Pontchartrain, Borgne, Calcasieou, and Sabine.

Redhead duck: The redhead was formerly a common or abundant winter resident in the Gulf Coast region from mid November to early April. Though present throughout Louisiana during migration, winter residence is concentrated in the coastal area, particularly in the southeast. The primary region is Chandeleur Sound, but redheads are also found in lakes and bays from Lake Borgne west to Vermillion Bay. Although they are inclined toward saltwater regions, redheads use large open lakes with abundant aquatic vegetation in north and central Louisiana during migration, and inland open waters in the southwest. They prefer the saltwater sounds and open gulf of the southeast, particularly the sheltered waters behind the barrier islands.

Hooded merganser: Although some hooded mergansers breed in Louisiana and may be permanent residents, the majority of
the population are winter visitors, arriving in late November and leaving by early April. While the species may be found in most parishes, the largest concentrations occur in the southeast (about 60 percent) and the southwest (about 30 percent). In the coastal marshes they will use bayous, ponds, and lakes. Since they are cavity nesters, breeding is restricted to timbered wetlands, particularly along clear-water streams in wooded swamplands. They will also use timbered lakes and beaver ponds.

Other Birds

Most of the birds in the following section and not currently considered to be game birds. For this reason at least, there is much less data available on them than was available on the waterfowl discussed above.

Loon: This is a moderately common winter resident of south Louisiana, but one that is rare during the winter in the northern part of the state. Some loons are summer residents on ponds, lakes, and streams of the interior. During the winter they use bays, lagoons, and inlets of the coastal zone. The migrants arrive in November and leave by mid April.

Pied-billed grebe: This grebe is a fairly common
permanent resident, but is most numerous during the period from October through April. It is found associated with almost all bodies of water and occurs practically throughout the state.

**Pelican:** Two species of pelican were native to Louisiana. The American white pelican was a permanent resident in the southern part of the state, being common in the winter and numerous in the summer. It was a transient in north Louisiana. The brown pelican, prior to its extinction, was an abundant permanent resident of the coastal region. It was an accidental or casual visitor as far north as Caddo Lake and the Lake Bisteneau area.

**Double crested cormorant:** Once known to breed in Louisiana in Devil’s Swamp north of Baton Rouge and in Cameron Parish, this cormorant is now a common winter-early spring visitor. The birds arrive in early September and leave in April. Their preferred habitat appears to be around lakes with forested banks.

**Great blue heron:** This species is a common permanent statewide resident, whose range reaches as far north as Monroe and Caddo Parish. Previously it has been called either the blue crane or the Ward heron.

**Little blue heron:** This heron is a spring through fall
resident that nests throughout the interior of Louisiana. On occasion fair numbers of the species will winter in the coastal marshes, and even as far north as Natchitoches. The majority, however, fly south in October for wintering grounds in Central America.

**Great egret:** This egret is a permanent resident of southern Louisiana. It is moderately common in winter and abundant in summer. Populations in northern Louisiana generally migrate to the southern parts of the state for the winter.

**Snowy egret:** The snowy egret is a common, locally abundant permanent resident of coastal Louisiana. It commonly breeds throughout the state but is most numerous in the south. It is a common summer resident (late March to mid October) in central Louisiana and a fairly common summer visitor to the northern region.

**Black-crowned night heron (gros-bec):** One of two herons known as gros-becs this species is a fairly common permanent resident throughout Louisiana, though it tends to concentrate in southern parishes during the winter. It is a bird of the uplands, marshes and other water bodies. The gros-bec is probably the most heavily poached bird in the state as a result of illegal night hunting.
Yellow-crowned night heron (gros-bec): This heron is a permanent resident of the state. It is fairly common statewide during the summer, but is uncommon in the winter when its range is limited to extreme southern Louisiana. Those migrants that leave the state for the winter depart in early September and return by early March.

American bittern (reed bird): The American bittern is a permanent resident of the state. It is numerous in the coastal marsh from October through May. Most summer observations are from noncoastal parishes. It derives its nickname from its camouflage technique of pointing its beak and head skyward which allows it to hide in a patch of reeds. Unfortunately, it uses the same technique even if it happens to be standing in the middle of a road.

Wood stork (bec croche, wood ibis): Erroneously called the wood ibis, this true stork is a fairly common permanent resident in south Louisiana. It is a regular summer visitor to north Louisiana from May to September.

Roseate spoonbill: Formerly, this bird was a common resident in the Gulf Coast region, apparently year-round in Cameron and Vermillion Parishes. The fact that it was also hunted in the vicinity of Natchez indicates some northern range (Hogan and Davis 1951).
Prairie chicken: The prairie chicken formerly ranged in
goodly numbers as a permanent resident of the coastal
prairies of western Louisiana. It likely also occurred in
meadowlands east of the Mississippi River and in the
vicinity of Macon Ridge. St. Amant (1959) lists it as
plentiful on open meadows and prairies in 1725. The last
authenticated report for the state came from Cameron parish
in 1919. It is now listed as extinct in Louisiana.

Bobwhite quail: Today the bobwhite is a common
permanent resident of all of Louisiana in suitable habitats
such as brushy coastal islands, cheniers, meadowland, and
pine savannas. Good bobwhite habitat must meet two
essential requirements: (1) brushy cover, and (2) weedy
fields or pastures for feeding. The brush does not have to
be extensive, but it must be dense. In the southern part of
its range, optimum bobwhite habitat may support one bird per
acre (Leopold, Gutierrez and Bronson 1981). The original
virgin bobwhite range, as of about 1700, consisted of
prairies, natural meadows, burned areas, and virgin longleaf
pine areas. This provided a total range of about 9,000,000
acres. These were poor bobwhite lands and produced and
estimated population of about 350,000 birds as compared to
the 3,500,000 population projected for the period between
1900 and 1920. This was the time of the greatest extent of
crude farming and new secondary growth on freshly cut pine
lands (St. Amant 1959).

**Wild turkey:** Formerly the turkey was widely and commonly distributed as a permanent resident over most of the state. The original virgin turkey range consisted of approximately 15,000,000 acres which produced a maximum population of about 1,000,000 birds. Like the squirrel, the turkey suffered a significant loss of range due to the cutting of the forests around the end of the nineteenth century. The turkey was more heavily impacted since it required more mature and virgin timber stands than did the squirrel (St. Amant 1959). The loss of range resulting from extensive logging and expanding agriculture combined with the pressure of market hunting and the introduction of a protozoan parasite common to free-ranging domestic chickens (called blackhead disease) to cause sharp drops in wild turkey population and restrict their distribution (Leopold, Gutierrez and Bronson 1981). The turkey had ranged over most of the forests of Louisiana except for the wetter swamps. It was a much sought after bird, for home consumption and the market, as well as for sport. In north Louisiana, turkeys were so numerous that they frequently were run down and lassoed by hunters on horseback (Dick 1948).

**Whooping crane:** The prairies and marshes of southwest Louisiana were once the wintering grounds for fairly large
numbers of whooping cranes. They arrived in late fall and departed in early spring. It has been said that along with the more familiar and numerous sandhill crane, the whooping crane was a "noble and majestic" edible target that became a target of unbridled shooting wherever it passed or stopped (Doughty 1983; National Research Council [NRC] 1970).

**Sandhill crane:** Formerly this crane was a fairly common winter resident in the southwest prairie section of Louisiana. It was likely present in the Florida Parishes as well, but was only a rare transient in central and northern parts of the state. There was a nonmigratory subspecies that nested in Louisiana. Like many shorebirds, the great decline in numbers was most rapid between 1870 and 1915 as a result of market hunting (Lewis 1977).

**Rail (corncrake):** Of the various species of rails in Louisiana, either or both of two species are probably the one referred to as being shot in the historic literature. These are the king and clapper rails. The king rail, the largest of the rail family, is a fairly common permanent resident of Louisiana. It is found associated with the interior marshes, well-vegetated swamps, and the lakes and ponds of the interior. It is often associated with muskrat in its distribution. The winter population is augmented by out-of-state migrants that arrive in August - September and
depart in April - May (Bateman 1977). The clapper rail is a common permanent resident in the salt and brackish marshes of the coastal region. It prefers tidal marshes bordered by shallow bodies of salt or brackish water. A typical habitat would have dense growths of cordgrass or needlerush (Mangold 1977). The breast of this bird is small and provides relatively little edible meat (Leopold, Gutierrez and Bronson 1981).

**Common gallinule (moorhen):** The common gallinule is a fairly common year-round resident in south Louisiana. It is common in the summer but only moderately common in the winter, when it apparently moves into other parts of the state. It frequents the coastal marshes, particularly in the summer, as well as the lakes, streams, ponds, and bayous of the interior.

**American coot (poule d’eau):** This species is a permanent resident throughout Louisiana. It is abundant on freshwater lakes and brackish ponds from the fall through the early spring. It tends to be rare or locally present during the summer. Coots were a common food source that was found on the settlers’ tables. The major period of decline in population was between 1870 and 1930. The decline was caused by expanding settlement combined with wetland reclamation that destroyed the coot’s habitat. There are
approximately 4.5 million acres of coot winter habitat in Louisiana (Fredrickson 1977).

**American golden plover:** These plovers are primarily spring migrants through Louisiana enroute from South America to northern Canada. The main spring migration route is up the Mississippi Valley. The birds are present in large numbers in Louisiana from early March to mid May. The golden plover prefers open areas such as clearings, meadows, freshly plowed fields, and such. Some are present in the state in the late fall and early winter as they migrate down the Mississippi Valley rather than the normal Labrador to Brazil route.

**Kildeer:** This permanent resident is fairly common locally in the summer. It is abundant throughout Louisiana from September through May. It frequents and nests in open situations such as pastures, meadows, or gravelly strands, and is attracted to newly opened agricultural fields.

**Marbled godwit:** In the 1800s this was a common migrant and winter visitor through south Louisiana. The marbled godwit is a shore bird that arrives in early April but is gone by the end of May. It reappears in mid August on its northward migration and stays until the end of November. Like other shore birds the marbled godwit was nearly driven to extinction in the late 1800s by the pressures of market
hunting.

**Eskimo curlew:** The Eskimo curlew was an abundant migrant through south Louisiana during the first two-thirds of the nineteenth century. It migrated north in a leisurely fashion in March and April on its way from Argentina and then returned in the fall. As Lowery noted "They were slaughtered unmercifully, and without heed for the possibility of their ultimate extinction. Each spring they came to our prairies by the thousands, and each spring their bodies were hauled away by the wagonload for shipment to the markets. By 1875, however, their numbers were so depleted that market hunting was no longer profitable," (1974b: 287-8). The curlews suffered from a lethal trait that caused them hover over and circle birds that had been shot, thus exposing the survivors to additional gunfire (NRC 1970).

**Upland sandpiper** (*Upland plover, papabotte*): Formerly, this sandpiper was an abundant transient throughout most of the state from late February to late May and again from early July through late October. It frequented prairies, meadows, the grassy margins of water bodies, and was also found on the uplands.

**Yellowlegs:** Two species of yellowlegs, the greater and the lesser, migrate into and through Louisiana. Both were uncommon to common winter residents in the coastal region,
but were spring and fall transients throughout most of the state.

**Willet:** The willet was a common to abundant permanent resident on the islands, beaches, and prairies of the coastal region. Elsewhere in Louisiana it was a rare transient.

**Spotted sandpiper:** Present all year, this sandpiper was common during its spring and fall migration through the state. It was rare as a resident in summer and winter.

**American woodcock (becasse):** The woodcock was primarily a winter resident in most of Louisiana except for the coastal marshes. There apparently were some year-round residents. The general modern winter range of the woodcock can be divided into four major areas based on different degrees of utilization. The Lower Mississippi - Atchafalaya Basin area included ideal woodcock range with damp wooded thickets. In the Southeast and Southwest Terrace lands the constantly flowing creeks and thicket covered spring heads formed ideal daytime feeding and cover areas. The Northwest Louisiana Uplands and Upper Mississippi Alluvial Plain region was little used by woodcock. This was primarily due to a combination of poor soils, few moist areas, and cold weather. The Southwest Prairies and Coastal Marshes were used only in times of cold weather when the birds were
driven south. In all of these areas of winter range, the most important habitat was the bottomland with its mixture of hardwood forests, crop and pasturelands, and brush borders (Owen 1977). When the woodcock are present they utilize much the same range as does the bobwhite quail, narrow wooded draws and scrub oak flats. In southwest Louisiana a ratio of bobwhite to woodcock has been determined since both species can be hunted at the same time. The bobwhite:woodcock ratio for this area is 6.2:1.0, which indicates approximately one woodcock per 186 acres. This suggests a total population of 10,000 to 12,000 birds on some 2,000,000 acres of southwest terrace lands. Assuming a similar bobwhite:woodcock ratio holds for other parts of the state, a rough estimate of the total wintering population can be set at between 100,000 and 200,000 woodcock (St. Amant 1959). The woodcock has withstood heavy hunting pressure in recent years without apparent population decline (Leopold, Gutierrez and Bronson 1981). Thus any drop in numbers during Stage III must have resulted from habitat destruction.

Common snipe (Jacksnipe): The common snipe is a Louisiana resident during the fall, winter, and spring. It arrives in late August and stays through May in all of the state. It is common to abundant in south Louisiana, but is less numerous in the north. Largest populations occur from
October through November and from February through April. It frequents marshes, grassy meadows, and lakeshores. Like the turkey and Upland sandpiper, the snipe was a much sought after game bird for the market, home, and for sport. It may be the most numerous of all the American shorebirds (Leopold, Gutierrez and Bronson 1981).

Pigeon (Passenger pigeon?): Surprisingly, none of the archival records examined clearly indicate that the pigeons shot during the nineteenth century in Louisiana were passenger pigeons. The occasional references to large numbers of pigeons were not in connection with hunting. None of the descriptions match those noted by Doughty (1983) and Audubon in other parts of the country. Audubon described the effects of a nighttime roost in Kentucky:

The dung lay several inches deep covering the whole extent of the roosting-place, like a bed of snow. Many trees two feet in diameter, I observed, were broken off at no great distance from the ground; and the branches of many of the largest and tallest had given way, as if the forest had been swept by a tornado....The pigeons arriving by the thousands, alighted everywhere, one above another, until solid masses as large as hogsheads were formed on the branches all around. Here and there the perches gave way under the weight with a crash, and falling to the ground destroyed hundreds of the birds beneath (quoted from Ornithological Biography, 1831-1839 by Mershon 1970:33, cited in NRC 1970:7).

Doughty (1983) reports hunts in which tens of birds were felled with one shot from a shotgun. The lack of similar
descriptions from Louisiana may result from the fact that, while the ecological effects of the passenger pigeon were severe and lasting they tended to be localized. This species had erratic migration habits. Temporarily favorable conditions could bring on a one-time concentration of the birds that would not be repeated for some years (NRC 1970). It may be that Louisiana simply never attracted the passenger pigeon in the stupendous numbers recorded elsewhere.

**Domestic pigeon:** Also known as the rock pigeon, this bird exists in a semiferal state in many cities and towns of Louisiana. This may also have been the case in nineteenth century New Orleans, the only part of the state in which there is some evidence that the domestic pigeon was used as food (Castille et al 1986).

**Mourning dove:** The mourning dove, a relative of the now extinct passenger pigeon, is a common permanent resident of Louisiana. Local birds and migrants flock to southern Louisiana in the winter, beginning in late September or early October, leaving the northern part of the state nearly empty. Like the bobwhite, doves were reported as rare or occasional by early travelers. Both are seed and grain eaters and share what is essentially the same winter range. If this was true in the past, the original virgin dove range
was only 9,000,000 acres. Modern dove populations appear to be substantially smaller than those of bobwhites and the same may be true of the nineteenth century pattern. The mourning dove has been described as largely a product of agriculture. It is an edge oriented species. In pre-European times in Louisiana the dove would have been limited to the edge ecotones of natural and man-made meadows or prairies and the edges of Native American agricultural fields for range. Unfortunately, no estimates of carrying capacities on natural dove range are available as a basis for projecting present-day or past population sizes. As recently as 1982 no population figures for this species were available (Larry Soileau, Louisiana Department of Wildlife and Fisheries, personal communication, 1982).

**Barred owl:** This is the most common of all the owls in Louisiana. It can be found in almost any sizable wooded area of the state, and is a permanent resident.

**Kingfisher:** The kingfisher is a fairly common permanent resident over all of Louisiana. The wintering population is augmented by seasonal migrants. It is especially abundant in south Louisiana. It frequents the streams, lakes, ponds, and inlets of the coast and the interior.

**Common flicker (Yellowhammer):** This flicker is a common and widespread permanent resident. It is more abundant in
the winter because of northern migrants. It can be found associated with forests and open country.

**Pileated woodpecker (Indian hen):** This is a fairly common permanent resident in the heavy forests of most of Louisiana. It was not known in the southwestern part of the state.

**Ivory-billed woodpecker:** Formerly, this species was probably a fairly common permanent resident found in the heavy bottomland hardwood forests. The largest of the woodpeckers, it is now either rare or absent from Louisiana.

**Red banded woodpecker:** One of the most common woodpeckers of Louisiana, this species can be found in practically any patch of woods in the state. They are permanent residents.

**Sapsucker:** The sapsucker is a common to fairly common winter resident in all the wooded sections of Louisiana. It is apparently absent from the coastal marsh area. It is present in Louisiana between mid September and mid April.

**Blue jay:** A fairly common permanent resident, this jay is found across the state. It becomes common to abundant during the winter as northern migrants move into Louisiana. It may be absent from parts of the coastal region but is found associated with most forests as well as in open
country.

**Common crow**: Primarily a winter visitor, the crow is found in all kinds of habitats from heavy forests to along the seashore. It is rare or absent from the coastal marshes where it is replaced by the fish crow.

**Tufted titmouse**: This bird is a widespread and common permanent resident of the state. It prefers wooded areas, and is absent only from the wooded cheniers in the coastal marshes.

**Robin**: The robin commonly breeds in parts of north Louisiana. It is a rare permanent resident whose numbers are increased to an abundant level throughout the state by winter migrants from the north.

**Bluebird**: The bluebird is a permanent resident that is fairly common in the summer. It becomes particularly numerous in the winter due to an influx of northern migrants. It is practically statewide in winter, with the possible exception of the coastal region.

**Cedar waxwing (Cedar bird)**: This is a winter resident present from late September through early June across the greater part of Louisiana. Its numbers range from uncommon to locally abundant.
Vireo (grasset): The several species of vireos found in Louisiana are either summer residents or spring and fall transients. Most species prefer wooded regions, but some favor brushy areas. They can generally be found across the state in suitable habitats.

Cerulean warbler (bleu warbler?): This warbler is a widespread, fairly common and occasionally abundant spring migrant, but its occurrence is more regular in the fall. The spring transients are present from late March to early May and the fall migrants pass through the state between August and early October.

Bobolink (rice bird): The bobolink is a spring and fall transient. It is common in the spring, early April to early June, but rare in the autumn, early August to late September. Its numbers vary regionally as well as seasonally. It is fairly common in southeast Louisiana but rare in the central, northern, and western parts of the state.

Red-winged black bird (wheat bird): This is a common to abundant permanent resident throughout the state. Large winter migrations increase the numbers in central and northern Louisiana. Jean-Bernard Bossu referred to the red-winged black birds as "these edible birds" (Feiler 1962:202).
Common grackle: This grackle is a common permanent resident over all of Louisiana except for the coastal marshes. It inhabits all kinds of country, both woodlands and open areas. There are two varieties in the state. One breeds north of a line extending from Lake Charles to Bunkie. The other variety breeds in southeast Louisiana. Apparently, most references to "black birds" in Louisiana and much of the south actually refer to the common grackle (Taylor 1982).

Cardinal (redbird): The cardinal is a widespread permanent resident of the state. It inhabits areas of thickets and undergrowth, but is absent from the coastal marshes and deep inland swamps. It also tends to be rare in other heavy deep forests.

Goldfinch: The goldfinch inhabits woodlands and open areas as well. It is a permanent resident that is rare in the summer. The wintering population is common to abundant and is found in northern and central Louisiana and in the northwestern part of southeast Louisiana.

Rufous-sided towhee (bullfinch): This towhee is a common winter resident throughout all of Louisiana. It is a common summer resident in the southeastern part of the state, but is almost completely absent from north Louisiana.
during this season. The winter population is augmented by migrants from the northern and western U. S.

**Saltwater Fish**

The distribution and movements of saltwater marine fishes are based on data taken from Gowanloch (1933/1965), Hoese and Moore (1977), and van Beek et al (1981). None of these sources discussed abundance or population levels. The data available for the different species varies in extent.

**Florida pompano:** During the summer the pompano moves into the nearshore waters and may migrate into saline areas of lower estuaries. They abound in the surf zone apparently attracted by sand-fleas upon which they feed.

**Redfish (red drum):** Redfish spawn in or near the mouths of passes and the young are numerous in these areas during the spring and summer. Adults tend to be solitary and live in the shallow water of bays in the inshore saline zone of the estuarine region. The estuarine region encompasses the lower portion of the freshwater zone, the brackish water zone, as well as the inshore saline zone. Large numbers of the fish migrate out into the Gulf in the fall and return in the spring. It is during these runs that larger fish can be caught.

**Atlantic croaker:** This is, perhaps, the most common
bottom dwelling species of the inshore saline zone. The croaker likes shallow water and haunts the shoreline of sandy beaches. The young occur in the deeper parts of the bays in the summer and depart in the fall. It is reported that only a few live past their first year.

**Black drum:** This is predominantly a bay species which occurs in the shallow inshore saline zone of the estuarine region. It is fond of shallow mud flats.

**Speckled seatrout:** The "speck" spawns in bays and the young generally spend their first year in or near grassflats. Adults are more common in deeper areas and are often found over oyster reefs. Their general distribution is in the inshore saline zone.

**Sheepshead:** A common inshore fish, it is found in the inshore saline zone.

**Mullet:** Two main species of mullet are present in Louisiana coastal waters. The white mullet is generally found in saltier water than is the striped mullet. The latter species is found in large schools in practically all environments from fresh to hypersaline. They have been recorded from many rivers of Louisiana as well as protected regions in bays. They occupy shallow bottom areas of the inshore saline zone. The striped mullet is a fall spawner.
Large schools leave the bays in the fall, with smaller schools returning over a period of about six months.

**Grouper (Black jewfish):** Generally located in clear offshore waters, small specimens, up to forty pounds, of this species are common around jetties.

**Southern flounder:** The young of this species are reported to occupy shallow bays and shallow waters along beaches in the inshore saline zone of the estuarine region. Large fish migrate into the open gulf during the fall to spawn. Mass migrations may result from a severe norther which provides an excellent opportunity for floundering or gigging.

**Red snapper:** This is a deep water, offshore fish.

**Spanish mackerel:** Predominantly an offshore fish as an adult, the young are common in the surfzone and in low-salinity bays. These fish like to swim near the surface.

**Sea catfish:** These are inhabitants of the estuarine zone. They are more abundant in bays and inlets than in the open Gulf. They may swarm in the lower zones of bayous and prefer mud to sand bottoms and shoals.

**Bluefish:** This is a mainly offshore fish that is farily
common along the Louisiana coast. It appears inshore only in the cooler months of the year. It moves in large schools and has been known to drive shoals of menhaden up on to the beach.

**Stingrays:** These are plentiful in bay and gulf surfzones. They are common inshore fish that prefers the bottoms. They have been known to enter the rivers of Louisiana.

**Freshwater Fish**

The following discussions of freshwater fish are based on the works of Gowanloch (1933/1965) and Douglas (1974). Only those species identifiable to at least the generic level will be discussed.

**White bass (barfish):** The white bass principally inhabits the larger rivers of northern and central Louisiana. It was apparently abundant in former times. Figures for the Mississippi River and its tributaries for the combined catches of rock bass, yellow bass, and white bass show a catch of over 510,000 pounds in 1894. The total catch for the same species in the same area for 1922 was only 74,862 pounds. As appears true for other freshwater fish, the population of white bass was not seriously impacted by human influences until the early twentieth
Largemouth bass: The largemouth bass is found statewide. It occupies all types of suitable freshwater from small creeks to large lakes. It is found most commonly in nonflowing water with abundant aquatic vegetation.

Rock bass: The rock bass has a limited distribution in Louisiana. It is limited to the Pearl River and the Lake Pontchartrain drainages. It is locally abundant in clear flowing streams and rivers, and favors areas of abundant deep pools where rocks abound.

Gaspergou (freshwater drum): The gaspergou is found statewide, most commonly in larger rivers and lakes. The greatest numbers occur in the shallow areas of the Mississippi and Red Rivers. It seems to prefer a silty water environment.

Pickerel: Two species of pickerel are present in Louisiana, the redfin and the chain. Both have statewide distributions. The redfin pickerel is common in clear lakes, bayous, oxbows, and the pool areas of rivers and streams, especially those with abundant vegetation. The chain pickerel is commonly found in most nonflowing waters with abundant vegetation. It also occurs in the backwaters, pools, and overflows of streams and rivers.
Paddlefish: This species was formerly abundant in the Mississippi Valley in larger streams and connected lakes. Statistics for its entire range in North America show a clear decline in numbers by 1933. The depletion resulted not only from subsistence fishing, but also from the fact that a single fish may produce as much as fifteen pounds of roe which could be sold to caviar manufacturers for a good price.

Gar: Four species of gar occur in Louisiana. Most are abundant in the larger lakes and rivers, and, being tolerant to saline conditions, are also plentiful in the southern marshland waters. The spotted gar is distributed statewide and is especially common in the clearer waters of lakes, bayous, oxbows, and backwaters of rivers and streams where there is abundant aquatic vegetation. The longnose gar is also found statewide. It is common in all major river drainages, though perhaps is more abundant in larger rivers. It is also found in bayous, oxbows, and backwaters. The shortnose gar has a statewide distribution and is locally abundant in the larger muddy rivers of the Mississippi drainage. The alligator gar is found statewide in all larger bodies of water, both rivers and lakes. It is very tolerant to the brackish water of the southern marshes.
Blue catfish: The blue catfish is found throughout the Mississippi River, larger streams, and silted bayous of the state. It is rarely found in smaller streams and ponds. Peak abundance is reached in south Louisiana. Generally a fish of deeper waters, it spreads into shallow bayous and backwaters in the spring. It has also been observed in the salty waters of Lake Borgne and the Mississippi Sound.

Channel catfish: This species is distributed statewide, occurring in most lakes and rivers.

Yellow (flathead) catfish: The yellow catfish has a statewide distribution. It is a big river fish found most often in the deeper pools of low gradient streams and rivers. It seems too prefer sluggish water areas to the swifter currents of the middle portions of the streams.

Bullhead catfish: There are two main species present in Louisiana, both with statewide distributions. The black bullhead is commonly found in backwaters of smaller streams and lakes. It is less common in larger streams and rivers. The yellow bullhead is often found in lakes and the backwaters of streams and rivers, but is most common in clear, nonturbid waters.

Smallmouth buffalo: This species of the buffalo is found in the larger streams, rivers, and lakes. It is
especially abundant in oxbow lakes and the backwaters of larger rivers. It has a statewide distribution.

**Buffalo:** There are two other species of buffalo fish in Louisiana, both of which have statewide distributions. The bigmouth buffalo is most common in larger rivers, lakes, oxbows, and sloughs. The black buffalo inhabits the larger rivers, oxbows, and bayous of the state. It is the largest and least common of the three types.

**Warmouth sunfish:** This species of sunfish occurs statewide in Louisiana. It is found to be most common in small impoundments and bayous with abundant vegetation, soft bottoms, and slow currents.

**Sac-a-lait (crappie):** Two species of crappies are found in Louisiana, both with statewide distributions. They are also called white perch or specs. The white crappie is tolerant to a wide variety of habitats but appears to be more common in the backwaters of rivers and streams and in the larger lakes with abundant vegetation. The black crappie is more commonly found in larger, clearer impoundments with aquatic vegetation. It, apparently, is not as tolerant of turbid conditions as is the white crappie. The two species occur sympatrically and are often confused as the amount and placement of pigmentation is usually not distinct enough to establish accurate
identification.

**Choupique (bowfin):** This fish has a statewide distribution. It typically haunts the sluggish waters of bayous and backwaters of rivers that are generally choked with weedy aquatic vegetation. The bowfin often moves into the shallows at night, returning to deepwater during daylight hours.

**American eel:** The American eel has a statewide distribution. It is especially abundant, however, in the lower Pearl River and the streams feeding into Lake Ponchartrain. The eel spawns in the Atlantic ocean near Bermuda, then enters freshwater where it grows and matures.

**Reptiles and Amphibians**

The distribution patterns and abundance levels of the following reptiles and amphibians are taken from Dundee and Rossman (1989).

**Loggerhead turtle:** The loggerhead is a very large marine turtle. It inhabits bays and open ocean waters. It is known in Louisiana only from the southeast coast and offshore islands.

**Green turtle:** This is another very large marine turtle that is presumable a visitor to Louisiana. Although there is
some evidence to suggest that it may be a nesting species. It is known from along the entire coast of the state.

**Alligator snapping turtle:** This species, also known as the loggerhead, is a large freshwater terrapin. It is found statewide, most commonly in large rivers, lakes, and oxbows, as well as in swamps near rivers. It is least common in the marshes.

**Common snapping turtle:** This is a large freshwater aquatic turtle. It has a statewide distribution in freshwater, but is uncommon in the coastal marshes. It is generally found in permanent ponds, lakes, and streams. And may also be found occasionally in somewhat brackish waters in marsh areas.

**Pond slider:** This is a large freshwater terrapin. It has a statewide distribution, being found in rivers and some lakes.

**River cooter:** This species is a large freshwater terrapin with a statewide distribution. It is found most often in sluggish or silted streams, ponds, and lakes.

**Eastern box turtle:** This medium sized land terrapin has a statewide distribution being absent only from the marsh, although it is found on some cheniers. It prefers open woodlands and hibernates during the winter.
**Gopher tortoise**: This is a large terrestrial tortoise. It inhabits relatively open forests with grasses and forbs. Though it was probably never abundant in Louisiana, historically it likely inhabited the longleaf forest uplands of all the Florida Parishes. It was previously captured and eaten by rural people. Benjamin L. C. Wailes of the Natchez District wrote that it was "esteemed a great delicacy by the gourmands of the watering places" (Sydnor 1938:189).

**Softshell turtle**: There are two species of this medium to large aquatic turtle. The smooth softshell may have been statewide previously. It is currently absent from the marshes, prairies, and most of the Atchafalaya Basin. This species prefers large streams with moderate to fast currents. The spiny softshell is basically statewide in distribution being absent only from the saline and brackish marsh areas. It inhabit lakes, oxbows, lagoons, and rivers. Both species are eaten by humans but are seldom found in Louisiana market places.

**Alligator**: Essentially the alligator has a statewide distribution in suitable habitats. In the hill country it is limited to areas near large lakes and the floodplains of the major streams. There is some debate concerning its use as a food animal, although Taylor (1982) and Cole (1916) mention its being eaten. Frederick Gerstaecker (1855) notes
spearing alligators and taking their tails for food. William Johnson wrote of collecting the fat from alligators he had shot (Hogan and Davis 1951). From personal experience I can state that alligator tail is quite edible, tasting much like pork with a similar texture.

**Bullfrog:** This, the largest frog in the United States, is found statewide wherever permanent freshwater habitats exist. It inhabits lakes, ponds, sloughs, sluggish streams, and freshwater marsh or swamp. The consumption of frog’s legs dates back to the early French period in Louisiana.

**Crustaceans**

**Crawfish:** Twenty-nine species of crawfish occur in Louisiana but only two, the red swamp and the river crawfish, are used commercially. Most likely these are the same species that are caught by noncommercial sports crawfishermen. Both species prefer fresh to brackish water. The river crawfish prefers a riverine environment, while the red swamp crawfish prefers the sluggish interior waters of cypress-tupelo swamps, bayous, and freshwater marshlands (van Beek et al. 1981).

**Brown shrimp:** The brown shrimp have two spawning seasons, March–April and September–October. The adults spawn offshore and the post-larvae forms move into the estuaries
and bays. They prefer the marine and lower estuary habitats with saline and highly brackish waters (Larson et al. 1980).

**White shrimp**: Like the brown shrimp this species spawns offshore and then the post-larvae forms move into the estuaries and bays. The white shrimp spawn from spring through fall. They prefer middle and lower estuary habitats with brackish and saline water.

**Seabob**: It is thought that the seabobs found off or along the Louisiana coast either spawn and mature offshore in deeper waters or migrate in from other Gulf states. They are known to spawn along the coasts of Texas and Mississippi. Seabobs occur along the beaches of Louisiana in great numbers in late summer, early fall, and in late winter.

**River shrimp**: The river shrimp occurs in the larger rivers of Louisiana from the Pearl in the east to the Sabine in the west. It is also found in the freshwater lakes of the floodplains. The river shrimp was long considered a great delicacy in Old New Orleans.

**Blue crab**: Of the many species of crabs inhabiting the coastal waters of Louisiana, only the blue crab is used for food. They are found throughout south Louisiana and as far
north as Krotz Springs in the Atchafalaya Basin. They prefer middle and lower estuary situations but are abundant in many different habitats of the Deltaic plain. Optimal conditions include shallow water, mud and/or mud-shell bottoms, mollusc beds, detrital matter, tidal fluctuations, warm temperatures, and mid-to-low salinity levels.
FROM FOREST, STREAM, AND SEA: ASPECTS OF SELF-SUFFICIENCY 
IN THE NINETEENTH CENTURY LOUISIANA DIET 

Volume II 

A Dissertation 

Submitted to the Graduate Faculty of the 
Louisiana State University and 
Agricultural and Mechanical College 
in partial fulfillment of the 
requirements for the degree of 
Doctor of Philosophy 

in 

The Department of Geography and Anthropology 

by 

James Patrick Whelan, Jr. 
B.A. San Francisco State University 1964 
M.A. San Francisco State University 1970 
December 1989
CHAPTER 8: HUNTING AND FISHING IN LOUISIANA

Despite the widespread distributions of many wild game and fishery species, statewide in some cases, these resources were not taken in all of the ecological divisions in which they occurred. For example, both species of rabbits occurred virtually statewide in suitable habitats, so no part of the state should have been without a harvestable rabbit population. Yet rabbits are reported as being hunted in only four of the ecological divisions. Also surprising is the regionally limited hunting of American woodcock and mourning dove, both of which shared essentially the same range as the bobwhite quail. While the quail was hunted everywhere except in the coastal marshes, the woodcock was reported as taken only in three regions and the mourning dove only in two. This may be partially explained by the fact that in much of the archival material birds hunted are identified only as "birds." The same is true with regard to fish resources. All too often letters, journals, and diaries simply report catching a "mess of fish" without specifying the type.

This chapter will present the documentary evidence for the use of wild game and fisheries resources in each of the seven ecological divisions of the state (Figure 10). The discussion has been organized by source rather than by
STATE OF LOUISIANA
1. Northwest Louisiana Uplands
2. Upper Mississippi - Tensas - Ouachita - Red River Bottomlands
3. Southwest Louisiana Terrace Lands
4. Lower Mississippi - Atchafalaya Bottomlands
5. Southwest Louisiana Prairies
6. Coastal Marshes
7. Southeast Louisiana Terrace Lands

Figure 10. Ecological Divisions of Louisiana (after St. Amant 1959).
species in order to minimize the number of references. This method of organization will, however, result in some duplication of species names as data from each source is presented. Depending upon the number of sources available for each ecological division, the material has been arranged either by type of source, that is, archival, contemporary writings, etc., or chronologically. A listing of all species exploited will be included for each of the seven ecological divisions.

1. **Northwest Louisiana Uplands**

This is the largest of the ecological divisions and includes an area of over 7,700,000 acres. It encompasses the oldest, the highest, and most heavily eroded part of the state. The region is uniform in character and quality. Originally it would have been covered with extensive forests comprised of pure pine, pine-hardwood, and mixed bottomland hardwood associations. The entire area would have offered excellent forest game range, as would the neighboring regions of southwest Arkansas and east Texas.

The contemporary information on hunting and fishing in this region is limited to the diaries of Leonidas Pendleton Spyker and Lestant Prudhomme and the writings of Frederick Gerstaecker and Timothy Flint. Some zooarchaeological data is available from a house site in Washington, Arkansas,
which occupies a similar environmental zone. Additional information is present in secondary sources for Louisiana and Texas.

Gerstaecker (1855) in writing about his travels through southwest Arkansas, east Texas, and northwest Louisiana in the 1830s recorded much of the wildlife he saw and hunted. He reports flocks of wild turkeys, large numbers of wild geese, herds of deer, alligators, and the occasional bear. Among the animals he killed for food were wild ducks, turkey, bear, and unspecified wildfowl. Concerning bear he wrote, "His flesh was savory and tender, but he was not so fat as was expected" (Gerstaecker 1855:79).

Excavations of the house of Abraham Block in Washington, Arkansas included a household trash pit that dates from the late 1830s to the early 1840s. Although the zooarchaeological sample is small, including only 41 individuals, it did comprise 2,629 bones which was considered an adequate sample for a single site. While the fauna represented is characterized by a preponderance of domestic species, wild species contributed 13.54 percent of the total biomass represented by the bone remains. The major game resource was deer which made up 9 percent of the total biomass. The diet was also supplemented on occasion by both grey and fox squirrels, turkey, mallard or domestic
duck, a flicker, and a corvid bird. Fish contributed only a minor component of the diet, primarily catfish, suckers, and sunfish. Wild birds represent some problems of identification in faunal analysis. By the mid 1880s mallards, Canada geese, and turkeys had been domesticated. Even earlier references to these birds suggest pen raising if not actual domestication. It is thus difficult to determine the wild species as opposed to the domestic ones. In the case of turkey, they are difficult to raise, being disease prone, thus large-scale domestication is relatively recent. It is reasonable to assume that the turkey at this site, if not the duck, was a wild bird (Ruff 1985; Stewart-Abernathy and Ruff 1986).

Hunting was apparently an enjoyable pastime for some residents of northwest Louisiana. In his diary, Leonidas Spyker, recorded 12 hunting events, 11 after deer and one for ducks. Not all of the trips were successful. On five occasions it appears that no deer were seen. Twice deer were seen, but either allowed no shots or the shots missed. The remaining four hunts resulted in killing at least one deer. The one duck hunting trip produced no ducks. Spyker did not usually hunt alone, on most occasions he was accompanied by friends. These trips took place in Bossier Parish between July 1 and November 30, 1856. Shortly thereafter Spyker moved to Morehouse Parish (Spyker Diary).
A portion of the diary of Lestant Prudhomme was transcribed and published as a chapter in a book on Louisiana by Lyle Saxon (1950). This part of the diary includes a number of entries that are unique for this ecological region. One contains the only reference in the region to what were most likely passenger pigeons. On the 29th of January, 1850, Prudhomme wrote:

Yesterday, during the whole morning, wild pigeons passed from one swamp to the other. It was really a most astonishing thing to see so many large flocks flying over with hardly any interruption. Many of them were killed, for such persons as had any guns in their possession made use of them... (Saxon 1950:171).

Prudhomme also recorded killing many black birds (probably grackles) on two occasions and shooting at cherry birds on another. The diary entries, which run from January through June of 1850, included mention of two deer hunts, only one of which was successful. Lestant Prudhomme was a Creole, which may explain two crawfishing trips made in March and April. Based on the other sources, Anglos in this region apparently did not appreciate this crustacean. Unfortunately only about one-sixth of Prudhomme's diary was included by Saxon, and it appears that the entire text has not been published elsewhere.

In 1860 yeoman farmers and nonslaveholders in the northern uplands of Jackson, Bienville, Claiborne, and
Bossier Parishes relied more on hunting than farming. They shot "deer, wild fowl, and furbearing animals by the thousands" (Shugg 1939:44). Slaves living on plantations in the Red River country often had to depend on wild meat to supplement inadequate or bad rations. Solomon Northup reported that the slaves had to hunt raccoon and opossum at night (Eakin and Logsden 1968; Taylor 1963). Timothy Flint, in his memoirs, wrote of the ease with which fish were caught in the streams of the Piney Woods around Alexandria. "During the summer, I took more that two thousand trout myself, besides pickerel and other fish....It seldom cost us half an hour to take enough for twenty people" (Flint 1968:255). He also reported eating duck pies for breakfast and supper at a plantation on Bayou Rapide between Alexandria and Natchitoches. An undated newspaper clipping reported the text of the 1904 Ouachita parish game ordinance which included the requirement of a license in order to seine for gar, buffalo, catfish, and gaspergou (Purvis Papers).

In east Texas bear, deer, and turkey provided food for small farmers, plantation owners, the slave quarters, and immigrant wagon trains heading west. Residents east of Nacogdoches netted quail and shot turkeys from their roosting trees. Professional hunters in the region would sell venison, bear, and turkey meat to markets in small
towns, or even sell the meat door-to-door. The oak woodlands of eastern and northeastern Texas sometimes housed thousands of passenger pigeons. A single night’s slaughter produced enough birds to occupy an entire day of plucking, gutting, salting, and packing (Doughty 1983). Although not documented it is reasonable to assume that similar activities occurred in northwest Louisiana as well.

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**Table 4. Species List for Ecological Division 1.**

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>Bobwhite quail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bison</td>
<td>Wild turkey</td>
</tr>
<tr>
<td>Black bear</td>
<td>Common flicker</td>
</tr>
<tr>
<td>Northern raccoon</td>
<td>Gaspargou</td>
</tr>
<tr>
<td>Fox squirrel</td>
<td>Pickerel</td>
</tr>
<tr>
<td>Grey squirrel</td>
<td>Gar</td>
</tr>
<tr>
<td>Opossum</td>
<td>Catfish</td>
</tr>
<tr>
<td>Goose</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Mallard</td>
<td>Sucker</td>
</tr>
<tr>
<td>Duck</td>
<td>Carpfish</td>
</tr>
<tr>
<td>Pigeon (passenger?)</td>
<td>Crawfish</td>
</tr>
<tr>
<td>Black bird (grackles)</td>
<td>Cherry bird ?</td>
</tr>
</tbody>
</table>

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2. **Upper Mississippi-Tensas-Ouachita-Red River Bottomlands**

This region includes about 4,500,000 acres of bottomlands in northeast Louisiana from the Arkansas border south to the vicinity of Old River. It consists of recently deposited
river alluvium and supports a variety of bottomland hardwood forests. These forests vary in their composition depending on elevation and relationship to the rivers. Though at higher elevations than the lower Mississippi basin, the area is still subjected to backwater flooding by the Mississippi and Red Rivers.

There is substantial documentation of hunting and fishing activities for this region in the archival record of plantation papers and diaries, as well as in the writings of early travelers. Unfortunately, the best reference for the general area is the diary of William Johnson of Natchez, Mississippi. However, it is probable that the river counties of Mississippi bordering Louisiana provided habitats and fauna similar to those found across the river. This would allow the use of data from the east side of the river for descriptions of hunting and fishing takes in the Upper Mississippi bottomlands region.

William H. Sparks (1882), writing of his travels through western Mississippi in the 1830s, noted that deer hunting was almost universal among the higher classes. Squirrel hunts also provided opportunities for social gatherings at plantations in the Natchez area. The Plain Folk yeoman farmers engaged in deer and bear hunts on a regular basis, while their children, followed by packs of
William Johnson was a free black living in Natchez. He started out as a barber and eventually rose to a position of prominence in free black society. Johnson went hunting quite often, generally in the company of friends. A favorite area was a region he called the Swamp. This was a swampy wooded area about 6 to 8 miles southwest of Natchez. Located between an old bed of St. Catherine's Creek and a narrow higher area along the Mississippi River, the area contained a number of shallow lakes. Johnson was quite meticulous about recording the results of his hunts as well as those of friends and acquaintances. The very first entry describing a hunt on Oct. 16, 1835 is fairly typical: "McCary and myself went into the Swamp Hunting & we Killed about thirty alligators between the three of us. Mr. Barland killed 4 ducks and one squerrell &MC Killed two Ducks and one Loon and I Killed One pelican, One Large duck & two Black squrerells and a Loon" (Hogan and Davis 1951:66). Obviously, Johnson and his friends were not single-minded hunters. The total results of hunts during this year included 13 squirrels, 4 geese, and 3 unidentified birds (ibid:69-81).

The diary entry for April 17, 1836 is rather
interesting: "found a Wild Turkey nest with eleven Eggs in it I took them and Brought them home with me" (ibid:116).

Johnson did not say whether he ate or hatched the eggs.

That same day he killed 3 small birds and 2 woodpeckers.

During 1836 Johnson records nine other hunts, the take from which included 3 kingfishers, 2 owls, 1 swallow, 1 rabbit, 13 squirrels, 1 woodpecker, 10 woodcock, 7 crows, 29 ducks, 2 cranes, 1 sparrow, 12 snipe, 3 loons, 2 yellow hammers (common flickers), 1 alligator, 1 pelican, 5 rice birds (bobolinks), 1 gold finch, 1 tom tit (tufted titmouse), 1 lark, 2 small birds, and 1 little fat bird (ibid:118-156).

1837 was a busy year with 15 hunts and several fishing trips recorded. One fishing trip occurred on May 25:

"I arose very Early in the morning and took Bill Nix and Bill Winston...and went a Fishing in the Concordia and Cocodria Lake....all the persons that were over there caught a Greate many. My two and myself caught 4 Doz and 4 Fish Mc Caught as many or more perhaps ....We Reached town quite Early in the Evening and got home in time to have Our fish Dressed for Supper... Mc and Mr Rufner, Harrison and a good many more treed a Coon on There way home...the Coon...was Shot Down by Rufner and Mc he Drew his Bucher Knife and was a spledgeing it about in Great stile over the Coon" (ibid:178-79).

Unfortunately, the results of the fishing trips are generally given simply as "fish." The hunting efforts of 1837 netted 5 raccoons, 18 squirrels, 1 rabbit, 2 fox squirrels, 3 geese, 1 black bird (common grackle), 1 owl, 2
woodcock, 2 crows, 6 ducks, 7 mallards, 3 summer (mottled) ducks, 1 sparrow, 4 snipe, 10 yellow hammers, 1 pelican, 9 rice birds, 14 larks, 1 partridge (bobwhite quail), 5 thrushes, 1 spotted breast (spotted sandpiper), 7 sapsuckers, 5 bull finches (rufous-sided towhees), 2 hawks, 1 white crane (egret), 4 kingfishers, 1 blue crane (blue heron), 1 bec croche (wood stork), 1 robin, 1 red bird (cardinal), and 7 wild hogs (ibid:160-214).

In 1838 Johnson recorded 10 hunts and 2 fishing trips. The results of the hunts included 8 deer, 77 robins, 2 rice birds, 11 yellow hammers, 1 wheat bird (red-winged black bird?), 1 sparrow, 3 black birds, 2 sapsuckers, 1 jay bird (blue jay), 1 woodpecker, 1 partridge, 1 buzzard, 1 loon, 2 bec croche, 1 blue crane, 1 duck, 2 larks, 1 thrush, and 1 big lead bird (ibid:219-240). None of the deer were killed by Johnson. Seven of them were killed by "Mr Doyal and several other Gentlemen" on November 4 (ibid:240). Most of the robins were shot in February. Johnson noted that on the 18th "There is at this time a Greate quantity of them in all parts of the woods" (ibid:220).

Johnson and his friends continued their hunting and fishing trips. They are documented in his diary up through March 9, 1851. During the period from January 1839 through January 1851 several additional species were added to the
list of their prey. In 1839 hunting trips produced Indian
hen (pileated woodpecker), bullfrogs, bacbons (unidentified
species), mourning dove, grey squirrel, and gar. Not all
the animals were killed for Johnson notes the capture of 4
opossums on December 1, all of which he took home
(ibid:237). Hunting trips in 1840 produced pigeons, killdees
(killdeer), grosbecs (black-crowned or yellow-crowned night
heron), grey plover (plover: various species), didaper duck
(pied-billed grebe), and teal ducks. In 1841 bluebirds,
ceder and sedar birds (cedar waxwings), catfish, fish ducks
(hooded mergansers), and shoate were added to the species
list. Hunting activities in 1842 added ivory billed
woodpecker, puldo (poule d'eau - American coot), roseate
spoonbill, soft shell and other turtles, plover teal
(plover), and buffalo fish. Johnson also noted seeing two
sand hill crane in the swamp on October 21 (ibid:410). No
new species were taken until 1851 when Johnson caught a
logahead (alligator snapping) turtle.

Johnson is one of a very few persons who recorded the
killing of wild or feral hogs. Although one entry for
December 1837 stated "Mr. Mossby had been Out the day before
and Killed 7 wild hogs" (ibid:214), wild hog hunting does
not appear to have been common before 1849. In February of
that year 10 small hogs were killed on two successive days.
In 1850 5 hogs were killed in February and another 13 in
December. The last hunting entry in the diary, Mar 9, 1851, records the killing of 19 wild hogs. All of these hunts appear to have been conducted in the Swamp during the winter. Apparently, the wild hogs were more available in cold weather.

Johnson's diary clearly illustrates many of the problems of species identification. His references to bacboms have remained unidentified. In some instances he records shooting jack snipe or plover, grey snipe or plover, and snipe or plover, not being specific in his identification. Yet other entries clearly distinguish between snipe and plover taken on the same hunt. For example on November 10, 1840 Johnson wrote "John killed 2 Large Plover, 1 Small snipe..." (ibid:306). It is not clear which of several species Johnson meant by the term plover, here they are all assumed to be some species of plover.

The fishing trips that Johnson records were generally quite successful. They often resulted in catches of more than two hundred fish. Unfortunately the type of fish caught is seldom specified. One last item of interest from the diary of William Johnson concerns market hunting. In the latter part of the diary are two references to this practice. On December 31, 1850 Johnson noted "Maj Winn is up from The Swamp with game for the market" (ibid:766). And
for January 7, 1851, the entry reads "William and Little
Winn Came up Last Evening...They had 3 squirrels and a
Rabit. Wm sold them in market" (ibid:768).

One other Mississippi source records the probable
killing of wild hogs. Dr. M. W. Philips of hinds County
recorded in his diary on December 23, 1850 that his hands
had "killed 638 lbs of wild meat." And the December 27,
1855 entry reads "killed Dec 27th, 276 lbs. wild meat in
field, 276 lbs; killed Dec 28th, 130 lbs. wild meat, 130
lbs; killed Dec 31st, 347 lbs. wild meat, 347 lbs" (Riley
1909: 435, 451-52). It is assumed that the term "wild meat"
refers primarily to feral hogs, although other entries in
the diary specify "wild hog", "wild pork", or even "wild
beef."

Herbert Weaver (1945) in his book on antebellum
Mississippi farmers notes that plantation owners encouraged
their slaves to hunt or trap animals that preyed on farm
produce. This may help explain the August 14, 1850 entry in
Dr. Philips diary: "Killed 113 squirrels; Peyton has killed
52 raccoons" (Riley 1909:434). Both of these animals were
guilty of depredation on plantation corn fields and killing
them reduced this as well as supplied another source of
food.

The correspondence and plantation diaries in the
Liddell Papers collection cover the time span from early 1839 to late 1869. Most of the correspondence is to St. John R. Liddell and most of the plantation records relate to his plantation, Llanada, on Black River near Trinity, Louisiana. Entries in the plantation diaries concerning hunting occur for 1839, 1840, 1843, 1844, 1867, and 1868. They refer primarily to the killing of deer and wildcat, with one mention of bear and one of raccoon. Two fishing references, one in 1844 and the second in 1868 note catching large number of barfish or white bass. In a notebook covering the 1855 – 1861 period there is an interesting entry on February 26, 1855: "Barfield said that the Panther killed by Kennedy at his old place was 11 ft and some inches long, & so heavy that 4 men co. with difficulty tote him between them on a pole" (Notebook 1855-1861, Ms Vol 23, Liddell Papers). There was no mention of the cougar being eaten.

The correspondence in the Liddell papers provides both direct and indirect evidence of hunting. Two letters written to St. John R. Liddell by J. D. Richardson, who lived on a small Boeuf River plantation, on July 13 and July 18, 1855 report the availability of fish, turtle, squirrel, and raccoon for food. Some indirect evidence is present in a Statement of Sale of Peltry by Cox, Gillis & Boyd on behalf of St. J. R. Liddell dated January 27, 1856. The statement lists 1 bear skin, 1 cub skin, 5 coon and Cat
skins, and 1 bundle of deer skins. Other indirect evidence of hunting includes an order placed by Liddell. "I require a fine double-barrelled Rifle (increased twist) for Deer, Bear, & target shooting" (Letter, St. J. R. Liddell to Mr. B. Mills, Harrodsburg, KY, March 31, 1851, Liddell Papers). The following year, Liddell ordered another fine double barrel gun and a Colt’s 6 Shooter (Bill from Brand, Adams & Co of New Orleans to St. J. R. Liddell, April 6, 1852, Liddell Papers).

The Lemuel Parker Conner and Family Papers consist primarily of letters. Although they cover a period from 1848 through 1900, references to hunting or fishing are few and often nonspecific as to results. The Conner family operated two plantations in Concordia Parish and had connections with at least one near Natchez. The earliest pertinent reference to hunting occurs in a letter from W. E. T. Griffith of New Orleans to Lemuel P. Conner dated December 2, 1848: "The mention of dogs, horses, wood cock &c roused the old spirit within me though it had been dormant since my sojourn here." In another letter of May 22, 1849, Griffith wrote: "I send the no. 3 [shot] thinking that you may find them useful for hawks, & water fowl & turkies." The next reference is in a letter from __E. Turner to Lemuel P. Conner dated April 13, 1852 regarding a deer hunt near Natchez. "Doct. Meade Killed a deer--The only Shot made
among us all" (Conner Papers).

One of the very few references to the presence of pigeons in large numbers in Louisiana is contained in a letter of December 20, 1881 from Mrs. M. L. McMurran of Woodlands, near Natchez, to Mrs. Lemuel P. Conner, her sister. "Genl Martin & his sons, Louis and Farar, on a little hunt to Spokan [up the Mississippi River from Natchez]. The boys are all fond of hunting. The woods are full of wild pigeon, and it is often annoying to me, the shooting so near the house, by both white and black men and boys: (Conner Papers).

Beginning in 1887 there are numerous letters from Lemuel P. Conner, Jr. to his father, his mother, but mostly to his wife. Many mention fishing trips and the occasional fish fry, a social event, but seldom identify the fish caught. There are two exceptions. In a letter L. P. Conner, Jr. wrote while at "Killarney" in Concordia Parish to his wife, Mrs. L. P. Conner, Jr., on May 25, 1891, he said "Willie & I tried the fish Sat. evening; caught a nice (word indecipherable), enough to freeze on ice and have for breakfast & dinner yesterday. This morning we set out at sunrise, & came back with 29, all fine." Later in the same letter he wrote: "I've got a fine large soft shell turtle to take back with me, if only he won't die before then." The
only other direct reference is in a letter of December 27, 1899 from L. P. Conner, Jr. to his wife describing a duck hunting trip up Red River. He wrote that they saw "several car loads of geese" but only killed two (Conner Papers).

James Monette of Hope Plantation in Morehouse Parish kept a daybook and diary that covered the period from August 1848 to November 1863. It contains however, only a few references to hunting and none concerning fishing. On November 24, 1848 he reported killing two crows with one shot from his rifle. The killing of deer on two occasional are recorded, July 13, 1849 and July 17, 1852. Two indirect references to hunting are recorded in the form of payments on purchases in 1855: $20.00 on a shot gun, August 15, and 50 cents for 1 lb of powder on August 29 (Monette Day Book & Diary).

The journal of Mary Susan Ker covers a short period from March 1850 to July 1851. Until late June of 1850 the Ker family lived on Good Hope Plantation in Concordia Parish. The journal contains references to twenty fishing occasions between March 25 and May 16, 1850. Most only note whether the fishing was good or bad. And on the four occasions that the catch is identified it is given as perch or trout, both of which could refer to several different species (Ker Papers).
Leonidas Spyker, who was cited earlier in the discussion of the Northwest Louisiana Uplands, moved to New Hope Plantation in Morehouse Parish in 1857. His diary records events between April 4, 1857 and October 24, 1860. During 1857 Spyker noted deer kills on two occasions, squirrels on one, and ducks on three. He also noted catching a large buffalo fish. Generally the results of his fishing are not identified. The 1858 hunting results were poor, two ducks on one occasion and nine squirrels on another. Spyker reported seeing three wild turkeys in a field on April 30, then returning home to get a gun, but he missed his shot at them. Only two deer and one catfish are reported for 1859, although several hunting and fishing trips are recorded. The next year, 1860, produced three ducks, one deer, some catfish, and a "fine mess of trout." The October 24 entry illustrates Spyker’s hunting luck: "I took breakfast at Col. Polk’s, and he, Tom, Leon & myself went hunting. Started a buck in the Mayo bend and ran it out to Marble’s, back to and across the bayou below Smith’s, recrossed & the last I heard of it the dogs were going down Boueff Bayou and John McCoyne after them" (Spyker Diary).

The diaries of Rowland Chambers provide an example of the hunting and fishing activities of the town dweller. Chambers was a dentist who lived in Satartia, Yazoo County, Mississippi in 1858, in Richmond and Floyd, Louisiana in
1859, and back in Richmond in January of 1860. He then moved to Vicksburg and apparently gave up hunting and fishing. The pertinent volumes of his diaries are numbers 3, 4, and 5 for the years 1858, 1859, and 1860. Entries for 1858 record the hunting success of Chambers' friends as well as his own. He reported deer being taken on five occasions and squirrel on one. During 1859, chambers went fishing more often than he went hunting. The fishing catches were not identified, but deer kills are noted on three occasions. The December 4 entry is interesting: "Saw immense droves of pigeons pass over, Saw a man stand at the door and shoot a deer." This is the second of two references found that refer to the presence of pigeons in large numbers. There is only a single pertinent entry for 1860, but it bears quoting. On January 7 chambers wrote: "To amuse my self in the afternoon I got out in the road and shot Robins and wife and me picked them and had a firstrate Stew for Supper" (Chambers Diaries).

Fishing was often an important activity on plantations as a means of providing a substantial portions of the family's or the slaves' diet. Occasionally, a planter went to some extremes. Horace Gather owned a plantation near Vidalia, and in the late antebellum period, he was reported to have served boiled catfish to his hands for breakfast and supper (West Baton Rouge Sugar Planter, June 2, 1960).
One chapter in Saxon's book on Louisiana includes a series of letters written to him by Mrs. Vincent Perrault. Mrs. Perrault had been born and raised at Bralston Plantation on the Louisiana side of the Mississippi River in the vicinity of Natchez. Her letters contain one particular reference that is unique. In a passage describing meals at the plantation, Mrs. Perrault wrote "for dinner we had gumbo or soup, baked chicken or turkey, vegetables from the garden, jellies, fish or shrimp from the river" (Saxon 1950:280). This is the only reference encountered that indicates the use of river shrimp specifically as a food source.

The journal of Kate Stone of Brokenburn covers the first years of the Civil War, 1861-62. Brokenburn was a large cotton plantation in Madison Parish in the Tensas Basin. The deer hunt was a very popular activity in this area. "...in the grey of the morning great squads of hunters starting out with their packs of hounds, baying, blowing of horns, and stamping and racing of horses" (Anderson 1955:4). In addition to deer, the occasional bear was still available for the hunt. The hunts were not always a success, as kate Stone wrote on June 8, 1861: "the boys with Ben Clarkson and George Richards were off by daybreak on a grand hunt. They were all back by eleven and the net
proceeds of the hunt were six suits of wet clothes, six good appetites, and one chill bagged by Mr. Clarkson" (Anderson 1955:23). During the period from May 23, 1861 to July 11, 1862 the journal lists the killing of one wild turkey, eight deer, and three ducks. Two entries from 1862 are of interest: the first with regard to methods of obtaining game birds and the second concerning the effects of the war on the local food supply. On January 17 Kate Stone wrote: "Warren sent up four partridges tonight. They were such sensible, happy looking little birds that I could not bear to have them killed and so turned them loose in the garden. He traps quite a number" (Anderson 1955:82). Then on May 22 the entry reads: "...we have been on a strict 'war footing' for some time....There are chickens, occasional partridges, and other birds, and often venison" (Anderson 1955:109). It appears that during part of 1862 at least, the people in the area had to rely more on wild game as a food source than they had in previous years. Either late in 1862 or early in 1863 Kate Stone's family was forced to leave Brokenburn and move to Tyler, Texas for the duration of the war.

The post war period is documented in part in the papers of the George C. Purvis family. This collection contains a daybook with some journal entries for the 1870s and many letter written between 1892 and 1906. The journal entries record two deer killed in the winter of 1873, a 10 foot
alligator killed in 1877, and another deer taken in January 1879. Members of the Purvis family did a lot of bird hunting. Unfortunately the take is generally referred to simply as "birds." Occasionally the references are more specific. In a letter from "T" to Cal Moore Purvis on December 7, 1898 is the statement: "There were lots of malards in the river yeasterday--Ben killed 2 but did not get but one." A February 17, 1899 letter from Carrie H. Purvis to Cal Moore Purvis says: "Shank has been training Prince he had kill (26) twenty six partridges in three evenings." In a letter from C. M. Purvis to Carrie Purvis on January 20, 1901, Cal Moore wrote that "Tot and I went over to the break the other night and killed two ducks and shot at a great many more but of course did not hurt any of them." In a few letters written by the family between 1898 and 1904 there are references to killing deer. For example a November 30, 1900 letter from (indecipherable) Purvis to Carrie Purvis stated that Buckner "and Frank have been bird hunting two or three times and have gone deer hunting today...Well Frank came home late this eve, and brough some fine venison, and he killed it himself...it is a big spiked buck." There is only one letter in the collection that refers to fishing. It is from Mollie (indecipherable) to Carrie Purvis and is dated June 22, 1906. It reads in part: "You just ought to have seen the fish I caught at the fish
fry yesterday - the finest white perch I ever saw" (Purvis Papers).

Table 5. Species list for Ecological Division 2.

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>Common flicker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black bear</td>
<td>Pileated woodpecker</td>
</tr>
<tr>
<td>Northern raccoon</td>
<td>Ivory-billed woodpecker</td>
</tr>
<tr>
<td>Fox squirrel</td>
<td>Woodpecker</td>
</tr>
<tr>
<td>Grey squirrel</td>
<td>Sapsucker</td>
</tr>
<tr>
<td>Rabbit</td>
<td>Lark</td>
</tr>
<tr>
<td>Opossum</td>
<td>Rufous-sided towhee</td>
</tr>
<tr>
<td>Cougar</td>
<td>Swallow</td>
</tr>
<tr>
<td>Bobcat</td>
<td>Blue jay</td>
</tr>
<tr>
<td>Feral hog</td>
<td>Common crow</td>
</tr>
<tr>
<td>Goose</td>
<td>Robin</td>
</tr>
<tr>
<td>Mallard</td>
<td>Thrush</td>
</tr>
<tr>
<td>Mottled duck</td>
<td>Bluebird</td>
</tr>
<tr>
<td>Hooded merganser</td>
<td>Cedar waxwing</td>
</tr>
<tr>
<td>Duck</td>
<td>Bobolink</td>
</tr>
<tr>
<td>Teal</td>
<td>Red-winged black bird</td>
</tr>
<tr>
<td>Loon</td>
<td>Black bird</td>
</tr>
<tr>
<td>Pied-billed grebe</td>
<td>Common grackle</td>
</tr>
<tr>
<td>Pelican</td>
<td>Cardinal</td>
</tr>
<tr>
<td>Great blue heron</td>
<td>Goldfinch</td>
</tr>
<tr>
<td>Egret</td>
<td>Sparrow</td>
</tr>
<tr>
<td>Black-crowned night heron</td>
<td>Bacbon</td>
</tr>
<tr>
<td>Yellow-crowned night heron</td>
<td>Tufted titmouse</td>
</tr>
<tr>
<td>Wood stork</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Roseate spoonbill</td>
<td>Perch/TROUT</td>
</tr>
<tr>
<td>Bobwhite quail</td>
<td>White bass</td>
</tr>
<tr>
<td>Wild turkey</td>
<td>Gar</td>
</tr>
<tr>
<td>American coot</td>
<td>Catfish</td>
</tr>
<tr>
<td>Plover</td>
<td>Alligator</td>
</tr>
<tr>
<td>Killdeer</td>
<td>Bullfrog</td>
</tr>
<tr>
<td>Spotted sandpiper</td>
<td>Alligator snapping turtle</td>
</tr>
<tr>
<td>American woodcock</td>
<td>Turtle</td>
</tr>
<tr>
<td>Common snipe</td>
<td>Softshell turtle</td>
</tr>
<tr>
<td>Pigeon</td>
<td>Crawfish</td>
</tr>
<tr>
<td>Mourning dove</td>
<td>River shrimp</td>
</tr>
<tr>
<td>Kingfisher</td>
<td></td>
</tr>
</tbody>
</table>
3. Southwest Louisiana Terrace Lands

This pine lands region which includes over 3,600,000 total acres was originally clothed in a nearly solid stand of longleaf pine. Just over 3,000,000 acres would have been classed as forest lands, comprising about 2,123,900 acres of pine lands, 475,520 acres of pine-hardwood association, and 490,000 acres of oak and mixed bottomland hardwoods. The only suitable range for large forest game lay in the larger river bottoms. After the pine forests were cut and as agriculture developed, the range for farm game improved and increased. Generally, however, this zone was not particularly productive of wild game in its virgin state.

The amount of documentation concerning hunting and fishing in this region is very limited. The primary source is a collection of oral histories collected in the Big Thicket of east Texas (Loughmiller and Loughmiller 1977). What some consider to be the original boundaries of the Big Thicket includes a westward extension of the longleaf pine lands of Louisiana (see Figures 11 and 12) (Doughty 1983; Gunter 1971). Thus, the area would contain habitats generally similar to those east of the Sabine River. Another justification for using this data comes from the following statement by Taylor: "Well into the twentieth century, people in the 'Big Thicket' of east Texas lived lives that
Figure 11. The Big Thicket of East Texas (after Gunter 1971)
Figure 12. Regions of Texas (after Doughty 1983).
corresponded closely to those of men and women on the eighteenth-century frontier" (1982:17).

The oral histories collected by the Loughmillers include family memories that extend well back into the nineteenth century. The people interviewed reported having all kinds of wild game: deer, bear, squirrel, fox squirrel, raccoon, and opossum. In addition to hunting deer, they also set snares for them. Most of the bear meat was cured for preservation. One person remarked that: "These fox squirrels, lots of 'em so tough you can't hardly cook 'em no other way than parboil 'em with rice or make dumplings out of it" (Loughmiller and Loughmiller 1977:196). Game birds and waterfowl hunted included wild turkey, passenger pigeon, ducks, including mallards, and bobwhite quail. Ducks were reported as being extremely plentiful. With regard to the passenger pigeons one respondent stated: "There would be so many pigeons they'd break the limbs off the trees" (ibid:8). The only fish mentioned by name were buffalo fish which were shot rather than caught. The last wild food source mentioned was the bullfrog. "We have worlds of frogs 'round here, bullfrogs— I eat all of it 'cept the guts and the head and the hide" (ibid:165).

Only two sources of data were found concerning this ecological division in Louisiana. Solomon Northup wrote that
while a slave on Edwin Epps plantation in southern Rapides Parish, he and other slaves were forced to hunt opossum and raccoon at night to supplement inadequate or bad pork rations. Northup noted that raccoon was palatable, but that he much preferred roasted opossum. He also wrote that rather than spend the night hunting possum or coon, he built a fish trap that proved successful. He did not, however, identify the type of fish that he caught (Eakin and Logsden 1968). The second source is tenative. The reference made in the discussion of ecological division 1 to the fishing of Timothy Flint in the Piney Woods around Alexandria, may also apply to this region. If so, then pickerel and trout were available and easily caught (Flint 1968).

Table 6. Species list for Ecological Division 3.

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>Wild turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black bear</td>
<td>Upland sandpiper</td>
</tr>
<tr>
<td>Northern raccoon</td>
<td>Pigeon</td>
</tr>
<tr>
<td>Fox squirrel</td>
<td>Bobolink</td>
</tr>
<tr>
<td>Squirrel</td>
<td>Robin</td>
</tr>
<tr>
<td>Opossum</td>
<td>Red-winged black bird</td>
</tr>
<tr>
<td>Cougar</td>
<td>Pickerel</td>
</tr>
<tr>
<td>Nearctic river otter</td>
<td>Channel catfish</td>
</tr>
<tr>
<td>Goose</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Mallard</td>
<td>Pike</td>
</tr>
<tr>
<td>Duck</td>
<td>Sac-a-lait</td>
</tr>
<tr>
<td>Black-crowned night heron</td>
<td>Choupique</td>
</tr>
<tr>
<td>Yellow-crowned night heron</td>
<td>Perch/trout</td>
</tr>
<tr>
<td>American bittern</td>
<td>Softshell turtle</td>
</tr>
<tr>
<td>Prairie chicken</td>
<td>Bullfrog</td>
</tr>
<tr>
<td>Bobwhite quail</td>
<td></td>
</tr>
</tbody>
</table>
4. Lower Mississippi-Atchafalaya Bottomlands

Historically this 4,000,000 acre area was covered by mixed hardwood, cypress-tupelo, and red gum swamp forests. The mature hardwoods formed an extremely dense canopy over an understory of thick canebrakes and palmetto. Generally the region was not good game country, the dense vegetation being suitable only for bear. There was, however, a wide range of game animals and birds present. As the area was opened for agriculture the range for forest game and farm game increased. The rivers, lakes, and swamps in this zone provided attractive habitats for waterfowl as well as for fish, reptiles, and crustaceans.

There is perhaps a greater range and body of documentation for this division than for any of the others. The material includes a number of plantation collections and diaries, the writings of contemporary inhabitants and travelers, contemporary newspaper reports, and some secondary sources including several thesis and dissertations. In addition, more historical archaeology has been conducted in this area than anywhere else in Louisiana. Most of the projects have been located in New Orleans, and the zooarchaeological record is likely more reflective of what was available in the French and other markets than what might have been hunted, trapped, or caught in the
surrounding territory.

The archival collections for the region are disappointing. It seems that most of the area planters were either practicing lawyers or politicians, who often had overseers running their plantations. The overseers generally did not record any hunting or fishing activities in the plantation diaries or other records they kept. For example, the William J. Minor and Family papers contain records for three plantations, Waterloo, Southdown, and Concord, that cover a span of about twenty years. In those records, there is only one reference to fishing with no indication of the catch given, and only one to hunting: "Duncan killed a wild turkey this afternoon at Quarters" (Plantation Diary, 1858-1861, October 5, 1858. Minor Papers). Few of the planters or their families wrote about hunting or fishing activities in letters or elsewhere. The only archival source that provides much information is the diary of Isaac Erwin, which covers the period from 1848 to 1868.

Erwin operated a plantation near Gross Tete in Iberville Parish. The first five years of his diary contain no mention of hunting or fishing. Two references to successful deer hunts occur for 1853. There are no further references until 1862. During the first two weeks of June of
that year, Erwin reported several deer kills: "Have been
taking from 3 to 4 Deer for the last 3 or 4 days" (June 7).
Entries for February 1863 reported killing doves and "Wile
Turky Gobler." In March 1864 Erwin reported that he caught a
great many perch at the Little Bayou. The next pertinent
entries are from December. On the 5th he wrote: "The little
boys Kill Squirrels everyday with Dogs." Then on the 20th
he noted "plenty of Ducks but no powder and shot or gun to
Kill them the little boys kill some Bickoss with sticks at
Night." I have interpreted the term "Bickoss" as well as the
terms "beaks, Backas, Beakas, and Beakass," which appear
later in the diary, as probable misspellings of the French
word becasse which means woodcock.

Hunting references in Erwin's diary increase over the
next four years. This suggest that the Civil War ultimately
had some effect on the domestic meat supply. The diary
indicates a growing reliance on wild game as a food source.
The entries for 1865 include references to deer, ducks,
partridges (bobwhite quail), doves, turkey, and woodcock.
Through 1866 deer was the main quarry, although bird hunting
was also important. On January 13, Erwin wrote: "the boys
Killed 35 Birds last Night. we have lived on Ducks & Bird
for the last 2 or 3 weeks." Hunting occasionally had
unexpected and unfortunate results. The July 19 entry
reads: "Caleb set to jail at Plaquemine for having taken a
Hunt and Killed my finest Mule." Hunting became an increasingly important activity in 1867. The results for the year included ducks, doves, jack or common snipe, woodcock, rabbits, deer, and squirrel. Again, deer was the main object of the hunt. The number of deer in the area varied during the year. The end of March saw high water and flooding conditions in the area and Erwin noted on March 31 "The Poor Deer are constantly crossing over this side of the Bayou." On May 15 the entry noted that deer were getting scarce, though on the 21st Erwin wrote that they were "pretty plenty." Deer were still numerous early in July, but evidence of their presence in late October was getting rare.

Erwin’s hunting luck was often bad. On May 11, 1867 he wrote: "I hunt every day and have not been able to Kill a Deer for some time Dogs no account. I have to holler so much to get the Dogs to hunt that I have no chance getting a Deer near enough to me to Kill." The importance of the hunt is very clearly shown in the entry for June 10: "son Joseph is here now with his wife attending to the crop we live very poor having onely very little Meat and no flour. I have to hunt for Meat to Morrow if Kind Providence spares me."

Hunting continued to be important in 1868, although the variety declined to woodcock and deer. The entry for June
18 illustrates the necessity that Erwin saw in deer hunting: "Hunted to day Kill 2 Deer I Killed one fat Doe I am riding a big Belly Mair old Molly and have a poor chance to Kill a Deer. but I am compelled to hunt to get meat to eat having nothing else to depend on." Luckily for the Erwins, two of the sons, Frank and Tom, were able to catch some large catfish on June 20. It is not clear from Erwin's diary why he had to depend on wild game as a source of meat. The diary entry for October 12, 1867 may provide a clue. Erwin wrote: "I went hunting to day in the Est side of the Bayou started a big Buck but he crossed Bayou Tomma and escaped plenty of Bear sign the bear are killing the Hogs every day on the other side of Gross Tete" (Erwin Diary). Erwin never mentioned if his hogs were being killed by bears, but such activities could seriously impact the availability of domestic meat.

Another antebellum source of data is the Liddell collection. Two letters from Moses Liddell of Bayou Teche to St. John R. Liddell describe an early attempt at catfish farming. On August 30, 1847 Moses Liddell wrote that he was stocking the plantation reservoir with various kinds of fish, hoping that they might provide good fishing in a few years. He said that they were getting no fish from the Bayou. The second letter, dated September 16, 1847 reported that nearly 300 small blue catfish had been placed in the
reservoir pond (Liddell Papers).

The diaries of Paul L. de Clouet contain a number of hunting and fishing references for the period from 1866 through 1887. The de Clouet family owned two plantations, St. Clair and Magenta, in St. Martin Parish. Paul de Clouet appear to have been interested primarily in duck hunting. He recorded two successful and one unsuccessful duck hunt in 1866. He mentioned one other hunting without noting the quarry, although he did report getting a few black birds (common grackles). The entries for 1867 are much the same, two successful hunts, one for teal and one for ducks, also one unsuccessful hunt. For 1868 no hunts were recorded and only a single duck kill was noted for 1869. There were no pertinent references for the period from 1870 through 1880.

In 1881 de Clouet noted a snipe hunt and several fishing trips without identifying the catch. The only useful entry for 1882 referred to a period of high water. On April 1 de Clouet wrote: "10 Gar fish Killed in front of house yard. Miniature Niagara in Quarter Canal." The only other pertinent entry in the diaries is from September 28, 1884 when a "passel of 44 wood-ducks" were shot (De Clouet Papers).

The remaining plantation collection references are isolated. In a June 6, 1862 letter Mary Dickinson of Live
Oak on Gross Tete wrote to Loda that high water in the bayou and flooding in the area had driven the deer up to range along the levee bank. This resulted in at least five deer being killed in the span of a week or two (Gay Papers). An October 30, 1884 letter from L. A. Bringier, Jr. to his brother Browse (DeBourg) noted the importance of wild game in Ascension Parish. "Charley went out hunting yesterday in the Brule and killed two deer, and this morning he killed another, so you see we cannot starve as long as Charley is supplied with powder and buck-shot." Another letter to Browse, from Stella on December 5, 1884 reported hunters bringing home two partridges (bobwhite quail) and a crippled rabbit (Bringier Papers). The Conner family papers contain two letters from Lemuel P. Conner, Jr. to his wife that refer to crawfishing. The first letter of February 7, 1884 reports that crawfish were being caught at "Southdown" at Bayou Goula. The second letter, March 23, 1884, noted going crawfishing in Southdown Canal while Conner was staying at "Concord" (Conner Papers).

Newspapers of the period often contained references to wild game and hunting. The Plaquemine Southern Sentinel reported on December 23, 1853 that large numbers of bears, deer, and some cougars had been killed in the Grosse Tete and Maringouin area. The July 4, 1858 menu for a celebration at Grosse Tete was reported as including bear
meat, venison, and panther steak *(Plaquemine Gazette and Sentinel, June 26, 1858)*. Hunters at Lake Le Boeuf in Lafourche Parish were reported to have bagged canvasback, redhead, mallard, and blackducks *(Co-Operative News, November 18, 1875)*.

There are a number of contemporary sources that contain references to hunting and fishing activities. They cover a time span extending from the early 1800s to the early 1900s. The most extensive of these is Dennett's (1876) description of the topography and material resources of Louisiana, with an emphasis on the parishes of the southwestern part of the state. In his discussion of St. Landry Parish he identified the following wild game species as objects of the hunt: deer, bear, cougar, opossum, raccoon, otter, squirrel, wildcat, fox, wild turkey, various ducks, geese, brant, upland sandpiper (papabouts), common snipe, bobwhite quail (partridges), prairie chicken, American bittern (reed bird), Black-crowned and perhaps yellow-crowned night heron (both of which are called grosbecs), American woodcock, bobolink (rice birds), and robins. Among the fish and reptiles caught Dennett listed: perch, trout, buffalo, pike, sac-a-lait (white perch), channel catfish (white catfish), choupique, and softshell turtle. With regard to St. Martin Parish, Dennett wrote that it is equal to St. Landry in game and fish resources, then stated: "Hunters and fishermen, and
fishing parties may have rare sport in this parish at any season of the year" (Dennett 1876:76). The description of St. Mary Parish noted the taking of redfish, black drum, trout, sheepshead, flounder, mullet, croaker, catfish, buffalo, perch, gar, choupique, softshell turtle, deer, geese, ducks, and brant. Because much of St. Mary Parish lies in Ecological Division 6, the saltwater fish listed above may refer more to that zone than to division 4. But there would have been nothing to prevent the inhabitant of division 4 using the resources of division 6. The same problem exists for Lafourche Parish. Dennett reported duck hunters around Lake Le Boeuf bagging canvasback, red head, black duck, and mallards. Lake Le Boeuf (today Lake Boeuf) appears to lie right on the boundary between divisions 4 and 6 (Dennett 1876).

The earliest description of the wild game and fishery resources of division 4 comes from the journal of John Landreth, who surveyed the coastal marshes of Louisiana west of the Mississippi River. Landreth’s journal runs from November 15, 1818 to May 19, 1819 and records his travels and survey through the lower section of division 4 and the central portion of division 6. In the vicinity of Franklin in St. Mary Parish, Landreth noted the presence of many deer, rabbits, squirrels, and bobwhite quail. He described the numbers of waterfowl as almost incredible and included
in this category geese, ducks, curlews, cranes, herons, and pelicans. He also reported large numbers of redfish, buffalo, and catfish in the rivers and bayous of the area. Near the end of his survey Landreth passed through New Orleans and notes in a description of the city's market: "plenty of Snipes Partridges and pidgeons... ...here is also a considerable Fish Market Sheeps Heads Red Drum...plenty of Bufelo Fish...Perch and Trout in abundance plenty of large and very fine Oysters" (Newton 1985:143-144). Also available were crabs, canvasbacks, brant and rabbit. Landreth listed the prices of some items: venison at $0.25 to 0.37 1/2 per pound; sheepsheads from $0.25 to 2.00 each; rock fish from $2.00 to 4.00 each; and redfish from $0.75 to 3.50 each (ibid:149).

One of John James Audubon's journals provides a description of the wild birds available in the New Orleans market in January and February of 1821. On four occasions Audubon visited the market, perhaps in search of subjects for his paintings. All told he saw the following species: Mallards, teals, American wigeons, Canada geese, snow geese, mergansers, robins, blue birds, red wing starlings (black birds), tell tale godwits (probably marbled godwits), blue cranes (Great or Little blue herons), coots, Caldwell ducks (gadwalls), keeldeers (killdeers), white cranes (whooping cranes?), white herons (Great or Snowy egrets), sand hill
cranes, blue-winged teal, common teal, northern shovellers, 
(double-crested) cormorants, water hens (poule d’eau or 
American coots), yellow shank snipe (possibly yellowlegs), 
bleu warblers (cerulean warblers), cardinal grosbeaks 
(cardinals), common turtle (mourning) doves, and golden 
winged woodpeckers [flickers (Daspit 1929)]. He was also 
"Much suprised and diverted on finding a Barred owl Cleand 
and exposed for sale" (Peattie 1940:161). During his 
February visit Audubon noted "the Market is regularly 
furnished with the English Snipe which the french call Cache 
Cache" (ibid:166). English snipe was an old hunters' name 
for the common snipe.

Audubon's journal of his 1821 visit to New Orleans 
includes one description of hunting on the estate of Etienne 
de Bore. On March 16 Audubon accompanied a group he 
estimated at 400 men who gathered to hunt American golden 
plover along Bayou St. John. The men were taking advantage 
of the bird's spring migration. Breaking into teams of 20 
to 100 men, the hunters assembled in different places on the 
bayou, forming a gauntlet along which the plover had to 
fly. The total kill of that hunt has been reported as "more 
than 48,000 plovers" by Crete (1981:261), and "some 48,000 
Both of these authors credit the estimate to Audubon. But in 
his journal entry for that day Audubon wrote: "a Man Near
where I was seated had Killed 63 dozens—from the firing
before and behind us I would suppose that 400 Gunners were
out. Supposing each Man to have Killed 30 dozen that day
144,000 must have been destroyed" (Peattie 1940:168).
Whatever the actual count, it was a slaughter.

With regard to the French Market, Henry Benjamin
Whipple noted in the early 1840s the presence of "Game of
all kinds, venison, woodcock, pheasant, snipe, plover &c"
(Whipple 1937:103). A more recent description of the Old
French Market was written by Mrs. Martha R. Fields under the
psuedonym of Catherine Cole (1916). Among the wild game and
fish available she listed blue crab, red crawfish, river
shrimp, croaker, pompano, bluefish, Spanish mackerel, trout,
sea turtle, flounder, stingray, grouper, gaspargou, ducks,
pelican, grassets (vireos), upland sandpiper (papabot),
snipe and opossum. She also noted "At one stall
porky-looking chunks of meat are being eagerly bought by
colored people. It is from a nice, fat alligator" (Cole
1916:21).

Other contemporary writers are more limited in their
usefulness. Generally, they may refer to only one or two
species. William H. Sparks (1882), for example, provided a
brief description of the inhabitants of Bayou Lafourche in
the 1830s, which noted the quest for cranes or ducks flying
along the bayou. In the account of his travels, Frederick Gerstaecker (1855) wrote that while in Point coupee he was able to hunt ducks and snipe, noting that with regard to the latter, "they occur in such numbers, that I have often killed from eighteen to twenty" (Gerstaecker 1855:302). In the swamps along the Mississippi River, he went alligator hunting. After shooting the creatures, he would cut off their tails which he took home to eat. Alligator was not a favorite food in this part of Louisiana. "Very few of the Creoles, or even the negroes, will eat the flesh of the alligator... ...feel disgust at it...fancy it to be poisonous" (ibid:304). The availability of fish and turtle in Woods Bay, an arm of which was less than two miles from New Orleans, was noted by Dr. John Sibley in 1802 (Sibley 1927). William H. Russell (1969), in his travel diary, made reference to having tortoise soup and pompano for dinner near New Orleans. He also noted having prawns (shrimp), fresh from New Orleans, for breakfast at the Burnside Plantation a little below Baton Rouge on the Mississippi River. J. Milton Mackie (1864) visited New Orleans shortly before the Civil War. In discussing the food available at hotels, restaurants, and in the market he mentioned redfish, pompano, croaker, trout, sheepshead, snapper, oysters, crabs, and turkey. While traveling up river from New Orleans, Mackie was able to visit some sugar plantations
where he noted tame or domestic turkeys and geese and a herd of tame deer. He also commented that "on feast days you are entitled to terrapin, no plantation yard being perfect without a terrapin pen in it" (1864:185).

As indicated previously, most of the historical archaeological projects undertaken in Louisiana have taken place in or near New Orleans. The zooarchaeological analysis of faunal remains from the various sites have identified a variety of wild game and fish species. The faunal collection from excavations conducted at Algiers Point included the following species: deer, raccoon, swamp rabbit, eastern cottontail, opossum, white-fronted goose, mallard, great blue heron, snowy egret, wild turkey, sheepshead, channel catfish, other catfish, turtle, and bullfrog. Originally native wild birds, the Canada goose, mallard, and wild turkey were eventually domesticated, with standards of excellence for these as poultry breeds being established by the mid 1800s. However, the specimens of goose and turkey from Algiers Point show none of the types of morphological changes that are associated with domestication. They, therefore, have been assumed to represent wild rather than domestic individuals. The archaeological remains from the site suggest two occupations: a pre-1850 working class neighborhood and a post-1850 low to middle class urban setting (Ruff and Reitz 1984).
Excavations at the site of the New Orleans Post Office at Esplanade Avenue and North Rampart Street yielded material from three different time periods. Faunal species from the earliest occupation, 1834-1844, included turkey (likely wild), duck (most probably mallard), other ducks, rail, black drum, sheepshead, blue catfish, and oyster. The second time period deposits, 1853-1863, came from two separate locations at the site and included deer, rabbit, opossum, turkey, mallard or domestic duck, other ducks, bobwhite quail, green-winged teal, northern shoveller, red drum, black drum, gaspergou, sheepshead, catfish, and oyster. The archaeological materials from these time periods are representative of an upper middle class occupation. The most recent deposit suggest a lower class occupation and dates to 1908-1915. The faunal species recovered include opossum, rabbit, duck, and oyster (Castille et al 1982).

Sequential occupations at the New Orleans General Hospital Site include Panis Plantation, a Society of the Relief of Destitute Orphan Boys home, the Fulton Colored School, and several middle or lower middle class shotgun residences. The archaeological evidence indicates that the zooarchaeological assemblage pertains to either the orphanage occupation or to the shotgun residences. The
The faunal materials included eastern cottontail, grey squirrel, loggerhead turtle, basking turtles, grouper, and speckled seatrout. Although these wild species contributed minor amounts to the diet, it is interesting to note that they made up four times as much of the food supply for the shotgun residents as for the orphanage (Reitz and Ruff 1982).

Extensive archaeological excavations were conducted in the Lower Garden District of New Orleans as part of the Greater New Orleans Bridge No. 2 project. The project area covered portions of at least 56 city blocks, or squares as they are called in New Orleans. The numerical square designations are those assigned in the city’s official records. Excavations in four of the squares provided enough identifiable zooarchaeological materials to warrant an analysis. Most of the faunal remains come from sites associated with lower economic status archaeological materials: Squares 72, 101, and 46. The materials from Square 119 are indicative of middle class status (Castille et al 1986).

The faunal materials recovered from the lower class sites in Squares 72, 101, and 46 include: deer, raccoon, rabbit, opossum, Canada goose, other goose, mallard or
domestic duck, lesser scaup, other ducks, double crested
cormorant, turkey, woodcock, domestic pigeon, red bellied
woodpecker, perching birds, jack fish, redfish, black drum,
sheepshead, mullet, sea catfish, largemouth bass, gaspergou,
blue catfish, channel catfish, yellow catfish, unspecified
catfish, smallmouth buffalo, unspecified buffalo, choupique,
blue crab, and oyster. The analysis of the faunal materials
did not determine for any of the sites whether the turkey
remains were those of wild or domestic birds. Likely either
was possible. The classification of domestic pigeon as a
food source is not certain, although pigeon was reported to
be a popular food in south Louisiana. The archaeological
materials indicate overlapping periods of occupation from
the 1850s to the 1880s for the sites on these squares
(Castille et al 1986).

The middle class associated deposits in Square 119
included the following faunal materials: raccoon, Canada
goose, other goose, mallard or domestic duck, other duck,
turkey, domestic pigeon, redfish, drum, sheepshead,
flounder, largemouth bass, gaspergou, blue catfish, channel
catfish, buffalo, turtle, and oyster. These materials have
been judged to date between 1830 and 1860 (Castille et al
1986). They differ from the wild game and fish resources
used by the lower status groups mainly in the absence of
species. And that may simply be a reflection of a more
limited sample, rather than of different economic status. The same game and fish were there to be taken or purchased by the rich and the poor.

Elmwood Plantation was located on the east bank of the Mississippi River in Jefferson Parish about one-half mile east of the Huey P. Long Bridge. The faunal collection from the site included deer, swamp rabbit, opossum, squirrel, duck, heron, bullhead catfish, sheepshead, turtle and frog or toad (likely bullfrog). The archaeological materials associated with the faunal remains cover an initial time span of from 1800 to 1835, and another post 1840 period. All of the above species are limited to the first time period with the exception of opossum which is present in both (Reitz 1984).

A last New Orleans project involved the archaeological monitoring of three floodwall projects. This monitoring produced a limited amount of faunal material, which was recovered from various locales along the floodwall. They included deer, duck, and gaspergou (Gobalet 1986).

Outside of the New Orleans area only one historic archaeological site in division 4 yielding faunal materials has been excavated. The Good Land Cypress Sawmill Company operated in Chacahoula, Louisiana from 1903 to 1916. In the early 1900s Chacahoula was about 10 miles by buggy southwest
of Thibodaux (Whelan and Pearson 1988). Archaeological excavations were conducted at the site of the black sawmill workers' residences. While the majority of the meat diet consisted of pork and beef, likely store bought cuts, some wild resources were utilized. The wild game and fish species represented in the faunal material included: raccoon, opossum, eastern cottontail, other rabbit, grey squirrel, wood duck, other duck, king rail, heron, choupique, gar, alligator, alligator snapping turtle, pond slider, river cooter, cooter/slider, and other turtle. These resources contributed approximately 4.9 percent of the meat portion of the diet (Kelley 1988).

Although a cultural resources survey of a portion of Bayou courtableau in St. Landry Parish did not produce any faunal remains, examination of the historic record provided some interesting information. In November 1857 the following shipments were delivered by the Anna Perrett to Washington and Port Barre: 1 bundle of shot, 1 keg of powder, 4 bags of shot, and 2 barrels of oysters. The supply list of the Steamer Irene for June 16, 1866 included 1 Kit of mackerel and 12 lobsters. The Freight Book of the Steamer Sonora for the week of August 1 to August 8, 1866 included the delivery of 1 bbl (barrel) of mackerel and 1 box of lobsters (Oramen Hinkley Papers, Louisiana State Archives, cited in Goodwin et al 1986). The shipments of
powder and shot indicate hunting activity in the area. The mackerel is likely Spanish mackerel, a fish native to the waters of the Gulf. The young mackerel are common in the surf zone and low-salinity bays of the gulf Coast. These fish could have been caught off the Louisiana coast or on the coast.

The usefulness of secondary sources for documentation of hunting and fishing varies. Most of the sources, particularly theses and dissertations, are aimed at particular sets of activities, and only mention hunting and fishing in passing. Those which discuss food habits or wild food industries tend to be aimed at particular species or groups of species. The occasional source, depending on its primary goal, may provide a substantial amount of information. One such source is Crete's description of life in Louisiana between 1815 and 1830. Her book is oriented towards southeast Louisiana, particularly the area around New Orleans. She noted that ducks, bobolinks (rice birds), and other game were sold on the streets of New Orleans during the winter. The area immediately west of New Orleans, on the sugar plantation of Etienne de Bore, yielded shrimp, crabs, ducks, common gallinule, snipe, rails, and plovers. A lake on the de Bore estate served as a gathering place for the elite of New Orleans who assembled every Saturday to hunt. One such hunt was that described by
Audubon, which has been discussed previously in this section. In addition to hunting, Crete also discussed Creole cooking and reports the use of oysters, crabs, turtles, crawfish, and shrimp in a variety of dishes. She noted that the other group of French descent, the Cajuns, generally ate crabs, fish, and crawfish as staples as well as shrimp, frog's legs, ducks, bobwhite quail, snipe, and wild geese. They also hunted and trapped otter, muskrat, raccoon, and alligator. Although these animals are not mentioned as being eaten, it is difficult to accept that the basically omnivorous Cajun did not use them to supplement other food sources (Crete 1981).

An indepth study of Acadian/Cajun culture was conducted by Comeaux (1969). As a result of floods in the Atchafalaya Basin which caused the loss of much farm land fishing became an important activity. The floods resulted from the clearing of rafts in the upper Atchafalaya Basin. While fishing for local consumption had always been significant, commercial fishing developed during the last third of the nineteenth century. The most important commercial fish were the yellow and blue catfish which were sold and consumed locally. Other fish caught included the channel catfish, three species of buffalo, gaspargou, paddlefish, and gar. The consumption of many wild foods goes back to early French settlers. Such foods included swamp and river crawfish,
blue crab, and bullfrogs. Comeaux noted that "Among persons of French descent, it is still common to eat both the body and legs" of frogs (1969:192). The Acadians made use of turtles when possible, although they were not an important part of the diet. The main turtles caught were the common snapping turtle and the alligator snapping turtle. Hunting was also an important activity, particularly during the winter months. "Even as late as 1937, game daily provided the principal dish at two of the meals during the hunting season" (ibid:216). The main animals hunted were deer, squirrels, rabbits, ducks, and both the black-crowned and yellow-crowned night herons or grosbecs (Comeaux 1969).

In the 1930s a number of theses dealing with the food habits of various parts of Louisiana were written in the Department of Home Economics at Louisiana State University. Even though these works emphasize twentieth century food habits, it is most likely that the information they contain regarding the use of wild game and fish would also apply to the late nineteenth century at least. Two theses discuss fish and seafood use in south Louisiana, and list the following species: sunfish, gaspergou, sac-a-lait, largemouth bass, catfish, gar, perch, trout, flounder, redfish, red snapper, stingray, crab, shrimp, crawfish, and oysters. The use of stingray seems to have been limited to New Orleans where it was made into a dish called Raie au
beurre noir (Fournet 1939; Hatfield 1933).

Other studies on Louisiana seafoods include a thesis on the shrimp industry and a dissertation on shellfisheries. According to Becnel (1962) shrimp were common in the New Orleans markets from colonial times. In the early 1800s they were caught with seines by Baratarians and sold at the French Market. In all, four types of shrimp were caught and sold: river shrimp, lake (white) shrimp, seabob, and brown (Brazilian) shrimp. Reliable statistical data on the catch is not available until the 1880s. In 1887 over 6,810,000 lbs of shrimp were caught. Most of the catch was sold in New Orleans, either fresh or to canneries.

Padgett's 1960 study on the marine shellfisheries of the state discusses shrimp, oysters, and crabs. The author noted that there was no real development of a fishing industry in Louisiana until after the 1920s. Prior to that time "Fishing was pursued chiefly for local markets, New Orleans in particular" (Padgett 1960:111). Before the development of successful canneries in the 1870s, shrimping was also a minor industry, which supplied New Orleans and other coastal communities during the peak season. A commercial trade in oysters likely existed in New Orleans well before the middle of the nineteenth century.

In Plaquemines Parish, upwards of 500 men are engaged in the oyster trade, 150 of which number
fish the oysters from the bays.... From the best information to be had on the subject, the parish of Plaquemines sends a weekly supply to the city of New Orleans of at least 4,000 barrels of oysters, amounting during the season to about $100,000 (Payne 1847:305).

Generally through the early part of the century oysters were so easily obtainable that the supply was much greater than the demand. As a market began to develop, it was limited to New Orleans and some up river plantations until 1880 when a wholesale trade began at Morgan City. The oyster industry was an extractive one until early in the twentieth century and merely supplied the local market. The blue crab has been used as a food source since the early days of settlement in Louisiana. Considerable quantities were marketed in New Orleans and other coastal cities. Crabbing has always tended to be a part-time summer occupation throughout much of south Louisiana. As noted previously, the blue crab is found as far north as Krotz Springs in the Atchafalaya Basin and was likely present in many of the streams and bayous of this area, as well as in the brackish waters of the coast.

Two other secondary sources containing information relevant to division 4 remain. As late as 1841 the area around Montegut on Bayou Terrebonne was reported to still be a complete wilderness teaming with wild game including deer and bear (Becnel 1985) In the 1860s and 1870s poor Creole
Table 7. Species List for Ecological Division 4.

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>Black bear</th>
<th>Northern raccoon</th>
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<tbody>
<tr>
<td>Grey squirrel</td>
<td>Squirrel</td>
<td>Swamp rabbit</td>
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<tr>
<td>Eastern cottontail</td>
<td>Opossum</td>
<td>Cougar</td>
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<tr>
<td>River otter</td>
<td>Canada goose</td>
<td>Snow goose</td>
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<td>White fronted goose</td>
<td>Goose</td>
<td>Mallard</td>
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<td>Blackduck</td>
<td>Gadwall</td>
<td>Wood duck</td>
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<td>Green-winged teal</td>
<td>Canvasback</td>
<td>Redhead</td>
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<td>Blue-winged teal</td>
<td>Northern shoveler</td>
<td>American wigeon</td>
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<td>Duck</td>
<td>Perching birds</td>
<td>Great egret</td>
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<td>Little blue heron</td>
<td>Great blue heron</td>
<td>Snowy egret</td>
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<td>Prairie chicken</td>
<td>Bobwhite quail</td>
<td>Wild turkey</td>
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<td>Mourning dove</td>
<td>Domestic pigeon</td>
<td>Bobolink</td>
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<td>Common gallinule</td>
<td>Common grackle</td>
<td>Robin</td>
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<td>American woodcock</td>
<td>Upland sandpiper</td>
<td>Barred owl</td>
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<td>Red-winged black bird</td>
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<td>Yellow-crowned night heron</td>
<td>American golden plover</td>
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<td>Black-crowned night heron</td>
<td>Red bellied woodpecker</td>
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<td>Common snipe</td>
<td>Pelican</td>
<td>Crane</td>
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<td>Rail</td>
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<td>Speckled seatrout</td>
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<td>Red snapper</td>
<td>Flounder</td>
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<td>Spanish mackerel</td>
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<td>Drum</td>
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<td>Paddlefish</td>
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</tr>
<tr>
<td>Yellow catfish</td>
<td>Channel catfish</td>
<td>Catfish</td>
</tr>
<tr>
<td>Smallmouth buffalo</td>
<td>Buffalo</td>
<td>Pike</td>
</tr>
<tr>
<td>Sac-a-lait</td>
<td>Choupique</td>
<td>Blue catfish</td>
</tr>
<tr>
<td>Perch/trout</td>
<td>Florida pompano</td>
<td>Jackfish</td>
</tr>
<tr>
<td>Largemouth bass</td>
<td>Redfish</td>
<td>Gaspergou</td>
</tr>
<tr>
<td>Gopher tortoise</td>
<td>Pond slider</td>
<td>Gar</td>
</tr>
<tr>
<td>Softshell turtle</td>
<td>Cooter/slider</td>
<td>River cooter</td>
</tr>
<tr>
<td>Loggerhead turtle</td>
<td>Alligator</td>
<td>Bullfrog</td>
</tr>
<tr>
<td>Brown shrimp</td>
<td>White shrimp</td>
<td>Seabob</td>
</tr>
<tr>
<td>Blue crab</td>
<td>River shrimp</td>
<td>Crawfish</td>
</tr>
<tr>
<td>Common snapping turtle</td>
<td></td>
<td>Turtle</td>
</tr>
</tbody>
</table>
and Cajun farmers in Lafourche and Terrebonne Parishes had to rely heavily on the fruits of the hunt. They likely spent as much time seeking after deer, rabbit, ducks, snipe, and various fish as they did farming (Shugg 1939).

5. Southwest Louisiana Prairie Lands

This extensive natural prairie land encompasses approximately 2,350,000 acres. Forested lands occur along stream courses, fringe low swampy areas, and form a transition zone on the northern border. The small blocks of forest on the northern edge are pine and pine-hardwoods. The streams, bayous and low area are bordered by bottomland hardwoods and cypress-tupelo stands. There is a limited amount of documentation on the use of wild game and fishery resources in this ecological division: only one historic and two secondary sources, one of which is from east Texas.

Although Dennett’s 1876 publication, Louisiana as it is, covered the entire state, the main emphasis was on the settings and resources of southwest Louisiana which was done on a parish by parish basis. The only parish to fall almost completely within the Prairie lands division is Lafayette Parish. Dennett’s list of wild game and fish present, and probably taken, included: deer, rabbits, squirrels, opossum,
raccoon, geese, mallards, canvasbacks, blackducks, teal ducks, bobwhite quail, prairie chicken, woodcock, snipe, upland sandpiper, bobolinks, robins, gasperegou, perch, catfish, buffalo, white bass, trout, choupique, sac-a-lait, and gar. The northern part of Vermilion Parish is included within this division. Among the wild resources listed are ducks, geese, deer, and wild hogs. Concerning Vermilion Parish Dennett wrote "There is more wild game in this than in the other parishes... The market here is often glutted with ducks and other wild game offered at low prices. There are large numbers of deer and wild hogs in Vermillion" (1876:89). He also stated "There is no parish where a man who is poor and industrious can more easily make a living than in the parish of Vermillion. The soil, climate, game, fish, oysters and beef are all his friends" (1876:90).

In Iberia Parish Lake Tasse (Spanish Lake) lies within the Prairie division. Fish taken from this lake included trout, perch, gar, sac-a-lait, rock bass, white bass, choupique, buffalo, gasperegou, catfish, blowing fish, also softshell turtle. What species is meant by the term blowing fish is unknown. True rock bass are found only in the Florida Parishes. They are however often confused with the warmouth sunfish which superficially resembles the rock bass. It is possible that it is the warmouth to which Dennett is referring. In 1870 St. Landry Parish included
what are now Evangeline and Acadia Parishes. Modern Acadia Parish falls completely within division 5 as does the southeast one third of Evangeline. Thus the wild game and fish listed for St. Landry Parish in the discussion of division 4 may also be accurate for Acadia and Evangeline. These species include deer, bear, cougar, opossum, raccoon, wildcat, otter, squirrel, wild turkey, ducks, geese, upland sandpiper, snipe, bobwhite quail, prairie chicken, American bittern, night herons, woodcocks, bobolinks, robins, perch, trout, buffalo, pike, channel catfish, sac-a-lait, choupique, and softshell turtle.

Additional data on the French section of Evangeline Parish is provided by Fontenot (1980) in a study of food habits. Wild game taken included deer, rabbit, squirrel, ducks, bobwhite quail, and dove. The author noted that in 23 per cent of all families at least one family member hunted. The seafoods eaten included shrimp, crawfish, crabs, oysters, various fish, turtles, and froglegs. In the 1970s most of these seafoods were purchased rather than caught. This use of wild game and fish resources undoubtedly continues a pattern of exploitation that dates back to the nineteenth century.

This prairie zone of southwest Louisiana continues westward across the Sabine River into east Texas. A limited
number of species are reported as having been hunted in this area: deer, whooping crane, sand hill crane, and eskimo curlew. Deer hunting provided both meat and entertainment for the settlers of this region (Doughty 1983).

Table 8. Species List for Ecological Division 5.

<table>
<thead>
<tr>
<th>Species</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-tailed deer</td>
<td>American woodcock</td>
</tr>
<tr>
<td>Northern raccoon</td>
<td>Common snipe</td>
</tr>
<tr>
<td>Squirrel</td>
<td>Pigeon</td>
</tr>
<tr>
<td>Rabbit</td>
<td>Robin</td>
</tr>
<tr>
<td>Opossum</td>
<td>Bobolink</td>
</tr>
<tr>
<td>Goose</td>
<td>Red-winged black bird</td>
</tr>
<tr>
<td>Mallard</td>
<td>White bass</td>
</tr>
<tr>
<td>Blackduck</td>
<td>Gasperegou</td>
</tr>
<tr>
<td>Canvasback</td>
<td>Gar</td>
</tr>
<tr>
<td>Duck</td>
<td>Catfish</td>
</tr>
<tr>
<td>Teal</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Prairie chicken</td>
<td>Sac-a-lait</td>
</tr>
<tr>
<td>Bobwhite quail</td>
<td>Choupique</td>
</tr>
<tr>
<td>Whooping crane</td>
<td>Perch/trout</td>
</tr>
<tr>
<td>Sandhill crane</td>
<td>Blowing fish</td>
</tr>
<tr>
<td>Eskimo curlew</td>
<td>Softshell turtle</td>
</tr>
<tr>
<td>Upland sandpiper</td>
<td></td>
</tr>
</tbody>
</table>

6. The Coastal Marshes

The coastal marshes comprise over 4,000,000 acres of fresh, brackish, and salt water zones. Forest makes up only 1.8 per cent of the region, and is comprised of scrub cypress-tupelo and wet land hardwoods with liveoak palmetto
savanna on beach ridges, natural levees, and cheniers. The documentation for hunting and fishing activities in the coastal marsh region comes from one archival record, two contemporary writings, and several secondary sources.

The only archival data are contained in some letters in the Weeks Family collection. These are three letters from W. F. Weeks at Grand Cote Island in St. Mary Parish. On September 1, 1845 Weeks wrote to his mother, Mary C. Moore: "yesterday, in one of the most exciting bear hunts, ever witnessed...ten dogs in the chase of four hours, I killed the bear as she was climbing a tree." In 1847, on May 23, Weeks wrote to his step-father, John Moore: "I killed a very fine deer this morning." After this date, Weeks apparently became too busy to hunt. The last pertinent reference is contained in a letter to his mother dated September 6, 1855: "We had a fine fish and oyster dinner on yesterday, wish you had been here" (Weeks Papers).

Most of the references to wild game and fish in the journal of John Landreth are only to the presence of the species not to hunting or fishing. His descriptions are good indications of the species available, and their exploitation is often supported by other sources. Landreth listed as present in the coastal marsh area the following species: deer, rabbit, raccoon, wildcat, ducks of various
kinds, cormorants, cranes, willets, curlews, bobwhite quail, wild turkey, sheepshead, black drum, seatrout, mackerel, buffalo, mullet, redfish, and green turtle (Newton 1985).

In Dennett's writing it is not always clear whether he is referring to game and fish actually taken or only present. Generally, there is at least the implication that the game was hunted and the fish were caught. Of the parishes of southwest Louisiana, the only one that falls almost entirely into the coastal marsh division is Cameron. The species Dennett listed are: deer, otter, muskrat, wild hog, ducks, and geese. The game available in Vermilion Parish and often in the town markets included deer, geese, and wild hog. In the marsh zone of Iberia Parish, Dennett specified two locations: Grand Cote Island where redfish were caught and oysters gathered, and Petit Anse (Avery) Island where bear, cougar, and wildcat roamed. The game in St. Mary Parish included deer, geese, and ducks. Fishery resources comprised redfish, black drum, seatrout, flounder, sheepshead, mullet, croaker, catfish, buffalo, perch, gar, choupique, and softshell turtle. Lastly, in Lafourche Parish, Lake Le Boeuf was noted as a good duck hunting location. Among the ducks taken there were mallards, redheads, canvasbacks, and blackducks (Dennett 1876).

There are three secondary sources for Louisiana and one
for east Texas. Shugg (1939) notes that by the 1860s the poorer people had been pushed into less desirable sections of the state, such as the coastal marshes and adjacent areas. The poor Creoles and Cajuns of Terrebonne and Lafourche Parishes took advantage of the coastal zone to hunt for deer, rabbits, ducks, and snipe which provided a substantial portion of their diet. According to Hatfield (1933) the fish and seafood taken in the coastal zone included: crab, shrimp, crawfish, oysters, speckled seatrout, sheepshead, redfish, Spanish mackerel, and pompano. She also noted that fish often were caught by women in their spare time (ibid:62). Although the markets mentioned by Padgett (1960) in his study of marine shellfisheries were located primarily in division 4, the resources themselves came from the coastal marsh zone. These included oysters, shrimp, and crab, and they undoubtedly provided much of the food supply for the people who caught or collected them.

The coastal marsh of southwestern Louisiana continues westward into Texas. There, on the Upper Coast, the area is known as wet coastal prairie, although parts are as marshy as Louisiana. Because of its site and situation, Galveston became an important urban center for the region. The development of the settlement did not prevent hunting in the area or on the island. Since deer and turkeys were scarce
on Galveston Island, most hunting involved water birds. More accomplished hunters "esteemed other 'savory friends,' such as eskimo curlew, which 'rained down' when fusilades were discharged into dense circling flocks. Willets, yellowlegs, sandpipers, godwits, and pigeons were all suitable quarry because they were abundant, amusing to shoot, and edible" (Doughty 1983:95). Rounding out the local game animals was the squirrel.

Table 9. Species List for Ecological Division 6.

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>Willet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black bear</td>
<td>Common snipe</td>
</tr>
<tr>
<td>Cougar</td>
<td>Sandpiper</td>
</tr>
<tr>
<td>Common muskrat</td>
<td>Pigeon</td>
</tr>
<tr>
<td>Nearctic river otter</td>
<td>Redfish</td>
</tr>
<tr>
<td>Goose</td>
<td>Atlantic croaker</td>
</tr>
<tr>
<td>Mallard</td>
<td>Black drum</td>
</tr>
<tr>
<td>Blackduck</td>
<td>Sheepshead</td>
</tr>
<tr>
<td>Northern pintail</td>
<td>Mullet</td>
</tr>
<tr>
<td>Canvasback</td>
<td>Southern flounder</td>
</tr>
<tr>
<td>Lesser scaup</td>
<td>Gar</td>
</tr>
<tr>
<td>Redhead</td>
<td>Catfish</td>
</tr>
<tr>
<td>Duck</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Wild turkey</td>
<td>Choupique</td>
</tr>
<tr>
<td>Whooping crane</td>
<td>Perch/trout</td>
</tr>
<tr>
<td>Plover</td>
<td>Green turtle</td>
</tr>
<tr>
<td>Marbled godwit</td>
<td>Turtles</td>
</tr>
<tr>
<td>Yellowleg</td>
<td>Softshell turtles</td>
</tr>
</tbody>
</table>

As fire arms improved during the nineteenth century, the large-scale slaughter of market species developed. In the spring of 1891 the Galveston meat market had for sale "pintails (the most abundant type of duck). Redheads,
lesser scaups, and half a dozen other waterfowl, including geese and coots.... Vendors sold a variety of shorebirds, too, such as plovers, yellowlegs, and sandpipers" (Doughty1983:99).

7. Southeast Louisiana Terrace Lands

This division comprises the 2,800,000 acres of the Florida parishes which are covered by the three major forest types: pine, pine-hardwood, and mixed bottomland hardwoods. The pine and pine-hardwood associations dominate on poor sandy soils in the easternmost three parishes. Bottomland hardwoods occur along the streams that feed into the Pontchartrain Basin. The documentation for the use of wild game and fisheries resources in this division include several archival sources, two contemporary writings, and one archaeological report.

The planters of the Florida Parishes, particularly in the Felicianas, enjoyed all forms of hunting. Daytime hunts were conducted for deer, bear, wild fowl, and rabbit. Torch-light night hunts for deer, raccoon, opossum, and wild turkey were also popular. Deer was generally hunted from horseback with dogs, although stands were occasionally employed. Bear were hunted from horseback or were trapped.
Packs of trained dogs were used to hunt alligators in the swamps. The rabbit was hunted on foot or from horseback. In addition to hunting, fishing was also a popular pastime (Davis 1936).

The best archival source located for this division is the diary of Bennet H. Barrow who owned Highland Plantation in West Feliciana Parish. The diary covers the period from 1836 to 1846. Wild game was plentiful in the area, and Barrow often noted seeing four, five, or more deer during a single drive. On May 7, 1839 Barrow wrote "Went hunting in the swamp yesterday quit a party &c Killed one Deer Started great many, went driving again to day -- Killed 5 Deer got 3 only -- Thick as Rabite" (Davis 1936:220). Wild turkeys were also abundant. On March 17, 1838 Barrow wrote: "saw the largest flock of Wild Turkeys in my field I ever saw in a field -- could have killed 5 or 8 with shot gun at one fire -- Killed one with Rifle" (ibid:150). Over the eleven years of the diary, February 1836 through March 1846, Barrow recorded the killing of many deer and turkeys, as well as the occasional bobcat, alligator, wild hog, goose, duck, and pigeon. The rare rabbit hunt mentioned generally produced two dozen or so animals. Barrow's brother Ruffin set traps for bear and caught one now and then. One unsuccessful night time fire hunt for woodcock was noted in the diary on February 22, 1838 (ibid:148).
Hunting was occasionally dangerous, not only for the quarry, but for man and dog as well. For example on July 10, 1843, Barrow noted "Alligators caught one more dog, 3 in all" (ibid:311). There was also danger for the hunter, particularly if the first shot did not kill the quarry.

Went driving — Ruffin shot a Large buck in No one drive — shot one eye out. The Deer ran at him blind side & knocked him — side of his horns hitting him only. I came up -- he shot again as he came at him -- missed he ran us both round & round -- the 3 hounds & one cur hanging to him -- we each gained a large tree -- the Deer took off I after him -- on horse back dogs stopped him some short distance -- went up to shot him -- dogs pointed, 'till he came so near me as to compell me to shoot in self defense shot his under jaw off as I jumped behind a tree -- after a while I found a chance to shoot him in the head & end his life -- after some verry narrow escapes -- 5 prongs -- very fat & large (November 24, 1838; ibid:174).

Barrow fished occasionally during the early years of the diary, and often he and his companions would combine hunting and fishing on a single trip. The number of fishing trips begins to increase in 1843, becoming almost as common as hunting in 1844 and 1845. The fish caught most often were trout and perch. Barrow wrote of seine fishing in a pond on his property and catching perch and catfish in large numbers. He also noted a 25 pound buffalo fish being giged by a Mr. Hurlburt in November 1845 (ibid:384).

The remaining archival sources provide minimal amounts of information. On February 2, 1836 Rachel O'Connor wrote
to her brother-in-law Alfred T. Conrad about the shortage of barrel pork. "I scarcely know how I managed to do without. I certainly could not if it had not been for some old wild hogs of mine that had been on the range for years. that Mr Germany hunted up and shot" (Weeks Papers). In another letter from Rachel O'Connor to her niece Frances M. Weeks is the note "Leven has taken a gun out to kill a wild turkey" (June 15, 1840; Weeks Papers). On My 12, 1866 a Jno. A. Collins at Clinton wrote to Mr. Weeks "I amuse myself sometimes by hunting Wild turkeys-- There is a little game of all kinds up here -- Any quantity of partridges & Squirrels" (Weeks Papers).

Although the Lewis Stirling and Family Papers contain several letters that discuss fishing, they all refer to events taking place at East Pascagoula. There is only one letter with data pertinent to the Florida Parishes. On May 22, 1836 John L. Lobdell of Edgewood near St. Francisville wrote to Lewis Stirling Esq.: "Ruffin and Robert Escorted by old Charles came down and spent the day with us, they brought down the half of wild Turkey which Dan succeeded in Shooting yesterday (the first of this season)" (Stirling Papers). This collection contains numerous bills and statements submitted to Lewis Stirling. They list purchases of items such as barrels of mackerel and of oysters, bags of shot, gunflints, partial kegs of powder, percussion caps, a
powder horn, a powder flask, various sized fish hooks, and fish lines. These purchases imply at least that a substantial amount of hunting was going on in the area even though it is not mentioned in any correspondence. These records cover a period from early 1831 through 1856 (Stirling Papers).

For those living near navigable streams, hunting and fishing were not the only sources of wild game and fish. A letter from Mary Gay to her mother Mrs. Dickinson, written from St. Louis Plantation near Bayou Sara stated: "Captain Yore (? , name not completely decipherable) & his son...gave us...redfish, & sheep head fish & crabs" off their boat (October 15, 1867; Gay Papers). While a student at Louisiana State University, Baton Rouge, Lemuel P. Conner Jr. wrote to his mother, Mrs. L. P. Conner, on May 11, 1878 "I was over at the 'Oaks' last Sat and in the evening went cray fishing, that is went with that intention, but were very unsuccessful" (Conner Papers). "The Oaks" was a plantation located in West Feliciana Parish.

The contemporary writings include a description of East Feliciana parish written in 1892 and an account of travels through the Piney Woods of southern Mississippi during the early 1840s. Among the fairly common foods for settlers in the early 1800s, in what was to become East Feliciana
parish, were panther steaks, saddles of venison, haunches of bear, and opossum. According to John White, in the period between 1807 and 1815, "I never...tasted meat, except bear, venison and an occasional panther steak, until I was a good sized boy" (Skipwith 1892:53). In his record of his trip through the Piney Woods of southern Mississippi in the early 1840s, J. F. H. Claiborne noted that the unbroken forest of Jones County abounded with deer, wild turkey, and bobwhite quail. In Greene County he recorded that the country had many deer, many of which were killed for the Mobile market. And that "the beautiful, clear, deep streams here are full of fish....in a few hours we were feasting on delicious venison and turtle. The boys had only to walk a few hundred yards to find at any time the articles wanted" (Claiborne 1906:522).

The single archaeological report presents the results of limited testing on a historic site on the Joseph Petitpierre land grant in East Baton Rouge Parish. The Kleinpeter-Knox site is located on high ground facing the Bayou Fountain floodplain. The archaeological materials indicate an occupation date during the 1850s for the area excavated (Castille, Hahn, and Bryant 1985). The faunal materials recovered included swamp rabbit, alligator snapping turtle, eastern box turtle, cooter or slider, and oyster. The swamp rabbit remains appeared to be a burial,
and thus could represent a pet rather than a food source (Kelley 1985).

Table 10. Species List for Ecological Division 7.

<table>
<thead>
<tr>
<th>White-tailed deer</th>
<th>American woodcock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black bear</td>
<td>Pigeon</td>
</tr>
<tr>
<td>Northern raccoon</td>
<td>Redfish</td>
</tr>
<tr>
<td>Squirrel</td>
<td>Sheepshead</td>
</tr>
<tr>
<td>Swamp rabbit</td>
<td>Spanish mackerel</td>
</tr>
<tr>
<td>Eastern cottontail</td>
<td>White bass</td>
</tr>
<tr>
<td>Opossum</td>
<td>Rock bass</td>
</tr>
<tr>
<td>Cougar</td>
<td>Catfish</td>
</tr>
<tr>
<td>Bobcat</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Feral hog</td>
<td>Perch/trout</td>
</tr>
<tr>
<td>Mallard</td>
<td>Alligator snapping turtle</td>
</tr>
<tr>
<td>Duck</td>
<td>Cooter/slider</td>
</tr>
<tr>
<td>Bobwhite quail</td>
<td>Alligator</td>
</tr>
<tr>
<td>Wild turkey</td>
<td>Crawfish</td>
</tr>
<tr>
<td></td>
<td>Blue crab</td>
</tr>
</tbody>
</table>
CHAPTER 9: POTENTIAL CONTRIBUTIONS OF WILD GAME AND FISHERY RESOURCES TO THE NINETEENTH CENTURY DIET

Previous studies of foodstuff self-sufficiency in Louisiana have shown that during the middle third of the nineteenth century the state suffered from a meat, primarily pork, deficit. For the years 1840, 1850, and 1860 Hilliard (1972) indicated deficits of 10,000 tons for the first two years and 21,000 tons for the third. Hutchinson and Williamson (1971) suggested larger deficits for these years: 17,000, 22,600, and 34,100 tons respectively. Both of these studies stated that these shortages were made up by imports from either the midwest or the Upper South. It is the thesis of this study that a substantial portion of these deficits could have been covered by a reliance on wild game and fishery resources. The potential contributions of these resources to the nineteenth century diet of Louisiana will be presented in the following pages.

It is not possible to estimate potential contributions for all species of wild game and fishery species harvested. In many cases the necessary population estimate and carrying capacity data are not available. This is particularly true of the modern nongame species of birds, the various species of turtles, and most species of fish. Thus, for example, although we know that birds such as the Eskimo curlew and
marbled godwit were hunted to near extinction by the 1880s, there is no data concerning probable range acreages, carrying capacities, densities or populations. The majority of the species listed in the appendicies are of necessity excluded from this analysis. With regard to fishery resources, there are data concerning the commercial catches for the year 1880, the first year in which the federal government collected such information. These figures will be used as the basis for extrapolating potential meat contributions for these species.

For some of the game species of mammals and birds, St. Amant (1959) has presented population estimates and virgin range estimates for circa 1800. These figures, while not always accepted, form a starting point for determining potential meat contributions from animals such as deer, turkey, quail, squirrel, and so on. Where possible the range of particular species has been broken down by ecological division, based on data presented by St. Amant (1959:52-53, Table 3). In these instances, the projected meat yield has also been determined by region. While the acreage figures derived from this data are not considered to be fully accurate depictions of the virgin range distributions, they do provide a basis for the analysis. In other cases, statewide range figures have been used when it was not possible to determine ecological division acreages.
with any kind of confidence.

In some instances, several species have been grouped into a single category as was the case for most of the fishery resources. This was true of the waterfowl as well. Wintering waterfowl population estimates were available only in terms of the numbers of ducks and the numbers of geese. And these became the categories of analysis even though they grouped together at least fourteen species of ducks and three species of geese. Other problems faced by this analysis will be discussed below as necessary.

**Harvest Rates**

Ideally, the harvest of any wild game species should be limited to either the annual surplus for what are known as "K" selected species such as deer, or the annual mortality figure for "r" selected species such as quail. Type "K" species are limited to one or two births per year and produce few young. Their population size tends to be fairly stable through time and remains close to the habitat's carrying capacity. Rapid reproduction is less important than being able to use the habitat while competing with other animals for its resources. Type "r" species engage in multiple breeding during the year and will produce several litters or clutches. The mortality of these species is often catastrophic with no relation to population density.
The great majority of individuals die at a young age. The rapid breeding and fast maturation patterns allow these species to make full use of their habitats by quickly expanding to near carrying capacity limits and using resources before potential competitors can (Zwank 1982; Anderson 1985). General harvest rates for the two categories, type "r" and type "K" species, were determined from the available literature.

**Edible Meat Portions**

A major problem in attempting to determine the potential dietary contribution of any species is that of determining what portion of the animal's live weight is edible. The first step is to establish average adult weights for the various species. The use of average adult weights is not without its own problems. The weight of any individual specimen will vary with age, season of the year, and the availability and quality of its food supply. One can only hope that when considering the hundreds of thousands of individuals taken for food, not for trophies, the average weights of these individuals will be reasonably close to the average adult weight of modern populations. The average weights used in this discussion have been taken from a number of sources that will be referenced appropriately.
The problem of edible meat percentages vis a vis live weight is one that has vexed zooarchaeologists for over three decades. The first attempt to deal with it was in a short note by Theodore White (1953). Essentially, White divided wild game animals into two categories: "stockers and feeders", animals with lighter bodies and longer legs, and "heavy bodied, short legged", animals built more like a hog (1953:397). White used domestic animal statistics as the basis for his suggestion that for animals in the first category, 50 percent of the live weight would be edible meat. For animals in the second category, 70 percent of the live weight would be edible meat. White also suggested a 70 percent edible meat ratio for birds (ibid). The figures for edible meat portions given by White were used extensively in a study of prehistoric subsistence strategies by Smith (1973). The edible meat portion data presented in Smith's dissertation have been used as guidelines to some extent in portions of the following analysis. Beginning in the 1970s people began to question these values.

In one Canadian study where total body weights of specimens were taken as well as weights of most organs and tissues, no consistent pattern for edible meat percentages was evident (Stewart and Stahl 1977). While the edible meat percentages determined represented the highest possible quantities of meat on the animals, they are consistently
lower than those suggested by White. For example, Stewart and Stahl’s percentages in comparison with White’s were: for grey squirrel 26.0 versus 70, for muskrat 51.9 versus 70, for black bear 58.9 versus 70, and for lynx 42.5 versus 50 (1977:268). Two bird specimens were also processed. A sharp-shinned hawk and a common crow which yielded 34.2 and 35.8 percent of edible meat respectively (ibid:269). This is in comparison to White’s 70 percent rate for birds.

Another method zooarchaeologists use to estimate usable meat weight is often called skeletal mass allometric scaling, which is based on the allometric relationship between whole body mass and skeletal mass (Castille et al. 1986; Wing and Brown 1979). Unfortunately, allometric formulas have not yet been published for individual genera or species (David B. Kelley - personal communication - August 15, 1989). The formulas are available for mammals, birds, fish, and turtles as broad categories as well as for the *Sciaenidae* fish as a group. According to these formulas, the amount of usable meat for mammals generally is 60 percent, for birds 70 percent, for fish including the *Sciaenidae* 80 percent, and for turtles 50 percent. In using these formulas all weights must be in kilograms.

Wing and Brown (1979) describe other techniques used to determine usable meat weights. In addition to White’s
method and skeletal mass allometry, another allometric scaling method is based on the relationship between skeletal linear dimensions and live body weight. However, the dimensions of specific bone elements must be known to employ this method. A fourth technique is based on the assumption that the skeletal weight of mammals is a certain percentage of the total body weight. The percentages used have ranged from 5.6 to 9 percent. Although a simple technique to use, the relative inaccuracy of the results make it less than suitable. A last method is based on a known skeletal-weight - body-weight ratio for specific species. This, of course, requires that the live body weight and the skeletal weight of at least one example of each species in question be known, data that are not always available.

Of the various techniques discussed, the skeletal mass allometry method produces the best results. There is a problem with this technique in that when starting with a known live body weight and trying to determine skeletal weight, the latter is apparently underestimated. For example, Rue (1978) has stated that for an average deer of 125 pounds the skeletal elements will weigh from 16 to 20 pounds. However, when either of the following allometric scaling formulas are used, \( \log Y = 1.12 + 0.90 \log X \) or \( Y = 13.2X^{.90} \) where \( Y \) is the live weight in kilograms and \( X \) is the skeletal weight in kilograms, the result is a skeletal
weight of 11.14 pounds. As noted above, for mammals, this method assumes a 60 percent usable meat percentage. Considering the apparent error in underestimating skeletal weight and the fact that it is not clear if the usable meat percentage excludes the weight of blood and organs, a more conservative estimate of 50 percent will be used for mammals except where more specific data on the amount of edible meat per species is available.

With respect to birds, the 70 percent edible meat ratio that has been suggested by White (1953) and current allometric scaling technique seems rather high, particularly when compared to the approximately 35 percent determined by Stewart and Stahl (1977) for their two specimens. Granted that these hawk and crow specimens likely carry less meat proportionately than would a turkey or quail, which may explain the low figure. Since the allometric scaling formulas for mammals apparently underestimate skeletal weight, and that possibility may also be true for birds, a figure lower than the 70 percent estimate of edible meat should be used. To be on the conservative side an edible meat ration of 50 percent will be used for birds in the following discussion.

One other attempt to try and determine reasonable estimates of the amount of meat different species provide
involved examining a number of wild game cook books. None of them gave any figures relating to the amount of meat that could be expected from any of the species included.

Forest Game

As indicated earlier, the time period covered by this study corresponds closely to Stage II:1800-1880 of St. Amant’s land use change model (1959). During this period the forests and the wild game they supported were only lightly impacted by the spread of agriculture and other land clearing activities. The main cause of forest range decline was the stripping and burning of the choice upland pine hardwood ranges in the virgin forest which did not begin until around 1890 in Stage III. This means that, in general, declines in the populations of most forest game species during Stage II were limited. Deer survived heavy hunting pressure because they had been numerous enough, reproduced fast enough, and had a large enough range to absorb most of the kill. Turkey survived reasonably well because of their initial numbers and a rapid breeding rate. All indications suggest that squirrels and furbearers remained plentiful until through the 1800s. The species that were hit the hardest were bear and cougar, primarily because of their slow reproductive rates (St. Amant 1959). Each of these species will be discussed below in terms of their potential
contributions to the nineteenth century diet. Conservative estimates of ranges and carrying capacities have been used throughout this discussion.

**White-tailed deer**

St. Amant has stated that around the beginning of the 1800s there were approximately 23,000 acres of good deer range in Louisiana (1959:46). Elsewhere, however, he has written that sections of the bottomlands of the Mississippi River and its associated streams were poor deer range. This was true particularly of the cypress-tupelo swamps (ibid:111). He also stated that park-like stands of pure longleaf pine never supported large numbers of deer (ibid:132). If the cypress-tupelo swamps, stands of pure pine forest, prairies, and salt marsh areas are removed from consideration as good deer range, we are left with a total range of 17,002,178 acres. This conservative estimate is divided among the seven ecological divisions as shown in Table 11. These figures are derived from St. Amant (1959:52-53, Table 3). They represent a combination of the forest acreage figures and farm land acreage figures in the table. While they may not reflect the forested deer range of 1800 with great accuracy, they are as close as we can likely come to determining the actual acreages involved.

In divisions 1, 3, and 5 the forests are comprised of
pine hardwoods and mixed bottomland hardwoods. Divisions 2 and 4 forests are mixed bottomland hardwoods. The deer range in division 6 includes forest stands on ridges, cheniers, and natural levees and the fresh and brackish marshes. The forests of division 7 are pine hardwoods and mixed hardwoods.

Table 11. Distribution of Virgin Deer Range, in acres.

1. Northwest Uplands 4,380,842
2. Upper Mississippi... 3,810,789
3. Southwest Terrace Lands 1,142,670
4. Lower Mississippi... 2,414,869
5. Southwest Prairies 427,799
6. Coastal Marshes 3,512,815
7. Southeast Terrace Lands 1,312,394
TOTAL 17,002,178

St. Amant established what he referred to as a conservative population density ratio of 1 deer per 50 acres for the original wilderness of Louisiana (1959:48). This ratio is applied to all ecological divisions, even though some clearly have higher carrying capacities. In divisions 2 and 4 for example, St. Amant states that the best areas could support at least 1 deer per 40 acres (ibid:117).

Research carried out by Bateman (1949, cited in St. Amant 1959:125) projected a carrying capacity in the Southeast Terrace Lands of at least 1 deer per 30 or 40 acres. St. Amant also notes that in the Southwest Terrace Lands many sections could likely support 1 deer per 30 acres (ibid:118). Studies by Dell and Chabreck in the coastal
marshes, on the other hand, result in deer carrying capacities of 1 per 30 acres in the fresh marsh and 1 per 331 acres in the brackish marsh (1986:19). This averages out to 1 deer per 59.4 acres for the area as a whole. The higher potential carrying capacities of the other regions balance the marsh figures and make the average ratio of 1 deer per 50 acres realistic for the state as a whole.

In determining deer populations statewide and for each ecological division, the above ratio has been employed. Using it and the estimate of 23,000,000 acres of good deer range St. Amant suggested an estimated total deer population of approximately 400,000 for the state (1959:48). This seems to be a rather high figure when other writers state that "deer numbers were very low through most of the state" (LDWF 1987a:1). The more limited deer range of 17,002,178 acres suggested above would produce a lower total population estimate of 340,044 deer.

The white-tailed deer is a type "K" species, thus it has a low net productivity or population increase increment. The net productivity for white-tails is generally 20–35 percent of the total population in any given area (Halls 1978:53). This 20–35 percent increase represents a surplus above and beyond what is necessary to maintain a stable population. As Halls has stated "If a herd is to be
held stable, all surplus deer should be harvested annually" (1978:59). This means that up to 35 percent of the population of a given area could be removed without causing any decrease in population numbers.

If a conservative harvest rate of 25 percent is used, the annual take of deer in Louisiana early in the nineteenth century would have been approximately 85,011 deer. A more liberal 30 percent harvest rate would allow the taking of 102,013 deer per year. To establish the potential food contribution of deer, the number of individuals must be converted into pounds of usable meat. It has been determined that approximately 57 percent of the live weight of a deer is considered edible by American hunters (Schwartz and Schwartz 1981:346-47). This is a figure with which Rue (1978) would disagree. With regard to an average 125 pound deer, Rue claimed that only 40 percent of the live weight is usable meat. It must be noted, however, that when butchering a deer, Rue would remove all fat, tissue, and bone. His usable meat percentage does not include organ meat either. The inclusion of fat and some organ meat, liver perhaps, as usable meat would likely raise the percentage to near the level given by Schwartz and Schwartz.

The average weight of a deer taken in Louisiana must also be known before the amount of meat produced can be
estimated. St. Amant has stated that the average weight of mature bucks taken in the state was approximately 100 pounds (1959:102). However, according to Burts and Carpenter, the average size of adult white-tails in Louisiana was between 125 and 150 pounds (1980:1). Lowery has stated that the weight of adult deer in the state is usually around 130 pounds (1974a:488). Thus we have an average weight range from 100 to 150 pounds. For purposes of computation, the middle ground of this range, 125 pounds, will be used.

If the average deer weighs 125 pounds, and 57 percent of that figure equals the amount of usable meat, then each deer would provide approximately 71.25 pounds of edible meat. Thus the annual take of 85,011 will produce 6,057,025.9 pounds or 3028.5 tons of meat. The complete set of computations would be: total deer range divided by the carrying capacity or density per acre (17,002,178/50), times the harvest rate (340.043.56 x .25), times the amount of edible meat per deer (85,010.89 x 71.25), divided by the weight of one ton (6,057,025.9/2000) which yields 3028.5 tons of meat. If the higher harvest rate of 30 percent is used the end result would be a 20 percent increase, or a total of 3634.22 tons of edible meat.

The total estimated deer population was not evenly distributed across the state. Since the different
ecological divisions had different amounts of good deer range, they also had different numbers of deer. For example, the Northwest Uplands with its 4,380,842 acres of deer range, would have had an estimated population of 87,617 deer which could have produced 780.34 tons of meat. The seven ecological division meat yields are presented in Table 12.

<table>
<thead>
<tr>
<th>Ecological Division</th>
<th>Population</th>
<th>Edible Meat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td>87,617</td>
<td>780.34</td>
</tr>
<tr>
<td>2. Upper Mississippi...</td>
<td>76,216</td>
<td>678.79</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td>22,853</td>
<td>203.54</td>
</tr>
<tr>
<td>4. Lower Mississippi...</td>
<td>48,297</td>
<td>430.15</td>
</tr>
<tr>
<td>5. Southwest Prairies</td>
<td>8,556</td>
<td>76.20</td>
</tr>
<tr>
<td>6. Coastal marshes</td>
<td>70,256</td>
<td>625.72</td>
</tr>
<tr>
<td>7. Southeast Terrace Lands</td>
<td>26,248</td>
<td>233.77</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>3028.51</td>
</tr>
</tbody>
</table>

It is unlikely that hunting pressure on deer was very heavy during the early part of the nineteenth century. The number of people in the state did not reach the half-million mark until about 1850. And ten years earlier, the human population of 352,411 barely exceeded the potential deer population of 340,044 (Calhoun and Dore 1988:131). Obviously not every person hunted, and, as the documentary record shows, those that did were not always successful. The greatest impact on the deer population would have come from market hunters. But, St. Amant believed that much of the
original deer herd remained as late as the 1880s. In 1884 deer were reported present in all but 10 of the 59 parishes then in existence. These ten included four coastal marsh and cypress-tupelo swamp parishes, two prairie parishes where deer were never plentiful, and three urbanized areas. It should be noted that not all parishes reported. The remaining 49 parishes, for the most part, still had deer in large enough numbers to allow hunting.

By the 1850s, however, the decline in deer may have been great enough to be noticeable in some parishes. In West Feliciana Parish, for example, the deer population at mid century had declined to the point that the deer drive lost some of its excitement (Davis 1936:89). An apparent decline in game numbers, perhaps including deer, led to the enactment of the first state game laws in 1857 (LDWF 1987a). Act No. 1 of the State of Louisiana for 1857 was passed on January 23. It gave the Police Juries of Tensas and Madison Parishes authority to pass game ordinances for the preservation of wild game. It also allowed them to ban fire-hunting and to protect planters from trespass (State of Louisiana 1857). A visible decline in the state's deer population by mid century most likely would have resulted from over-hunting rather than from a depletion of the range. Such would suggest that through the middle third of the 1800s, deer were being harvested at a rate greater than
the sustained yield figures of 25-30 percent. And, therefore, were providing more edible meat than has been suggested above. Whether these events really indicate a serious decline in deer numbers or the fact that in response to hunting pressure deer learned to skulk and hide more effectively cannot be determined at present.

If we can assume either meat yield suggested above of 3028.5 tons at a 25 percent harvest rate or 3634.22 tons at a 30 percent harvest rate is reasonable and compare it to the meat deficits suggested by Hilliard (1972) for the middle third of the century, as represented by the census years 1840, 1850, and 1860 (Table 2), it is apparent that the white-tailed deer harvest could have made up over one-third of the deficits for 1840 and 1850, and just over 17 percent of the 1860 deficit. This would have lessened the dependence on imported pork significantly, for the first two years in particular.

Wild Turkey

A second important forest game animal was the wild turkey. According to early historical accounts, the turkey ranged over most of Louisiana and was present in considerable numbers (DuPratz 1774; Joutel 1846). More recent research has concluded that turkey were originally plentiful in the uplands and pine hardwood regions of the
state until as late as the 1880s. They were, however, either absent or rare in the coastal marshes, cypress-tupelo swamps, and the prairie region. While impacted to some extent by land use changes and hunting pressure, the large turkey population of the state did not decline seriously until large scale timber operations began around 1890 (St. Amant 1959).

According to St. Amant the original virgin turkey range comprised nearly 15,000,000 acres (1959:46, Fig. 9). This range may have been divided as shown in Table 13. The forested regions of the southwest prairies division are included on the possibility that they provided turkey habitat. There is, however, no solid documentation for the species presence there, only the mention of its presence in St. Landry Parish, part of which falls into another division, by Dennett (1876). With regard to the coastal marsh zone, Landreth did note the presence of wild turkey in that region (Newton 1985), which accounts for the inclusion of the small forested area of that division. All areas of pure pine forest and cypress-tupelo swamp have been excluded from the turkey range acreage.

The original population of wild turkey in Louisiana as of circa 1800 is given as 1,000,000 (St. Amant 1959; Burts and Carpenter 1980; Timmer and Cockerman 1987). With
approximately 15,000,000 acres as the original turkey range, such a population would have an average density of 1 turkey per 15 acres. This is substantially greater than the more recent carrying capacity of 1 bird per 475 acres for the average turkey range in Louisiana and the southeastern United States in the 1940s and 1950s (St. Amant 1959:153). For comparison, a density of 1:475 acres on the virgin turkey range would result in a total population of 31,579 birds for the entire state. The discrepancy may simply be due to the facts that little if any virgin range is left and that modern turkey range is not as productive. For the sake of discussion the original population proposed by St. Amant and others will be accepted.

Table 13. Distribution of Virgin Turkey Range, in acres.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Region</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Northwest Uplands</td>
<td>4,897,527</td>
</tr>
<tr>
<td>2</td>
<td>Upper Mississippi...</td>
<td>3,768,419</td>
</tr>
<tr>
<td>3</td>
<td>Southwest Terrace Lands</td>
<td>1,372,083</td>
</tr>
<tr>
<td>4</td>
<td>Lower Mississippi...</td>
<td>2,807,775</td>
</tr>
<tr>
<td>5</td>
<td>Southwest Prairies</td>
<td>357,996</td>
</tr>
<tr>
<td>6</td>
<td>Coastal Marshes</td>
<td>77,769</td>
</tr>
<tr>
<td>7</td>
<td>Southeast Terrace Lands</td>
<td>1,613,526</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>14,895,095</td>
</tr>
</tbody>
</table>

The average weight of a Louisiana wild turkey is about 13.5 pounds. Burts and Carpenter give weight ranges of 12-22 pounds for males and 8-12 pounds for females (1980:4). If we take the average of each range, 17 and 10 pounds, and average them, we get 13.5 pounds.
The wild turkey appears to be an "r" type species. This classification is based on the close similarity between its breeding behavior and that of the bobwhite quail. Bobwhite produce only one brood per year, and this is apparently true of turkeys as well. A typical bobwhite clutch is 12 to 14 eggs, while the turkey’s is 10 to 13. The literature indicates that the hens of both species do not begin to breed until they are one year old (Lowery 1974b; Leopold, Guitierrez and Bronson 1981). Since the wild turkey resembles the bobwhite so closely in breeding and reproductive behavior, it is logical to assume that it could be harvested at much the same rate of approximately 45 percent of the total population (see discussion on the bobwhite quail below). At a harvest rate of 45 percent, a population of 1,000,000 turkeys would yield a take of 450,000 birds. Given an average weight of 13.5 pounds and an edible meat ratio of 0.5, the annual take would produce about 3,000,000 pounds or 1500 tons of meat for the entire state.

The 15,000,000 acres of good turkey range were not evenly distributed across Louisiana. Thus, the wild turkeys were unevenly dispersed in the various ecological divisions. The potential edible meat yield of the seven ecological divisions are presented in Table 14.
Table 14. Potential Meat Contribution of Wild Turkey for Each Ecological Division, in tons.

<table>
<thead>
<tr>
<th>Division</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td>475.87 tons</td>
</tr>
<tr>
<td>2. Upper Mississippi...</td>
<td>381.56 tons</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td>138.92 tons</td>
</tr>
<tr>
<td>4. Lower Mississippi...</td>
<td>284.28 tons</td>
</tr>
<tr>
<td>5. Southwest Prairies</td>
<td>36.24 tons</td>
</tr>
<tr>
<td>6. Coastal Marshes</td>
<td>7.87 tons</td>
</tr>
<tr>
<td>7. Southeast Terrace Lands</td>
<td>163.37 tons</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1488.11 tons</td>
</tr>
</tbody>
</table>

In actual fact, since there is no documentation for the taking of turkeys in the Southwest Prairie region that 357,996 acres can be removed from consideration. The real potential meat contribution of the wild turkey would then be 1451.87 tons.

There can be no doubt that the wild turkey population declined during the nineteenth century. The main question is when? Recent research has shown that the wild turkey is much more adaptable than once thought and that the species can in fact flourish on lands once considered to be marginal turkey habitat (Dennett 1985). These factors, in conjunction with the breeding potential of the species, suggest that the overall population was not seriously impacted through much of the 1800s. The real disaster for the wild turkey came with the wholesale cutting of mature upland forests beginning around 1890 and the rapid spread of mechanizing and modernizing agriculture that occurred about the same time. As the turkey’s prime habitat was destroyed, the
effects of year-round unregulated hunting increased and the population quickly declined (Timmer and Cockerman 1987).

It is likely, therefore, that during the middle third of the nineteenth century, the turkey harvest proposed above could have continued. If such was the case, the wild turkey would have made a major contribution to the meat deficits noted by Hilliard (1972) for this period.

**Squirrels**

Louisiana has two species of squirrels which are comprised of five races. There are two races of the grey squirrel: the southern grey squirrel (*Sciurus carolinensis* *carolinensis*) and the bayou grey squirrel (*S. c. fuligenosus*). The grey squirrel is found over the entire state, but is confined primarily to bottomland hardwood areas along streams and swamps or in mixed pine hardwood forests. The southern grey is associated with creek bottoms in the hill and terrace lands of western and southeastern Louisiana. The bayou grey occurs primarily along the Atchafalaya and lower Mississippi Rivers as well as the bayous in south Louisiana. The fox squirrel consists of three races: Bachman’s fox squirrel (*Sciurus niger bachmani*), the delta fox squirrel (*S. n. subauratus*), and the big-head fox squirrel (*S. n. ludovicianus*). In general the fox squirrel also has a statewide distribution, although
racial associations are quite distinct. Bachman's fox
squirrel is limited to the Florida Parishes. The delta fox
is found along the Mississippi, Tensas, Ouachita,
Atchafalaya, and Red River bottoms. The big-head is
confined to the Northwest Uplands and the Southwest Terrace
Lands (Figure 13). Squirrel habitat in the coastal marshes
is limited to bottomland hardwood areas (St. Amant 1959;
Kidd 1987).

Since most historic references are simply to
"squirrels" rather than particular species, and since the
ranges of the grey and fox squirrels overlap, the following
discussion will treat them as a single type unless otherwise
specified.

According to St. Amant the original virgin squirrel
range in 1800 amounted to about 23,000,000 acres and
supported an estimated population of 20,000,000 squirrels
(1959:46-47, Figs. 9 and 10). This would equate to an
overall density of 0.87 squirrels per acre. Conservative
modern estimates are somewhat lower, ranging from 0.70 per
acre on the best range (mixed bottomland hardwoods) to 0.20
per acre on relatively poor range (second growth pine and
scrub oak). Measured squirrel densities from Mississippi
and East Texas range as high as 2.0 per acre in mixed
bottomland hardwoods and 0.5 per acre in pine hardwood
Figure 13. Distribution of Squirrel Races.

**FOX SQUIRREL**
1. *Scirurus niger bachimal*
2. *Scirurus niger subauratus*
3. *Scirurus niger ludovicianus*

**GREY SQUIRREL**
2. *Scirurus carolinensis fuliginosus*
1., 3. *Scirurus carolinensis carolinensis*
forest. In Louisiana the maximum densities were 1.0 and 0.5 per acre respectively and 0.5 per acre on poor range. What has been designated poor squirrel range in Louisiana consists of parishes that are extensively farmed or cut-over. The bottomland forests along creeks and rivers in these parishes and in the prairies and coastal marshes provide excellent squirrel range (St. Amant 1959). Under their original cover, these parishes would have provide good range at least.

The assumption that Louisiana contained 23,000,000 acres of good to excellent squirrel range in 1800 does not seem to be tenable. The total forested area of the state could not have exceeded this figure by much. Once the areas covered by pure pine forest, which did not provide good squirrel habitat, are removed the total squirrel range consists of 16,231,782 acres. Of this total 10,815,617 acres were mixed bottomland hardwoods and 5,416,165 acres were pine hardwood associations. Assuming a density of 0.87 squirrels per acre this range would have supported a total population of 14,121,650 squirrels.

The modern squirrel density figures given by St. Amant (1959:166, Table 45) of 0.70 per acre for excellent range and 0.37 per acre for good range have a ratio of 1.9:1. That is, for every squirrel supported by one acre of good range,
excellent range would support 1.9 squirrels. If this same ratio is applied to the virgin squirrel range with an average carrying capacity of 0.87 squirrels per acre, it reflects probable densities of 1.033 per acre of excellent range and 0.544 per acre of good range. These density figures will be used in determining squirrel production for each ecological division as discussed below.

Squirrels are primarily type "K" species. They generally have two litters per year with an average litter size of about three (Kidd 1987). Like the white-tailed deer, squirrel were, and are, abundant enough, widespread enough, and have a high enough reproductive rate to sustain a large annual harvest. While the population may vary for year to year, it does not suffer the catastrophic declines found among some "r" type species such as the rabbits. According to studies conducted in the 1940s and 1950s the average squirrel population was 5,790,000 and the annual kill was estimated to be about 2,300,000. This equals a harvest rate of 40 percent (St. Amant 1959). More recent statistics suggest a harvest rate of 30 percent (LDWF 1987b).

If we use the lower figure of a 30 percent harvest rate, the potential annual take based on a population of 14,121,650 would be about 4,236,495 squirrels. A small game survey conducted by the Louisiana Wild Life and Fisheries
Commission during 1966-67 indicated that the total squirrel population consisted of 60 percent grey squirrels and 40 percent fox squirrels, and that the kill rates were about the same (Lowery 1974a). Thus, the potential annual harvest would have consisted of 2,541,897 grey squirrels and 1,694,598 fox squirrels.

The fox squirrel is the larger of the two species with an average weight of just over two pounds, while the grey squirrel averages about one pound adult weight (Rue 1981; Lowery 1974a). Thus the total weight of the harvest would have been 5,931,093 pounds with the fox squirrel contributing 3,389,196 pounds. On the basis of a 50 percent edible meat ratio, the potential annual harvest would have supplied a total of 2,965,546.5 pounds or 1482.8 tons of meat from all seven ecological divisions. Of this total, 847.3 tons would have been fox squirrel and 635.5 tons grey squirrel.

The original squirrel range of Louisiana would have been divided in approximately as shown in Table 15. It should be noted that there is no documentation for the taking of squirrels in the Coastal Marsh division, and this zone will not be included as part of the meat producing squirrel range.
Table 15. Distribution of Virgin Squirrel Range, in acres.

<table>
<thead>
<tr>
<th>Region</th>
<th>Bottomland hardwoods (excellent)</th>
<th>Pine hardwoods (good)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td>1,484,138</td>
<td>3,413,389</td>
</tr>
<tr>
<td>2. Upper Mississippi</td>
<td>3,768,419</td>
<td>881,966</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td>490,117</td>
<td>801,966</td>
</tr>
<tr>
<td>4. Lower Mississippi</td>
<td>3,899,875</td>
<td></td>
</tr>
<tr>
<td>5. Southwest Prairie</td>
<td>357,996</td>
<td>70,267</td>
</tr>
<tr>
<td>6. Coastal Marshes</td>
<td>252,089</td>
<td></td>
</tr>
<tr>
<td>7. Southeast Terrace Lands</td>
<td>562,983</td>
<td>1,050,543</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16,231,782</td>
<td></td>
</tr>
</tbody>
</table>

The edible meat yield for each ecological division for both fox squirrels and grey squirrels were determined as follows. Ecological Division 1, the Northwest uplands, contained 1,484,138 acres of bottomland hardwoods with a carrying capacity of 1.033 squirrels per acre. This gives a total population of 1,533,114.5 squirrels. At a rate of 30 percent the annual harvest would be 459,934.35. Sixty percent, or 275,960.61, of this total consists of grey squirrels. At approximately one pound average weight, the total weight would be 275,960.61 pounds. Using the 50 percent edible meat weight to live body weight ratio, this portion of the harvest would provide 137,980.3 pounds or 68.99 tons of meat. The 40 percent of the harvest made up
of fox squirrels would equal 183,973.74 animals. With an average weight of two pounds, each squirrel would produce one pound of meat for a total of 183,973.74 pounds or 91.97 tons. The potential squirrel meat contribution of the bottomland hardwoods of zone 1 would be 160.96 tons.

Table 16. Potential Squirrel Meat Production for each Ecological Division, in tons.

<table>
<thead>
<tr>
<th>Ecological Division</th>
<th>Grey Sq.</th>
<th>Fox Sq.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>68.99</td>
<td>91.17</td>
<td>160.96</td>
</tr>
<tr>
<td>Pine hardwood</td>
<td>83.56</td>
<td>111.41</td>
<td>194.97</td>
</tr>
<tr>
<td>2. Upper Mississippi...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>175.17</td>
<td>233.57</td>
<td>408.74</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>22.78</td>
<td>30.38</td>
<td>53.16</td>
</tr>
<tr>
<td>Pine hardwood</td>
<td>21.59</td>
<td>28.78</td>
<td>50.37</td>
</tr>
<tr>
<td>4. Lower Mississippi...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>181.29</td>
<td>241.71</td>
<td>423.00</td>
</tr>
<tr>
<td>5. Southwest Prairies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>16.64</td>
<td>22.19</td>
<td>38.83</td>
</tr>
<tr>
<td>Pine hardwood</td>
<td>1.72</td>
<td>2.29</td>
<td>4.01</td>
</tr>
<tr>
<td>6. Southeast Terrace Lands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottomland hardwoods</td>
<td>26.17</td>
<td>34.89</td>
<td>61.06</td>
</tr>
<tr>
<td>Pine hardwood</td>
<td>25.72</td>
<td>34.29</td>
<td>60.01</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1455.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The potential meat supply from the pine hardwood association was worked out in the same fashion using the carrying capacity rate of 0.544 per acre. The grey squirrel production would have been 83.56 tons and that of the fox squirrel 111.41 tons for a pine hardwood total of 194.97 tons. The entire output of this ecological division would have been 355.93 tons. A complete breakdown of squirrel meat production by ecological division is given in Table 16.
Unfortunately, there is a lack of data concerning these species. Russell (1978) has noted that little scientific information about the cougar in general is available. No information on carrying capacities, densities, or harvest rates for cougars in Louisiana was located. All the early writers reported this cat as being rare, despite several historical references to the use of its flesh for food. The range of the cougar in Louisiana was apparently much the same as that of the white-tailed deer which was its main food source. At the present time there is no way to estimate population totals for the state or any of its ecological divisions, much less a potential edible meat contribution. The species was plentiful enough to have been taken in four of the ecological divisions (see Appendix 2). The average weight of adult cougars in western North America are given as 140-160 pounds for males and 90-110 pounds for females (Russell 1978:209). This equates to an average adult weight of about 125 pounds. Based on the 50 percent edible meat ratio for mammals, an adult cougar would provide approximately 62.5 pounds of meat.

The primary bear habitat in Louisiana was the thick canebrakes of the Mississippi and Atchafalaya Alluvial Plains' hardwood forests. However, the evidence indicates
that bear were found throughout the state in the thicker wooded areas and river bottoms (St. Amant 1959). Black bears were reported as being present or taken in all ecological divisions except for the southwest prairies. As with cougar, there is no data on historic carrying capacity or population density of the bear in Louisiana. Thus, an edible meat contribution cannot be determined. There is also a lack of data on harvest rates for the state. In general, a rule-of-thumb estimate used in management oriented removal for purposes of maintaining a stable population is 1 for every 12 to 18 black bears in the population (Jonkel 1978:248). A weight range for the Louisiana black bear is given as 200-300 pounds (Burts and Carpenter 1980:3). The potential edible portion, thus, would be in the area of 125 pounds at least, depending of course on the season. Stewart and Stahl determined an edible meat portion of 58.9 percent for a rather thin Canadian black bear (1977:268).

It is not likely that either the cougar or the black bear were ever numerous enough to supply a reliable and meaningful amount of edible meat. At best, their contributions should be thought of as lagniappe rather than as a usual food source.

American Woodcock

The woodcock is identified primarily as a woodland or
forest game species. In Louisiana, however, part of its modern wintering range is the same as that of quail. In the Southwest Terrace Lands, for example, both species are confined to the same narrow wooded draws and scrub oak flats which provide their primary sources of food and cover. A similar relationship of shared range may exist also in the Southeast Terrace Lands (St. Amant 1959:177). Whether woodcock and quail are limited to the same range statewide today or were in the past is not clear. It is most likely that this relationship is accidental and limited to the pinelands areas where the only usable habitats would be those noted. Woodcock prefer moist woodland habitats with open grassy meadows and glades for daytime cover and nighttime feeding (Lowery 1974b; Leopold, Gutierrez and Bronson 1981).

The general range of this winter visitor includes the entire state with the exception of the Coastal Marshes. The birds are prevalent in bottomland forests and the wooded stream and creek bottoms of the uplands, although the bulk of the population congregates in the southern part of the state. The woodcock arrive in Louisiana beginning in mid November. Peak populations are present by January, but the birds are usually gone by the middle of February. It is estimated that up to 80 percent of the continental population of woodcock winter in Louisiana (St. Amant 1959;
Burts and Carpenter 1980; LDWF 1987b). However, no population estimates for Louisiana or for North America have been found. Such data were not obtainable from the LDWF office in Baton Rouge (LDWF - personal communication - 1989).

Although woodcock are classed as forest game or an upland game bird, they have responded to changes in land use in a manner similar to quail rather than as have wild turkey. The cutting of virgin forests in Louisiana and the north has increased and improved the original range. And it has withstood heavy hunting pressure over the years without any apparent decline in numbers (Leopold, Gutierrez and Bronson 1981). Recent declines in the woodcock population are the result of loss of breeding grounds and habitat in the northern United States and Canada (LDWF - personal communication - 1989). Due to the lack of any population estimates for woodcock, a process of working backwards from kill data must be employed. The questions is, in part at least, were early population numbers closer to the woodland oriented wild turkey or to the farm game bobwhite quail? Since the turkey population of circa 1800 is estimated to be about three times the size of the quail population, 1,000,000 versus 350,000, the model used will greatly affect projected annual harvest rates.
Traditionally woodcock have not been popular game birds in Louisiana, at least with regard to legal hunting. Data collected in the southwest Louisiana pinelands in the 1950s show that quail hunters reported only 1 woodcock for every 6.2 quail seen. The kill rate was 1.3 woodcock for every 4.66 hours hunted, which would be a harvest rate of about 44 percent. The woodcock kill was only incidental to the quail hunt, and more woodcock would probably have been taken, and possibly seen, if they were specifically hunted. These figures apply only to the legal kill. Illegal night kills are another matter. Reports indicated that in the 1940s and 1950s anywhere from 25 to 100 woodcock might be taken by individual hunters at night (St. Amant 1959). This suggests a much larger population than that indicated by the 6.2:1 quail to woodcock ratio noted by daytime hunters in the southwest pinelands. It also suggests that the original wintering population may have been much more like that of the native wild turkey population than that of quail. A large woodcock population is also suggested by entries in the diary of Isaac Erwin for the winters of 1865-66 and 1866-67. He reported his boys killing 25 to 35 birds in a single night on several occasions (Erwin Diary). On the basis of the potentially large illegal night kills and other factors noted above, an original woodcock population of 1,000,000 birds will be suggested.
The woodcock may not quite fit the criteria of an "r" type species since the hen only lays four eggs. The birds do, however, have a rapid turnover in population due to a high natural mortality rate. Thus, like quail or turkey they could be harvested at a rate suitable to an "r" type species, that is 45 percent of the peak population. This harvest rate would provide an annual take of 450,000 birds. In terms of live weight, the woodcock is approximately the same size as the quail, about 6 ounces (Pough 1951:219). Based on a 50 percent edible meat ratio, each bird would produce 3 ounces of meat, and the annual harvest would provide 84,375 pounds or 42.19 tons.

The population estimate used for woodcock is probably not out of line when we consider that a 45 percent harvest rate produced only 450,000 birds. In comparison the circa 1950 quail population of 1,240,000 birds yielded a bag of only about 200,000 (St. Amant 1959: 207,215), a harvest rate of just over 16 percent. Since it is likely that the actual harvest rate seldom reached the maximum suggested rate, the 1981-82 woodcock harvest of 430,000 birds (LDWF n.d.) may represent a population of 2,000,000 or more birds. In turn the 1985-86 estimated harvest of 263,000 likely represents a substantially smaller population that is decreasing rapidly due to the destruction or serious modification of its northern habitat. As suggested above, the woodcock is an
upland forest or woodland game bird, whose natural virgin range should be substantially larger than that of bobwhite quail and closer in size to that of the wild turkey. Evidence indicates that woodcock populations increased as land use changes improved the bird's range. The population apparently remained stable until the late 1970s at least, but in recent years further land use changes in the bird's northern habitat have seriously reduced the range. Like many species of game, woodcock numbers in the late 1980s may actually be lower than those suggested for the pre-European period.

Farm Game

The term farm game refers to those species that are associated with agricultural land and whose populations and welfare are strongly affected by changes in farming methods and in the use of agricultural lands. The major farm game species are quail, dove, and rabbit.

The majority of the data available on farm game has a primary reference to quail. It is believed, however, that the other farm game species respond to changes in land use and farming methods in much the same way as do quail. The primary factor governing quail production is the carrying capacity of the land. This, in turn, is determined by the types, amounts and distribution of cover. The maximum
sustained carrying capacity of a given range type is reflected in the fall population. The mortality rate of one fall population from predation, hunter kills, and winter losses due to starvation or other causes, has little effect on the population of the following fall. Data show that about 80 percent of the total fall quail population dies each year regardless of hunting pressure. The surviving 20 percent provide a more than adequate base to replace those individuals removed and, in fact, to increase the overall population if the range were to be improved. Population increase can only occur if the carrying capacity of the range is increased. Although quail production may exhibit annual fluctuations caused by various factors impacting breeding conditions, generally any permanent change, either up or down, is reflective of changes in the range (St. Amant 1959; Prickett 1981). This relationship between population and range quality holds true for other farm game species as well.

Because of the close relationship between agricultural lands and farm game species, these animals would not be expected to have high population numbers under pre-European conditions. Quail and dove, for example, were consistently reported to be only occasional or rare by early writers. Both of these birds are seed eaters and early range conditions did not produce large quantities of suitable
foods. Neither of these species hit their peak populations until after 1900 when still crude farming was expanded and when thousands of acres of upland forest were cleared extending their range. Somewhat surprisingly woodcock were reported to have been quite abundant on their wintering range. In general the woodcock is reported to have withstood heavy hunting pressure without apparent population decline. The original range of this species was also improved by the cutting of virgin forests, as was the case for quail and doves (St. Amant 1959: Leopold, Gutierrez and Bronson 1981). The seeming differences in population sizes of these birds in early times may reflect behavior and visibility rather than actual numbers. The annual influx of woodcock may have made the species seem more numerous that it actually was. And quail and dove may have been better at hiding, thus suggesting population densities somewhat lower than they in fact were.

The early situation of the rabbit is not clear. In the early sources it was reported, in all cases, to be abundant and present over the entire state. However, the virgin forests with their relatively clean floors probably did not provide habitats that were as good as those that developed later with increased farming. As with other farm game species, rabbits probably did not achieve peak population levels until early in the twentieth century (St. Amant
Bobwhite Quail

The bobwhite quail currently occurs statewide in Louisiana and likely did so in the past as well. The numbers of course would vary in the different ecological divisions depending on the amount and distribution of cover and food. The original quail range has been estimated to comprise some 9,000,000 acres of prairies, natural meadow, burned areas, and longleaf pine forests (St. Amant 1959:46-47, Fig. 9). None of these would be classed as good quail range today. Thus the estimated original population is low, 350,000 birds (ibid:47, Fig. 10). This equates to a general density of 1 quail per 25.7 acres. Through the nineteenth century, quail and other farm game species increased in numbers due to the widespread development of crude farming which increased and improved the range. Judging from the patterns in Figure 8, the quail population had nearly tripled to approximately 1,000,000 by the 1880s. By the 1909-1910 quail season the population was large enough to allow a total bag of 1,140,750 birds (McIlhenny 1934:192). The rate of increase suggested above is just a guesstimate and will not be used in determining edible meat ratios for this species (St. Amant 1959; Prickett 1981).

Quail, like other small game, are a type "r" species.
They are short lived individuals with high reproductive rates. Breeding activity begins in April and only a single brood is raised each year, although several nesting attempts may be needed to produce that single brood. The normal clutch contains 8 to 12 eggs, 90 percent of which will hatch (Byrd, Olinde and Prickett 1984). Quail live rigorous lives and are subject to high levels of natural mortality. Even in the absence of hunting, the annual mortality rate averages about 80 percent. The 20 percent surviving spring population is able to produce to the maximum carrying capacity of the range by the next fall. Several recent investigations have indicated that the land will produce to its maximum carrying capacity with or without hunting. The hunter only takes some of those animals that would have died anyway. Studies have shown that heavy hunting pressure can reduce 10 bird coveys down to coveys of only 2 or 3 birds within the first few weeks of the hunting season. Yet, populations the following fall would be as high as in previous years (St. Amant 1959; Burts and Carpenter 1980; Prickett 1981; Byrd, Olinde and Prickett 1984).

The 80 percent annual mortality rate does not necessarily mean that 80 percent of the fall population could be safely taken by hunters. Harvest rates of 40 to 50 percent are generally allowed by quail experts (Lowery 1974a; Leopold, Gutierrez and Bronson 1981). For this study
a middle range harvest rate of 45 percent will be used. A total statewide population of 350,000 quail harvested at a 45 percent rate would produce 157,500 birds annually. The average weight of a bobwhite quail is about 6 ounces. If a 50 percent edible meat ratio, equaling 3 ounces, is used, the annual harvest would provide 29,531.25 pounds or 14.77 tons of meat.

It has not been possible to determine the complete distribution of the 9,000,000 acres of virgin quail range, due to a lack of information on the sizes of the many small upland prairies and meadows of the state, as well as the burned areas maintained by the native Indians and early settlers. A compilation of the available acreages of probable pure pine and prairie areas results in a total of 8,033,200 acres. The acreages for the Upper and Lower Mississippi divisions include pure pine stands and second growth pine hardwoods on land once covered by stands of pure pine. The distribution of the range is given in Table 17.

The 2,320,113 acres of quail range in the Northwest uplands would support a population of 90,276.77 quail at a density of 1 bird per 25.7 acres. A 45 percent harvest rate would result in an annual take of 40,624.5 birds. Each bird would produce about 3 ounces of edible meat, for a total of 7617.1 pounds or 3.8 tons. The edible meat production
figures for each ecological division are given in Table 18.

Table 17. Distribution of Virgin Quail Range, in acres.

<table>
<thead>
<tr>
<th>Division</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td>2,320,113</td>
</tr>
<tr>
<td>2. Upper Mississippi</td>
<td>76,346</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td>2,123,924</td>
</tr>
<tr>
<td>4. Lower Mississippi</td>
<td>14,140</td>
</tr>
<tr>
<td>5. Southwest Prairies</td>
<td>1,459,459</td>
</tr>
<tr>
<td>6. Coastal Marshes</td>
<td>0</td>
</tr>
<tr>
<td>7. Southeast Terrace Lands</td>
<td>2,039,218</td>
</tr>
<tr>
<td>Subtotal</td>
<td>8,033,200</td>
</tr>
<tr>
<td>Other: Upland prairie, etc.</td>
<td>966,800</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9,000,000</td>
</tr>
</tbody>
</table>

Table 18. Potential Meat Contribution of Bobwhite Quail for Each Ecological Division, in tons.

<table>
<thead>
<tr>
<th>Division</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northwest Uplands</td>
<td>3.8</td>
</tr>
<tr>
<td>2. Upper Mississippi</td>
<td>0.125</td>
</tr>
<tr>
<td>3. Southwest Terrace Lands</td>
<td>3.49</td>
</tr>
<tr>
<td>4. Lower Mississippi</td>
<td>0.024</td>
</tr>
<tr>
<td>5. Southwest Prairies</td>
<td>2.39</td>
</tr>
<tr>
<td>7. Southeast Terrace Lands</td>
<td>3.35</td>
</tr>
<tr>
<td>966,800 acres of Upland prairie, etc.</td>
<td>1.987</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14.766</td>
</tr>
</tbody>
</table>

It is evident from the small virgin quail population and the small meat return per bird that quail would not have made more than a minimal contribution against the meat deficit of Louisiana in the mid nineteenth century if estimated 1800 population levels are relied on as the only basis for projection. By 1850, however, the effects of an expanding farming economy had resulted in the existence of 1,590,025 acres of improved farm land. In 1860 the amount of improved farm land had increased to 2,707,108 acres (Dodd and Dodd 1973:26). This expansion of agricultural land would
have provided the important large-scale creation of new quail range of excellent quality. Quail densities on unmanaged excellent range have been shown to reach 1 bird to 3 to 5 acres in Louisiana early in the twentieth century (St. Amant 1959). Based on the more conservative 1 bird to 5 acres density, the 1,590,025 acres of improved farm land in 1850 would have supported a population of 454,292.85 quail. Using the 45 percent harvest rate and 3 ounces of edible meat figures, this quail population could have produced 26,831.67 pounds or 13.41 tons of usable meat, which combined with the projected 14.766 tons from the natural range would provide 28.186 tons of quail meat. The 1860 improved farm acreage quail range could have provided, on the same basis, 22.84 tons which added to the natural range output would have increased quail meat production to about 37.6 tons. Considering the size of the meat deficits for 1850 and 1860, these contributions are still negligible.

**Mourning Dove**

The mourning dove is a member of the pigeon family and is related to both the domestic pigeon and the now extinct passenger pigeon. The dove is smaller than either of these, with an average weight of about four ounces. This bird has long been prized as a table delicacy, as is shown by the feasts that followed dove shoots on deep South plantations
in the past. Like many other small animals, particularly farm game species, the mourning dove is an "r" type species. The annual mortality due to natural causes reaches about 90 percent of the annual crop, or 70 percent of the total population. Doves, like quail, cannot be stockpiled by a lack of hunting, and all evidence indicates that legal hunting has no affect on the subsequent fall population (St. Amant 1959; Duffy 1983; LDWF n.d.).

There is a permanent resident dove population in Louisiana that is distributed statewide during the warm part of the year. During late fall and winter the doves of northern Louisiana migrate south. This resident population has its principal nesting period from March through late August. A typical nesting pair will make five or six nesting attempts and generally three of these will be successful. Each nesting attempt will produce only two eggs, and the entire season will result in only five or six young doves each year. During the winter, this resident dove population is augmented by large numbers of migrants from northern states.

Virtually all of the mourning dove's diet is made up of plant seeds and grains. It is thus attracted to certain kinds of agricultural fields, fallow fields, pastures, and some meadows. A favorite wild food is doveweed or goatweed
which used to occur in solid stands on some levees in the
fall. Like other farm game species, dove populations are
closely related to the state of their habitat. Changes in
land use can have a direct impact on dove numbers. The
closest species is apparently somewhat more adaptable than is the
bobwhite quail. While the latter's numbers have declined
since the introduction of clean farming and the appearance
of more scrub vegetation on cut-over pine lands in the late
1920s, dove numbers have increased to a plateau that has
remained fairly steady at 500,000,000 for North America over
the past twenty years. These differences in populations are
despite the fact that the mourning dove's winter range in
Louisiana is approximately the same as that of the quail
(St. Amant 1959; Duffy 1983; LDWF n.d.).

There is no data available on past mourning dove
populations nor on the extent of any original dove range.
The best indication of virgin dove range is the statement by
St. Amant equating the dove's winter range with that of
quail. This would suggest an original range of
approximately 9,000,000 acres distributed in the pattern as
shown for quail range in Table 17 above. Attempts to
suggest possible mourning dove populations in pre-European
times are difficult. With regard to twentieth century
populations, St. Amant said "There is no way to compare
present populations with those of the past" (1959:255). If
that is the case, projecting populations of the early 1800s will be a tenuous process.

There is a little evidence that allows some suggestion of recent dove population sizes in comparison those of bobwhite quail. Studies in the late 1940s indicated an average peak fall quail population of 1,240,000 birds with average densities of 1:8.2 acres on the occupied range of 10,248,149 acres and 1:23.3 acres for the entire state (St. Amant 1959:207). Although there was little dependable statistical data to provide good support, St. Amant stated that the annual kill of quail in Louisiana in the late 1940s and early 1950s was no more than 200,000 birds (1959:215). This represents a harvest rate of just over 16 percent. A 1950 inventory of doves, based on control road counts, suggested a post hunting season spring dove population of about 2,400,000 birds. St. Amant cautioned that the amount of statistical error in these dove counts was so great that the actual population could have been anywhere between 600,000 and 2,500,000 (ibid:254–55). If we use a middle range number, the population of doves would approximate 1,500,000. Unfortunately no data on the likely dove kill of the 1949–1950 hunting season could be located. (The Annual Reports of the Louisiana Wildlife and Fisheries Commission are sorely lacking in this kind of information.) If we employ the same harvest rate as is indicated for quail, 16
percent, a peak dove pre-season population of about 1,800,000 is indicated. If the dove's winter range is basically the same as the quail range, this figure would indicate population densities of 1:5.7 acres of occupied range and 1:16.1 acres for the entire state. This population figure may in fact be low, particularly in the light of recent kill data on quail and doves.

A 1981-82 season small game survey indicated a total legal quail kill of 407,200 (LDWF n.d.). A 1985-86 harvest survey by LDWF indicated that about 400,000 quail and 2,000,000 doves were legally taken (LDWF 1987b:8). If the harvest rates were similar this suggests that the mourning dove population is four to five times as large as that of the bobwhite quail. Since the mourning dove appears to be the more adaptable of the two species, and its resident population is augmented by out-of-state winter visitors, it is reasonably safe to assume that its numbers have always exceeded those of quail. If the occupied range densities for circa 1950 are used as a basis, 1:8.2 for quail and 1:5.7 for doves, a dove density to quail density ration of 1.44:1 is indicated. Then, based on the virgin quail range density of 1:25.7 acres, the density for mourning dove would have been 1:17.8 acres. Thus, the 9,000,000 acre virgin range would support 505,618 doves as compared to 350,000 quail. Since the mourning dove, like quail, is a farm game
and "r" type species, it should be able to sustain the same harvest rate of 45 percent. This would provide an annual statewide take of 227,528 birds. As noted above the average weight of the mourning dove is 4 ounces of which, at an edible meat ratio of 50 percent, 2 ounces would be meat. The annual take would result in 28,441 pounds or 14.22 tons of meat, roughly the same as for quail.

According to the historic record, during the 1800s mourning dove were harvested in only two of the seven ecological divisions. These were the Upper and Lower Mississippi zones, which contained the smallest quail/dove range acreages (see Table 17 above). The 76,346 acres of range in the upper Mississippi zone could have supported 4289.1 doves, of which 1930 could have been harvested. This kill would have provided 241.26 pounds or 0.12 tons of meat. The Lower Mississippi region contained only 14,140 acres of virgin range. It would have supported about 794 doves of which 357.5 could have been harvested. This take would have provided 44.68 pounds or 0.022 tons of meat. The probable contribution of mourning doves to the diet of nineteenth century Louisiana would have been only 0.142 tons of meat annually if no increase in range is considered. As was the case for quail, the opening of much of Louisiana to farming during the 1800s would have significantly increased the usable range for these birds, and their potential
contribution to the annual meat supply.

Such range increases did occur. As noted for quail improved farm acreages of 1,590,025 in 1850 and 2,707,108 in 1860 would have significantly increased the total range of mourning dove as well as provided better range. It is likely that much of this new range would have been in the Upper and Lower Mississippi divisions. This new range would have been of much better quality than the natural range and would have supported a denser dove population. As noted above, the quail density for this improved farm acreage was estimated at 1 bird per 5 acres, and comparative possible densities for quail and dove for circa 1950 had a ratio of 1 quail to 1.44 dove. If such a ratio existed in the past, mourning dove densities on this new range would have been about 1 bird to 3.5 acres.

An analysis based on this density, a 45 percent harvest rate and a 2 ounce per bird edible meat portion suggests an 1850 meat contribution from the farm acreage of 12.78 tons and of 21.75 tons for 1860. If these figures are combined with the natural range output of 0.142 tons from the Upper and Lower Mississippi divisions, total dove meat contributions could have been about 12.9 tons in 1850 and 21.89 tons in 1860, figures which are still negligible in light of the projected meat deficits of those years.
Rabbits

Louisiana has two species of rabbits. The eastern cottontail (*Sylvilagus floridanus alacer*) is virtually statewide in distribution except for the coastal marsh tidal flats. There are two races of the swamp rabbit. *Sylvilagus aquaticus aquaticus* is found across most of the state but is restricted to the wetter woodlands and stream bottomlands. The other race *S. a. littoralis* is confined to a narrow strip along the coast. Unfortunately, the two species are not well differentiated in the literature, which, itself, is not extensive. Because of that, and the fact that there is little differentiation in the historic record the cottontail and the swamper will be treated as a single species.

There is a real lack of information on rabbits in Louisiana. In the words of St. Amant "It is a peculiar fact that the common rabbit so familiar to all has been studied less than most game species" (1959:260). From the earliest records, the rabbit has always been listed as abundant. Its numbers apparently increased as did those of quail and mourning dove as land use changes in farming and timber cutting occurred in the nineteenth and early twentieth centuries. Rabbit numbers were so high that they long resisted any impact from hunting pressure. It was not until the middle of the twentieth century that market hunting was
made illegal and bag and season limits were placed on rabbits (St. Amant 1959).

Like the other farm game species, the rabbit is an "r" type species. Both the cottontail and the swamper are prolific breeders. A doe may have five or six litters per year and produce, on the average, 3-4 surviving young among cottontails and 2-3 among swampers. The potential annual production would be as high as 24 and 18 young for the respective species although only 18 to 15 are actually produced and only 20 percent of these will reach maturity (St. Amant 1959; Burts and Carpenter 1980; Cockerham 1984). Rabbits can suffer from catastrophic population declines. They are particularly susceptible to avian and mammalian predation, as well as weather extremes and diseases such as tularemia. Yet due to their high reproductive potential, these losses can be made up quickly if adequate food and cover is available in the habitat (St. Amant 1959).

The fact that the rabbit is the only game animal to truly range over the entire state, including the cheniers and levees of the marsh and the ridges of even the deepest swamps, led St. Amant to project an excess of 25,000,000 acres of occupied rabbit range at mid twentieth century (1959:262). Considering the fact that the projected rabbit range greatly exceeds that of the other farm game species,
it is likely that crude farming would primarily enhance rabbit range improving it from good to excellent rather than significantly increasing the amount of range. This would allow us to accept the 25,000,000 acre figure as a reasonably accurate estimate of the virgin rabbit range in Louisiana. St. Amant has suggested an average population density on good range of about 1 rabbit per five acres, noting densities as high as 1:1 acre on excellent range and possibly as low as 1:10 acres in some areas (1959:263). A density of 1:5 acres over a 25,000,000 acre range would result in a population of 5,000,000 rabbits as an annual average.

A current harvest rate of about 25 percent has been estimated by the state (LDWF 1987b:7). However, in other parts of the United States, on areas of good range, harvest rates of 55 and 67 percent have been recorded without any harmful affects on the following year’s crop (Allen 1962:129). This would suggest that an actual harvest rate of 45 percent as used for other farm game species might be more accurate in terms of what pressure rabbits could sustain. It should be noted that the 25 percent harvest rate suggested by LWDF is based on a survey of licensed hunters. There is another group, made up of blacks and farmers, who, in the hill parishes particularly, harvest the rabbit exclusively for food. These individuals are not likely to
have been included in hunter surveys (St. Amant 1959).

Based on a harvest rate of 45 percent, a population of 5,000,000 would provide a bag of 2,250,000 rabbits annually. Because there is no differentiation in the records as to what percent of the rabbit population is comprised of cottontails or swampers, a single edible meat weight will be used. Since the swamp rabbit generally outweighs the cottontail by around 50 percent, the total potential meat contribution figure will be an underestimate. According to Schwartz and Schwartz an average cottontail will provide 1.5 pounds of meat (1981:108). The annual harvest, then, would produce 3,375,000 pounds or 1687.5 tons of edible meat.

A major limiting factor on rabbits is the presence or absence of sufficient cover. Although rabbits are reported to range over the entire state, they would most likely be only occasional or rare in those regions that produced a lack of cover. The most likely vegetation pattern to fall into this category would be large stands of pure pine. If these are removed from consideration a total range of 23,445,534 acres is left, distributed as shown in Table 19.
Table 19. Distribution of Virgin Rabbit Range in acres.

1. Northwest Uplands 5,447,338
2. Upper Mississippi... 3,848,069
3. Southwest Terrace Lands 1,526,799
4. Lower Mississippi... 4,024,782
5. Southwest Prairies 2,286,867
6. Coastal Marshes 4,514,299
7. Southeast Terrace Lands 1,797,400
   TOTAL 23,445,534

In the historical record rabbits were reported as being taken only in zones 2, 4, 5, and 7. Therefore, potential meat contributions will be determined only for these divisions. The results are given in Table 20. In those regions where they were taken, rabbits would have made up a reasonably significant portion of the meat deficit noted for mid nineteenth century Louisiana.

Table 20. Potential Meat Contribution of Rabbits, in tons.

2. Upper Mississippi... 259.75
4. Lower Mississippi... 271.67
5. Southwest Prairies 154.36
7. Southeast Terrace Lands 121.33
   TOTAL 807.11

The increase in farming that resulted in the 1,590,025 acres of improved farm land in 1850 and the 2,707,108 acres in 1860 would have directly affected rabbit populations by improving this part of their range from good to excellent. The rabbit densities would have increased to the 1:1 acre figure noted by St. Amant. Because this improved farm acreage likely did not constitute new rabbit range, if its
contributions to rabbit population and potential meat yields are to be determined, it must be subtracted from the existing natural range acreage. Assuming, as was done for quail, that most of this acreage would have been in the Upper and Lower Mississippi divisions, the improved acreages of 1850 and 1860 will be deducted from the total acres represented by the four ecological divisions in which rabbits were harvested, and the meat yields from these reduced ranges will be refigured. The projected meat yields from the improved farm acreage will then be added to determine the potential meat contributions of rabbits for 1850 and 1860.

Divisions 2, 4, 5, and 7 represent a total of 11,957,118 acres of good range. Deducting the 1,590,025 acres of improved farm land in 1850 reduces the natural range to 10,367,093 acres. At 1 rabbit per 5 acres this range would support 2,073,418.6 rabbits. A 45 percent harvest would yield 933,038.37 animals which would provide 1,399,557.5 pounds or 699.78 tons of meat at the rate of 1.5 pounds of meat per rabbit. The 1,590,025 acres of improved land would support, at a 1:1 density, that number of rabbits. The projected meat yield for this population would be 536.63 tons. The total potential meat contribution of rabbits in 1850 would have been 1236.41 tons. In 1860 the natural range of the four divisions would have been reduced
to 9,250,010 acres of good range augmented by 2,707,108 acres of excellent range. The total potential rabbit contribution for this year would have been 1538.03 tons. This would significantly increase the amount of rabbit meat available over that provided by the natural range alone.

**Other Game Birds**

This group of potential food sources includes four species of game birds still hunted in Louisiana: rails, gallinule, coot, and snipe. Most of these, including the clapper rails, are residents of southern Louisiana. The king rail is found statewide. Harvest records do not differentiate the various species of rails or the two species of gallinule. There is no data upon which good range acreages can be based, and it is most likely that any changes in range size or quality have been detrimental rather than beneficial in terms of the present day versus the 1800s. In addition, the harvest records are not extensive. Early twentieth century data are available for snipe and coot. According to a report from the Fish and Game Commission of the State of Louisiana, during the 1909-10 hunting season 280,740 American coot and 606,635 snipe were shot (McIlhenny 1934:192). According to personnel at the Louisiana Department of Wildlife and Fisheries in Baton Rouge, the oldest harvest records for rail and
gallinule are from the 1981-82 season (LDWF — personal communication — 1989). Statewide harvest estimates for the 1981-82 season list 46,400 rails and 74,100 gallinule killed (LDWF 1982; Marte 1984).

Table 21. Other Game Birds Live and Edible Meat Weights.

<table>
<thead>
<tr>
<th>Species</th>
<th>Live wt. (lbs.)</th>
<th>50% ratio Edible meat wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snipe</td>
<td>0.25</td>
<td>0.125</td>
</tr>
<tr>
<td>American coot</td>
<td>1.25</td>
<td>0.625</td>
</tr>
<tr>
<td>Gallinule</td>
<td>0.875</td>
<td>0.4375</td>
</tr>
<tr>
<td>Rail</td>
<td>0.75</td>
<td>0.375</td>
</tr>
</tbody>
</table>

(Live weights taken from Pough 1951.)

Table 22. Potential Meat Contributions of Other Game Birds, in tons.

<table>
<thead>
<tr>
<th>Harvest</th>
<th>Total wt.</th>
<th>Poten. Cons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snipe</td>
<td>606,635</td>
<td>75.83</td>
</tr>
<tr>
<td>American coot</td>
<td>280,740</td>
<td>175.46</td>
</tr>
<tr>
<td>Gallinule</td>
<td>74,100</td>
<td>32.42</td>
</tr>
<tr>
<td>Rail</td>
<td>46,400</td>
<td>17.40</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assuming that these kill data represent harvest rates equal to or lower than sustained yield rates, they can be used as conservative estimates for the potential annual take during the nineteenth century. None of these birds is particularly large and the estimated harvests are not particularly great with the exception of snipe, which happens to be the smallest of the species. The live and
edible meat weights for these species are given in Table 21, and the results of the analysis for meat contributions are presented in Table 22.

**Furbearers**

Although furbearing animals are generally taken for their pelts, there is ample evidence that some, such as the opossum and raccoon, were also taken as food animals. The raccoon was also killed as a result of the damage it caused to domestic crops, but it is likely that most of these were eaten as well. There is no historical evidence that other small furbearers, such as muskrat, otter, or mink, were eaten in Louisiana. Both the raccoon and the opossum had statewide distributions and were generally abundant across their ranges. Both were taken in all ecological divisions except for the Coastal Marshes. It is not possible, unfortunately, to estimate current statewide populations of these species, much less past population numbers (St. Amant 1959).

With regard to the annual furbearer take, there are problems. Even fur harvest records can be misleading in terms of the number of animals killed. For example, during the 1970-71 fur season 3,563 opossum pelts were sold, along with 40,000 pounds of meat. If we were to assume that meat came only from the animals whose pelts were sold, the
average amount of meat provided by each opossum would have equaled 11.23 pounds. This from a species with an average adult weight of about 6 pounds (Lowery 1974a; Rue 1981). If we use the 50 percent edible meat weight ratio used for other mammals discussed above, the sale of 40,000 pounds of opossum meat would require the taking of about 13,333 animals. And this poundage sold figure likely does not include meat consumed by the trapper or hunter or sold privately to individuals (Ensminger and Linscombe 1980).

The fur records can be misleading also, if recent pelt harvest data are used to represent a percentage of the total population. According to St. Amant, the demand for raccoon and opossum pelts was negligible after 1930 (1959:317-18). Although the market seems to have improved slightly over the past few years, the number of pelts sold, about 200,000 raccoon and 36,000 opossum, based on a ten year average from 1976-77 through 1985-86 (LDWF 1987b:25), does not compare with the average sales for the period 1913-14 through 1929-30 of 280,298 raccoon and 230,670 opossum (Lowery 1974a:34-45, Table 2; St. Amant 1959:304-8, Table 75).

Lacking any basis for estimating statewide populations of these species precludes any determination of densities or carrying capacities. It becomes impossible to suggest edible meat contributions on any but a statewide level. In
determining the statewide potential meat contributions of these species, the average fur harvest figures for the fifteen seasons from 1913-14 through 1929-30, for which there is data, will be used. They will provide a conservative estimate of the potential annual harvest rates that the two species could sustain.

Average adult weights for raccoons range from about 8 pounds (Ensminger and Linscombe 1980:33) to 18 pounds (Rue 1981:84). The average of this range is 13 pounds, which, at an edible meat ratio of 50 percent, would provide 6.5 pounds of meat. An annual harvest of 280,298 raccoons would produce 1,821,937 pounds or 910.97 tons of usable meat. As noted above, the average weight of an adult opossum is about 6 pounds, the range is 5 to 7 pounds. At a 50 percent edible meat ratio, a 6 pound opossum would provide 3 pounds of meat. The annual harvest of 230,670 animals would thus provide 692,010 pounds or 346 tons of edible meat. In combination these species could have made a significant contribution toward erasing the meat deficit of mid nineteenth century Louisiana.

Waterfowl

Throughout the nineteenth century Louisiana provided perhaps the best waterfowl wintering range in North America. Waterfowl wintering in Louisiana on a regular basis included
four species of geese and twenty-nine species of ducks. Of these, the historical record documents the taking of three species of geese and at least fourteen species of ducks (see Appendix 1). Four of the ducks, the mottled duck, blue-winged teal, wood duck, and hooded merganser are known to breed in Louisiana (St. Amant 1959).

In general, migratory waterfowl begin entering Louisiana in August. By November all species are present. The first appearance is made by the blue-winged teal while the canvasbacks are among the last to arrive. The geese usually arrive in October. In normal years waterfowl are primarily transients through north and central Louisiana. It has been estimated that up to 90 percent of all the migratory waterfowl spend some time in the Coastal Marsh division. Because of the migratory pattern of winter residence of ducks and geese and the fact that waterfowl range is highly localized in the northern and central parts of the state, no attempt will be made to delimit waterfowl range for each ecological division. Identification of specific range locales is complicated by the increase in the number of man-made impoundments throughout the state. Also, the extent of waterfowl range in any given region can vary greatly from year to year. In north Louisiana, for example, range can vary from a low of 200,000 acres in dry years to as much as 1,000,000 acres during episodes of high water.
(St. Amant 1959:274).

The wintering waterfowl population of Louisiana has numbered from six to eight million in recent years. Of these, up to 550,000 are geese, primarily snows (Burts and Carpenter 1980; Harris 1987). Due to decreases in the extent and quality of northern breeding grounds, and other land use changes, these population estimates are undoubtedly lower than were the actual numbers of waterfowl throughout the nineteenth century. It appears that waterfowl were able to withstand extreme hunting pressure through most of the 1800s and early 1900s. Prior to 1912 there were no bag limits, no closed seasons, and no restrictions on the sale of game, with rare exceptions (McIlhenny 1934). As early as 1857, however, Act No. 100 of the Louisiana State Legislature set penalties for hunting waterfowl and snipe in St. Bernard Parish outside the allowed hours of 6:00 A.M. to 2:00 P.M. (State of Louisiana 1857). Whether this action was aimed at limiting the harvest or had some other purpose is unknown, as there appear to be no records of any debate or discussion of the topic. Market hunting, on the other hand, was not outlawed until around 1920, and the limited records indicate that the kill had been fairly stable for some years (St. Amant 1959).

The earliest record of waterfowl kill data comes from
the Fish and Game Commission of the State of Louisiana
report on the 1909-10 season which listed 3,176,000 ducks
and 202,210 geese killed. Market hunting was so extensive
that "In December 1912, the daily papers of New Orleans
commented on the fact that the markets were so glutted with
wild ducks...that many were spoiling in dealers hands and
ducks could be bought at the rate of six for one dollar"
(McIlhenny 1934:192). Since these figures represent a period
when waterfowl populations were apparently stable, they will
be used as annual harvest rate estimates for determining the
potential meat contributions of these species.

Because the 1909-10 kill figures for waterfowl are not
given by species, it is not possible to determine edible
meat contributions at anything other than the goose and duck
levels. To obtain edible meat figures for these groups, the
live body weights and 50 percent edible meat portions of the
species reported taken in the state were determined (Pough
1951; Smith 1973). The edible meat portions of each group
were totaled and then averaged to produce a single figure
for geese and another for ducks. These figures are 3.29
pounds for geese and 0.948 pounds for ducks. The data are
shown in Table 23. While these averages may not be accurate
projections for each year, which would depend upon the
number of each species taken, it is hoped that it
approximates a reasonably accurate figure for a 100 year
average. There is, unfortunately, no way to weight the values for each species.

Table 23. Waterfowl Average Live and Edible Meat Weights.

<table>
<thead>
<tr>
<th>Species</th>
<th>Live wt. (in lbs)</th>
<th>Meat wt. (in lbs)</th>
<th>Group Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada goose</td>
<td>8.25</td>
<td>4.125</td>
<td></td>
</tr>
<tr>
<td>Snow goose</td>
<td>6.00</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>White fronted goose</td>
<td>5.50</td>
<td>2.75</td>
<td>3.29</td>
</tr>
<tr>
<td>Mallard</td>
<td>2.50</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Mottled duck</td>
<td>2.50</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Blackduck</td>
<td>2.75</td>
<td>1.375</td>
<td></td>
</tr>
<tr>
<td>Gadwall</td>
<td>2.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Northern pintail</td>
<td>2.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Green-winged teal</td>
<td>0.75</td>
<td>0.375</td>
<td></td>
</tr>
<tr>
<td>Blue-winged teal</td>
<td>0.875</td>
<td>0.437</td>
<td></td>
</tr>
<tr>
<td>Northern shoveler</td>
<td>1.33</td>
<td>0.665</td>
<td></td>
</tr>
<tr>
<td>American wigeon</td>
<td>1.75</td>
<td>0.875</td>
<td></td>
</tr>
<tr>
<td>Wood duck</td>
<td>1.5</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>Canvasback</td>
<td>3.0</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Lesser scaup</td>
<td>1.75</td>
<td>0.875</td>
<td></td>
</tr>
<tr>
<td>Redhead</td>
<td>2.50</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Hooded merganser</td>
<td>1.25</td>
<td>0.675</td>
<td>0.948</td>
</tr>
</tbody>
</table>

Based on these average edible meat portions the projected kill of 3,176,000 ducks would produce 3,010,848 pounds or 1505.424 tons of meat, while the potential contribution of geese would be 665,270.9 pounds or 332.635 tons. The total potential contribution of waterfowl towards filling the mid nineteenth century meat deficit would have been about 1838 tons.
The Rest of the Story: Reptiles, Amphibians, Crustaceans, Oysters, and Fishes

Unfortunately, no nineteenth century data on the harvest rates, densities, populations, and so on of turtles, alligators, and frogs could be located. While all of these were eaten to some extent, they most probably did not make up a significant portion of anyone's food intake. It should be noted, however, that by the early 1930s the harvesting of frogs and turtles had become important elements of the fishery industry. In 1934 over 1,800,000 frogs and 142,000 turtles were harvested. Most of the harvest was for export, but substantial numbers of both groups were likely consumed in Louisiana (Dauenhauer 1934:165). These figures do not provide enough data from which to project state consumption levels, however. We can only assume that potential contributions to the diet of the period would have been rather minimal.

Crustaceans

The earliest date in references to crustacean harvests is 1880. This appears to be the first year in which the federal government began to collect such data, and about the last year before the beginnings of intensive commercial seafood extraction in Louisiana. Because there are no earlier data,
the figures for 1880 will be used as the basis for determining potential meat contributions for these species. It should be noted that these figures would not include the private or sport harvesting of crustaceans for home consumption. Rather, they reflect the beginnings or early stages of commercial activities. The recorded 1880 harvest figures are given in Table 24. While marine shrimp catch data are available for 1880, the same is not true for freshwater river shrimp. The earliest data found on this species is from 1932 when 2,063,450 pounds were caught (Dauenhauer 1934:165).

Table 24. Crustacean Harvest Figures for 1880, in lbs.

<table>
<thead>
<tr>
<th>Crustacean</th>
<th>Harvest Figures (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine shrimp</td>
<td>534,000</td>
</tr>
<tr>
<td>Crawfish</td>
<td>10,000</td>
</tr>
<tr>
<td>Blue Crab</td>
<td>288,000</td>
</tr>
<tr>
<td>(source: Rathburn 1889:810).</td>
<td></td>
</tr>
</tbody>
</table>

These harvest figures refer to complete individuals rather than to the amount of meat (U.S. Bureau of the Census 1975:549), therefore, edible meat ratios or portions must be determined if potential meat contributions are to be derived from the data. According to the Seafood Specialist at the Louisiana Cooperative Extension Service office in Cameron, LA, general meat yield figures for these species are: shrimp, 50-60 percent; crawfish, 15-20 percent; and crab, 12-15 percent (Paul Coreil - personal communication - Sept. 19, 1989). The range for each species is relative to the
size of the specimen and the season of the catch. An average of the range for each species will be used to determine potential meat contributions. The results are presented in Table 25. It should be noted that while marine shrimp harvest data are available for 1880, the same is not true for freshwater shrimp. The earliest data on this species is from 1932 when 2,063,450 pounds were caught (Dauenhauer 1934:165).

Table 25. Potential Meat Contributions of Crustaceans, in tons.

<table>
<thead>
<tr>
<th>Catch</th>
<th>Weight</th>
<th>Meat Yield %</th>
<th>Potential Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrimp</td>
<td>276</td>
<td>55.0</td>
<td>151.80</td>
</tr>
<tr>
<td>Crawfish</td>
<td>5</td>
<td>17.5</td>
<td>0.875</td>
</tr>
<tr>
<td>Blue crab</td>
<td>144</td>
<td>13.5</td>
<td>19.44</td>
</tr>
<tr>
<td>TOTAL</td>
<td>172.115</td>
<td></td>
<td>172.115</td>
</tr>
</tbody>
</table>

**Oysters**

The earliest and lowest recorded oyster harvest was 1,189,000 pounds of meat in 1880 (LDWF 1987b). One earlier reference refers to the shipping of about 4,000 barrels of oysters to New Orleans from Plaquemines Parish every week during the 1847 season (Payne 1847:305). Unfortunately, there is no mention of the pounds of oysters or oyster meat per barrel or the length of the season. From its beginnings in the nineteenth century the commercial oyster fishery was an extractive industry, and data indicate that since 1880
the annual harvest has generally increased each year with some fluctuations to 12,700,000 pounds of meat in 1986 (LDWF 1987b). This suggests that the 1880 harvest level did not put undue pressure on this resource and, thus, could have been maintained indefinitely. On the basis of this supposition, the 1880 harvest figure will be used as the potential meat contribution level for the middle third of the nineteenth century. This would equal the production of 594.5 tons of meat. This figure, it must be noted, does not include any private oyster harvesting, which might have increased it to an unknown extent.

Fishes

The earliest record of Louisiana's fish production, like those for crustaceans and oysters, comes from 1880. In that year a commercial catch of 6,996,000 pounds was recorded (U.S. Department of Commerce 1940:723, Table 726). Unfortunately, the source does not specify if this figure refers to saltwater fish alone, or if it includes fresh water fish and, perhaps, oysters and crustaceans. Table 726 in the Statistical Abstract of the United States 1939 (USDC 1940:723) does include a section for the Mississippi River and its tributaries including the Red, Atchafalaya, and Ohio Rivers among others. This suggests that the data for Louisiana refers only to marine species. However, according
to the U. S. Bureau of the Census "All general references to fish include fish, shellfish, and other marine or freshwater products" (1975:549). It is probably safest to assume that the nearly 7 million pounds of fish listed for 1880 included all commercial fresh and salt water fish, as well as oyster, crabs, crawfish, and all species of shrimp. If the total weights of those species already discussed above are subtracted from the overall total, we are left with a commercial fishery catch of 4,975,000 pounds, which should include any commercial river shrimp harvest. Not all of this would have been edible meat. Based on allometric scaling techniques, an estimated 80 percent of the total body mass of fish is edible. The application of that figure to the total fish catch results in the availability of 3,980,000 pounds or 1990 tons of meat.

It is important to reiterate that the figures available for fishery production are underestimates of the total catch for a number of reasons. First, these data do not include catches that were not of a commercial nature, i.e., sportsfishing activities. There is no way of telling how large this take would have been, but considering the number of times fishing parties are mentioned in the historical and archival literature, it likely would have been substantial. Second, it is very likely that the actual amounts of the commercial catches were underreported in an attempt to avoid
paying or to pay lower taxes. Such practices go on today in Louisiana according to persons associated with the fishery products industries (Anonymous - personal communication - Sept. 17, 1989). The data available do allow, however an estimate of the potential contributions of fishery resources to the nineteenth century diet.


<table>
<thead>
<tr>
<th>Species</th>
<th>1840</th>
<th>1850</th>
<th>1860</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-tailed deer</td>
<td>3028.51</td>
<td>3028.51</td>
<td>3028.51</td>
</tr>
<tr>
<td>Fish</td>
<td>1990.00</td>
<td>1990.00</td>
<td>1990.00</td>
</tr>
<tr>
<td>Rabbits</td>
<td>807.11</td>
<td>1236.41</td>
<td>1538.03</td>
</tr>
<tr>
<td>Duck</td>
<td>1505.424</td>
<td>1505.424</td>
<td>1505.424</td>
</tr>
<tr>
<td>Squirrel</td>
<td>1455.11</td>
<td>1455.11</td>
<td>1455.11</td>
</tr>
<tr>
<td>Wild turkey</td>
<td>1451.87</td>
<td>1451.87</td>
<td>1451.87</td>
</tr>
<tr>
<td>Raccoon</td>
<td>910.97</td>
<td>910.97</td>
<td>910.97</td>
</tr>
<tr>
<td>Oyster</td>
<td>594.50</td>
<td>594.50</td>
<td>594.50</td>
</tr>
<tr>
<td>Opossum</td>
<td>346.00</td>
<td>346.00</td>
<td>346.00</td>
</tr>
<tr>
<td>Goose</td>
<td>332.635</td>
<td>332.635</td>
<td>332.635</td>
</tr>
<tr>
<td>Marine shrimp</td>
<td>151.80</td>
<td>151.80</td>
<td>151.80</td>
</tr>
<tr>
<td>American coot</td>
<td>87.73</td>
<td>87.73</td>
<td>87.73</td>
</tr>
<tr>
<td>American woodcock</td>
<td>42.19</td>
<td>42.19</td>
<td>42.19</td>
</tr>
<tr>
<td>Snipe</td>
<td>37.915</td>
<td>37.915</td>
<td>37.915</td>
</tr>
<tr>
<td>Bobwhite quail</td>
<td>14.76</td>
<td>28.186</td>
<td>37.60</td>
</tr>
<tr>
<td>Mourning dove</td>
<td>0.142</td>
<td>12.90</td>
<td>21.69</td>
</tr>
<tr>
<td>Blue crab</td>
<td>19.44</td>
<td>19.44</td>
<td>19.44</td>
</tr>
<tr>
<td>Gallinule</td>
<td>16.21</td>
<td>16.21</td>
<td>16.21</td>
</tr>
<tr>
<td>Rail</td>
<td>8.70</td>
<td>8.70</td>
<td>8.70</td>
</tr>
<tr>
<td>Crawfish</td>
<td>0.875</td>
<td>0.875</td>
<td>0.875</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12801.897</td>
<td>13257.375</td>
<td>13576.399</td>
</tr>
</tbody>
</table>

The total of the combined potential meat contributions of all of the species and groups analyzed is given in Table 26, in descending order of importance for census year 1860. It should not be assumed that these figures are presented as the results of actual harvests for every year of the nineteenth century, or even for 1850 and 1860. They are
simply projections of the amount of meat that could be obtained from what are considered, in most cases, to be sustained yield harvest rates for the species listed.
CHAPTER 10: CONCLUSION

The primary hypothesis examined by the foregoing analysis was that the meat deficits sustained by Louisiana in the middle third of the nineteenth century could have been made up in part by a reliance on the wild game and fishery resources of the state. This proposal was based on four factors: (1) the recognition of the importance of hunting and fishing as food sources in the frontier and pioneer periods as shown in Hilliard (1972); (2) the fact that in parts of Louisiana the frontier/pioneer period lasted until near the end of the nineteenth century if not into the early years of the twentieth; (3) evidence from present day Louisiana which clearly indicates that the importance of hunting and fishing activities has, in fact, not diminished over time; and (4) the emphasis by Shingleton (1972) on hunting as a continuing important food procurement practice in the South through the antebellum period at least.

To set the stage for testing this hypothesis, a variety of background information was presented. This began with a fairly detailed description of the physical setting and ecological divisions of Louisiana. Arguments concerning the question of foodstuff self-sufficiency for the South as a whole and for Louisiana in particular were then examined.
This discussion illustrated the fact that parts of Louisiana were clearly in a deficit position with regard to domestic meat production for the census years 1840, 1850 and 1860. The traditional idea of the need for imports from the Upper South or midwest was noted and the suggestion made that a substantial part of the meat deficit could have been filled by a reliance on wild game and fishery resources. To help support this suggestion it was necessary to show that Louisiana, like the rest of the South, had a long tradition of hunting and fishing among all segments of the state's population.

Because the nineteenth century was a major period of growth for Louisiana, the effects of human activities on wild game were discussed. The expansion of agriculture throughout the century and the tremendous amount of logging that occurred during the last two decades of the 1800s had direct impacts on the numbers and distributions of some game animals. A basic assumption made going into this study was that not all species of wildlife in Louisiana were hunted or taken. Close examination of archival and other records provided a somewhat surprisingly long list of species that were taken. The current and or past distributions and levels of abundance of these species were presented, if such data were available. And the hunting or taking of these species was documented for each ecological division of the
state. The final substantive chapter analyzed the potential meat contributions of those species for which the necessary data were available. The estimates of population densities, harvest rates, and edible meat ratios were generally conservative.

The final figures presented in Table 26 clearly indicate that substantial portions of the mid nineteenth century meat deficit could have been made up from a reliance on wild game and fishery resources. If Hilliard’s deficit figures are used (see Table 2), hunting and fishing could have easily overcome the total deficits for 1840 and 1850 and made up over 64 percent of the 1860 deficit. Based on the deficit projections of Hutchinson and Williamson (1971), wild game fishery resources could have reduced the 1840 deficit by nearly 75 percent, the 1850 deficit by over 58 percent, and the 1860 deficit by nearly 40 percent. There can be no doubt that hunting and fishing remained important subsistence activities through the nineteenth century in Louisiana.

There are a few more observations that can be drawn from the data collected for this study. In a recent report on urban/rural contrasts in vertebrate fauna occurrence at sites on the southern Atlantic Coastal Plain, Reitz stated "urban diets may have included fewer wild mammals than did
rural diets. Not only do urban assemblages have fewer wild individuals, but they also have fewer wild species" (1986a:54). She also reported that town dwellers consumed fewer species of wild birds, turtles, and fish than did rural folk, and that no alligator remains were recovered from the urban sites (ibid:54-55). An examination of the tables in Chapter 8 of this work, clearly shows that the two ecological divisions listing the greatest diversity of species were 2 and 4. The latter division includes New Orleans and a large number of the species listed were noted in the markets of the city by various observers. These include a great variety of birds, fish, and turtles as well as alligator. While division 2 is predominantly rural many, if not most, of the species listed in Table 5 were reported taken by William Johnson, who lived in Natchez. It appears then, that, based on the documentary and archaeological record (for division 4), in Louisiana urban dwellers had access to and consumed a greater variety of wild game and fishery resources than did the people of the rural countryside.

A somewhat surprising result was the fact that the ubiquitous rabbit was reported taken in only four ecological divisions. This is most likely an artifact of the historic record since wildlife personnel reported in the 1950s that many blacks and farmers in the hill parishes harvested the
rabbit for food (St. Amant 1959). This should include the parishes of ecological division 1, from which there were no reports of rabbit harvesting. We would expect that during the postwar period at least, if not in antebellum times to judge from the comments of Solomon Northup, that black tenants and sharecroppers, as well as small white farmers, in this area would have used rabbit as a likely reliable food source.

A major difference in regional variation of fishery resource use is, as might be expected, the distribution of the reports of saltwater fish being taken. They are reported only from divisions 4, 6 and 7, with the exception of Spanish mackerel which was shipped up river in barrels to St. John R. Liddell’s plantation, Llanada, on Black River. Several other sets of plantation records included reference to shipments of barrels or kits of Spanish mackerel, all in divisions 4 and 7 (Weeks Papers; Randolph Papers; Bringier Papers; Stirling Papers). A similar pattern of limited harvesting hold true for crustaceans as well. With the exception of crawfish, all other crustaceans are reported only from divisions 4 and 7. Crawfish were also taken in division 2.

This was not intended to be a comparative work. Thus it is not certain if the results have any applicability
outside of Louisiana. The results do suggest that hunting and fishing may have remained important subsistence activities throughout the South during both the antebellum and postwar periods. With the exception of Louisiana only one other area of the antebellum South showed a meat deficit during the middle third of the nineteenth century, coastal South Carolina (Hilliard 1972). It is beyond the scope of this report to speculate about potential wild game and fishery resource meat contributions in that or any area outside of Louisiana. However, the value of these resources to the Louisiana diet suggest that similar contributions may have been made to the diet of South Carolina by the resources available there. It is at least likely that hunting and fishing contributed significant amounts of food to the diets of regions bordering Louisiana. Evidence indicates that the practices discussed here were not bound by political boundaries.
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*West Baton Rouge Sugar Planter*, June 2, 1860.


### APPENDIX I:
Wildgame and Fishery Resources Taken

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
</tr>
<tr>
<td>White tailed deer</td>
<td><em>Odocoileus virginianus</em></td>
</tr>
<tr>
<td>Bison</td>
<td><em>Bison bison</em></td>
</tr>
<tr>
<td>Black bear</td>
<td><em>Ursus americanus</em></td>
</tr>
<tr>
<td>Northern raccoon</td>
<td><em>Procyon lotor</em></td>
</tr>
<tr>
<td>Fox squirrel</td>
<td><em>Sciurus niger</em></td>
</tr>
<tr>
<td>Grey squirrel</td>
<td><em>Sciurus carolinensis</em></td>
</tr>
<tr>
<td>Squirrel</td>
<td><em>Sciurus spp.</em></td>
</tr>
<tr>
<td>Swamp rabbit</td>
<td><em>Sylvilagus aquaticus</em></td>
</tr>
<tr>
<td>Eastern cottontail</td>
<td><em>Sylvilagus floridanus</em></td>
</tr>
<tr>
<td>Rabbit</td>
<td><em>Sylvilagus spp.</em></td>
</tr>
<tr>
<td>Opossum</td>
<td><em>Didelphis virginiana</em></td>
</tr>
<tr>
<td>Panther</td>
<td><em>Felis concolor</em></td>
</tr>
<tr>
<td>Bobcat</td>
<td><em>Lynx rufus</em></td>
</tr>
<tr>
<td>Muskrat</td>
<td><em>Ondatra zibethicus</em></td>
</tr>
<tr>
<td>Nearctic river otter</td>
<td><em>Lutra canadensis</em></td>
</tr>
<tr>
<td>Feral hog</td>
<td><em>Sus scrofa</em></td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
</tr>
<tr>
<td>Canada goose</td>
<td><em>Branta canadensis</em></td>
</tr>
<tr>
<td>Snow goose</td>
<td><em>Chen caerulescens</em></td>
</tr>
<tr>
<td>White fronted goose</td>
<td><em>Anser albifrons</em></td>
</tr>
<tr>
<td>Goose/brant</td>
<td>Fam. Anatidae; <em>Anser spp.</em></td>
</tr>
<tr>
<td>Mallard</td>
<td><em>Anas platyrhynchos</em></td>
</tr>
<tr>
<td>Mottled duck</td>
<td><em>Anas fulvigula</em></td>
</tr>
<tr>
<td>Blackduck</td>
<td><em>Anas rubripes</em></td>
</tr>
<tr>
<td>Gadwall</td>
<td><em>Anas strepera</em></td>
</tr>
<tr>
<td>Northern pintail</td>
<td><em>Anas acuta</em></td>
</tr>
<tr>
<td>Green-winged teal</td>
<td><em>Anas crecca</em></td>
</tr>
<tr>
<td>Blue-winged teal</td>
<td><em>Anas discors</em></td>
</tr>
<tr>
<td>Northern shoveler</td>
<td><em>Anas clypeata</em></td>
</tr>
<tr>
<td>American wigeon</td>
<td><em>Anas americana</em></td>
</tr>
<tr>
<td>Wood duck</td>
<td><em>Aix sponsa</em></td>
</tr>
<tr>
<td>Canvasback duck</td>
<td><em>Aythya valisineria</em></td>
</tr>
<tr>
<td>Lesser scaup</td>
<td><em>Aythya affinis</em></td>
</tr>
<tr>
<td>Redhead duck</td>
<td><em>Aythya americana</em></td>
</tr>
<tr>
<td>Diving duck</td>
<td><em>Aythya spp.</em></td>
</tr>
</tbody>
</table>
Hooded merganser
Duck
Teal
Loon
Pied-billed grebe
Pelican
Double-crested cormorant
Great blue heron
Little blue heron
Great egret
Snowy egret
Egret (crane)
Black-crowned night heron
Yellow-crowned night heron
Heron
American bittern
Wood stork
Roseate spoonbill
Prairie chicken
Bobwhite quail
Wild turkey
Whooping crane
Sandhill crane
Crane
Rail (King or Clapper)
Common gallinule
American coot
American golden plover
Plover
Kildeer
Marbled godwit
Eskimo curlew
Upland sandpiper
Yellow leg
Willet
Spotted sandpiper
American woodcock
Common snipe
Sandpiper
Domestic pigeon
Pigeon
Mourning dove
Barred owl
Kingfisher
Common flicker
Pileated woodpecker
Ivory-billed woodpecker
Red bellied woodpecker
Woodpecker
Sapsucker
Lark

Lophodytes cucullatus
Fam. Anatidae
Anas spp.
Gavia spp.
Podilymbus podiceps
Pelecanus spp.
Phalacrocorax auritus
Ardea herodias
Florida caerulea
Casmerodius albus
Egretta thula
Fam. Ardeidae
Nycticorax nycticorax
Nyctanassa violacea
Fam. Ardeidae
Botaurus lentiginosus
Nycticorax americana
Ajaia ajaja
Tympanuchus cupido
Colinus virginianus
Meleagris gallopavo
Bras americana
Bras canadensis
Fam. Bruidae
Rallus spp.
Gallinula chloropus
Fulica americana
Pluvialis dominica
Fam. Charadriidae
Charadrius vociferus
Limosa fedoa
Numenius borealis
Bartramia longicauda
Tringa spp.
Caloptrophorus semipalmatus
Actitis macularia
Philohela minor
Capella gallinago
Fam. Scolopacidae
Columbia livia
Fam. Columbidae
Zenaida macroura
Strix varia
Megaceryle alcyon
Colaptes auratus
Dryocopus pileatus
Campephilus principalis
Centurina carolinus
Fam. Pilidae
Sphyrapicus varius
Order Passeriformes
### Perching birds

- Swallow
- Blue jay
- Common crow
- Tufted titmouse
- Robin
- Thrush
- Bluebird
- Cedar waxwing
- Vireos
- Cerulean warbler
- Bobolink
- Red-winged black bird
- Black bird
- Common grackle
- Cardinal
- Goldfinch
- Rufous-sided towhee
- Sparrow
- Bacbon

**Order Passeriformes**

**Fam. Hirundinidae**
- *Cyanocitta cristata*
- *Corvus brachyrhynchos*
- *Parus bicolor*
- *Turdus migratorius*

**Fam. Turdidae**
- *Sialia sialis*

**Fam. Vireo spp.**
- *Dendroica cerulea*
- *Dolichonyx oryzivorus*
- *Agelaius phoeniceus*
- *Euphagus spp.*
- *Quiscalus quiscula*
- *Cardinalis cardinalis*
- *Spinus tristis*
- *Pipilo erythrophthalmus*

**Fam. Fringillidae**

### Saltwater Fish

- Florida pampano
- Jack
- Redfish (red drum)
- Black drum
- Drum
- Atlantic croaker
- Speckled seatrout
- Sheepshead
- Mullet
- Grouper (Black jewfish)
- Southern flounder
- Flounder
- Red snapper
- Spanish mackerel
- Sea catfish
- Bluefish
- Stingray

**Trachinotus carolinus**
**Fam. Carangidae**
- *Sciaenops ocellata*
- *Pogonias croisi*
- *Fam. Sciaenidae*
- *Micropogon undulatus*
- *Cynoscion nebulosus*
- *Archosargus probatocephalus*
- *Mugil spp.*
- *Epinephelus nigritus*
- *Paralichthys lethostigma*
- *Fam. (Bothidae)*
- *Lutjanus campechanus*
- *Scomberomorus maculatus*
- *Arius felis*
- *Pomatomus saltatrix*
- *Dasyatis spp.*

### Freshwater Fish

- White bass (barfish)
- Largemouth bass
- Rock bass
- Gaspergou
- Pickerel
- Paddlefish

**Morone chrysops**
**Micropterus salmoides**
**Ambloplites rupestris**
**Apidinotus grunniens**
**Esox spp.**
**Polydon spathula**
Gar
Blue catfish
Channel catfish
Yellow (flathead) catfish
Bullhead catfish
Paddlefish
Catfish
Smallmouth buffalo
Buffalo
Sucker
Warmouth sunfish
Sunfish
Pike
Sac-a-lait (crappie)
Choupique (bowfin)
American eel
Perch/trout
Carpfish
Blowing fish

Lepisoteus spp.
Ictalurus furcatus
Ictalurus punctatus
Pyldictus olivarius
Ictalurus spp.
Polydon spathula
Fam. Ictaluridae
Ictiobus bubalus
Ictiobus spp.
Fam. Catostomidae
Lepomis gulosus
Lepomis spp.
Fam. Percidae
Pomoxis spp.
Amia calva
Anguilla rostrata

Reptiles

Loggerhead turtle
Green turtle
Alligator snapping turtle
Common snapping turtle
Turtles
Pond slider
River cooter
Cooter/slider
Eastern box turtle
Gopher tortoise
Softshell turtle
Alligator
Bullfrog

Caretta caretta
Chelonia mydas
Macrolemys temminckii
Chelydra serpentina
Fam. Emydidae
Trachemys scripta
Pseudemys concinna
Trachemys or Pseudemys spp.
Terrapene carolina
Gopherus polyphemus
Apalone spp.
Alligator mississippiensis
Rana catesbeiana

Crustaceans

Crawfish
Brown shrimp
White shrimp
Shrimp
Seabob
River shrimp
Blue crab

Procambarus spp.
Penaeus aztecs
Penaeus setiferus
Pinaeus spp.
Xiphopeneaus kroyeri
Marpobrachium obione
Callineces sapidus
APPENDIX II:

Wildgame and Fishery Resources Taken, Distributions,
and Ecological Divisions In Which Taken

Species and Past(1)/Present(2) Distributions____Ecol. Div.

**MAMMALS**

White-tailed deer: Virtually statewide in a variety of habitats(1) 1,2,3,4,5,6,7
Bison: Most of state except coastal marshes and perhaps Southeast terrace lands(1) 1
Black bear: Widespread through most of state(1) 1,2,3,4,6,7
Northern raccoon: Widespread over entire state(1) 1,2,3,4,5,7
Fox squirrel: Statewide except for coastal marsh, coastal islands and cheniers(2) 1,2,3
Grey squirrel: Statewide in forested areas except for some isolated cheniers(2) 1,2,4
Squirrel (various species) 1,2,3,4,5,7
Swamp rabbit: Statewide in suitable habitats(2) 4,7
Eastern cottontail: Virtually statewide except for parts of coastal marsh(2) 4,7
Rabbit (various species) 2,4,5,7
Opossum: Statewide in wooded areas and coastal marshes(2) 1,2,3,4,5,7
Cougar: Statewide in hardwood forest regions(1) 2,4,6,7
Bobcat: Virtually statewide in most habitats(2) 2,7
Common muskrat: South Louisiana, particularly in coastal marshes(1) 6
Nearctic river otter: Probably statewide in all marshes, streams, and swamps(1) 4,6
Feral hog 2,7

**BIRDS**

Canada goose: Transient through most of state, winter resident in coastal marshes and prairies(1) 4
Snow goose: Winter resident in coastal marshes of Louisiana(2) 4
White-fronted goose: Winter resident of coastal marshes and prairies west of the Mississippi River (1)

Goose/brant (various species) 1, 2, 4, 5, 6

Mallard: Statewide winter resident in suitable situations (2) 1, 2, 3, 4, 5, 6, 7

Mottled duck: Permanent resident of coastal region and prairies (2) 2

Blackduck: Statewide, but chiefly in south Louisiana (2) 4, 5, 6

Gadwall: Winter resident of coastal region, especially Cameron Parish, less common in interior (2) 4

Northern pintail: Unevenly statewide, primarily south Louisiana (2) 6

Green-winged teal: Statewide in winter, but mainly in southern area (2) 4

Blue-winged teal: Abundant transients through state in late summer—early fall and in spring migrations (2) 4

Northern shoveler: Primarily in south Louisiana in winter, transient elsewhere in state (2) 4

American wigeon: Statewide winter resident in coastal regions mainly (2) 4

Wood duck: Statewide permanent resident in suitable habitats (2) 4

Canvasback duck: South Louisiana winter resident transient elsewhere in state (2) 4, 5, 6

Lesser scaup: Statewide winter resident, chiefly in south Louisiana (2) 6

Redhead duck: Gulf coast winter resident, mainly in southeast Louisiana (2) 4, 6

Diving duck (various species) 2

Hooded merganser: Statewide winter resident, mainly in south Louisiana (2) 2

Duck (various species) 1, 2, 3, 4, 5, 6, 7

Teal (various species) 2, 4, 5

Loon: Primarily winter resident in southern Louisiana (2) 2

Pied-billed grebe: Virtually statewide permanent resident (2) 2

Pelicans: Permanent residents of coastal region, transient elsewhere in state (1) 2, 4

Double-crested cormorant: Winter and early spring residents, previously bred in state (1) 4

Great blue heron: Statewide permanent resident (2) 2, 4
Little blue heron: Primarily spring-summer residents southern part of state, some winter residents.

Great egret: Permanent resident of southern part of state.

Snowy egret: Statewide permanent resident most numerous in south Louisiana.

Egret: (various species)

Black-crowned night heron: Statewide permanent resident, concentrates in south in winter.

Yellow-crowned night heron: Statewide summer resident, permanent in south.

Heron (various species)

American bittern: Statewide permanent resident, seasonally variable presence.

Wood stork: Permanent resident, south Louisiana, summer visitor in north.

Roseate spoonbill: Permanent resident, southwest Louisiana and coastal zone.

Prairie chicken: Permanent resident of coastal prairies of southwest, also southeast meadowlands and in Macon Ridge vicinity.

Bobwhite quail: Virtually statewide in suitable habitat.

Wild turkey: Virtually statewide in suitable habitat.

Whooping crane: Winter resident of prairies and marshes of southwest Louisiana.

Sandhill crane: Winter resident of southwest prairies region and southeast terrace lands.

Crane (various species)

Rail: Primarily southern half of Louisiana.

Common gallinule: Primarily south Louisiana.

American coot: Permanent resident, statewide.

American golden plover: Spring transients over much of state, occasional presence in fall and late winter.

Plover (various species)

Killdeer: Virtually statewide.

Marbled godwit: Transient over south Louisiana.

Eskimo curlew: Transient over south Louisiana.

Upland sandpiper: Transient through state during spring and fall.

Yellowleg: Primarily winter residents in coastal region, transients elsewhere.
Willet: Permanent resident of coastal region, rare transient elsewhere(1)

Spotted sandpiper: Apparently statewide(1)

American woodcock: Virtually statewide winter resident except in coastal marshes(1)

Common snipe: Present statewide except during summer(2)

Sandpiper (various species)

Domestic pigeon: Semiferal resident of towns and cities around state(2)

Pigeon (uncertain species)

Mourning dove: Statewide permanent resident with winter concentration in south(2)

Barred owl: Permanent in most forested parts of Louisiana(2)

Kingfisher: Statewide permanent resident(2)

Common flicker: Widespread permanent resident(2)

Pileated woodpecker: Permanent resident in heavy forest regions(2)

Ivory-billed woodpecker: Permanent resident in heavy bottomland and hardwood forest(1)

Red bellied woodpecker: Permanent in practically all wooded parts of the state(2)

Woodpecker (various species)

Sapsucker: Winter resident in all wooded parts of state(2)

Lark (various species)

Perching birds (various species)

Swallow (various species)

Blue jay: Statewide permanent resident except for parts of coastal region(2)

Common crow: Statewide winter visitor, absent only from coastal marshes(2)

Tufted titmouse: Widespread permanent resident of wooded areas except in coastal marshes(2)

Robin: Statewide winter resident(2)

Thrush (various species)

Bluebird: Virtually statewide in winter, may be absent from coastal region(2)

Cedar waxwing: Winter resident across most of Louisiana(2)

Vireos: Primarily summer residents statewide in wooded or brushy regions(2)

Cerulean warbler: Widespread spring and fall transients across state(2)
Bobolink: Spring and fall transient across Louisiana(2)
Red-winged black bird: Statewide permanent resident(2)
Black bird (various species) 2
Common grackle: Statewide permanent resident except for coastal marshes(2)
Cardinal: Widespread permanent resident, absent from coastal marshes and deep inland swamps(2)
Goldfinch: Primarily northern and central parts of state and northwestern Florida Parishes(2)
Rufous-sided towhee: Widespread winter resident, summer concentrations in southeastern part of state(2)
Sparrow (various species) 2
Bacbon (unidentified species) 2

SALTWATER FISH

Florida pampano: Surf zone and lower estuaries during summer(2)
Jack (various species) 4
Redfish: Inshore saline zone of estuarine region(2)
Black drum: Shallow estuarine region, mud flats, intercoastal waters(2)
Drum (various species) - 4
Atlantic croaker: Shallows and sandy beach shorelines(2)
Speckled seatrout: Inshore saline zone, near grassflats and oyster reefs(2)
Sheepshead: Inshore saline zone(2)
Mullet: Shallow bottom areas of rivers of inshore saline zone(2)
Grouper: Clear offshore waters and some around jetties(2)
Southern flounder: shallows of inshore saline zone of estuarine region(2)
Flounder (various species) 4
Red snapper: Deep water, offshore fish(2)
Spanish mackerel: Generally offshore fish, young are common in the surf zone and in low-salinity bays.
Sea catfish: estuarine region, bays and inlets, may swarm in bayous
Bluefish: Mainly offshore, appears inshore only during cooler months(2)
Stingrays: Plentiful in bay and gulf surfs, they are common inshore fish, known to enter rivers in Louisiana, bottom dwellers.

**FRESHWATER FISH**

<table>
<thead>
<tr>
<th>Fish</th>
<th>Habitat and Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>White bass</td>
<td>Larger rivers of northern and central Louisiana</td>
</tr>
<tr>
<td>Largemouth bass</td>
<td>Statewide in all suitable freshwater habitats from small creeks to large lakes</td>
</tr>
<tr>
<td>Rock bass</td>
<td>Limited to streams of the Florida Parishes and the Pearl River</td>
</tr>
<tr>
<td>Gaspergou</td>
<td>Statewide, mainly in larger rivers and lakes</td>
</tr>
<tr>
<td>Pickerel</td>
<td>Statewide in various situations</td>
</tr>
<tr>
<td>Paddlefish</td>
<td>Larger streams and connected lakes of Mississippi Valley</td>
</tr>
<tr>
<td>Gar</td>
<td>Statewide in all types of water bodies</td>
</tr>
<tr>
<td>Blue catfish</td>
<td>Mississippi River, larger streams, and silted bayous of Louisiana</td>
</tr>
<tr>
<td>Channel catfish</td>
<td>Statewide in most lakes and rivers</td>
</tr>
<tr>
<td>Yellow catfish</td>
<td>Statewide distribution</td>
</tr>
<tr>
<td>Bullhead catfish</td>
<td>Statewide in most lakes, rivers and backwaters</td>
</tr>
<tr>
<td>Catfish (various species)</td>
<td>Statewide in larger streams, rivers, and lakes</td>
</tr>
<tr>
<td>Smallmouth buffalo</td>
<td>Statewide in larger streams, rivers, and lakes</td>
</tr>
<tr>
<td>Buffalo</td>
<td>Statewide in larger streams, rivers, and lakes</td>
</tr>
<tr>
<td>Sucker (various species)</td>
<td>Statewide, mainly in bayous and small impoundments</td>
</tr>
<tr>
<td>Warmouth sunfish</td>
<td>Statewide, mainly in bayous and small impoundments</td>
</tr>
<tr>
<td>Sunfish (various species)</td>
<td>Statewide, mainly in bayous and small impoundments</td>
</tr>
<tr>
<td>Pike (species uncertain)</td>
<td>Statewide in a variety of habitats</td>
</tr>
<tr>
<td>Sac-a-lait</td>
<td>Statewide in bayous and backwaters of rivers</td>
</tr>
<tr>
<td>Choupique</td>
<td>Statewide in bayous and backwaters of rivers</td>
</tr>
<tr>
<td>American eel</td>
<td>Statewide, but especially abundant in Lower Pearl River and streams of the Lake Pontchartrain drainage</td>
</tr>
<tr>
<td>Perch/trout</td>
<td>(unidentified species)</td>
</tr>
<tr>
<td>Carpfish</td>
<td>(unidentified species)</td>
</tr>
<tr>
<td>Blowing fish</td>
<td>(unidentified species)</td>
</tr>
</tbody>
</table>
REPTILES AND AMPHIBIANS

Loggerhead turtle: Bays of southeast coast of state and offshore islands (2)
Green turtle: Coast of state (2)
Alligator snapping turtle: Statewide, in large rivers, lakes, and riverine swamps (2)
Common snapping turtle: Statewide in freshwater, permanent ponds, lakes, and streams (2)

Turtles (various species)
Pond slider: Statewide in rivers and some lakes (2)
River cooter: Statewide in sluggish or silted streams, ponds, and lakes (2)
Cooter/slider: Statewide in various habitats (2)
Eastern box turtle: Statewide except for coastal marshes (2)

Gopher tortoise: Longleaf forest uplands of Florida Parishes (1)
Softshell turtle: Statewide, absent only from saline and brackish marsh (2)
Alligator: Essentially statewide in suitable habitats (2)
Bullfrog: Statewide where permanent water is present (2)

CRUSTACEANS

Crawfish: Primarily rivers and swamps of southern Louisiana (1)
Brown shrimp: Bays and estuaries of coastal region (2)
White shrimp: Bays and estuaries of coastal region (2)
Shrimp: Bays and estuaries of coastal region (2)
Seabob: Found in near offshore waters and near beaches seasonally (2)
River shrimp: Larger rivers from Pearl to Sabine, and lakes of floodplains (2)
Blue crab: South Louisiana and Atchafalaya Basin as far north as Krotz Springs (2)
STATE OF LOUISIANA
1. Northwest Louisiana Uplands
2. Upper Mississippi - Tensas - Ouachita - Red River Bottomlands
3. Southwest Louisiana Terrace Lands
4. Lower Mississippi - Atchafalaya Bottomlands
5. Southwest Louisiana Prairies
6. Coastal Marshes
7. Southeast Louisiana Terrace Lands

Figure 14. Ecological Divisions of Louisiana (after St. Amant 1959).
VITA

James Patrick Whelan, Jr. was born in Fort Wayne, Indiana on November 20, 1939. After a brief sojourn in Trinidad, British West Indies, he grew up in San Bernardino, California where he attended St. Bernardine's High School and San Bernardino Valley College. He moved to San Francisco and attended San Francisco State University where he received his B.A. (1964) and M.A. (1970) in anthropology. During a period in Canada, he taught at the University of Winnipeg, Brandon University, the University of Manitoba, the University of Alberta, and Medicine Hat College.

He entered the doctoral program in Geography at Louisiana State University in August 1981. After completing his coursework, he taught at the University of New Orleans, Xavier University of New Orleans, Southeastern Louisiana University, and two summer sessions at LSU. He has also worked as an archaeological - historical resources consultant for a company in Baton Rouge. He is currently Assistant Professor of Geography and Anthropology at McNeese State University, Lake Charles, Louisiana.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: James Patrick Whelan, Jr

Major Field: Geography

Title of Dissertation: FROM FOREST, STREAM, AND SEA: ASPECTS OF SELF-SUFFICIENCY IN THE NINETEENTH CENTURY LOUISIANA DIET

Approved:

James B. Williams
Major Professor and Chairman

F. Ellen Hembry
Dean of the Graduate School

EXAMINING COMMITTEE:

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Date of Examination:

11-15-89